

IOWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey

W-0965

RECORD OF WELL

Location:

Town: Keota (N E)
(S W): County Keokuk

NW-NW sec. 25 T 76 N., R. 10 W. La Fayette Twp.

0	
	25

Well name and number City Well #5 (Edwards)

Owner City of Keota Address _____

Tenant _____ Address _____

Contractor D.E Edwards Address West Branch

Drillers _____

Drilling dates 2/25/39 to 3/3/39.

Well data:

Elevations: Drilling curb 784 feet; Land surface _____ feet

Determined by _____

Topographic position _____

Total depth: Reported _____ feet, Measured 150' feet

Drilling method _____

Hole and casing data _____

Original depth to water _____ above
ft. below _____ Date _____

Original elevation of water level _____ ft.; Source of data _____

Sources of water: Principal _____ ; Others _____

Production data:

Date _____

Static depth to water _____ Measuring point _____

Pumping level _____ at _____ g.p.m.

Specific capacity _____ g.p.m. per ft. drawdown; Temperature _____ °F.

Pump data; Type pump _____ Column Dia. _____ Length _____

Cylinder or bowls: Dia. _____ Length _____ Suction pipe _____

Power _____ Airline _____

Estimated rate of production: _____ g.p.m. for _____ hrs. a day

Use of water _____

WATER ANALYSES (in parts per million)

Date samples	_____	_____	_____	_____
Sampled by	_____	_____	_____	_____
Total solids	_____	_____	_____	_____
Insoluble matter	_____	_____	_____	_____
Alkalinity (Meo)	_____	_____	_____	_____
Alkalinity (Phn)	_____	_____	_____	_____
pH	_____	_____	_____	_____
Fe ₂ O ₃ + Mn ₂ O ₃ +Al ₂ O ₃	_____	_____	_____	_____
Alkali as sodium	_____	_____	_____	_____
Calcium	_____	_____	_____	_____
Magnesium	_____	_____	_____	_____
Iron (unfiltered)	_____	_____	_____	_____
Manganese	_____	_____	_____	_____
Nitrate	_____	_____	_____	_____
Fluoride	_____	_____	_____	_____
Chloride	_____	_____	_____	_____
Sulfate	_____	_____	_____	_____
Bicarbonate	_____	_____	_____	_____
Hardness (ppm)	_____	_____	_____	_____
Hardness (gpg)	_____	_____	_____	_____

Remarks _____

Laboratory data:

Sample storage location _____

Sample range 0-150 No. spls. 32 No. dupls. & cond. 48 Cond.

Spls. prepared by Unklesby Washed range 5-150 by Unklesby

Driller's log and cond. _____

Insoluble residues: Prepared by _____ Studied by _____ Strip log _____

Microscopic study 0-150 Schuett strip log EMR Jan 27, 1950

Gen. log _____ Correl. by _____

Date Received Mar. 2, 1939

Name of Well Town Well - Edwards No 5 Well No. V-0065

Town Keota County Keokuk

Location _____ Sec. 25 T. 76 N, R. 10 W., Lafayette Twp.

Contractor and Address D. E. Edwards, West Branch

Driller Bruce McGowan & D. E. Edwards

Date Drilled Feb. 25 - Mar. 3, 1939 Curb Elevation _____

No. of Samples 32 ^{31 washed} No. of Duplicates 48 Condition Good

Log: No Yes Condition of Log: —

Sample Range: 1-50, 55-60, 62-150

Remarks: Washed spls. from 5 feet, 3 in number

2 Duplicates from 80-85' down, except for 107 1/2

Boxed by: Vanklesbay + Vaha 3/3/39.

Sand 103-105,

D. E. EDWARDS

WELL DRILLING, ELECTRIC PUMPS

and SUPPLIES

PHONE 278

WEST BRANCH, IOWA

Well No. Five

Keota, Iowa

Well was drilled to top of rock at 62 ft. 2 in., and casing was set at same depth on Saturday, February 25, 1939.

The hole was cleaned and well was left until Monday, Feb. 27, at 10:30 A.M.

Drilling and water levels were recorded as follows:

February 27:- 10:30 A.M.
Total Depth - 62 ft. 2 in. Static Level - 42 ft. 6 in.
In Feed - slight.

February 27:- 12:30 P.M. Pump Running
Total Depth - 68 ft. 6 in. Static Level - 44 ft. 2 in.
In Feed - 5 GPM at 52 ft. Static Level

February 27:- 3:00 P.M.
Total Depth - 75 ft. Static Level - 47 ft.
In Feed - 5 GPM at 52 ft. Drilling time - 65 minutes

Static Level of well #5 at 3:45 P.M. equals 67 ft. 6 in., Pump shut off at 4:00 P.M.

February 27:- 4:02 P.M.
Total Depth - 80 ft. Static Level - 46 ft. 6 in.
In Feed - 6½ GPM at 52 ft. Drilling time - 53 minutes

February 27:- 4:57 P.M.
Total Depth - 85 ft. Static Level - 45 ft.
In Feed - 6½ GPM at 52 ft. Drilling time - 38 minutes

February 28:- 1:15 P.M.
Pump had been shut off for unknown time, possibly not less than 5 hours. Static Level - 40 ft.

February 28:- 3:15 P.M.
Total Depth - 90 ft. Static Level - 47 ft. 6 in.
Drilling time - 52 minutes

February 28:- 4:12 P.M.
Total Depth @ 95 ft. Static Level - 49 ft.
In Feed Drilling time - 40 minutes

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WELL DRILLING, ELECTRIC PUMPS

and SUPPLIES

PHONE 278

WEST BRANCH, IOWA

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February 28:- 5:26 P.M.
Total Depth - 100 feet

Static Level - 49 ft. 6 in.
Drilling time - 47 minutes

March 1:- 8:29 AM
Pump was running for an unknown time

Static Level - 42 ft. 10 in.

March 1:- 9:55 A. M.
Total Depth - 105 ft.

Static Level - 48 ft. 2 in.
Drilling time - 66 minutes

March 1:- 10:55 A.M.
Total Depth - 107 ft. 6 in.
In Feed - 33 in.

Static Level - 43 ft. 8 in.
Drilling time - 35 minutes

March 1:- 12:05 P.M.
Total Depth - 110 ft.
In Feed - 36 in.

Static Level - 44 ft. 3 in.
Drilling time - 36 minutes

March 1:- 1:32 P.M.
Total Depth - 115 feet.
In Feed - 37 in.

Static Level - 44 ft. 9 in.
Drilling time - 62 minutes

March 1:- 2:35 P.M.
Total Depth - 120 ft.
In Feed - 32 in. in 30 sec.

Static Level - 56 ft. 10 in.
Drilling time - 55 minutes

March 1:- 3:57 P.M.
Total Depth - 125 ft.
In Feed - 36 in. in 30 sec.

Static Level - 56 ft. 10 in.
Drilling time - 63 minutes

March 1:- 5:05 P.M.
Total Depth - 130 ft.
In Feed - 36 in. in 30 sec.

Static Level - 56 ft. 7 in.
Drilling time - 50 minutes

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WEST BRANCH, IOWA

3

Well #3 was checked at 3:35 P.M. and the pump had been running for an unknown time, possibly not less than 10 hours. The static level of well #3 at this time was 65 ft. 6 in. The static level of old well in brick bldg. at same time was 65 ft. 3 in.

On February 27, after the well had stood from noon, February 25, without any work being done on same, or any water removed in this time, it showed a static level of 62 ft. 6 in. The water was then bailed from the well, and the infeed was less than 1 in. per minute. The well was then drilled to 68 ft. 6 in. and showed a static level of 44 ft. 2 in., with an infeed of 24 in. in 1 minute. The casing was then driven 7 in. into the rock. The rock seemed to be of a Dolomite, cherty formation; laying in thin layers, carrying streaks of a yellow, sandy limestone, and considerable yellow clay between the layers.

At 105 ft., the rock became very broken, and layers of blue-clay or a dark mud several inches thick, lay between the layers from 105 ft. to 107 ft. 06 in. The cuttings in the hole got very thick in 2½ ft. of drilling, due to the clay and rock sluffing into the well.

At 105 ft., 120 gallons of water was bailed from the well, doing all bailing from the bottom of the well. The bailer was then purged on the bottom of the well, and in 5 gallons of water, approximately 2 quarts of pure sand was obtained. At 107 ft. 6", bailing was repeated, but not quite as much sand fed into the well.

At 110 ft. bailing was repeated with not over 1 pt. of sand in 5 gallons of water.

At 115 ft. the amount of sand was very slight.

At 120 ft. level, our water dropped to 56 ft. 10 in., and the cutting came clean from the well.

At 125 ft. the static level remained the same, and the cuttings still clean.

At 130 ft. the cuttings was quite thick, indicating there was not much in-feed between 125 ft. and 130 ft.

Drilling was discontinued at this depth, and the pump from well #4 was shut down at 7:35 P.M. March 1st, and was not started until 8:30 A.M. March 2nd.

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WELL DRILLING, ELECTRIC PUMPS

and SUPPLIES

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WEST BRANCH, IOWA

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Drilling was then continued through a lead colored rock mixed with a light dolomite, to 145 ft. This rock between 130 ft. and 145 ft. was every bit as porous as the rock between 117 ft. and 125 ft.; and the cuttings were clean in 5 runs. The rock between 145 ft. and 148 ft. was mixed with shale and 148 ft. to 150 ft. was pure blue shale.

Drilling was discontinued at this depth, and a test pump was set in well #5 and started at 7:20 A.M., March 8.

This pump started drawing the water to the bottom of the bowl at 110 ft., pumping 80 GPM.

At 10:45 A.M. well pumped 80 GPM
At 11:50 A.M. well pumped 79 GPM
At 3:30 P.M. well pumped 74 GPM
At 5:53 P.M. well pumped 74 GPM
At 7:25 A.M., March 9, well pumped 74 GPM

The interesting part of this draw down is that in 6 hours 10 minutes, or at 3:30 P.M., the well had cut from 80 GPM to 74 GPM, and at 4:30 P.M., the pump in #4 hole which had been pumping 30 GPM since 7:30 A.M., refused to pump that gallonage, and was shut off at that time, and pump in #5 hole showed no change in gallonage when #4 shut down. But it is not known that #5 would have continued to hold at 74 GPM if #4 would have continued to pump.

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WEST BRANCH, IOWA

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The draw down in #3 hole is as follows:

March 8	7:19	A.M.	static level	52 ft. 2 in.	Both pumps shut
	8:20	A.M.	Pumping level	59 ft. 1 in.	down
	9:20	A.M.	Pumping level	68 ft. 1 in.	
	10:20	A.M.	Pumping level	72 ft. 4 in.	
	11:20	A.M.	Pumping level	75 ft. 11 in.	
	12:20	P.M.	Pumping level	78 ft. 04 in.	
	1:20	P.M.	Pumping level	80 ft. 05 in.	
	2:20	P.M.	Pumping level	81 ft. 10 in.	
	3:20	P.M.	Pumping level	82 ft. 07 in.	
	4:20	P.M.	Pumping level	83 ft. 03 in.	
	5:20	P.M.	Pumping level	81 ft. 07 in.	
	6:20	P.M.	Pumping level	80 ft. 03 in.	
	7:20	P.M.	Pumping level	79 ft. 08 in.	
	8:19	P.M.	Pumping level	79 ft. 05 in.	
	9:19	P.M.	Pumping level	79 ft. 03 in.	
	10:20	P.M.	Pumping level	79 ft. 04 in.	
	11:20	P.M.	Pumping level	79 ft. 06 in.	
March 9	12:19	P.M.	Pumping level	79 ft. 08 in.	
	1:19	A.M.	Pumping level	79 ft. 09 in.	
	2:20	A.M.	Pumping level	79 ft. 11 in.	
	3:20	A.M.	Pumping level	80 ft. 00 in.	
	4:20	A.M.	Pumping level	80 ft. 01 in.	
	5:20	A.M.	Pumping level	80 ft. 02 in.	
	6:20	A.M.	Pumping level	80 ft. 03 in.	
	7:20	A.M.	Pumping level	80 ft. 05 in.	

This hole shows our lowest draw down to be 83 ft. 03 in. at 4:20 P.M. March 8, or after 9 hour pumping. But the pump in #4 hole was shut off at 4:30 P.M., or 10 minutes after this test was made.

This #3 well showed a slight raise in water until 9:19 P.M. or for 5 hours after #4 shut down, and then it showed a slight draw down for the next 10 hours, gradually lowering from 79 ft. 03 in. to 80 ft. 05 in., or 1 ft. 02 in. of draw-down in those mentioned 10 hours; which is within 2 ft. 10 in. of the total amount of draw-down while both pumps were running.

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The pump in #5 hole was shut off at 7:20 A.M., March 9, and hole #3 showed a recharge as follows:

March 9	8:00	A.M.	Water level in well	76	ft.	11	in.
	8:29	A.M.	Water level in well	74	ft.	02	in.
	9:00	A.M.	Water level in well	73	ft.	--	in.
	9:43	A.M.	Water level in well	69	ft.	06	in.
	10:53	A.M.	Water level in well	66	ft.	10	in.
	12:00	Noon	Water level in well	65	ft.	--	in.
	12:47	P.M.	Water level in well	63	ft.	10	in.
	1:37	P.M.	Water level in well	62	ft.	10	in.
	3:00	P.M.	Water level in well	61	ft.	01	in.
	3:55	P.M.	Water level in well	60	ft.	04	in.

The town was low on water and the pump in well #4 was started at 4:00 P.M., and pump in well #5 was started at 4:40 P.M. Water levels in well #3 were as follows:

4:37	P.M.	Water level in well	63	ft.	05	in.
4:45	P.M.	Water level in well	63	ft.	--	in.
5:00	P.M.	Water level in well	66	ft.	02	in.

Measurements were discontinued at this time.

This hole with both pumps running, pumping at least 105 GPM for 9 hours, showed a draw-down of 31 ft. 01 in. But in the first 2 hours pumping, showed a draw-down of 16 ft. 11 in., or over $\frac{1}{2}$ of the total draw-down. The first 2 hrs. 23 minutes of recharge showed 10 ft. 11 in. compared to the last 2 hours with 2 ft. 06 in. recharge. This is due to the fact that as the water rises, it spreads back into a wider area similar to the slope of a funnel, and it takes a much larger number of gallons to show 1 ft. of recharge as the water reaches nears the static level, and the area enlarges.

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The draw down in the old well in the brick bldg. were as follows:

March 8	7:17	A.M.	Water level in well	52	ft.	08	in.
	8:17	A.M.	Water level in well	58	ft.	01	in.
	9:17	A.M.	Water level in well	67	ft.	01	in.
	10:17	A.M.	Water level in well	70	ft.	07	in.
	11:17	A.M.	Water level in well	72	ft.	09	in.
	12:17	P.M.	Water level in well	74	ft.	04	in.
	1:17	P.M.	Water level in well	77	ft.	02	in.
	2:17	P.M.	Water level in well	78	ft.	07	in.
	3:17	P.M.	Water level in well	79	ft.	03	in.
	4:17	P.M.	Water level in well	80	ft.	02	in.
	5:17	P.M.	Water level in well	79	ft.	06	in.
	6:17	P.M.	Water level in well	78	ft.	03	in.
	7:17	P.M.	Water level in well	77	ft.	10	in.
	8:17	P.M.	Water level in well	77	ft.	07	in.
	9:18	P.M.	Water level in well	77	ft.	09	in.
	10:17	P.M.	Water level in well	77	ft.	09	in.
	11:17	P.M.	Water level in well	77	ft.	10	in.
March 9	12:18	A.M.	Water level in well	77	ft.	10	in.
	1:16	A.M.	Water level in well	77	ft.	11	in.
	2:16	A.M.	Water level in well	78	ft.	--	in.
	3:20	A.M.	Water level in well	78	ft.	01	in.
	4:17	A.M.	Water level in well	78	ft.	02	in.
	5:16	A.M.	Water level in well	78	ft.	02	in.
	6:17	A.M.	Water level in well	78	ft.	02	in.
	7:17	A.M.	Water level in well	78	ft.	05	in.

Measurements were discontinued at this time.

This well does not seem to draw-down as freely as did well #3, and does not seem to recharge as rapidly as did #3. This is undoubtedly due to the fact that this well has been used for water supply for a greater number of years, and undoubtedly the pores in the rock directly around this hole are packed much tighter with the sediment than it is in well #3.

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WELL DRILLING, ELECTRIC PUMPS

and SUPPLIES

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WEST BRANCH, IOWA

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We are very sorry that our best cord in well #3 got tangled with the bolted column, and when the driller tried to raise this cord when he started checking the recharge, the cord broke, leaving about 63 ft. in the hole. Another cord could not be gotten past this broken one to check the recharge in well #3. But the pump will have to be removed from the well before this cord can be removed, and there was not time to do this within the recharging period.

Well #3 showed a total draw-down in 24 hours pumping, of 33 ft. 03 in. from peak static of 47 ft. -- in. allowing for the raise of 3 ft. in elevation between well #3 and #5, the water is still 34 ft. 07 in. higher at #3 than it is at #5, and well #3 is 400 ft. away from well #5. As #3 seemed to hold close to 60 ft. static level during the 24 hours, with a slight draw-down in the last 12 hours of pumping, it would indicate that 60 to 70 cwt could be pumped from well #3 for a considerable length of time; as #3 showed a recharge of 16 ft. 07 in. in 8 hours, which was 1 in. more than the draw-down in the latter 22 hours of pumping. It is my belief there is ample water supply stored in this rock to supply the town of Keosauqua if the water bearing channels can be kept from clogging as the water moves toward and into the wells.

As we pumped at least 124,000 gallons of water in 24 hours, which is at least twice as much as the peak consumption of the town, and we still showed a reasonable recharge.

3:57 P T.D 125 ft
State 56' 10" Inlet 36"
in 30 sec. Shutters 65-
min.

5:05 P - T.D 130 ft.
State 56' 7" Inlet 36"
in 30 sec.
Shutters 50 min.

4 to for No 5 to No 4.

State of No 3 65' - 6"

3:35 P

Old well 65' 3"

referred to top of camp of no. 3. Pump
running at least 10 hours.

Keta No 5 - Report from
Edwards over phone

Mar. 1., 1939 8:29A Station level
42'-10" Pump

66 minutes, runny shot lens:

5ft Infeed 33" 9:55A T.D. 105

run 8" pipe
at 52 level

Station 44' 2"
10:55A, T.D. 107' 6"

Station 43' 8"

Infeed 33" 8" pipe hole
Shell lens 35 - 25 ft.

and out much
between 103 & 105 ft

12:05 T.D. 110 ft

Station 44' 3" Infeed
36" 4 min 8" hole.

Shell lens 36 min

1:32P T.D. 115 ft

Station 44' 9" Infeed 37"

Shell lens 62 min

2:35P. T.D. 120 ft

Station 56' 10" Infeed 32" run

30 sec at 56' 10" station

Keota - Edwards No 5

Feb 28, 1939 - Report from H. W. Edwards on this

measuring Point top pipe and top drive clamp 6" above ground

0 - 62' - 2" drift. - Static level Feb. 27, 1939 @ 10:30 AM = 42' 8"

Bailed out water 4 barrels - 102.1 gal/barrel = 43 gal
Less than 1 gal/min infused

Drilled to 68' 6" - rock - Let well stand $\frac{3}{4}$ hr - D/W = 44' - 2" @ 12:30 P

65 min drilling time

Bailed out - let water run in - 2 ft min
in 8" hole = 5 gal/min.

75 ft

at 3:00 P.M. Static level 47 ft immediately after
drilling - Bailed out - infused 2 ft min = 5 gal/min

53 min drill. time
rock little harder

Pump running from 10:30 to 4:00 P.M.

80 ft

at 4:02 P.M. Static 46' 6"
Infused at 52 ft depth was $6\frac{1}{2}$ gal/min.

Water level in Edwards No 3. at 3:45 P.M. = 67' 6"

March 1, 1939 - Report from Edwards over phone

No drilling well cells from 5:30 P.M. Feb 27 to 1:15 P.M.
Feb 28. Static water level 40 feet at T.D. 80 feet. Pump
in No 4 not running

3:15 P.M. - T.D. = 90 feet. Static water level
immediately after tools withdrawn = 47 ft 6 inch
pumps running

4:12 P.M., T.D. = 95 feet - Static immediately after tools
taken out 49 ft

5:26 P.M. T.D. = 100 feet Static tools just out = 49' 6"