

Shilhaneck Well Drilling
Tama, Iowa (zip) 310 7th St.
Leonard F. 52339

Dear Mr. Shilhaneck:

4/6/76

Regarding the trouble in the Elberon town well, after reviewing all data, I am inclined to think the producing zones have become clogged in some way.

Hoeg & Ames, Inc. the drillers of this well report the only casing installed was 262 feet of 7-inch O.D. pipe. Our log shows unconsolidated glacial clay to 250 feet, sand and gravel from 250-265 feet, and limestone and dolomite representing the Devonian and upper 15 feet of the Silurian rocks between 265 and 635 feet. Although I am not sure, it is possible that sand and clay are moving into the well at the bottom of the casing just above rock. This interval should be effectively sealed.

Perhaps you can underream the hole below the casing for about 15 feet into the limestone, to 8-inch diameter, set a temporary plug below this in the 6-inch hole, fill the hole with cement five feet back up into the 7-inch O.D. casing, and then lower 5-inch liner pipe ^{with centering guides} into the cement to rest on the plug. The length of the liner pipe will be approximately 20 feet but you could add more if desired. After the

cement has set the ~~hole~~^{ceement} can be drilled out and the well bailed clean to bottom.

I would then treat the well with a polyphosphate ^{solution} which will break up the clay and allow it to be moved by surging and then pumped or bailed from the well. Use about 15-20 pounds of the chemical for each 100 gallons of water. The solution should be left in the well about 24 hours, but the treatment will be more effective if the ~~pump~~ is ~~removed and the~~ solution is agitated by turning the pump on and off occasionally or by using a surge plunger. A second ~~polyphosphate~~ treatment may be desirable, but you might ~~also~~ consider ^{pressure} acidizing the well with full strength inhibited hydrochloric acid first. About 1,000 gallons of acid should be used and placed in the hole from the bottom up with black pipe and then followed with ~~a~~ large quantities of water on top to force the acid out into the formation. The acid shouldn't be left in the well more than four hours or it will attack the casing and pump parts when the inhibitor breaks down.

Because the acid will precipitate ^{the} iron in solution in the water a final polyphosphate treatment is advised to disperse the iron sludge before pumping it to waste. The well capacity test can then be made.

If these steps do not restore some of the original production, they may have to drill another well. In this case, it would seem advisable to drill a 10-inch hole 15-20 feet into the top of the limestone and set and grout 7-inch O.D. pipe back to the surface. The remainder of the well can be a 6-inch open hole to a depth of about 500-600 feet. I hope this discussion will aid in solving the problem at Elberon. I will be very interested to hear what steps are taken and the final results. If any questions remain or if I can be of additional assistance in this matter, please let me know.

Vty,

RTK

STATE OF IOWA
IOWA GEOLOGICAL SURVEY
123 NORTH CAPITOL STREET
IOWA CITY, IOWA 52242
Phone: (319) 338-1173

MEMORANDUM

To: _____

Date: April 7, 1976

From: Michael J. Beunk

Re: Well call from Shilhanek Well
drilling

I ~~called~~ Mr. Shilhanek this morning for Mr. Paul Horick, and gave him the information which Mr. Horick had enclosed in a letter which was sent out last night. At that time, Mr. Shilhanek said that there was no problem with muddy water, but that the SWI had dropped about 90' as of about 1 year ago and was continuing to drop. He doubts that the producing zones are clogged.

I agreed to call him again that afternoon with more information. After calling him that afternoon, (see attached sheet) he still does not feel that the problem is due to clogging or other well failure. I think he is probably planning to try lowering the pump.

STATE OF IOWA
IOWA GEOLOGICAL SURVEY
123 NORTH CAPITOL STREET
IOWA CITY, IOWA 52242
Phone: (319) 338-1173

MEMORANDUM

To: Schlanik Date: _____

From: _____ Re: _____

Dec 13 83-13W
515 48-40422

~~Elberon~~
Elberon - 1953 645 TD.

slowing down

SWL was 90 1/2 yds ago
was ~~50~~ 50 gpm @ 160 ft

SWL now ?

pump at about 250
approx 8 gpm

casing ~ 260

Hoeg & Ames 473 2707

casing record Elberon

262' of 7" OD pipe
pump setting - unk.

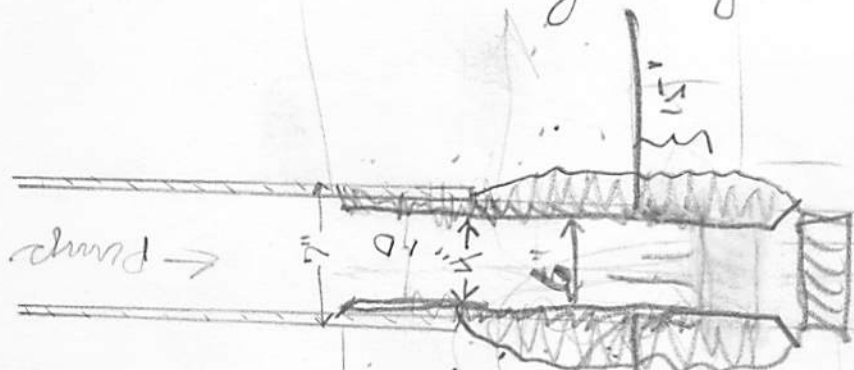
SWL 6' ? (1953)

5 gpm flowing in 40 sec.

TD 645

DD 120' @ 60 gpm

info. at time of drilling (1953)
no work since by Hoeg & Ames.



pumping case out

Elberon

4/7/76

For Shilhanek

The drop in SWI is so large it suggests either dramatic well failure or a big increase in the amount of water being withdrawn from the aquifer nearby.

Since Shilhanek says there are no wells nearby producing large quantities of water from the Devonian aquifer, well failure must be the cause. Either the aquifer is plugged in some way or water is escaping into the sand and gravel at the base of the drift which may be under much lower head than the Devonian.

I feel he must rebuild the well as I suggested to seal off the unconsolidated aquifer at the base of the drift. To do this he might have to set and grout liner pipe farther than 15-20 feet into the limestone because of crevices or a fractured condition in the upper part of the limestone, say 50' into the limestone.

PS Horick

IOWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey
RECORD OF WELL

W 6017

Location:

Town: ELBERON (NE)
(SW): County TAMA
sec. 12 T. 83 N., R. 13 W. Twp.

Well name and number Town of Elberon

Owner A Address _____

Tenant _____ Address _____

Contractor Hoes & Ames Address Lincoln, Iowa

Drillers _____

Drilling dates MAY - JUNE 1953

Well data:

Altitudes: Drilling curb _____ feet; Land surface _____ feet

Determined by _____

Topographic position _____

Total depth: Reported 635 feet, Measured _____ feet

Drilling method _____

Hole and casing data _____

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

Source of data _____

Sources of water: Principal _____

Others _____

Production Data

Date _____
 Static water level _____
 Measuring point _____
 Pumping water level _____
 Yield (g. p. m.) _____
 Duration of pumping _____
 Specific capacity _____

Pump Data

Type pump _____ Column diameter and length _____
 Cylinder or bowls diameter and length _____
 Suction pipe _____ Airline _____
 Power _____ Production _____ g. p. m. for _____ hours per day
 Use of water _____

Dissolved constituents and properties (in parts per million except as indicated)

Date sampled _____
 Sampled by _____
 Silica (SiO₂) _____
 Iron (Fe) _____
 Manganese (Mn) _____
 Calcium (Ca) _____
 Magnesium (Mg) _____
 Potassium (K) _____
 Sodium (Na) _____
 Carbonate (CO₃) _____
 Bicarbonate (HCO₃) _____
 Sulfate (SO₄) _____
 Chloride (Cl) _____
 Fluoride (F) _____
 Nitrate (NO₃) _____
 Dissolved solids _____
 Hardness (as CaCO₃) _____
 Total _____
 Grains per gallon _____
 Noncarbonate _____
 Alkalinity (as CaCO₃) _____
 pH _____
 Specific conductance _____
 (micromhos at 25°C) _____
 Temperature (°F) _____
 Analysis No. _____

Laboratory Data

Well No. **6017** Sample range **0-635** No. of samples **127**
 No. of dupls. and cond. **127** Good Washed range **265-635**
 Samples prepared by **NORTHUP** Date **JUNE 1953**
 Logged by _____ Date _____
 Correlations by _____ Date _____

LOCATION - EB6-3,4

file in well folder

June 2, 1953

MEMO:

RE: Well now drilling for Town of Elberon (Tama Co)
 FROM: JBC.

Chuck Lane called this morning from Celwein in regard to a request made from Sylvan Ames for information about a well they are now drilling for the Town of Elberon in Tama Co. Samples to 400 feet were received yesterday from Hoeg and Ames. These samples are from this well. Mr. Ames wanted to know as soon as possible where they were in the section. The well will now produce about 15 gpm. Chuck said Ames thought there might be a possibility of a flowing well at this location.

Elevation at Elberon as given by CM&StP. is 840'. The Tama County Home well in SE NE NW Sec. 2, T. 83 N., R. 15 W. is at an elevation of 1040' and has a SWL of 153'. TD 694' finished near top of Wapsi. Elberon is in Secs 12 & 13 T.83N., R. 13 W., about 14 miles East of the County Home. Another well drilled by H&A is the Sac & Fox School well in SW NW SE Sec. 19, T.83N., R.15W., about 17 miles West of Elberon. The elevation of this well is 916' and the SWL was 70'. TD 927' finished in top of Maquoketa Shale. I suppose it is these two wells which give Ames the idea that a flowing well may be developed at Elberon since the land surface elevation is much lower there. SWL elevation at the County Home well is 887' and is 846' at the Sac & Fox School. So there may be a possibility of a high SWL at Elberon.

Northup examined the sample interval from 300 to 400' from unwashed samples and feels confident that in the Elberon well the top of the ^{rapid} Solon is at 320' and that the material at 400' is Solon. Correllating this information with the Belle Plaine deep well it appears that the top of the Maquoketa Shale should be reached at around 700', or at a maximum depth of 740'.

The deep well at Belle Plaine, TD 1503' finished in the Root Valley, is at an elevation of 815', original SWL was 34'. SWL elevation of 781'. This well produced mainly from Galena, St. Peter & Root Valley. No record above Maquoketa.

The Tama Co. Home well produced 135 gpm, 1½' dd., & 230 gpm, 2½' dd...
 The Sac & Fox well produced 51 gpm, 83' dd.

It seems that a well drilled at Elberon to the top of the Maquoketa Shale at a total depth of approximately 700' should produce enough water for the town (1950 population: 256)

 Samples from this well are being processed now and will be studied in detail tomorrow.

 Suggest calling Sylvan Ames and giving him our ideas on this well. If there are major changes after samples are studied in detail we can repeat call.

 Quality of water developed above Maquoketa may be hard, although there is not believed to be gypsum in the Wapsi. as is present in wells farther west. No gypsum at Belle Plain, although present in Sax & Fox well.

(over)

2:00 pm June 2-53

Called Ames & told him where to expect top of
mag. etc.

He says well now is down 555' - no more.

Well flowed a little at surface - pumped at
10 PM.

JBC.

Finished since bring in more samples

June 4-53

JBC

9-26-69
RP 11-22-70

STATE		COUNTY		LATITUDE							LONGITUDE							SEQ. NO.
				DEG.		MIN		SEC		N or S			DEG.		MIN		SEC	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	9	8	6	4	2	0	0	2	9	N	0	9	2	1	9	0	1	1

IOWA DISTRICT WRD

WELL NO. 6017 CO TAMA
OWNER TOWN OF ELBERØN ADDRESS ELBERØN
DRILLER HØEG AND AMES DATE DRLD 6-24-1953
MAP _____
SOURCE OF DATA FILE
DESCRIPTION M. P. LSD FEET (ABOVE)
BELOW LSD _____

CONTINUED FROM ABOVE	ACCURACY	LOCAL WELL NUMBER										LOCAL USE										OWNER OR NAME	OWNERSHIP	WATER USE	WELL TYPE	WELL DATA	FREQ W/L	FIELD CHAR	HYD LAB	QW-DATA	QW-FREQ.	PUMPAGE	APERTURE	LOG DATA	CARD																									
		T	R	E	SEC	QUARTERS	W-NUMBER	OPTIONAL																																																				
		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39															40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
		2	0	8	3	1	3	W	1	2	C	C	C			0	6	0	1	7	/	/	5	3	T	O	W	N					E	L	B	E	R	O	N						M	P	W	6					G	A						

[illegible][illegible]

CODED BY HEXUM DATE 6/16/72

PUNCHED BY HEXUM DATE 6/72

VERIFIED BY _____ DATE _____

SKETCH ON REVERSE: YES _____ NO _____

A 4x4 grid with the number 12 in the center.

WELL NO. 601

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

6017
083-13W-12 CCC
TOWN OF ELBERON

Water Quality
(ppm)

Card Q

State: IOWA 1 9 County: TAMA 8 6 Town: ELBERON

Well No. 4 2 0 0 2 9 N Latitude 0 9 2 1 9 0 1 Longitude 1 Seq. No. 1 Date 0 6 0 8 5 3

Sampling Depth 6 3 5 Type 1 Kx10⁶ 1 pH 7.6 Temp. °F 1

SiO₂ 1 Ca 1 3 8 Mg 4 6 Na 3 1 5 K 2 0

HCO₃ 3 1 0 CO₃ 0 SO₄ 9 1 0 Cl 1 8 Source No. 3 Q

Card R

Duplicate Columns 1-25 from Card Q

F 2 4 NO₃ 0 PO₄ 1 B 1 Al 1 Fe 1 5

Mn 0 Cu 1 Pb 1 Zn 1

Solids 1 6 8 8 Calc. 1 6 8 8 Ca, Mg 5 3 4 Hardness 2 8 0

Color 1 No. R

Card S

Duplicate Columns 1-25 from Card Q

Br 1 I 1 Alk. as CaCO₃ 2 5 4 Free CO₂ 1 SAR 1

RSC 1 ABS 1 1

Alpha (pc/l) 1 Beta (pc/l) 1 Ra (pc/l) 1 U (ug/l) 1

No. S
80

Recorded by: HEXUM

Punched by: MACGOWAN Date: 6/72

Published: _____