

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

W 8350

Location: IN TOWN

(N E)
Town: IOWA FALLS (S W) : County HARDIN
E.
sec. 13 T. 89 N., R. 21 W. Twp.

Well name and number _____

Owner IOWA FALLS CITY WELL (1957) Address _____

Tenant _____ Address _____

Contractor LAYNE-WESTERN Address _____

Drillers _____

Drilling dates JUNE 1957

Well data:

Altitudes: Drilling curb _____ feet; Land surface 1069 feet

Determined by _____

Topographic position _____

Total depth: Reported 215 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 _____

Mr. Jack L. Clapsaddle

2

December 8, 1959

We hope this discussion will aid you in solving the Iowa Falls water problem. If there are any questions remaining or if we can be of further assistance in any way, please feel free to write us.

Very truly yours,

H. G. Hershey

PJH:jj

Enc.

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 (SiO ₂)	_____	_____	_____	_____
Iron (Fe)	_____	_____	_____	_____
Manganese (Mn)	_____	_____	_____	_____
Calcium (Ca)	_____	_____	_____	_____
Magnesium (Mg)	_____	_____	_____	_____
Potassium (K)	_____	_____	_____	_____
Sodium (Na)	_____	_____	_____	_____
Carbonate (CO ₃)	_____	_____	_____	_____
Bicarbonate (HCO ₃)	_____	_____	_____	_____
Sulfate (SO ₄)	_____	_____	_____	_____
Chloride (Cl)	_____	_____	_____	_____
Fluoride (F)	_____	_____	_____	_____
Nitrate (NO ₃)	_____	_____	_____	_____
Dissolved solids	_____	_____	_____	_____
Hardness (as CaCO ₃)	_____	_____	_____	_____
Total	_____	_____	_____	_____
Grains per gallon	_____	_____	_____	_____
Noncarbonate	_____	_____	_____	_____
Alkalinity (as CaCO ₃)	_____	_____	_____	_____
pH	_____	_____	_____	_____
Specific conductance	_____	_____	_____	_____
(micromhos at 25°C)	_____	_____	_____	_____
Temperature (°F)	_____	_____	_____	_____
Analysis No.	_____	_____	_____	_____

Laboratory Data

Well No. V 8350	Sample range 0-215	No. of samples 43
No. of dupls. and cond. 43 Good	Washed range 5-215	
Samples prepared by V. DOW	Date 6/20/57	
Logged by NORTHUP	Date 6/20/57	
Correlations by "	Date 6/20/57	

JUN 18 1957

COLLINS, THOMPSON and WILLIS
Professional Engineers

ELDON M. COLLINS, P.E.
DONALD H. THOMPSON, P.E.
WARREN W. WILLIS, P.E.

815 North Third Avenue
MARSHALLTOWN, IOWA
Phone 2-0859

Algona, Iowa
MORTON W. BITTINGER, P.E.

June 17, 1957

Mr. H. G. Hershey, Director
Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Dear Sir:

We are sending under separate cover drilling samples from a new 12" well just completed in Foster Park in Iowa Falls. This well is located at a point 75 feet from Test Well No. 1 which was drilled last fall and for which you have the pertinent information in your files. The ground elevation at the site of the new 12 inch well is 1069 feet and the well is 221 feet deep.

*Samples coming
Give top priority
H*

A preliminary pumping test indicates a yield of about 350 G. P. M. at a draw down elevation of 945 feet. Static water level elevation is 1060 feet. This test was made June 12, 1957.

The well was acidized Friday, June 14, and a complete pumping test is scheduled for Monday, June 17.

The preliminary pumping test indicated the most productive aquifer to be at a depth of 50 to 80 feet from the top of the well. The well is cased and grouted to a depth of 50 feet followed by 170 feet of uncased 12 inch hole.

We are quite interested in receiving your analysis of these drilling samples. There is an indication that the log of this well and the log of Test Well No. 1, referred to above, will differ, even though they are only 75 feet apart.

Yours very truly,

Jack L. Clapsaddle
Jack L. Clapsaddle, P. E.

JLC/cr

1069
945
124

Hardin

JUN 25 1957

June 21, 1957

Mr. Jack L. Clapsaddle
Collins, Thompson and Willis
815 North Third Avenue
Marshalltown, Iowa

Dear Mr. Clapsaddle:

city #4

We have now completed a study of the Iowa Falls city well in Foster Park, and a copy of the geologic log is enclosed for your records.

The section and thickness of the rock units is quite similar to Test Hole No. 1 and the other tests drilled late in 1956. The new well appears to have a very good yield and the section from 50 feet to 80 feet indicates that the water is coming from the upper part of the Maynes Creek dolomite member of the Hampton formation. The good yield of water may be attributed to a creviced zone and developed joint pattern in the rock at this point. Also the acidization program probably improved the specific capacity of the well. As the well location is close to the Iowa River, there is a possibility of permanent recharge here. Close observation over a period of time to check the capacity pumping level, recovery time, temperature, etc. may throw more light on the latter problem.

Please let us know if we can be of further assistance in any way.

Very truly yours,

H. G. Hershey

HGH:RCN:L
Enclosure

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STATE OF IOWA

IOWA NATURAL RESOURCES COUNCIL

STATE HOUSE
DES MOINES 19. IOWA

OTHIE R. MCMURRY, DIRECTOR
R. G. BULLARD, WATER COMMISSIONER

AUG -1 1958

July 31, 1958

Dr. H. Garland Hershey
Iowa Geological Survey
Geology Annex
Iowa City, Iowa

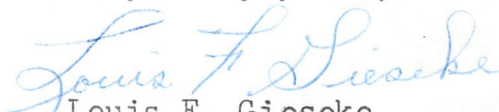
Dear Dr. Hershey:

Within the last year, the City of Iowa Falls has constructed two new wells in the NW 1/4 of Section 13, T89N, R21W, 5th P.M. These two wells are known as well No. 4 (Foster Park Well) and well No. 5 (Elk Run Well). Withdrawal from well No. 4 is authorized by Water Commissioner's permit No. 19, dated March 14, 1958, and the application for well No. 5 is now being processed.

At the recent hearing on well No. 5 (Elk Run Well) it was indicated that there may be considerable interference between well No. 5 and a creamery well of approximately the same depth about 1/4 mile away. The city representative indicated that this interference may be in the range of 40 to 50 feet or more of additional draw-down in the creamery well. The exact location of the creamery well is not known to us. The creamery owners did not appear at the hearing and the city representative indicated that a workable solution between the city and the creamery owners would be worked out in the future. The exact amount of interference when both wells are pumping was not known at the time of the hearing, but the city representative was confident that an agreement could be reached.

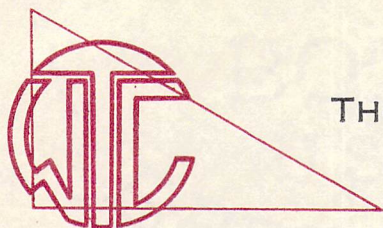
According to testimony on record, your department has logs and copies of pumping tests on wells No. 4 and No. 5. Any comment you can make on the groundwater supply in this area and the above noted interference will be appreciated.

Very truly yours,


Louis F. Gieseke
Deputy Water Commissioner

LFG:dlj

AUG - 5 1958



THOMPSON, WILLIS & CLAPSADDLE

Professional Engineers

101A WEST STATE STREET
MARSHALLTOWN, IOWA
PHONE 4681

August 4, 1958

Mr. H. G. Hershey, Director
Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Dear Mr. Hershey:

We have your inquiry of August 1, concerning the new municipal wells at Iowa Falls, and are pleased to pass the following information on to you.

<u>Well No.</u>	<u>Size</u>	<u>Depth</u>	<u>Cased and grouted depth</u>	<u>Static WL</u>	<u>Draw- Down</u>	<u>Pumping Level</u>	<u>GPM</u>
4(Foster Park)	12"	220'	51'	12'	110	122	420
5(Elk Run)	12"	232'	56'	12	126	138	200

The elevation of the No. 4 pump pedestal is 1072.5. The elevation of the No. 5 pump pedestal is 1074.5. In both wells the top of the bowls are 170' down.

If we have failed to include herein all the information you desire, please feel free to inquire further. We are glad to furnish you with any information we have available.

Yours truly,

Jack L. Clapsaddle
Jack L. Clapsaddle, P. E.

JLC/cr.

August 5, 1958

Mr. Louis F. Gieseke
Deputy Water Commissioner
State House
Des Moines 19, Iowa

Dear Mr. Gieseke:

In reply to your letter of July 31 concerning the ground-water conditions and the interference effects of the new municipal wells No. 4 and No. 5 at the city of Iowa Falls, Iowa, we have reviewed the available information in the files of the State-Federal Geological Survey investigations. Pertinent data and comments on this subject are summarized as follows.

City wells No. 4 (Foster Park) and No. 5 (Elk Run) are located on the south and north banks of the Iowa river and derive their water from limestone and cherty dolomite strata of Mississippian age above the Maple Mill shale. Well No. 4 reportedly produced 350 g.p.m. with 115 feet of drawdown during a preliminary pumping test made June 12, 1957. The static and pumping water levels were reported as 9 and 124 feet below the surface. We have not received a complete test on this well which was scheduled after acidizing the water beds, or of well No. 5. On the basis of the preliminary test on well No. 4 it is apparent that fairly large quantities of water can be withdrawn from the Mississippian aquifer in this vicinity. However, the yield from these rocks will vary locally depending on the presence of large crevices or open joints which permit the water to reach the pumped well. The river water may form a source of recharge either directly at outcrops of the bedrock or indirectly through alluvial materials on the bed of the river. Acidizing the wells probably increased the yields to some extent. Therefore, some interference may occur in other wells nearby producing from the same aquifer that will lower their pumping levels. The amount of interference at the creamery well can not be determined accurately without a controlled pumping test in which at least one well, in addition to the pumped well, is used for water level measurements. It would also be preferable to pump both city wells while measuring the water level in the creamery well. The data obtained from such a test should be adequate to determine how serious the interference will be and what the

Mr. Louis F. Gieseke

2

August 5, 1958

new pump setting would have to be at the Creamery well.

We are writing for the final pumping test results from the new city wells. Copies will be forwarded to you if you so request. We hope this information will give you a better understanding of the local ground water conditions. If there are any questions remaining or if we can provide you further information on this matter, please let me know.

Very truly yours,

H. G. Hershey

PJH:m

CLAPSADDLE ENGINEERING COMPANY

DEC 7 1959

CONSULTING ENGINEERS

JACK L. CLAPSADDLE
Registered Civil EngineerPhone: FOrrest 6-2620
CONRAD, IOWA

Dec. 3, 1959

Dr. H. Garland Hershey, Director
Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Dear Dr. Hershey,

We would very much like to have your opinion on a matter in connection with the municipal water supply at Iowa Falls, Iowa.

You may recall that in 1957-8 the City constructed two new wells to augment the supply, at which time much valuable data and assistance was received from your office. After these wells had been in production for about a month a mineral analysis was made of a sample from each well. As we recall, the iron content in one sample was negligible and about 0.2 or 0.3 ppm in the other sample. We are now obtaining containers for another analysis as there is evidence to indicate that the iron content is now much higher, possibly in the 1.0 to 1.5 range. There is physical evidence of iron floc and the city is receiving many complaints.

These wells were acidized under pressure following construction (the driller objected to the method, preferring to acidize under atmospheric pressure and "surging" the acid). Mr. Guy Burton, Water Superintendent, now recalls that during acidizing the driller commented that the pressure method had been known to increase the iron content of the resulting water supply.

Within the range of our limited knowledge of the subject we find no basis upon which to accept such a statement. Your comments will be awaited with much interest.

Yours Very Truly,

Jack L. Clapsaddle
Jack L. Clapsaddle, P.E.

JLC/c

Handwritten:
Hardsin
Iowa Falls

December 8, 1959

Mr. Jack L. Clapsaddle, P.E.
Clapsaddle Engineering Company
Conrad, Iowa

Dear Mr. Clapsaddle:

In Dr. Hershey's absence we are replying to your letter of December 3 concerning the problem of excess iron in the municipal water supply at Iowa Falls, Iowa.

A review of the water analyses of the two new city wells drilled in 1957-1958, and known as the Foster Park and Elk Run wells, and the three older city wells known as city wells No. 1, No. 2, and No. 3, is summarized on a separate sheet included with this letter. Note that the iron content of the new wells is considerably less than that of the old wells although still higher than the estimates you gave in your letter. If another water sample is collected from the new wells and the iron content is found to be in the range of 1.0 to 1.5 p.p.m. this would not appear to be unusual because the old wells producing from the same aquifer average 1.23 p.p.m. iron. Therefore, we think that the physical evidence of iron flocculent you refer to may be attributed to iron precipitate in the mains and probably also in the well above the lowest pumping water level. Their problem may be one of corrosion control, rather than excessive iron. A mixture of chlorinated lime or Calgon may clean out the iron rust and stabilize the iron dissolved in the water and prevent iron pick-up from pipes and the resulting red-water trouble.

The driller's comments that the pressure method of acidizing a well has been known to increase the iron content of the resulting water supply, might apply in certain cases. For example, we believe that certain genera of iron bacteria may be introduced into a well by drilling tools, casing, etc. in the course of drilling. When the slug of acid is placed in the well, the use of pressure to force the acid into the surrounding aquifer may carry iron bacteria along with ^{the} acid-water mixture. If the bacteria become lodged in the formation and grow, the water supply may show an appreciable increase in iron content that may be difficult to remove. However, if the well is chlorinated during drilling, this probably will not happen.

IOWA GEOLOGICAL SURVEY
TABULATION OF WATER ANALYSIS
(Dissolved constituents in parts per million)

[illegible]

NOTES:

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