WELL RECORD FORM (Page 1)

PWTS No. or PWS No. 5815101 | PWTS Permit No. 20160189 | GEOSAM Well No. (IGS use only) 83404 -

Site Identification

Property owner Tyson Fresh Meats, Inc. Other ID WL09

Address 16198 HWY 70 North City Columbus Junction

Tenant

Well depth 1530 ft Date completed 7 / 22 / 16

Drill Method

☑ Rotary ☐ Auger ☐ Cable ☐ Other

Hole size (See Attached)

42 inch from 0 ft to 38 ft

35 inch from 38 ft to 150 ft

hole size continued

29 inch from 150 ft to 455 ft

23 inch from 455 ft to 1,100 ft

Location

County Lousia

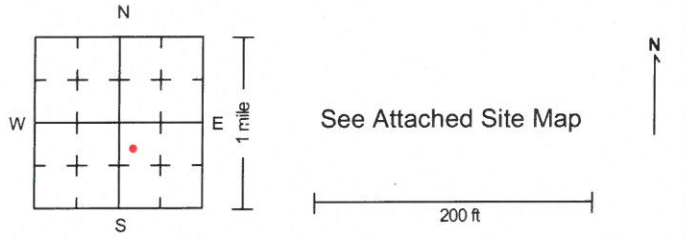
GPS coordinates (NAD83 datum)

41.2964010 Latitude -91.3540850 Longitude

☐ Decimal Degrees ☐ Degrees, Decimal Minutes ☑ Degrees, Minutes, Seconds

SW 1/4 of the NE 1/4 of the SE 1/4 of Sec 18 TWP 75 RNG 4 E (W)

Show exact location of well in section grid with a dot (•). Sketch map of well location on property.



Casing or Loop Pipe

Record all depth measurements from ground level (GL). Use + for above GL measurements.

Size (in)	Material	Depth Top	Depth Bottom	Perforated	Slotted	Screen
36	0.375" Blk Steel	0	38	☐	☐	☐ slot size
30	0.375" Blk Steel	+2	150	☐	☐	☐ slot size
24	0.500" Blk Steel	+2	450	☐	☐	☐ slot size
18	0.500" Blk Steel	450	1100	☐	☐	☐ slot size
				☐	☐	☐ slot size

Casing Grout

Placement method Haliburton

Type	Depth Top	Depth Bottom	Amount (vol/wt)
Type I Portland Cement - 30"	0	150	210 SKS
Type I Portland Cement - 24" x 18"	0	1100	900 SKS
☐ Gravel packed variety			
☐ Seals/packers			

Formation Log

From	To	Color	Hardness	Formation description
0	14			Sand, gravel
14	21			Clay
21	48	gray		Sand, small gravel
48	90			Coarse sand, boulders
90	104			Sandy clay
104	125			Clay, gravel mix
125	190			Clay, shale mix, some lime
190	196			Shale, limestone mix
196	203			Limestone
203	212			Limestone, Shale mix
212	240			Limestone
240	340			Dolomite
340	390	gray		Limestone
390	395			Limestone, some chert
395	401			Limestone
401	405			Limestone, shale mix
				(use additional sheets as needed) Continued on Next Sheet

Pump Installation

Date 4 / 10 / 2017

Type of pump Vertical Turbine Depth to intake 620 ft

Pump diameter 12 in Rated capacity 1450 GPM

Water Information

Date / /

Use + for above GL measurements.

Static Water Level	Pumping Water Level	Yield	Duration
180 ft	465 ft	1066 GPM	6.00 hrs

Water level measurement: ☐ Sonic ☐ Tape ☑ Airline ☐ E-line ☐ Estimate

Water yield measurement: ☑ Orifice ☐ Volumetric ☐ Estimate

Main water-supply zone from 1100 ft to 1530 ft below GL

Remarks (including depth of lost drilling fluids, materials, or tools)

Well Development

☑ Physical explain: Airlift development and over pumping w/test pump

☐ Chemical explain:

Well Use

☐ Domestic ☐ Public supply ☐ Livestock

☐ Heat pump ☑ Commercial ☐ Irrigation

# of borehole(s) ___ ☐ Monitoring ☐ Other

Contractor

Company Layne Christensen Company

Address 721 W. Illinois Ave

Driller Jason Gerwing Certification no. 11098

IGS IIHR Hydroscience & Engineering

Mail form to **Iowa Geological Survey**: 100 Oakdale IGS, Iowa City, IA 52242-1304

Or click here to e-mail form to: IIHR-IGS-WellRecords@uiowa.edu

Make copies for: **well contractor, customer, and county health department**

The University of Iowa

Rev. 2014

WELL RECORD FORM (Page 2)

PWTS No. or PWS No. 5815101 | **PWTS Permit No.** 20160189 | **GEOSAM Well No.** *(IGS use only)*

Site Identification

Property owner Tyson Fresh Meats, Inc. Other ID WL09

Address 16198 HWY 70 North City Columbus Junction

Tenant

Well depth 1530 ft Date completed 7 / 22 / 16

Drill Method

☑ Rotary ☐ Auger ☐ Cable ☐ Other

Hole size

____ inch from 0 ft to ____ ft

17 inch from 1,100 ft to 1,530 ft

hole size continued

____ inch from ____ ft to ____ ft

____ inch from ____ ft to ____ ft

Location

County Lousia

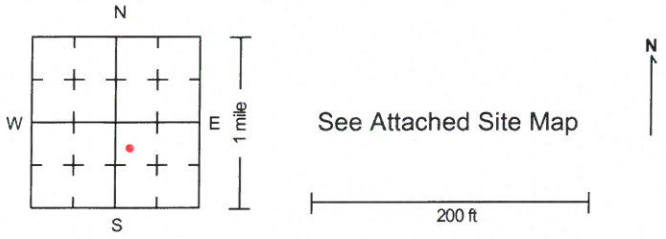
GPS coordinates (NAD83 datum)

41.2964010 Latitude -91.3540850 Longitude

☐ Decimal Degrees ☐ Degrees, Decimal Minutes ☑ Degrees, Minutes, Seconds

SW 1/4 of the NE 1/4 of the SE 1/4 of Sec 18 TWP 75 RNG 4 E (W)

Show exact location of well in section grid with a dot (•). Sketch map of well location on property.



Casing or Loop Pipe

Record all depth measurements from ground level (GL). Use + for above GL measurements.

Size (in)	Material	Depth Top	Depth Bottom	Perforated	Slotted	Screen
				☐	☐	☐ slot size ____
				☐	☐	☐ slot size ____
				☐	☐	☐ slot size ____
				☐	☐	☐ slot size ____
				☐	☐	☐ slot size ____

Casing Grout

Placement method ____

Type	Depth Top	Depth Bottom	Amount (vol/wt)
☐ Gravel packed variety ____			
☐ Seals/packers			

Formation Log

From	To	Color	Hardness	Formation description
405	640			Shale
640	860			Limestone
860	875			Limestone, shale mix
875	945			Limestone
945	970			Shale
970	1015			Limestone
1015	1030			Limestone, some shale
1030	1100			Limestone
1,100	1,120			Dolomite
1120	1135			Limestone
1135	1430			Dolomite
1430	1450			Sandy dolomite
1450	1460			Dolomite, shale mix
1460	1500			Dolomite
1500	1510			Dolomite, shale mix
1510	1517			Dolomite, cemented sandstone
				(use additional sheets as needed) Continued on Next Sheet

Pump Installation

Date ____/____/____

Type of pump ____ Depth to intake ____ ft

Pump diameter ____ in Rated capacity ____ GPM

Water Information

Date ____/____/____

Use + for above GL measurements.

Static Water Level	Pumping Water Level	Yield	Duration
____ ft	____ ft	____ GPM	____ hrs

Water level measurement: ☐ Sonic ☐ Tape ☐ Airline ☐ E-line ☐ Estimate

Water yield measurement: ☐ Orifice ☐ Volumetric ☐ Estimate

Main water-supply zone from ____ ft to ____ ft below GL

Remarks (including depth of lost drilling fluids, materials, or tools)

Well Development

☐ Physical explain: ____

☐ Chemical explain: ____

Well Use

☐ Domestic ☐ Public supply ☐ Livestock

☐ Heat pump ☑ Commercial ☐ Irrigation

# of borehole(s) ____ ☐ Monitoring ☐ Other ____

Contractor

Company ____

Address ____

Driller ____ Certification no. ____

IGS IIHR Hydroscience & Engineering

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The University of Iowa

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WELL RECORD FORM (Page 3)

PWTS No. or PWS No. 5815101 | **PWTS Permit No.** 20160189 | **GEOSAM Well No.** *(IGS use only)*

Site Identification

Property owner Tyson Fresh Meats, Inc. Other ID WL09

Address 16198 HWY 70 North City Columbus Junction

Tenant

Well depth 1530 ft Date completed 7 / 22 / 16

Drill Method

☑ Rotary ☐ Auger ☐ Cable ☐ Other

Hole size

____ inch from 0 ft to ____ ft

____ inch from ____ ft to ____ ft

hole size continued

____ inch from ____ ft to ____ ft

____ inch from ____ ft to ____ ft

Location

County Lousia

GPS coordinates (NAD83 datum)

41.2964010 Latitude -91.3540850 Longitude

☐ Decimal Degrees ☐ Degrees, Decimal Minutes ☑ Degrees, Minutes, Seconds

SW 1/4 of the NE 1/4 of the SE 1/4 of Sec 18 TWP 75 RNG 4 E (W)

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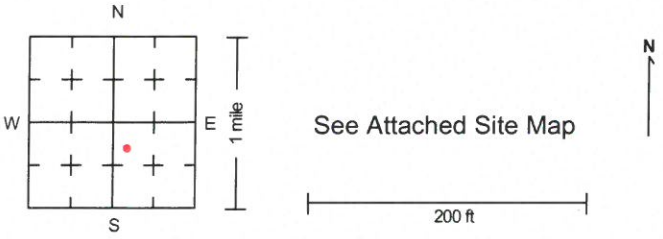

Casing or Loop Pipe

Record all depth measurements from ground level (GL). Use + for above GL measurements.

Size (in)	Material	Depth Top	Depth Bottom	Perforated	Slotted	Screen
				☐	☐	☐ slot size ____
				☐	☐	☐ slot size ____
				☐	☐	☐ slot size ____
				☐	☐	☐ slot size ____
				☐	☐	☐ slot size ____

Casing Grout

Placement method ____

Type	Depth Top	Depth Bottom	Amount (vol/wt)
☐ Gravel packed variety ____			
☐ Seals/packers			

Formation Log

From	To	Color	Hardness	Formation description
1517	1520			Cemented sandstone
1520	1526			Dolomite
1526	1529			Cemented sandstone
1529	1530			Cemented sandstone, shale
				(use additional sheets as needed)

Pump Installation

Date ____/____/____

Type of pump ____ Depth to intake ____ ft

Pump diameter ____ in Rated capacity ____ GPM

Water Information

Date ____/____/____

Use + for above GL measurements.

Static Water Level	Pumping Water Level	Yield	Duration
____ ft	____ ft	____ GPM	____ hrs

Water level measurement: ☐ Sonic ☐ Tape ☐ Airline ☐ E-line ☐ Estimate

Water yield measurement: ☐ Orifice ☐ Volumetric ☐ Estimate

Main water-supply zone from ____ ft to ____ ft below GL

Remarks (including depth of lost drilling fluids, materials, or tools)

Well Development

☐ Physical explain: ____

☐ Chemical explain: ____

Well Use

☐ Domestic ☐ Public supply ☐ Livestock

☐ Heat pump ☑ Commercial ☐ Irrigation

# of borehole(s) ____ ☐ Monitoring ☐ Other ____

Contractor

Company ____

Address ____

Driller ____ Certification no. ____

IGS IIHR Hydroscience & Engineering

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Google Earth

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WELL INFORMATION - ROCK WELLS

Layne Christensen Company

PROFESSIONAL SERVICES FOR WATER SYSTEMS

721 West Illinois Avenue • Aurora, Illinois 60506-2892 • Phone 630/897-6941
229 West Indiana Avenue • Beecher, Illinois 60401 • Phone 708/946-2244

Name Of Job: Tyson Fresh Meats, Inc. Date: 9/13/16

City: Columbus Junction State: Iowa

Well No.: 8 Drillers: Harold Waydell

Well Location: _____ ft. (_____) and _____ ft. (_____) of the _____ corner of

the 1/4 of Section 18 ,Twp. 75 (North), Range 4 (West) Louisa County

Otherwise located as: NE ¼ SW ¼ SE ¼

16198 Hwy 70 North, Columbus Junction, IA

Work Began: April 25, 2015 Work Completed: July 22, 2016

Casing Record:

Amount	Dia.	Wt. or Thickness	Material					
40’	36”	0.375”	Black Steel	with	no	Joints from	+2’	38’
150’	30”	.0375”	Black Steel	with	welded	joints from	+2’	to 150’
450’	24”	0.500”	Black Steel	with	welded	joints from	+2’	to 450’
5’	24”x 18”	0.500”	Black Steel	with	welded	joints from	450’	to 455’
645’	18”	0.500”	Black Steel	with	welded	joints from	455’	to 1,100’

Hole Record:

42”	inch from	0’	to	38’	
36”	inch from	38’	to	150’	
29”	inch from	150’	to	455’	
23”	inch from	455’	to	1,100’	
17”	inch from	1,100’	to	1,530’	bottom of hole

Cementing Record: 30” cemented using Type I Portland cement from 150’ (210 sacks); 24” x 18” long string casing with 24”x18” concentric reducer cemented using neat cement (900 sacks) of Portland Type I Cement

Well Test Data: Static Level 140 ft ; pumping level 473’ after 24 hours pumping at 1,025 g.p.m.

Length of test 24 hrs. See Well Test Data Sheet Dated

Remarks: No sand; clear water

Layne Job No.: 42098 Well Permit No.: 2016-1089W

SEE OTHER SIDE

WELL LOG

Feet		Feet	Description
0	to	14	Sand, gravel
14	to	21	Clay
21	to	48	Gray sand, small gravel
48	to	90	Coarse sand, boulders
90	to	104	Sandy clay
104	to	125	Clay, gravel mix
125	to	190	Clay, shale mix, some lime
190	to	196	Shale, limestone mix
196	to	203	Limestone
203	to	212	Limestone, shale mix
212	to	240	Limestone
240	to	340	Dolomite
340	to	390	Gray limestone
390	to	395	Limestone, some chert
395	to	401	Limestone
401	to	405	Limestone, shale mix
405	to	640	Shale
640	to	860	Limestone
860	to	875	Limestone, shale mix
875	to	945	Limestone
945	to	970	Shale
970	to	1015	Limestone
1015	to	1030	Limestone, some shale
1030	to	1100	Limestone
1100	to	1120	Dolomite
1120	to	1135	Limestone
1135	to	1140	Dolomite
1140	to	1430	Dolomite
1430	to	1450	Sandy dolomite

WELL LOG

Feet		Feet	Description
1450	to	1460	Dolomite, shale mix
1460	to	1500	Dolomite
1500	to	1510	Dolomite, shale mix
1510	to	1517	Dolomite, cemented sandstone mix
1517	to	1520	Cemented sandstone
1520	to	1526	Dolomite
1526	to	1529	Cemented sandstone
1529	to	1530	Cemented sandstone, shale
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