



# Appendix K

## Slug Test

C-Block Quarry

Load Line 12

Building 1200

Landfill North of Winklepeck Burning Grounds

NACA Test Area

Load Line 5

Load Line 7

Load Line 8

Load Line 10

Atlas Scrap Yard

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: CBLmw-001      Date Started: 01/26/05      Date Completed: 01/26/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	A926	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1181.08</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>6.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>49.65</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>38.90</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>10.75</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~39'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	CBLmw-001-IN	01/26/05	01/26/05	1352	1408	~48'				
2	CBLmw-001-OUT	01/26/05	01/26/05	1408	1430	~48'				

STORAGE LOCATION OF DATA:

1) ~~PROJECTS-CONTRACTS/RVAAP/RI14 CHARACTERIZATION/SLUG TEST DATA~~ \minitroll DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER

ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)

Reviewed by: [Signature]

Signature: [Signature]

Date: 5/6/05



**MKM Engineers, Inc.**

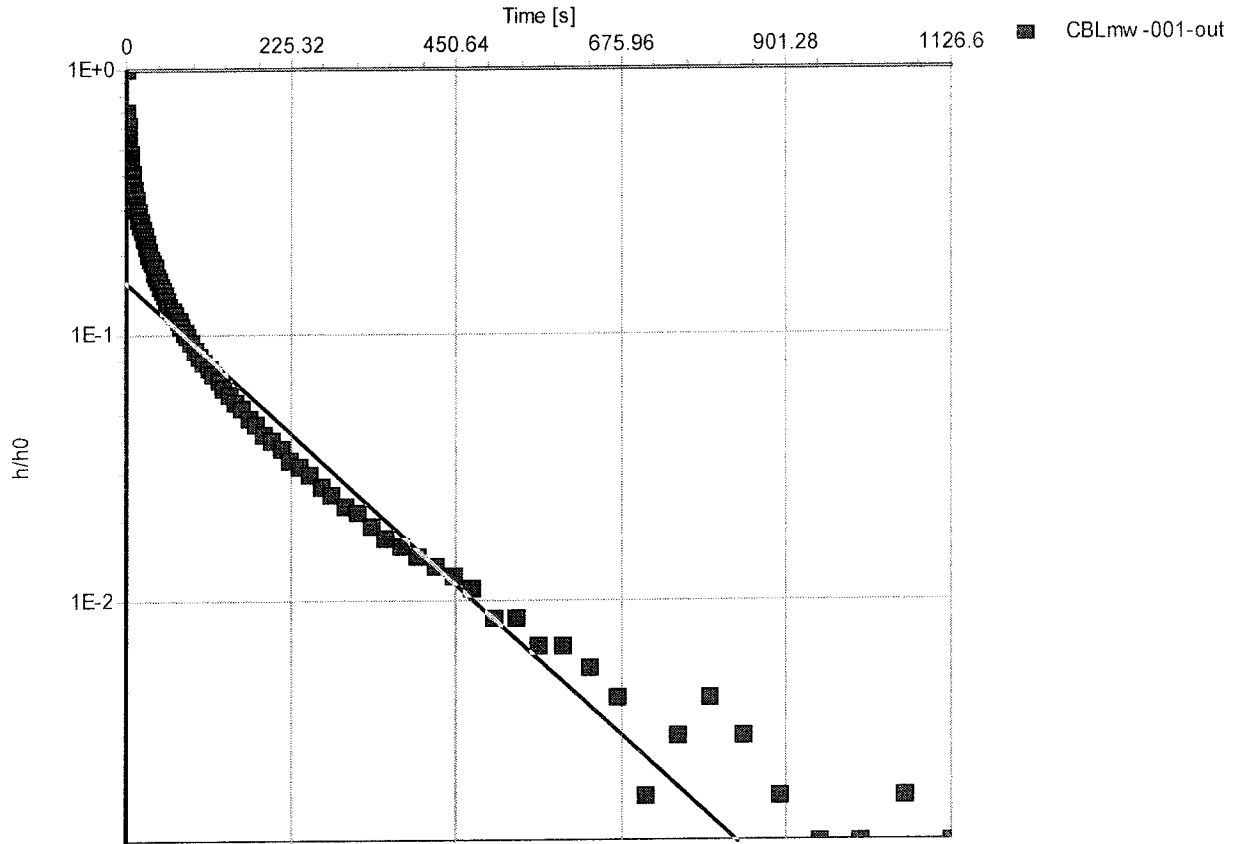
8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

CBLmw-001 (Bouwer-Rice)



Test name: CBLmw-001

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity: 1.75E-4 [cm/s]

Test parameters:

Test Well:	CBLmw-001-out	Aquifer thickness:	10.75 [ft]
Screen radius:	0.26042 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.149 [ft]		

Comments:

Evaluated by:

Date: 2/10/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/28/05 07:33:31  
 Report from file: ...\\SN04926 2005-01-26 140841 CBLmw-001-out.bin  
 Win-Situ Version 4.50

Serial number: 00004926  
 Firmware Version 3.09  
 Unit name: miniTROLL

Test name: CBLmw-001-out

Test defined on: 01/25/05 15:39:18  
 Test started on: 01/26/05 14:08:41  
 Test stopped on: 01/26/05 14:30:51  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 114

TOTAL DATA SAMPLES 114

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 6.825 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	
			Temperature Fahrenheit	Pressure Feet H2O	
01/26/05		14:08:41	0.0	52.54	0.000
01/26/05		14:08:41	0.3	52.54	0.883
01/26/05		14:08:42	0.6	52.56	0.394
01/26/05		14:08:42	0.9	52.56	0.340
01/26/05		14:08:42	1.2	52.58	0.234
01/26/05		14:08:43	1.5	52.58	0.258
01/26/05		14:08:43	1.8	52.58	0.188
01/26/05		14:08:43	2.1	52.58	0.184
01/26/05		14:08:44	2.4	52.58	0.151
01/26/05		14:08:44	2.7	52.58	0.129
01/26/05		14:08:44	3.0	52.60	0.107
01/26/05		14:08:44	3.3	52.60	0.087
01/26/05		14:08:45	3.6	52.60	0.070
01/26/05		14:08:45	3.9	52.60	0.050
01/26/05		14:08:45	4.2	52.60	0.035
01/26/05		14:08:46	4.5	52.60	0.021
01/26/05		14:08:46	4.8	52.60	0.008
01/26/05		14:08:46	5.1	52.60	-0.005
01/26/05		14:08:47	5.4	52.60	-0.022
01/26/05		14:08:47	5.7	52.60	-0.033

CBLmw-001-out.txt

01/26/05	14:08:47	6.0	52.60	-0.047
01/26/05	14:08:48	6.4	52.60	-0.058
01/26/05	14:08:48	6.7	52.63	-0.071
01/26/05	14:08:48	7.1	52.63	-0.088
01/26/05	14:08:49	7.5	52.63	-0.099
01/26/05	14:08:49	8.0	52.63	-0.111
01/26/05	14:08:50	8.4	52.63	-0.126
01/26/05	14:08:50	8.9	52.63	-0.139
01/26/05	14:08:51	9.5	52.63	-0.152
01/26/05	14:08:51	10.0	52.60	-0.165
01/26/05	14:08:52	10.6	52.60	-0.178
01/26/05	14:08:52	11.3	52.60	-0.193
01/26/05	14:08:53	11.9	52.60	-0.205
01/26/05	14:08:54	12.6	52.60	-0.220
01/26/05	14:08:55	13.4	52.60	-0.233
01/26/05	14:08:55	14.2	52.60	-0.246
01/26/05	14:08:56	15.0	52.60	-0.259
01/26/05	14:08:57	15.9	52.58	-0.272
01/26/05	14:08:58	16.8	52.60	-0.286
01/26/05	14:08:59	17.8	52.58	-0.298
01/26/05	14:09:00	18.9	52.58	-0.312
01/26/05	14:09:01	20.0	52.58	-0.325
01/26/05	14:09:02	21.2	52.58	-0.338
01/26/05	14:09:04	22.4	52.58	-0.347
01/26/05	14:09:05	23.8	52.58	-0.358
01/26/05	14:09:06	25.2	52.58	-0.373
01/26/05	14:09:08	26.7	52.58	-0.384
01/26/05	14:09:09	28.2	52.58	-0.397
01/26/05	14:09:11	29.8	52.58	-0.408
01/26/05	14:09:13	31.5	52.58	-0.419
01/26/05	14:09:14	33.3	52.58	-0.430
01/26/05	14:09:16	35.2	52.58	-0.443
01/26/05	14:09:18	37.3	52.58	-0.454
01/26/05	14:09:21	39.5	52.58	-0.465
01/26/05	14:09:23	41.8	52.58	-0.474
01/26/05	14:09:25	44.3	52.58	-0.487
01/26/05	14:09:28	46.9	52.58	-0.498
01/26/05	14:09:31	49.7	52.56	-0.507
01/26/05	14:09:34	52.6	52.56	-0.516
01/26/05	14:09:37	55.7	52.56	-0.526
01/26/05	14:09:40	59.0	52.56	-0.537
01/26/05	14:09:44	62.5	52.56	-0.546
01/26/05	14:09:47	66.2	52.56	-0.553
01/26/05	14:09:51	70.1	52.56	-0.562
01/26/05	14:09:55	74.3	52.56	-0.570
01/26/05	14:10:00	78.7	52.56	-0.579
01/26/05	14:10:05	83.4	52.56	-0.586
01/26/05	14:10:10	88.4	52.56	-0.594
01/26/05	14:10:15	93.7	52.54	-0.603
01/26/05	14:10:20	99.3	52.56	-0.610
01/26/05	14:10:26	105.2	52.54	-0.618
01/26/05	14:10:33	111.5	52.54	-0.623
01/26/05	14:10:39	118.1	52.54	-0.629
01/26/05	14:10:46	125.1	52.54	-0.636
01/26/05	14:10:54	132.6	52.54	-0.643
01/26/05	14:11:02	140.5	52.54	-0.649
01/26/05	14:11:10	148.9	52.54	-0.655
01/26/05	14:11:19	157.8	52.54	-0.660
01/26/05	14:11:28	167.2	52.54	-0.667
01/26/05	14:11:38	177.2	52.54	-0.671
01/26/05	14:11:49	187.8	52.54	-0.677
01/26/05	14:12:00	199.0	52.54	-0.680
01/26/05	14:12:12	210.9	52.54	-0.684

CBLmw-001-out.txt

01/26/05	14:12:25	223.5	52.51	-0.690
01/26/05	14:12:38	236.8	52.54	-0.693
01/26/05	14:12:52	250.9	52.51	-0.697
01/26/05	14:13:07	265.8	52.51	-0.701
01/26/05	14:13:23	281.6	52.51	-0.704
01/26/05	14:13:40	298.4	52.51	-0.708
01/26/05	14:13:57	316.2	52.51	-0.710
01/26/05	14:14:16	335.0	52.51	-0.714
01/26/05	14:14:36	354.9	52.49	-0.717
01/26/05	14:14:57	376.0	52.49	-0.719
01/26/05	14:15:20	398.4	52.47	-0.721
01/26/05	14:15:43	422.1	52.47	-0.723
01/26/05	14:16:08	447.2	52.45	-0.725
01/26/05	14:16:35	473.8	52.45	-0.727
01/26/05	14:17:03	502.0	52.45	-0.731
01/26/05	14:17:33	531.9	52.45	-0.731
01/26/05	14:18:05	563.5	52.45	-0.734
01/26/05	14:18:38	597.0	52.45	-0.734
01/26/05	14:19:14	632.5	52.45	-0.736
01/26/05	14:19:51	670.1	52.45	-0.738
01/26/05	14:20:31	709.9	52.45	-0.742
01/26/05	14:21:13	752.1	52.45	-0.740
01/26/05	14:21:58	796.8	52.42	-0.738
01/26/05	14:22:45	844.2	52.45	-0.740
01/26/05	14:23:36	894.4	52.45	-0.742
01/26/05	14:24:29	947.5	52.45	-0.743
01/26/05	14:25:25	1003.8	52.45	-0.743
01/26/05	14:26:25	1063.4	52.45	-0.742
01/26/05	14:27:28	1126.6	52.45	-0.743
01/26/05	14:28:35	1193.5	52.45	-0.745
01/26/05	14:29:46	1264.4	52.45	-0.745

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: CBLmw-002      Date Started: 01/26/05      Date Completed: 01/26/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>175.24</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>6.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>47.31</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>33.73</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>13.58</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~ 3A'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	CBLmw-002-IN	01/26/05	01/26/05	1338	1400	~46'				
2	CBLmw-002-OUT	01/26/05	01/26/05	1401	1421	~46'				

STORAGE LOCATION OF DATA: PROJECTS-CONTRACTS\RVAAP-RI14\CHARACTERIZATION\SLUG TEST DATA\MINI-TROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
 ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

### REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
 Signature: David K. Earnest      Date: 5/6/05



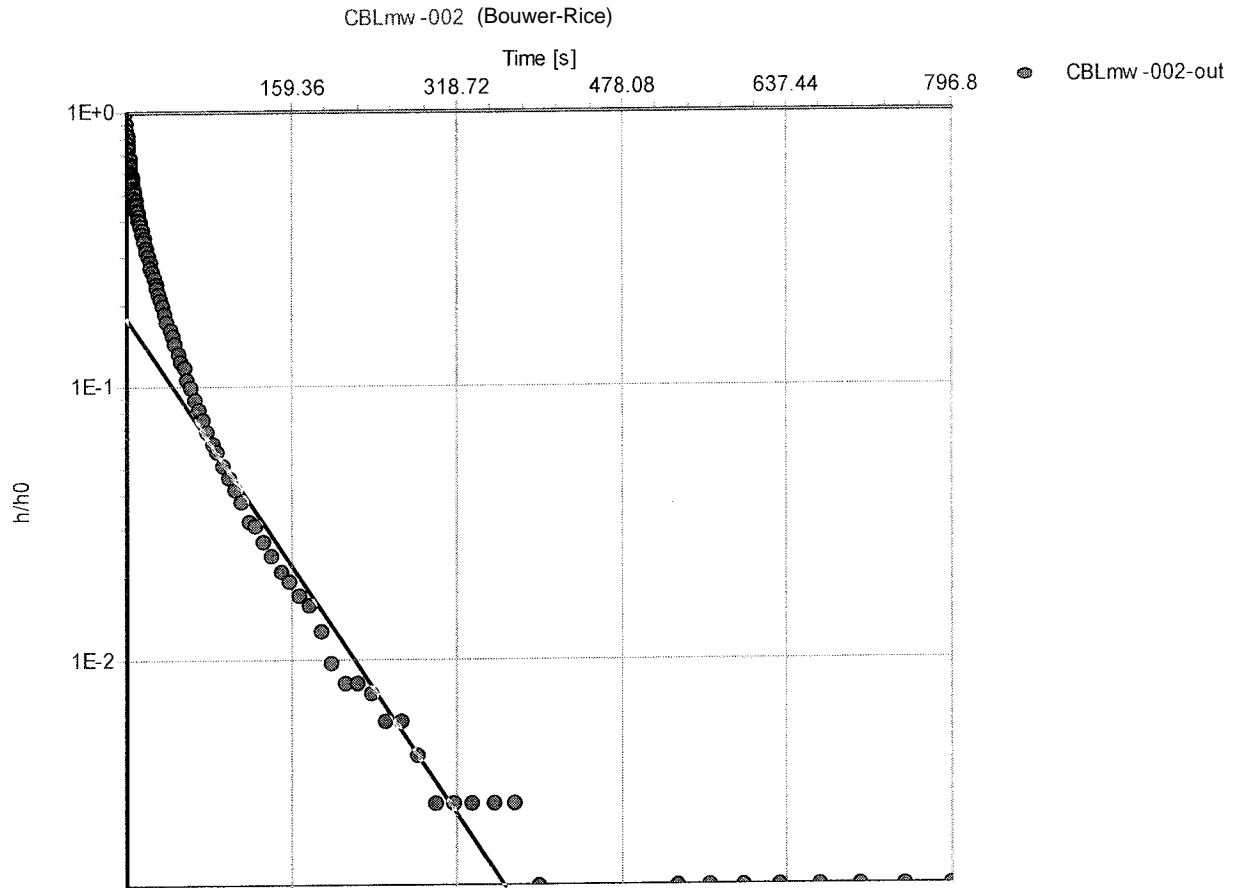
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: CBLmw-002

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity: 4.14E-4 [cm/s]

Test parameters:

Test Well:	CBLmw-002-out	Aquifer thickness:	13.58 [ft]
Screen radius:	0.26042 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.149 [ft]		

Comments:

Evaluated by:

Date: 2/10/2005





CBLmw-002-out.txt

01/26/05	14:01:42	6.0	51.74	-1.226
01/26/05	14:01:42	6.4	51.74	-1.239
01/26/05	14:01:43	6.7	51.74	-1.256
01/26/05	14:01:43	7.1	51.74	-1.269
01/26/05	14:01:44	7.5	51.74	-1.286
01/26/05	14:01:44	8.0	51.74	-1.300
01/26/05	14:01:44	8.4	51.74	-1.315
01/26/05	14:01:45	8.9	51.74	-1.330
01/26/05	14:01:46	9.5	51.76	-1.347
01/26/05	14:01:46	10.0	51.74	-1.362
01/26/05	14:01:47	10.6	51.74	-1.378
01/26/05	14:01:47	11.3	51.74	-1.393
01/26/05	14:01:48	11.9	51.74	-1.410
01/26/05	14:01:49	12.6	51.72	-1.427
01/26/05	14:01:49	13.4	51.72	-1.442
01/26/05	14:01:50	14.2	51.72	-1.458
01/26/05	14:01:51	15.0	51.72	-1.475
01/26/05	14:01:52	15.9	51.72	-1.490
01/26/05	14:01:53	16.8	51.72	-1.507
01/26/05	14:01:54	17.8	51.72	-1.524
01/26/05	14:01:55	18.9	51.72	-1.540
01/26/05	14:01:56	20.0	51.72	-1.557
01/26/05	14:01:57	21.2	51.72	-1.574
01/26/05	14:01:58	22.4	51.72	-1.590
01/26/05	14:02:00	23.8	51.72	-1.607
01/26/05	14:02:01	25.2	51.72	-1.622
01/26/05	14:02:03	26.7	51.72	-1.639
01/26/05	14:02:04	28.2	51.72	-1.654
01/26/05	14:02:06	29.8	51.72	-1.667
01/26/05	14:02:08	31.5	51.72	-1.683
01/26/05	14:02:09	33.3	51.70	-1.696
01/26/05	14:02:11	35.2	51.70	-1.711
01/26/05	14:02:13	37.3	51.70	-1.726
01/26/05	14:02:16	39.5	51.70	-1.741
01/26/05	14:02:18	41.8	51.70	-1.756
01/26/05	14:02:20	44.3	51.70	-1.769
01/26/05	14:02:23	46.9	51.70	-1.782
01/26/05	14:02:26	49.7	51.70	-1.795
01/26/05	14:02:29	52.6	51.70	-1.808
01/26/05	14:02:32	55.7	51.70	-1.817
01/26/05	14:02:35	59.0	51.70	-1.830
01/26/05	14:02:39	62.5	51.70	-1.841
01/26/05	14:02:42	66.2	51.70	-1.853
01/26/05	14:02:46	70.1	51.70	-1.862
01/26/05	14:02:50	74.3	51.70	-1.871
01/26/05	14:02:55	78.7	51.67	-1.881
01/26/05	14:02:59	83.4	51.67	-1.890
01/26/05	14:03:04	88.4	51.67	-1.895
01/26/05	14:03:10	93.7	51.67	-1.903
01/26/05	14:03:15	99.3	51.67	-1.910
01/26/05	14:03:21	105.2	51.67	-1.916
01/26/05	14:03:28	111.5	51.67	-1.921
01/26/05	14:03:34	118.1	51.67	-1.929
01/26/05	14:03:41	125.1	51.67	-1.931
01/26/05	14:03:49	132.6	51.67	-1.936
01/26/05	14:03:57	140.5	51.67	-1.940
01/26/05	14:04:05	148.9	51.65	-1.944
01/26/05	14:04:14	157.8	51.65	-1.946
01/26/05	14:04:23	167.2	51.65	-1.949
01/26/05	14:04:33	177.2	51.65	-1.951
01/26/05	14:04:44	187.8	51.65	-1.955
01/26/05	14:04:55	199.0	51.65	-1.959
01/26/05	14:05:07	210.9	51.65	-1.961

CBLmw-002-out.txt

01/26/05	14:05:20	223.5	51.65	-1.961
01/26/05	14:05:33	236.8	51.65	-1.962
01/26/05	14:05:47	250.9	51.65	-1.964
01/26/05	14:06:02	265.8	51.65	-1.964
01/26/05	14:06:18	281.6	51.63	-1.966
01/26/05	14:06:34	298.4	51.65	-1.968
01/26/05	14:06:52	316.2	51.65	-1.968
01/26/05	14:07:11	335.0	51.63	-1.968
01/26/05	14:07:31	354.9	51.65	-1.968
01/26/05	14:07:52	376.0	51.65	-1.968
01/26/05	14:08:14	398.4	51.63	-1.970
01/26/05	14:08:38	422.1	51.65	-1.972
01/26/05	14:09:03	447.2	51.65	-1.972
01/26/05	14:09:30	473.8	51.63	-1.972
01/26/05	14:09:58	502.0	51.63	-1.972
01/26/05	14:10:28	531.9	51.65	-1.974
01/26/05	14:11:00	563.5	51.63	-1.974
01/26/05	14:11:33	597.0	51.63	-1.974
01/26/05	14:12:09	632.5	51.63	-1.974
01/26/05	14:12:46	670.1	51.63	-1.974
01/26/05	14:13:26	709.9	51.65	-1.974
01/26/05	14:14:08	752.1	51.63	-1.974
01/26/05	14:14:53	796.8	51.65	-1.974
01/26/05	14:15:40	844.2	51.65	-1.972
01/26/05	14:16:30	894.4	51.63	-1.972
01/26/05	14:17:24	947.5	51.63	-1.972
01/26/05	14:18:20	1003.8	51.63	-1.972
01/26/05	14:19:19	1063.4	51.63	-1.972
01/26/05	14:20:23	1126.6	51.63	-1.972

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: CBLMW-003      Date Started: 01/26/05      Date Completed: 01/26/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1175.06</u>	RISER CASING I.D. (in.): <u>2 in</u>
SCREEN OR OPEN HOLE I.D. (in): <u>2 in</u>	DIAMETER OF BOREHOLE (IF SCREENED): <u>6.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>44.73</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>30.14</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>14.59</u>	SCREEN LENGTH
		FEET
		METERS

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~31'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>CBLMW-003-IN</u>	<u>01/26/05</u>	<u>01/26/05</u>	<u>15:06</u>	<u>15:27</u>	<u>~43'</u>				
2	<u>CBLMW-003-OUT</u>	<u>01/26/05</u>	<u>01/26/05</u>	<u>15:27</u>	<u>15:49</u>	<u>~43'</u>				

STORAGE LOCATION OF DATA:

1) PROJECTS CONTRACTS \RVAAP\ RI 14 CHARACTERIZATION \SLUG TEST DATA\ MINI TROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	-	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)

Reviewed by: [Signature]

Signature: [Signature]

Date: 5/6/05



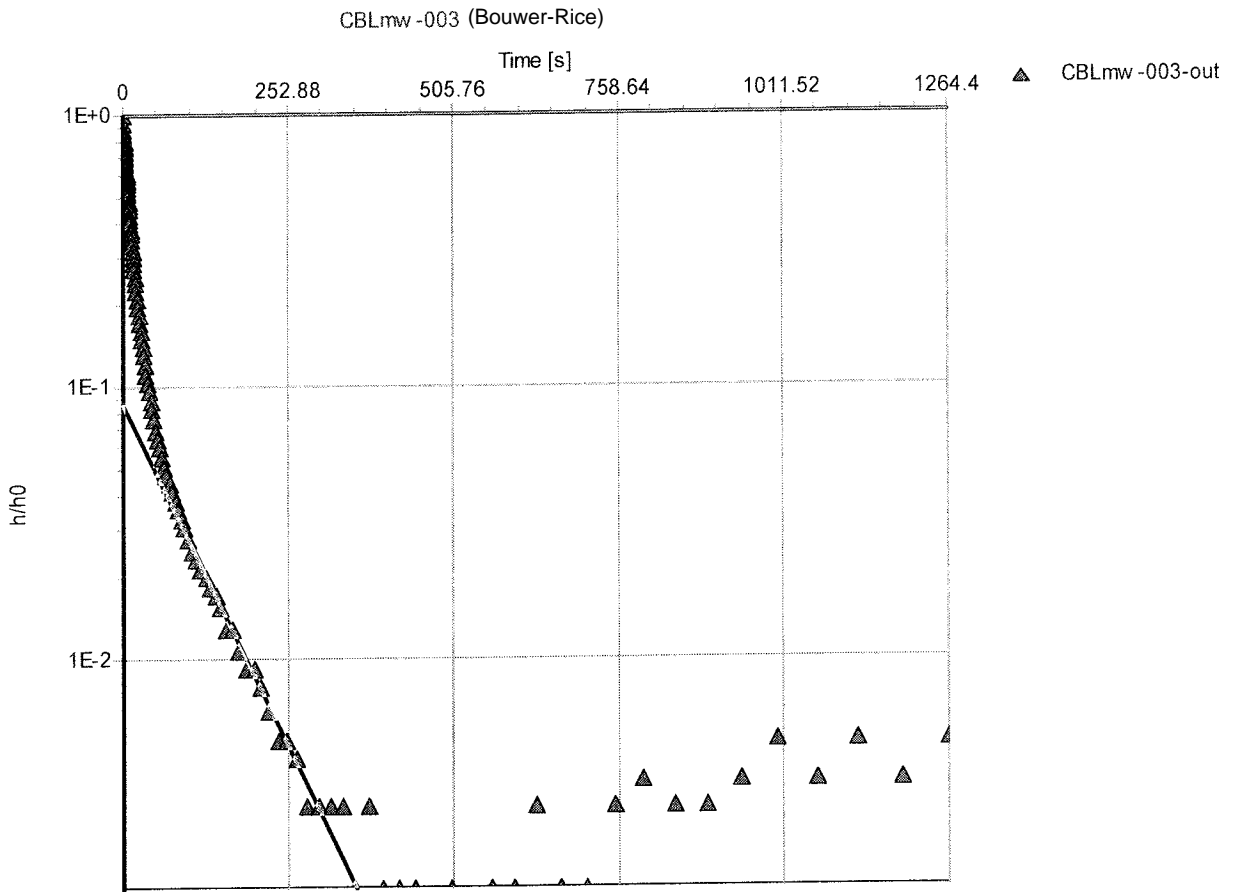
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: CBLmw-003

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity: 3.69E-4 [cm/s]

Test parameters:

Test Well:	CBLmw-003-out	Aquifer thickness:	14.59 [ft]
Screen radius:	0.26042 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.149 [ft]		

Comments:

Evaluated by:  
 Date: 2/10/2005

CBLmw-003-out.txt

In-Situ Inc. MiniTroll Pro

Report generated: 01/28/05 07:39:54  
 Report from file: ... \SN05444 2005-01-26 152720 CBLmw-003-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: CBLmw-003-out

Test defined on: 01/26/05 15:06:23  
 Test started on: 01/26/05 15:27:20  
 Test stopped on: 01/26/05 15:49:01  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 114

TOTAL DATA SAMPLES 114

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 8.038 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	Feet H2O
			Temperature	Pressure	
			Fahrenheit	Feet H2O	
01/26/05	15:27:20		0.0	52.73	0.000
01/26/05	15:27:20		0.3	52.76	-1.823
01/26/05	15:27:21		0.6	52.78	-1.914
01/26/05	15:27:21		0.9	52.78	-1.979
01/26/05	15:27:21		1.2	52.78	-2.020
01/26/05	15:27:22		1.5	52.80	-2.053
01/26/05	15:27:22		1.8	52.80	-2.113
01/26/05	15:27:22		2.1	52.80	-2.137
01/26/05	15:27:23		2.4	52.80	-2.169
01/26/05	15:27:23		2.7	52.80	-2.195
01/26/05	15:27:23		3.0	52.80	-2.224
01/26/05	15:27:23		3.3	52.80	-2.250
01/26/05	15:27:24		3.6	52.82	-2.276
01/26/05	15:27:24		3.9	52.82	-2.300
01/26/05	15:27:24		4.2	52.82	-2.325
01/26/05	15:27:25		4.5	52.82	-2.347
01/26/05	15:27:25		4.8	52.82	-2.367
01/26/05	15:27:25		5.1	52.82	-2.390
01/26/05	15:27:26		5.4	52.82	-2.410
01/26/05	15:27:26		5.7	52.82	-2.429

CBLmw-003-out.txt

01/26/05	15:27:26	6.0	52.82	-2.449
01/26/05	15:27:26	6.4	52.82	-2.470
01/26/05	15:27:27	6.7	52.82	-2.492
01/26/05	15:27:27	7.1	52.82	-2.514
01/26/05	15:27:28	7.5	52.82	-2.538
01/26/05	15:27:28	8.0	52.82	-2.561
01/26/05	15:27:29	8.4	52.82	-2.583
01/26/05	15:27:29	8.9	52.82	-2.607
01/26/05	15:27:30	9.5	52.82	-2.629
01/26/05	15:27:30	10.0	52.82	-2.652
01/26/05	15:27:31	10.6	52.82	-2.674
01/26/05	15:27:31	11.3	52.82	-2.698
01/26/05	15:27:32	11.9	52.82	-2.722
01/26/05	15:27:33	12.6	52.80	-2.745
01/26/05	15:27:34	13.4	52.80	-2.769
01/26/05	15:27:34	14.2	52.80	-2.793
01/26/05	15:27:35	15.0	52.80	-2.813
01/26/05	15:27:36	15.9	52.80	-2.836
01/26/05	15:27:37	16.8	52.80	-2.858
01/26/05	15:27:38	17.8	52.80	-2.880
01/26/05	15:27:39	18.9	52.80	-2.901
01/26/05	15:27:40	20.0	52.80	-2.923
01/26/05	15:27:41	21.2	52.80	-2.944
01/26/05	15:27:43	22.4	52.80	-2.962
01/26/05	15:27:44	23.8	52.80	-2.981
01/26/05	15:27:45	25.2	52.80	-2.997
01/26/05	15:27:47	26.7	52.80	-3.014
01/26/05	15:27:48	28.2	52.80	-3.029
01/26/05	15:27:50	29.8	52.78	-3.042
01/26/05	15:27:52	31.5	52.78	-3.057
01/26/05	15:27:53	33.3	52.78	-3.070
01/26/05	15:27:55	35.2	52.78	-3.085
01/26/05	15:27:57	37.3	52.78	-3.094
01/26/05	15:28:00	39.5	52.78	-3.105
01/26/05	15:28:02	41.8	52.78	-3.116
01/26/05	15:28:04	44.3	52.78	-3.124
01/26/05	15:28:07	46.9	52.78	-3.133
01/26/05	15:28:10	49.7	52.78	-3.143
01/26/05	15:28:13	52.6	52.78	-3.150
01/26/05	15:28:16	55.7	52.78	-3.156
01/26/05	15:28:19	59.0	52.78	-3.163
01/26/05	15:28:23	62.5	52.78	-3.169
01/26/05	15:28:26	66.2	52.78	-3.174
01/26/05	15:28:30	70.1	52.78	-3.178
01/26/05	15:28:34	74.3	52.78	-3.183
01/26/05	15:28:39	78.7	52.78	-3.187
01/26/05	15:28:44	83.4	52.78	-3.191
01/26/05	15:28:49	88.4	52.78	-3.195
01/26/05	15:28:54	93.7	52.78	-3.198
01/26/05	15:28:59	99.3	52.76	-3.202
01/26/05	15:29:05	105.2	52.78	-3.206
01/26/05	15:29:12	111.5	52.76	-3.208
01/26/05	15:29:18	118.1	52.76	-3.211
01/26/05	15:29:25	125.1	52.76	-3.213
01/26/05	15:29:33	132.6	52.76	-3.215
01/26/05	15:29:41	140.5	52.76	-3.217
01/26/05	15:29:49	148.9	52.76	-3.219
01/26/05	15:29:58	157.8	52.76	-3.223
01/26/05	15:30:07	167.2	52.76	-3.223
01/26/05	15:30:17	177.2	52.76	-3.226
01/26/05	15:30:28	187.8	52.76	-3.228
01/26/05	15:30:39	199.0	52.76	-3.228
01/26/05	15:30:51	210.9	52.76	-3.230

CBLmw-003-out.txt

01/26/05	15:31:04	223.5	52.76	-3.232
01/26/05	15:31:17	236.8	52.76	-3.234
01/26/05	15:31:31	250.9	52.76	-3.234
01/26/05	15:31:46	265.8	52.78	-3.235
01/26/05	15:32:02	281.6	52.76	-3.237
01/26/05	15:32:19	298.4	52.76	-3.237
01/26/05	15:32:36	316.2	52.78	-3.237
01/26/05	15:32:55	335.0	52.78	-3.237
01/26/05	15:33:15	354.9	52.78	-3.239
01/26/05	15:33:36	376.0	52.78	-3.237
01/26/05	15:33:59	398.4	52.78	-3.239
01/26/05	15:34:22	422.1	52.78	-3.239
01/26/05	15:34:47	447.2	52.76	-3.239
01/26/05	15:35:14	473.8	52.78	-3.241
01/26/05	15:35:42	502.0	52.78	-3.239
01/26/05	15:36:12	531.9	52.78	-3.241
01/26/05	15:36:44	563.5	52.76	-3.239
01/26/05	15:37:17	597.0	52.78	-3.239
01/26/05	15:37:53	632.5	52.76	-3.237
01/26/05	15:38:30	670.1	52.76	-3.239
01/26/05	15:39:10	709.9	52.76	-3.239
01/26/05	15:39:52	752.1	52.76	-3.237
01/26/05	15:40:37	796.8	52.76	-3.236
01/26/05	15:41:24	844.2	52.76	-3.237
01/26/05	15:42:15	894.4	52.76	-3.237
01/26/05	15:43:08	947.5	52.76	-3.236
01/26/05	15:44:04	1003.8	52.76	-3.234
01/26/05	15:45:04	1063.4	52.76	-3.236
01/26/05	15:46:07	1126.6	52.76	-3.234
01/26/05	15:47:14	1193.5	52.76	-3.236
01/26/05	15:48:25	1264.4	52.76	-3.234



# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: CBLmw-004      Date Started: 01/26/05      Date Completed: 01/26/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1174.84</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>6.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>46.98</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>31.65</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>15.33</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~32'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	CBLmw-004-IN	01/26/05	01/26/05	1519	1539	~45'				
2	CBLmw-004-OUT	01/26/05	01/26/05	1541	1559	~45'				

STORAGE LOCATION OF DATA: 1) PROJECTS-CONTRACTS-RVAAP-RI14-CHARACTERIZATION\SLUG TEST DATA\MINITROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

### REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



**MKM Engineers, Inc.**

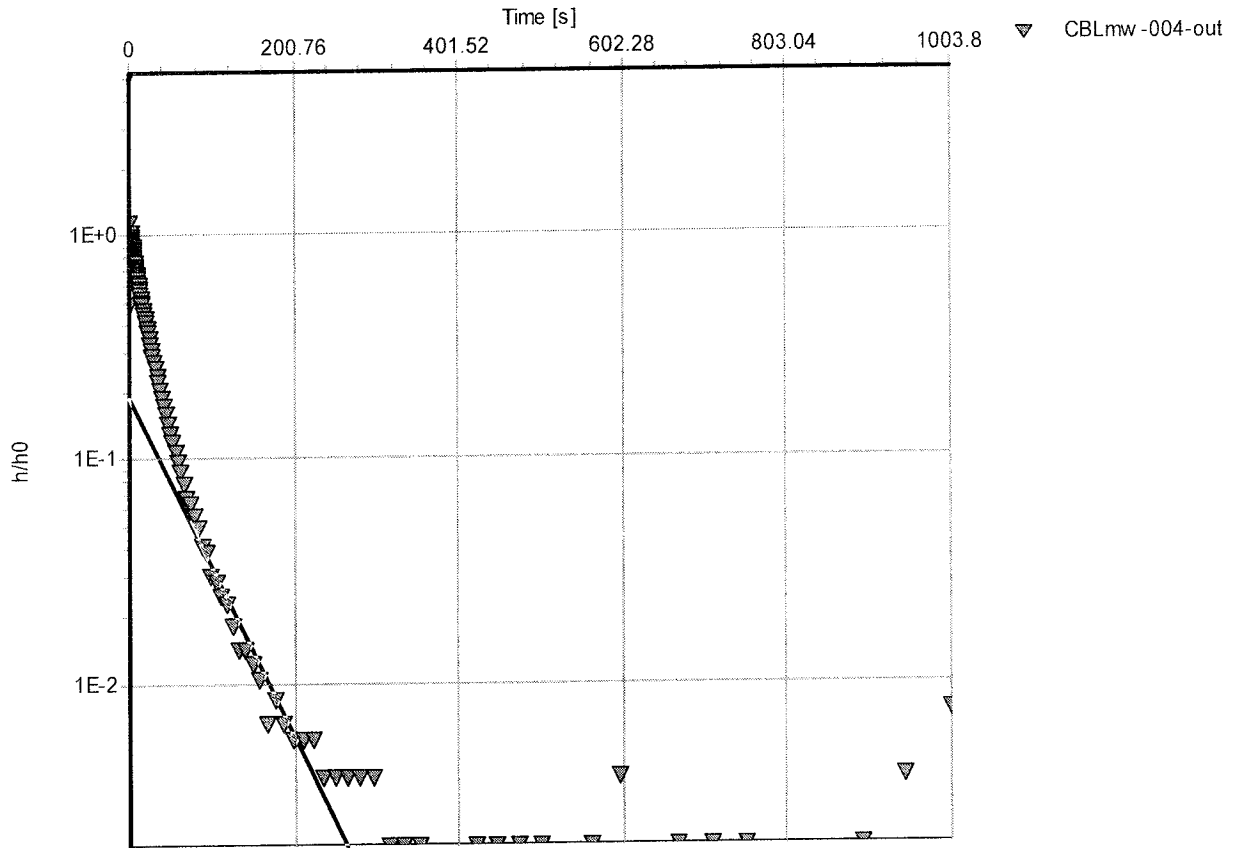
8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

CBLmw-004 (Bouwer-Rice)



Test name: **CBLmw-004**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 5.62E-4 [cm/s]

Test parameters:

Test Well:	CBLmw-004-out	Aquifer thickness:	15.33 [ft]
Screen radius:	0.26042 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.149 [ft]		

Comments:

Evaluated by:

Date: 2/10/2005

CBLmw-004-out.txt

In-Situ Inc. MiniTroll Pro

Report generated: 01/28/05 07:46:55  
 Report from file: ...\\SN04886 2005-01-26 154123 CBLmw-004-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: CBLmw-004-out

Test defined on: 01/25/05 15:50:04  
 Test started on: 01/26/05 15:41:23  
 Test stopped on: 01/26/05 15:59:07  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 110

TOTAL DATA SAMPLES 110

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 12.756 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	
			Temperature	Pressure	
			Fahrenheit	Feet H2O	
01/26/05	15:41:23		0.0	52.50	0.000
01/26/05	15:41:23		0.3	52.55	5.123
01/26/05	15:41:24		0.6	52.55	-0.051
01/26/05	15:41:24		0.9	52.55	0.491
01/26/05	15:41:24		1.2	52.57	0.653
01/26/05	15:41:25		1.5	52.57	0.531
01/26/05	15:41:25		1.8	52.57	0.518
01/26/05	15:41:25		2.1	52.57	0.489
01/26/05	15:41:25		2.4	52.57	0.467
01/26/05	15:41:26		2.7	52.59	0.443
01/26/05	15:41:26		3.0	52.59	0.423
01/26/05	15:41:26		3.3	52.59	0.404
01/26/05	15:41:27		3.6	52.59	0.384
01/26/05	15:41:27		3.9	52.59	0.368
01/26/05	15:41:27		4.2	52.59	0.349
01/26/05	15:41:28		4.5	52.59	0.333
01/26/05	15:41:28		4.8	52.59	0.316
01/26/05	15:41:28		5.1	52.59	0.301
01/26/05	15:41:28		5.4	52.59	0.285
01/26/05	15:41:29		5.7	52.59	0.270

CBLmw-004-out.txt

01/26/05	15:41:29	6.0	52.59	0.257
01/26/05	15:41:29	6.4	52.59	0.240
01/26/05	15:41:30	6.7	52.59	0.224
01/26/05	15:41:30	7.1	52.59	0.207
01/26/05	15:41:31	7.5	52.59	0.191
01/26/05	15:41:31	8.0	52.59	0.174
01/26/05	15:41:32	8.4	52.59	0.156
01/26/05	15:41:32	8.9	52.59	0.139
01/26/05	15:41:33	9.5	52.61	0.119
01/26/05	15:41:33	10.0	52.59	0.104
01/26/05	15:41:34	10.6	52.57	0.085
01/26/05	15:41:34	11.3	52.57	0.065
01/26/05	15:41:35	11.9	52.57	0.045
01/26/05	15:41:36	12.6	52.57	0.026
01/26/05	15:41:36	13.4	52.57	0.006
01/26/05	15:41:37	14.2	52.57	-0.016
01/26/05	15:41:38	15.0	52.57	-0.036
01/26/05	15:41:39	15.9	52.57	-0.057
01/26/05	15:41:40	16.8	52.57	-0.079
01/26/05	15:41:41	17.8	52.57	-0.101
01/26/05	15:41:42	18.9	52.57	-0.121
01/26/05	15:41:43	20.0	52.57	-0.143
01/26/05	15:41:44	21.2	52.57	-0.165
01/26/05	15:41:46	22.4	52.55	-0.186
01/26/05	15:41:47	23.8	52.55	-0.208
01/26/05	15:41:48	25.2	52.55	-0.228
01/26/05	15:41:50	26.7	52.55	-0.248
01/26/05	15:41:51	28.2	52.55	-0.269
01/26/05	15:41:53	29.8	52.55	-0.287
01/26/05	15:41:55	31.5	52.55	-0.305
01/26/05	15:41:56	33.3	52.55	-0.326
01/26/05	15:41:58	35.2	52.55	-0.342
01/26/05	15:42:00	37.3	52.55	-0.361
01/26/05	15:42:03	39.5	52.55	-0.377
01/26/05	15:42:05	41.8	52.55	-0.392
01/26/05	15:42:07	44.3	52.55	-0.409
01/26/05	15:42:10	46.9	52.55	-0.423
01/26/05	15:42:13	49.7	52.55	-0.438
01/26/05	15:42:16	52.6	52.52	-0.451
01/26/05	15:42:19	55.7	52.52	-0.462
01/26/05	15:42:22	59.0	52.52	-0.473
01/26/05	15:42:26	62.5	52.52	-0.484
01/26/05	15:42:29	66.2	52.52	-0.495
01/26/05	15:42:33	70.1	52.52	-0.505
01/26/05	15:42:37	74.3	52.52	-0.510
01/26/05	15:42:42	78.7	52.52	-0.518
01/26/05	15:42:46	83.4	52.52	-0.525
01/26/05	15:42:51	88.4	52.50	-0.533
01/26/05	15:42:57	93.7	52.50	-0.536
01/26/05	15:43:02	99.3	52.50	-0.545
01/26/05	15:43:08	105.2	52.50	-0.547
01/26/05	15:43:15	111.5	52.50	-0.551
01/26/05	15:43:21	118.1	52.50	-0.553
01/26/05	15:43:28	125.1	52.50	-0.558
01/26/05	15:43:36	132.6	52.48	-0.562
01/26/05	15:43:44	140.5	52.48	-0.562
01/26/05	15:43:52	148.9	52.48	-0.564
01/26/05	15:44:01	157.8	52.48	-0.566
01/26/05	15:44:10	167.2	52.48	-0.570
01/26/05	15:44:20	177.2	52.48	-0.568
01/26/05	15:44:31	187.8	52.48	-0.570
01/26/05	15:44:42	199.0	52.48	-0.571
01/26/05	15:44:54	210.9	52.48	-0.571

		CBLmw-004-out.txt		
01/26/05	15:45:07	223.5	52.48	-0.571
01/26/05	15:45:20	236.8	52.48	-0.573
01/26/05	15:45:34	250.9	52.48	-0.573
01/26/05	15:45:49	265.8	52.48	-0.573
01/26/05	15:46:05	281.6	52.48	-0.573
01/26/05	15:46:21	298.4	52.48	-0.573
01/26/05	15:46:39	316.2	52.48	-0.575
01/26/05	15:46:58	335.0	52.48	-0.575
01/26/05	15:47:18	354.9	52.48	-0.575
01/26/05	15:47:39	376.0	52.48	-0.577
01/26/05	15:48:01	398.4	52.48	-0.577
01/26/05	15:48:25	422.1	52.46	-0.575
01/26/05	15:48:50	447.2	52.46	-0.575
01/26/05	15:49:17	473.8	52.46	-0.575
01/26/05	15:49:45	502.0	52.46	-0.575
01/26/05	15:50:15	531.9	52.46	-0.577
01/26/05	15:50:47	563.5	52.48	-0.575
01/26/05	15:51:20	597.0	52.46	-0.573
01/26/05	15:51:56	632.5	52.46	-0.577
01/26/05	15:52:33	670.1	52.48	-0.575
01/26/05	15:53:13	709.9	52.48	-0.575
01/26/05	15:53:55	752.1	52.48	-0.575
01/26/05	15:54:40	796.8	52.48	-0.577
01/26/05	15:55:27	844.2	52.48	-0.577
01/26/05	15:56:17	894.4	52.48	-0.575
01/26/05	15:57:11	947.5	52.50	-0.573
01/26/05	15:58:07	1003.8	52.50	-0.569

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: L12MW-242      Date Started: 01/25/05      Date Completed: 01/25/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	A886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>981.20</u>	RISER CASING I.D. (in.): <u>2 in</u>
SCREEN OR OPEN HOLE I.D. (in): <u>2 in</u>		DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>
	FEET	METERS
TOTAL WELL DEPTH	<u>29.84</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>6.84</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>22.50</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~7'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>L12mw-242-IN</u>	<u>01/25/05</u>	<u>01/25/05</u>	<u>901</u>	<u>930</u>	<u>~28'</u>				
2	<u>L12mw-242-OUT</u>	<u>01/25/05</u>	<u>01/25/05</u>	<u>931</u>	<u>959</u>	<u>~28'</u>				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
 ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
 Signature: [Signature]      Date: 5/6/05



**MKM Engineers, Inc.**

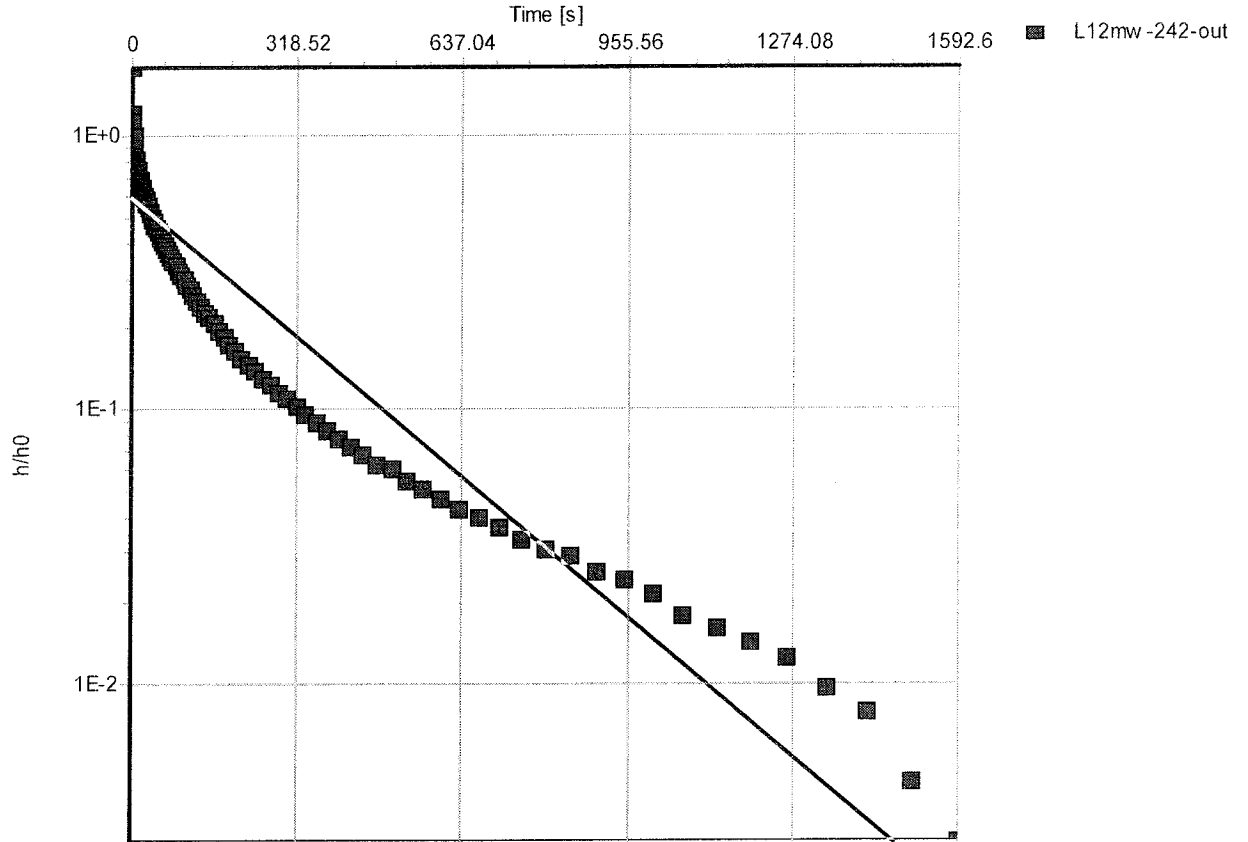
8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**Slug Test Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

L12mw -242 (Bouwer-Rice)



Test name: **L12mw-242**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 1.20E-4 [cm/s]

Test parameters:

Test Well:	L12mw-242-out	Aquifer thickness:	22.5 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/9/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 15:48:00  
 Report from file: ...\\SN04886 2005-01-25 093123 L12mw-242-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: L12mw-242-out

Test defined on: 01/25/05 07:34:16  
 Test started on: 01/25/05 09:31:23  
 Test stopped on: 01/25/05 09:59:52  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 119

TOTAL DATA SAMPLES 119

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 18.313 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/25/05	09:31:23		0.0	52.82
01/25/05	09:31:23		0.3	52.86
01/25/05	09:31:24		0.6	52.86
01/25/05	09:31:24		0.9	52.86
01/25/05	09:31:24		1.2	52.88
01/25/05	09:31:25		1.5	52.88
01/25/05	09:31:25		1.8	52.88
01/25/05	09:31:25		2.1	52.88
01/25/05	09:31:26		2.4	52.88
01/25/05	09:31:26		2.7	52.91
01/25/05	09:31:26		3.0	52.91
01/25/05	09:31:26		3.3	52.91
01/25/05	09:31:27		3.6	52.91
01/25/05	09:31:27		3.9	52.91
01/25/05	09:31:27		4.2	52.91
01/25/05	09:31:28		4.5	52.91
01/25/05	09:31:28		4.8	52.91
01/25/05	09:31:28		5.1	52.91
01/25/05	09:31:29		5.4	52.91
01/25/05	09:31:29		5.7	52.91



L12mw-242-out.txt

01/25/05	09:31:29	6.0	52.91	-0.933
01/25/05	09:31:30	6.4	52.91	-0.946
01/25/05	09:31:30	6.7	52.91	-0.949
01/25/05	09:31:30	7.1	52.91	-0.957
01/25/05	09:31:31	7.5	52.91	-0.966
01/25/05	09:31:31	8.0	52.91	-0.973
01/25/05	09:31:32	8.4	52.91	-0.983
01/25/05	09:31:32	8.9	52.93	-0.992
01/25/05	09:31:33	9.5	52.93	-1.001
01/25/05	09:31:33	10.0	52.88	-1.005
01/25/05	09:31:34	10.6	52.88	-1.012
01/25/05	09:31:34	11.3	52.88	-1.022
01/25/05	09:31:35	11.9	52.88	-1.031
01/25/05	09:31:36	12.6	52.88	-1.049
01/25/05	09:31:37	13.4	52.88	-1.062
01/25/05	09:31:37	14.2	52.88	-1.071
01/25/05	09:31:38	15.0	52.86	-1.082
01/25/05	09:31:39	15.9	52.86	-1.094
01/25/05	09:31:40	16.8	52.86	-1.106
01/25/05	09:31:41	17.8	52.86	-1.116
01/25/05	09:31:42	18.9	52.86	-1.129
01/25/05	09:31:43	20.0	52.86	-1.140
01/25/05	09:31:44	21.2	52.86	-1.152
01/25/05	09:31:46	22.4	52.86	-1.164
01/25/05	09:31:47	23.8	52.86	-1.176
01/25/05	09:31:48	25.2	52.86	-1.191
01/25/05	09:31:50	26.7	52.86	-1.202
01/25/05	09:31:51	28.2	52.86	-1.213
01/25/05	09:31:53	29.8	52.86	-1.226
01/25/05	09:31:55	31.5	52.86	-1.239
01/25/05	09:31:56	33.3	52.86	-1.252
01/25/05	09:31:58	35.2	52.86	-1.265
01/25/05	09:32:00	37.3	52.86	-1.280
01/25/05	09:32:03	39.5	52.86	-1.292
01/25/05	09:32:05	41.8	52.86	-1.307
01/25/05	09:32:07	44.3	52.86	-1.320
01/25/05	09:32:10	46.9	52.86	-1.333
01/25/05	09:32:13	49.7	52.86	-1.348
01/25/05	09:32:16	52.6	52.86	-1.362
01/25/05	09:32:19	55.7	52.84	-1.375
01/25/05	09:32:22	59.0	52.84	-1.390
01/25/05	09:32:26	62.5	52.84	-1.403
01/25/05	09:32:29	66.2	52.84	-1.418
01/25/05	09:32:33	70.1	52.84	-1.433
01/25/05	09:32:37	74.3	52.84	-1.447
01/25/05	09:32:42	78.7	52.84	-1.462
01/25/05	09:32:47	83.4	52.84	-1.475
01/25/05	09:32:52	88.4	52.84	-1.490
01/25/05	09:32:57	93.7	52.84	-1.503
01/25/05	09:33:02	99.3	52.84	-1.517
01/25/05	09:33:08	105.2	52.82	-1.532
01/25/05	09:33:15	111.5	52.84	-1.545
01/25/05	09:33:21	118.1	52.84	-1.560
01/25/05	09:33:28	125.1	52.82	-1.575
01/25/05	09:33:36	132.6	52.82	-1.586
01/25/05	09:33:44	140.5	52.82	-1.599
01/25/05	09:33:52	148.9	52.82	-1.610
01/25/05	09:34:01	157.8	52.82	-1.622
01/25/05	09:34:10	167.2	52.82	-1.635
01/25/05	09:34:20	177.2	52.82	-1.648
01/25/05	09:34:31	187.8	52.82	-1.659
01/25/05	09:34:42	199.0	52.82	-1.668
01/25/05	09:34:54	210.9	52.82	-1.680

L12mw-242-out.txt

01/25/05	09:35:07	223.5	52.82	-1.689
01/25/05	09:35:20	236.8	52.82	-1.698
01/25/05	09:35:34	250.9	52.82	-1.707
01/25/05	09:35:49	265.8	52.82	-1.716
01/25/05	09:36:05	281.6	52.82	-1.724
01/25/05	09:36:22	298.4	52.82	-1.731
01/25/05	09:36:39	316.2	52.82	-1.738
01/25/05	09:36:58	335.0	52.82	-1.746
01/25/05	09:37:18	354.9	52.82	-1.753
01/25/05	09:37:39	376.0	52.82	-1.759
01/25/05	09:38:02	398.4	52.82	-1.766
01/25/05	09:38:25	422.1	52.82	-1.772
01/25/05	09:38:50	447.2	52.82	-1.777
01/25/05	09:39:17	473.8	52.82	-1.783
01/25/05	09:39:45	502.0	52.82	-1.786
01/25/05	09:40:15	531.9	52.82	-1.792
01/25/05	09:40:47	563.5	52.82	-1.796
01/25/05	09:41:20	597.0	52.82	-1.801
01/25/05	09:41:56	632.5	52.82	-1.805
01/25/05	09:42:33	670.1	52.82	-1.808
01/25/05	09:43:13	709.9	52.82	-1.812
01/25/05	09:43:55	752.1	52.82	-1.816
01/25/05	09:44:40	796.8	52.82	-1.819
01/25/05	09:45:27	844.2	52.82	-1.821
01/25/05	09:46:18	894.4	52.82	-1.825
01/25/05	09:47:11	947.5	52.82	-1.827
01/25/05	09:48:07	1003.8	52.84	-1.830
01/25/05	09:49:07	1063.4	52.82	-1.834
01/25/05	09:50:10	1126.6	52.84	-1.836
01/25/05	09:51:17	1193.5	52.84	-1.838
01/25/05	09:52:28	1264.4	52.84	-1.840
01/25/05	09:53:43	1339.5	52.84	-1.843
01/25/05	09:55:02	1419.0	52.84	-1.845
01/25/05	09:56:26	1503.3	52.84	-1.849
01/25/05	09:57:56	1592.6	52.84	-1.851
01/25/05	09:59:30	1687.1	52.84	-1.854

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: L12mw-243      Date Started: 01/25/05      Date Completed: 01/25/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>980.79</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>25.92</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>11.22</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>14.70</u>	SCREEN LENGTH
		10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~12</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>L12mw-243-IN</u>	<u>01/25/05</u>	<u>01/25/05</u>	<u>1040</u>	<u>1058</u>	<u>~24</u>				
2	<u>L12mw-243-OUT</u>	<u>01/25/05</u>	<u>01/25/05</u>	<u>1058</u>	<u>1117</u>	<u>~24</u>				

STORAGE LOCATION OF DATA:      1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



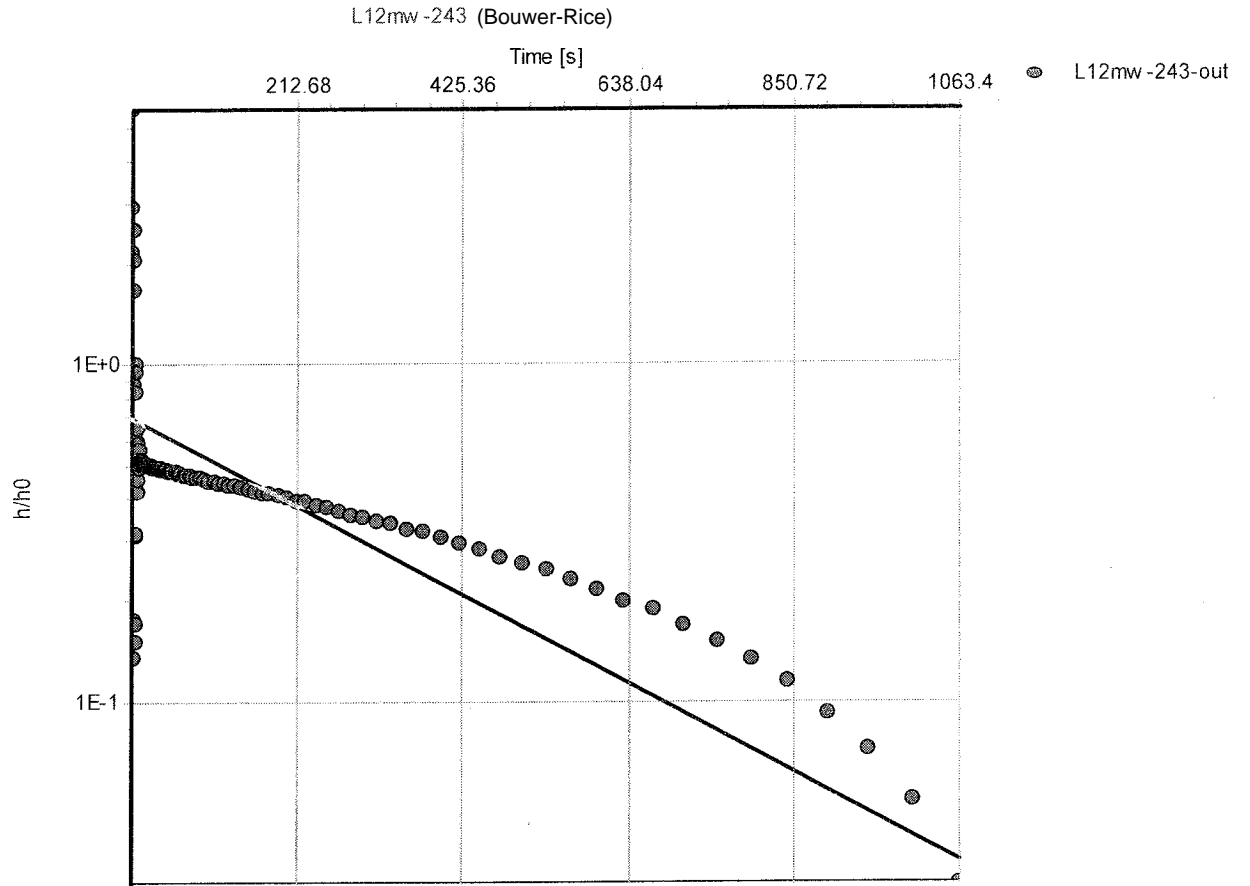
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: L12mw-243

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity: 8.44E-5 [cm/s]

Test parameters:

Test Well: L12mw-243-out

Aquifer thickness: 14.7 [ft]

Screen radius: 0.34375 [ft]

Gravel Pack Porosity (%) 25

Screen length: 10 [ft]

Casing radius: 0.08333 [ft]

r(eff): 0.186 [ft]

Comments:

Evaluated by:

Date: 2/9/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 15:48:49  
 Report from file: ...\\SN04886 2005-01-25 105848 L12mw-243-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: L12mw-243-out

Test defined on: 01/25/05 07:34:38  
 Test started on: 01/25/05 10:58:48  
 Test stopped on: 01/25/05 11:17:49  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 112

TOTAL DATA SAMPLES 112

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 12.550 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	
			Temperature	Pressure	
			Fahrenheit	Feet H2O	
01/25/05		10:58:48	0.0	53.47	0.000
01/25/05		10:58:48	0.3	53.52	4.725
01/25/05		10:58:48	0.6	53.52	2.022
01/25/05		10:58:49	0.9	53.52	-2.900
01/25/05		10:58:49	1.2	53.54	-2.432
01/25/05		10:58:49	1.5	53.54	1.182
01/25/05		10:58:49	1.8	53.54	1.617
01/25/05		10:58:50	2.1	53.54	-0.679
01/25/05		10:58:50	2.4	53.56	-1.750
01/25/05		10:58:50	2.7	53.56	-0.289
01/25/05		10:58:51	3.0	53.56	0.814
01/25/05		10:58:51	3.3	53.56	0.036
01/25/05		10:58:51	3.6	53.56	-0.981
01/25/05		10:58:52	3.9	53.56	-0.663
01/25/05		10:58:52	4.2	53.56	0.163
01/25/05		10:58:52	4.5	53.56	0.117
01/25/05		10:58:52	4.8	53.56	-0.510
01/25/05		10:58:53	5.1	53.56	-0.644
01/25/05		10:58:53	5.4	53.56	-0.193
01/25/05		10:58:53	5.7	53.56	0.001

L12mw-243-out.txt

01/25/05	10:58:54	6.0	53.56	-0.292
01/25/05	10:58:54	6.4	53.56	-0.506
01/25/05	10:58:54	6.7	53.58	-0.239
01/25/05	10:58:55	7.1	53.58	-0.176
01/25/05	10:58:55	7.5	53.58	-0.404
01/25/05	10:58:56	8.0	53.58	-0.298
01/25/05	10:58:56	8.4	53.58	-0.246
01/25/05	10:58:57	8.9	53.58	-0.369
01/25/05	10:58:57	9.5	53.58	-0.270
01/25/05	10:58:58	10.0	53.56	-0.327
01/25/05	10:58:58	10.6	53.56	-0.301
01/25/05	10:58:59	11.3	53.56	-0.314
01/25/05	10:59:00	11.9	53.56	-0.305
01/25/05	10:59:00	12.6	53.56	-0.318
01/25/05	10:59:01	13.4	53.56	-0.307
01/25/05	10:59:02	14.2	53.56	-0.320
01/25/05	10:59:03	15.0	53.54	-0.316
01/25/05	10:59:03	15.9	53.54	-0.316
01/25/05	10:59:04	16.8	53.54	-0.320
01/25/05	10:59:05	17.8	53.54	-0.320
01/25/05	10:59:06	18.9	53.54	-0.320
01/25/05	10:59:08	20.0	53.54	-0.322
01/25/05	10:59:09	21.2	53.54	-0.322
01/25/05	10:59:10	22.4	53.54	-0.324
01/25/05	10:59:11	23.8	53.54	-0.322
01/25/05	10:59:13	25.2	53.54	-0.326
01/25/05	10:59:14	26.7	53.54	-0.327
01/25/05	10:59:16	28.2	53.54	-0.327
01/25/05	10:59:17	29.8	53.54	-0.329
01/25/05	10:59:19	31.5	53.54	-0.331
01/25/05	10:59:21	33.3	53.54	-0.331
01/25/05	10:59:23	35.2	53.54	-0.333
01/25/05	10:59:25	37.3	53.54	-0.335
01/25/05	10:59:27	39.5	53.54	-0.335
01/25/05	10:59:29	41.8	53.54	-0.338
01/25/05	10:59:32	44.3	53.54	-0.338
01/25/05	10:59:34	46.9	53.54	-0.340
01/25/05	10:59:37	49.7	53.54	-0.344
01/25/05	10:59:40	52.6	53.54	-0.344
01/25/05	10:59:43	55.7	53.54	-0.346
01/25/05	10:59:47	59.0	53.54	-0.348
01/25/05	10:59:50	62.5	53.54	-0.350
01/25/05	10:59:54	66.2	53.54	-0.353
01/25/05	10:59:58	70.1	53.54	-0.355
01/25/05	11:00:02	74.3	53.54	-0.357
01/25/05	11:00:06	78.7	53.54	-0.361
01/25/05	11:00:11	83.4	53.54	-0.362
01/25/05	11:00:16	88.4	53.54	-0.364
01/25/05	11:00:21	93.7	53.54	-0.368
01/25/05	11:00:27	99.3	53.54	-0.372
01/25/05	11:00:33	105.2	53.54	-0.375
01/25/05	11:00:39	111.5	53.54	-0.379
01/25/05	11:00:46	118.1	53.54	-0.381
01/25/05	11:00:53	125.1	53.54	-0.385
01/25/05	11:01:00	132.6	53.54	-0.388
01/25/05	11:01:08	140.5	53.54	-0.392
01/25/05	11:01:16	148.9	53.54	-0.397
01/25/05	11:01:25	157.8	53.54	-0.401
01/25/05	11:01:35	167.2	53.54	-0.407
01/25/05	11:01:45	177.2	53.54	-0.410
01/25/05	11:01:55	187.8	53.54	-0.416
01/25/05	11:02:07	199.0	53.54	-0.421
01/25/05	11:02:18	210.9	53.54	-0.427

		L12mw-243-out.txt		
01/25/05	11:02:31	223.5	53.54	-0.432
01/25/05	11:02:44	236.8	53.54	-0.440
01/25/05	11:02:58	250.9	53.54	-0.445
01/25/05	11:03:13	265.8	53.54	-0.455
01/25/05	11:03:29	281.6	53.54	-0.462
01/25/05	11:03:46	298.4	53.54	-0.469
01/25/05	11:04:04	316.2	53.54	-0.477
01/25/05	11:04:23	335.0	53.54	-0.484
01/25/05	11:04:42	354.9	53.56	-0.495
01/25/05	11:05:04	376.0	53.54	-0.502
01/25/05	11:05:26	398.4	53.54	-0.514
01/25/05	11:05:50	422.1	53.54	-0.525
01/25/05	11:06:15	447.2	53.54	-0.536
01/25/05	11:06:41	473.8	53.54	-0.549
01/25/05	11:07:10	502.0	53.54	-0.560
01/25/05	11:07:39	531.9	53.54	-0.572
01/25/05	11:08:11	563.5	53.54	-0.587
01/25/05	11:08:45	597.0	53.56	-0.600
01/25/05	11:09:20	632.5	53.56	-0.617
01/25/05	11:09:58	670.1	53.56	-0.629
01/25/05	11:10:37	709.9	53.56	-0.646
01/25/05	11:11:20	752.1	53.56	-0.663
01/25/05	11:12:04	796.8	53.56	-0.681
01/25/05	11:12:52	844.2	53.56	-0.699
01/25/05	11:13:42	894.4	53.56	-0.720
01/25/05	11:14:35	947.5	53.56	-0.740
01/25/05	11:15:31	1003.8	53.56	-0.760
01/25/05	11:16:31	1063.4	53.58	-0.782
01/25/05	11:17:34	1126.6	53.58	-0.810

## Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: L12mw-2A4      Date Started: 01/25/05      Date Completed: 01/25/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4926	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>980.65</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>31.95</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>7.55</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>24.40</u>	SCREEN LENGTH
		10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~8'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1		<u>01/25/05</u>	<u>01/25/05</u>	<u>9:11</u>	<u>9:47</u>	<u>~30</u>				
2		<u>01/25/05</u>	<u>01/25/05</u>	<u>9:47</u>	<u>10:07</u>	<u>~30</u>				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

### REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: David K. Earnest      Date: 5/6/05



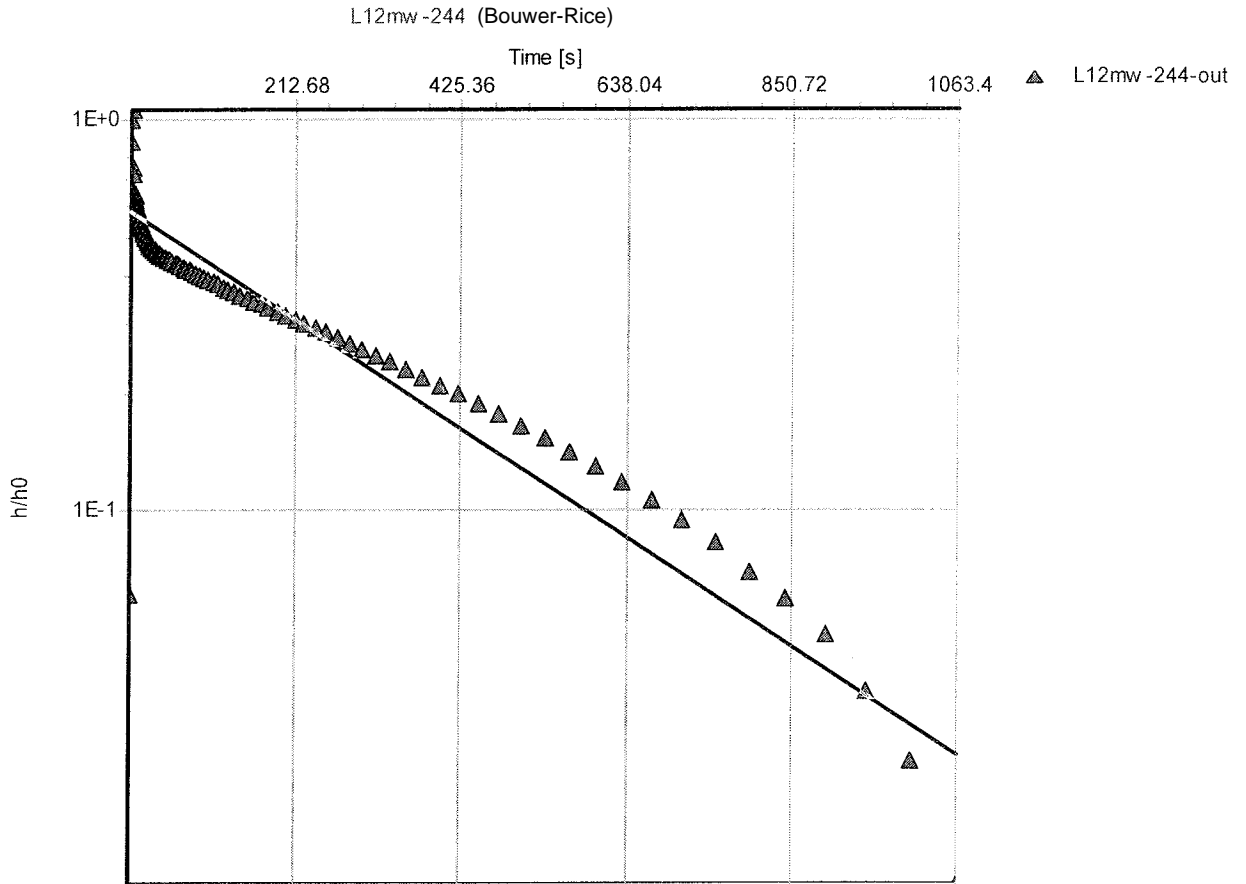
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

Test name: L12mw-244Analysis Method: Bouwer & RiceAnalysis results: Conductivity: 9.86E-5 [cm/s]

<u>Test parameters:</u>	Test Well:	L12mw-244-out	Aquifer thickness:	24.4 [ft]
	Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
	Screen length:	10 [ft]		
	Casing radius:	0.08333 [ft]		
	r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/9/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 15:37:40  
 Report from file: ...\\SN04926 2005-01-25 094744 L12mw-244-out.bin  
 Win-Situ Version 4.50

Serial number: 00004926  
 Firmware Version 3.09  
 Unit name: miniTROLL

Test name: L12mw-244-out

Test defined on: 01/25/05 09:11:27  
 Test started on: 01/25/05 09:47:44  
 Test stopped on: 01/25/05 10:07:16  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 112

TOTAL DATA SAMPLES 112

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 18.306 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/25/05	09:47:44		0.0	53.03
01/25/05	09:47:44		0.3	53.08
01/25/05	09:47:44		0.6	53.10
01/25/05	09:47:44		0.9	53.10
01/25/05	09:47:45		1.2	53.12
01/25/05	09:47:45		1.5	53.12
01/25/05	09:47:45		1.8	53.12
01/25/05	09:47:46		2.1	53.12
01/25/05	09:47:46		2.4	53.12
01/25/05	09:47:46		2.7	53.12
01/25/05	09:47:47		3.0	53.14
01/25/05	09:47:47		3.3	53.14
01/25/05	09:47:47		3.6	53.14
01/25/05	09:47:47		3.9	53.14
01/25/05	09:47:48		4.2	53.14
01/25/05	09:47:48		4.5	53.14
01/25/05	09:47:48		4.8	53.14
01/25/05	09:47:49		5.1	53.14
01/25/05	09:47:49		5.4	53.14
01/25/05	09:47:49		5.7	53.14

L12mw-244-out.txt

01/25/05	09:47:50	6.0	53.14	-1.792
01/25/05	09:47:50	6.4	53.14	-1.803
01/25/05	09:47:50	6.7	53.14	-1.807
01/25/05	09:47:51	7.1	53.14	-1.814
01/25/05	09:47:51	7.5	53.14	-1.821
01/25/05	09:47:52	8.0	53.14	-1.827
01/25/05	09:47:52	8.4	53.17	-1.834
01/25/05	09:47:52	8.9	53.14	-1.841
01/25/05	09:47:53	9.5	53.14	-1.849
01/25/05	09:47:54	10.0	53.12	-1.851
01/25/05	09:47:54	10.6	53.12	-1.858
01/25/05	09:47:55	11.3	53.12	-1.865
01/25/05	09:47:55	11.9	53.12	-1.871
01/25/05	09:47:56	12.6	53.12	-1.878
01/25/05	09:47:57	13.4	53.12	-1.884
01/25/05	09:47:58	14.2	53.10	-1.891
01/25/05	09:47:59	15.0	53.10	-1.897
01/25/05	09:47:59	15.9	53.10	-1.906
01/25/05	09:48:00	16.8	53.10	-1.912
01/25/05	09:48:01	17.8	53.10	-1.919
01/25/05	09:48:02	18.9	53.10	-1.928
01/25/05	09:48:04	20.0	53.10	-1.934
01/25/05	09:48:05	21.2	53.10	-1.939
01/25/05	09:48:06	22.4	53.10	-1.945
01/25/05	09:48:07	23.8	53.10	-1.952
01/25/05	09:48:09	25.2	53.10	-1.957
01/25/05	09:48:10	26.7	53.10	-1.961
01/25/05	09:48:12	28.2	53.10	-1.967
01/25/05	09:48:13	29.8	53.10	-1.970
01/25/05	09:48:15	31.5	53.08	-1.974
01/25/05	09:48:17	33.3	53.08	-1.980
01/25/05	09:48:19	35.2	53.08	-1.983
01/25/05	09:48:21	37.3	53.08	-1.987
01/25/05	09:48:23	39.5	53.08	-1.991
01/25/05	09:48:25	41.8	53.08	-1.994
01/25/05	09:48:28	44.3	53.08	-1.998
01/25/05	09:48:30	46.9	53.08	-2.002
01/25/05	09:48:33	49.7	53.08	-2.005
01/25/05	09:48:36	52.6	53.08	-2.011
01/25/05	09:48:39	55.7	53.08	-2.013
01/25/05	09:48:43	59.0	53.08	-2.018
01/25/05	09:48:46	62.5	53.05	-2.022
01/25/05	09:48:50	66.2	53.05	-2.026
01/25/05	09:48:54	70.1	53.05	-2.031
01/25/05	09:48:58	74.3	53.05	-2.035
01/25/05	09:49:02	78.7	53.05	-2.040
01/25/05	09:49:07	83.4	53.05	-2.046
01/25/05	09:49:12	88.4	53.05	-2.051
01/25/05	09:49:17	93.7	53.05	-2.057
01/25/05	09:49:23	99.3	53.03	-2.063
01/25/05	09:49:29	105.2	53.03	-2.070
01/25/05	09:49:35	111.5	53.03	-2.076
01/25/05	09:49:42	118.1	53.03	-2.083
01/25/05	09:49:49	125.1	53.03	-2.090
01/25/05	09:49:56	132.6	53.03	-2.096
01/25/05	09:50:04	140.5	53.03	-2.105
01/25/05	09:50:12	148.9	53.03	-2.112
01/25/05	09:50:21	157.8	53.03	-2.120
01/25/05	09:50:31	167.2	53.03	-2.129
01/25/05	09:50:41	177.2	53.01	-2.136
01/25/05	09:50:51	187.8	53.01	-2.145
01/25/05	09:51:03	199.0	53.01	-2.155
01/25/05	09:51:14	210.9	53.01	-2.164

L12mw-244-out.txt

01/25/05	09:51:27	223.5	53.01	-2.173
01/25/05	09:51:40	236.8	53.01	-2.182
01/25/05	09:51:54	250.9	53.01	-2.193
01/25/05	09:52:09	265.8	53.01	-2.204
01/25/05	09:52:25	281.6	53.01	-2.215
01/25/05	09:52:42	298.4	53.01	-2.226
01/25/05	09:53:00	316.2	53.01	-2.239
01/25/05	09:53:19	335.0	53.01	-2.250
01/25/05	09:53:38	354.9	53.01	-2.263
01/25/05	09:54:00	376.0	53.01	-2.276
01/25/05	09:54:22	398.4	53.01	-2.289
01/25/05	09:54:46	422.1	53.01	-2.302
01/25/05	09:55:11	447.2	53.01	-2.316
01/25/05	09:55:37	473.8	53.01	-2.329
01/25/05	09:56:06	502.0	53.01	-2.344
01/25/05	09:56:35	531.9	53.01	-2.359
01/25/05	09:57:07	563.5	53.01	-2.373
01/25/05	09:57:41	597.0	53.01	-2.388
01/25/05	09:58:16	632.5	53.01	-2.403
01/25/05	09:58:54	670.1	53.03	-2.417
01/25/05	09:59:33	709.9	53.03	-2.432
01/25/05	10:00:16	752.1	53.03	-2.447
01/25/05	10:01:00	796.8	53.05	-2.463
01/25/05	10:01:48	844.2	53.05	-2.476
01/25/05	10:02:38	894.4	53.05	-2.490
01/25/05	10:03:31	947.5	53.05	-2.507
01/25/05	10:04:27	1003.8	53.03	-2.522
01/25/05	10:05:27	1063.4	53.03	-2.537
01/25/05	10:06:30	1126.6	53.03	-2.551

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: L12mw-245      Date Started: 01/25/05      Date Completed: 01/25/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>980.04</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>30.28</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>7.09</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>23.19</u>	SCREEN LENGTH
		10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	24 x 1.6" OD	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~8'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1		01/25/05	01/25/05	1026	1045	~29'				
2		01/25/05	01/25/05	1046	1103	~29'				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



**MKM Engineers, Inc.**

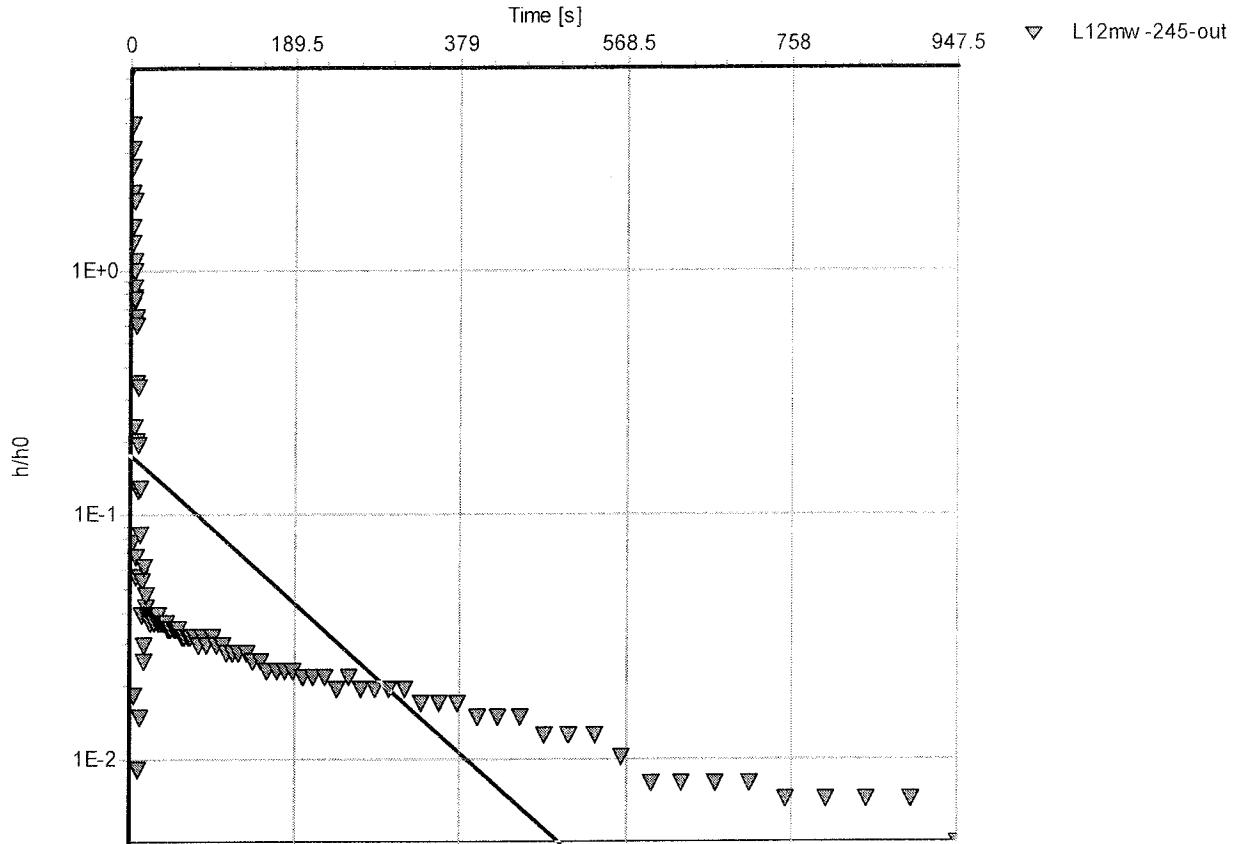
8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

L12mw -245 (Bouwer-Rice)



Test name: L12mw-245

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity: 2.42E-4 [cm/s]

Test parameters:

Test Well:	L12mw-245-out	Aquifer thickness:	23.19 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/9/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 15:43:47  
 Report from file: ...\\SN05444 2005-01-25 104612 L12mw-245-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: L12mw-245-out

Test defined on: 01/25/05 07:42:01  
 Test started on: 01/25/05 10:46:12  
 Test stopped on: 01/25/05 11:03:26  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 110

TOTAL DATA SAMPLES 110

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 19.666 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/25/05	10:46:12		0.0	52.17
01/25/05	10:46:12		0.3	52.19
01/25/05	10:46:13		0.6	52.22
01/25/05	10:46:13		0.9	52.22
01/25/05	10:46:13		1.2	52.24
01/25/05	10:46:13		1.5	52.24
01/25/05	10:46:14		1.8	52.24
01/25/05	10:46:14		2.1	52.24
01/25/05	10:46:14		2.4	52.24
01/25/05	10:46:15		2.7	52.24
01/25/05	10:46:15		3.0	52.26
01/25/05	10:46:15		3.3	52.26
01/25/05	10:46:16		3.6	52.26
01/25/05	10:46:16		3.9	52.24
01/25/05	10:46:16		4.2	52.26
01/25/05	10:46:16		4.5	52.26
01/25/05	10:46:17		4.8	52.26
01/25/05	10:46:17		5.1	52.26
01/25/05	10:46:17		5.4	52.26
01/25/05	10:46:18		5.7	52.26

L12mw-245-out.txt

01/25/05	10:46:18	6.0	52.26	-1.320
01/25/05	10:46:18	6.4	52.26	-0.813
01/25/05	10:46:19	6.7	52.26	-0.232
01/25/05	10:46:19	7.1	52.26	-0.577
01/25/05	10:46:20	7.5	52.26	-1.056
01/25/05	10:46:20	8.0	52.26	-0.705
01/25/05	10:46:20	8.4	52.26	-0.462
01/25/05	10:46:21	8.9	52.28	-0.863
01/25/05	10:46:21	9.5	52.26	-0.746
01/25/05	10:46:22	10.0	52.24	-0.585
01/25/05	10:46:23	10.6	52.24	-0.826
01/25/05	10:46:23	11.3	52.24	-0.642
01/25/05	10:46:24	11.9	52.24	-0.741
01/25/05	10:46:25	12.6	52.24	-0.705
01/25/05	10:46:25	13.4	52.24	-0.720
01/25/05	10:46:26	14.2	52.24	-0.707
01/25/05	10:46:27	15.0	52.22	-0.732
01/25/05	10:46:28	15.9	52.22	-0.700
01/25/05	10:46:29	16.8	52.22	-0.728
01/25/05	10:46:30	17.8	52.22	-0.717
01/25/05	10:46:31	18.9	52.22	-0.713
01/25/05	10:46:32	20.0	52.22	-0.720
01/25/05	10:46:33	21.2	52.22	-0.720
01/25/05	10:46:34	22.4	52.22	-0.722
01/25/05	10:46:36	23.8	52.22	-0.720
01/25/05	10:46:37	25.2	52.22	-0.720
01/25/05	10:46:39	26.7	52.22	-0.720
01/25/05	10:46:40	28.2	52.22	-0.722
01/25/05	10:46:42	29.8	52.22	-0.720
01/25/05	10:46:43	31.5	52.22	-0.720
01/25/05	10:46:45	33.3	52.22	-0.722
01/25/05	10:46:47	35.2	52.22	-0.722
01/25/05	10:46:49	37.3	52.22	-0.722
01/25/05	10:46:51	39.5	52.22	-0.722
01/25/05	10:46:54	41.8	52.22	-0.722
01/25/05	10:46:56	44.3	52.22	-0.724
01/25/05	10:46:59	46.9	52.22	-0.724
01/25/05	10:47:02	49.7	52.22	-0.724
01/25/05	10:47:05	52.6	52.22	-0.724
01/25/05	10:47:08	55.7	52.22	-0.724
01/25/05	10:47:11	59.0	52.22	-0.726
01/25/05	10:47:14	62.5	52.22	-0.726
01/25/05	10:47:18	66.2	52.22	-0.726
01/25/05	10:47:22	70.1	52.19	-0.726
01/25/05	10:47:26	74.3	52.19	-0.726
01/25/05	10:47:31	78.7	52.22	-0.728
01/25/05	10:47:35	83.4	52.22	-0.726
01/25/05	10:47:40	88.4	52.22	-0.728
01/25/05	10:47:46	93.7	52.19	-0.726
01/25/05	10:47:51	99.3	52.19	-0.728
01/25/05	10:47:57	105.2	52.19	-0.728
01/25/05	10:48:03	111.5	52.19	-0.730
01/25/05	10:48:10	118.1	52.19	-0.730
01/25/05	10:48:17	125.1	52.19	-0.730
01/25/05	10:48:25	132.6	52.19	-0.730
01/25/05	10:48:32	140.5	52.19	-0.732
01/25/05	10:48:41	148.9	52.19	-0.732
01/25/05	10:48:50	157.8	52.19	-0.734
01/25/05	10:48:59	167.2	52.19	-0.734
01/25/05	10:49:09	177.2	52.19	-0.734
01/25/05	10:49:20	187.8	52.19	-0.734
01/25/05	10:49:31	199.0	52.19	-0.735
01/25/05	10:49:43	210.9	52.19	-0.735



L12mw-245-out.txt

01/25/05	10:49:55	223.5	52.19	-0.735
01/25/05	10:50:09	236.8	52.19	-0.737
01/25/05	10:50:23	250.9	52.19	-0.735
01/25/05	10:50:38	265.8	52.19	-0.737
01/25/05	10:50:54	281.6	52.19	-0.737
01/25/05	10:51:10	298.4	52.19	-0.737
01/25/05	10:51:28	316.2	52.19	-0.737
01/25/05	10:51:47	335.0	52.19	-0.739
01/25/05	10:52:07	354.9	52.19	-0.739
01/25/05	10:52:28	376.0	52.19	-0.739
01/25/05	10:52:50	398.4	52.19	-0.741
01/25/05	10:53:14	422.1	52.19	-0.741
01/25/05	10:53:39	447.2	52.19	-0.741
01/25/05	10:54:06	473.8	52.19	-0.743
01/25/05	10:54:34	502.0	52.19	-0.743
01/25/05	10:55:04	531.9	52.19	-0.743
01/25/05	10:55:35	563.5	52.19	-0.745
01/25/05	10:56:09	597.0	52.19	-0.747
01/25/05	10:56:44	632.5	52.19	-0.747
01/25/05	10:57:22	670.1	52.19	-0.747
01/25/05	10:58:02	709.9	52.19	-0.747
01/25/05	10:58:44	752.1	52.19	-0.748
01/25/05	10:59:29	796.8	52.19	-0.748
01/25/05	11:00:16	844.2	52.19	-0.748
01/25/05	11:01:06	894.4	52.19	-0.748
01/25/05	11:01:59	947.5	52.19	-0.750
01/25/05	11:02:56	1003.8	52.22	-0.754

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: L12mw-246      Date Started: 01/25/05      Date Completed: 01/25/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>984.83</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>34.85</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>13.59</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>21.26</u>	SCREEN LENGTH
		10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>2.14</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>L12mw-246-IN</u>	<u>01/25/05</u>	<u>01/25/05</u>	<u>923</u>	<u>952</u>	<u>~33</u>				
2	<u>L12mw-246-OUT</u>	<u>01/25/05</u>	<u>01/25/05</u>	<u>953</u>	<u>1013</u>	<u>~33</u>				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

### REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



**MKM Engineers, Inc.**

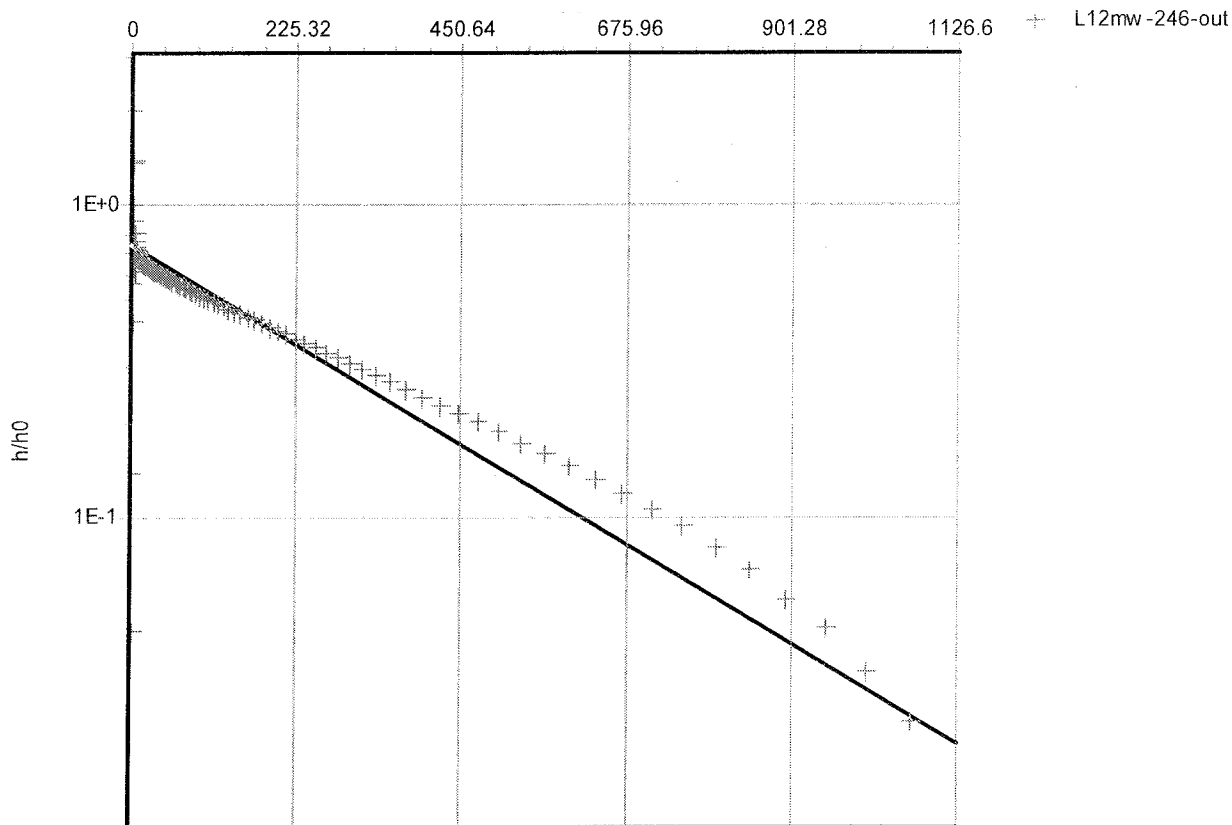
8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

L12mw-246 (Bouwer-Rice)



Test name: L12mw-246

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity: 1.05E-4 [cm/s]

Test parameters:

Test Well:	L12mw-246-out	Aquifer thickness:	21.26 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/9/2005



L12mw-246-out.txt

01/25/05	09:53:19	6.0	51.81	-2.821
01/25/05	09:53:19	6.4	51.81	-2.881
01/25/05	09:53:19	6.7	51.81	-2.836
01/25/05	09:53:20	7.1	51.81	-2.845
01/25/05	09:53:20	7.5	51.81	-2.873
01/25/05	09:53:21	8.0	51.81	-2.853
01/25/05	09:53:21	8.4	51.81	-2.873
01/25/05	09:53:21	8.9	51.81	-2.871
01/25/05	09:53:22	9.5	51.81	-2.879
01/25/05	09:53:23	10.0	51.79	-2.875
01/25/05	09:53:23	10.6	51.79	-2.881
01/25/05	09:53:24	11.3	51.79	-2.882
01/25/05	09:53:24	11.9	51.79	-2.888
01/25/05	09:53:25	12.6	51.76	-2.892
01/25/05	09:53:26	13.4	51.76	-2.894
01/25/05	09:53:27	14.2	51.76	-2.899
01/25/05	09:53:28	15.0	51.76	-2.901
01/25/05	09:53:28	15.9	51.76	-2.905
01/25/05	09:53:29	16.8	51.76	-2.907
01/25/05	09:53:30	17.8	51.76	-2.910
01/25/05	09:53:31	18.9	51.76	-2.914
01/25/05	09:53:33	20.0	51.76	-2.918
01/25/05	09:53:34	21.2	51.76	-2.922
01/25/05	09:53:35	22.4	51.76	-2.923
01/25/05	09:53:36	23.8	51.76	-2.927
01/25/05	09:53:38	25.2	51.76	-2.931
01/25/05	09:53:39	26.7	51.76	-2.936
01/25/05	09:53:41	28.2	51.76	-2.938
01/25/05	09:53:42	29.8	51.76	-2.942
01/25/05	09:53:44	31.5	51.76	-2.948
01/25/05	09:53:46	33.3	51.76	-2.951
01/25/05	09:53:48	35.2	51.76	-2.955
01/25/05	09:53:50	37.3	51.74	-2.957
01/25/05	09:53:52	39.5	51.74	-2.964
01/25/05	09:53:54	41.8	51.74	-2.970
01/25/05	09:53:57	44.3	51.74	-2.974
01/25/05	09:53:59	46.9	51.76	-2.979
01/25/05	09:54:02	49.7	51.74	-2.985
01/25/05	09:54:05	52.6	51.74	-2.990
01/25/05	09:54:08	55.7	51.74	-2.996
01/25/05	09:54:12	59.0	51.74	-3.002
01/25/05	09:54:15	62.5	51.74	-3.007
01/25/05	09:54:19	66.2	51.74	-3.015
01/25/05	09:54:23	70.1	51.74	-3.020
01/25/05	09:54:27	74.3	51.74	-3.028
01/25/05	09:54:31	78.7	51.74	-3.035
01/25/05	09:54:36	83.4	51.74	-3.042
01/25/05	09:54:41	88.4	51.74	-3.050
01/25/05	09:54:46	93.7	51.74	-3.059
01/25/05	09:54:52	99.3	51.72	-3.067
01/25/05	09:54:58	105.2	51.72	-3.076
01/25/05	09:55:04	111.5	51.74	-3.083
01/25/05	09:55:11	118.1	51.72	-3.093
01/25/05	09:55:18	125.1	51.72	-3.104
01/25/05	09:55:25	132.6	51.72	-3.113
01/25/05	09:55:33	140.5	51.72	-3.122
01/25/05	09:55:41	148.9	51.72	-3.132
01/25/05	09:55:50	157.8	51.72	-3.143
01/25/05	09:56:00	167.2	51.72	-3.154
01/25/05	09:56:10	177.2	51.72	-3.167
01/25/05	09:56:20	187.8	51.72	-3.178
01/25/05	09:56:32	199.0	51.72	-3.191
01/25/05	09:56:43	210.9	51.72	-3.202

L12mw-246-out.txt

01/25/05	09:56:56	223.5	51.72	-3.217
01/25/05	09:57:09	236.8	51.70	-3.228
01/25/05	09:57:23	250.9	51.70	-3.243
01/25/05	09:57:38	265.8	51.70	-3.256
01/25/05	09:57:54	281.6	51.70	-3.269
01/25/05	09:58:11	298.4	51.70	-3.284
01/25/05	09:58:29	316.2	51.70	-3.299
01/25/05	09:58:48	335.0	51.70	-3.312
01/25/05	09:59:07	354.9	51.70	-3.327
01/25/05	09:59:29	376.0	51.70	-3.342
01/25/05	09:59:51	398.4	51.70	-3.358
01/25/05	10:00:15	422.1	51.70	-3.373
01/25/05	10:00:40	447.2	51.70	-3.388
01/25/05	10:01:06	473.8	51.70	-3.403
01/25/05	10:01:35	502.0	51.70	-3.418
01/25/05	10:02:04	531.9	51.70	-3.435
01/25/05	10:02:36	563.5	51.70	-3.450
01/25/05	10:03:10	597.0	51.70	-3.464
01/25/05	10:03:45	632.5	51.70	-3.479
01/25/05	10:04:23	670.1	51.70	-3.494
01/25/05	10:05:02	709.9	51.70	-3.509
01/25/05	10:05:45	752.1	51.70	-3.522
01/25/05	10:06:29	796.8	51.70	-3.537
01/25/05	10:07:17	844.2	51.70	-3.550
01/25/05	10:08:07	894.4	51.70	-3.565
01/25/05	10:09:00	947.5	51.70	-3.576
01/25/05	10:09:56	1003.8	51.70	-3.589
01/25/05	10:10:56	1063.4	51.70	-3.600
01/25/05	10:11:59	1126.6	51.70	-3.613
01/25/05	10:13:06	1193.5	51.70	-3.624

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: B12mw-010      Date Started: 02/01/05      Date Completed: 02/01/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4926	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1005.92</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>6.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>22.80</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>14.71</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>8.09</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~15.5'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>B12mw-010-IN</u>	<u>02/01/05</u>	<u>02/01/05</u>	<u>14:45</u>	<u>15:26</u>	<u>~ 22'</u>				
2	<u>B12mw-010-OUT</u>	<u>02/01/05</u>	<u>02/01/05</u>	<u>15:26</u>	<u>15:52</u>	<u>~ 22'</u>				

STORAGE LOCATION OF DATA: 1) PROJECTS/CONTRACTS/RVAAP/RTIA CHARACTERIZATION/SLUG TEST DATA/MINI TROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

### REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



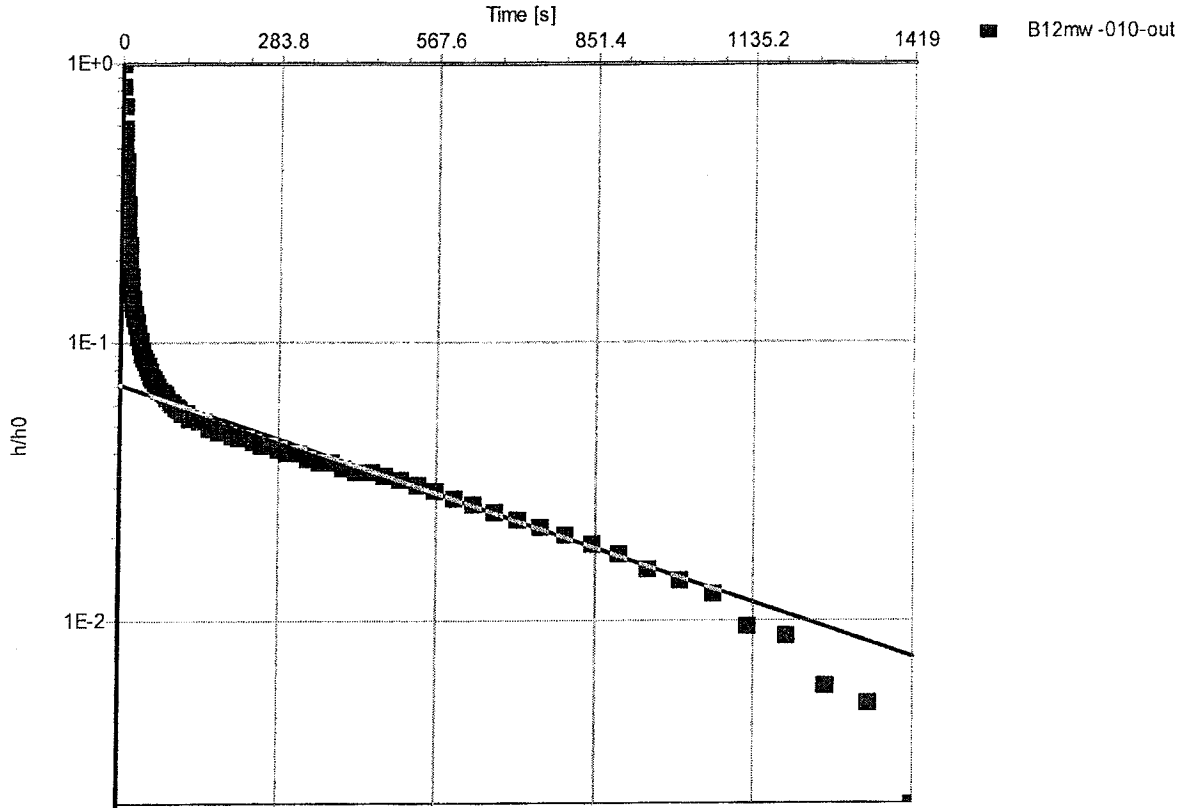
**MKM Engineers, Inc.**  
 8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

B12mw-010 (Bouwer-Rice)



Test name: B12mw-010

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity:

4.48E-5 [cm/s]

Test parameters:

Test Well: B12mw-010-out

Aquifer thickness: 8.09 [ft]

Screen radius: 0.26042 [ft]

Gravel Pack Porosity (%): 25

Screen length: 10 [ft]

Casing radius: 0.08333 [ft]

r(eff): 0.149 [ft]

Comments:

Evaluated by:

Date: 2/10/2005



In-Situ Inc. MiniTroll Pro

Report generated: 02/02/05 08:22:15  
 Report from file: ...\\SN04926 2005-02-01 152649 B12mw-010-out.bin  
 Win-Situ Version 4.50

Serial number: 00004926  
 Firmware Version 3.09  
 Unit name: miniTROLL

Test name: B12mw-010-out

Test defined on: 01/28/05 07:36:02  
 Test started on: 02/01/05 15:26:49  
 Test stopped on: 02/01/05 15:52:47  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 117

TOTAL DATA SAMPLES 117

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 3.246 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O	
02/01/05	15:26:49		0.0	50.92	0.000
02/01/05	15:26:49		0.3	50.94	-2.282
02/01/05	15:26:49		0.6	50.96	-2.550
02/01/05	15:26:50		0.9	50.96	-1.364
02/01/05	15:26:50		1.2	50.96	-1.605
02/01/05	15:26:50		1.5	50.96	-2.131
02/01/05	15:26:51		1.8	50.99	-1.936
02/01/05	15:26:51		2.1	50.99	-1.776
02/01/05	15:26:51		2.4	50.99	-1.953
02/01/05	15:26:51		2.7	50.99	-2.011
02/01/05	15:26:52		3.0	50.99	-1.947
02/01/05	15:26:52		3.3	50.99	-1.978
02/01/05	15:26:52		3.6	50.99	-2.035
02/01/05	15:26:53		3.9	51.01	-2.033
02/01/05	15:26:53		4.2	50.99	-2.043
02/01/05	15:26:53		4.5	51.01	-2.076
02/01/05	15:26:54		4.8	51.01	-2.092
02/01/05	15:26:54		5.1	51.01	-2.105
02/01/05	15:26:54		5.4	51.01	-2.125
02/01/05	15:26:54		5.7	51.01	-2.144

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02/01/05	15:26:55	6.0	51.01	-2.158
02/01/05	15:26:55	6.4	51.01	-2.179
02/01/05	15:26:56	6.7	51.01	-2.199
02/01/05	15:26:56	7.1	51.01	-2.219
02/01/05	15:26:56	7.5	51.01	-2.239
02/01/05	15:26:57	8.0	51.01	-2.261
02/01/05	15:26:57	8.4	51.01	-2.281
02/01/05	15:26:58	8.9	51.01	-2.305
02/01/05	15:26:58	9.5	51.01	-2.327
02/01/05	15:26:59	10.0	51.01	-2.348
02/01/05	15:26:59	10.6	51.01	-2.370
02/01/05	15:27:00	11.3	51.01	-2.392
02/01/05	15:27:01	11.9	50.99	-2.412
02/01/05	15:27:01	12.6	50.99	-2.432
02/01/05	15:27:02	13.4	50.99	-2.451
02/01/05	15:27:03	14.2	50.99	-2.467
02/01/05	15:27:04	15.0	50.99	-2.484
02/01/05	15:27:05	15.9	50.99	-2.499
02/01/05	15:27:06	16.8	50.99	-2.511
02/01/05	15:27:07	17.8	50.99	-2.523
02/01/05	15:27:08	18.9	50.99	-2.532
02/01/05	15:27:09	20.0	50.96	-2.543
02/01/05	15:27:10	21.2	50.99	-2.550
02/01/05	15:27:11	22.4	50.96	-2.558
02/01/05	15:27:13	23.8	50.99	-2.565
02/01/05	15:27:14	25.2	50.96	-2.572
02/01/05	15:27:15	26.7	50.96	-2.578
02/01/05	15:27:17	28.2	50.96	-2.583
02/01/05	15:27:19	29.8	50.96	-2.591
02/01/05	15:27:20	31.5	50.96	-2.596
02/01/05	15:27:22	33.3	50.96	-2.602
02/01/05	15:27:24	35.2	50.96	-2.607
02/01/05	15:27:26	37.3	50.96	-2.611
02/01/05	15:27:28	39.5	50.96	-2.615
02/01/05	15:27:31	41.8	50.96	-2.620
02/01/05	15:27:33	44.3	50.96	-2.624
02/01/05	15:27:36	46.9	50.96	-2.627
02/01/05	15:27:38	49.7	50.96	-2.629
02/01/05	15:27:41	52.6	50.96	-2.633
02/01/05	15:27:44	55.7	50.96	-2.637
02/01/05	15:27:48	59.0	50.96	-2.640
02/01/05	15:27:51	62.5	50.96	-2.642
02/01/05	15:27:55	66.2	50.96	-2.646
02/01/05	15:27:59	70.1	50.96	-2.648
02/01/05	15:28:03	74.3	50.96	-2.650
02/01/05	15:28:07	78.7	50.94	-2.652
02/01/05	15:28:12	83.4	50.94	-2.655
02/01/05	15:28:17	88.4	50.94	-2.657
02/01/05	15:28:22	93.7	50.92	-2.659
02/01/05	15:28:28	99.3	50.92	-2.661
02/01/05	15:28:34	105.2	50.92	-2.663
02/01/05	15:28:40	111.5	50.92	-2.665
02/01/05	15:28:47	118.1	50.92	-2.665
02/01/05	15:28:54	125.1	50.92	-2.668
02/01/05	15:29:01	132.6	50.90	-2.668
02/01/05	15:29:09	140.5	50.92	-2.670
02/01/05	15:29:18	148.9	50.92	-2.670
02/01/05	15:29:27	157.8	50.92	-2.674
02/01/05	15:29:36	167.2	50.90	-2.674
02/01/05	15:29:46	177.2	50.90	-2.676
02/01/05	15:29:57	187.8	50.90	-2.676
02/01/05	15:30:08	199.0	50.90	-2.678
02/01/05	15:30:20	210.9	50.90	-2.679

		B12mw-010-out.txt		
02/01/05	15:30:32	223.5	50.90	-2.679
02/01/05	15:30:46	236.8	50.92	-2.681
02/01/05	15:31:00	250.9	50.92	-2.683
02/01/05	15:31:15	265.8	50.92	-2.683
02/01/05	15:31:30	281.6	50.92	-2.685
02/01/05	15:31:47	298.4	50.90	-2.687
02/01/05	15:32:05	316.2	50.87	-2.687
02/01/05	15:32:24	335.0	50.87	-2.689
02/01/05	15:32:44	354.9	50.85	-2.691
02/01/05	15:33:05	376.0	50.85	-2.691
02/01/05	15:33:27	398.4	50.85	-2.693
02/01/05	15:33:51	422.1	50.85	-2.695
02/01/05	15:34:16	447.2	50.85	-2.695
02/01/05	15:34:43	473.8	50.85	-2.696
02/01/05	15:35:11	502.0	50.85	-2.698
02/01/05	15:35:41	531.9	50.83	-2.700
02/01/05	15:36:12	563.5	50.83	-2.702
02/01/05	15:36:46	597.0	50.81	-2.704
02/01/05	15:37:21	632.5	50.78	-2.706
02/01/05	15:37:59	670.1	50.78	-2.708
02/01/05	15:38:39	709.9	50.78	-2.710
02/01/05	15:39:21	752.1	50.76	-2.712
02/01/05	15:40:06	796.8	50.72	-2.714
02/01/05	15:40:53	844.2	50.69	-2.716
02/01/05	15:41:43	894.4	50.69	-2.718
02/01/05	15:42:36	947.5	50.72	-2.721
02/01/05	15:43:33	1003.8	50.74	-2.723
02/01/05	15:44:32	1063.4	50.74	-2.725
02/01/05	15:45:35	1126.6	50.69	-2.729
02/01/05	15:46:42	1193.5	50.74	-2.730
02/01/05	15:47:53	1264.4	50.74	-2.734
02/01/05	15:49:08	1339.5	50.63	-2.735
02/01/05	15:50:28	1419.0	50.58	-2.739
02/01/05	15:51:52	1503.3	50.60	-2.742

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: B12mw-011      Date Started: 02/01/05      Date Completed: 02/01/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1006.70</u>	RISER CASING I.D. (in.): <u>2 in</u>
SCREEN OR OPEN HOLE I.D. (in): <u>2 in</u>		DIAMETER OF BOREHOLE (IF SCREENED): <u>6.25"</u>
	FEET	METERS
TOTAL WELL DEPTH	<u>26.68</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>17.24</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>9.44</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~18'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	B12mw-011-IN	02/01/05	02/01/05	14:24	15:09	~25'	-----		-----	
2	B12mw-011-OUT	02/01/05	02/01/05	15:11	15:40	~25'	-----		-----	

STORAGE LOCATION OF DATA: 1) \PROJECTS-CONTRACTS\RVAAP\RI 14 CHARACTERIZATION\SLUG TEST DATA\MINITROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: SRSJ  
Signature: David K. Earnest      Date: 5/6/05



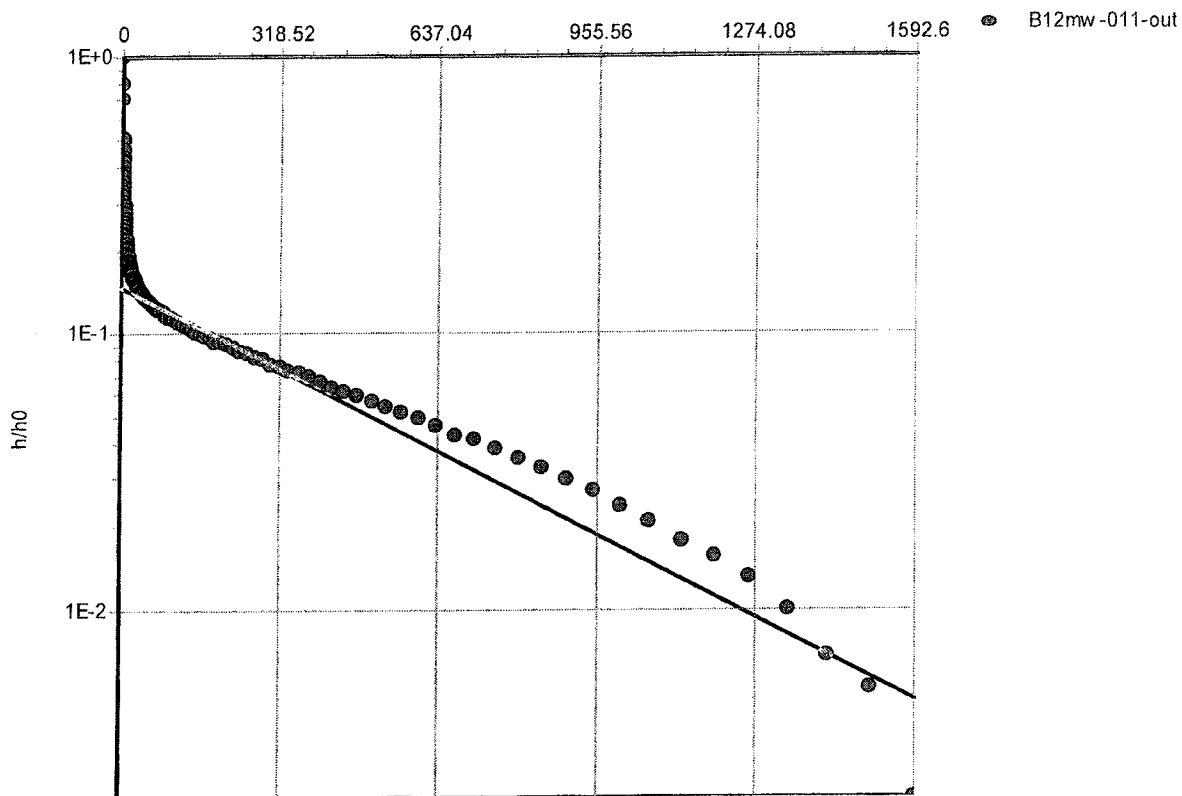
**MKM Engineers, Inc.**  
 8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

B12mw-011 (Bouwer-Rice)



Test name: B11mw-011

Analysis Method: Bouwer & Rice

Analysis results: Conductivity: 6.33E-5 [cm/s]

Test parameters:

Test Well:	B12mw-011-out	Aquifer thickness:	9.44 [ft]
Screen radius:	0.26042 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
$r(\text{eff})$ :	0.149 [ft]		

Comments:

Evaluated by:  
 Date: 2/10/2005

In-Situ Inc. MiniTroll Pro

Report generated: 02/02/05 08:13:27  
 Report from file: ...\\SN05444 2005-02-01 151113 B12mw-011-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: B12mw-011-out

Test defined on: 01/28/05 07:42:53  
 Test started on: 02/01/05 15:11:13  
 Test stopped on: 02/01/05 15:40:00  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 119

TOTAL DATA SAMPLES 119

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 2.910 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O	
02/01/05	15:11:13		0.0	51.88	0.000
02/01/05	15:11:14		0.3	51.88	-2.077
02/01/05	15:11:14		0.6	51.88	-2.471
02/01/05	15:11:14		0.9	51.90	-3.399
02/01/05	15:11:14		1.2	51.90	-2.638
02/01/05	15:11:15		1.5	51.92	-3.079
02/01/05	15:11:15		1.8	51.92	-3.004
02/01/05	15:11:15		2.1	51.92	-3.025
02/01/05	15:11:16		2.4	51.92	-3.107
02/01/05	15:11:16		2.7	51.92	-3.107
02/01/05	15:11:16		3.0	51.92	-3.161
02/01/05	15:11:17		3.3	51.92	-3.187
02/01/05	15:11:17		3.6	51.92	-3.222
02/01/05	15:11:17		3.9	51.92	-3.253
02/01/05	15:11:17		4.2	51.92	-3.281
02/01/05	15:11:18		4.5	51.94	-3.311
02/01/05	15:11:18		4.8	51.94	-3.337
02/01/05	15:11:18		5.1	51.94	-3.363
02/01/05	15:11:19		5.4	51.92	-3.385
02/01/05	15:11:19		5.7	51.94	-3.408

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02/01/05	15:11:19	6.0	51.94	-3.426
02/01/05	15:11:20	6.4	51.94	-3.449
02/01/05	15:11:20	6.7	51.94	-3.467
02/01/05	15:11:20	7.1	51.94	-3.486
02/01/05	15:11:21	7.5	51.94	-3.502
02/01/05	15:11:21	8.0	51.94	-3.519
02/01/05	15:11:22	8.4	51.94	-3.532
02/01/05	15:11:22	8.9	51.94	-3.547
02/01/05	15:11:23	9.5	51.94	-3.560
02/01/05	15:11:23	10.0	51.94	-3.573
02/01/05	15:11:24	10.6	51.94	-3.584
02/01/05	15:11:25	11.3	51.94	-3.595
02/01/05	15:11:25	11.9	51.94	-3.605
02/01/05	15:11:26	12.6	51.92	-3.614
02/01/05	15:11:27	13.4	51.94	-3.621
02/01/05	15:11:27	14.2	51.94	-3.629
02/01/05	15:11:28	15.0	51.92	-3.636
02/01/05	15:11:29	15.9	51.92	-3.644
02/01/05	15:11:30	16.8	51.92	-3.649
02/01/05	15:11:31	17.8	51.92	-3.655
02/01/05	15:11:32	18.9	51.92	-3.662
02/01/05	15:11:33	20.0	51.92	-3.666
02/01/05	15:11:34	21.2	51.92	-3.672
02/01/05	15:11:36	22.4	51.92	-3.677
02/01/05	15:11:37	23.8	51.92	-3.683
02/01/05	15:11:38	25.2	51.92	-3.687
02/01/05	15:11:40	26.7	51.92	-3.692
02/01/05	15:11:41	28.2	51.92	-3.696
02/01/05	15:11:43	29.8	51.92	-3.700
02/01/05	15:11:45	31.5	51.92	-3.703
02/01/05	15:11:47	33.3	51.92	-3.707
02/01/05	15:11:48	35.2	51.92	-3.711
02/01/05	15:11:51	37.3	51.92	-3.716
02/01/05	15:11:53	39.5	51.92	-3.718
02/01/05	15:11:55	41.8	51.92	-3.722
02/01/05	15:11:58	44.3	51.92	-3.726
02/01/05	15:12:00	46.9	51.92	-3.729
02/01/05	15:12:03	49.7	51.90	-3.733
02/01/05	15:12:06	52.6	51.90	-3.737
02/01/05	15:12:09	55.7	51.90	-3.739
02/01/05	15:12:12	59.0	51.90	-3.743
02/01/05	15:12:16	62.5	51.90	-3.746
02/01/05	15:12:19	66.2	51.90	-3.750
02/01/05	15:12:23	70.1	51.90	-3.754
02/01/05	15:12:28	74.3	51.90	-3.756
02/01/05	15:12:32	78.7	51.90	-3.759
02/01/05	15:12:37	83.4	51.90	-3.763
02/01/05	15:12:42	88.4	51.88	-3.767
02/01/05	15:12:47	93.7	51.88	-3.771
02/01/05	15:12:53	99.3	51.88	-3.772
02/01/05	15:12:58	105.2	51.88	-3.776
02/01/05	15:13:05	111.5	51.88	-3.780
02/01/05	15:13:11	118.1	51.88	-3.784
02/01/05	15:13:18	125.1	51.88	-3.785
02/01/05	15:13:26	132.6	51.88	-3.789
02/01/05	15:13:34	140.5	51.88	-3.793
02/01/05	15:13:42	148.9	51.88	-3.797
02/01/05	15:13:51	157.8	51.88	-3.800
02/01/05	15:14:00	167.2	51.88	-3.804
02/01/05	15:14:10	177.2	51.88	-3.806
02/01/05	15:14:21	187.8	51.85	-3.812
02/01/05	15:14:32	199.0	51.85	-3.813
02/01/05	15:14:44	210.9	51.88	-3.817

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02/01/05	15:14:57	223.5	51.85	-3.821
02/01/05	15:15:10	236.8	51.85	-3.826
02/01/05	15:15:24	250.9	51.85	-3.830
02/01/05	15:15:39	265.8	51.85	-3.834
02/01/05	15:15:55	281.6	51.85	-3.838
02/01/05	15:16:12	298.4	51.85	-3.843
02/01/05	15:16:29	316.2	51.85	-3.847
02/01/05	15:16:48	335.0	51.85	-3.851
02/01/05	15:17:08	354.9	51.85	-3.854
02/01/05	15:17:29	376.0	51.85	-3.858
02/01/05	15:17:52	398.4	51.85	-3.864
02/01/05	15:18:15	422.1	51.83	-3.869
02/01/05	15:18:40	447.2	51.83	-3.873
02/01/05	15:19:07	473.8	51.83	-3.877
02/01/05	15:19:35	502.0	51.81	-3.882
02/01/05	15:20:05	531.9	51.81	-3.888
02/01/05	15:20:37	563.5	51.81	-3.892
02/01/05	15:21:10	597.0	51.81	-3.897
02/01/05	15:21:46	632.5	51.81	-3.903
02/01/05	15:22:23	670.1	51.81	-3.909
02/01/05	15:23:03	709.9	51.81	-3.912
02/01/05	15:23:45	752.1	51.81	-3.918
02/01/05	15:24:30	796.8	51.79	-3.924
02/01/05	15:25:17	844.2	51.81	-3.929
02/01/05	15:26:08	894.4	51.81	-3.935
02/01/05	15:27:01	947.5	51.81	-3.940
02/01/05	15:27:57	1003.8	51.81	-3.946
02/01/05	15:28:57	1063.4	51.79	-3.951
02/01/05	15:30:00	1126.6	51.81	-3.957
02/01/05	15:31:07	1193.5	51.79	-3.961
02/01/05	15:32:18	1264.4	51.79	-3.966
02/01/05	15:33:33	1339.5	51.76	-3.972
02/01/05	15:34:52	1419.0	51.76	-3.978
02/01/05	15:36:17	1503.3	51.76	-3.981
02/01/05	15:37:46	1592.6	51.76	-3.987
02/01/05	15:39:20	1687.1	51.76	-3.991



# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: B12mw-012      Date Started: 02/01/05      Date Completed: 02/01/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	1886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1006.32</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>6.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>24.80</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>17.50</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>7.30</u>	SCREEN LENGTH
		FEET
		METERS

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~18'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	B12mw-012-IN	02/01/05	02/01/05	14:32	15:14	~23'				
2	B12mw-012-OUT	02/01/05	02/01/05	15:15	15:46	~23'				

STORAGE LOCATION OF DATA: 1) PROJECTS-CENTRAL-RVAAP-RI14 CHARACTERIZATION\SLUG TEST DATA\MINITROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

### REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



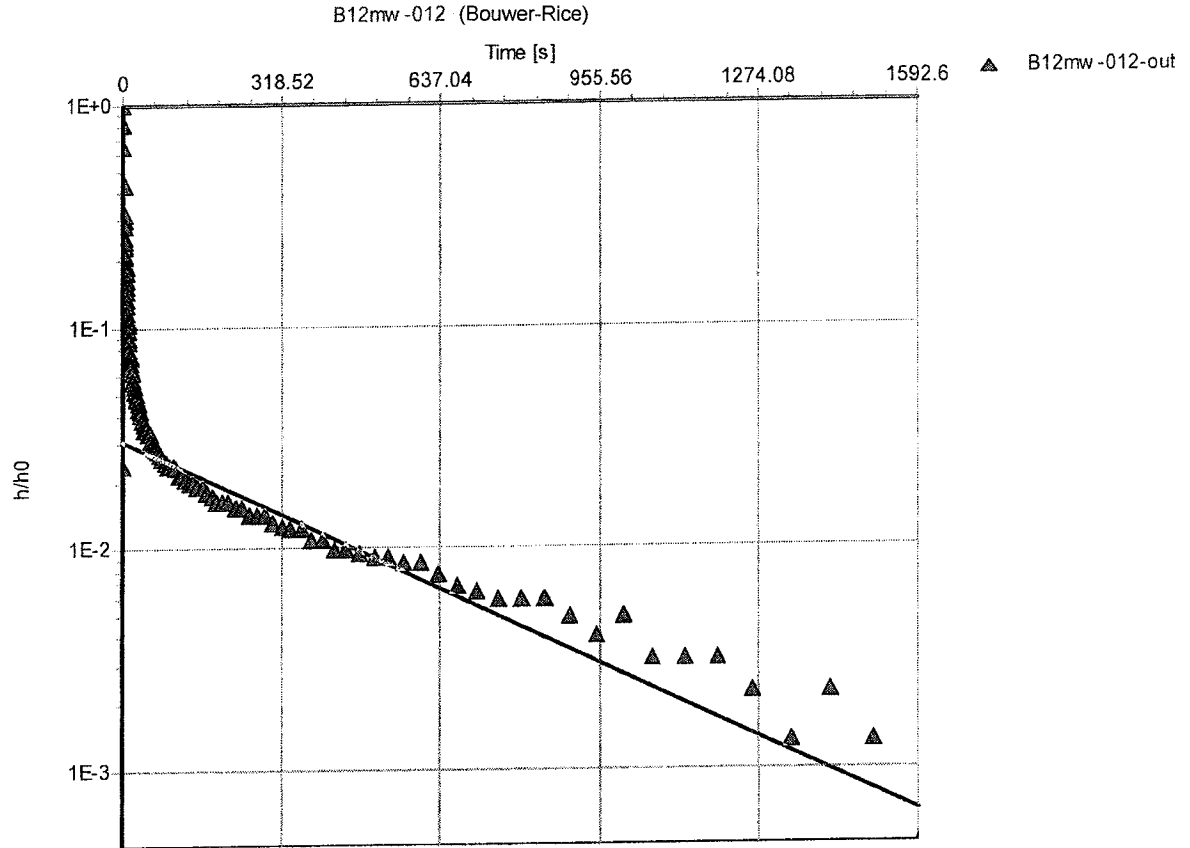
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: **B12mw-012**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity:

6.63E-5 [cm/s]

Test parameters:

Test Well: B12mw-012-out

Aquifer thickness: 7.3 [ft]

Screen radius: 0.26042 [ft]

Gravel Pack Porosity (%) 25

Screen length: 10 [ft]

Casing radius: 0.08333 [ft]

r(eff): 0.149 [ft]

Comments:

Evaluated by:

Date: 2/10/2005

In-Situ Inc. MiniTroll Pro

Report generated: 02/02/05 07:54:31  
 Report from file: ...\\SN04886 2005-02-01 151515 B12mw-012-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: B12mw-012-out

Test defined on: 01/28/05 07:50:46  
 Test started on: 02/01/05 15:15:15  
 Test stopped on: 02/01/05 15:46:31  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 120

TOTAL DATA SAMPLES 120

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 1.191 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	Feet H2O
			Temperature Fahrenheit	Pressure Feet H2O	
02/01/05	15:15:15		0.0	52.30	0.000
02/01/05	15:15:16		0.3	52.32	-5.628
02/01/05	15:15:16		0.6	52.34	-1.600
02/01/05	15:15:16		0.9	52.34	-2.836
02/01/05	15:15:17		1.2	52.34	-3.762
02/01/05	15:15:17		1.5	52.34	-2.393
02/01/05	15:15:17		1.8	52.34	-3.186
02/01/05	15:15:18		2.1	52.37	-3.258
02/01/05	15:15:18		2.4	52.37	-2.847
02/01/05	15:15:18		2.7	52.37	-3.280
02/01/05	15:15:18		3.0	52.37	-3.147
02/01/05	15:15:19		3.3	52.37	-3.103
02/01/05	15:15:19		3.6	52.37	-3.293
02/01/05	15:15:19		3.9	52.37	-3.184
02/01/05	15:15:20		4.2	52.37	-3.258
02/01/05	15:15:20		4.5	52.37	-3.311
02/01/05	15:15:20		4.8	52.37	-3.271
02/01/05	15:15:21		5.1	52.37	-3.343
02/01/05	15:15:21		5.4	52.39	-3.343
02/01/05	15:15:21		5.7	52.39	-3.356

B12mw-012-out.txt

02/01/05	15:15:21	6.0	52.39	-3.396
02/01/05	15:15:22	6.4	52.39	-3.402
02/01/05	15:15:22	6.7	52.39	-3.422
02/01/05	15:15:23	7.1	52.39	-3.451
02/01/05	15:15:23	7.5	52.39	-3.475
02/01/05	15:15:23	8.0	52.39	-3.496
02/01/05	15:15:24	8.4	52.39	-3.518
02/01/05	15:15:24	8.9	52.39	-3.538
02/01/05	15:15:25	9.5	52.39	-3.557
02/01/05	15:15:26	10.0	52.39	-3.575
02/01/05	15:15:26	10.6	52.37	-3.588
02/01/05	15:15:27	11.3	52.37	-3.601
02/01/05	15:15:27	11.9	52.37	-3.616
02/01/05	15:15:28	12.6	52.37	-3.625
02/01/05	15:15:29	13.4	52.37	-3.638
02/01/05	15:15:30	14.2	52.37	-3.647
02/01/05	15:15:30	15.0	52.37	-3.651
02/01/05	15:15:31	15.9	52.37	-3.660
02/01/05	15:15:32	16.8	52.37	-3.668
02/01/05	15:15:33	17.8	52.37	-3.675
02/01/05	15:15:34	18.9	52.37	-3.688
02/01/05	15:15:35	20.0	52.37	-3.686
02/01/05	15:15:37	21.2	52.37	-3.690
02/01/05	15:15:38	22.4	52.37	-3.695
02/01/05	15:15:39	23.8	52.37	-3.701
02/01/05	15:15:41	25.2	52.37	-3.703
02/01/05	15:15:42	26.7	52.37	-3.708
02/01/05	15:15:44	28.2	52.37	-3.710
02/01/05	15:15:45	29.8	52.37	-3.714
02/01/05	15:15:47	31.5	52.37	-3.719
02/01/05	15:15:49	33.3	52.37	-3.721
02/01/05	15:15:51	35.2	52.37	-3.725
02/01/05	15:15:53	37.3	52.37	-3.730
02/01/05	15:15:55	39.5	52.37	-3.730
02/01/05	15:15:57	41.8	52.37	-3.734
02/01/05	15:16:00	44.3	52.37	-3.738
02/01/05	15:16:02	46.9	52.37	-3.739
02/01/05	15:16:05	49.7	52.37	-3.741
02/01/05	15:16:08	52.6	52.37	-3.741
02/01/05	15:16:11	55.7	52.37	-3.747
02/01/05	15:16:14	59.0	52.37	-3.749
02/01/05	15:16:18	62.5	52.37	-3.751
02/01/05	15:16:22	66.2	52.37	-3.752
02/01/05	15:16:26	70.1	52.37	-3.754
02/01/05	15:16:30	74.3	52.37	-3.756
02/01/05	15:16:34	78.7	52.37	-3.758
02/01/05	15:16:39	83.4	52.37	-3.760
02/01/05	15:16:44	88.4	52.37	-3.762
02/01/05	15:16:49	93.7	52.37	-3.762
02/01/05	15:16:55	99.3	52.37	-3.763
02/01/05	15:17:01	105.2	52.34	-3.764
02/01/05	15:17:07	111.5	52.34	-3.767
02/01/05	15:17:14	118.1	52.34	-3.767
02/01/05	15:17:21	125.1	52.37	-3.769
02/01/05	15:17:28	132.6	52.34	-3.771
02/01/05	15:17:36	140.5	52.34	-3.771
02/01/05	15:17:44	148.9	52.34	-3.773
02/01/05	15:17:53	157.8	52.34	-3.773
02/01/05	15:18:03	167.2	52.34	-3.775
02/01/05	15:18:13	177.2	52.32	-3.777
02/01/05	15:18:23	187.8	52.32	-3.779
02/01/05	15:18:34	199.0	52.32	-3.779
02/01/05	15:18:46	210.9	52.30	-3.779

B12mw-012-out.txt

02/01/05	15:18:59	223.5	52.30	-3.781
02/01/05	15:19:12	236.8	52.30	-3.781
02/01/05	15:19:26	250.9	52.30	-3.784
02/01/05	15:19:41	265.8	52.30	-3.784
02/01/05	15:19:57	281.6	52.30	-3.784
02/01/05	15:20:14	298.4	52.28	-3.786
02/01/05	15:20:32	316.2	52.25	-3.787
02/01/05	15:20:50	335.0	52.25	-3.788
02/01/05	15:21:10	354.9	52.25	-3.788
02/01/05	15:21:31	376.0	52.23	-3.791
02/01/05	15:21:54	398.4	52.21	-3.791
02/01/05	15:22:18	422.1	52.21	-3.793
02/01/05	15:22:43	447.2	52.21	-3.793
02/01/05	15:23:09	473.8	52.21	-3.794
02/01/05	15:23:37	502.0	52.19	-3.795
02/01/05	15:24:07	531.9	52.19	-3.795
02/01/05	15:24:39	563.5	52.19	-3.796
02/01/05	15:25:12	597.0	52.19	-3.796
02/01/05	15:25:48	632.5	52.19	-3.798
02/01/05	15:26:26	670.1	52.16	-3.800
02/01/05	15:27:05	709.9	52.14	-3.801
02/01/05	15:27:48	752.1	52.16	-3.802
02/01/05	15:28:32	796.8	52.16	-3.802
02/01/05	15:29:20	844.2	52.14	-3.802
02/01/05	15:30:10	894.4	52.14	-3.804
02/01/05	15:31:03	947.5	52.12	-3.806
02/01/05	15:31:59	1003.8	52.12	-3.804
02/01/05	15:32:59	1063.4	52.12	-3.808
02/01/05	15:34:02	1126.6	52.12	-3.808
02/01/05	15:35:09	1193.5	52.09	-3.808
02/01/05	15:36:20	1264.4	52.12	-3.810
02/01/05	15:37:35	1339.5	52.12	-3.812
02/01/05	15:38:54	1419.0	52.09	-3.810
02/01/05	15:40:19	1503.3	52.09	-3.812
02/01/05	15:41:48	1592.6	52.12	-3.814
02/01/05	15:43:23	1687.1	52.14	-3.815
02/01/05	15:45:03	1787.2	52.14	-3.815

# Slug Test Record



Project Name: RVAAP-RJ 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: LNW<sub>MW</sub>-024      Date Started: 02/01/05      Date Completed: 02/01/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1038.00</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>22.41</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>10.68</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>11.73</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~11'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	LNW <sub>MW</sub> -024-IN	02/01/05	02/01/05	955	1023	~21.0'	_____		_____	
2	LNW <sub>MW</sub> -024-OUT	02/01/05	02/01/05	1024	1050	~21.0'	_____		_____	

STORAGE LOCATION OF DATA:

1) PROJECTS-CONTRACTS\RVAAP RJ 14 CHARACTERIZATION\SLUG TEST DATA\MINI TROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)

Reviewed by: [Signature]

Signature: [Signature]

Date: 5/6/05



In-Situ Inc. MiniTroll Pro

Report generated: 02/02/05 08:14:19  
 Report from file: ...\\SN05444 2005-02-01 102412 LNwmw-024-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: LNwmw-024-out

Test defined on: 01/28/05 07:43:23  
 Test started on: 02/01/05 10:24:12  
 Test stopped on: 02/01/05 10:50:50  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 118

TOTAL DATA SAMPLES 118

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 8.376 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O	
02/01/05		10:24:12	0.0	51.47	0.000
02/01/05		10:24:13	0.3	51.49	-1.085
02/01/05		10:24:13	0.6	51.52	-0.204
02/01/05		10:24:13	0.9	51.52	-0.923
02/01/05		10:24:14	1.2	51.52	-0.299
02/01/05		10:24:14	1.5	51.54	-0.849
02/01/05		10:24:14	1.8	51.54	-0.410
02/01/05		10:24:14	2.1	51.54	-0.769
02/01/05		10:24:15	2.4	51.54	-0.507
02/01/05		10:24:15	2.7	51.54	-0.704
02/01/05		10:24:15	3.0	51.54	-0.574
02/01/05		10:24:16	3.3	51.54	-0.665
02/01/05		10:24:16	3.6	51.54	-0.615
02/01/05		10:24:16	3.9	51.54	-0.652
02/01/05		10:24:17	4.2	51.54	-0.639
02/01/05		10:24:17	4.5	51.54	-0.648
02/01/05		10:24:17	4.8	51.56	-0.652
02/01/05		10:24:17	5.1	51.56	-0.652
02/01/05		10:24:18	5.4	51.56	-0.659
02/01/05		10:24:18	5.7	51.56	-0.659



LNwmw-024-out.txt

02/01/05	10:24:18	6.0	51.56	-0.665
02/01/05	10:24:19	6.4	51.56	-0.667
02/01/05	10:24:19	6.7	51.56	-0.670
02/01/05	10:24:19	7.1	51.56	-0.674
02/01/05	10:24:20	7.5	51.56	-0.676
02/01/05	10:24:20	8.0	51.56	-0.680
02/01/05	10:24:21	8.4	51.56	-0.683
02/01/05	10:24:21	8.9	51.56	-0.687
02/01/05	10:24:22	9.5	51.56	-0.691
02/01/05	10:24:22	10.0	51.56	-0.695
02/01/05	10:24:23	10.6	51.56	-0.700
02/01/05	10:24:24	11.3	51.54	-0.704
02/01/05	10:24:24	11.9	51.54	-0.708
02/01/05	10:24:25	12.6	51.54	-0.715
02/01/05	10:24:26	13.4	51.54	-0.717
02/01/05	10:24:26	14.2	51.54	-0.728
02/01/05	10:24:27	15.0	51.54	-0.711
02/01/05	10:24:28	15.9	51.54	-0.719
02/01/05	10:24:29	16.8	51.54	-0.715
02/01/05	10:24:30	17.8	51.54	-0.752
02/01/05	10:24:31	18.9	51.54	-0.762
02/01/05	10:24:32	20.0	51.54	-0.769
02/01/05	10:24:33	21.2	51.54	-0.775
02/01/05	10:24:35	22.4	51.54	-0.782
02/01/05	10:24:36	23.8	51.54	-0.789
02/01/05	10:24:37	25.2	51.54	-0.797
02/01/05	10:24:39	26.7	51.54	-0.804
02/01/05	10:24:40	28.2	51.54	-0.812
02/01/05	10:24:42	29.8	51.54	-0.821
02/01/05	10:24:44	31.5	51.54	-0.829
02/01/05	10:24:46	33.3	51.54	-0.838
02/01/05	10:24:47	35.2	51.54	-0.849
02/01/05	10:24:50	37.3	51.54	-0.856
02/01/05	10:24:52	39.5	51.54	-0.868
02/01/05	10:24:54	41.8	51.54	-0.879
02/01/05	10:24:57	44.3	51.54	-0.888
02/01/05	10:24:59	46.9	51.54	-0.901
02/01/05	10:25:02	49.7	51.54	-0.914
02/01/05	10:25:05	52.6	51.54	-0.925
02/01/05	10:25:08	55.7	51.54	-0.940
02/01/05	10:25:11	59.0	51.54	-0.953
02/01/05	10:25:15	62.5	51.54	-0.966
02/01/05	10:25:18	66.2	51.54	-0.981
02/01/05	10:25:22	70.1	51.54	-0.996
02/01/05	10:25:27	74.3	51.54	-1.011
02/01/05	10:25:31	78.7	51.54	-1.027
02/01/05	10:25:36	83.4	51.54	-1.044
02/01/05	10:25:41	88.4	51.54	-1.063
02/01/05	10:25:46	93.7	51.54	-1.079
02/01/05	10:25:52	99.3	51.54	-1.098
02/01/05	10:25:57	105.2	51.54	-1.117
02/01/05	10:26:04	111.5	51.54	-1.135
02/01/05	10:26:10	118.1	51.54	-1.156
02/01/05	10:26:17	125.1	51.54	-1.176
02/01/05	10:26:25	132.6	51.54	-1.196
02/01/05	10:26:33	140.5	51.54	-1.217
02/01/05	10:26:41	148.9	51.54	-1.239
02/01/05	10:26:50	157.8	51.54	-1.262
02/01/05	10:26:59	167.2	51.54	-1.282
02/01/05	10:27:09	177.2	51.54	-1.304
02/01/05	10:27:20	187.8	51.52	-1.327
02/01/05	10:27:31	199.0	51.52	-1.349
02/01/05	10:27:43	210.9	51.52	-1.371

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02/01/05	10:27:56	223.5	51.52	-1.395
02/01/05	10:28:09	236.8	51.52	-1.418
02/01/05	10:28:23	250.9	51.52	-1.438
02/01/05	10:28:38	265.8	51.52	-1.461
02/01/05	10:28:54	281.6	51.52	-1.481
02/01/05	10:29:11	298.4	51.49	-1.503
02/01/05	10:29:28	316.2	51.49	-1.522
02/01/05	10:29:47	335.0	51.49	-1.542
02/01/05	10:30:07	354.9	51.47	-1.561
02/01/05	10:30:28	376.0	51.47	-1.580
02/01/05	10:30:51	398.4	51.47	-1.596
02/01/05	10:31:14	422.1	51.47	-1.613
02/01/05	10:31:39	447.2	51.47	-1.630
02/01/05	10:32:06	473.8	51.49	-1.645
02/01/05	10:32:34	502.0	51.47	-1.658
02/01/05	10:33:04	531.9	51.47	-1.671
02/01/05	10:33:36	563.5	51.47	-1.682
02/01/05	10:34:09	597.0	51.47	-1.693
02/01/05	10:34:45	632.5	51.45	-1.702
02/01/05	10:35:22	670.1	51.45	-1.712
02/01/05	10:36:02	709.9	51.45	-1.719
02/01/05	10:36:44	752.1	51.45	-1.725
02/01/05	10:37:29	796.8	51.45	-1.730
02/01/05	10:38:16	844.2	51.47	-1.738
02/01/05	10:39:07	894.4	51.47	-1.741
02/01/05	10:40:00	947.5	51.49	-1.745
02/01/05	10:40:56	1003.8	51.49	-1.749
02/01/05	10:41:56	1063.4	51.52	-1.750
02/01/05	10:42:59	1126.6	51.52	-1.754
02/01/05	10:44:06	1193.5	51.54	-1.754
02/01/05	10:45:17	1264.4	51.56	-1.756
02/01/05	10:46:32	1339.5	51.56	-1.758
02/01/05	10:47:51	1419.0	51.58	-1.759
02/01/05	10:49:16	1503.3	51.58	-1.761
02/01/05	10:50:45	1592.6	51.61	-1.761

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: LNWmw-025      Date Started: 02/01/05      Date Completed: 02/01/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1029.13</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>20.21</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>4.21</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>16.00</u>	SCREEN LENGTH
	FEET	METERS
		<u>6' BGS</u>
		<u>8' BGS</u>
		10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>2.5'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>LNWmw-025-IN</u>	<u>02/01/05</u>	<u>02/01/05</u>	<u>1015</u>	<u>1032</u>	<u>~ 19'</u>				
2	<u>LNWmw-025-OUT</u>	<u>02/01/05</u>	<u>02/01/05</u>	<u>1032</u>	<u>1059</u>	<u>~ 19'</u>				

STORAGE LOCATION OF DATA:

1) PROJECTS - CONTRACT 31 RVAAP RI 14 CHARACTERIZATION  
2) DATA CREATION (SLUG TEST DATA) MINI TROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER

ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)

Reviewed by: [Signature]

Signature: [Signature]

Date: 5/6/05



**MKM Engineers, Inc.**

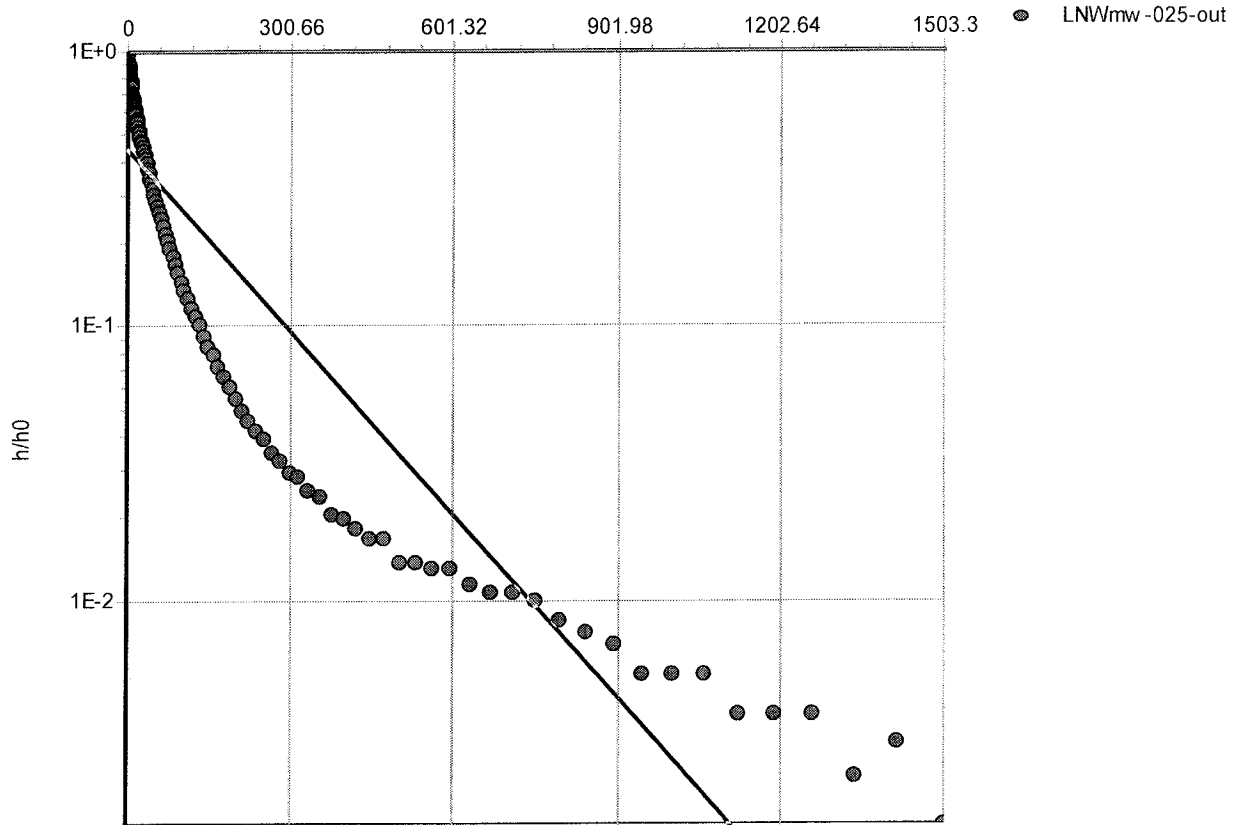
8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

LNWmw -025 (Bouwer-Rice)



Test name: **LNWmw-025**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 1.54E-4 [cm/s]

Test parameters:

Test Well:	LNWmw-025-out	Aquifer thickness:	16 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:  
 Date: 2/25/2005

In-Situ Inc. MiniTroll Pro

Report generated: 02/02/05 07:57:35  
 Report from file: ...\\SN04886 2005-02-01 103227 LNwmw-025-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: LNwmw-025-out

Test defined on: 01/28/05 07:51:09  
 Test started on: 02/01/05 10:32:27  
 Test stopped on: 02/01/05 10:59:06  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 118

TOTAL DATA SAMPLES 118

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 12.591 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	Feet H2O
			Temperature Fahrenheit	Pressure Feet H2O	
02/01/05	10:32:27		0.0	50.38	0.000
02/01/05	10:32:27		0.3	50.43	-0.307
02/01/05	10:32:28		0.6	50.43	-0.263
02/01/05	10:32:28		0.9	50.45	-0.348
02/01/05	10:32:28		1.2	50.45	-0.366
02/01/05	10:32:28		1.5	50.45	-0.377
02/01/05	10:32:29		1.8	50.45	-0.390
02/01/05	10:32:29		2.1	50.47	-0.408
02/01/05	10:32:29		2.4	50.47	-0.421
02/01/05	10:32:30		2.7	50.47	-0.434
02/01/05	10:32:30		3.0	50.47	-0.447
02/01/05	10:32:30		3.3	50.47	-0.458
02/01/05	10:32:31		3.6	50.47	-0.469
02/01/05	10:32:31		3.9	50.47	-0.478
02/01/05	10:32:31		4.2	50.47	-0.499
02/01/05	10:32:31		4.5	50.47	-0.515
02/01/05	10:32:32		4.8	50.47	-0.526
02/01/05	10:32:32		5.1	50.47	-0.539
02/01/05	10:32:32		5.4	50.49	-0.548
02/01/05	10:32:33		5.7	50.49	-0.559

LNwmw-025-out.txt

02/01/05	10:32:33	6.0	50.49	-0.568
02/01/05	10:32:33	6.4	50.49	-0.579
02/01/05	10:32:34	6.7	50.49	-0.590
02/01/05	10:32:34	7.1	50.49	-0.600
02/01/05	10:32:34	7.5	50.49	-0.653
02/01/05	10:32:35	8.0	50.49	-0.657
02/01/05	10:32:35	8.4	50.49	-0.666
02/01/05	10:32:36	8.9	50.49	-0.679
02/01/05	10:32:36	9.5	50.49	-0.692
02/01/05	10:32:37	10.0	50.47	-0.699
02/01/05	10:32:38	10.6	50.47	-0.712
02/01/05	10:32:38	11.3	50.47	-0.725
02/01/05	10:32:39	11.9	50.47	-0.738
02/01/05	10:32:40	12.6	50.47	-0.753
02/01/05	10:32:40	13.4	50.47	-0.766
02/01/05	10:32:41	14.2	50.47	-0.782
02/01/05	10:32:42	15.0	50.47	-0.795
02/01/05	10:32:43	15.9	50.45	-0.812
02/01/05	10:32:44	16.8	50.47	-0.828
02/01/05	10:32:45	17.8	50.47	-0.845
02/01/05	10:32:46	18.9	50.47	-0.862
02/01/05	10:32:47	20.0	50.47	-0.880
02/01/05	10:32:48	21.2	50.47	-0.898
02/01/05	10:32:49	22.4	50.47	-0.915
02/01/05	10:32:51	23.8	50.47	-0.933
02/01/05	10:32:52	25.2	50.47	-0.952
02/01/05	10:32:54	26.7	50.47	-0.970
02/01/05	10:32:55	28.2	50.47	-0.989
02/01/05	10:32:57	29.8	50.47	-1.007
02/01/05	10:32:58	31.5	50.47	-1.026
02/01/05	10:33:00	33.3	50.47	-1.044
02/01/05	10:33:02	35.2	50.49	-1.064
02/01/05	10:33:04	37.3	50.49	-1.082
02/01/05	10:33:06	39.5	50.49	-1.103
02/01/05	10:33:09	41.8	50.49	-1.121
02/01/05	10:33:11	44.3	50.49	-1.141
02/01/05	10:33:14	46.9	50.52	-1.161
02/01/05	10:33:17	49.7	50.52	-1.182
02/01/05	10:33:20	52.6	50.52	-1.200
02/01/05	10:33:23	55.7	50.52	-1.219
02/01/05	10:33:26	59.0	50.52	-1.237
02/01/05	10:33:29	62.5	50.54	-1.255
02/01/05	10:33:33	66.2	50.54	-1.274
02/01/05	10:33:37	70.1	50.54	-1.292
02/01/05	10:33:41	74.3	50.56	-1.308
02/01/05	10:33:46	78.7	50.56	-1.323
02/01/05	10:33:50	83.4	50.58	-1.340
02/01/05	10:33:55	88.4	50.58	-1.356
02/01/05	10:34:01	93.7	50.58	-1.369
02/01/05	10:34:06	99.3	50.61	-1.384
02/01/05	10:34:12	105.2	50.61	-1.398
02/01/05	10:34:18	111.5	50.63	-1.409
02/01/05	10:34:25	118.1	50.63	-1.422
02/01/05	10:34:32	125.1	50.63	-1.433
02/01/05	10:34:40	132.6	50.65	-1.442
02/01/05	10:34:47	140.5	50.67	-1.453
02/01/05	10:34:56	148.9	50.67	-1.464
02/01/05	10:35:05	157.8	50.70	-1.471
02/01/05	10:35:14	167.2	50.70	-1.480
02/01/05	10:35:24	177.2	50.72	-1.488
02/01/05	10:35:35	187.8	50.74	-1.495
02/01/05	10:35:46	199.0	50.79	-1.502
02/01/05	10:35:58	210.9	50.81	-1.509

## LNwmw-025-out.txt

02/01/05	10:36:10	223.5	50.85	-1.514
02/01/05	10:36:24	236.8	50.90	-1.519
02/01/05	10:36:38	250.9	50.94	-1.522
02/01/05	10:36:53	265.8	50.99	-1.528
02/01/05	10:37:09	281.6	51.01	-1.531
02/01/05	10:37:25	298.4	51.01	-1.535
02/01/05	10:37:43	316.2	51.03	-1.536
02/01/05	10:38:02	335.0	51.01	-1.540
02/01/05	10:38:22	354.9	51.01	-1.542
02/01/05	10:38:43	376.0	51.03	-1.546
02/01/05	10:39:05	398.4	51.06	-1.547
02/01/05	10:39:29	422.1	51.08	-1.549
02/01/05	10:39:54	447.2	51.06	-1.551
02/01/05	10:40:21	473.8	51.06	-1.551
02/01/05	10:40:49	502.0	51.06	-1.555
02/01/05	10:41:19	531.9	51.06	-1.555
02/01/05	10:41:50	563.5	51.06	-1.556
02/01/05	10:42:24	597.0	51.08	-1.556
02/01/05	10:42:59	632.5	51.08	-1.558
02/01/05	10:43:37	670.1	51.12	-1.559
02/01/05	10:44:17	709.9	51.12	-1.559
02/01/05	10:44:59	752.1	51.10	-1.560
02/01/05	10:45:44	796.8	51.10	-1.562
02/01/05	10:46:31	844.2	51.10	-1.563
02/01/05	10:47:21	894.4	51.08	-1.564
02/01/05	10:48:14	947.5	51.06	-1.566
02/01/05	10:49:11	1003.8	51.03	-1.566
02/01/05	10:50:10	1063.4	50.99	-1.566
02/01/05	10:51:14	1126.6	50.97	-1.568
02/01/05	10:52:20	1193.5	50.99	-1.568
02/01/05	10:53:31	1264.4	50.99	-1.568
02/01/05	10:54:46	1339.5	50.99	-1.570
02/01/05	10:56:06	1419.0	51.08	-1.569
02/01/05	10:57:30	1503.3	51.12	-1.571
02/01/05	10:59:00	1592.6	51.10	-1.573

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: LNWmw-026      Date Started: 02/01/05      Date Completed: 02/01/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5AAA	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1027.80</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>25.95</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>3.87</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>22.08</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~4.0'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>LNWmw-026-IN</u>	<u>02/01/05</u>	<u>02/01/05</u>	<u>1119</u>	<u>1140</u>	<u>~24'</u>				
2	<u>LNWmw-026-CUT</u>	<u>02/01/05</u>	<u>02/01/05</u>	<u>1141</u>	<u>1159</u>	<u>~24'</u>				

STORAGE LOCATION OF DATA: 1) PROJECTS CONTRACTS / RVAAP/RI14 CHARACTERIZATION / SLUG TEST DATA / MINI TROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05





**MKM Engineers, Inc.**

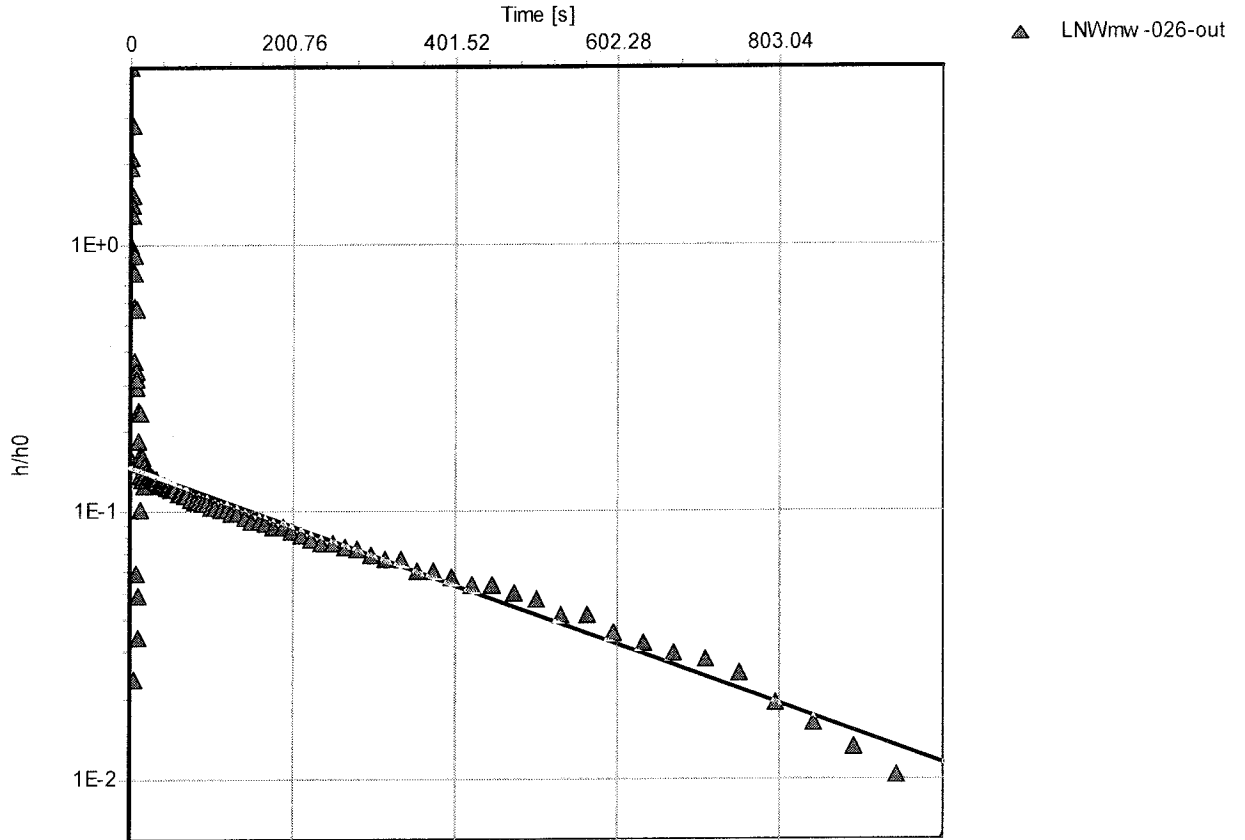
8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

LNWmw-026 (Bouwer-Rice)



Test name: LNWmw-026

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity: 8.20E-5 [cm/s]

Test parameters:

Test Well:	LNWmw-026-out	Aquifer thickness:	22.08 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/25/2005

In-Situ Inc. MiniTroll Pro

Report generated: 02/02/05 08:14:59  
 Report from file: ...\\SN05444 2005-02-01 114135 LNwmw-026-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: LNwmw-026-out

Test defined on: 01/28/05 07:43:40  
 Test started on: 02/01/05 11:41:35  
 Test stopped on: 02/01/05 11:59:49  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 111

TOTAL DATA SAMPLES 111

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 17.954 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
02/01/05	11:41:35		0.0	52.46
02/01/05	11:41:35		0.3	52.49
02/01/05	11:41:35		0.6	52.51
02/01/05	11:41:36		0.9	52.51
02/01/05	11:41:36		1.2	52.51
02/01/05	11:41:36		1.5	52.53
02/01/05	11:41:37		1.8	52.53
02/01/05	11:41:37		2.1	52.53
02/01/05	11:41:37		2.4	52.53
02/01/05	11:41:37		2.7	52.53
02/01/05	11:41:38		3.0	52.53
02/01/05	11:41:38		3.3	52.53
02/01/05	11:41:38		3.6	52.53
02/01/05	11:41:39		3.9	52.55
02/01/05	11:41:39		4.2	52.55
02/01/05	11:41:39		4.5	52.55
02/01/05	11:41:40		4.8	52.55
02/01/05	11:41:40		5.1	52.55
02/01/05	11:41:40		5.4	52.55
02/01/05	11:41:40		5.7	52.55

LNwmw-026-out.txt

02/01/05	11:41:41	6.0	52.55	-2.316
02/01/05	11:41:41	6.4	52.55	-1.885
02/01/05	11:41:41	6.7	52.55	-1.727
02/01/05	11:41:42	7.1	52.55	-2.074
02/01/05	11:41:42	7.5	52.55	-2.217
02/01/05	11:41:43	8.0	52.55	-1.916
02/01/05	11:41:43	8.4	52.55	-1.903
02/01/05	11:41:44	8.9	52.55	-2.147
02/01/05	11:41:44	9.5	52.58	-1.989
02/01/05	11:41:45	10.0	52.53	-1.954
02/01/05	11:41:45	10.6	52.53	-2.091
02/01/05	11:41:46	11.3	52.53	-1.956
02/01/05	11:41:47	11.9	52.53	-2.045
02/01/05	11:41:47	12.6	52.53	-2.004
02/01/05	11:41:48	13.4	52.53	-2.021
02/01/05	11:41:49	14.2	52.51	-2.011
02/01/05	11:41:50	15.0	52.51	-2.024
02/01/05	11:41:51	15.9	52.51	-2.006
02/01/05	11:41:52	16.8	52.51	-2.028
02/01/05	11:41:53	17.8	52.51	-2.013
02/01/05	11:41:54	18.9	52.51	-2.017
02/01/05	11:41:55	20.0	52.51	-2.024
02/01/05	11:41:56	21.2	52.51	-2.021
02/01/05	11:41:57	22.4	52.51	-2.021
02/01/05	11:41:59	23.8	52.51	-2.021
02/01/05	11:42:00	25.2	52.51	-2.021
02/01/05	11:42:01	26.7	52.51	-2.023
02/01/05	11:42:03	28.2	52.51	-2.024
02/01/05	11:42:05	29.8	52.51	-2.024
02/01/05	11:42:06	31.5	52.51	-2.024
02/01/05	11:42:08	33.3	52.51	-2.026
02/01/05	11:42:10	35.2	52.51	-2.028
02/01/05	11:42:12	37.3	52.51	-2.028
02/01/05	11:42:14	39.5	52.51	-2.028
02/01/05	11:42:17	41.8	52.51	-2.028
02/01/05	11:42:19	44.3	52.49	-2.030
02/01/05	11:42:22	46.9	52.49	-2.030
02/01/05	11:42:24	49.7	52.49	-2.032
02/01/05	11:42:27	52.6	52.49	-2.032
02/01/05	11:42:30	55.7	52.49	-2.032
02/01/05	11:42:34	59.0	52.49	-2.034
02/01/05	11:42:37	62.5	52.49	-2.034
02/01/05	11:42:41	66.2	52.49	-2.036
02/01/05	11:42:45	70.1	52.49	-2.036
02/01/05	11:42:49	74.3	52.49	-2.038
02/01/05	11:42:53	78.7	52.49	-2.039
02/01/05	11:42:58	83.4	52.49	-2.039
02/01/05	11:43:03	88.4	52.49	-2.041
02/01/05	11:43:08	93.7	52.49	-2.041
02/01/05	11:43:14	99.3	52.49	-2.043
02/01/05	11:43:20	105.2	52.49	-2.043
02/01/05	11:43:26	111.5	52.49	-2.045
02/01/05	11:43:33	118.1	52.49	-2.045
02/01/05	11:43:40	125.1	52.49	-2.047
02/01/05	11:43:47	132.6	52.49	-2.047
02/01/05	11:43:55	140.5	52.49	-2.049
02/01/05	11:44:04	148.9	52.49	-2.051
02/01/05	11:44:13	157.8	52.49	-2.051
02/01/05	11:44:22	167.2	52.49	-2.052
02/01/05	11:44:32	177.2	52.49	-2.054
02/01/05	11:44:43	187.8	52.49	-2.054
02/01/05	11:44:54	199.0	52.49	-2.056
02/01/05	11:45:06	210.9	52.49	-2.058

		LNwmw-026-out.txt		
02/01/05	11:45:18	223.5	52.49	-2.060
02/01/05	11:45:32	236.8	52.49	-2.062
02/01/05	11:45:46	250.9	52.49	-2.062
02/01/05	11:46:01	265.8	52.49	-2.064
02/01/05	11:46:16	281.6	52.49	-2.065
02/01/05	11:46:33	298.4	52.49	-2.067
02/01/05	11:46:51	316.2	52.49	-2.069
02/01/05	11:47:10	335.0	52.49	-2.069
02/01/05	11:47:30	354.9	52.49	-2.073
02/01/05	11:47:51	376.0	52.51	-2.073
02/01/05	11:48:13	398.4	52.49	-2.075
02/01/05	11:48:37	422.1	52.49	-2.078
02/01/05	11:49:02	447.2	52.49	-2.078
02/01/05	11:49:29	473.8	52.49	-2.080
02/01/05	11:49:57	502.0	52.46	-2.082
02/01/05	11:50:27	531.9	52.46	-2.086
02/01/05	11:50:58	563.5	52.44	-2.086
02/01/05	11:51:32	597.0	52.44	-2.090
02/01/05	11:52:07	632.5	52.44	-2.092
02/01/05	11:52:45	670.1	52.44	-2.094
02/01/05	11:53:25	709.9	52.44	-2.095
02/01/05	11:54:07	752.1	52.44	-2.097
02/01/05	11:54:52	796.8	52.44	-2.101
02/01/05	11:55:39	844.2	52.44	-2.103
02/01/05	11:56:29	894.4	52.44	-2.105
02/01/05	11:57:22	947.5	52.44	-2.107
02/01/05	11:58:19	1003.8	52.44	-2.110
02/01/05	11:59:18	1063.4	52.44	-2.114

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: LNWmw - 027      Date Started: 02/01/05      Date Completed: 02/01/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1027.13</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>26.80</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>6.55</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>20.25</u>	SCREEN LENGTH
		10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	24 x 1.6" OD	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~7'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>LNWmw-027-IN</u>	<u>02/01/05</u>	<u>02/01/05</u>	<u>1133</u>	<u>1147</u>	<u>~25'</u>				
2	<u>LNWmw-027-OUT</u>	<u>02/01/05</u>	<u>02/01/05</u>	<u>1147</u>	<u>1207</u>	<u>~25'</u>				

STORAGE LOCATION OF DATA: 1) PROJECTS-CONTRACTS\RVAAP\RI14 CHARACTERIZATION\SLUG TEST DATA\MINI TROLL DATA

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
 ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

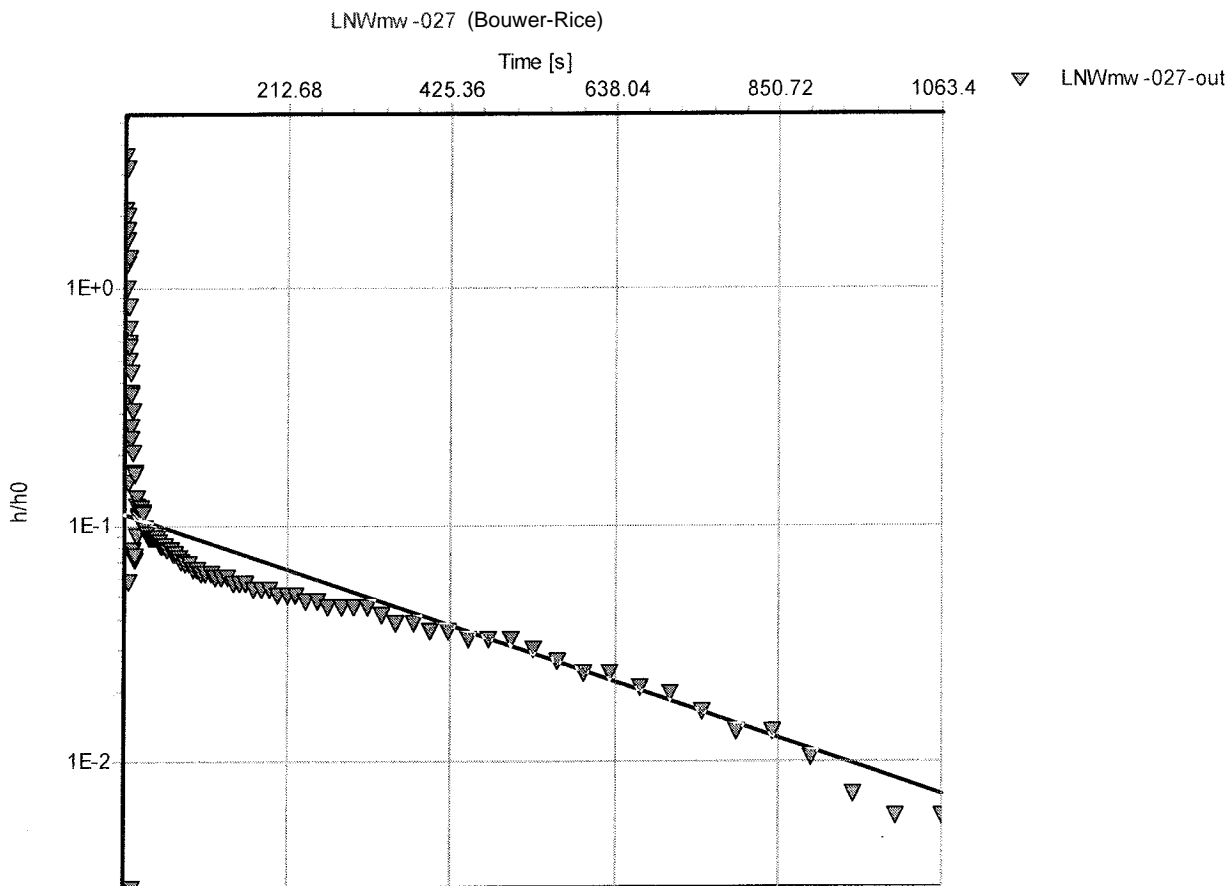
**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
 Signature: [Signature]      Date: 2/6/05

**MKM Engineers, Inc.**8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

Test name:      **LNWmw-027**Analysis Method:      **Bouwer & Rice**Analysis results:

Conductivity:      8.12E-5 [cm/s]

Test parameters:

Test Well:	LNWmw-027-out	Aquifer thickness:	20.25 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date:      2/25/2005



LNwmw-027-out.txt

02/01/05	11:47:46	6.0	51.80	-1.090
02/01/05	11:47:47	6.4	51.80	-1.694
02/01/05	11:47:47	6.7	51.80	-1.900
02/01/05	11:47:47	7.1	51.82	-1.358
02/01/05	11:47:48	7.5	51.82	-1.414
02/01/05	11:47:48	8.0	51.82	-1.813
02/01/05	11:47:49	8.4	51.82	-1.480
02/01/05	11:47:49	8.9	51.82	-1.498
02/01/05	11:47:50	9.5	51.82	-1.708
02/01/05	11:47:50	10.0	51.78	-1.449
02/01/05	11:47:51	10.6	51.78	-1.653
02/01/05	11:47:51	11.3	51.78	-1.519
02/01/05	11:47:52	11.9	51.78	-1.607
02/01/05	11:47:53	12.6	51.78	-1.543
02/01/05	11:47:54	13.4	51.78	-1.605
02/01/05	11:47:54	14.2	51.78	-1.545
02/01/05	11:47:55	15.0	51.78	-1.594
02/01/05	11:47:56	15.9	51.78	-1.574
02/01/05	11:47:57	16.8	51.78	-1.567
02/01/05	11:47:58	17.8	51.78	-1.582
02/01/05	11:47:59	18.9	51.78	-1.583
02/01/05	11:48:00	20.0	51.76	-1.578
02/01/05	11:48:01	21.2	51.78	-1.576
02/01/05	11:48:03	22.4	51.76	-1.578
02/01/05	11:48:04	23.8	51.76	-1.580
02/01/05	11:48:05	25.2	51.76	-1.589
02/01/05	11:48:07	26.7	51.76	-1.591
02/01/05	11:48:08	28.2	51.76	-1.593
02/01/05	11:48:10	29.8	51.76	-1.593
02/01/05	11:48:12	31.5	51.76	-1.595
02/01/05	11:48:13	33.3	51.76	-1.595
02/01/05	11:48:15	35.2	51.76	-1.596
02/01/05	11:48:17	37.3	51.76	-1.596
02/01/05	11:48:20	39.5	51.76	-1.596
02/01/05	11:48:22	41.8	51.76	-1.596
02/01/05	11:48:24	44.3	51.76	-1.598
02/01/05	11:48:27	46.9	51.76	-1.600
02/01/05	11:48:30	49.7	51.76	-1.600
02/01/05	11:48:33	52.6	51.76	-1.600
02/01/05	11:48:36	55.7	51.76	-1.602
02/01/05	11:48:39	59.0	51.76	-1.602
02/01/05	11:48:43	62.5	51.76	-1.604
02/01/05	11:48:46	66.2	51.76	-1.604
02/01/05	11:48:50	70.1	51.76	-1.606
02/01/05	11:48:54	74.3	51.76	-1.608
02/01/05	11:48:59	78.7	51.76	-1.609
02/01/05	11:49:04	83.4	51.76	-1.609
02/01/05	11:49:09	88.4	51.76	-1.611
02/01/05	11:49:14	93.7	51.76	-1.611
02/01/05	11:49:19	99.3	51.76	-1.613
02/01/05	11:49:25	105.2	51.76	-1.613
02/01/05	11:49:32	111.5	51.73	-1.613
02/01/05	11:49:38	118.1	51.73	-1.615
02/01/05	11:49:45	125.1	51.76	-1.615
02/01/05	11:49:53	132.6	51.73	-1.615
02/01/05	11:50:01	140.5	51.73	-1.617
02/01/05	11:50:09	148.9	51.73	-1.617
02/01/05	11:50:18	157.8	51.73	-1.617
02/01/05	11:50:27	167.2	51.73	-1.619
02/01/05	11:50:37	177.2	51.73	-1.619
02/01/05	11:50:48	187.8	51.73	-1.619
02/01/05	11:50:59	199.0	51.73	-1.621
02/01/05	11:51:11	210.9	51.73	-1.621



		LNwmw-027-out.txt		
02/01/05	11:51:24	223.5	51.71	-1.621
02/01/05	11:51:37	236.8	51.71	-1.623
02/01/05	11:51:51	250.9	51.69	-1.623
02/01/05	11:52:06	265.8	51.69	-1.625
02/01/05	11:52:22	281.6	51.67	-1.625
02/01/05	11:52:39	298.4	51.67	-1.625
02/01/05	11:52:56	316.2	51.64	-1.625
02/01/05	11:53:15	335.0	51.64	-1.627
02/01/05	11:53:35	354.9	51.62	-1.629
02/01/05	11:53:56	376.0	51.60	-1.629
02/01/05	11:54:19	398.4	51.60	-1.631
02/01/05	11:54:42	422.1	51.60	-1.631
02/01/05	11:55:07	447.2	51.58	-1.633
02/01/05	11:55:34	473.8	51.58	-1.633
02/01/05	11:56:02	502.0	51.55	-1.633
02/01/05	11:56:32	531.9	51.55	-1.635
02/01/05	11:57:04	563.5	51.55	-1.637
02/01/05	11:57:37	597.0	51.55	-1.639
02/01/05	11:58:13	632.5	51.55	-1.639
02/01/05	11:58:50	670.1	51.55	-1.641
02/01/05	11:59:30	709.9	51.55	-1.642
02/01/05	12:00:12	752.1	51.55	-1.644
02/01/05	12:00:57	796.8	51.55	-1.646
02/01/05	12:01:44	844.2	51.55	-1.646
02/01/05	12:02:35	894.4	51.55	-1.648
02/01/05	12:03:28	947.5	51.58	-1.650
02/01/05	12:04:24	1003.8	51.58	-1.651
02/01/05	12:05:24	1063.4	51.58	-1.651
02/01/05	12:06:27	1126.6	51.60	-1.655

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTAmw-107      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1080.30</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>24.34</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>11.01</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>13.31</u>	SCREEN LENGTH
	FEET	METERS
	<u>9' BGS</u>	
	<u>12' BGS</u>	
	10 ft	

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~12'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	NTAmw-107-IN	01/24/05	01/24/05	943	1013	~23'				
2	NTAmw-107-OUT	01/24/05	01/24/05	1014	1034	~23'				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05

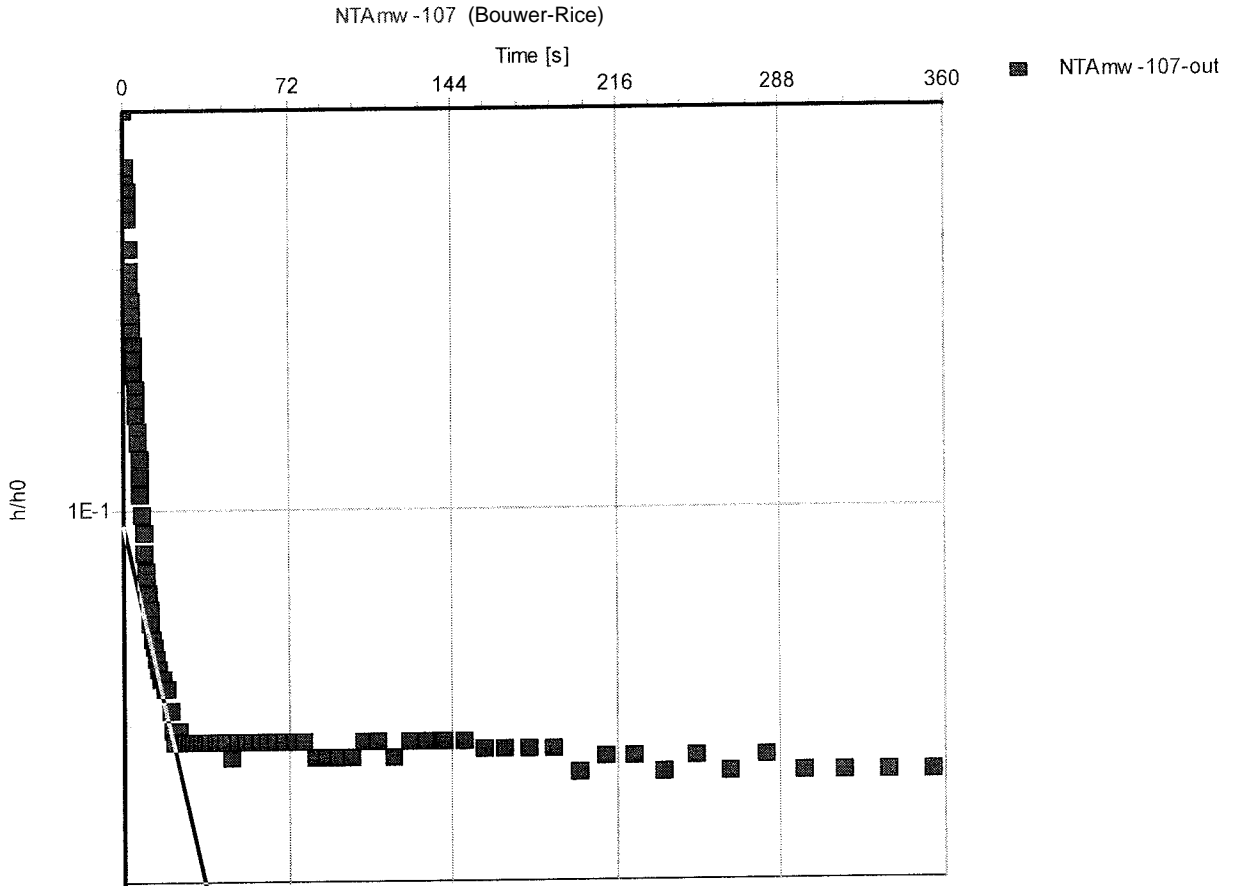
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

Test name: NTAmw-107Analysis Method: Bouwer & RiceAnalysis results:

Conductivity:

1.69E-3 [cm/s]

Test parameters:

Test Well:

NTAmw-107-out

Aquifer thickness:

13.33 [ft]

Screen radius:

0.34375 [ft]

Gravel Pack Porosity (%)

25

Screen length:

10 [ft]

Casing radius:

0.08333 [ft]

r(eff):

0.186 [ft]

Comments:

Evaluated by:

Date:

2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:30:40  
 Report from file: ...\\SN04886 2005-01-24 101401 NTAmw-107-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: NTAmw-107-out

Test defined on: 01/21/05 16:42:52  
 Test started on: 01/24/05 10:14:01  
 Test stopped on: 01/24/05 10:34:26  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 113

TOTAL DATA SAMPLES 113

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 5.791 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/24/05	10:14:01		0.0	51.94
01/24/05	10:14:02		0.3	51.96
01/24/05	10:14:02		0.6	51.98
01/24/05	10:14:02		0.9	51.98
01/24/05	10:14:03		1.2	51.98
01/24/05	10:14:03		1.5	51.98
01/24/05	10:14:03		1.8	52.00
01/24/05	10:14:03		2.1	52.00
01/24/05	10:14:04		2.4	52.00
01/24/05	10:14:04		2.7	52.00
01/24/05	10:14:04		3.0	52.00
01/24/05	10:14:05		3.3	52.00
01/24/05	10:14:05		3.6	52.00
01/24/05	10:14:05		3.9	52.00
01/24/05	10:14:06		4.2	52.03
01/24/05	10:14:06		4.5	52.03
01/24/05	10:14:06		4.8	52.03
01/24/05	10:14:06		5.1	52.03
01/24/05	10:14:07		5.4	52.03
01/24/05	10:14:07		5.7	52.03

NTAmw-107-out.txt

01/24/05	10:14:07	6.0	52.03	-4.354
01/24/05	10:14:08	6.4	52.03	-4.365
01/24/05	10:14:08	6.7	52.03	-4.376
01/24/05	10:14:08	7.1	52.03	-4.389
01/24/05	10:14:09	7.5	52.03	-4.400
01/24/05	10:14:09	8.0	52.03	-4.410
01/24/05	10:14:10	8.4	52.03	-4.419
01/24/05	10:14:10	8.9	52.03	-4.428
01/24/05	10:14:11	9.5	52.05	-4.435
01/24/05	10:14:11	10.0	52.03	-4.439
01/24/05	10:14:12	10.6	52.00	-4.443
01/24/05	10:14:13	11.3	52.00	-4.448
01/24/05	10:14:13	11.9	52.00	-4.452
01/24/05	10:14:14	12.6	52.00	-4.456
01/24/05	10:14:15	13.4	52.00	-4.458
01/24/05	10:14:15	14.2	52.00	-4.461
01/24/05	10:14:16	15.0	52.00	-4.463
01/24/05	10:14:17	15.9	52.00	-4.465
01/24/05	10:14:18	16.8	52.00	-4.465
01/24/05	10:14:19	17.8	52.00	-4.467
01/24/05	10:14:20	18.9	52.00	-4.467
01/24/05	10:14:21	20.0	52.00	-4.471
01/24/05	10:14:23	21.2	52.00	-4.474
01/24/05	10:14:24	22.4	52.00	-4.476
01/24/05	10:14:25	23.8	52.00	-4.474
01/24/05	10:14:27	25.2	52.00	-4.476
01/24/05	10:14:28	26.7	52.00	-4.476
01/24/05	10:14:30	28.2	52.00	-4.476
01/24/05	10:14:31	29.8	52.00	-4.476
01/24/05	10:14:33	31.5	52.00	-4.476
01/24/05	10:14:35	33.3	52.00	-4.476
01/24/05	10:14:37	35.2	52.00	-4.476
01/24/05	10:14:39	37.3	52.00	-4.476
01/24/05	10:14:41	39.5	52.00	-4.476
01/24/05	10:14:43	41.8	52.00	-4.476
01/24/05	10:14:46	44.3	52.00	-4.476
01/24/05	10:14:48	46.9	52.00	-4.478
01/24/05	10:14:51	49.7	52.00	-4.476
01/24/05	10:14:54	52.6	52.00	-4.476
01/24/05	10:14:57	55.7	52.00	-4.476
01/24/05	10:15:00	59.0	51.98	-4.476
01/24/05	10:15:04	62.5	51.98	-4.476
01/24/05	10:15:08	66.2	51.98	-4.476
01/24/05	10:15:11	70.1	51.98	-4.476
01/24/05	10:15:16	74.3	51.98	-4.476
01/24/05	10:15:20	78.7	51.98	-4.476
01/24/05	10:15:25	83.4	51.98	-4.478
01/24/05	10:15:30	88.4	51.98	-4.478
01/24/05	10:15:35	93.7	51.98	-4.478
01/24/05	10:15:41	99.3	51.98	-4.478
01/24/05	10:15:47	105.2	51.98	-4.476
01/24/05	10:15:53	111.5	51.98	-4.476
01/24/05	10:15:59	118.1	51.98	-4.478
01/24/05	10:16:06	125.1	51.98	-4.476
01/24/05	10:16:14	132.6	51.98	-4.476
01/24/05	10:16:22	140.5	51.98	-4.476
01/24/05	10:16:30	148.9	51.98	-4.476
01/24/05	10:16:39	157.8	51.96	-4.477
01/24/05	10:16:49	167.2	51.96	-4.477
01/24/05	10:16:59	177.2	51.96	-4.477
01/24/05	10:17:09	187.8	51.96	-4.477
01/24/05	10:17:20	199.0	51.96	-4.480
01/24/05	10:17:32	210.9	51.96	-4.478

		NTAmw-107-out.txt		
01/24/05	10:17:45	223.5	51.96	-4.478
01/24/05	10:17:58	236.8	51.96	-4.480
01/24/05	10:18:12	250.9	51.96	-4.478
01/24/05	10:18:27	265.8	51.96	-4.480
01/24/05	10:18:43	281.6	51.96	-4.478
01/24/05	10:19:00	298.4	51.96	-4.480
01/24/05	10:19:18	316.2	51.96	-4.480
01/24/05	10:19:36	335.0	51.96	-4.480
01/24/05	10:19:56	354.9	51.96	-4.480
01/24/05	10:20:17	376.0	51.96	-4.480
01/24/05	10:20:40	398.4	51.96	-4.480
01/24/05	10:21:03	422.1	51.96	-4.480
01/24/05	10:21:29	447.2	51.96	-4.482
01/24/05	10:21:55	473.8	51.96	-4.480
01/24/05	10:22:23	502.0	51.96	-4.484
01/24/05	10:22:53	531.9	51.96	-4.482
01/24/05	10:23:25	563.5	51.96	-4.484
01/24/05	10:23:58	597.0	51.96	-4.484
01/24/05	10:24:34	632.5	51.96	-4.484
01/24/05	10:25:11	670.1	51.96	-4.482
01/24/05	10:25:51	709.9	51.96	-4.484
01/24/05	10:26:33	752.1	51.98	-4.486
01/24/05	10:27:18	796.8	51.98	-4.484
01/24/05	10:28:06	844.2	51.98	-4.484
01/24/05	10:28:56	894.4	51.98	-4.486
01/24/05	10:29:49	947.5	51.98	-4.486
01/24/05	10:30:45	1003.8	51.98	-4.486
01/24/05	10:31:45	1063.4	51.98	-4.486
01/24/05	10:32:48	1126.6	51.98	-4.487
01/24/05	10:33:55	1193.5	51.98	-4.500

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTAMW-108      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4926	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1085.62</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>24.50</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>15.90</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>8.60</u>	SCREEN LENGTH
		10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~16'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>NTAMW-108-IN</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>954</u>	<u>1018</u>	<u>~23'</u>				
2	<u>NTAMW-108-OUT</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1018</u>	<u>1039</u>	<u>~23'</u>				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



**MKM Engineers, Inc.**

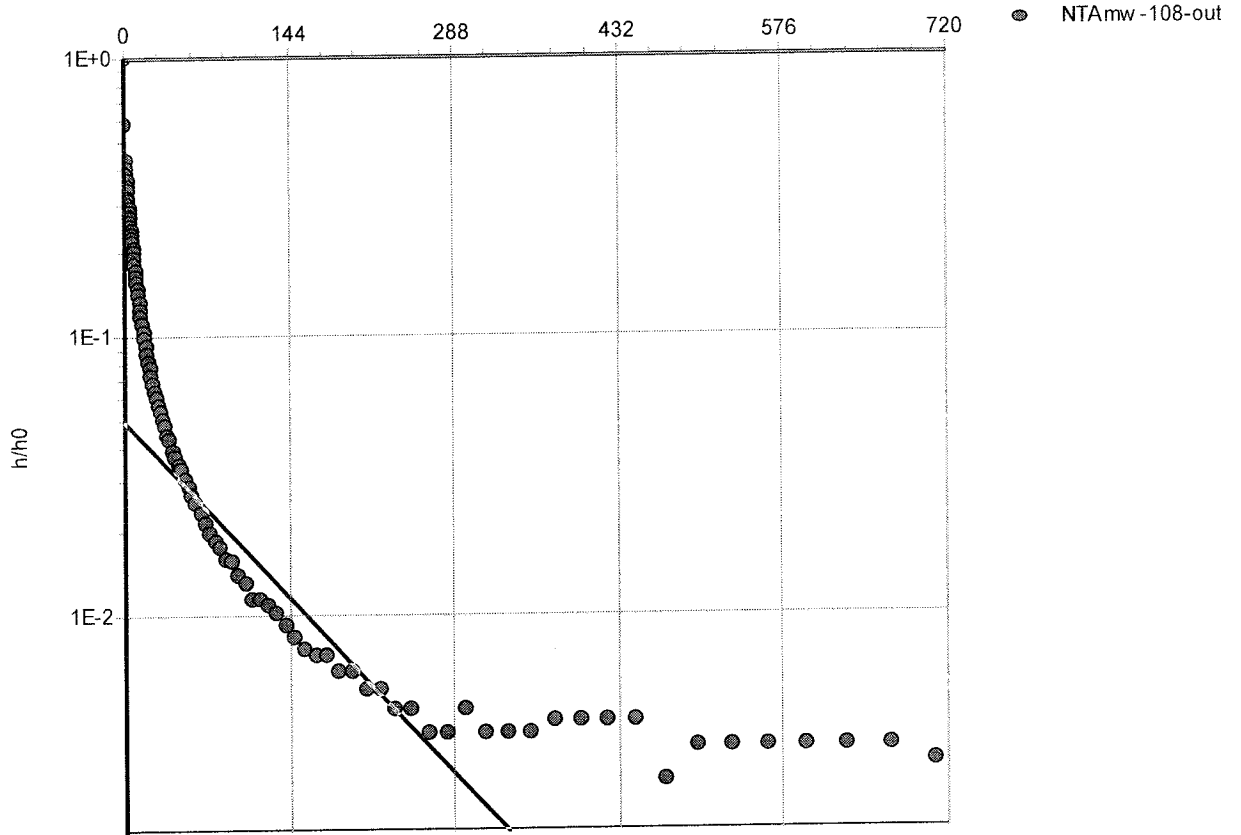
8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

NTAmw -108 (Bouwer-Rice)



Test name: **NTAmw-108**

Analysis Method: **Bouwer & Rice**

Analysis results: Conductivity: 2.64E-4 [cm/s]

Test parameters:

Test Well:	NTAmw-108-out	Aquifer thickness:	8.6 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/14/2005



In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:45:02  
 Report from file: ...\\SN04926 2005-01-24 101840 NTAmw-108-out.bin  
 Win-Situ Version 4.50

Serial number: 00004926  
 Firmware Version 3.09  
 Unit name: miniTROLL

Test name: NTAmw-108-out

Test defined on: 01/21/05 16:53:35  
 Test started on: 01/24/05 10:18:40  
 Test stopped on: 01/24/05 10:39:46  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 114

TOTAL DATA SAMPLES 114

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: -1.717 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/24/05	10:18:40		0.0	51.53 0.000
01/24/05	10:18:41		0.3	51.55 -6.251
01/24/05	10:18:41		0.6	51.57 -7.262
01/24/05	10:18:41		0.9	51.57 -7.602
01/24/05	10:18:42		1.2	51.59 -7.700
01/24/05	10:18:42		1.5	51.59 -7.679
01/24/05	10:18:42		1.8	51.59 -7.722
01/24/05	10:18:43		2.1	51.59 -7.770
01/24/05	10:18:43		2.4	51.59 -7.764
01/24/05	10:18:43		2.7	51.59 -7.762
01/24/05	10:18:43		3.0	51.59 -7.808
01/24/05	10:18:44		3.3	51.62 -7.839
01/24/05	10:18:44		3.6	51.62 -7.889
01/24/05	10:18:44		3.9	51.62 -7.900
01/24/05	10:18:45		4.2	51.62 -7.924
01/24/05	10:18:45		4.5	51.62 -7.948
01/24/05	10:18:45		4.8	51.62 -7.966
01/24/05	10:18:46		5.1	51.62 -7.983
01/24/05	10:18:46		5.4	51.62 -8.003
01/24/05	10:18:46		5.7	51.62 -8.019

NTAmw-108-out.txt

01/24/05	10:18:46	6.0	51.62	-8.036
01/24/05	10:18:47	6.4	51.62	-8.056
01/24/05	10:18:47	6.7	51.62	-8.076
01/24/05	10:18:48	7.1	51.62	-8.095
01/24/05	10:18:48	7.5	51.64	-8.115
01/24/05	10:18:48	8.0	51.64	-8.139
01/24/05	10:18:49	8.4	51.64	-8.157
01/24/05	10:18:49	8.9	51.64	-8.177
01/24/05	10:18:50	9.5	51.64	-8.198
01/24/05	10:18:51	10.0	51.62	-8.218
01/24/05	10:18:51	10.6	51.62	-8.238
01/24/05	10:18:52	11.3	51.62	-8.257
01/24/05	10:18:52	11.9	51.62	-8.277
01/24/05	10:18:53	12.6	51.62	-8.295
01/24/05	10:18:54	13.4	51.62	-8.315
01/24/05	10:18:55	14.2	51.62	-8.336
01/24/05	10:18:55	15.0	51.62	-8.352
01/24/05	10:18:56	15.9	51.62	-8.369
01/24/05	10:18:57	16.8	51.62	-8.385
01/24/05	10:18:58	17.8	51.62	-8.400
01/24/05	10:18:59	18.9	51.62	-8.415
01/24/05	10:19:00	20.0	51.62	-8.429
01/24/05	10:19:02	21.2	51.62	-8.440
01/24/05	10:19:03	22.4	51.62	-8.451
01/24/05	10:19:04	23.8	51.62	-8.462
01/24/05	10:19:06	25.2	51.62	-8.474
01/24/05	10:19:07	26.7	51.62	-8.483
01/24/05	10:19:09	28.2	51.62	-8.492
01/24/05	10:19:10	29.8	51.62	-8.501
01/24/05	10:19:12	31.5	51.62	-8.507
01/24/05	10:19:14	33.3	51.62	-8.514
01/24/05	10:19:16	35.2	51.62	-8.521
01/24/05	10:19:18	37.3	51.62	-8.529
01/24/05	10:19:20	39.5	51.62	-8.534
01/24/05	10:19:22	41.8	51.62	-8.543
01/24/05	10:19:25	44.3	51.62	-8.547
01/24/05	10:19:27	46.9	51.62	-8.553
01/24/05	10:19:30	49.7	51.62	-8.556
01/24/05	10:19:33	52.6	51.62	-8.562
01/24/05	10:19:36	55.7	51.62	-8.567
01/24/05	10:19:39	59.0	51.62	-8.571
01/24/05	10:19:43	62.5	51.62	-8.575
01/24/05	10:19:47	66.2	51.62	-8.580
01/24/05	10:19:51	70.1	51.62	-8.584
01/24/05	10:19:55	74.3	51.62	-8.588
01/24/05	10:19:59	78.7	51.62	-8.591
01/24/05	10:20:04	83.4	51.64	-8.593
01/24/05	10:20:09	88.4	51.64	-8.597
01/24/05	10:20:14	93.7	51.64	-8.598
01/24/05	10:20:20	99.3	51.64	-8.602
01/24/05	10:20:26	105.2	51.64	-8.604
01/24/05	10:20:32	111.5	51.64	-8.608
01/24/05	10:20:39	118.1	51.64	-8.608
01/24/05	10:20:46	125.1	51.64	-8.609
01/24/05	10:20:53	132.6	51.66	-8.611
01/24/05	10:21:01	140.5	51.66	-8.613
01/24/05	10:21:09	148.9	51.66	-8.615
01/24/05	10:21:18	157.8	51.66	-8.617
01/24/05	10:21:28	167.2	51.66	-8.618
01/24/05	10:21:38	177.2	51.66	-8.618
01/24/05	10:21:48	187.8	51.66	-8.620
01/24/05	10:21:59	199.0	51.66	-8.620
01/24/05	10:22:11	210.9	51.68	-8.622

		NTAmw-108-out.txt		
01/24/05	10:22:24	223.5	51.68	-8.622
01/24/05	10:22:37	236.8	51.68	-8.624
01/24/05	10:22:51	250.9	51.68	-8.624
01/24/05	10:23:06	265.8	51.68	-8.626
01/24/05	10:23:22	281.6	51.68	-8.626
01/24/05	10:23:39	298.4	51.68	-8.624
01/24/05	10:23:57	316.2	51.68	-8.626
01/24/05	10:24:15	335.0	51.68	-8.626
01/24/05	10:24:35	354.9	51.68	-8.626
01/24/05	10:24:56	376.0	51.71	-8.625
01/24/05	10:25:19	398.4	51.71	-8.625
01/24/05	10:25:43	422.1	51.71	-8.625
01/24/05	10:26:08	447.2	51.71	-8.625
01/24/05	10:26:34	473.8	51.73	-8.629
01/24/05	10:27:02	502.0	51.73	-8.627
01/24/05	10:27:32	531.9	51.73	-8.627
01/24/05	10:28:04	563.5	51.75	-8.627
01/24/05	10:28:37	597.0	51.75	-8.627
01/24/05	10:29:13	632.5	51.75	-8.627
01/24/05	10:29:51	670.1	51.77	-8.627
01/24/05	10:30:30	709.9	51.80	-8.628
01/24/05	10:31:13	752.1	51.80	-8.627
01/24/05	10:31:57	796.8	51.80	-8.627
01/24/05	10:32:45	844.2	51.82	-8.626
01/24/05	10:33:35	894.4	51.82	-8.628
01/24/05	10:34:28	947.5	51.84	-8.630
01/24/05	10:35:24	1003.8	51.84	-8.630
01/24/05	10:36:24	1063.4	51.86	-8.630
01/24/05	10:37:27	1126.6	51.89	-8.630
01/24/05	10:38:34	1193.5	51.89	-8.631
01/24/05	10:39:45	1264.4	51.91	-8.635

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA mw-109      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1079.84</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>20.93</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>10.38</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>10.55</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~11'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>NTA mw-109-IN</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1004</u>	<u>1023</u>	<u>~20'</u>				
2	<u>NTA mw-109-OUT</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1023</u>	<u>1046</u>	<u>~20'</u>				

STORAGE LOCATION OF DATA:      1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER

ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
 Signature: [Signature]      Date: 5/6/05



**MKM Engineers, Inc.**

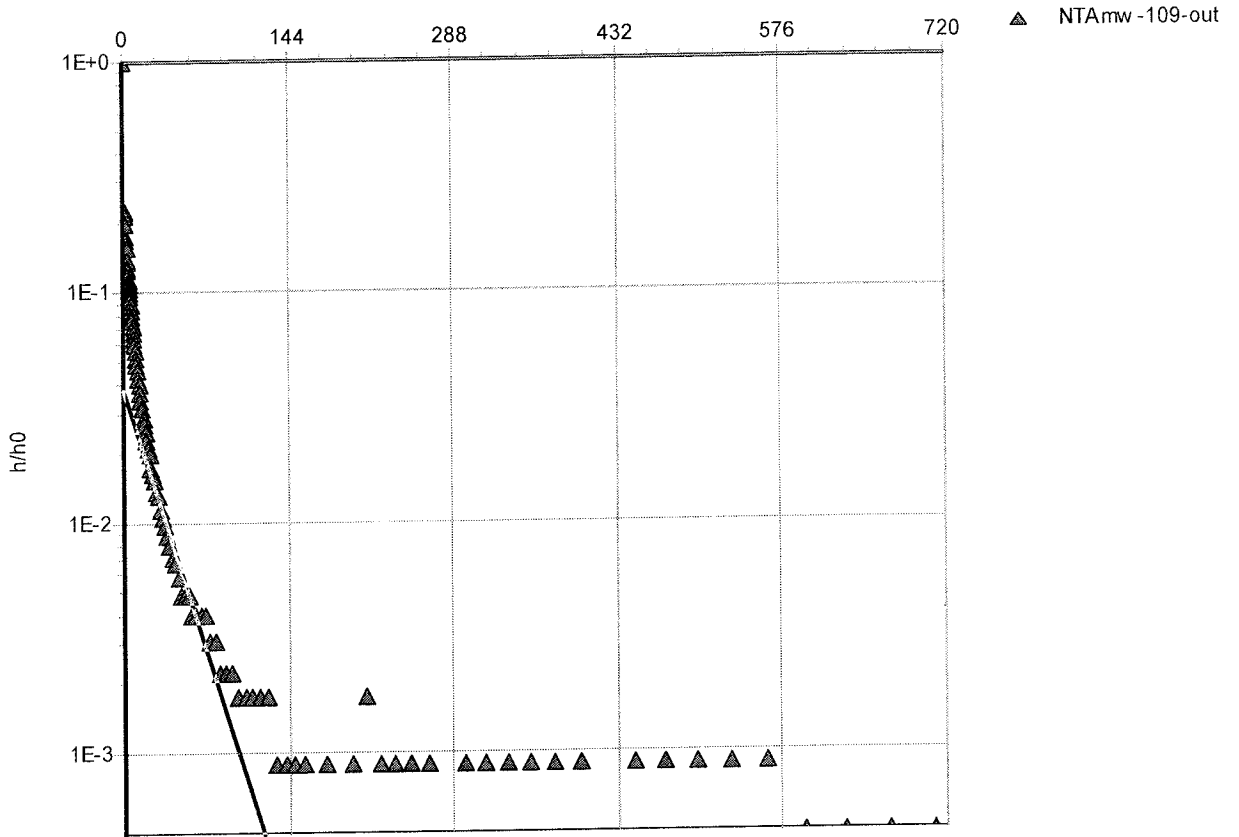
8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

NTAmw -109 (Bouwer-Rice)



Test name: **NTAmw-109**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 1.01E-3 [cm/s]

Test parameters:

Test Well:	NTAmw-109-out	Aquifer thickness:	10.55 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:38:01  
 Report from file: ...\\SN05444 2005-01-24 102339 NTAmw-109-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: NTAmw-109-out

Test defined on: 01/21/05 16:58:02  
 Test started on: 01/24/05 10:23:39  
 Test stopped on: 01/24/05 10:46:04  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 115

TOTAL DATA SAMPLES 115

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 2.152 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O	
01/24/05		10:23:39	0.0	48.72	0.000
01/24/05		10:23:39	0.3	48.74	-2.452
01/24/05		10:23:40	0.6	48.74	-4.512
01/24/05		10:23:40	0.9	48.76	-4.207
01/24/05		10:23:40	1.2	48.76	-4.231
01/24/05		10:23:41	1.5	48.76	-4.315
01/24/05		10:23:41	1.8	48.79	-4.331
01/24/05		10:23:41	2.1	48.79	-4.333
01/24/05		10:23:42	2.4	48.79	-4.268
01/24/05		10:23:42	2.7	48.79	-4.359
01/24/05		10:23:42	3.0	48.79	-4.404
01/24/05		10:23:42	3.3	48.79	-4.402
01/24/05		10:23:43	3.6	48.79	-4.422
01/24/05		10:23:43	3.9	48.79	-4.432
01/24/05		10:23:43	4.2	48.79	-4.446
01/24/05		10:23:44	4.5	48.81	-4.456
01/24/05		10:23:44	4.8	48.81	-4.467
01/24/05		10:23:44	5.1	48.81	-4.476
01/24/05		10:23:45	5.4	48.81	-4.487
01/24/05		10:23:45	5.7	48.81	-4.495

NTAmw-109-out.txt

01/24/05	10:23:45	6.0	48.81	-4.504
01/24/05	10:23:46	6.4	48.81	-4.513
01/24/05	10:23:46	6.7	48.81	-4.524
01/24/05	10:23:46	7.1	48.81	-4.534
01/24/05	10:23:47	7.5	48.81	-4.543
01/24/05	10:23:47	8.0	48.81	-4.552
01/24/05	10:23:48	8.4	48.81	-4.560
01/24/05	10:23:48	8.9	48.81	-4.569
01/24/05	10:23:49	9.5	48.81	-4.578
01/24/05	10:23:49	10.0	48.81	-4.586
01/24/05	10:23:50	10.6	48.81	-4.595
01/24/05	10:23:50	11.3	48.81	-4.602
01/24/05	10:23:51	11.9	48.81	-4.610
01/24/05	10:23:52	12.6	48.79	-4.617
01/24/05	10:23:53	13.4	48.79	-4.623
01/24/05	10:23:53	14.2	48.79	-4.630
01/24/05	10:23:54	15.0	48.79	-4.636
01/24/05	10:23:55	15.9	48.79	-4.642
01/24/05	10:23:56	16.8	48.79	-4.649
01/24/05	10:23:57	17.8	48.79	-4.653
01/24/05	10:23:58	18.9	48.79	-4.658
01/24/05	10:23:59	20.0	48.79	-4.662
01/24/05	10:24:00	21.2	48.79	-4.666
01/24/05	10:24:02	22.4	48.79	-4.669
01/24/05	10:24:03	23.8	48.79	-4.675
01/24/05	10:24:04	25.2	48.79	-4.677
01/24/05	10:24:06	26.7	48.79	-4.679
01/24/05	10:24:07	28.2	48.79	-4.683
01/24/05	10:24:09	29.8	48.79	-4.684
01/24/05	10:24:11	31.5	48.79	-4.688
01/24/05	10:24:12	33.3	48.76	-4.690
01/24/05	10:24:14	35.2	48.76	-4.692
01/24/05	10:24:16	37.3	48.76	-4.694
01/24/05	10:24:19	39.5	48.76	-4.696
01/24/05	10:24:21	41.8	48.76	-4.698
01/24/05	10:24:23	44.3	48.76	-4.699
01/24/05	10:24:26	46.9	48.76	-4.701
01/24/05	10:24:29	49.7	48.76	-4.703
01/24/05	10:24:32	52.6	48.76	-4.703
01/24/05	10:24:35	55.7	48.76	-4.703
01/24/05	10:24:38	59.0	48.76	-4.705
01/24/05	10:24:42	62.5	48.76	-4.705
01/24/05	10:24:45	66.2	48.76	-4.705
01/24/05	10:24:49	70.1	48.79	-4.705
01/24/05	10:24:53	74.3	48.79	-4.707
01/24/05	10:24:58	78.7	48.79	-4.707
01/24/05	10:25:03	83.4	48.79	-4.709
01/24/05	10:25:08	88.4	48.79	-4.709
01/24/05	10:25:13	93.7	48.79	-4.709
01/24/05	10:25:18	99.3	48.79	-4.710
01/24/05	10:25:24	105.2	48.79	-4.710
01/24/05	10:25:31	111.5	48.79	-4.710
01/24/05	10:25:37	118.1	48.79	-4.710
01/24/05	10:25:44	125.1	48.79	-4.710
01/24/05	10:25:52	132.6	48.81	-4.712
01/24/05	10:26:00	140.5	48.81	-4.712
01/24/05	10:26:08	148.9	48.81	-4.712
01/24/05	10:26:17	157.8	48.81	-4.712
01/24/05	10:26:26	167.2	48.81	-4.714
01/24/05	10:26:36	177.2	48.81	-4.712
01/24/05	10:26:47	187.8	48.81	-4.714
01/24/05	10:26:58	199.0	48.81	-4.712
01/24/05	10:27:10	210.9	48.81	-4.710

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01/24/05	10:27:23	223.5	48.81	-4.712
01/24/05	10:27:36	236.8	48.81	-4.712
01/24/05	10:27:50	250.9	48.81	-4.712
01/24/05	10:28:05	265.8	48.81	-4.712
01/24/05	10:28:21	281.6	48.81	-4.714
01/24/05	10:28:38	298.4	48.83	-4.712
01/24/05	10:28:55	316.2	48.83	-4.712
01/24/05	10:29:14	335.0	48.83	-4.712
01/24/05	10:29:34	354.9	48.83	-4.712
01/24/05	10:29:55	376.0	48.83	-4.712
01/24/05	10:30:18	398.4	48.83	-4.712
01/24/05	10:30:41	422.1	48.83	-4.714
01/24/05	10:31:06	447.2	48.85	-4.712
01/24/05	10:31:33	473.8	48.85	-4.712
01/24/05	10:32:01	502.0	48.88	-4.712
01/24/05	10:32:31	531.9	48.88	-4.712
01/24/05	10:33:03	563.5	48.90	-4.712
01/24/05	10:33:36	597.0	48.90	-4.713
01/24/05	10:34:12	632.5	48.92	-4.713
01/24/05	10:34:49	670.1	48.92	-4.713
01/24/05	10:35:29	709.9	48.92	-4.713
01/24/05	10:36:11	752.1	48.90	-4.713
01/24/05	10:36:56	796.8	48.88	-4.714
01/24/05	10:37:43	844.2	48.90	-4.713
01/24/05	10:38:34	894.4	48.88	-4.715
01/24/05	10:39:27	947.5	48.85	-4.716
01/24/05	10:40:23	1003.8	48.83	-4.714
01/24/05	10:41:23	1063.4	48.79	-4.714
01/24/05	10:42:26	1126.6	48.76	-4.716
01/24/05	10:43:33	1193.5	48.76	-4.714
01/24/05	10:44:44	1264.4	48.76	-4.714
01/24/05	10:45:59	1339.5	48.79	-4.714



# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA mw-110      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1082.62</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>29.73</u>	<del>29.73</del>
DEPTH TO WATER	<u>16.08</u>	<u>17' BGS</u>
HEIGHT OF WATER COLUMN	<u>13.65</u>	10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~17'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>NTA mw-110-IN</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1100</u>	<u>1127</u>	<u>~28'</u>				
2	<u>NTA mw-110-OUT</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1127</u>	<u>1146</u>	<u>~28'</u>				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

### REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: SR SH  
Signature: David K. Earnest      Date: 5/6/05



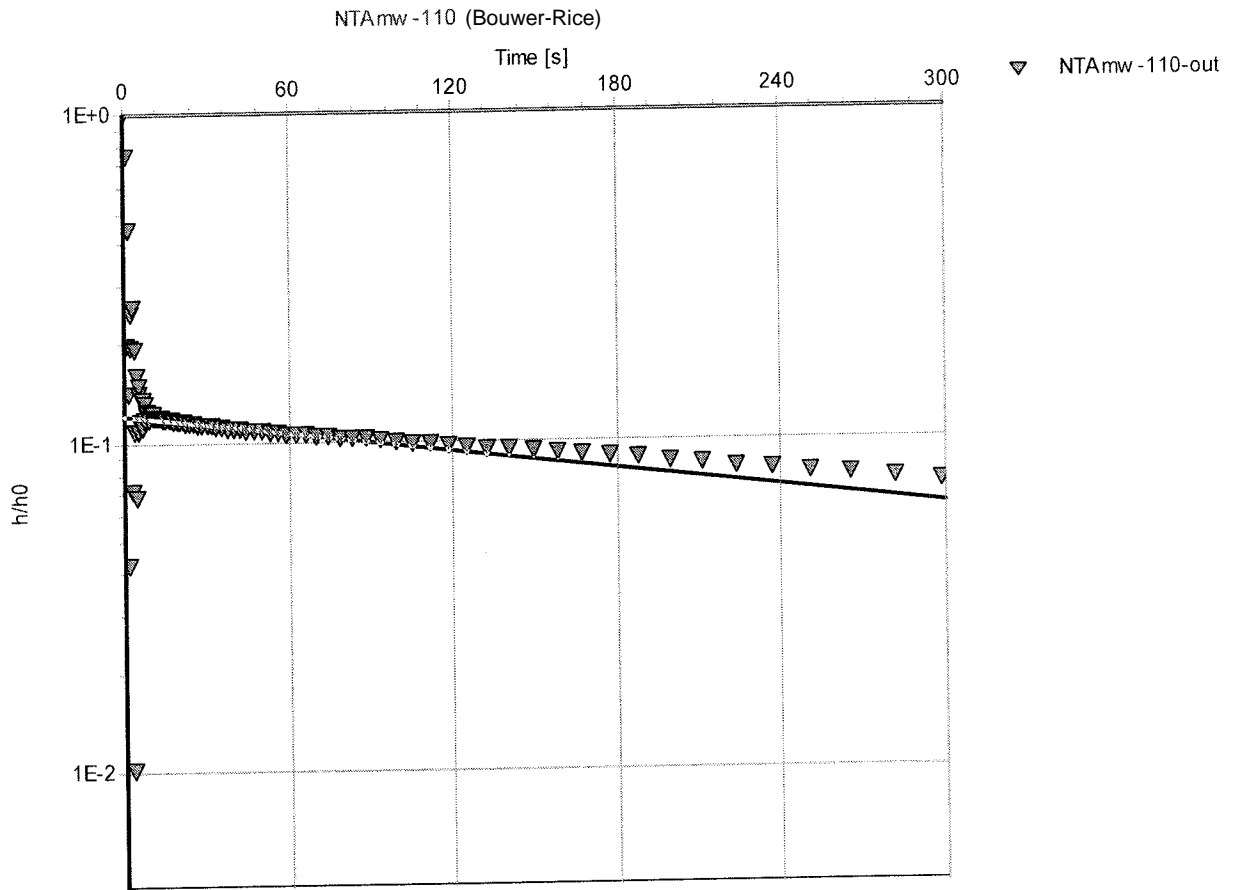
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: **NTAmw-110**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 6.41E-5 [cm/s]

Test parameters:

Test Well:	NTAmw-110-out	Aquifer thickness:	13.65 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:31:41  
 Report from file: ...\\SN04886 2005-01-24 112733 NTAmw-110-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: NTAmw-110-out

Test defined on: 01/21/05 16:43:45  
 Test started on: 01/24/05 11:27:33  
 Test stopped on: 01/24/05 11:46:13  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 seconds.  
 Number of data samples: 111

TOTAL DATA SAMPLES 111

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 4.177 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/24/05	11:27:33		0.0	52.73
01/24/05	11:27:33		0.3	52.75
01/24/05	11:27:33		0.6	52.77
01/24/05	11:27:34		0.9	52.77
01/24/05	11:27:34		1.2	52.79
01/24/05	11:27:34		1.5	52.79
01/24/05	11:27:35		1.8	52.79
01/24/05	11:27:35		2.1	52.79
01/24/05	11:27:35		2.4	52.79
01/24/05	11:27:35		2.7	52.79
01/24/05	11:27:36		3.0	52.82
01/24/05	11:27:36		3.3	52.82
01/24/05	11:27:36		3.6	52.82
01/24/05	11:27:37		3.9	52.82
01/24/05	11:27:37		4.2	52.82
01/24/05	11:27:37		4.5	52.82
01/24/05	11:27:38		4.8	52.82
01/24/05	11:27:38		5.1	52.82
01/24/05	11:27:38		5.4	52.82
01/24/05	11:27:38		5.7	52.82

NTAmw-110-out.txt

01/24/05	11:27:39	6.0	52.82	-7.581
01/24/05	11:27:39	6.4	52.82	-7.432
01/24/05	11:27:40	6.7	52.82	-7.607
01/24/05	11:27:40	7.1	52.82	-7.463
01/24/05	11:27:40	7.5	52.82	-7.566
01/24/05	11:27:41	8.0	52.84	-7.526
01/24/05	11:27:41	8.4	52.82	-7.519
01/24/05	11:27:42	8.9	52.82	-7.566
01/24/05	11:27:42	9.5	52.84	-7.535
01/24/05	11:27:43	10.0	52.82	-7.533
01/24/05	11:27:43	10.6	52.82	-7.552
01/24/05	11:27:44	11.3	52.79	-7.554
01/24/05	11:27:45	11.9	52.79	-7.554
01/24/05	11:27:45	12.6	52.79	-7.554
01/24/05	11:27:46	13.4	52.79	-7.557
01/24/05	11:27:47	14.2	52.79	-7.561
01/24/05	11:27:48	15.0	52.79	-7.565
01/24/05	11:27:49	15.9	52.79	-7.568
01/24/05	11:27:50	16.8	52.79	-7.570
01/24/05	11:27:51	17.8	52.79	-7.574
01/24/05	11:27:52	18.9	52.79	-7.578
01/24/05	11:27:53	20.0	52.79	-7.580
01/24/05	11:27:54	21.2	52.79	-7.583
01/24/05	11:27:55	22.4	52.79	-7.587
01/24/05	11:27:57	23.8	52.79	-7.587
01/24/05	11:27:58	25.2	52.77	-7.591
01/24/05	11:27:59	26.7	52.77	-7.595
01/24/05	11:28:01	28.2	52.79	-7.600
01/24/05	11:28:03	29.8	52.79	-7.602
01/24/05	11:28:04	31.5	52.77	-7.606
01/24/05	11:28:06	33.3	52.77	-7.611
01/24/05	11:28:08	35.2	52.77	-7.615
01/24/05	11:28:10	37.3	52.77	-7.618
01/24/05	11:28:12	39.5	52.77	-7.622
01/24/05	11:28:15	41.8	52.77	-7.626
01/24/05	11:28:17	44.3	52.77	-7.630
01/24/05	11:28:20	46.9	52.77	-7.633
01/24/05	11:28:22	49.7	52.77	-7.637
01/24/05	11:28:25	52.6	52.77	-7.641
01/24/05	11:28:28	55.7	52.77	-7.644
01/24/05	11:28:32	59.0	52.77	-7.650
01/24/05	11:28:35	62.5	52.77	-7.653
01/24/05	11:28:39	66.2	52.75	-7.659
01/24/05	11:28:43	70.1	52.75	-7.665
01/24/05	11:28:47	74.3	52.77	-7.668
01/24/05	11:28:51	78.7	52.75	-7.674
01/24/05	11:28:56	83.4	52.75	-7.678
01/24/05	11:29:01	88.4	52.75	-7.681
01/24/05	11:29:06	93.7	52.75	-7.689
01/24/05	11:29:12	99.3	52.75	-7.696
01/24/05	11:29:18	105.2	52.75	-7.702
01/24/05	11:29:24	111.5	52.75	-7.709
01/24/05	11:29:31	118.1	52.75	-7.714
01/24/05	11:29:38	125.1	52.73	-7.722
01/24/05	11:29:45	132.6	52.73	-7.731
01/24/05	11:29:53	140.5	52.73	-7.739
01/24/05	11:30:02	148.9	52.73	-7.744
01/24/05	11:30:11	157.8	52.73	-7.755
01/24/05	11:30:20	167.2	52.73	-7.766
01/24/05	11:30:30	177.2	52.73	-7.774
01/24/05	11:30:41	187.8	52.73	-7.785
01/24/05	11:30:52	199.0	52.73	-7.796
01/24/05	11:31:04	210.9	52.73	-7.805

NTAmw-110-out.txt

01/24/05	11:31:16	223.5	52.73	-7.820
01/24/05	11:31:30	236.8	52.73	-7.831
01/24/05	11:31:44	250.9	52.73	-7.844
01/24/05	11:31:59	265.8	52.73	-7.857
01/24/05	11:32:14	281.6	52.73	-7.871
01/24/05	11:32:31	298.4	52.75	-7.886
01/24/05	11:32:49	316.2	52.75	-7.901
01/24/05	11:33:08	335.0	52.75	-7.917
01/24/05	11:33:28	354.9	52.75	-7.934
01/24/05	11:33:49	376.0	52.75	-7.952
01/24/05	11:34:11	398.4	52.73	-7.971
01/24/05	11:34:35	422.1	52.73	-7.989
01/24/05	11:35:00	447.2	52.75	-8.008
01/24/05	11:35:27	473.8	52.75	-8.028
01/24/05	11:35:55	502.0	52.75	-8.050
01/24/05	11:36:25	531.9	52.75	-8.074
01/24/05	11:36:56	563.5	52.75	-8.096
01/24/05	11:37:30	597.0	52.75	-8.120
01/24/05	11:38:05	632.5	52.75	-8.144
01/24/05	11:38:43	670.1	52.75	-8.172
01/24/05	11:39:23	709.9	52.77	-8.197
01/24/05	11:40:05	752.1	52.77	-8.225
01/24/05	11:40:50	796.8	52.77	-8.254
01/24/05	11:41:37	844.2	52.77	-8.286
01/24/05	11:42:27	894.4	52.79	-8.315
01/24/05	11:43:20	947.5	52.79	-8.346
01/24/05	11:44:17	1003.8	52.79	-8.379
01/24/05	11:45:16	1063.4	52.79	-8.411

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA mw-111      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4926	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1080.94</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>22.05</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>3.64</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>18.41</u>	SCREEN LENGTH
	FEET	METERS
	<u>6.5' BGS</u>	
	<u>9.5' BGS</u>	
	10 ft	

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>4'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	NTA mw-111-IN	01/24/05	01/24/05	1110	1131	~21'				
2	NTA mw-111-OUT	01/24/05	01/24/05	1132	1151	~21'				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)

Reviewed by: [Signature]

Signature: [Signature]

Date: 5/6/05



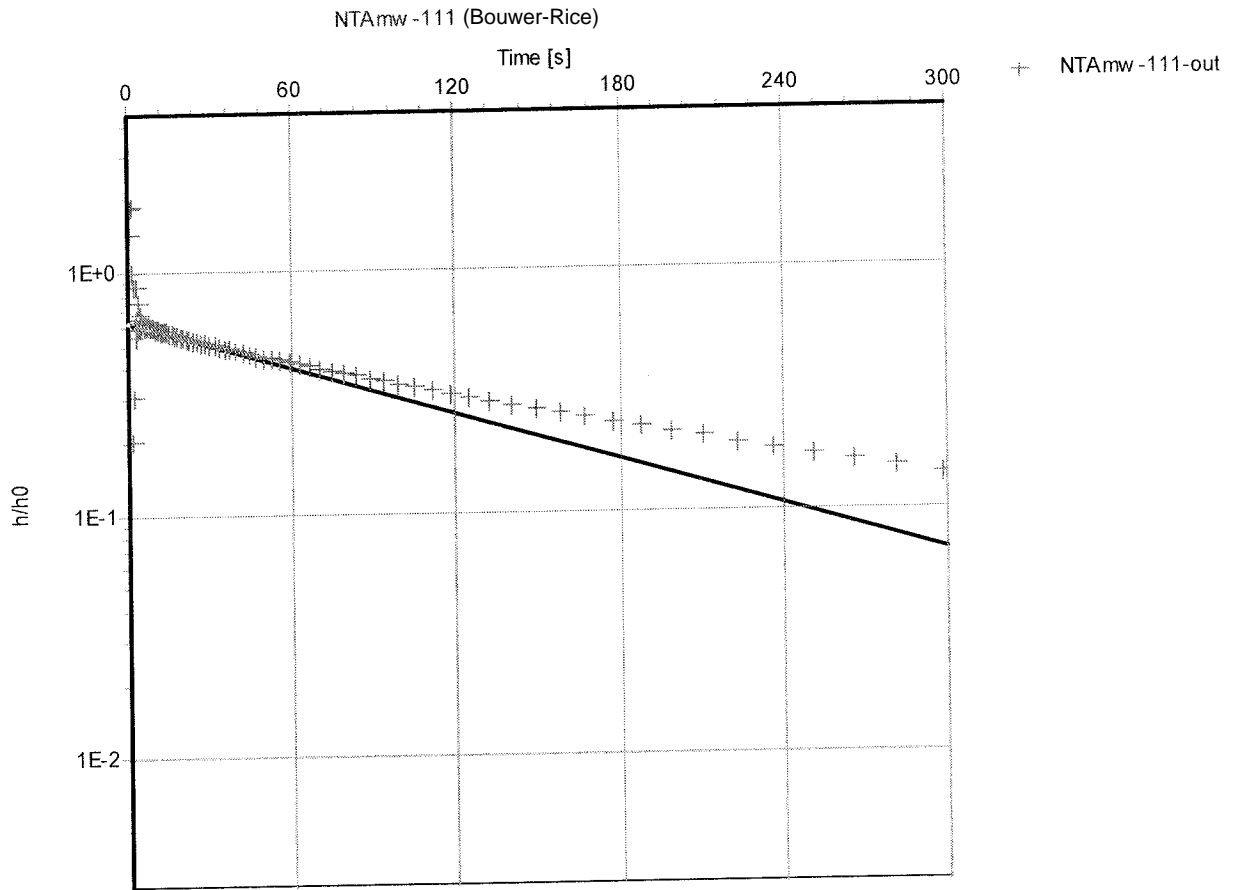
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: **NTAmw-111**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 2.30E-4 [cm/s]

Test parameters:

Test Well:	NTAmw-111-out	Aquifer thickness:	18.41 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
$r_{(eff)}$ :	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:45:36  
 Report from file: ...\\SN04926 2005-01-24 113201 NTAmw-111-out.bin  
 Win-Situ Version 4.50

Serial number: 00004926  
 Firmware Version 3.09  
 Unit name: miniTROLL

Test name: NTAmw-111-out

Test defined on: 01/21/05 16:54:18  
 Test started on: 01/24/05 11:32:01  
 Test stopped on: 01/24/05 11:51:19  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 112

TOTAL DATA SAMPLES 112

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 11.075 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/24/05	11:32:01		0.0	50.99
01/24/05	11:32:01		0.3	51.03
01/24/05	11:32:01		0.6	51.03
01/24/05	11:32:02		0.9	51.05
01/24/05	11:32:02		1.2	51.05
01/24/05	11:32:02		1.5	51.05
01/24/05	11:32:02		1.8	51.05
01/24/05	11:32:03		2.1	51.08
01/24/05	11:32:03		2.4	51.08
01/24/05	11:32:03		2.7	51.08
01/24/05	11:32:04		3.0	51.08
01/24/05	11:32:04		3.3	51.08
01/24/05	11:32:04		3.6	51.08
01/24/05	11:32:05		3.9	51.08
01/24/05	11:32:05		4.2	51.08
01/24/05	11:32:05		4.5	51.08
01/24/05	11:32:05		4.8	51.08
01/24/05	11:32:06		5.1	51.10
01/24/05	11:32:06		5.4	51.10
01/24/05	11:32:06		5.7	51.10



NTAmw-111-out.txt

01/24/05	11:32:07	6.0	51.08	-2.721
01/24/05	11:32:07	6.4	51.10	-2.746
01/24/05	11:32:07	6.7	51.10	-2.741
01/24/05	11:32:08	7.1	51.10	-2.750
01/24/05	11:32:08	7.5	51.10	-2.752
01/24/05	11:32:09	8.0	51.10	-2.761
01/24/05	11:32:09	8.4	51.10	-2.765
01/24/05	11:32:10	8.9	51.10	-2.772
01/24/05	11:32:10	9.5	51.10	-2.776
01/24/05	11:32:11	10.0	51.08	-2.778
01/24/05	11:32:11	10.6	51.08	-2.785
01/24/05	11:32:12	11.3	51.08	-2.789
01/24/05	11:32:13	11.9	51.08	-2.796
01/24/05	11:32:13	12.6	51.08	-2.802
01/24/05	11:32:14	13.4	51.08	-2.807
01/24/05	11:32:15	14.2	51.08	-2.813
01/24/05	11:32:16	15.0	51.08	-2.820
01/24/05	11:32:17	15.9	51.08	-2.827
01/24/05	11:32:17	16.8	51.08	-2.835
01/24/05	11:32:18	17.8	51.08	-2.844
01/24/05	11:32:20	18.9	51.08	-2.851
01/24/05	11:32:21	20.0	51.08	-2.858
01/24/05	11:32:22	21.2	51.08	-2.868
01/24/05	11:32:23	22.4	51.08	-2.879
01/24/05	11:32:24	23.8	51.10	-2.886
01/24/05	11:32:26	25.2	51.08	-2.893
01/24/05	11:32:27	26.7	51.10	-2.904
01/24/05	11:32:29	28.2	51.10	-2.913
01/24/05	11:32:30	29.8	51.10	-2.923
01/24/05	11:32:32	31.5	51.10	-2.932
01/24/05	11:32:34	33.3	51.10	-2.943
01/24/05	11:32:36	35.2	51.10	-2.952
01/24/05	11:32:38	37.3	51.12	-2.965
01/24/05	11:32:40	39.5	51.12	-2.978
01/24/05	11:32:42	41.8	51.12	-2.989
01/24/05	11:32:45	44.3	51.12	-3.000
01/24/05	11:32:48	46.9	51.12	-3.014
01/24/05	11:32:50	49.7	51.14	-3.027
01/24/05	11:32:53	52.6	51.14	-3.040
01/24/05	11:32:56	55.7	51.14	-3.053
01/24/05	11:33:00	59.0	51.14	-3.067
01/24/05	11:33:03	62.5	51.14	-3.080
01/24/05	11:33:07	66.2	51.14	-3.095
01/24/05	11:33:11	70.1	51.17	-3.111
01/24/05	11:33:15	74.3	51.17	-3.126
01/24/05	11:33:19	78.7	51.17	-3.143
01/24/05	11:33:24	83.4	51.17	-3.157
01/24/05	11:33:29	88.4	51.17	-3.176
01/24/05	11:33:34	93.7	51.19	-3.190
01/24/05	11:33:40	99.3	51.19	-3.209
01/24/05	11:33:46	105.2	51.19	-3.225
01/24/05	11:33:52	111.5	51.21	-3.241
01/24/05	11:33:59	118.1	51.21	-3.262
01/24/05	11:34:06	125.1	51.23	-3.280
01/24/05	11:34:13	132.6	51.23	-3.296
01/24/05	11:34:21	140.5	51.23	-3.315
01/24/05	11:34:30	148.9	51.23	-3.333
01/24/05	11:34:38	157.8	51.23	-3.353
01/24/05	11:34:48	167.2	51.21	-3.370
01/24/05	11:34:58	177.2	51.21	-3.390
01/24/05	11:35:08	187.8	51.21	-3.409
01/24/05	11:35:20	199.0	51.21	-3.427
01/24/05	11:35:32	210.9	51.21	-3.444

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01/24/05	11:35:44	223.5	51.19	-3.464
01/24/05	11:35:57	236.8	51.21	-3.482
01/24/05	11:36:12	250.9	51.19	-3.499
01/24/05	11:36:26	265.8	51.21	-3.517
01/24/05	11:36:42	281.6	51.21	-3.534
01/24/05	11:36:59	298.4	51.21	-3.550
01/24/05	11:37:17	316.2	51.21	-3.567
01/24/05	11:37:36	335.0	51.21	-3.583
01/24/05	11:37:56	354.9	51.19	-3.598
01/24/05	11:38:17	376.0	51.19	-3.613
01/24/05	11:38:39	398.4	51.19	-3.627
01/24/05	11:39:03	422.1	51.17	-3.642
01/24/05	11:39:28	447.2	51.17	-3.655
01/24/05	11:39:54	473.8	51.17	-3.668
01/24/05	11:40:23	502.0	51.17	-3.681
01/24/05	11:40:53	531.9	51.17	-3.692
01/24/05	11:41:24	563.5	51.19	-3.703
01/24/05	11:41:58	597.0	51.19	-3.714
01/24/05	11:42:33	632.5	51.17	-3.723
01/24/05	11:43:11	670.1	51.17	-3.732
01/24/05	11:43:51	709.9	51.19	-3.740
01/24/05	11:44:33	752.1	51.19	-3.749
01/24/05	11:45:17	796.8	51.17	-3.756
01/24/05	11:46:05	844.2	51.17	-3.762
01/24/05	11:46:55	894.4	51.17	-3.767
01/24/05	11:47:48	947.5	51.17	-3.773
01/24/05	11:48:44	1003.8	51.19	-3.778
01/24/05	11:49:44	1063.4	51.17	-3.784
01/24/05	11:50:47	1126.6	51.17	-3.789

## Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA mw -112      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1078.33</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>26.62</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>7.20</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>19.42</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~ 8'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	NTAmw-112-IN	01/24/05	01/24/05	1119	1135	~ 25'				
2	NTAmw-112-OUT	01/24/05	01/24/05	1136	1156	~ 25'				

STORAGE LOCATION OF DATA:      1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: David K. Earnest      Date: 5/6/05



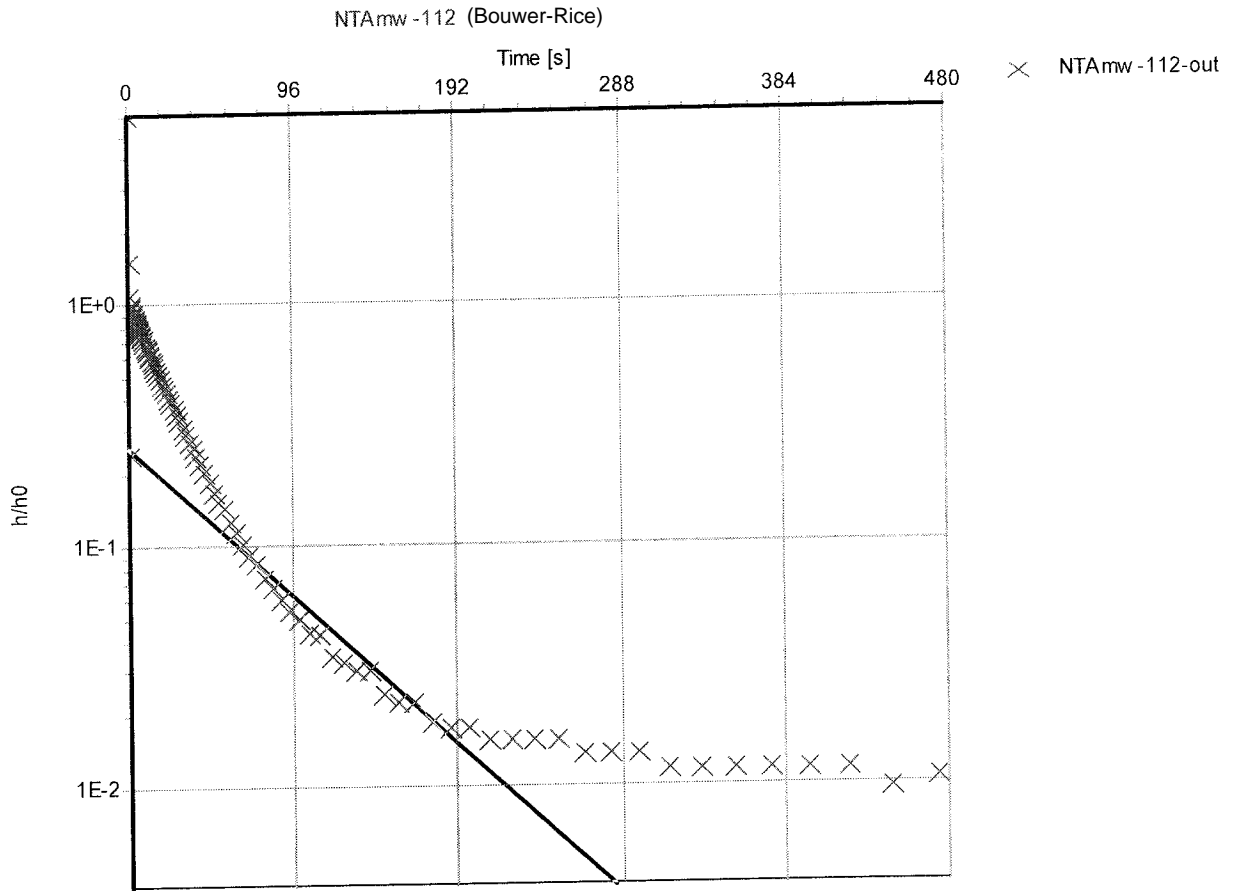
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: **NTAmw-112**

Analysis Method: **Bouwer & Rice**

Analysis results: Conductivity: 4.66E-4 [cm/s]

Test parameters:

Test Well:	NTAmw-112-out	Aquifer thickness:	19.42 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:  
 Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:38:43  
 Report from file: ...\\SN05444 2005-01-24 113603 NTAmw-112-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: NTAmw-112-out

Test defined on: 01/21/05 16:58:25  
 Test started on: 01/24/05 11:36:03  
 Test stopped on: 01/24/05 11:56:15  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 113

TOTAL DATA SAMPLES 113

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 12.914 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	Feet H2O
			Temperature Fahrenheit	Pressure Feet H2O	
01/24/05		11:36:03	0.0	51.88	0.000
01/24/05		11:36:04	0.3	51.90	3.583
01/24/05		11:36:04	0.6	51.90	-2.486
01/24/05		11:36:04	0.9	51.92	-1.185
01/24/05		11:36:05	1.2	51.92	-1.724
01/24/05		11:36:05	1.5	51.94	-1.618
01/24/05		11:36:05	1.8	51.94	-1.700
01/24/05		11:36:06	2.1	51.94	-1.709
01/24/05		11:36:06	2.4	51.94	-1.727
01/24/05		11:36:06	2.7	51.94	-1.737
01/24/05		11:36:06	3.0	51.94	-1.770
01/24/05		11:36:07	3.3	51.94	-1.785
01/24/05		11:36:07	3.6	51.97	-1.794
01/24/05		11:36:07	3.9	51.97	-1.805
01/24/05		11:36:08	4.2	51.97	-1.820
01/24/05		11:36:08	4.5	51.97	-1.833
01/24/05		11:36:08	4.8	51.97	-1.844
01/24/05		11:36:09	5.1	51.97	-1.856
01/24/05		11:36:09	5.4	51.97	-1.867
01/24/05		11:36:09	5.7	51.97	-1.878

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01/24/05	11:36:09	6.0	51.97	-1.891
01/24/05	11:36:10	6.4	51.97	-1.904
01/24/05	11:36:10	6.7	51.97	-1.917
01/24/05	11:36:11	7.1	51.97	-1.930
01/24/05	11:36:11	7.5	51.97	-1.945
01/24/05	11:36:11	8.0	51.97	-1.960
01/24/05	11:36:12	8.4	51.97	-1.974
01/24/05	11:36:12	8.9	51.99	-1.989
01/24/05	11:36:13	9.5	51.99	-2.006
01/24/05	11:36:13	10.0	51.97	-2.019
01/24/05	11:36:14	10.6	51.97	-2.036
01/24/05	11:36:15	11.3	51.97	-2.052
01/24/05	11:36:15	11.9	51.97	-2.069
01/24/05	11:36:16	12.6	51.97	-2.088
01/24/05	11:36:17	13.4	51.97	-2.104
01/24/05	11:36:18	14.2	51.97	-2.123
01/24/05	11:36:18	15.0	51.97	-2.142
01/24/05	11:36:19	15.9	51.97	-2.162
01/24/05	11:36:20	16.8	51.97	-2.183
01/24/05	11:36:21	17.8	51.97	-2.203
01/24/05	11:36:22	18.9	51.97	-2.223
01/24/05	11:36:23	20.0	51.97	-2.246
01/24/05	11:36:25	21.2	51.97	-2.264
01/24/05	11:36:26	22.4	51.99	-2.285
01/24/05	11:36:27	23.8	51.99	-2.309
01/24/05	11:36:29	25.2	51.99	-2.329
01/24/05	11:36:30	26.7	51.99	-2.351
01/24/05	11:36:32	28.2	51.99	-2.372
01/24/05	11:36:33	29.8	52.01	-2.392
01/24/05	11:36:35	31.5	52.01	-2.413
01/24/05	11:36:37	33.3	52.01	-2.433
01/24/05	11:36:39	35.2	52.01	-2.453
01/24/05	11:36:41	37.3	52.04	-2.470
01/24/05	11:36:43	39.5	52.04	-2.491
01/24/05	11:36:45	41.8	52.04	-2.509
01/24/05	11:36:48	44.3	52.06	-2.526
01/24/05	11:36:50	46.9	52.06	-2.544
01/24/05	11:36:53	49.7	52.08	-2.561
01/24/05	11:36:56	52.6	52.08	-2.578
01/24/05	11:36:59	55.7	52.08	-2.585
01/24/05	11:37:02	59.0	52.10	-2.603
01/24/05	11:37:06	62.5	52.10	-2.616
01/24/05	11:37:10	66.2	52.10	-2.628
01/24/05	11:37:13	70.1	52.10	-2.639
01/24/05	11:37:18	74.3	52.13	-2.646
01/24/05	11:37:22	78.7	52.13	-2.657
01/24/05	11:37:27	83.4	52.15	-2.665
01/24/05	11:37:32	88.4	52.15	-2.672
01/24/05	11:37:37	93.7	52.15	-2.679
01/24/05	11:37:43	99.3	52.17	-2.683
01/24/05	11:37:49	105.2	52.17	-2.689
01/24/05	11:37:55	111.5	52.17	-2.690
01/24/05	11:38:01	118.1	52.17	-2.698
01/24/05	11:38:08	125.1	52.17	-2.700
01/24/05	11:38:16	132.6	52.17	-2.703
01/24/05	11:38:24	140.5	52.17	-2.703
01/24/05	11:38:32	148.9	52.19	-2.709
01/24/05	11:38:41	157.8	52.19	-2.711
01/24/05	11:38:51	167.2	52.19	-2.711
01/24/05	11:39:01	177.2	52.17	-2.715
01/24/05	11:39:11	187.8	52.17	-2.716
01/24/05	11:39:22	199.0	52.19	-2.716
01/24/05	11:39:34	210.9	52.17	-2.718

NTAmw-112-out.txt

01/24/05	11:39:47	223.5	52.19	-2.718
01/24/05	11:40:00	236.8	52.17	-2.718
01/24/05	11:40:14	250.9	52.17	-2.718
01/24/05	11:40:29	265.8	52.17	-2.720
01/24/05	11:40:45	281.6	52.19	-2.720
01/24/05	11:41:02	298.4	52.19	-2.720
01/24/05	11:41:20	316.2	52.19	-2.722
01/24/05	11:41:38	335.0	52.19	-2.722
01/24/05	11:41:58	354.9	52.19	-2.722
01/24/05	11:42:19	376.0	52.19	-2.722
01/24/05	11:42:42	398.4	52.22	-2.722
01/24/05	11:43:05	422.1	52.22	-2.722
01/24/05	11:43:31	447.2	52.22	-2.724
01/24/05	11:43:57	473.8	52.24	-2.723
01/24/05	11:44:25	502.0	52.24	-2.725
01/24/05	11:44:55	531.9	52.26	-2.725
01/24/05	11:45:27	563.5	52.26	-2.725
01/24/05	11:46:00	597.0	52.26	-2.725
01/24/05	11:46:36	632.5	52.28	-2.725
01/24/05	11:47:13	670.1	52.28	-2.727
01/24/05	11:47:53	709.9	52.31	-2.727
01/24/05	11:48:35	752.1	52.31	-2.727
01/24/05	11:49:20	796.8	52.31	-2.727
01/24/05	11:50:08	844.2	52.31	-2.729
01/24/05	11:50:58	894.4	52.31	-2.727
01/24/05	11:51:51	947.5	52.33	-2.729
01/24/05	11:52:47	1003.8	52.33	-2.729
01/24/05	11:53:47	1063.4	52.33	-2.730
01/24/05	11:54:50	1126.6	52.33	-2.730
01/24/05	11:55:57	1193.5	52.33	-2.734

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA mw - 113      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1075.68</u>	RISER CASING I.D. (in.): <u>2 in</u>
SCREEN OR OPEN HOLE I.D. (in): <u>2 in</u>	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>29.63</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>5.19</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>24.44</u>	SCREEN LENGTH
	FEET	METERS
		<u>14' BGS</u>
		<u>17' BGS</u>
		<u>10 ft</u>

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~6'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>NTA mw - 113-IN</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1356</u>	<u>14.26</u>	<u>~28'</u>				
2	<u>NTA mw - 113-OUT</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1426</u>	<u>1446</u>	<u>~28'</u>				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05





**MKM Engineers, Inc.**

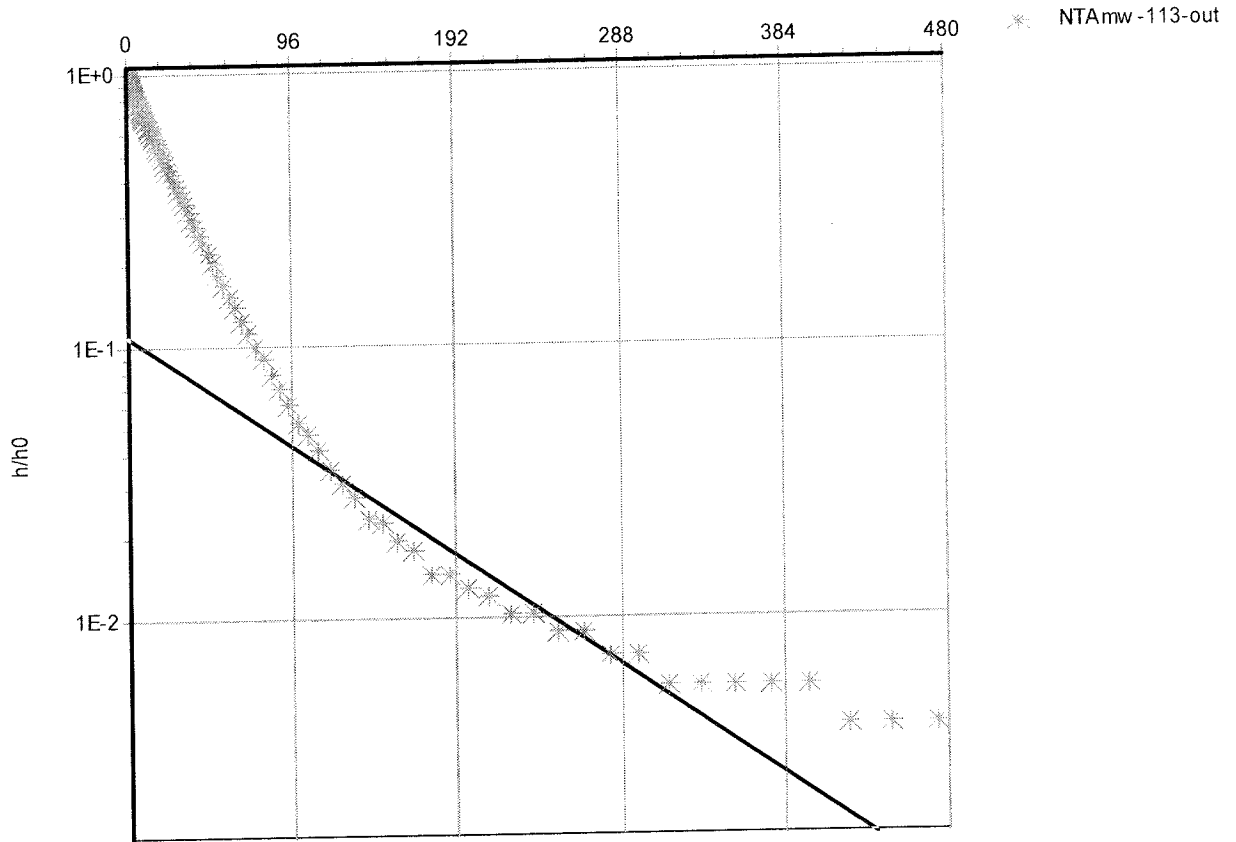
8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

NTAmw -113 (Bouwer-Rice)



Test name: **NTAmw-113**

Analysis Method: **Bouwer & Rice**

Analysis results: Conductivity: 3.19E-4 [cm/s]

<u>Test parameters:</u>	Test Well:	NTAmw-113-out	Aquifer thickness:	24.44 [ft]
	Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%)	25
	Screen length:	10 [ft]		
	Casing radius:	0.08333 [ft]		
	r(eff):	0.186 [ft]		

Comments:

Evaluated by:  
 Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:32:22  
 Report from file: ... \SN04886 2005-01-24 142644 NTAmw-113-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: NTAmw-113-out

Test defined on: 01/21/05 16:44:41  
 Test started on: 01/24/05 14:26:44  
 Test stopped on: 01/24/05 14:46:01  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 112

TOTAL DATA SAMPLES 112

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 17.718 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/24/05	14:26:44		0.0	52.84
01/24/05	14:26:44		0.3	52.88
01/24/05	14:26:45		0.6	52.91
01/24/05	14:26:45		0.9	52.91
01/24/05	14:26:45		1.2	52.93
01/24/05	14:26:46		1.5	52.93
01/24/05	14:26:46		1.8	52.93
01/24/05	14:26:46		2.1	52.93
01/24/05	14:26:47		2.4	52.93
01/24/05	14:26:47		2.7	52.93
01/24/05	14:26:47		3.0	52.93
01/24/05	14:26:47		3.3	52.95
01/24/05	14:26:48		3.6	52.95
01/24/05	14:26:48		3.9	52.95
01/24/05	14:26:48		4.2	52.95
01/24/05	14:26:49		4.5	52.95
01/24/05	14:26:49		4.8	52.95
01/24/05	14:26:49		5.1	52.95
01/24/05	14:26:50		5.4	52.95
01/24/05	14:26:50		5.7	52.95

NTAmw-113-out.txt

01/24/05	14:26:50	6.0	52.95	-3.200
01/24/05	14:26:50	6.4	52.95	-3.213
01/24/05	14:26:51	6.7	52.95	-3.225
01/24/05	14:26:51	7.1	52.95	-3.240
01/24/05	14:26:52	7.5	52.95	-3.255
01/24/05	14:26:52	8.0	52.97	-3.271
01/24/05	14:26:53	8.4	52.97	-3.286
01/24/05	14:26:53	8.9	52.97	-3.303
01/24/05	14:26:54	9.5	52.97	-3.321
01/24/05	14:26:54	10.0	52.93	-3.331
01/24/05	14:26:55	10.6	52.93	-3.347
01/24/05	14:26:55	11.3	52.93	-3.366
01/24/05	14:26:56	11.9	52.93	-3.384
01/24/05	14:26:57	12.6	52.93	-3.402
01/24/05	14:26:57	13.4	52.93	-3.423
01/24/05	14:26:58	14.2	52.91	-3.443
01/24/05	14:26:59	15.0	52.91	-3.465
01/24/05	14:27:00	15.9	52.91	-3.485
01/24/05	14:27:01	16.8	52.91	-3.508
01/24/05	14:27:02	17.8	52.91	-3.531
01/24/05	14:27:03	18.9	52.91	-3.555
01/24/05	14:27:04	20.0	52.91	-3.579
01/24/05	14:27:05	21.2	52.91	-3.601
01/24/05	14:27:07	22.4	52.91	-3.627
01/24/05	14:27:08	23.8	52.91	-3.653
01/24/05	14:27:09	25.2	52.91	-3.677
01/24/05	14:27:11	26.7	52.91	-3.701
01/24/05	14:27:12	28.2	52.91	-3.725
01/24/05	14:27:14	29.8	52.91	-3.749
01/24/05	14:27:16	31.5	52.91	-3.773
01/24/05	14:27:17	33.3	52.91	-3.797
01/24/05	14:27:19	35.2	52.91	-3.821
01/24/05	14:27:21	37.3	52.91	-3.845
01/24/05	14:27:24	39.5	52.91	-3.868
01/24/05	14:27:26	41.8	52.91	-3.892
01/24/05	14:27:28	44.3	52.91	-3.914
01/24/05	14:27:31	46.9	52.91	-3.937
01/24/05	14:27:34	49.7	52.91	-3.959
01/24/05	14:27:37	52.6	52.91	-3.983
01/24/05	14:27:40	55.7	52.91	-4.003
01/24/05	14:27:43	59.0	52.91	-4.021
01/24/05	14:27:47	62.5	52.91	-4.038
01/24/05	14:27:50	66.2	52.91	-4.056
01/24/05	14:27:54	70.1	52.91	-4.071
01/24/05	14:27:58	74.3	52.91	-4.086
01/24/05	14:28:03	78.7	52.91	-4.099
01/24/05	14:28:07	83.4	52.91	-4.113
01/24/05	14:28:12	88.4	52.91	-4.124
01/24/05	14:28:18	93.7	52.88	-4.134
01/24/05	14:28:23	99.3	52.88	-4.145
01/24/05	14:28:29	105.2	52.88	-4.152
01/24/05	14:28:36	111.5	52.91	-4.159
01/24/05	14:28:42	118.1	52.88	-4.167
01/24/05	14:28:49	125.1	52.88	-4.172
01/24/05	14:28:57	132.6	52.88	-4.176
01/24/05	14:29:05	140.5	52.88	-4.182
01/24/05	14:29:13	148.9	52.88	-4.183
01/24/05	14:29:22	157.8	52.88	-4.187
01/24/05	14:29:31	167.2	52.88	-4.189
01/24/05	14:29:41	177.2	52.88	-4.193
01/24/05	14:29:52	187.8	52.88	-4.193
01/24/05	14:30:03	199.0	52.88	-4.195
01/24/05	14:30:15	210.9	52.88	-4.196

NTAmw-113-out.txt

01/24/05	14:30:28	223.5	52.88	-4.198
01/24/05	14:30:41	236.8	52.88	-4.198
01/24/05	14:30:55	250.9	52.88	-4.200
01/24/05	14:31:10	265.8	52.88	-4.200
01/24/05	14:31:26	281.6	52.88	-4.202
01/24/05	14:31:42	298.4	52.88	-4.202
01/24/05	14:32:00	316.2	52.88	-4.204
01/24/05	14:32:19	335.0	52.88	-4.204
01/24/05	14:32:39	354.9	52.88	-4.204
01/24/05	14:33:00	376.0	52.88	-4.204
01/24/05	14:33:22	398.4	52.88	-4.204
01/24/05	14:33:46	422.1	52.88	-4.206
01/24/05	14:34:11	447.2	52.88	-4.206
01/24/05	14:34:38	473.8	52.88	-4.206
01/24/05	14:35:06	502.0	52.88	-4.206
01/24/05	14:35:36	531.9	52.88	-4.206
01/24/05	14:36:08	563.5	52.88	-4.207
01/24/05	14:36:41	597.0	52.88	-4.206
01/24/05	14:37:17	632.5	52.88	-4.207
01/24/05	14:37:54	670.1	52.88	-4.207
01/24/05	14:38:34	709.9	52.88	-4.209
01/24/05	14:39:16	752.1	52.88	-4.209
01/24/05	14:40:01	796.8	52.88	-4.209
01/24/05	14:40:48	844.2	52.88	-4.209
01/24/05	14:41:38	894.4	52.88	-4.211
01/24/05	14:42:32	947.5	52.88	-4.211
01/24/05	14:43:28	1003.8	52.88	-4.211
01/24/05	14:44:27	1063.4	52.88	-4.213
01/24/05	14:45:31	1126.6	52.88	-4.211

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA mw - 14      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4926	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1078.71</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>22.78</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>4.58</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>18.20</u>	SCREEN LENGTH
		FEET
		METERS

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>NS'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	NTA MW-114-IN	01/24/05	01/24/05	1406	1430	~21'				
2	NTA MW-114-OUT	01/24/05	01/24/05	1430	1451	~21'				

STORAGE LOCATION OF DATA:      1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



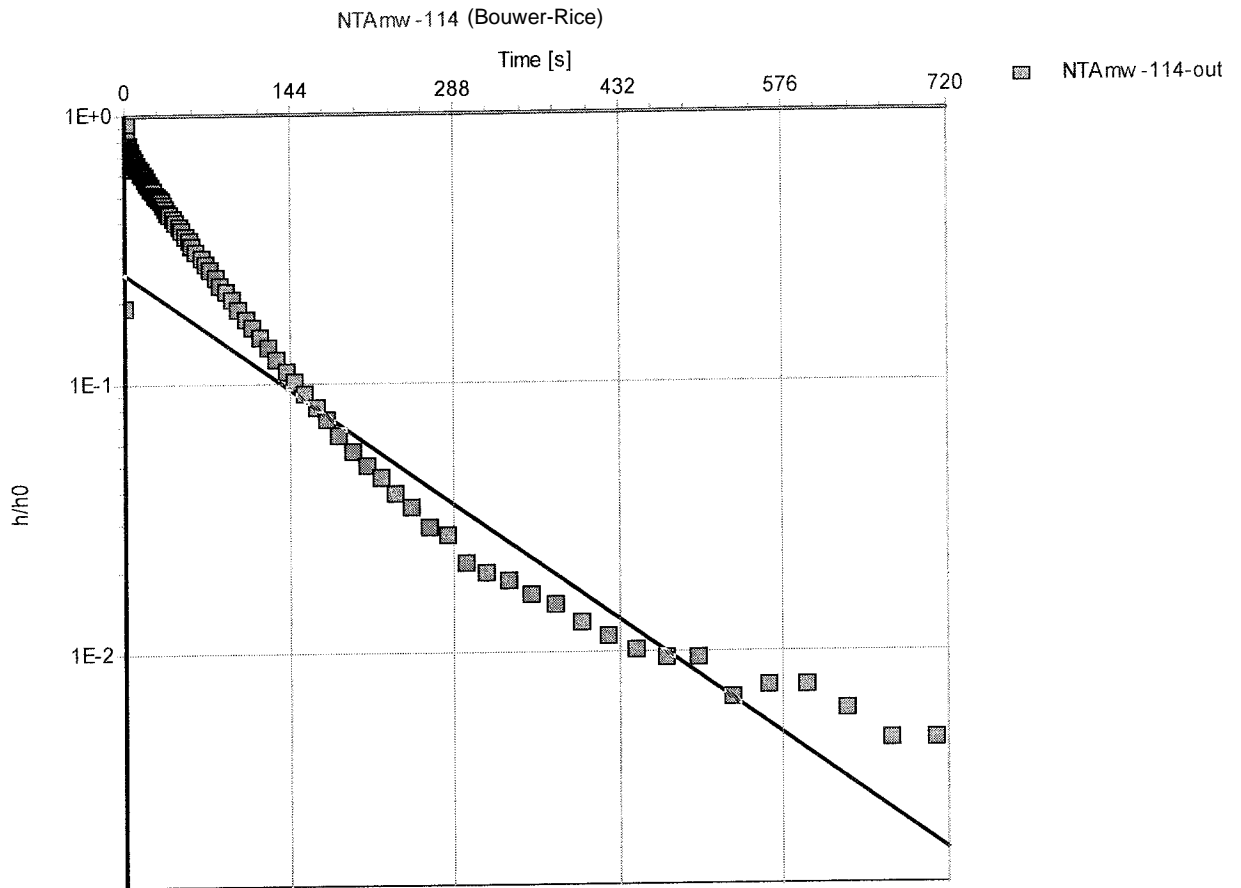
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: **NTAmw-114**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 2.13E-4 [cm/s]

Test parameters:

Test Well:	NTAmw-114-out	Aquifer thickness:	18.2 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:  
 Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:46:11  
 Report from file: ...\\SN04926 2005-01-24 143048 NTAmw-114-out.bin  
 Win-Situ Version 4.50

Serial number: 00004926  
 Firmware Version 3.09  
 Unit name: miniTROLL

Test name: NTAmw-114-out

Test defined on: 01/21/05 16:54:47  
 Test started on: 01/24/05 14:30:48  
 Test stopped on: 01/24/05 14:51:01  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 113

TOTAL DATA SAMPLES 113

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 11.596 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	
			Temperature Fahrenheit	Pressure Feet H2O	
01/24/05		14:30:48	0.0	53.12	0.000
01/24/05		14:30:48	0.3	53.14	-3.329
01/24/05		14:30:49	0.6	53.17	-2.300
01/24/05		14:30:49	0.9	53.17	-2.137
01/24/05		14:30:49	1.2	53.19	-2.682
01/24/05		14:30:49	1.5	53.19	-2.236
01/24/05		14:30:50	1.8	53.19	-2.543
01/24/05		14:30:50	2.1	53.19	-2.405
01/24/05		14:30:50	2.4	53.19	-2.486
01/24/05		14:30:51	2.7	53.19	-2.471
01/24/05		14:30:51	3.0	53.21	-2.486
01/24/05		14:30:51	3.3	53.21	-2.500
01/24/05		14:30:52	3.6	53.21	-2.504
01/24/05		14:30:52	3.9	53.21	-2.519
01/24/05		14:30:52	4.2	53.21	-2.524
01/24/05		14:30:52	4.5	53.21	-2.535
01/24/05		14:30:53	4.8	53.21	-2.541
01/24/05		14:30:53	5.1	53.21	-2.550
01/24/05		14:30:53	5.4	53.21	-2.555
01/24/05		14:30:54	5.7	53.21	-2.563

NTAmw-114-out.txt

01/24/05	14:30:54	6.0	53.21	-2.570
01/24/05	14:30:54	6.4	53.21	-2.577
01/24/05	14:30:55	6.7	53.21	-2.587
01/24/05	14:30:55	7.1	53.23	-2.594
01/24/05	14:30:56	7.5	53.21	-2.603
01/24/05	14:30:56	8.0	53.23	-2.610
01/24/05	14:30:56	8.4	53.23	-2.618
01/24/05	14:30:57	8.9	53.23	-2.629
01/24/05	14:30:57	9.5	53.23	-2.636
01/24/05	14:30:58	10.0	53.21	-2.644
01/24/05	14:30:59	10.6	53.19	-2.653
01/24/05	14:30:59	11.3	53.19	-2.666
01/24/05	14:31:00	11.9	53.19	-2.675
01/24/05	14:31:01	12.6	53.19	-2.686
01/24/05	14:31:01	13.4	53.19	-2.699
01/24/05	14:31:02	14.2	53.19	-2.708
01/24/05	14:31:03	15.0	53.19	-2.719
01/24/05	14:31:04	15.9	53.19	-2.732
01/24/05	14:31:05	16.8	53.17	-2.745
01/24/05	14:31:06	17.8	53.17	-2.760
01/24/05	14:31:07	18.9	53.17	-2.771
01/24/05	14:31:08	20.0	53.17	-2.784
01/24/05	14:31:09	21.2	53.17	-2.798
01/24/05	14:31:10	22.4	53.17	-2.813
01/24/05	14:31:12	23.8	53.17	-2.829
01/24/05	14:31:13	25.2	53.17	-2.844
01/24/05	14:31:15	26.7	53.17	-2.863
01/24/05	14:31:16	28.2	53.14	-2.877
01/24/05	14:31:18	29.8	53.14	-2.896
01/24/05	14:31:19	31.5	53.14	-2.910
01/24/05	14:31:21	33.3	53.14	-2.929
01/24/05	14:31:23	35.2	53.14	-2.947
01/24/05	14:31:25	37.3	53.12	-2.969
01/24/05	14:31:27	39.5	53.12	-2.986
01/24/05	14:31:30	41.8	53.12	-3.006
01/24/05	14:31:32	44.3	53.10	-3.025
01/24/05	14:31:35	46.9	53.10	-3.047
01/24/05	14:31:38	49.7	53.10	-3.069
01/24/05	14:31:41	52.6	53.10	-3.091
01/24/05	14:31:44	55.7	53.08	-3.113
01/24/05	14:31:47	59.0	53.08	-3.133
01/24/05	14:31:50	62.5	53.05	-3.157
01/24/05	14:31:54	66.2	53.03	-3.180
01/24/05	14:31:58	70.1	53.03	-3.202
01/24/05	14:32:02	74.3	53.01	-3.224
01/24/05	14:32:07	78.7	52.99	-3.248
01/24/05	14:32:11	83.4	52.99	-3.270
01/24/05	14:32:16	88.4	52.96	-3.292
01/24/05	14:32:22	93.7	52.96	-3.312
01/24/05	14:32:27	99.3	52.94	-3.335
01/24/05	14:32:33	105.2	52.94	-3.357
01/24/05	14:32:39	111.5	52.92	-3.375
01/24/05	14:32:46	118.1	52.92	-3.395
01/24/05	14:32:53	125.1	52.92	-3.414
01/24/05	14:33:01	132.6	52.92	-3.432
01/24/05	14:33:08	140.5	52.90	-3.449
01/24/05	14:33:17	148.9	52.90	-3.463
01/24/05	14:33:26	157.8	52.90	-3.478
01/24/05	14:33:35	167.2	52.87	-3.493
01/24/05	14:33:45	177.2	52.85	-3.504
01/24/05	14:33:56	187.8	52.83	-3.519
01/24/05	14:34:07	199.0	52.81	-3.530
01/24/05	14:34:19	210.9	52.76	-3.540



NTAmw-114-out.txt

01/24/05	14:34:31	223.5	52.74	-3.547
01/24/05	14:34:45	236.8	52.72	-3.555
01/24/05	14:34:59	250.9	52.69	-3.562
01/24/05	14:35:14	265.8	52.69	-3.570
01/24/05	14:35:30	281.6	52.69	-3.573
01/24/05	14:35:46	298.4	52.72	-3.581
01/24/05	14:36:04	316.2	52.74	-3.584
01/24/05	14:36:23	335.0	52.76	-3.586
01/24/05	14:36:43	354.9	52.78	-3.589
01/24/05	14:37:04	376.0	52.81	-3.591
01/24/05	14:37:26	398.4	52.83	-3.594
01/24/05	14:37:50	422.1	52.87	-3.596
01/24/05	14:38:15	447.2	52.87	-3.598
01/24/05	14:38:42	473.8	52.90	-3.599
01/24/05	14:39:10	502.0	52.92	-3.599
01/24/05	14:39:40	531.9	52.96	-3.603
01/24/05	14:40:11	563.5	52.99	-3.602
01/24/05	14:40:45	597.0	53.01	-3.602
01/24/05	14:41:20	632.5	53.01	-3.604
01/24/05	14:41:58	670.1	53.03	-3.606
01/24/05	14:42:38	709.9	53.03	-3.606
01/24/05	14:43:20	752.1	53.03	-3.608
01/24/05	14:44:05	796.8	53.03	-3.608
01/24/05	14:44:52	844.2	53.03	-3.608
01/24/05	14:45:42	894.4	53.05	-3.606
01/24/05	14:46:35	947.5	53.03	-3.609
01/24/05	14:47:32	1003.8	53.03	-3.609
01/24/05	14:48:31	1063.4	53.03	-3.606
01/24/05	14:49:35	1126.6	53.01	-3.611
01/24/05	14:50:41	1193.5	53.01	-3.613

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTAmw - 115      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1089.65</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>25.27</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>12.49</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>12.78</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~13'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>NTAmw-115-IN</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1528</u>	<u>1547</u>	<u>~24'</u>				
2	<u>NTAmw-115-OUT</u>	<u>01/24/05</u>	<u>01/24/05</u>	<u>1548</u>	<u>1602</u>	<u>~24'</u>				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 2/6/05



**MKM Engineers, Inc.**

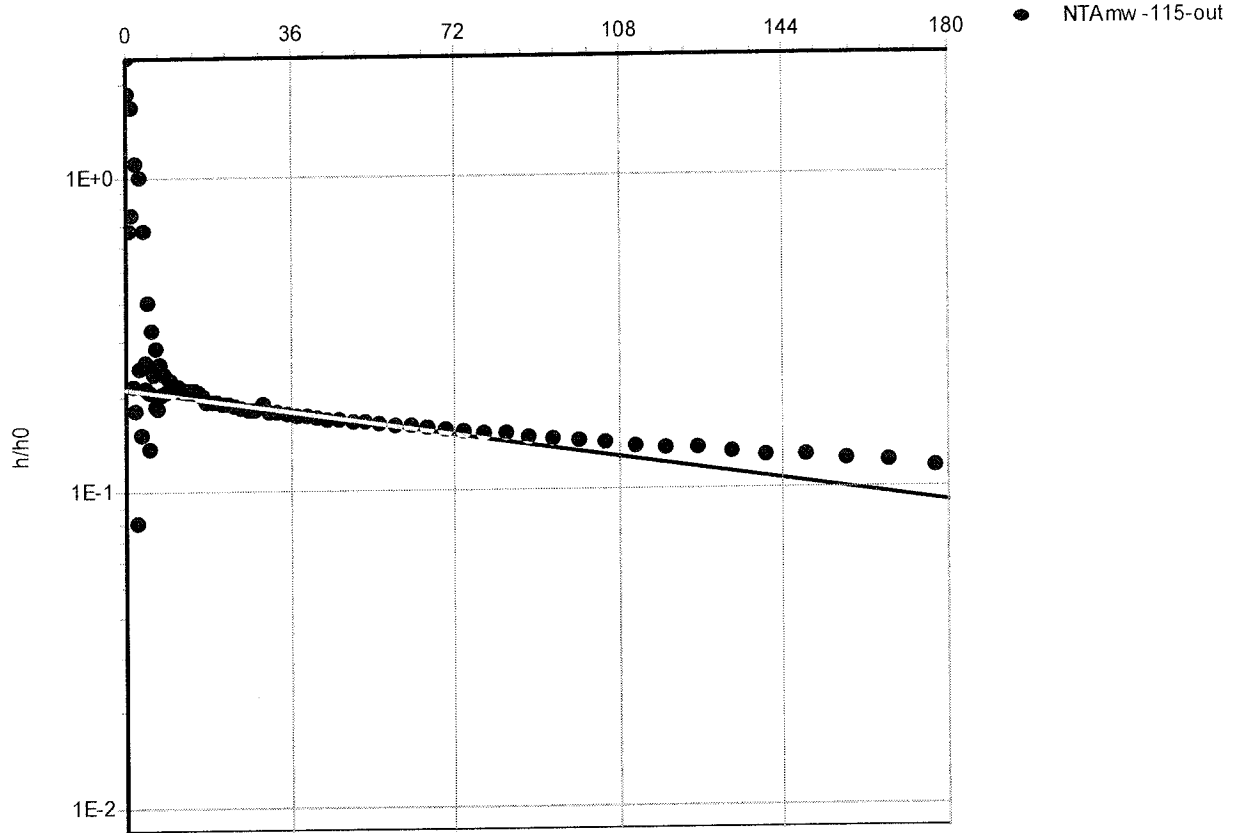
8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

NTAmw -115 (Bouwer-Rice)



Test name: **NTAmw-115**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 1.37E-4 [cm/s]

Test parameters:

Test Well:	NTAmw-115-out	Aquifer thickness:	12.78 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:33:05  
 Report from file: ...\\SN04886 2005-01-24 154812 NTAmw-115-out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: NTAmw-115-out

Test defined on: 01/21/05 16:45:12  
 Test started on: 01/24/05 15:48:12  
 Test stopped on: 01/24/05 16:02:12  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 106

TOTAL DATA SAMPLES 106

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 9.244 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O	
01/24/05	15:48:12		0.0	53.18	0.000
01/24/05	15:48:13		0.3	53.20	1.206
01/24/05	15:48:13		0.6	53.20	-2.851
01/24/05	15:48:13		0.9	53.22	-0.446
01/24/05	15:48:14		1.2	53.22	0.496
01/24/05	15:48:14		1.5	53.22	-1.808
01/24/05	15:48:14		1.8	53.25	-0.884
01/24/05	15:48:14		2.1	53.25	-0.027
01/24/05	15:48:15		2.4	53.25	-1.262
01/24/05	15:48:15		2.7	53.25	-1.013
01/24/05	15:48:15		3.0	53.25	-0.134
01/24/05	15:48:16		3.3	53.25	-0.855
01/24/05	15:48:16		3.6	53.25	-0.945
01/24/05	15:48:16		3.9	53.27	-0.442
01/24/05	15:48:17		4.2	53.27	-0.843
01/24/05	15:48:17		4.5	53.27	-0.886
01/24/05	15:48:17		4.8	53.27	-0.711
01/24/05	15:48:17		5.1	53.27	-0.891
01/24/05	15:48:18		5.4	53.27	-0.958
01/24/05	15:48:18		5.7	53.27	-0.779

NTAmw-115-out.txt

01/24/05	15:48:18	6.0	53.27	-0.864
01/24/05	15:48:19	6.4	53.27	-0.912
01/24/05	15:48:19	6.7	53.27	-0.818
01/24/05	15:48:19	7.1	53.27	-0.914
01/24/05	15:48:20	7.5	53.27	-0.847
01/24/05	15:48:20	8.0	53.27	-0.895
01/24/05	15:48:21	8.4	53.27	-0.866
01/24/05	15:48:21	8.9	53.27	-0.893
01/24/05	15:48:22	9.5	53.27	-0.875
01/24/05	15:48:22	10.0	53.27	-0.888
01/24/05	15:48:23	10.6	53.25	-0.884
01/24/05	15:48:24	11.3	53.25	-0.882
01/24/05	15:48:24	11.9	53.25	-0.886
01/24/05	15:48:25	12.6	53.25	-0.890
01/24/05	15:48:26	13.4	53.25	-0.890
01/24/05	15:48:26	14.2	53.25	-0.890
01/24/05	15:48:27	15.0	53.25	-0.890
01/24/05	15:48:28	15.9	53.25	-0.892
01/24/05	15:48:29	16.8	53.25	-0.897
01/24/05	15:48:30	17.8	53.25	-0.905
01/24/05	15:48:31	18.9	53.25	-0.906
01/24/05	15:48:32	20.0	53.25	-0.906
01/24/05	15:48:34	21.2	53.25	-0.908
01/24/05	15:48:35	22.4	53.25	-0.910
01/24/05	15:48:36	23.8	53.22	-0.912
01/24/05	15:48:38	25.2	53.22	-0.914
01/24/05	15:48:39	26.7	53.22	-0.916
01/24/05	15:48:40	28.2	53.25	-0.916
01/24/05	15:48:42	29.8	53.22	-0.908
01/24/05	15:48:44	31.5	53.22	-0.919
01/24/05	15:48:46	33.3	53.22	-0.919
01/24/05	15:48:47	35.2	53.22	-0.921
01/24/05	15:48:50	37.3	53.22	-0.923
01/24/05	15:48:52	39.5	53.22	-0.925
01/24/05	15:48:54	41.8	53.22	-0.927
01/24/05	15:48:57	44.3	53.22	-0.929
01/24/05	15:48:59	46.9	53.22	-0.929
01/24/05	15:49:02	49.7	53.22	-0.931
01/24/05	15:49:05	52.6	53.22	-0.932
01/24/05	15:49:08	55.7	53.22	-0.934
01/24/05	15:49:11	59.0	53.22	-0.936
01/24/05	15:49:15	62.5	53.22	-0.936
01/24/05	15:49:18	66.2	53.22	-0.938
01/24/05	15:49:22	70.1	53.22	-0.940
01/24/05	15:49:27	74.3	53.22	-0.942
01/24/05	15:49:31	78.7	53.22	-0.945
01/24/05	15:49:36	83.4	53.22	-0.945
01/24/05	15:49:41	88.4	53.22	-0.949
01/24/05	15:49:46	93.7	53.22	-0.951
01/24/05	15:49:52	99.3	53.20	-0.953
01/24/05	15:49:57	105.2	53.22	-0.955
01/24/05	15:50:04	111.5	53.20	-0.958
01/24/05	15:50:10	118.1	53.20	-0.960
01/24/05	15:50:17	125.1	53.22	-0.960
01/24/05	15:50:25	132.6	53.22	-0.964
01/24/05	15:50:33	140.5	53.22	-0.967
01/24/05	15:50:41	148.9	53.22	-0.967
01/24/05	15:50:50	157.8	53.22	-0.971
01/24/05	15:50:59	167.2	53.22	-0.973
01/24/05	15:51:09	177.2	53.22	-0.977
01/24/05	15:51:20	187.8	53.22	-0.980
01/24/05	15:51:31	199.0	53.22	-0.982
01/24/05	15:51:43	210.9	53.22	-0.986

NTAmw-115-out.txt

01/24/05	15:51:56	223.5	53.22	-0.990
01/24/05	15:52:09	236.8	53.22	-0.991
01/24/05	15:52:23	250.9	53.22	-0.995
01/24/05	15:52:38	265.8	53.22	-0.999
01/24/05	15:52:54	281.6	53.22	-1.002
01/24/05	15:53:11	298.4	53.22	-1.008
01/24/05	15:53:28	316.2	53.22	-1.010
01/24/05	15:53:47	335.0	53.25	-1.015
01/24/05	15:54:07	354.9	53.25	-1.019
01/24/05	15:54:28	376.0	53.25	-1.022
01/24/05	15:54:51	398.4	53.25	-1.028
01/24/05	15:55:14	422.1	53.25	-1.030
01/24/05	15:55:39	447.2	53.25	-1.037
01/24/05	15:56:06	473.8	53.25	-1.039
01/24/05	15:56:34	502.0	53.25	-1.045
01/24/05	15:57:04	531.9	53.27	-1.050
01/24/05	15:57:36	563.5	53.27	-1.055
01/24/05	15:58:09	597.0	53.27	-1.061
01/24/05	15:58:45	632.5	53.27	-1.065
01/24/05	15:59:22	670.1	53.27	-1.072
01/24/05	16:00:02	709.9	53.27	-1.078
01/24/05	16:00:44	752.1	53.27	-1.081
01/24/05	16:01:29	796.8	53.27	-1.089

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA mw - 116      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4926	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1094.33</u>	RISER CASING I.D. (in.): <u>2 in</u>
SCREEN OR OPEN HOLE I.D. (in): <u>2 in</u>	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>22.55</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>4.68</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>17.87</u>	SCREEN LENGTH
		FEET
		METERS
		<u>7' BGS</u>
		<u>10' BGS</u>
		<u>10 ft</u>

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~5'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	NTA MW-116-IN	01/24/05	01/24/05	1514	1539	~21'				
2	NTA MW-116-OUT	01/24/05	01/24/05	1540	1556	~21'				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05

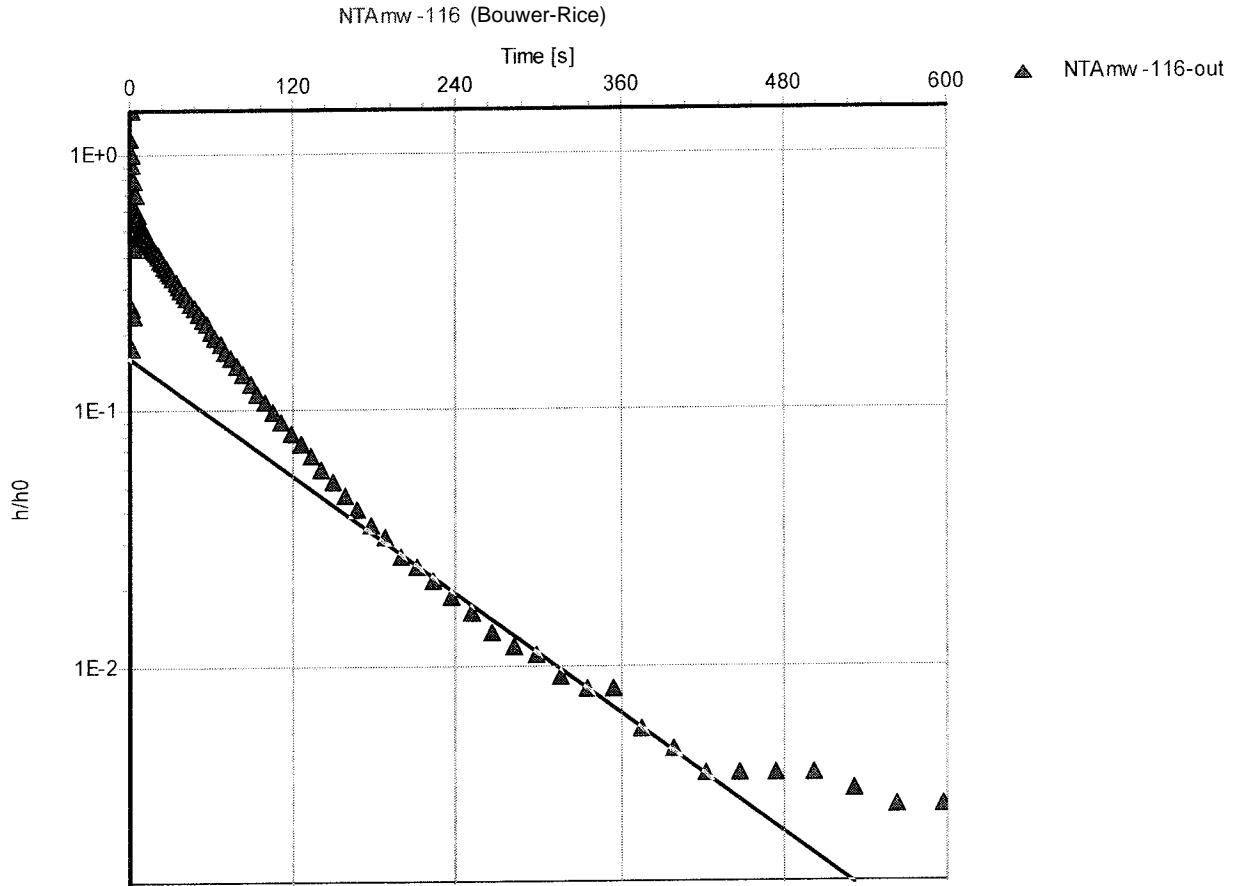
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

Test name: **NTAmw-116**Analysis Method: **Bouwer & Rice**Analysis results:

Conductivity: 2.76E-4 [cm/s]

Test parameters:

Test Well:	NTAmw-116-out	Aquifer thickness:	17.87 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/14/2005



In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:46:50  
 Report from file: ...\\SN04926 2005-01-24 154003 NTAmw-116-out.bin  
 Win-Situ Version 4.50

Serial number: 00004926  
 Firmware Version 3.09  
 Unit name: miniTROLL

Test name: NTAmw-116-out

Test defined on: 01/21/05 16:55:19  
 Test started on: 01/24/05 15:40:03  
 Test stopped on: 01/24/05 15:56:25  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 109

TOTAL DATA SAMPLES 109

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 9.762 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O	
01/24/05	15:40:03		0.0	53.05	0.000
01/24/05	15:40:03		0.3	53.08	-2.942
01/24/05	15:40:03		0.6	53.10	-6.653
01/24/05	15:40:03		0.9	53.12	-3.445
01/24/05	15:40:04		1.2	53.12	-2.249
01/24/05	15:40:04		1.5	53.12	-4.823
01/24/05	15:40:04		1.8	53.12	-4.983
01/24/05	15:40:05		2.1	53.14	-3.252
01/24/05	15:40:05		2.4	53.14	-3.829
01/24/05	15:40:05		2.7	53.14	-4.860
01/24/05	15:40:06		3.0	53.14	-4.041
01/24/05	15:40:06		3.3	53.14	-3.693
01/24/05	15:40:06		3.6	53.14	-4.450
01/24/05	15:40:06		3.9	53.14	-4.375
01/24/05	15:40:07		4.2	53.14	-3.882
01/24/05	15:40:07		4.5	53.14	-4.195
01/24/05	15:40:07		4.8	53.14	-4.404
01/24/05	15:40:08		5.1	53.17	-4.094
01/24/05	15:40:08		5.4	53.17	-4.123
01/24/05	15:40:08		5.7	53.14	-4.349

NTAmw-116-out.txt

01/24/05	15:40:09	6.0	53.17	-4.224
01/24/05	15:40:09	6.4	53.17	-4.167
01/24/05	15:40:09	6.7	53.17	-4.320
01/24/05	15:40:10	7.1	53.17	-4.211
01/24/05	15:40:10	7.5	53.17	-4.283
01/24/05	15:40:11	8.0	53.17	-4.274
01/24/05	15:40:11	8.4	53.17	-4.283
01/24/05	15:40:12	8.9	53.17	-4.298
01/24/05	15:40:12	9.5	53.17	-4.312
01/24/05	15:40:13	10.0	53.14	-4.309
01/24/05	15:40:13	10.6	53.14	-4.334
01/24/05	15:40:14	11.3	53.14	-4.336
01/24/05	15:40:14	11.9	53.14	-4.357
01/24/05	15:40:15	12.6	53.12	-4.375
01/24/05	15:40:16	13.4	53.14	-4.386
01/24/05	15:40:17	14.2	53.12	-4.401
01/24/05	15:40:18	15.0	53.12	-4.415
01/24/05	15:40:18	15.9	53.12	-4.434
01/24/05	15:40:19	16.8	53.12	-4.449
01/24/05	15:40:20	17.8	53.12	-4.467
01/24/05	15:40:21	18.9	53.12	-4.483
01/24/05	15:40:23	20.0	53.12	-4.502
01/24/05	15:40:24	21.2	53.12	-4.520
01/24/05	15:40:25	22.4	53.12	-4.540
01/24/05	15:40:26	23.8	53.12	-4.561
01/24/05	15:40:28	25.2	53.12	-4.579
01/24/05	15:40:29	26.7	53.12	-4.601
01/24/05	15:40:31	28.2	53.12	-4.621
01/24/05	15:40:32	29.8	53.12	-4.643
01/24/05	15:40:34	31.5	53.12	-4.664
01/24/05	15:40:36	33.3	53.12	-4.686
01/24/05	15:40:38	35.2	53.12	-4.709
01/24/05	15:40:40	37.3	53.12	-4.732
01/24/05	15:40:42	39.5	53.12	-4.755
01/24/05	15:40:44	41.8	53.12	-4.779
01/24/05	15:40:47	44.3	53.12	-4.803
01/24/05	15:40:49	46.9	53.12	-4.827
01/24/05	15:40:52	49.7	53.12	-4.851
01/24/05	15:40:55	52.6	53.12	-4.875
01/24/05	15:40:58	55.7	53.12	-4.899
01/24/05	15:41:02	59.0	53.10	-4.925
01/24/05	15:41:05	62.5	53.10	-4.947
01/24/05	15:41:09	66.2	53.10	-4.971
01/24/05	15:41:13	70.1	53.08	-4.995
01/24/05	15:41:17	74.3	53.08	-5.017
01/24/05	15:41:21	78.7	53.05	-5.041
01/24/05	15:41:26	83.4	53.03	-5.061
01/24/05	15:41:31	88.4	52.99	-5.083
01/24/05	15:41:36	93.7	52.96	-5.106
01/24/05	15:41:42	99.3	52.92	-5.126
01/24/05	15:41:48	105.2	52.87	-5.145
01/24/05	15:41:54	111.5	52.83	-5.162
01/24/05	15:42:01	118.1	52.78	-5.180
01/24/05	15:42:08	125.1	52.74	-5.197
01/24/05	15:42:15	132.6	52.69	-5.212
01/24/05	15:42:23	140.5	52.63	-5.228
01/24/05	15:42:31	148.9	52.58	-5.241
01/24/05	15:42:40	157.8	52.51	-5.254
01/24/05	15:42:50	167.2	52.49	-5.265
01/24/05	15:43:00	177.2	52.47	-5.276
01/24/05	15:43:10	187.8	52.47	-5.284
01/24/05	15:43:22	199.0	52.47	-5.295
01/24/05	15:43:33	210.9	52.47	-5.300

NTAmw-116-out.txt

01/24/05	15:43:46	223.5	52.45	-5.306
01/24/05	15:43:59	236.8	52.45	-5.312
01/24/05	15:44:13	250.9	52.45	-5.317
01/24/05	15:44:28	265.8	52.45	-5.323
01/24/05	15:44:44	281.6	52.45	-5.326
01/24/05	15:45:01	298.4	52.45	-5.328
01/24/05	15:45:19	316.2	52.45	-5.332
01/24/05	15:45:38	335.0	52.45	-5.334
01/24/05	15:45:57	354.9	52.45	-5.334
01/24/05	15:46:19	376.0	52.47	-5.339
01/24/05	15:46:41	398.4	52.47	-5.341
01/24/05	15:47:05	422.1	52.47	-5.343
01/24/05	15:47:30	447.2	52.42	-5.343
01/24/05	15:47:56	473.8	52.40	-5.343
01/24/05	15:48:25	502.0	52.36	-5.343
01/24/05	15:48:54	531.9	52.27	-5.344
01/24/05	15:49:26	563.5	52.20	-5.345
01/24/05	15:50:00	597.0	52.16	-5.345
01/24/05	15:50:35	632.5	52.16	-5.345
01/24/05	15:51:13	670.1	52.16	-5.347
01/24/05	15:51:52	709.9	52.22	-5.348
01/24/05	15:52:35	752.1	52.27	-5.346
01/24/05	15:53:19	796.8	52.29	-5.348
01/24/05	15:54:07	844.2	52.27	-5.346
01/24/05	15:54:57	894.4	52.25	-5.346
01/24/05	15:55:50	947.5	52.27	-5.351

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA mw - 117      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	544A	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1094.54</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>27.50</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>12.50</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>15.00</u>	SCREEN LENGTH

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~13'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	NTA mw - 117 - IN	01/24/05	01/24/05	1506	1535	~26'				
2	NTA mw - 117 - OUT	01/24/05	01/24/05	1535	1551	~26'				

STORAGE LOCATION OF DATA:      1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



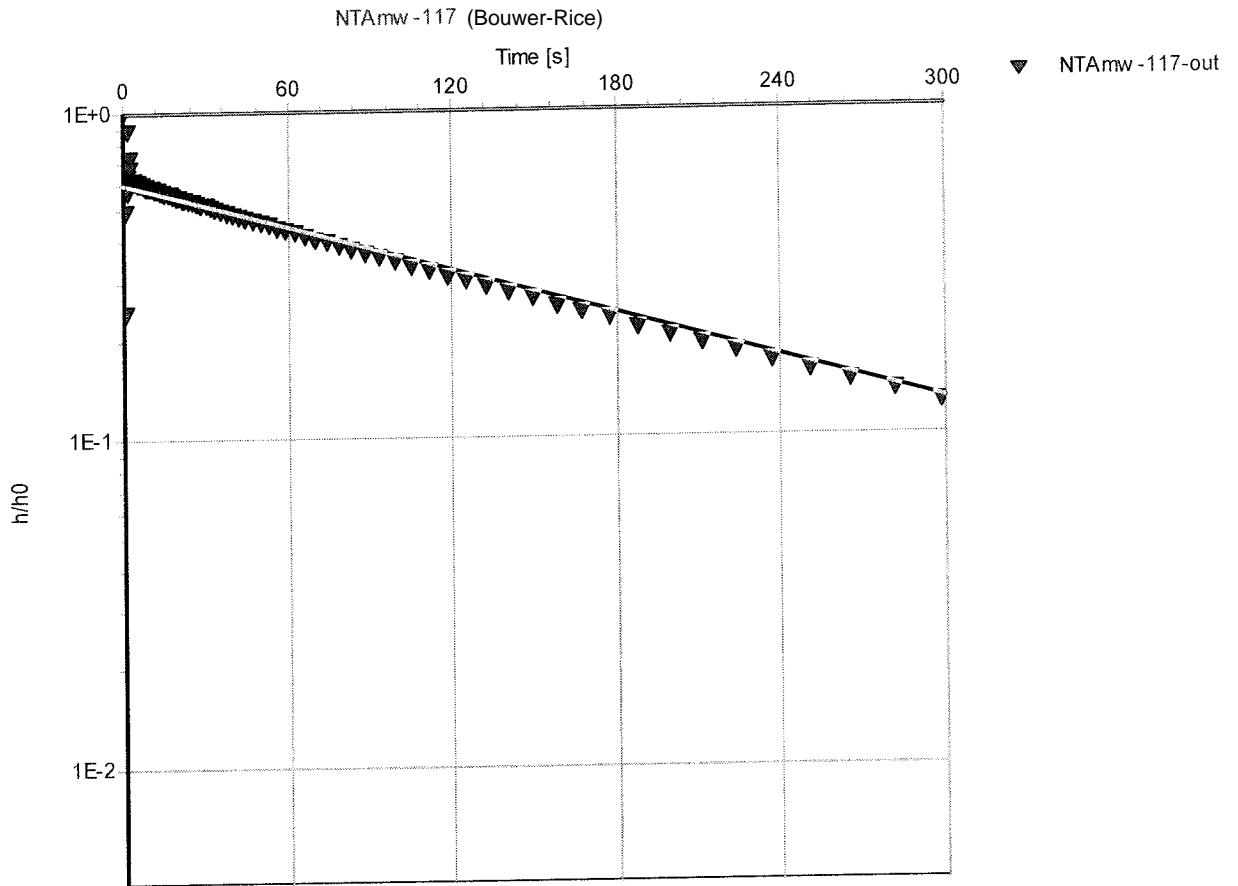
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: **NTAmw-117**

Analysis Method: **Bouwer & Rice**

Analysis results:

Conductivity: 1.54E-4 [cm/s]

Test parameters:

Test Well:	NTAmw-117-out	Aquifer thickness:	15 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:40:08  
 Report from file: ...\\SN05444 2005-01-24 153527 NTAmw-117-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: NTAmw-117-out

Test defined on: 01/21/05 16:59:14  
 Test started on: 01/24/05 15:35:27  
 Test stopped on: 01/24/05 15:51:57  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 109

TOTAL DATA SAMPLES 109

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 10.203 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/24/05	15:35:27		0.0	52.37
01/24/05	15:35:27		0.3	52.37
01/24/05	15:35:28		0.6	52.40
01/24/05	15:35:28		0.9	52.42
01/24/05	15:35:28		1.2	52.42
01/24/05	15:35:28		1.5	52.42
01/24/05	15:35:29		1.8	52.42
01/24/05	15:35:29		2.1	52.44
01/24/05	15:35:29		2.4	52.44
01/24/05	15:35:30		2.7	52.44
01/24/05	15:35:30		3.0	52.44
01/24/05	15:35:30		3.3	52.44
01/24/05	15:35:31		3.6	52.44
01/24/05	15:35:31		3.9	52.44
01/24/05	15:35:31		4.2	52.44
01/24/05	15:35:31		4.5	52.44
01/24/05	15:35:32		4.8	52.44
01/24/05	15:35:32		5.1	52.44
01/24/05	15:35:32		5.4	52.46
01/24/05	15:35:33		5.7	52.46

NTAmw-117-out.txt

01/24/05	15:35:33	6.0	52.46	-1.934
01/24/05	15:35:33	6.4	52.46	-1.936
01/24/05	15:35:34	6.7	52.46	-1.938
01/24/05	15:35:34	7.1	52.46	-1.941
01/24/05	15:35:34	7.5	52.46	-1.945
01/24/05	15:35:35	8.0	52.46	-1.949
01/24/05	15:35:35	8.4	52.46	-1.953
01/24/05	15:35:36	8.9	52.46	-1.954
01/24/05	15:35:36	9.5	52.46	-1.958
01/24/05	15:35:37	10.0	52.44	-1.960
01/24/05	15:35:38	10.6	52.44	-1.964
01/24/05	15:35:38	11.3	52.44	-1.969
01/24/05	15:35:39	11.9	52.44	-1.973
01/24/05	15:35:40	12.6	52.44	-1.977
01/24/05	15:35:40	13.4	52.44	-1.982
01/24/05	15:35:41	14.2	52.44	-1.988
01/24/05	15:35:42	15.0	52.44	-1.994
01/24/05	15:35:43	15.9	52.44	-1.997
01/24/05	15:35:44	16.8	52.44	-2.003
01/24/05	15:35:45	17.8	52.44	-2.008
01/24/05	15:35:46	18.9	52.42	-2.016
01/24/05	15:35:47	20.0	52.44	-2.021
01/24/05	15:35:48	21.2	52.44	-2.029
01/24/05	15:35:49	22.4	52.42	-2.035
01/24/05	15:35:51	23.8	52.42	-2.044
01/24/05	15:35:52	25.2	52.42	-2.051
01/24/05	15:35:54	26.7	52.42	-2.059
01/24/05	15:35:55	28.2	52.42	-2.066
01/24/05	15:35:57	29.8	52.42	-2.074
01/24/05	15:35:58	31.5	52.42	-2.083
01/24/05	15:36:00	33.3	52.42	-2.092
01/24/05	15:36:02	35.2	52.42	-2.101
01/24/05	15:36:04	37.3	52.42	-2.113
01/24/05	15:36:06	39.5	52.42	-2.122
01/24/05	15:36:09	41.8	52.42	-2.133
01/24/05	15:36:11	44.3	52.42	-2.144
01/24/05	15:36:14	46.9	52.42	-2.153
01/24/05	15:36:17	49.7	52.42	-2.166
01/24/05	15:36:19	52.6	52.42	-2.179
01/24/05	15:36:23	55.7	52.42	-2.192
01/24/05	15:36:26	59.0	52.42	-2.205
01/24/05	15:36:29	62.5	52.42	-2.220
01/24/05	15:36:33	66.2	52.42	-2.235
01/24/05	15:36:37	70.1	52.42	-2.248
01/24/05	15:36:41	74.3	52.42	-2.263
01/24/05	15:36:46	78.7	52.42	-2.280
01/24/05	15:36:50	83.4	52.42	-2.295
01/24/05	15:36:55	88.4	52.42	-2.311
01/24/05	15:37:01	93.7	52.42	-2.328
01/24/05	15:37:06	99.3	52.42	-2.345
01/24/05	15:37:12	105.2	52.40	-2.364
01/24/05	15:37:18	111.5	52.40	-2.380
01/24/05	15:37:25	118.1	52.40	-2.399
01/24/05	15:37:32	125.1	52.40	-2.416
01/24/05	15:37:39	132.6	52.40	-2.436
01/24/05	15:37:47	140.5	52.40	-2.455
01/24/05	15:37:56	148.9	52.40	-2.473
01/24/05	15:38:05	157.8	52.40	-2.492
01/24/05	15:38:14	167.2	52.40	-2.512
01/24/05	15:38:24	177.2	52.40	-2.529
01/24/05	15:38:35	187.8	52.40	-2.549
01/24/05	15:38:46	199.0	52.40	-2.568
01/24/05	15:38:58	210.9	52.40	-2.587

NTAmw-117-out.txt

01/24/05	15:39:10	223.5	52.40	-2.605
01/24/05	15:39:24	236.8	52.40	-2.622
01/24/05	15:39:38	250.9	52.40	-2.640
01/24/05	15:39:53	265.8	52.40	-2.657
01/24/05	15:40:08	281.6	52.40	-2.674
01/24/05	15:40:25	298.4	52.40	-2.691
01/24/05	15:40:43	316.2	52.40	-2.707
01/24/05	15:41:02	335.0	52.40	-2.724
01/24/05	15:41:22	354.9	52.42	-2.737
01/24/05	15:41:43	376.0	52.40	-2.752
01/24/05	15:42:05	398.4	52.40	-2.765
01/24/05	15:42:29	422.1	52.40	-2.776
01/24/05	15:42:54	447.2	52.40	-2.789
01/24/05	15:43:21	473.8	52.40	-2.800
01/24/05	15:43:49	502.0	52.40	-2.811
01/24/05	15:44:19	531.9	52.40	-2.821
01/24/05	15:44:50	563.5	52.40	-2.830
01/24/05	15:45:24	597.0	52.40	-2.841
01/24/05	15:45:59	632.5	52.40	-2.847
01/24/05	15:46:37	670.1	52.40	-2.854
01/24/05	15:47:17	709.9	52.40	-2.862
01/24/05	15:47:59	752.1	52.37	-2.869
01/24/05	15:48:44	796.8	52.37	-2.875
01/24/05	15:49:31	844.2	52.37	-2.880
01/24/05	15:50:21	894.4	52.37	-2.884
01/24/05	15:51:14	947.5	52.37	-2.891



# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: NTA-mw-118      Date Started: 01/24/05      Date Completed: 01/24/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	5444	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1081.44</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>24.70</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>7.27</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>17.43</u>	SCREEN LENGTH
	FEET	METERS
		<u>9' BGS</u>
		<u>12' BGS</u>
		<u>10 ft</u>

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~8'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	NTA-mw-118-IN	01/24/05	01/24/05	1419	1434	~23'				
2	NTA-mw-118-OUT	01/24/05	01/24/05	1435	1456	~23'				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (1)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(1) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
 ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

**REMARKS:**

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
 Signature: [Signature]      Date: 5/6/05



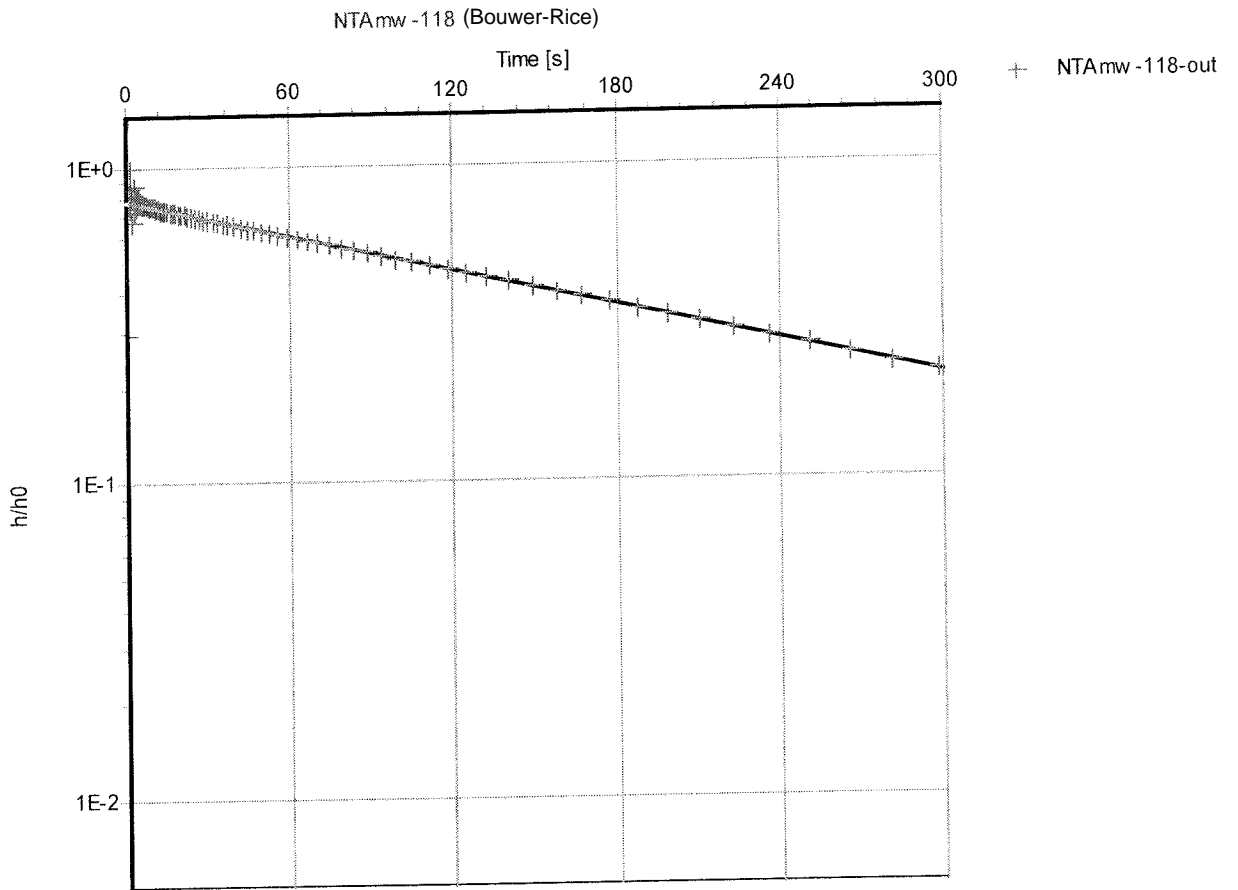
**MKM Engineers, Inc.**

8451 St Rt 5, Bldg 1038  
 Ravenna, Ohio 44266  
 (330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE



Test name: **NTAmw-118**

Analysis Method: **Bouwer & Rice**

Analysis results: Conductivity: 1.37E-4 [cm/s]

Test parameters:

Test Well:	NTAmw-118-out	Aquifer thickness:	20.23 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:  
 Date: 2/14/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/25/05 07:39:27  
 Report from file: ...\\SN05444 2005-01-24 143504 NTAmw-118-out.bin  
 Win-Situ Version 4.50

Serial number: 00005444  
 Firmware Version 3.09  
 Unit name: MKM 45

Test name: NTAmw-118-out

Test defined on: 01/21/05 16:58:47  
 Test started on: 01/24/05 14:35:04  
 Test stopped on: 01/24/05 14:56:18  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 114

TOTAL DATA SAMPLES 114

Channel number [1]  
 Measurement type: Temperature  
 Channel name: H2O Temp.

Channel number [2]  
 Measurement type: Pressure  
 Channel name: H2O Level  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 10.861 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/24/05	14:35:04		0.0	51.09
01/24/05	14:35:04		0.3	51.11
01/24/05	14:35:04		0.6	51.13
01/24/05	14:35:04		0.9	51.16
01/24/05	14:35:05		1.2	51.16
01/24/05	14:35:05		1.5	51.16
01/24/05	14:35:05		1.8	51.16
01/24/05	14:35:06		2.1	51.16
01/24/05	14:35:06		2.4	51.16
01/24/05	14:35:06		2.7	51.18
01/24/05	14:35:07		3.0	51.18
01/24/05	14:35:07		3.3	51.18
01/24/05	14:35:07		3.6	51.18
01/24/05	14:35:07		3.9	51.18
01/24/05	14:35:08		4.2	51.18
01/24/05	14:35:08		4.5	51.18
01/24/05	14:35:08		4.8	51.18
01/24/05	14:35:09		5.1	51.18
01/24/05	14:35:09		5.4	51.18
01/24/05	14:35:09		5.7	51.18

NTAmw-118-out.txt

01/24/05	14:35:10	6.0	51.18	-1.681
01/24/05	14:35:10	6.4	51.20	-1.692
01/24/05	14:35:10	6.7	51.18	-1.690
01/24/05	14:35:11	7.1	51.20	-1.696
01/24/05	14:35:11	7.5	51.20	-1.698
01/24/05	14:35:11	8.0	51.20	-1.700
01/24/05	14:35:12	8.4	51.20	-1.703
01/24/05	14:35:12	8.9	51.20	-1.707
01/24/05	14:35:13	9.5	51.20	-1.709
01/24/05	14:35:14	10.0	51.18	-1.709
01/24/05	14:35:14	10.6	51.18	-1.715
01/24/05	14:35:15	11.3	51.18	-1.716
01/24/05	14:35:15	11.9	51.18	-1.724
01/24/05	14:35:16	12.6	51.18	-1.729
01/24/05	14:35:17	13.4	51.18	-1.731
01/24/05	14:35:18	14.2	51.18	-1.735
01/24/05	14:35:18	15.0	51.16	-1.739
01/24/05	14:35:19	15.9	51.16	-1.744
01/24/05	14:35:20	16.8	51.16	-1.750
01/24/05	14:35:21	17.8	51.16	-1.754
01/24/05	14:35:22	18.9	51.16	-1.759
01/24/05	14:35:24	20.0	51.16	-1.763
01/24/05	14:35:25	21.2	51.16	-1.769
01/24/05	14:35:26	22.4	51.16	-1.774
01/24/05	14:35:27	23.8	51.16	-1.780
01/24/05	14:35:29	25.2	51.16	-1.785
01/24/05	14:35:30	26.7	51.16	-1.793
01/24/05	14:35:32	28.2	51.18	-1.798
01/24/05	14:35:33	29.8	51.16	-1.806
01/24/05	14:35:35	31.5	51.18	-1.811
01/24/05	14:35:37	33.3	51.18	-1.819
01/24/05	14:35:39	35.2	51.18	-1.828
01/24/05	14:35:41	37.3	51.18	-1.835
01/24/05	14:35:43	39.5	51.18	-1.843
01/24/05	14:35:45	41.8	51.18	-1.852
01/24/05	14:35:48	44.3	51.18	-1.861
01/24/05	14:35:50	46.9	51.18	-1.871
01/24/05	14:35:53	49.7	51.18	-1.880
01/24/05	14:35:56	52.6	51.18	-1.893
01/24/05	14:35:59	55.7	51.18	-1.902
01/24/05	14:36:02	59.0	51.18	-1.911
01/24/05	14:36:06	62.5	51.18	-1.924
01/24/05	14:36:10	66.2	51.18	-1.937
01/24/05	14:36:14	70.1	51.20	-1.950
01/24/05	14:36:18	74.3	51.20	-1.963
01/24/05	14:36:22	78.7	51.20	-1.976
01/24/05	14:36:27	83.4	51.20	-1.991
01/24/05	14:36:32	88.4	51.20	-2.006
01/24/05	14:36:37	93.7	51.22	-2.023
01/24/05	14:36:43	99.3	51.22	-2.038
01/24/05	14:36:49	105.2	51.22	-2.054
01/24/05	14:36:55	111.5	51.25	-2.073
01/24/05	14:37:02	118.1	51.25	-2.089
01/24/05	14:37:09	125.1	51.27	-2.106
01/24/05	14:37:16	132.6	51.27	-2.125
01/24/05	14:37:24	140.5	51.29	-2.143
01/24/05	14:37:32	148.9	51.29	-2.164
01/24/05	14:37:41	157.8	51.29	-2.186
01/24/05	14:37:51	167.2	51.31	-2.204
01/24/05	14:38:01	177.2	51.34	-2.226
01/24/05	14:38:11	187.8	51.34	-2.249
01/24/05	14:38:22	199.0	51.34	-2.271
01/24/05	14:38:34	210.9	51.36	-2.291

NTAmw-118-out.txt

01/24/05	14:38:47	223.5	51.36	-2.314
01/24/05	14:39:00	236.8	51.36	-2.334
01/24/05	14:39:14	250.9	51.38	-2.356
01/24/05	14:39:29	265.8	51.38	-2.380
01/24/05	14:39:45	281.6	51.40	-2.403
01/24/05	14:40:02	298.4	51.40	-2.423
01/24/05	14:40:20	316.2	51.40	-2.445
01/24/05	14:40:38	335.0	51.40	-2.468
01/24/05	14:40:58	354.9	51.43	-2.488
01/24/05	14:41:19	376.0	51.43	-2.508
01/24/05	14:41:42	398.4	51.43	-2.527
01/24/05	14:42:06	422.1	51.43	-2.547
01/24/05	14:42:31	447.2	51.45	-2.566
01/24/05	14:42:57	473.8	51.45	-2.582
01/24/05	14:43:25	502.0	51.45	-2.597
01/24/05	14:43:55	531.9	51.45	-2.610
01/24/05	14:44:27	563.5	51.45	-2.625
01/24/05	14:45:00	597.0	51.47	-2.636
01/24/05	14:45:36	632.5	51.47	-2.647
01/24/05	14:46:14	670.1	51.47	-2.657
01/24/05	14:46:53	709.9	51.47	-2.664
01/24/05	14:47:36	752.1	51.47	-2.672
01/24/05	14:48:20	796.8	51.49	-2.679
01/24/05	14:49:08	844.2	51.49	-2.684
01/24/05	14:49:58	894.4	51.49	-2.688
01/24/05	14:50:51	947.5	51.49	-2.692
01/24/05	14:51:47	1003.8	51.49	-2.696
01/24/05	14:52:47	1063.4	51.49	-2.697
01/24/05	14:53:50	1126.6	51.49	-2.699
01/24/05	14:54:57	1193.5	51.49	-2.703
01/24/05	14:56:08	1264.4	51.49	-2.710

# Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: LL5mw - 001      Date Started: 01/20/05      Date Completed: 01/20/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	A926	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1127.92</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>27.00</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>16.25</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>10.75</u>	SCREEN LENGTH
	FEET	METERS
		<u>11' BGS</u>
		<u>14' BGS</u>
		10 ft

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		<u>~17'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>LL5mw-001-IN</u>	<u>01/20/05</u>	<u>01/20/05</u>	<u>1055</u>	<u>1124</u>	<u>~26'</u>				
2	<u>LL5mw-001-OUT</u>	<u>01/20/05</u>	<u>01/20/05</u>	<u>1125</u>	<u>1142</u>	<u>~26'</u>				

STORAGE LOCATION OF DATA: 1) I:\Projects-Contracts\RVAAP\RI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

### REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



**MKM Engineers, Inc.**

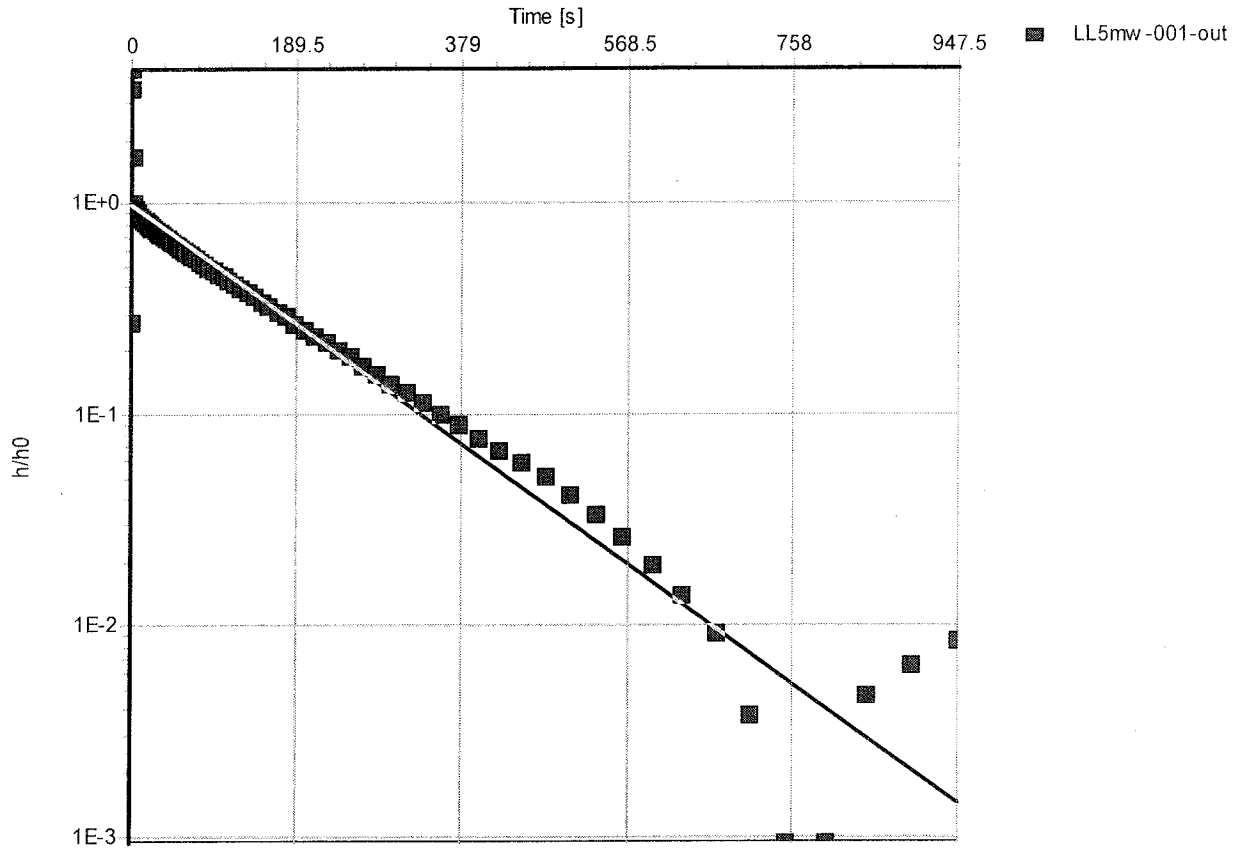
8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

LL5mw -001 (Bouwer-Rice)



Test name: LL5mw-001

Analysis Method: Bouwer & Rice

Analysis results:

Conductivity: 1.91E-4 [cm/s]

Test parameters:

Test Well:	LL5mw-001-out	Aquifer thickness:	10.75 [ft]
Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
Screen length:	10 [ft]		
Casing radius:	0.08333 [ft]		
r(eff):	0.186 [ft]		

Comments:

Evaluated by:

Date: 2/24/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/20/05 16:21:50  
 Report from file: ...\\SN04926 2005-01-20 112527 LL5mw-001-Out.bin  
 Win-Situ Version 4.50

Serial number: 00004926  
 Firmware Version 3.09  
 Unit name: miniTROLL

Test name: LL5mw-001-Out

Test defined on: 01/19/05 10:34:29  
 Test started on: 01/20/05 11:25:27  
 Test stopped on: 01/20/05 11:42:01  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 109

TOTAL DATA SAMPLES 109

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 8.508 Feet H2O

Date	Time	ET (sec)	Chan[1] Temperature Fahrenheit	Chan[2] Pressure Feet H2O
01/20/05		11:25:27	0.0	53.14
01/20/05		11:25:27	0.3	53.17
01/20/05		11:25:28	0.6	53.19
01/20/05		11:25:28	0.9	53.19
01/20/05		11:25:28	1.2	53.21
01/20/05		11:25:29	1.5	53.21
01/20/05		11:25:29	1.8	53.21
01/20/05		11:25:29	2.1	53.21
01/20/05		11:25:30	2.4	53.21
01/20/05		11:25:30	2.7	53.21
01/20/05		11:25:30	3.0	53.23
01/20/05		11:25:30	3.3	53.23
01/20/05		11:25:31	3.6	53.23
01/20/05		11:25:31	3.9	53.23
01/20/05		11:25:31	4.2	53.23
01/20/05		11:25:32	4.5	53.23
01/20/05		11:25:32	4.8	53.23
01/20/05		11:25:32	5.1	53.23
01/20/05		11:25:33	5.4	53.23
01/20/05		11:25:33	5.7	53.23



LL5mw-001-out.txt

01/20/05	11:25:33	6.0	53.23	0.960
01/20/05	11:25:33	6.4	53.23	0.957
01/20/05	11:25:34	6.7	53.23	0.953
01/20/05	11:25:34	7.1	53.26	0.948
01/20/05	11:25:35	7.5	53.26	0.944
01/20/05	11:25:35	8.0	53.26	0.938
01/20/05	11:25:36	8.4	53.26	0.935
01/20/05	11:25:36	8.9	53.26	0.929
01/20/05	11:25:37	9.5	53.26	0.924
01/20/05	11:25:37	10.0	53.23	0.920
01/20/05	11:25:38	10.6	53.23	0.914
01/20/05	11:25:38	11.3	53.23	0.909
01/20/05	11:25:39	11.9	53.23	0.903
01/20/05	11:25:40	12.6	53.23	0.898
01/20/05	11:25:40	13.4	53.23	0.892
01/20/05	11:25:41	14.2	53.23	0.887
01/20/05	11:25:42	15.0	53.21	0.881
01/20/05	11:25:43	15.9	53.21	0.874
01/20/05	11:25:44	16.8	53.23	0.868
01/20/05	11:25:45	17.8	53.21	0.861
01/20/05	11:25:46	18.9	53.21	0.854
01/20/05	11:25:47	20.0	53.21	0.846
01/20/05	11:25:48	21.2	53.21	0.839
01/20/05	11:25:50	22.4	53.21	0.831
01/20/05	11:25:51	23.8	53.21	0.822
01/20/05	11:25:52	25.2	53.21	0.813
01/20/05	11:25:54	26.7	53.21	0.804
01/20/05	11:25:55	28.2	53.21	0.795
01/20/05	11:25:57	29.8	53.21	0.787
01/20/05	11:25:59	31.5	53.21	0.778
01/20/05	11:26:00	33.3	53.21	0.769
01/20/05	11:26:02	35.2	53.21	0.758
01/20/05	11:26:04	37.3	53.21	0.749
01/20/05	11:26:07	39.5	53.21	0.736
01/20/05	11:26:09	41.8	53.21	0.727
01/20/05	11:26:11	44.3	53.21	0.712
01/20/05	11:26:14	46.9	53.21	0.701
01/20/05	11:26:17	49.7	53.21	0.686
01/20/05	11:26:20	52.6	53.21	0.673
01/20/05	11:26:23	55.7	53.21	0.659
01/20/05	11:26:26	59.0	53.21	0.644
01/20/05	11:26:30	62.5	53.21	0.627
01/20/05	11:26:33	66.2	53.21	0.613
01/20/05	11:26:37	70.1	53.21	0.598
01/20/05	11:26:41	74.3	53.21	0.581
01/20/05	11:26:46	78.7	53.21	0.565
01/20/05	11:26:50	83.4	53.21	0.548
01/20/05	11:26:55	88.4	53.21	0.530
01/20/05	11:27:01	93.7	53.21	0.512
01/20/05	11:27:06	99.3	53.21	0.495
01/20/05	11:27:12	105.2	53.21	0.477
01/20/05	11:27:19	111.5	53.21	0.458
01/20/05	11:27:25	118.1	53.21	0.440
01/20/05	11:27:32	125.1	53.21	0.421
01/20/05	11:27:40	132.6	53.21	0.403
01/20/05	11:27:48	140.5	53.21	0.383
01/20/05	11:27:56	148.9	53.21	0.364
01/20/05	11:28:05	157.8	53.21	0.344
01/20/05	11:28:14	167.2	53.21	0.326
01/20/05	11:28:24	177.2	53.21	0.308
01/20/05	11:28:35	187.8	53.21	0.287
01/20/05	11:28:46	199.0	53.21	0.269
01/20/05	11:28:58	210.9	53.21	0.251

LL5mw-001-out.txt

01/20/05	11:29:11	223.5	53.21	0.232
01/20/05	11:29:24	236.8	53.21	0.216
01/20/05	11:29:38	250.9	53.23	0.199
01/20/05	11:29:53	265.8	53.21	0.181
01/20/05	11:30:09	281.6	53.23	0.166
01/20/05	11:30:25	298.4	53.21	0.149
01/20/05	11:30:43	316.2	53.23	0.135
01/20/05	11:31:02	335.0	53.23	0.122
01/20/05	11:31:22	354.9	53.23	0.107
01/20/05	11:31:43	376.0	53.21	0.096
01/20/05	11:32:05	398.4	53.21	0.083
01/20/05	11:32:29	422.1	53.23	0.072
01/20/05	11:32:54	447.2	53.23	0.063
01/20/05	11:33:21	473.8	53.23	0.054
01/20/05	11:33:49	502.0	53.23	0.045
01/20/05	11:34:19	531.9	53.23	0.036
01/20/05	11:34:51	563.5	53.23	0.028
01/20/05	11:35:24	597.0	53.23	0.021
01/20/05	11:36:00	632.5	53.23	0.015
01/20/05	11:36:37	670.1	53.23	0.010
01/20/05	11:37:17	709.9	53.23	0.004
01/20/05	11:37:59	752.1	53.21	0.001
01/20/05	11:38:44	796.8	53.21	-0.001
01/20/05	11:39:31	844.2	53.21	-0.005
01/20/05	11:40:21	894.4	53.21	-0.007
01/20/05	11:41:15	947.5	53.21	-0.009

## Slug Test Record



Project Name: RVAAP-RI 14

Ravenna Army Ammunition Plant  
Ravenna, Ohio

Well No.: LL5mw-002      Date Started: 01/20/05      Date Completed: 01/20/05

### EQUIPMENT INFORMATION SUMMARY

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NO.	RANGE (PSI)	LAST CALIBRATION
DATA LOGGER	In-Situ	Mini-Troll	4886	30 psi	N/A
TRANSDUCER					
WATER LEVEL IND.					

### PRETEST DATA

REFERENCE POINT: TIC	REFERENCE POINT ELEVATION: <u>1128.68</u>	RISER CASING I.D. (in.): 2 in
SCREEN OR OPEN HOLE I.D. (in): 2 in	DIAMETER OF BOREHOLE (IF SCREENED): <u>8.25"</u>	
	FEET	METERS
TOTAL WELL DEPTH	<u>27.47</u>	TOP OF FILTER PACK
DEPTH TO WATER	<u>16.96</u>	TOP OF SCREEN
HEIGHT OF WATER COLUMN	<u>10.51</u>	SCREEN LENGTH
	FEET	METERS
	<u>12' BGS</u>	
	<u>15' BGS</u>	
	10 ft	

### TEST METHODS SUMMARY

TEST METHOD	SLUG IN: Test #1	SLUG OUT: Test #2
SLUG DIMENSIONS:	<u>24 x 1.6" OD</u>	SLUG VOL (GAL)
		SLUG DEPTH (FT) <u>~17'</u>

### DATA LOGGER RECORDS

DATA LOGGER TEST NO.	FILE NAME	DATE (MM/DD/YY)		TIME (HH:MM:SS)		DEPTH TO TRANSDUCER	DEPTH TO WATER (FT)		HEIGHT OF WATER COLUMN (FT)	
		BEGIN	END	BEGIN	END		BEGIN	END	BEGIN	END
1	<u>LL5mw-002-IN</u>	<u>01/20/05</u>	<u>01/20/05</u>	<u>1104</u>	<u>1130</u>	<u>~26'</u>				
2	<u>LL5mw-002-OUT</u>	<u>01/20/05</u>	<u>01/20/05</u>	<u>1131</u>	<u>1147</u>	<u>~26'</u>				

STORAGE LOCATION OF DATA:      1) I:\Projects-Contracts\RVAAPRI 14 Characterization\Slug Test data\Mini Troll Data      2)

FILE STRUCTURES	DATA TYPE	FORMAT (I)	UNITS	TEST TIME INTERVAL		COMMENTS
				LOG SCALE	ARITH. SCALE	
COLUMN A	Date	bin	--	√		
COLUMN B	Time	bin	sec	√		
COLUMN C	Ft H <sub>2</sub> O	bin	Ft	√		

(I) CK - 24 HR CLOCK TIME    H - HEIGHT OF WATER ABOVE TRANSDUCER    E - WATER LEVEL ELVATION    O - OTHER  
ET - ELAPSED TIME    FT BRP - DEPTH TO WATER    P - PRESSURE    (EXPLAIN IN REMARKS)

DATA CHECK RESULTS: DATA ✓ OK

REMARKS:

Logged by: David K. Earnest (Please Print)      Reviewed by: [Signature]  
Signature: [Signature]      Date: 5/6/05



**MKM Engineers, Inc.**

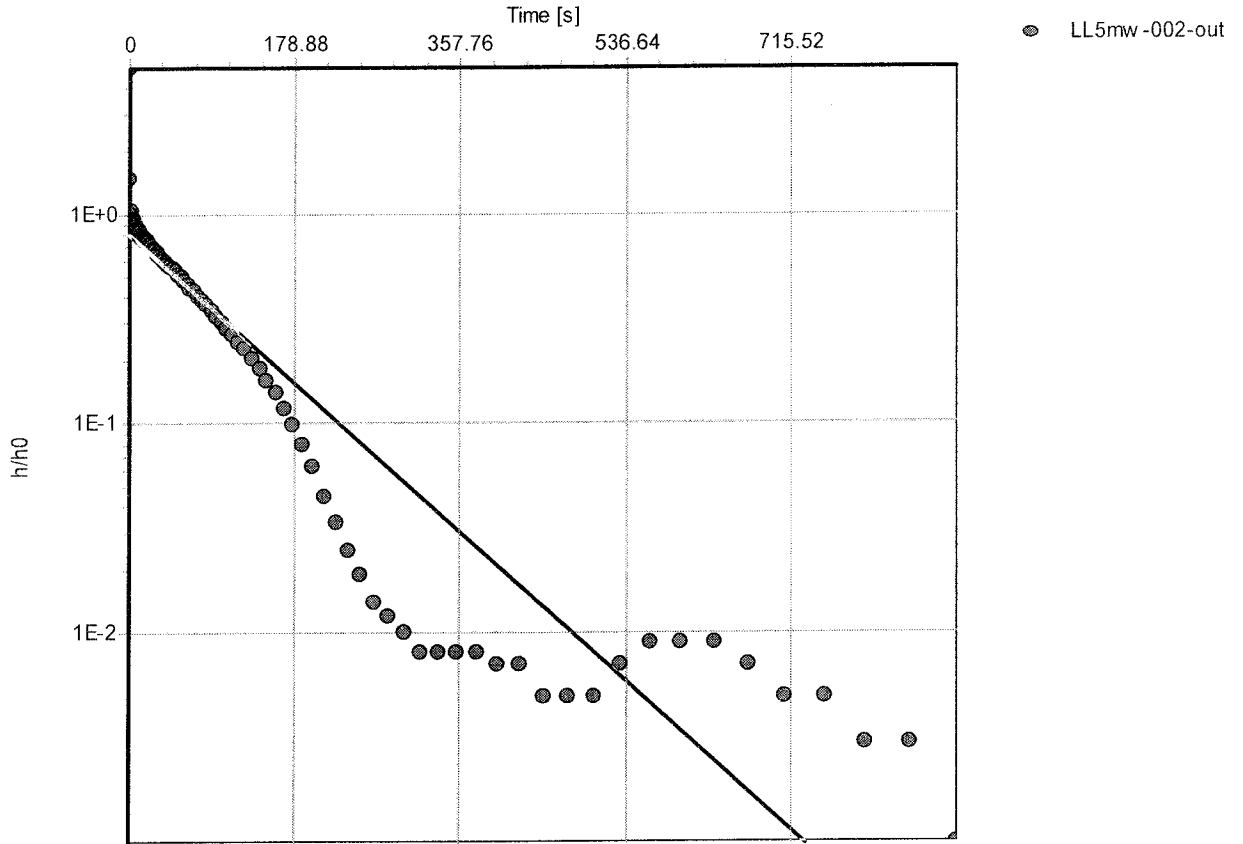
8451 St Rt 5, Bldg 1038  
Ravenna, Ohio 44266  
(330) 358-2920

**SlugTest Analysis Report**

Project: RVAAP-14 CHARACTERIZATION

Client: USACE

LL5mw-002 (Bouwer-Rice)



Test name: **LL5mw-002**

Analysis Method: **Bouwer & Rice**

Analysis results: Conductivity: 2.52E-4 [cm/s]

<u>Test parameters:</u>	Test Well:	LL5mw-002-out	Aquifer thickness:	10.51 [ft]
	Screen radius:	0.34375 [ft]	Gravel Pack Porosity (%):	25
	Screen length:	10 [ft]		
	Casing radius:	0.08333 [ft]		
	r(eff):	0.186 [ft]		

Comments:

Evaluated by:  
Date: 2/24/2005

In-Situ Inc. MiniTroll Pro

Report generated: 01/20/05 16:07:06  
 Report from file: ...\\SN04886 2005-01-20 113108 LL5mw-002-Out.bin  
 Win-Situ Version 4.50

Serial number: 00004886  
 Firmware Version 3.09  
 Unit name: MKM 55

Test name: LL5mw-002-Out

Test defined on: 01/19/05 10:37:45  
 Test started on: 01/20/05 11:31:08  
 Test stopped on: 01/20/05 11:47:41  
 Test extracted on: N/A N/A

Data gathered using Logarithmic testing  
 Maximum time between data points: 600.0 Seconds.  
 Number of data samples: 109

TOTAL DATA SAMPLES 109

Channel number [1]  
 Measurement type: Temperature  
 Channel name: OnBoard Temp

Channel number [2]  
 Measurement type: Pressure  
 Channel name: OnBoard Pressure  
 Sensor Range: 30 PSIG.  
 Specific gravity: 1.000  
 Mode: TOC  
 User-defined reference: 0.000 Feet H2O  
 Referenced on: test start  
 Pressure head at reference: 6.120 Feet H2O

Date	Time	ET (sec)	Chan[1]	Chan[2]	Feet H2O
			Temperature Fahrenheit	Pressure Feet H2O	
01/20/05		11:31:08	0.0	53.83	0.000
01/20/05		11:31:08	0.3	53.85	3.064
01/20/05		11:31:08	0.6	53.88	-2.808
01/20/05		11:31:09	0.9	53.88	-0.396
01/20/05		11:31:09	1.2	53.90	-0.881
01/20/05		11:31:09	1.5	53.90	-0.907
01/20/05		11:31:10	1.8	53.90	-0.833
01/20/05		11:31:10	2.1	53.90	-0.945
01/20/05		11:31:10	2.4	53.90	-0.877
01/20/05		11:31:11	2.7	53.90	-0.947
01/20/05		11:31:11	3.0	53.90	-0.920
01/20/05		11:31:11	3.3	53.92	-0.962
01/20/05		11:31:11	3.6	53.92	-0.932
01/20/05		11:31:12	3.9	53.92	-0.973
01/20/05		11:31:12	4.2	53.92	-0.945
01/20/05		11:31:12	4.5	53.92	-0.966
01/20/05		11:31:13	4.8	53.92	-0.964
01/20/05		11:31:13	5.1	53.92	-0.977
01/20/05		11:31:13	5.4	53.92	-0.977
01/20/05		11:31:14	5.7	53.92	-0.991

LL5mw-002-out.txt

01/20/05	11:31:14	6.0	53.92	-0.991
01/20/05	11:31:14	6.4	53.92	-1.002
01/20/05	11:31:15	6.7	53.92	-1.001
01/20/05	11:31:15	7.1	53.92	-1.010
01/20/05	11:31:15	7.5	53.92	-1.019
01/20/05	11:31:16	8.0	53.92	-1.025
01/20/05	11:31:16	8.4	53.92	-1.032
01/20/05	11:31:17	8.9	53.94	-1.037
01/20/05	11:31:17	9.5	53.94	-1.045
01/20/05	11:31:18	10.0	53.92	-1.050
01/20/05	11:31:18	10.6	53.92	-1.058
01/20/05	11:31:19	11.3	53.92	-1.065
01/20/05	11:31:20	11.9	53.92	-1.071
01/20/05	11:31:20	12.6	53.90	-1.082
01/20/05	11:31:21	13.4	53.90	-1.087
01/20/05	11:31:22	14.2	53.90	-1.093
01/20/05	11:31:23	15.0	53.90	-1.102
01/20/05	11:31:24	15.9	53.90	-1.111
01/20/05	11:31:25	16.8	53.90	-1.119
01/20/05	11:31:26	17.8	53.90	-1.130
01/20/05	11:31:27	18.9	53.90	-1.141
01/20/05	11:31:28	20.0	53.90	-1.148
01/20/05	11:31:29	21.2	53.90	-1.159
01/20/05	11:31:30	22.4	53.90	-1.170
01/20/05	11:31:32	23.8	53.90	-1.183
01/20/05	11:31:33	25.2	53.90	-1.191
01/20/05	11:31:34	26.7	53.90	-1.202
01/20/05	11:31:36	28.2	53.90	-1.213
01/20/05	11:31:38	29.8	53.90	-1.224
01/20/05	11:31:39	31.5	53.90	-1.237
01/20/05	11:31:41	33.3	53.90	-1.250
01/20/05	11:31:43	35.2	53.90	-1.263
01/20/05	11:31:45	37.3	53.90	-1.277
01/20/05	11:31:47	39.5	53.90	-1.290
01/20/05	11:31:50	41.8	53.90	-1.303
01/20/05	11:31:52	44.3	53.90	-1.320
01/20/05	11:31:55	46.9	53.90	-1.335
01/20/05	11:31:57	49.7	53.90	-1.349
01/20/05	11:32:00	52.6	53.90	-1.366
01/20/05	11:32:03	55.7	53.90	-1.383
01/20/05	11:32:07	59.0	53.90	-1.399
01/20/05	11:32:10	62.5	53.90	-1.416
01/20/05	11:32:14	66.2	53.90	-1.436
01/20/05	11:32:18	70.1	53.90	-1.454
01/20/05	11:32:22	74.3	53.90	-1.473
01/20/05	11:32:26	78.7	53.90	-1.493
01/20/05	11:32:31	83.4	53.92	-1.515
01/20/05	11:32:36	88.4	53.92	-1.535
01/20/05	11:32:41	93.7	53.92	-1.556
01/20/05	11:32:47	99.3	53.92	-1.576
01/20/05	11:32:53	105.2	53.92	-1.596
01/20/05	11:32:59	111.5	53.92	-1.617
01/20/05	11:33:06	118.1	53.92	-1.635
01/20/05	11:33:13	125.1	53.92	-1.655
01/20/05	11:33:20	132.6	53.92	-1.676
01/20/05	11:33:28	140.5	53.94	-1.697
01/20/05	11:33:37	148.9	53.92	-1.720
01/20/05	11:33:46	157.8	53.92	-1.740
01/20/05	11:33:55	167.2	53.92	-1.764
01/20/05	11:34:05	177.2	53.92	-1.782
01/20/05	11:34:16	187.8	53.92	-1.801
01/20/05	11:34:27	199.0	53.92	-1.819
01/20/05	11:34:39	210.9	53.94	-1.836