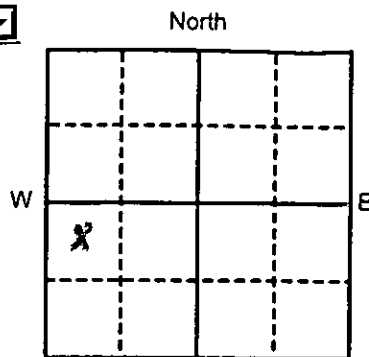


SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW ¼ SW ¼ Sec 17 Twp 9 N Rg 12 ECounty Meade ☒Please mark well
location with an "X"

Well Completion Date

10-28-2019

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
_____ ft. from _____ (identify source)

PROPOSED USE:

☒ Domestic/Stock ☐ Municipal ☐ Business ☐ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Mud Rotary

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
40.5 LB/FT	10.75 IN	0 FT	45 FT	14.75 IN
23.0 LB/FT	7 IN	+2 FT	1206 FT	9.87 IN
11.6 LB/FT	4.5 IN	1165 FT	3815 FT	6.0 IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Lite Cement	300	12.7 Lb/gal	0.0 Ft	1206 Ft
Lite Cement	285	12.7 Lb/gal	1165 Ft	3815 Ft

Describe grouting procedure

Pumped Plug

SCREEN:

☐ Perforated pipe ☐ Manufactured

Diameter _____ Inches Length _____ Feet

Material _____

Slot Size _____ Set From _____ Feet to _____ Feet

Other information Shot perforated 3612-3628, 3650-3724WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material? _____

Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?

☒ Yes. How? Chlorine Tablets☐ No. Why Not? _____Lab to which water
quality sample sent for analysisMidContinentWell Owner: Lane Cammack

Business Name: _____

Address: 17027 Old Stoneville RdCity, State, Zip: Union Center SD 57787

WELL LOG:

DEPTH

FORMATION

FROM

TO

ATTACHED

STATIC WATER LEVEL

596

FEET

If flowing: closed in pressure _____

PSI

GPM flow _____ through _____

Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____

GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe: Airlift☐ Bailed☒ Other

Pumping Level Below Land Surface

800 Ft. After 8 Hrs. pumped 150 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____

GPM

REMARKS

This well was drilled under license # 604 and this report is true and accurate.Drilling firm: Weston Engineering, Inc.

Signature of License Representative: _____

Signature of Well Owner or Equitable Property Holder: _____

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FEB 14 2020

WATER RIGHTS
PROGRAMDate: 12/31/19

LITHOLOGIC LOG
Cammack #1
MEADE COUNTY, SOUTH DAKOTA
NW SW 1/4 SEC 17 , T9N, R12E

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FEB 14 2020

**WATER RIGHTS
PROGRAM**

DEPTH	GENERAL LITHOLOGY	SAMPLE DESCRIPTION	COMMENTS
TOP SOIL			
0- 12	Clay	Brown to gray clay and shale, some cobble	
12-224	Interbedded Sandstone, Shale and clay	Fine grained, calcite cemented, light gray sandstone, with non-calcareous dark gray shale and iron staining in lower olive black shale. Light gray v.f. to med. grained sub-angular to sub-rounded quartz sandstone	
PIERRE FORMATION			
225 - 1200	Shale	multi-colored silty calcareous clay - chips of pale And grayish yellow green silty clay	
1200 - 1975	Shale	hard, platy olive black shale interbedded with siltstone	
1975 - 2112	Siltstone	olive black siltstone containing abundant sand and Clayey (Marl) interlayers	
2112-2238	Shale	Olive black shale, occasionally iron stained with interbedded Olive black marl, yellowish gray non-calcareous shale and calcareous siltstone	
TOP OF NIOBRARA FORMATION			
2238-2236	Chalk and shale	Calcareous light gray shale with abundant chalk	
TOP OF CARLILE FORMATION			
2236 - 2596	Shale	Dusky blue, fissile, non calcareous shale, pale-dark yellowish brown noncalcareous shale with streaks of v.f. sand	
2596- 2646	Shale	Grayish black non-calcareous shale and limestone interbedded with gray marl and olive gray sandstone	
TOP OF GREENHORN LIMESTONE			
2646- 2744	Limestone	Dark gray with rounded white calcareous grains, light gray sandy limestone with fine yellowish gray lime mudstone	
TOP OF BELLE FOURCHE SHALE			
2744- 2944	Shale	Brownish black, slightly fissile shale; abundant bentonite and minor yellowish brown calcareous shale	
TOP OF MOWRY			
2944- 30905	Shale	Brownish black, fossiliferous shale, pyrite and oxidized iron stains; Interbedded with white arkosic/calcareous sandstone, calcite veining and yellowish brown micaceous shale	
TOP OF MUDDY FORMATION			
3090-3222	Interbedded shale and sandstone	Brown - black shale containing dolomite concretions, pyrite, calcite veining. Finely laminated black and light olive gray shale with bentonite and calcite cemented v.f. sandstone	

3222 - 3230	Sandstone	Light gray v.f. to med. grained sub-angular to sub-rounded quartz sandstone Silica cemented sand friable
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SKULL CREEK SHALE

3230 - 3458	Shale	Black shale containing dolomite concretions, pyrite; Olive black shale with iron staining in lower shales
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TOP OF DAKOTA SANDSTONE

3458-3560	Interbedded Sandstone and Shale	Fine grained, calcite cemented, light gray sandstone, with non-calcareous dark gray shale and iron staining in lower olive black shale. Small amount of pyrite. Light gray v.f. to med. grained sub-angular to sub-rounded quartz sandstone
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TOP OF FUSON SHALE

3560 - 3612	Shale/ Clay	Dark gray shale containing pyrite, iron staining
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TOP OF LAKOTA SANDSTONE

3612 - 3630	Sandstone	Light gray v.f. to med. grained sub-angular to sub-rounded quartz sandstone Silica cemented sand friable
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3630- 3646	Interbedded Shales and Silty Sandstone	Light olive gray v.f. to med. grained sub-angular to sub-rounded quartz sandstone. Sandstones dirty and silty. Dark gray calcareous-non-calcareous shale intermingled with white clay
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3646 - 3735	Sandstone	Light gray v.f. to med. grained sub-angular to sub-rounded quartz sandstone Silica cemented sand friable
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3735-3800	Interbedded Sandstone and Shale	Fine grained, calcite cemented, light gray sandstone, with non-calcareous dark gray shale and iron staining in lower olive black shale. Small amount of pyrite. Light gray v.f. to med. grained sub-angular to sub-rounded quartz sandstone
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TOP OF MORRISON FORMATION

3800 - 3852	Siltstone Sandstone, Shale	brown and gray shale, white to greenish teal clay and orange sandstone stringers light gray to dark gray shale with white bentonite stringers
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TOP OF SUNDANCE FORMATION

3852 - 3924	Shale, Sandstone Siltstone, Sandstone	Gray shale; white to pale yellowish brown and red fine to very fine- grained, well cemented sandstone stringers Red clay, siltstone w/red to rust colored sandstone
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RECEIVED

FEB 14 2020

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FEB 14 2020