

**WATER WELL RECORD**

**Form WWC-5**

Division of Water Resources App. No.  

<b>1 LOCATION OF WATER WELL:</b> County: <u>Ottawa</u>	Fraction <u>1/4 1/4 SE 1/4 NE 1/4</u>	Section Number <u>16</u>	Township No. T <u>11</u> S	Range Number R <u>2</u> <input type="checkbox"/> E <input checked="" type="checkbox"/> W
Street/Rural Address of Well Location; if unknown, distance & direction from nearest town or intersection: If at owner's address, check here <input type="checkbox"/> . Former Atlas Missile site S-1 located at intersection of Justice Rd. and N. 210th Rd.		<b>Global Positioning System (GPS) information:</b> Latitude: <u>279210.9'</u> (Northing)..... (in decimal degrees) Longitude: <u>1442002.0'</u> (Easting)..... (in decimal degrees) Elevation: <u>1404.8'</u> Datum: <input type="checkbox"/> WGS 84, <input checked="" type="checkbox"/> NAD 83, <input type="checkbox"/> NAD 27 Collection Method: <input type="checkbox"/> GPS unit (Make/Model: .....) <input type="checkbox"/> Digital Map/Photo, <input type="checkbox"/> Topographic Map, <input checked="" type="checkbox"/> Land Survey Est. Accuracy: <input checked="" type="checkbox"/> <3 m, <input type="checkbox"/> 3-5 m, <input type="checkbox"/> 5-15 m, <input type="checkbox"/> >15 m		
<b>2 WATER WELL OWNER:</b> RR#, Street Address, Box #: <u>Army Corps of Engineers 601 E. 12th St.</u> City, State, ZIP Code : <u>Kansas City, MO 64106</u>				

<p><b>3 LOCATE WELL WITH AN "X" IN SECTION BOX:</b> N</p> <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px;">NW</td> <td style="border: 1px solid black; padding: 5px;">NE</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">SW</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">X</td> </tr> </table> <p style="text-align: center;">S  -----1 mile----- </p>	NW	NE	SW	X	<p><b>4 DEPTH OF COMPLETED WELL</b> <u>101.8</u> ft.</p> <p>Depth(s) Groundwater Encountered (1)..... ft. (2)..... ft. (3)..... ft. WELL'S STATIC WATER LEVEL..... ft. below land surface measured on mo/day/yr. <u>9/19/2011</u> Pump test data: Well water was..... ft. after..... hours pumping..... gpm EST. YIELD..... gpm. Well water was..... ft. after..... hours pumping..... gpm Bore Hole Diameter <u>8</u> in. to <u>20.4</u> ft., and <u>8</u> in. to <u>101.8</u> ft. WELL WATER TO BE USED AS: <input type="checkbox"/> Public water supply <input type="checkbox"/> Geothermal <input type="checkbox"/> Injection well <input type="checkbox"/> Domestic <input type="checkbox"/> Feedlot <input type="checkbox"/> Oil field water supply <input type="checkbox"/> Dewatering <input type="checkbox"/> Other (Specify below) <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Domestic-lawn &amp; garden <input checked="" type="checkbox"/> Monitoring well <u>MW-06</u> Was a chemical/bacteriological sample submitted to Department? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, mo/day/yr sample was submitted..... Water well disinfected? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
NW	NE				
SW	X				

**5 TYPE OF CASING USED:**  Steel  PVC  Other .....

CASING JOINTS:  Glued  Clamped  Welded  Threaded  
Casing diameter 2 in. to 81.4 ft., Diameter ..... in. to ..... ft., Diameter ..... in. to ..... ft.  
Casing height above land surface 3 in., Weight ..... lbs./ft., Wall thickness or gauge No. ....

TYPE OF SCREEN OR PERFORATION MATERIAL:  
 Steel  Stainless Steel  PVC  Other (Specify) .....  
 Brass  Galvanized Steel  None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE:  
 Continuous slot  Mill slot  Gauze wrapped  Torch cut  Drilled holes  None (open hole)  
 Louvered shutter  Key punched  Wire wrapped  Saw cut  Other (specify) .....

SCREEN-PERFORATED INTERVALS: From 101.4 ft. to 81.4 ft., From ..... ft. to ..... ft.  
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

GRAVEL PACK INTERVALS: From 101.8 ft. to 76.3 ft., From ..... ft. to ..... ft.  
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

**6 GROUT MATERIAL:**  Neat cement  Cement grout  Bentonite  Other .....

Grout Intervals: From 70.3 ft. to 10 ft., From ..... ft. to ..... ft., From ..... ft. to ..... ft.

What is the nearest source of possible contamination:  
 Septic tank  Lateral lines  Pit privy  Livestock pens  Insecticide storage  Other (specify below)  
 Sewer lines  Cesspool  Sewage lagoon  Fuel storage  Abandoned water well  
 Watertight sewer lines  Seepage pit  Feedyard  Fertilizer storage  Oil well/gas well missile complex  
Direction from well ..... Distance from well .....

FROM	TO	LITHOLOGIC LOG	FROM	TO	LITHO. LOG (cont.) or PLUGGING INTERVALS
0	21	fill/clay/silt/sand overburden			
21	31.8	interbedded shale/sandstone			
31.8	101.8	sandstone w/ occasional claystone			

**7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION:** This water well was  constructed,  reconstructed, or  plugged under my jurisdiction and was completed on (mo/day/year) 08/02/2011 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. .... This Water Well Record was completed on (mo/day/year) 12/09/2011 under the business name of US Army COE by (signature) *[Signature]*

**INSTRUCTIONS:** Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks and check the correct answers. Send three copies (white, blue, pink) to Kansas Department of Health and Environment, Bureau of Water, Geology Section, 1000 SW Jackson St., Suite 420, Topeka, Kansas 66612-1367. Telephone 785-296-5524. Send one copy to WATER WELL OWNER and retain one for your records. Include fee of \$5.00 for each constructed well. Visit us at <http://www.kdheks.gov/waterwell/index.html>.

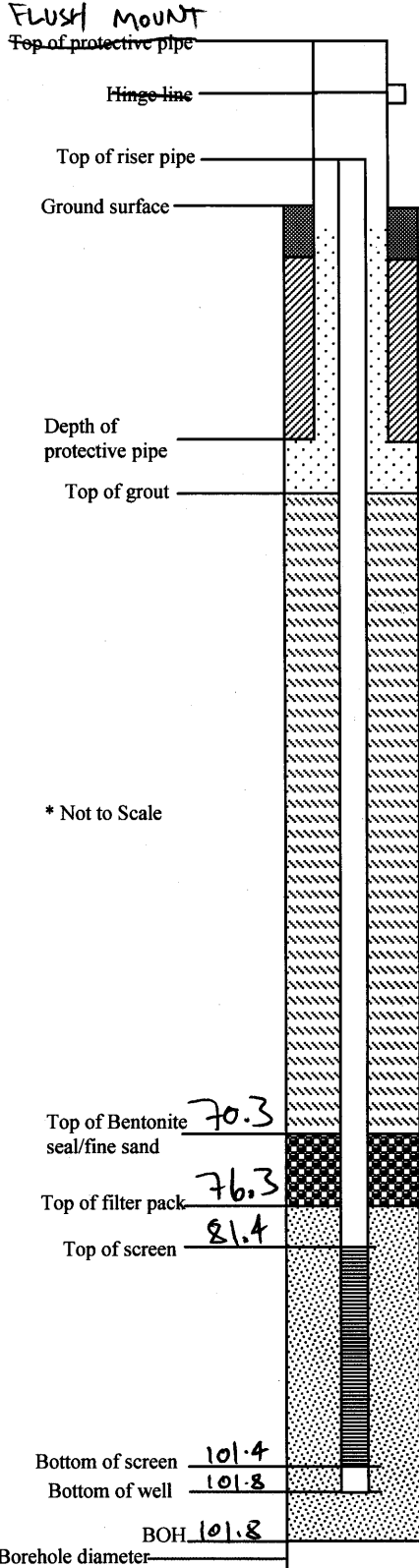
**MONITORING WELL INSTALLATION FORM**

Project Schilling S-1  
 Boring Number MW-06

Well Number MW-06  
 Date Installed 8/2/11

Type of riser pipe & diameter Sch 40 2" PVC

Type of screen & slot size PVC 20 slot



\* Not to Scale

**Measurements:**

Length of riser pipe 101.4

Length of screen 20.0

Length of end blank 0.4

Total length of well installation 101.8

Bottom depth of borehole 101.8

Length of riser pipe stickup above ground surface \_\_\_\_\_

**Centralizers:**

Total number of centralizers 2

Depth(s) of centralizer(s) BGS 21.0, 61.0

**Protective Pipe:**

Date set FLUSH MOUNT SURFACE COMPLETION

Size and type of protective pipe \_\_\_\_\_

Number of weep holes drilled in protective pipe \_\_\_\_\_

**Well Pad:**

Dimensions of well pad \_\_\_\_\_

Number and size of protective posts around well \_\_\_\_\_

**Filter Pack:**

Type and grain size of filter pack material 20/40 Silica Sand

**Grout Mix (es):**

Type of grout mix and locations used in the well installation

1:1 portland grout with 5% Bentonite

Amount and type of grout materials used for each mix

Other:

Portland:

Bentonite (specify type):

Water:

1. Material used to fill annular space between borehole and protective pipe Grout

2. Material used to fill void between protective pipe and well riser pipe \_\_\_\_\_

# HTW DRILLING LOG

HOLE NO.  
MW-06

1. COMPANY NAME  
USACE

2. DRILLING SUBCONTRACTOR

SHEET 1  
OF 13 SHEETS

3. PROJECT  
Schilling S-1

4. LOCATION  
Schilling S-1

5. NAME OF DRILLER  
D Morris

6. MANUFACTURER'S DESIGNATION OF DRILL  
Dietrich D90TM

7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT

3 3/4" ID USA  
3 1/4" ID IBS  
3 3/4" ID SS  
4" Core Barrel

8. HOLE LOCATION  
KS State Plane 1501 N F  
279211.044 N, 1442002.174 E NAD 83

9. SURFACE ELEVATION  
1405.053

10. DATE STARTED  
7/26/11

11. DATE COMPLETED  
8/2/11

12. OVERBURDEN THICKNESS  
22.2

15. DEPTH GROUNDWATER ENCOUNTERED

13. DEPTH DRILLED INTO ROCK  
79.6

16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED

14. TOTAL DEPTH OF HOLE  
101.8

17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY)

18. GEOTECHNICAL SAMPLES

DISTURBED NA  
UNDISTURBED NA

19. TOTAL NUMBER OF CORE BOXES  
9

20. SAMPLES FOR CHEMICAL ANALYSIS

VOC METALS OTHER (SPECIFY) OTHER (SPECIFY) OTHER (SPECIFY)

✓ NA NA NA NA

21. TOTAL CORE RECOVERY  
77%

22. DISPOSITION OF HOLE

BACKFILLED MONITORING WELL OTHER (SPECIFY)

NA ✓ NA

23. SIGNATURE OF INSPECTOR  
*Ernest J. Thomas*

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	0	TOPSOIL BROWN DRY STICKY Roots 0.3	Measured with PID 0.0ppm	NA	Sampled with Terracore NA	NA	3 3/4" Drive 1 Hollow Stem Auger (USA) 3 3/4" ID Inner Barrel Section (IBS) 0.5 D-0.5 B-0.1
	1	GRAVEL FILL WITH SILT FINE TO MEDIUM GRAINED GREY DRY HARD 1.5	0.0ppm				SPT 1 3 3/4" ID SPT Spun (SS) with metal catcher (me) 0-1.5 R-1.0 2.0
	2	FILL - LEAN CLAY STIFF BROWN DRY Trace gravel	0.0ppm				SPT 2 3 3/4" ID SS 0.5
	3		0.0ppm		3.5		0-1.5 R-0.9 7.5
	4		0.0ppm		MW-06-SB-01 MW-06-SB-01MS MW-06-SB-01MSB		Drive 2 3 3/4" ID USA 3 3/4" ID IBS 0-1.5 R-1.5
	5				5.0		

# HTW DRILLING LOG

HOLE NO.  
MW-06

PROJECT Schilling S-1

INSPECTOR *[Signature]*

SHEET 5  
OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	5	Same As Above					Drive 3 3/4" ID HSA 3/4" ID FOS D-4.6 R-3.0
	6	FILL LEAN CLAY STIFF BROWN DRY Trace gravel	0.0ppm				
	7						
	8	R.1					
		SILT BROWN LOOSE moist	0.0ppm	NA	NA	NA	
		R.4					
	9	SAND TAN TO ORANGISH BROWN LOOSE moist	0.0ppm				
		9.5					9.6
		FINE TO MEDIUM GRAVEL					
	10	LEAN CLAY STIFF BROWN DRY	0.0ppm				Drive 4 3/4" ID HSA 3/4" ID FOS D-4.7 R-1.3
	11						
	12						
	13						
	14						

14.0

PROJECT Schilling S-1

HOLE NO. MW-06

# HTW DRILLING LOG

HOLE NO.  
MW-06

PROJECT Schilling S-1

INSPECTOR *[Signature]*

SHEET 3 OF 3 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	14	SANDY SILT LOOSE DARK BROWN MOIST Rained Cohesive	0.0ppm	NA	14.0 MW-06- SB-03	NA	Drive 4 14.3
	15						Drive 5 3 3/8" ID HSA 3 1/4" ID IBS
	15.3				15.3		
	16	LEAN CLAY GREY STIFF PRY	0.0ppm				Ø-2.5 R-2.5
	15.3						
	17	SANDY SILT MEDIUM DENSE MOIST BROWN TO DARK BROWN Cohesive	0.0ppm		NA		16.8
	17.0						Drive 6 3 3/8" ID HSA 3 1/4" ID IBS Ø-2.5 R-0.1 Shoe blocked off by 3" Ø gravel
	18	FAT CLAY STIFF MOIST GREYISH BROWN					
	19						17.3
	20	LIMESTONE COBBLE GREY FINE GRAINED MODERATELY HARD	0.0ppm				Drive 7 3 3/8" ID HSA 3 1/4" ID IBS Ø-0.7 R-0.2 20.0 End 7/26/14 clean out 5 1/2" Tri cone Basin Roller Bit 7/27/14 set 20.5' 6" casing 20.4'
	21						PULL 1 4" Core Barrel Start 20.4' stop 20.5' Run 4.9' Rec'd 2.5' RQD 30% CD 34.9' LOW 5.5ppm loss 2.2' UL: 1.8
	22	INTERBEDDED SANDSTONE + SHALE SS-FINE GRAINED ORANGISH BROWN SOFT THEN BEDDED Moderately cemented Iron stain paintings	0.0ppm	Box 1			
	23						

LOSS = 1.8'

PROJECT Schilling S-1

HOLE NO. MW-06

# HTW DRILLING LOG

HOLE NO.  
MW-06

PROJECT *Schillings S1*

INSPECTOR *[Signature]*

SHEET 4  
OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	25	Same as above INTERBEDDED SANDSTONE + SHALE		Box 1	NA	NA	PULL 1 Core'd
	24	SS - FINE GRAINED SOFT ORANGISH BROWN THIN BEDDED	0.0ppm				Start 0224 Stop 0228 Run 4.9 Core'd 2.7 RQD 30% CD 24.9 LOW < 55ppm loss 2.2 UL = 1.8
	23	SH - VERY FINE GRAINED SOFT GREY THIN BEDDED	0.0ppm		24.7 MW-06-SB-03 24.8		
	22		0.0ppm		NA		CD 25.3
	21						PULL 2 4" Core Box #1 Start 0904 Stop 0923 Run 6.5 Core'd 3.7 RQD 19% CD 31.2 LOW 0. loss 2.8 UL 2.7
	20						
	19						
	18						
	17						
	16						
	15						
	14						
	13						
	12						
	11						
	10						
	9						
	8						
	7						
	6						
	5						
	4						
	3						
	2						
	1						
	0						

PEN

LOSS = 2.7'

CD

21.8

PULL 3

# HTW DRILLING LOG

HOLE NO. MW-06

PROJECT Schilling S-1

INSPECTOR *[Signature]*

SHEET 5 OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	32	Same As Above	0.0ppm	Box 1 32.4	NA	NA	PULL 3 4" Core Barrel
	33	SANDSTONE ORANGISH BROWN SOFT THIN TO MEDIUM BEDDED FINE GRAINED Dyed to VEGY	0.0ppm	Box 2	32.8 MW-06-56-04 33-1		Start 0941 Stop 0954 Pen 2.2 Rec 2.2 CO 27.5 CD 29.5 Low Spm loss 0
	34				NA		
	35						
	36	veg	0.0ppm				
	37						
	38		0.0ppm				
	39						End 75411
	39.5			39.5			CO
	40	SANDSTONE SOFT ORANGISH BROWN THIN TO THICK BEDDED FINE GRAINED Moderately cemented	0.0ppm	Box 3			40.0 Beg. 1 21" PULL 4 4" ID Core Barrel Start 1330 Stop 1359 Pen 1.6 Rec 2.0 Gain 0.4 CO 49.5
	41						

# HTW DRILLING LOG

HOLE NO.  
MW-06

PROJECT Schilling S-1

INSPECTOR *[Signature]*

SHEET 6 OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	41	Same as above SANDSTONE SOFT. ORANGISH BROWN THIN TO THICK BEDDED FINE GRAINED moderately cemented	0.0 ppm	Box 3	NA	NA	PULL 4 Core 41.6
	42						PULL 5 4" Core Barrel Start 1253 SPM (32) Run 10.3 feet @ 1 DRO 27% @ 51.4 LOW GLOSS @ 1.2
	43						UL = 1.8
	44						
	45		0.0 ppm				
	46						
	46.3						
	46.4						
	46.5						
	46.8						
	47.9						
	48						
	48.9						
	49						
	50						

RW

LOSS-1.0

Fract'd

Ironstone Parting

Ironstone Parting  
SHALE BED

MW-06-32.8

46.3  
MW-06-FB-05  
46.4

NA

47.9  
Box 4



# HTW DRILLING LOG

HOLE NO.  
MW-06

PROJECT  
Schilling S-1

INSPECTOR  
*[Signature]*

SHEET 7  
OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	S0	Same As Above SANDSTONE SOFT	0.0ppm	Box 4	NA	NA	PULL 5 Cont'd
LOSS = 0.8	S1	ORANGISH BROWN THIN TO THICK BEDDED FINE GRAINED Moderately cemented Occ Shale Bed					Start 1253 Stop 1321 Run 10.3 Rev'd 2.1 RQD 89% CD 5.4 LOW 6.5 gm loss 2.2 UL = 1.8 S1.9
MB BS	S2	SHALE BED capped by IRONSTONE	0.0ppm				PULL 6 4' Core Barrel Start 1371 Stop 140 Run 9.9 Rev'd 5.3 RQD 64% CD 60.0 LOW 6.5 gm loss 4.6 UL = 3.3
	S3						
	S4						
	S5	SHALE BED	0.0ppm		SA.7 MW-06- SB-06		
	S6		0.0ppm	S6.3	SA.9		
	S7			Box 5	NA		
LOSS = 3.3	S8						
	S9						

PROJECT Schilling S-1

HOLE NO. MW-06

# HTW DRILLING LOG

HOLE NO. MW-06

PROJECT Schilling S1

INSPECTOR *[Signature]*

SHEET 8 OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
Loss	59	Same As Above SANDSTONE ORANGY BROWN SOFT FINE GRAINED THEN TO MEDIUM BEDDED Moderately Cemented		Box 5	NA	NA	Pull 6 Cont'd Run 9.9 Rec'd 3 RQD 64% CD 60.0 Low bpm loss 4.6
	60						
	61		0.0ppm				
	62						61.8 Pull 7 4" Core Barrel Start 15.04 Stop 15.14 Run 10.0 Rec'd 8.2 RQD 28% CD 71.0 Low bpm loss 1.3 UL = 2.3
	63	SANDSTONE TAN SOFT FINE GRAINED THEN TO MEDIUM BEDDED Pitted Weakly Cemented	0.0ppm				
	64						
	65						
	66						
	67		0.0ppm	Box 6	67.0 NA	67.0 MW-06- SB-07	
	68						

PROJECT Schilling S1

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# HTW DRILLING LOG

HOLE NO.  
MW-06

PROJECT *Schillings S-1*

INSPECTOR *[Signature]*

SHEET 10  
OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	79	Same as above SANDSTONE SOFT TAN FINE GRAINED THIN TO MEDIUM BEDDED Weakly cemented	0.0ppm	Box 6	NA	NA	Pull 8 cored Run 9.7 Rec'd 8.2 LPW 8 gpm CD 21 UL=0.4 loss 1.1 RQD 65%
	78			78.4			
	77		0.0ppm	Box 7			
	80						End 8 1/4"
	81						CD
	82						81.5
	83						PULL 9 4' Core Barrel Start 8 1/2' Stop 0 7/8' Run 10.0 Rec'd 9.1 LPW 8 1/2 gpm CD 11.0 UL=0.9 loss 0.9 UL=0.9
	84						Segs 8 1/4"
	85		0.0ppm	85.7			
	86			Box 8			

# HTW DRILLING LOG

HOLE NO.  
MW-06

PROJECT  
Schilling S-1

INSPECTOR  
*[Signature]*

SHEET 4  
OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	86	Same As Above SANDSTONE SOFT TAN  FINE GRAINED THEN TO MEDIUM BEDDED  Weakly Cemented	0.0 ppm	Box 8	NA	NA	PULL 9 cont'd  Run 10.0 Dec'd 7.1 LDW 10 spm CD 91.0 Loss 0.9 U2=0.9 R00 87%
	88						
	89		0.0 ppm				
	90						
	91						
	92						91.5  PULL 10 4" Core Barrel Start core step 285 Run 9.5 Dec'd 7.5 R00 89% CD 100 LDW 10 spm loss 2.0 U2=1.5
	93			93.5			
	94			Box 9			
	95						

# HTW DRILLING LOG

HOLE NO. MW-06

PROJECT Schilling S-1

INSPECTOR [Signature]

SHEET 13 OF 12 SHEETS

ELEV. a	DEPTH b	DESCRIPTION OF MATERIALS c	FIELD SCREENING RESULTS d	GEOTECH SAMPLE OR CORE BOX NO. e	ANALYTICAL SAMPLE NO. f	BLOW COUNTS g	REMARKS h
	95	Same As Above SANDSTONE SOFT TAN FINE GRAINED THIN TO MEDIUM BEDDED Weakly cemented	0.0 ppm	Box 9	NA	NA	PULL 10 Cott'd Run 9.5 Rec'd 7.5 RQD 27% CD 100 LOW logpn loss UL = 1.5
	96						
	97						
	98						
	99		6.0 ppm				
	100						CD
	101	101.8 BOM	101.8	101.2	101.2	101.2	101.8 PULL 11 4" Core Barrel Start 29.4 Stop 29.34 Run 2.4 Rec'd 0.0 RQD 0 CD 101.8 LOW logpn loss 2.4 UL = 1.8
	102	Installed MW-06					
	103						103.4
	104						

Loss = 1.8'

PROJECT Schilling S-1

HOLE NO. MW-06

## Well Development Form

<b>Project Name:</b> <i>Schelling S-1</i>		<b>Project Number:</b>		<b>Well Number:</b> <i>MW-6</i>	
<b>Project Information</b>			<b>Elevation of Well</b>		
Facility Name: <i>Schelling S-1</i>			Ground Surface Elevation: <i>1405.053</i>		
Location: <i>N 279210.863 E 1442001.957</i>			Top of Casing Elevation (TOC): <i>1404.764</i>		
<b>Well Information</b>			<b>Borehole Volume Calculation:</b>		
Date and Time Well Seal Installed: <i>8/02/11</i>			$(101.59 - 84.50) \times 0.0408 \times 2^2$ $17.09 \times 0.1632 = 2.89 \text{ Gallons}$ <p style="font-size: small;">1 borehole volume (gallons) = initial height of water column (ft) x 0.0408 x (borehole diameter (in))<sup>2</sup>                      initial height of water column = total depth (ft) - initial depth to water (ft)</p>		
Total Depth of Well: <i>101.8</i> feet from <i>BGS</i>					
Depth to Top of Screen: <i>81.4</i> feet from <i>BGS</i>					
Length of Casing Screened: <i>20</i> feet					
Type of Formation Screened: <i>Sandstone</i>			<b>Volume of Water Lost During Drilling and Well Installation:</b>		
<b>Well development Method description</b>			<b>Development Completion Criteria</b>		
Surge: <input checked="" type="checkbox"/>			Field parameter stabilized? <input checked="" type="checkbox"/> <b>N</b>		
Bail: <input type="checkbox"/>			Turbidity < 50 NTU? <input checked="" type="checkbox"/> <b>N</b>		
Pump: <input checked="" type="checkbox"/>			Volume of water removed during development: <i>400</i> gallons		
Other: <input type="checkbox"/>			Other:		

Observations During Well Development											
Date	Start time	End time	Depth to water	Total depth	Water removed		Temp (degrees F)	pH (units)	S.C. (µS/cm)	Turbidity (NTU)	Remarks (color, odor, particulates)
					Gallons	Total					
<i>9/18/2011</i>	<i>07:25</i>		<i>84.50</i>	<i>101.59</i>							<i>Water level = TD</i>
	<i>07:50</i>	<i>08:10</i>									<i>Start Surging</i>
	<i>08:17</i>	<i>08:22</i>			<i>25</i>	<i>25</i>	<i>58.2</i>	<i>7.75</i>	<i>532</i>	<i>Over Range</i>	<i>Start Pump Rate = 5 gpm DO = 6.79 mg/L ORP = 170 ORP mV, Dark Brown in color</i>
	<i>08:22</i>	<i>08:27</i>			<i>25</i>	<i>50</i>	<i>58.3</i>	<i>7.68</i>	<i>477</i>	<i>Over Range</i>	<i>DO = 7.46 mg/L ORP = 194 ORP mV Light Brown in color</i>
	<i>08:27</i>	<i>08:32</i>			<i>25</i>	<i>75</i>	<i>58.4</i>	<i>7.50</i>	<i>455</i>	<i>Over Range</i>	<i>DO = 7.22 mg/L, ORP = 193 ORP mV Light Brown</i>
	<i>08:32</i>	<i>08:37</i>			<i>25</i>	<i>100</i>	<i>58.2</i>	<i>7.40</i>	<i>446</i>	<i>Over Range</i>	<i>Light Brown DO = 6.56 mg/L ORP = 189 ORP mV</i>
	<i>08:37</i>	<i>08:42</i>			<i>20</i>	<i>120</i>	<i>58.2</i>	<i>7.36</i>	<i>438</i>	<i>Over Range</i>	<i>Reduce Rate to 4 GPM, very light brown, DO = 6.10 mg/L ORP = 192 ORP mV</i>
	<i>08:42</i>	<i>08:47</i>			<i>20</i>	<i>140</i>	<i>58.3</i>	<i>7.32</i>	<i>429</i>	<i>315</i>	<i>Cloudy DO = 5.99 mg/L ORP = 189 ORP mV</i>
	<i>08:47</i>	<i>08:52</i>			<i>20</i>	<i>160</i>	<i>58.7</i>	<i>7.27</i>	<i>426</i>	<i>207</i>	<i>Cloudy DO = 6.49 mg/L ORP = 187 ORP mV</i>

Measurements from TOC unless otherwise noted.





TABLE 1  
Monitoring Well Network Construction Information

Schilling Air Force Base Atlas S-01, Project No. B07KS025902 - Correct locations provided by Samantha See, E.I.T. (USACE-KCD)

Well ID	Northing	Easting	Latitude	Longitude	Top of Casing (ft amsl)	Well Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Well Diameter (inches)	Sampling Frequency
<b>Shallow Monitoring Wells</b>										
MW-02	279032.169	1441867.496	39.0985705727	-97.5435716983	1397.54	90.1	70.1	90.1	2	Annually
MW-03	278937.277	1441577.013	39.0983140530	-97.5445969123	1384.71	78.60	58.60	78.60	2	Annually
MW-04	279109.941	1441576.113	39.0987881310	-97.5445970239	1389.17	86.00	66.00	86.00	2	Annually
MW-05	279344.840	1441570.378	39.0994331480	-97.5446130692	1383.92	79.65	59.65	79.65	2	Annually
MW-06	279210.863	1442001.957	39.0990593324	-97.5430947409	1404.76	101.40	81.40	101.40	2	Annually
MW-07	279310.810	1442343.890	39.0993290033	-97.5418881317	1384.41	79.70	59.70	79.70	2	Annually
MW-09	278756.990	1441794.260	39.0978160555	-97.5438346336	1391.50	85.90	65.90	85.90	2	Annually
MW-10S	279105.200	1441252.830	39.0987795724	-97.5457362163	1388.86	81.20	61.20	81.20	2	Annually
MW-14S	279330.968	1440981.456	39.0994031739	-97.5466884379	1368.40	71.25	47.70	67.70	2	Annually
<b>Deep Monitoring Wells</b>										
MW-08	279035.52	1441848.21	39.0985800401	-97.5436395941	1396.88	126.90	106.90	126.90	2	Annually
MW-10D	279086.68	1441253.16	39.0987287194	-97.5457353809	1390.13	124.70	104.70	124.70	2	Annually
MW-11	279409.82	1441246.39	39.0996160246	-97.5457535239	1375.15	114.00	94.00	114.00	2	Annually
MW-12	278823.90	1441248.66	39.0980072936	-97.5457558816	1391.58	127.10	107.10	127.10	2	Annually
MW-13	279215.44	1440657.48	39.0990904279	-97.5478320311	1362.53	93.90	73.90	93.90	2	Annually
MW-14D	279337.39	1440978.52	39.0994208465	-97.5466986699	1368.10	106.93	83.00	103.00	2	Annually
<b>Other Wells</b>										
MW-01	278836.203	1441792.168	39.0980335714	-97.5438405989	1391.64	91.15	65.73	91.15	4	Annually
TH 06-10	278851.15	1442371.89	39.0980665739	-97.5417976666	1390.63	115.00	95.00	115.00	2	Annually
TH 09-10	279590.79	1440702.39	39.1001203716	-97.5476671807	1366.13	104.00	83.50	103.50	2	Annually

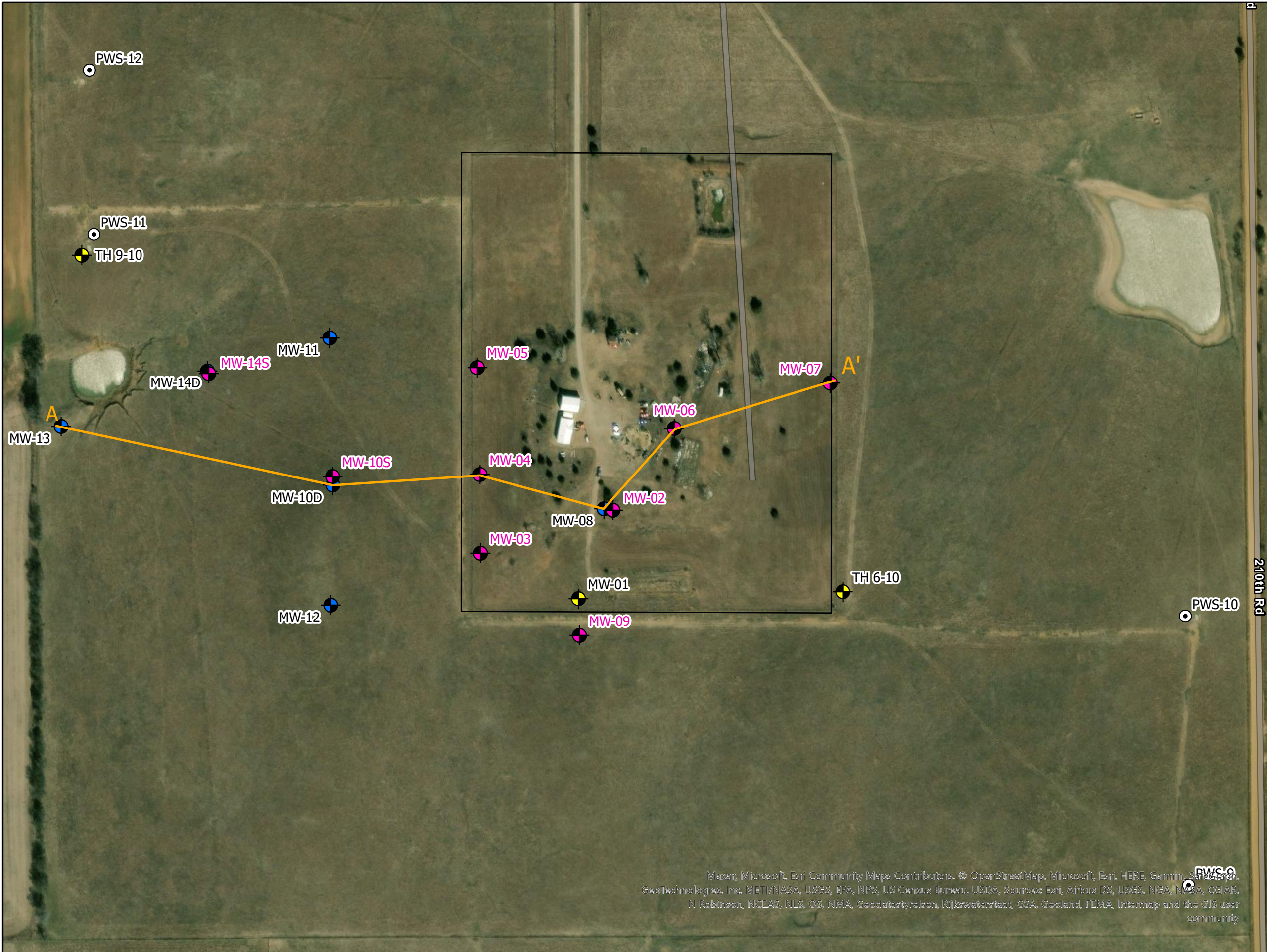
Notes:

- 1) Horizontal Coordinates are Kansas State Plane North, Zone 1501, NAD 1983 US Survey feet and Geographic NAD83
- 2) Elevations are NAVD 1988 US Survey feet
- 3) ft amsl = feet above mean sea level
- 4) ft bgs = feet below ground surface

*received KGS-DRL 1/4/2024 (dls)*

Table 1: MODFLOW Observation Data

Well	Northing	Easting	Ground Surface Elevation	TOC Corrected Elevation (USACE -0.49 ft)	Screen Mid Point Elevation	September 2011 Water Level Elevation
MW-02	279032.169	1441867.496	1397.73	1397.05	1316.95	1319.63
MW-03	278937.277	1441577.013	1385.01	1384.22	1315.62	1319.17
MW-04	279109.941	1441576.113	1389.43	1388.68	1312.68	1319.17
MW-05	279344.84	1441570.378	1384.18	1383.43	1313.78	1319.24
MW-06	279210.771	1442001.931	1405.08	1404.27	1312.87	1319.87
TH1-10	280513.40	1440693.08	1359.12	1361.58	1280.08	1315.79
TH2-10	278194.98	1440713.24	1355.61	1358.19	1278.19	1317.62
TH3-10	278198.09	1443127.10	1381.35	1383.58	1277.58	1321.05
TH4-10	280618.82	1443138.71	1377.74	1379.58	1276.58	1323.76
TH5-10	278778.84	1443158.88	1374.51	1377.21	1279.21	1321.72
TH6-10	278851.15	1442371.89	1388.27	1390.63	1285.63	1320.23
TH8-10	279917.13	1440699.72	1371.23	1373.77	1273.77	1316.68
TH9-10	279590.79	1440702.39	1363.79	1366.13	1275.13	1317.08
TH11-10	279108.87	1441553.16	1388.16	1390.93	1283.93	1319.36
TW10-10	279593.93	1440716.42	1364.36	1366.96	1275.96	1317.12
TW12-10	278201.09	1443112.03	1381.89	1384.31	1278.31	1321.07
TW13-10	279970.88	1440696.52	1371.57	1373.99	1277.99	1316.64
TW7-10	278797.28	1443161.43	1375.78	1378.21	1282.21	1321.76



### Legend

- Missile Property Boundary
- Shallow Monitoring Well
- Deep Monitoring Well
- Other Monitoring Well
- PWS Well

LTM - Long Term Monitoring  
 Note: Cross-section A to A' shown on Figure 2-5

0 50 100 200 300 400 Feet



Figure 2-4  
 LTM Network and Existing Wells  
 2023 Annual Report  
 Schilling Air Force Base Atlas Site S-01  
 Bennington, Kansas

DESIGNED BY: SMC	CHECKED BY: SS
DRAWN BY: SMC	REVIEWED BY: SS
DATE: DECEMBER 2023	

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