CORRECTION(S) TO WATER WELL RECORD (Form WWC-5)
(to rectify lacking or incorrect information)

LOCATION OF WATER WELL: County: Johnson	Fraction ___¼ NE ¼ NE ¼ NE ¼	Section 30	Township T 13 S	Range R 22 ☒E ☐W

Owner: USACE c/o Burns & McDonnell

Location was listed as:

Sec. _____ **T** _____ **S** **R** _____ ☐E ☐W

Fraction: _____ _____ _____ _____

Location changed to:

Sec. _____ **T** _____ **S** **R** _____ ☐E ☐W

Fraction: _____ _____ _____ _____

Other changes: Initial statements: HTW Drill Log Location: N 2176841.7079 E 2850973.0487

Changed to: 38.895208892 -95.009908295

Comments: Converted State Plane 1501-Kansas North NAD 27 to Geographic Decimal Degrees NAD 83.

Verification method: Corpscon 6.0.1

initials: df date: 04/14/2014

Submitted by: Kansas Geological Survey, Data Resources Library, 1930 Constant Ave., Lawrence, KS 66047-3726
to: Kansas Dept of Health & Environment, Bureau of Water, 1000 SW Jackson, Suite 420, Topeka, KS 66612-1367.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

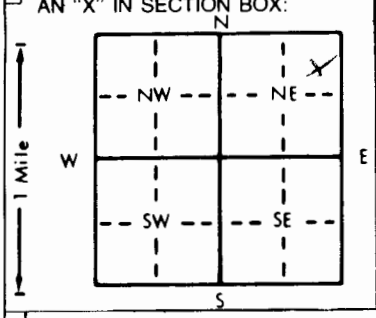
1 LOCATION OF WATER WELL: County: Johnson	Fraction: NW ¼ NE ¼ NE ¼	Section Number: 30	Township Number: T 13 S	Range Number: R 22 (E) W

Distance and direction from nearest town or city street address of well if located within city? Well #96-19D at Sunflower AAP near DeSoto KS

2 WATER WELL OWNER: USACE % Burns & McDonnell
RR#, St. Address, Box # : 9400 Ward Parkway
City, State, ZIP Code : Kansas City MO 64114

Board of Agriculture, Division of Water Resources Application Number:

3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 47 ft. ELEVATION:
Depth(s) Groundwater Encountered 1. ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 47 ft. below land surface measured on mo/day/yr
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 10 in. to 34.5 ft., and 6 in. to 48 ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well
Was a chemical/bacteriological sample submitted to Department? Yes (No); If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes (No)

5 TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
(2) PVC 4 ABS 7 Fiberglass Threaded X
Blank casing diameter 6 in. to 34.5 ft., Dia 2 in. to +34' to 36.8 ft., Dia in. to ft.
Casing height above land surface 34 in., weight lbs./ft. Wall thickness or gauge No. Sch 40
TYPE OF SCREEN OR PERFORATION MATERIAL: (7) PVC 10 Asbestos-cement
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)
SCREEN-PERFORATED INTERVALS: From 36.8 ft. to 46.8 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 33 ft. to 48.0 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

6 GROUT MATERIAL: 1 Neat cement (2) Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 34.5 ft., From 0 ft. to 33 ft., From ft. to ft.
What is the nearest source of possible contamination: 10 Livestock pens 14 Abandoned water well
1 Septic tank 4 Lateral lines 7 Pit privy 11 Fuel storage 15 Oil well/Gas well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 12 Fertilizer storage (16) Other (specify below)
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 13 Insecticide storage Ammunition plant
Direction from well? How many feet?

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 9/8/96 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 570 This Water Well Record was completed on (mo/day/yr) 11/27/96 under the business name of AQUADRILL, INC. by (signature) [signature]

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

OFFICE USE ONLY T R E/W SEC. ¼ ¼ ¼

T13S-R22E - Sec. 30 - NE-NW-NE

HTW DRILLING LOG

HOLE NO. 96-19D

1. COMPANY NAME: BURNS & McDONNELL	2. DRILLING SUBCONTRACTOR: AQUADRILL
SHEET 1 OF 8 SHEETS	
3. PROJECT: 94-800-4-020-01 USSFRFI	4. LOCATION: SUNFLOWER ARMY AMMUNITION PLANT
5. NAME OF DRILLER: Jeff Josiyn	6. MANUFACTURER'S DESIGNATION OF DRILL: Gus Pech. Brat-22R, MOBILE B-57
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT: 8¼" I.D Hollow Stem Augers (HSA); Kelly bar; Chisel & Blade Bit; NQ2 WIRELINE CORE BARREL; ROTARY WASH 6" TRICONE	8. HOLE LOCATION: N - 218684.7079 E - 2850973.0487
	9. SURFACE ELEVATION: 938.4
	10. DATE STARTED: 9-03-96 / 11. DATE COMPLETED: 9-04-96
12. OVERBURDEN THICKNESS: 31.7	15. DEPTH GROUNDWATER ENCOUNTERED: 260'
13. DEPTH DRILLED INTO ROCK: 15.8	16. DEPTH TO WATER AND ELAPSED TIME AFTER DRILLING COMPLETED: 24.35' (from 19S)
14. TOTAL DEPTH OF HOLE: 47.5	17. OTHER WATER LEVEL MEASUREMENTS (SPECIFY): None

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
See log for 96-19S	NA	NA	3

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER (SPECIFY)	OTHER (SPECIFY)	OTHER (SPECIFY)	21. TOTAL CORE RECOVERY
See log for 96-19S	NA	NA	NA	NA	NA	99%

22. DISPOSITION OF HOLE	BACKFILLED	MONITORING WELL	OTHER (SPECIFY)	23. SIGNATURE OF INSPECTOR
Monitoring Well	NA	96-19D / 96-13	NA	[signature]

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	See Log of 96-19S.	1552 BZ = 0 ppm C = 0 ppm LEL = 0% O_2 = 20.8%	NA	NA	1552	1552 Begin drilling with 8¼" I.D. HSAs. Not sampling.
	1					NA	
	2						
	3						
	4						
	5					1555	

MRK FORM JUN 89 55

PROJECT: 94-800-4-020-01 USSFRFI

HOLE NO. 96-19D

HTW DRILLING LOG

HOLE NO. 96-19D

PROJECT 94-800-4-020-01 USSFRFI

INSPECTOR [illegible]

SHEET 2 OF 8 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	See log of 96-19S	~~1447~~ CCM=0ppm in BH, 62,C LEL=0% O_2=20.8%			1609	~~Begin~~ End 9-03-96 ~~1609~~ Begin run 2 15 ft of HSAs on drillstem.
	6						
	7						
	8						
	9			N/A	N/A	N/A	
	10						
	11						
	12						
	13						
	14					See next page	

MRK FORM JUN 89 55-2

PROJECT 94-800-4-020-01 USSFRFI

HOLE NO. 96-19D

HTW DRILLING LOG

HOLE NO. 96-19D

PROJECT 94-800-4-020-01 USSFRFI

INSPECTOR J. Milton Zure

SHEET 3 OF 8 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	See log of 96-19S.		N/A	N/A	N/A	
						1617	1629
	15		~~1627~~ OVM=0ppm in BH, B2, C LEL=0% O_2=20.8%	N/A	N/A	1629 N/A	Begin run 3; 30 ft HSAs on drill stem.
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						

HTW DRILLING LOG

HOLE NO. 96-19D

PROJECT 94-800-4-020-01 USSFRFI

INSPECTOR Melissa Price

SHEET 7 OF 8 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
	23	See log of 96-19S.					
	24						
	25		See previous page	N/A	N/A	N/A	
	26						
	27						
	28					1639	1653
		SAND, trace silt (5%), pale yellow (2.5Y 7/3), wet, poorly graded, loose density, subrounded to rounded, medium grained (SP) [Glacial outwash]	OVM=0ppm in BH, B2, S LEL=0% O_2=20.8%	N/A	N/A	1653 3 5 4 5 0.9/2.0 1713	Start continuous sampling with 2'x1 7/8" I.D split spoons.
	30		BH=0ppm B2=0ppm LEL=0% O_2=20.8% S=0ppm	N/A	N/A	1722 12 14 83 0.9/2.0 1741	
	31	SAND, trace silt, Brown (10YR 5/3), wet, well graded, medium to coarse, very dense, subangular to subrounded, fine to medium grained (SW) [Glacial outwash]					Note: No's sand, although mostly medium grained, is coarser than the sand above it.
	32	LIMESTONE	BH=0ppm	NA	NA	1756	

MRK FORM JUN 89 55-2

PROJECT 94-800-4-020-01 USSFRFI

HOLE NO. 96-19D

HTW DRILLING LOG

HOLE NO. 96-19D

PROJECT 94-800-4-020-01 USSFRFI

INSPECTOR [illegible]

SHEET 5 OF 8 SHEETS

ELEV. a	DEPTH	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	LIMESTONE	LEL=0% O_2=20.8%	NA	NA	~~1750~~ 1756 1900	~~HF 9-03-96~~ 1756 Begin Rung Now. Last spoon went to 31.75' Hit bedrock there. 1900 TD = 32.4' Now. drillers left for supplies [illegible] 1915 Install 34.5' of 6". Schedule 40 PVC Casing. 1940 Casing installed. Will grout tomorrow 9-04-96 0750 Mixing 1st batch of grout as follows. 3-94-lb bags of Lonestar Portland Cement (TYPE I); 14.5 lb Benseal brand bentonite (15%); 21 gal water (7.9%) 0756 tremied 1st batch of grout into hole. 0800-0815 Pulling augers 0820 Insert tremie pipe. Mix & tremie 3 additional batches of grout (same mix as batch 1). 0835 Checking casing for plumbness.
		SEE PAGE 6 FOR ROCK DESCRIPTION.					
	33						
	34						
	35						
	36						
	37		0815 OVM=0ppm BH=0ppm BZ=0ppm LEL=0% O_2=20.8%				

HTW DRILLING LOG

HOLE NO. 96-19D

PROJECT 94-800-4-020-01 USSFRFI

INSPECTOR [illegible]

SHEET 6 OF 8 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						4/12/96 BEGIN CORING 1430
	33	LIMESTONE (MEDIUM GRAY (N5), FRESH, MODERATE STRONG, MICROCRYSTALLINE MATRIX W/SOME (20%) CLAY, SOME TO ABUNDANT (30-40%) FOSSILS; BRACHIOPODS, PELECYPODS, FUSULINIDS, CRINOIDS TRACE (1%) SHALE CLASTS? [SOUTH BEND LIMESTONE]	BH = 0.0 BZ = 0.0 S = 0.0 LEL = 0% O_2 = 20.9	NA	NA	RUN 2 BOX 1 2.0/2.0	BOTTOM OF CASING FRACTURE FRACTURE
	34	SANDSTONE, DARK GRAY (N3) FRESH, WEAK, WET, FINE TO VF GRAINED, QTZ, TRACE MICA, SOME (30-40%) CLAY & SILT, FOSSIL FRAGMENTS - SHELL?, ORGANIC DEBRIS. SUBROUNDED WELL SORTED GRADES INTO INTERBEDDED SANDSTONE/SHALE THINLY BEDDED, BIOTURBATED IN ONE ZONE					FRACTURE FRACTURE 1440 END RUN 34.5
	35	SANDSTONE BECOMES MODERATELY STRONG, SHALE IS WEAK, NUMEROUS SMALL FRACTURES - FOSSIL CONTENT DECREASES TO ZERO @ 34.0' bgs, (JUST ABOVE BIOTURBATED ZONE) [ROCK LAKE SHALE]	BH = 0.0 BZ = 0.0 S = 0.0 LEL = 0% O_2 = 20.9				1450 FRACTURE FRACTURE FRACTURE FRACTURE FRACTURE FRACTURE
	36						
	37					RUN BOX 2 10.0/10.0	
	38	SHALE, CALCAREOUS PALE YELLOWISH BROWN (10YR6/2) TO BLACK (N1) TO MEDIUM BLUISH GRAY (5G6/1) THINLY LAMINATED, MODERATELY STRONG TO VERY WEAK, TRACE TO SOME (0-30%) SHALE CLASTS [ROCK LAKE SHALE]		NA	NA		FRACTURE FRACTURE FRACTURE FRACTURE FRACTURE FRACTURE
	39	LIMESTONE, LIGHT GREY (N7) FRESH MODERATELY STRONG, MASSIVE TO THICKLY BEDDED, MICROCRYSTALLINE MATRIX, SOME (20%) CLAY & CLAY SEAMS/PARTINGS, TRACE ORGANIC MATTER (1%), SOME FOSSILS (30-40%) PELECYPODS, BRACHIOPODS, RECRYSTALLIZED ALGAL REMAINS, CRINOIDS, FUSULINIDS - CONCENTRATED AT CLAY SEAMS, TRACE TO SOME SPARRY CALCITE IN MATRIX (10-20%) TRACE (1%) VUGS PARTIALLY FILLED W/SPARRY CALCITE. [STONER LM]					HIGHLY FRACTURED ZONE
	40						FRACTURE
	41						CLAY SEAM

MRK FORM JUN 89 55-2

PROJECT 94-800-4-020-01 USSFRFI

HOLE NO.

HTW DRILLING LOG

HOLE NO. 96-19D

PROJECT 94-800-4-020-01 USSFRFI

INSPECTOR [illegible]

SHEET OF 7 SHEETS 8

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 previous [STONER LIMESTONE]	BH=0.0 BZ=0.0 S=0.0				CLAY SEAMS
	42		LEL=0% O_2=20.8				-STYLOLITE -CLAYSEAMS -CLAY PARTING
				NA	NA		
	43						
	44						-FRACTURE -CLAY SEAM
							1510 @ 44.5' END RUN
							-FRACTURE CONTAINS VF QTZ SAND & SILT
	45		BH=0.0 BZ=0.0 S=0.0				
	46		LEL=0% O_2=20.9	NA	NA	RUN BOX 3	-CLAY SEAM -FRACTURE
						2.9/3.0	-CLAY SEAM CLOSED FRACTURE
	47						-FRACTURE
							-HEALED FRACTURE 1535 @ 47.5'
			BOTTOM OF HOLE 47.5'				
	48						
	49						
	50						

MRK FORM JUN 89 55-2

PROJECT 94-800-4-020-01 USSFRFI

HOLE NO.

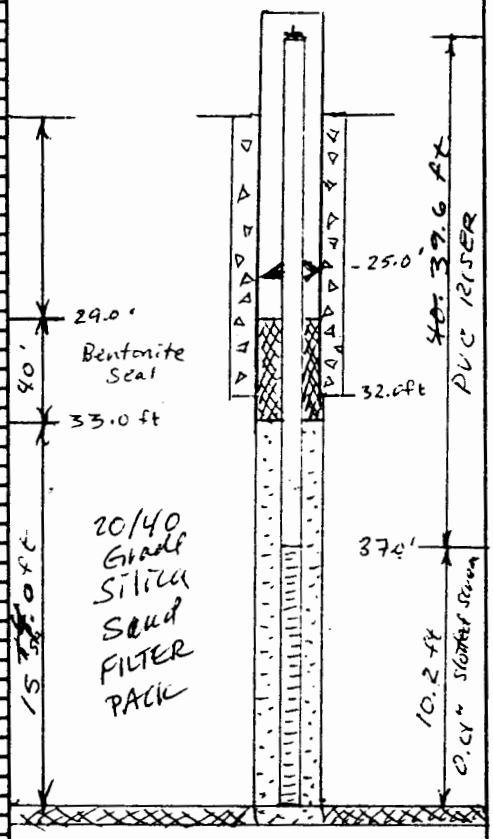
HTW DRILLING LOG

HOLE NO. 96-19D

PROJECT 94-800-4-020-01 USSFRFI

INSPECTOR SUZANNE BAILEY

SHEET 8 OF 8 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
							9-8-96 Began reaming borehole with 6 5/8" Tri-cone button bit on Gus Pech Brat 22-R 1335 Began reaming borehole 1414 Stopped reaming at ~~47.3~~ 48.0 ft bgs. 1416 Installed 10.0 ft of 2" diam Sch 40 PVC, 0.01" slotted well screen with 0.2" threaded end cap and 40.0 ft of PVC riser. 1435 Tremied ~~18.0~~ 15 ft of 20/40 grade silica sand filter pack (Northern gravel) to 33 ft. 1444 Surging filter pack with surge block. 1454 SAND SETTLED TO 34.0 ft bgs after surging, added more sand to 33 ft. bgs. 1459 Added Baroid Holeplug bentonite chips (4.0 ft) to 29.0 ft bgs 1505 Cut off 0.4 ft. riser stickup is 2.8 ft.

MRK FORM JUN 89 55-2

PROJECT 94-800-4-020-01 USSFRFI

HOLE NO. 96-19D