

IOWA GEOLOGICAL SURVEY
Iowa City, Iowa
Generalized Well Log
Based on Examination of Drill Cuttings

Name of Well Duncombe Park Well #1 Survey No. W. - 1931
 Location SW¹/₄ NW¹/₄ NW¹/₄, Sec. 3, T. 88 N., R. 27 W. County Webster
 Total depth 974 ft. Drilled by Layne-Western Co. Date Nov. 1944 to Jan. 1945
 Curb elevation 1115 ft. Static level 48.75 ft.; Drawdown 47.8 ft. at 37 gal. per min.
 Casing and hole size record 251' of 10" pipe from 0 to 251' (cemented in from 0' to
50'); 56' of 8" liner from 234 to 290' (slotted from 251' to 290'); open 8" hole
from 290' to 974'

Description of Formation	Thickness	Depth in feet	
		From	To
Pleistocene system (undifferentiated)			
1. Soil, black, sandy	5	0	5
2. Till, buff, oxidized, unleached, very sandy, many pebbles	10	5	15
3. Till, drab, unoxidized, very sandy, containing coarse pebbles	80	15	95
4. Sand	8	95	103
5. Till, drab	57	103	160
6. Gravel, very coarse, 5 to 25 mm, igneous, dolomite, and limestone	10	160	170
7. Sand, brown, fine- and medium-grained	15	170	185
8. Till, drab, sandy	25	185	210
9. Sand and gravel	25	210	235
Mississippian system			
Iowa series			
Osage group			
Warsaw formation			
10. Limestone, cream, fine-grained	9	235	244
11. Shale, cream, oxidized, calcareous, sandy	1	244	245
12. Dolomite 80%, drab, fine-grained, saccharoidal, cherty, calcareous, silty. Chert 20%, gray, watery, banded, conchoidal	15	245	260
13. Shale 50%, light gray, dolomitic. Dolomite 35%, drab, very fine-grained, cherty. Chert 15%, white and light gray, conchoidal, translucent	15	260	275

	<u>Description of Formation</u>	<u>Thickness</u>	<u>Depth in Feet</u>	
			<u>From</u>	<u>To</u>
14.	Chert 55%, light gray and drab, conchoidal, translucent, banded, quartzose. Dolomite 45%, drab, cherty, silty Gilmore City formation	5	275	280
15.	Limestone, cream, fine-to medium-grained, crystalline, phenoclastic, oolitic and pseudo-oolitic, calcitic Kinderhook group Hampton formation Iowa Falls member	90	280	370
16.	Limestone, cream, medium-grained, crystalline, in fine matrix, pseudo-oolitic Eagle City member	25	370	395
17.	Limestone, drab, fine medium-grained, crystalline, oolitic	20	395	415
18.	Limestone, beige, very fine-grained to sublithographic, dolomite rhombs embedded. Dolomite 40% from 440 to 450 feet, tan, medium-grained, crystalline Maynes Creek member	40	415	455
19.	Dolomite 65%, gray, medium-grained, saccharoidal. Limestone 35%, drab, fine-grained	5	455	460
20.	Dolomite 90%, gray, fine-medium grained, calcitic. Chert 10%, gray, conchoidal, opaque	15	460	475
21.	Dolomite, gray, fine- to fine medium-grained, dense	15	475	490
22.	Dolomite 80%, light brown, saccharoidal, oolitic, porous. Chert 20%, light gray and light brown, conchoidal, opaque	50	490	540
23.	Dolomite, yellowish brown, fine medium-grained, crystalline; grading into limestone, cream. Sand 5%, fine-grained. Calcite abundant English River formation	10	540	550
24.	Dolomite 70%, brown, fine medium-grained, sandy. Sandstone 30%, gray, very fine-grained, highly dolomitic. Marcasite present Devonian system Upper Devonian series Sheffield formation	5	550	555
25.	Shale, light gray, dolomitic, disintegrated	25	555	580

	<u>Description of Formation</u>	<u>Thickness</u>	<u>Depth in feet</u>	
			<u>From</u>	<u>To</u>
26.	Dolomite, cream, yellow and gray, fine medium-grained, crystalline, slightly vesicular. Marcasite throughout Lime Creek formation	20	580	600
27.	Limestone, cream, very fine-grained to sublithographic, subconchoidal. Shale trace, light green, dolomitic	25	600	625
28.	Dolomite, yellow, fine medium-grained; dolomite, light gray, medium-grained. Limestone, cream, sublithographic. Shale 30% from 640 to 645 feet, green	20	625	645
29.	Dolomite, yellow, fine medium- to medium-grained, crystalline, calcareous. Shale 20% from 665 to 670 feet, green	45	645	695
30.	Dolomite 85%, brown, fine-grained, granular, argillaceous. Shale 15%, grayish green, pyritic	10	695	705
31.	Dolomite, tan, very fine-grained, crystalline. Shale 20% from 725 to 730 feet, light gray, pyritic	25	705	730
32.	Shale 90%, light gray, dull, disintegrated, dolomitic. Dolomite 10%, very light gray, sublithographic, subconchoidal	25	730	755
33.	Dolomite, medium gray, fine medium-grained, crystalline	25	755	780
34.	Shale 60%, light gray, dolomitic. Dolomite 40%, light gray, very fine-grained, saccharoidal Cedar Valley formation	10	780	790
35.	Dolomite, buff, fine medium-grained. Shale trace, gray and green; shale partings, brown. Sand trace from 835 to 845 feet and 855 to 870 feet. Chalcedony 5% from 835 to 845 feet, white, vitreous, translucent	85	790	875
36.	Dolomite 90%, brown, fine-grained, granular. Shale 10%, grayish green and brown	20	875	895
37.	Limestone, light brown, fine-grained, crystalline	10	895	905
38.	Dolomite 30-70%, medium gray, fine medium-grained; grading into limestone 30-70%, yellow, very fine-grained to sublithographic. Sand 5% from 920 to 955, medium-grained, round, frosted. Shale 5% from 920 to 955, green	50	905	955

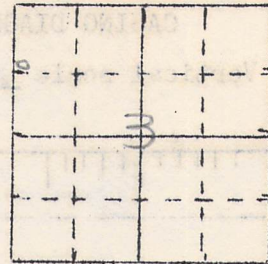
<u>Description of Formation</u>	<u>Thickness</u>	<u>Depth in Feet</u>	
		<u>From</u>	<u>To</u>
Independence formation			
39. Shale, green, dolomitic, silty	15	955	970
40. Shale 70%, green; shale 30%, brown	4	970	974

T.D. - 974*

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

W-1931

RECORD OF WELL



Location:

Town: Duncombe (N E)
(S W); County Webster
K.
SW - NW - NW sec. 3 T. 88 N., R. 27 W. Washington Twp.

Well name and number Duncombe Town Well (Park Well #1)

Owner Town of Duncombe Address _____
Tenant _____ Address _____

Contractor Layne - Western Address Ames

Drillers Earl Speed

Drilling dates October 14, 1944 to January 22, 1945

Well data:

Elevations: Drilling curb 1115 feet; Land surface 1114 feet

Determined by W E H

Topographic position upland

Total depth: Reported 974 feet, Measured _____ feet

Drilling method cable tool

Hole and casing data 251' of 10-inch casing from 0-251 feet
(Give amount, size, kind, and depth of all casing; type and
(cemented in from 0 to 50 ft) 56' of 8-inch lines from
position of seals and packers; cementing; how finished--perforated pipe, screen,
235 to 290 ft (slotted from 251 to 290 ft. 8-inch open hole
gravel pack, open hole, etc.)
from 290 to 970 ft.

Original depth to water 49.2 ft. ^{above} _____ Date _____

Original elevation of water level 1066.3 ft.; Source of data W. E. H.

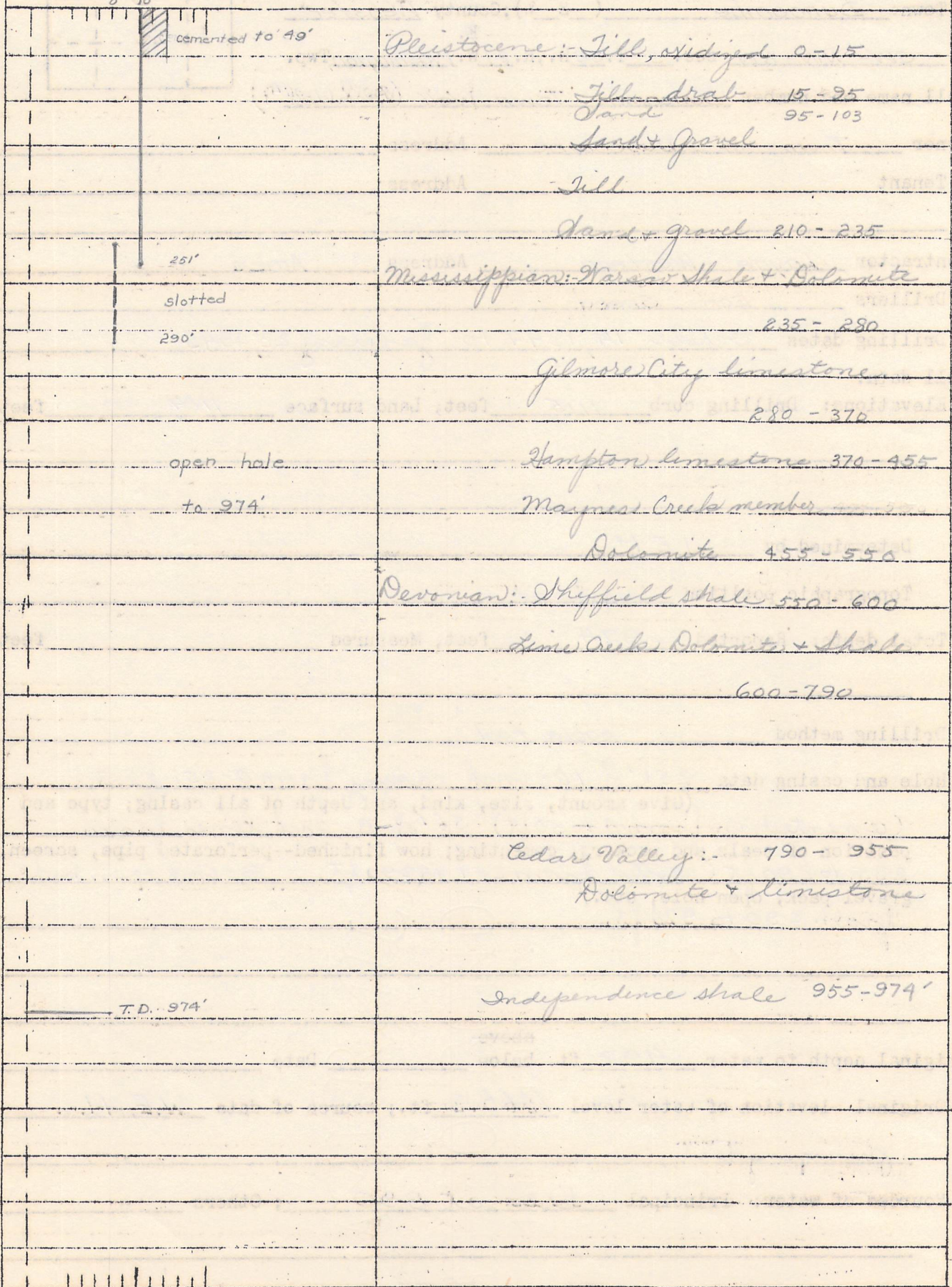
jumping test

Sources of water: Principal Dev at 890; Others _____

CASING DIAGRAM

LOG

Vertical scale $\frac{3}{4}'' = 100'$



Production data:

Date Jan 25 1945

Static depth to water 49.22

Measuring point top wood clamp 1.4' above land

Pumping level 86

at 33 g.p.m.

97.7

37

Specific capacity .38 g.p.m. per ft. drawdown; Temperature 50 1/2 °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 sampled	<u>Jan 25 1945</u>	_____	_____	_____
Sampled by	<u>W.E.H.</u>	_____	_____	_____
Total solids	<u>642</u>	_____	_____	_____
Insoluble matter	<u>2.5</u>	_____	_____	_____
Alkalinity (Meo)	<u>438.0</u>	_____	_____	_____
Alkalinity (Phn)	<u>0.0</u>	_____	_____	_____
pH	<u>7.4</u>	_____	_____	_____
Fe ₂ O ₃ + Mn ₂ O ₃ +Al ₂ O ₃	<u>3.5</u>	_____	_____	_____
Alkali as sodium	<u>71.7</u>	_____	_____	_____
Calcium	<u>105.4</u>	_____	_____	_____
Magnesium	<u>31.2</u>	_____	_____	_____
Iron (unfiltered)	<u>1.4</u>	_____	_____	_____
Manganese	<u>0.00</u>	_____	_____	_____
Nitrate	<u>tr</u>	_____	_____	_____
Fluoride	<u>1.2</u>	_____	_____	_____
Chloride	<u>3.7</u>	_____	_____	_____
Sulfate	<u>133.3</u>	_____	_____	_____
Bicarbonate	<u>534.4</u>	_____	_____	_____
Hardness (ppm)	<u>394</u>	_____	_____	_____
Hardness (gpg)	<u>23.0</u>	_____	_____	_____

Remarks _____

Laboratory data: _____ Sample storage location _____

Sample range 0 - 974 No. spls. _____ No. dupls. & cond. _____

Spls. prepared by Dick Rush Washed range 240 - 994 by Dick Rush

Driller's log and cond. _____

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

Microscopic study Schultz Harris strip log

Gen. log Schultz Correl. by SEH

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington
District
6-9333

Duncombe Town Well No. Park Well

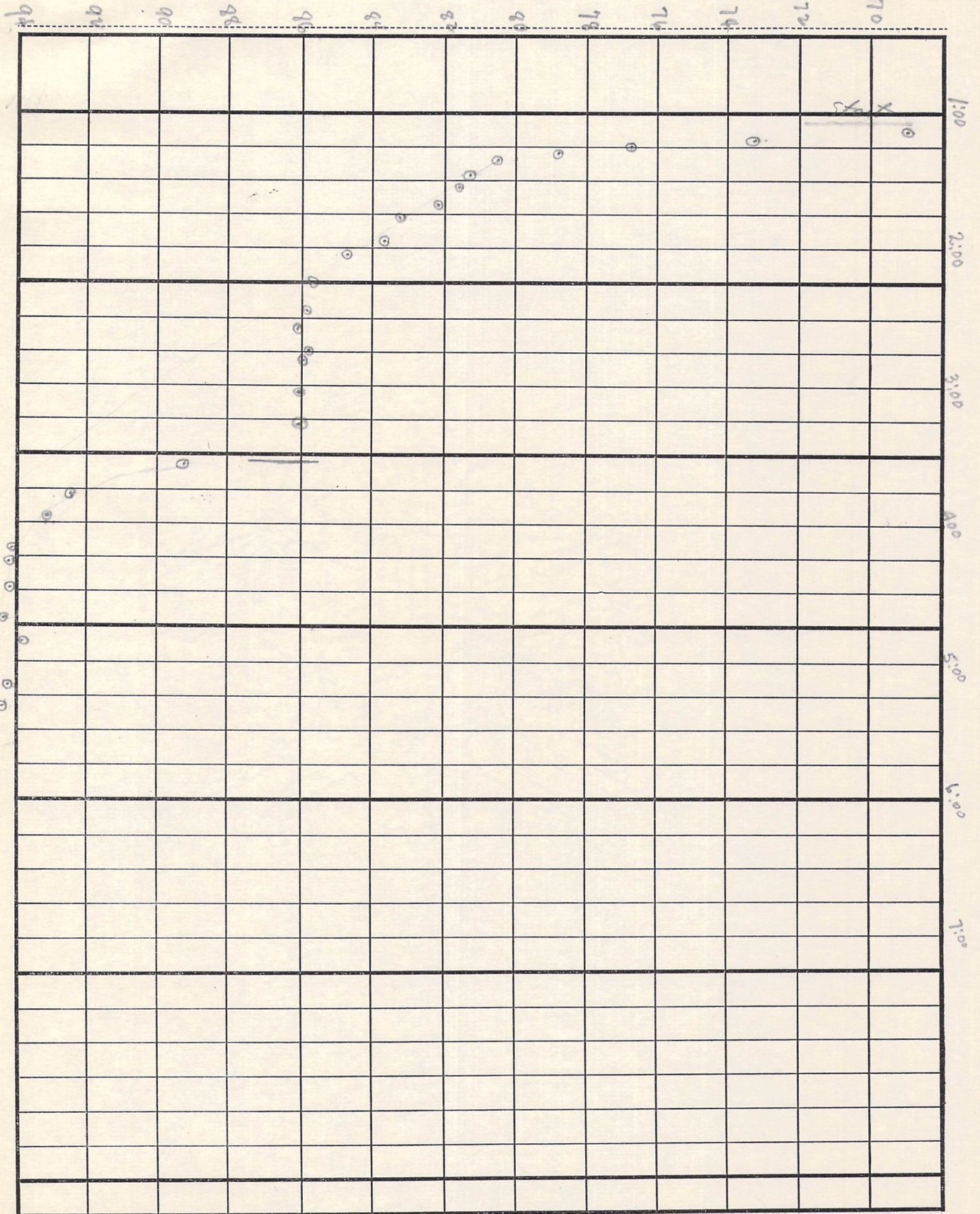
January 24, 1945

Time	Depth to water (feet)	Discharge Gallons per minute	Remarks
Jan 24 8:40	49.22		Static level
9:15	49.20		
10:20	49.65		Testing lift pump set up, pumped a little water
Jan 25			
10:20a	49.10		
10:30	49.12		
10:33			Started pumping
10:38	105±		Pumping air, shut down
10:42	67.5		
10:45	53.5		
10:46 10:51			Pump closed Pump air shut down
10:52	94.5		
10:53	81.00		
10:54	70.4		
10:55	63.3		
10:56	58.2		
10:57	54.6		
10:58	52.5		
10:59	51.55		
11:00	51.08		
11:01	50.72		
11:10	49.75		
11:11			Pumping started
	84	84	
11:16	105		shut down, pumping air
11:17	98.0		
11:18	83.3		

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Duncombe (Park Well)

File No. { Washington
District
GPO 6-9333



Driller's log at Duncombe

0-5' - Black soil
 5'-10' - Yellow clay, sandy
 10'-95' Blue clay, Hard
 95'-103' Sand
 103'-105' Boulder
 105'-115 Sandy shale
 115'-140' shale
 140'-155 Sandy shale, (water)
 155'-156 Boulder
 156'-165 Coarse gravel & sand mixed
 with gray shale
 165-170 Lime streak
 170-180 Coarse packed gravel
 180-190 Blue shale
 190-220 Sand & shale
 220-225 Packed sand & water gravel
 225-239 Sandy shale
 239-241 Lime & boulders
 241-244 Coarse sand & gravel
 244-245 white shale
 245-255 Sand flint
 255-275 Lime & shale
 275-282 Lime & flint
 282-284 Light shale, sticky (liner set at 290')
 284-320 Gray line
 320-325 white shale & line
 325-350 Gray line
 350-460 white lime & shale
 460-500 Dark gray line (ceivers at 465-485)
 500-535 Coarse line some shale streaks, pretty loose
 535-560 Fine dark lime, very hard
 560-580 Gray hard shale, ceivers at 555
 580-600 Dark gray line, some shale, ceivers at 593
 600-640 Gray line ceivers at 605-630
 640-645 Gray line, very hard

645-650 Blue shale
 650-670 Gray line, hard
 670-690 Brown line
 690-705 Blue shale & lime
 705-720 Dark brown lime, hard
 720-730 Gray line, hard
 730-745 Gray shale
 745-760 Gray lime & shale, hard, mixed
 760-780 Blue lime, fine & hard
 780-795 Gray lime & shale, very hard
 795-875 Gray lime
 875-880 Brown coarse line
 880-945 Gray fine lime hard (water level dropped
 from 30 to 45' at 890)
 945-974 Blue shale, little lime



August 21, 1942

Town of Durcombe

Inf. on city well collected from minutes of council meeting

Entry June 30, 1924 - Thorpe Bros labor on Well \$539⁰⁰Mr. Roach recalls that Thorpe cleared ^{out} old rods etc., lost in hole and then drilled deeper. He was on the job for about 2 months.

Entry Apr 21, 1920 - committee to construct well men were agreed to clean out old well or drilling new one.

Entry Feb. 27, 1911 - committee to construct well drilled on cost of drilling 8" to 10" well 250' deep.

Entry Apr 24, 1911 - Town to enter into contract with W^m McNames of PomfretMar. 4, 1912 - Bill of 438⁰⁰ from W^m McNames

Old Dug Well - about 6' in diameter to a depth of about 25' deep, was a drilled well. Pried well was about 500 feet deep

W^m Gleason

according to Frank

First well was drilled by Dally in about 1880 - 1900 to about 500 feet. Gravel? sand was struck at that depth. Put in screens but sand sheet off flow. Was shot out and sand rose to bottom of pit. Pit was dug through rocks, sand stone

Well was first drilled about 500' + • Water level stands about 40' below land surface.

3 1/2" cylinder 20" stroke - 20 strokes to the minute, and it usually pumped all night and part of the day about 12 hrs

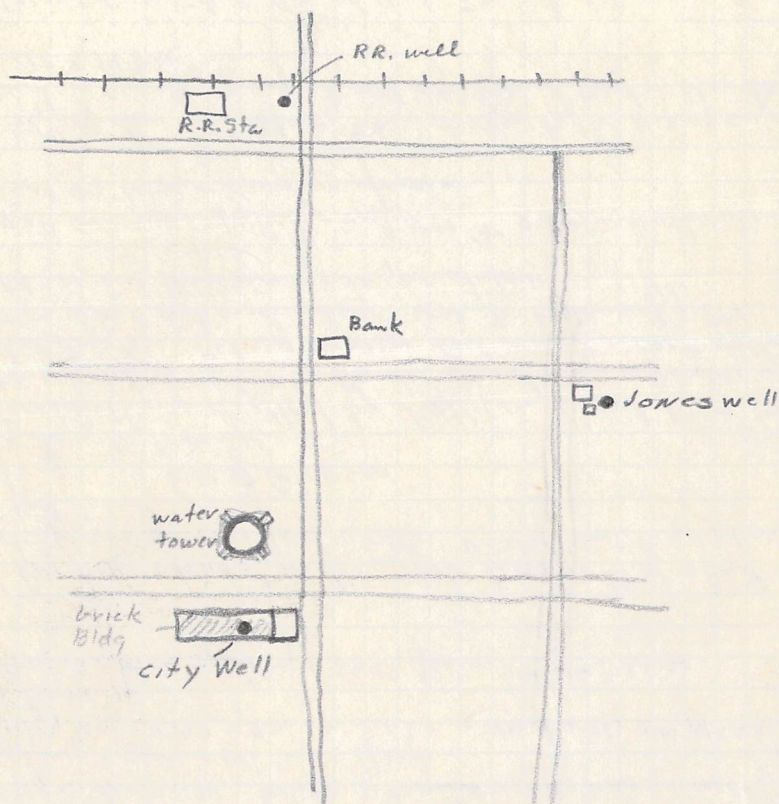
The sand reported in this well was white and not too fine grained

3.5

9

113

9.5



The bench mark to which these wells are tied is in the porch of the town bank and is stamped 1113? The bench mark is a U.S.G.S Marked made in cooperation with the state of Iowa.

The water mains have been in since 1900. There is no accurate source of data in regard to these wells

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

WELL SCHEDULE

Date _____, 19____ Field No. _____
Record by FLT Office No. _____
Source of data 165 F. 1es

1. Location: State Iowa County Webster

Map _____

_____ $\frac{1}{4}$ _____ $\frac{1}{4}$ sec. T _____ N _____ R _____ E _____
S _____ W _____

2. Owner: Duncombe Address Duncombe

Tenant _____ Address _____

Driller _____ Address _____

3. Topography _____

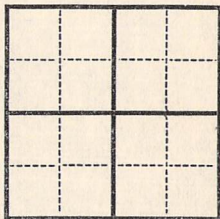
4. Elevation _____ ft. above
_____ below

5. Type: Dug, drilled, driven, bored, jetted _____ 19____

6. Depth: Rept. 432 ft. Meas. _____ ft.

7. Casing: Diam. _____ in., to _____ in., Type _____

Depth _____ ft., Finish _____



8. Chief Aquifer Mississippian From _____ ft. to _____ ft.

Others _____

9. Water level _____ ft. rept. _____ 19____ above
_____ meas. _____ below

_____ which is _____ ft. above
_____ below surface

10. Pump: Type _____ Capacity _____ G. M.

Power: Kind _____ Horsepower _____

11. Yield: Flow _____ G. M., Pump _____ G. M., Meas., Rept. Est.

Drawdown _____ ft. after _____ hours pumping _____ G. M.

12. Use: Dom., Stock, PS., RR., Ind., Irr., Obs. _____

Adequacy, permanence _____

13. Quality _____ Temp _____ °F.

Taste, odor, color _____ Sample Yes
No

Unfit for _____

14. Remarks: (Log, Analyses, etc.) _____

Mineral Analysis



Remember, Iowa cut

According to Gleason

The shallow wells in the town are all bored wells and on the average are about 50 feet deep and derive most of their water from gravel. In the SE. part of town the sand extends within a few feet of the surface and wells are put down by slaking the pipe and cleaning out the middle with a sand pump. The sand extends all the way to the gravel at about 40' to 50'. There is reported to be no water in the sand and when water is encountered in the gravel (so wells) are not too strong but will yield enough water for ordinary domestic use. There are a few old, old wells that are only 25 feet in depth and these probably go dry quite often. There are no other drilled wells in the immediate locality so far as I know.



Nov. 14, 1944

Webster, Co.

Duncombe

Duncombe Town Well - Loc. SW NW NW Sec. 3, T. 88 N.
 Driller: Earl Sneed R. 27 W.
 Contractor: Layne-Western Company Ele. 1114'

Placed 50 feet of 12" casing from +1' to 49'

Drilled 10" hole driving 10" casing. Set casing at 250'.

Then removed 12" casing and cemented 10" casing from 0 to 49 feet.

Drilling depth as of Nov 14, 253'

Drillers Log

- 0-5' Black soil
- 5-10' yellow clay, sandy
- 10-95' Blue clay, hard
- 95-103' sand
- 103-105' lime or boulder
- 105-115 sandy clay
- 115-140 shale clay
- 140-155 sandy shale (water)
- 155-156 lime streaks or boulder
- 156-165 coarse gravel & sand mud, and some water mud?
- 165-170 fine lime streaks
- 170-180 very coarse rock & gravel
- 180-190 blue shale
- 190-220 sand & shale
- 220-225 black sand & water gravel
- 225-235 - sand & shale mixed

Sneed reported that 300 gpm could be developed from the sand and gravel from 156 to 180 feet. The depth to water was 35 feet.

W. E. H.

U. S. DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Water Resources Division Well Schedule Form

MASTER CARD

Well Number **42, 28, 03** ^N **093, 59, 16**
d m s s d m s

HYDROGEOLOGIC CARD

Record by **D. AARONSON** Source of data **FILE** Date **12/8/65** Map **1:63,360** COUNTY **NEWY**

State **IOWA** County (or town) **WEBSTER** Section **9 4**

Latitude: **42 28 03 N** Longitude: **09 35 16 W** Sequential number: **1**

Local well number: **08827W03B3C** Other number: **W-1931**

Local use: **AIRCITY** Owner or name: **DUNCOMBE TOWNSHIP**

Owner or name: **DUNCOMBE, IA**

Ownership: County, Fed Gov't, City, Corp or Co, Private, State Agency, Water Dist **M**

Use of water: Air cond, Comm, Dewatering, Fire, Dom, Irr, Ind, P.S., Stock, Instit, Unused **P**

Use of well: Anode, Drain, Seismic, Obs, Oil-gas, Recharge, Spring, Test, Unused, Withdraw, Waste, Destroyed **W**

DATA AVAILABLE: Well data **1** Freq. W/L meas.: **INVENTORY** Field aquifer char. **71**

Hyd. lab. data: **73**

Qual. water data; type: **COMPLETE** **74 C**

Freq. sampling: **ORIGINAL** Pumpage inventory: **75**

Aperture cards: **77**

Log data: **GEOLOGIST LOG** **78 79 G**

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD Depth well: **974** ft Meas. **974** accuracy **6**

Depth cased: **251** ft Casing type: **STEEL** Diam: **10** in **10**

Finish: porous concrete, gravel w. (perf.), (screen), gallery, end, (H) horz. open, (O) sd. pt., shored, (P) perf., (S) screen, (T) shored, (W) other **X**

Method: air bored, cable, dug, hyd jetted, air rot., (B) (C) (D) (H) (J) (P) (R) (T) (V) (W) (Z) **C**

Date Drilled: **JAN. 1945** **9 4 5** Pump intake setting: **36 38**

Driller: **LAYNE WESTERN CO., AMES, IA.**

Lift (type): air, bucket, cent, jet, (cent.) (turb.) none, piston, rot, submerg, turb, other **D**

Power (type): diesel, elec, gas, gasoline, hand, gas, wind; H.P. **39** Trans. or meter no. **40**

Descrip. MP **LSD** ft above below lsd, Alt. MP **1119**

Alt. LSD: **1114** Accuracy: **ACTINOMETER** **47 7**

Water Level **49.22** ft above below MP; Ft lsd **49** Accuracy: **DRILLER'S LOG** **52 D**

Date meas: **JAN. 1945** **1 4 5** Yield: **37** gpm **37** Method determined **61**

Drawdown: **48** ft Accuracy: **48** Pumping period **3** hrs **68**

QUALITY OF WATER DATA: Iron **1.4** Sulfate **133.3** Chloride **3.7** Hard. **394** **72 7**

Sp. Conduct **K x 10⁶** Temp. **69** Date sampled **JAN 25, 1945** **1 4 5** **77 79**

Taste, color, etc.

SAME AS ON MASTER CARD Physiographic Province: **CENTRAL LOWLAND** Section: **WESTERN**

LAKE **B** Drainage Basin: **DESMOINES** Subbasin: **25 B**

Topo of well site: local depression, flat surface, hilltop, hillside, terrace, valley flat, **UPLAND** **H**

MAJOR AQUIFER: **DEVONIAN** **MIDDLE** **D 2** **CEDAR VALLEY FM** **M C**

Lithology: **SHALY DOLOMITE** **Y D** Origin: **MARINE** **6** Aquifer Thickness: **650** ft

Length of well open to: **324** ft Depth to top of: **650** ft

MINOR AQUIFER: **MISSISSIPPIAN** **LOWER** **M 1** **WARSAW FM** **W**

Lithology: **CHESTY DOLOMITE** **Q D** Origin: **MARINE** **6** Aquifer Thickness: **45** ft

Length of well open to: **29** ft Depth to top of: **235** ft

Intervals Screened: **NONE**

Depth to consolidated rock: **235** ft **235** Source of data: **WELL CUTTINGS** **64 C**

Depth to basement: **65** Source of data: **69**

Surficial material: **SANDY TILL** **B T** Infiltration characteristics: **POOR** **72 9**

Coefficient Trans: **73** Coefficient Storage: **75**

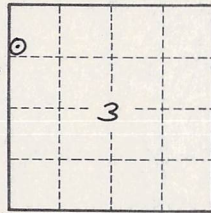
Coefficient Perm: **76** **77** **78** **79**

CASING:

251' OF 10" CASING 0-251' (CEMENTED 0'-50')

56' OF 8" LINER FROM 235'-290' (SLOTTED FROM 251'-290')

8" OPEN HOLE FROM 290'-974'



STATE OF IOWA
IOWA GEOLOGICAL SURVEY
GEOLOGY ANNEX
IOWA CITY

RESULTS OF PUMPING TEST

at

DUNCOMBE TOWN WELL

Duncombe, Iowa

January 25, 1945

Name: Duncombe Town Well (Park Well No. 1)

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 88 N., R. 27 W.

Elevation: Land surface, 1114 feet above sea level. Drilling curb,
1115 feet above sea level.

Owner: Town of Duncombe.

Contractor: Layne-Western Company, Ames, Iowa

Driller: Earl Sneed

Drilling dates: *Started, October 14, 1944; *Finished, January 22, 1945

Depth: *974 feet.

Casing and hole size:

*251 feet of 10-inch casing from 0 to 251 feet (cemented in
from 0 to 50 feet)

*56 feet of 8-inch liner from 235 to 290 feet (slotted from
251 to 290 feet)

8-inch open hole from 290 to 974 feet.

Principal producing aquifer: Devonian at 890 feet.

Test pump: *Lift pump. 100 feet of 6-inch column, 5 feet of 8-inch cylinder.

Production measurements: Obtained time to fill 41.5 gallon barrel.

Water level measurements: Measuring point, top of wood clamp 0.9 foot above
drilling platform and 1.4 feet above land surface. Elevation, 1115.5
feet above sea level.

* From driller.

STATE OF IOWA
IOWA GEOLOGICAL SURVEY
GEOLOGY ANNEX
IOWA CITY

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Depth: *974 feet.

Casing and hole size:

*251 feet of 10-inch casing from 0 to 251 feet (cemented in
from 0 to 50 feet)

*56 feet of 8-inch liner from 235 to 290 feet (slotted from
251 to 290 feet)

8-inch open hole from 290 to 974 feet.

Principal producing aquifer: Devonian at 890 feet.

Test pump: *Lift pump. 100 feet of 6-inch column, 5 feet of 8-inch cylinder.

Production measurements: Obtained time to fill 41.5 gallon barrel.

Water level measurements: Measuring point, top of wood clamp 0.9 foot above
drilling platform and 1.4 feet above land surface. Elevation, 1115.5
feet above sea level.

* From driller.

STATE OF IOWA
IOWA GEOLOGICAL SURVEY
 GEOLOGY ANNEX
 IOWA CITY

RESULTS OF PUMPING TEST

at

DUNCOMBE TOWN WELL

Duncombe, Iowa

January 25, 1945

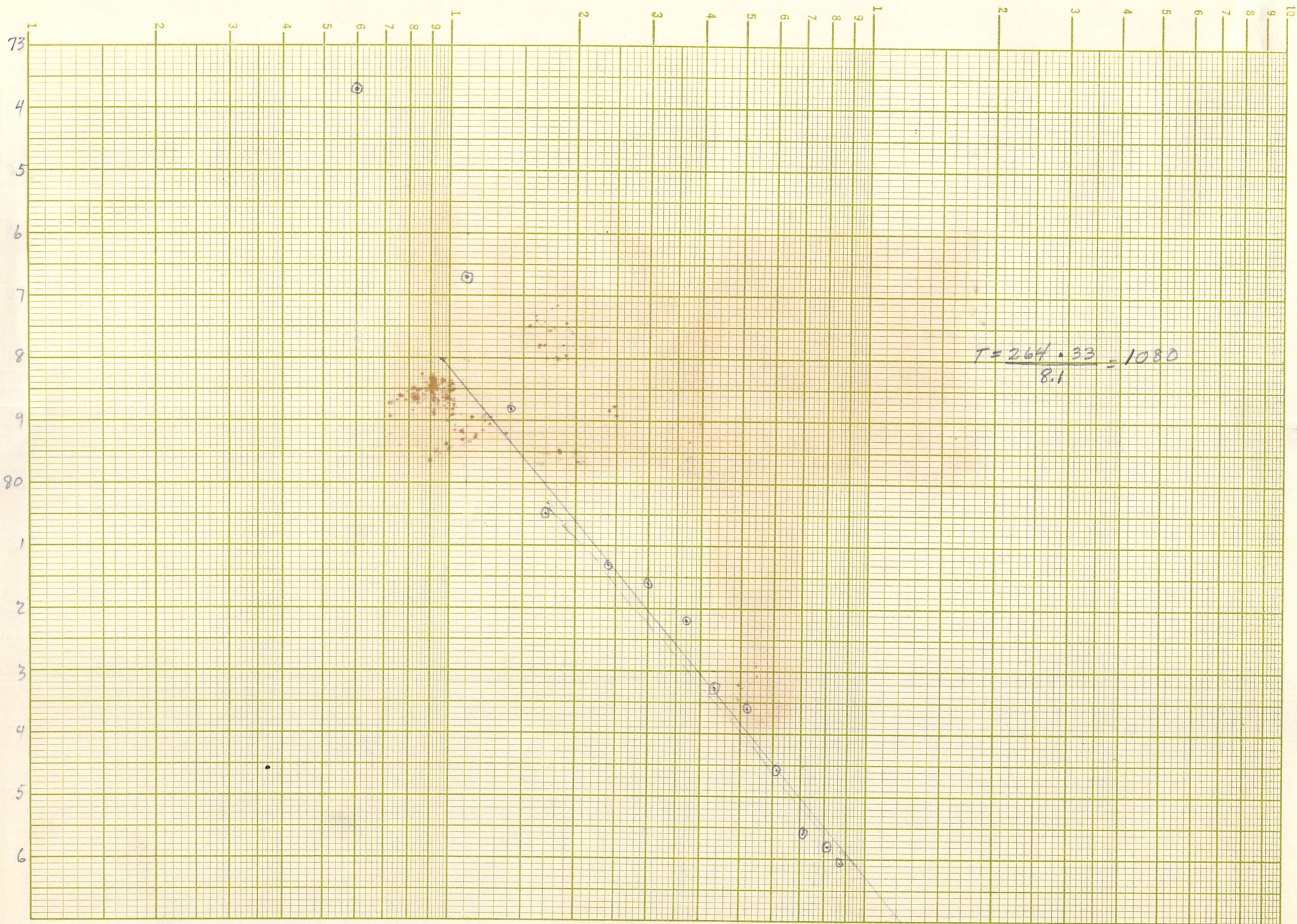
<u>Time</u>	<u>Depth to water in feet</u>	<u>Discharge (g.p.m.)</u>	<u>Water Temperature (°F.)</u>	<u>Remarks</u>
Jan. 25, 1945				
8:40 a.m.	49.22			
9:15	49.20			Static level.
10:20 to 11:30				Testing lift pump set up. Pumped some water.
12:53	51.14			
12:58	50.40			
1:03	50.00			
1:04 ³⁰				Pumping started.
1:07:30	69.0			
1:10:30	73.7			
1:15	76.7			
1:18	78.83			
1:20		33		
1:21	80.5			
1:28	81.28			
1:30			49½	Air 34°F.
1:34	81.62			Water slightly cloudy, little odor.
1:41	82.18	33		
1:47	83.27		49½	Air 35°F. Water cloudy.
1:56	83.63			
2:05	84.63			
2:10		33		
2:15	85.60			
2:25	85.80		50	Water cloudy to slightly muddy.
2:31	86.05			
2:45	85.75			
2:49	85.95			
3:04	86.00			
3:08			50½	Air 36°F. Water cloudy, clearing slightly.
3:16	86.00			
3:26	85.90			
3:30		33		Water clearing.

86.0
 49.2
 36.8

<u>Time</u>	<u>Depth to water in feet</u>	<u>Discharge (G.P.M.)</u>	<u>Water Temperature (°F.)</u>	<u>Remarks</u>
Jan. 25, 1944				
3:34 p.m.				Speed increased.
3:36	89.20			
3:44		37		
3:49	92.55			
3:56	93.27		50	
4:09	94.08			
4:17	94.12			
4:27	94.08			
4:40	94.40			
4:45		38		
4:52	93.80			
5:08	94.23		50½	Air 35°F. Water slightly cloudy.
5:18		37		
5:20	94.45			
7:04	95.80			
7:14	95.80			
7:27	96.20			
7:36	96.35			
7:47	96.40			
8:06	96.48			
8:40	97.00			
9:10	97.45			
9:28		37		
9:30	97.37			
9:55	97.10			
10:00			50½	Air 26°F. Water almost clear. Water sample collected.
10:08	97.00			
10:27	96.41			
10:33				Pumping stopped. Recovery measurements.
10:34	80.55			
10:35	71.20			
10:36	63.90			
10:37	58.97			
10:38	55.90			
10:39	54.25			
10:40	53.60			
10:41	53.13			
10:42	52.88			
10:43	52.65			
10:44	52.50			
10:45	52.40			
10:47	52.25			
10:52	52.02			
10:58	51.97			
11:04	51.85			

<u>Time</u>	<u>Depth to water in feet</u>	<u>Discharge (c.f.m.)</u>	<u>Water Temperature (°F.)</u>	<u>Remarks</u>
Jan. 25, 1944				
11:09 p.m.	51.80			
11:15	51.76			
11:20	51.70			
11:25	51.64			
11:28	51.60			
11:30	51.57			
11:33	51.58			

Duncombe



IOWA PRESS
CLIPPING BUREAU

Des Moines, Iowa

Messenger

Fort Dodge, Iowa

FEB 5 - 1945

Drill Through Rock and Shale to Depth of 972 Feet

DUNCOMBE, Feb. 5.—The drilling of the new city well has been completed at a depth of 972 feet. About 60 per cent of this depth was through rock and shale. An adequate supply of good water in Duncombe now seems to be assured. It will be from 30 to 60 days before the new equipment is installed and water from the new well is turned into the mains.

The Duncombe postoffice was moved the first of the month to the building formerly owned by the Farmers Saving bank. New fixtures

tures have been installed and complete settling of the place will soon be completed. Postmaster, Mrs. Laurretta Erickson, took office about two months ago.

December 21, 1944

Mr. R. W. Brooks
Layne-Western Company
Box 662
Ames, Iowa

Dear Mr. Brooks:

On December 18 I wrote to you in regard to the well being drilled at Duncombe. In my letter I referred to the town name as Belmond. I presume that you caught the error and understood what had happened.

Very truly yours,

H. G. Hershey

HGH:KNB

December 18, 1944

Mr. R. W. Brooks
Layne-Western Company
Box 662
Ames, Iowa

Dear Mr. Brooks:

Duncombe

Thank you for your letter of December 16 concerning drilling progress at Belmont. We have received and examined the samples to a depth of 645 feet. They appear to be fairly typical although the percentage of shale is somewhat lower than in other wells in that area.

From a comparison with other wells it appears that the top of the Juniper Hill will occur at an approximate depth of 700 feet. The Juniper Hill should be composed of green and gray shale interspersed with dolomite. It is possible that the dolomite may make up more than fifty per cent of the section which we expect to be 50-60 feet thick. Beneath this should occur the Cedar Valley dolomite.

Very truly yours,

H. G. Hershey

HGH:KNB

LAYNE-WESTERN COMPANY

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FACTORIES:
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HOUSTON, TEXAS
LOS ANGELES, CALIF.
BRANCHES - REPRESENTATIVES
THROUGHOUT THE COUNTRY

AMES, IOWA

December 16, 1944

Dr. H. G. Hershey
Iowa Geological Survey
Geology Annex Bldg.
Iowa City, Iowa

Dear Dr. Hershey:

We wish to acknowledge and thank you for your letter of December 13th, with reference to the well being drilled at Duncombe, Iowa. As of Thursday, December 14th, drilling had progressed to a depth of 648' and the drillers log of the formations below 550' is as follows:

550	-	580	Gray Shale, Hard
580	-	582	Dark Lime, Hard
582	-	600	Lime and Shale Mixed
600	-	610	Gray Lime
610	-	613	Brown Lime, Very Hard, Lots of Crevices
613	-	625	Brown Lime Shale Crevices Lime very hard
625	-	645	Gray Lime
645	-	648	Blue Shale

The driller reports these crevices to be filled with soft shale, both in this section and from 530' to 545'.

Yours very truly,

LAYNE-WESTERN COMPANY


R. W. Brooks

RWB:mbb

December 13, 1944

Mr. R. W. Brooks
Layne-Western Company
Box 662
Ames, Iowa

Dear Mr. Brooks:

The samples from Duncombe have now been examined to a depth of 550 feet. At that depth drilling was proceeding in the lower portion of the Hampton formation.

The Hampton dolomite appeared to be somewhat more dense than normal although there were some porous zones (one in particular at 530-545 feet in depth) and evidence of crevicing. Within the next 25 feet the dolomite should become silty grading downward into a silty shale. This should be followed by the shale and dolomite of the Sheffield formation. Beneath the Sheffield are the Devonian limestones and dolomites which contain considerable quantities of water in north central Iowa.

There is some possibility that gypsum will be present in the lower part of the Devonian section. The city well at Webster City has about 75 feet of it but none is present at Ft. Dodge. It would seem advisable to make every attempt to make a well above the Independence shale believed to be 985 feet below the surface.

The following forecast of the geologic section will give you some idea of the type of rocks which you may expect:

	<u>Thick.</u>	<u>From</u>	<u>To</u>
Mississippian system			
Hampton formation - dolomite, silty at base			570'
Devonian formation			
Sheffield formation			
Shale	20'	570'	590'
Dolomite	30'	590'	620'
Shale	10'	620'	630'

Mr. R. W. Brooks

-2-

December 13, 1944

	<u>Thick.</u>	<u>From</u>	<u>To</u>
Lime Creek formation			
Limestone and dolomite	95	630	725
Dolomite with shale beds interbedded	65	725	790
Cedar Valley formation - dolomite	195	790	985
Independence shale	10	985	995
Wapsipinicon formation - dolomite and possibly gypsum	180†	995	1175†

Please let me hear from you if you have any question concerning these remarks.

Very truly yours,

H. G. Hershey

HGH:KNB

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AMES, IOWA

Dec 11 1944

FACTORIES:
MEMPHIS, TENN.
HOUSTON, TEXAS
LOS ANGELES, CALIF.
BRANCHES - REPRESENTATIVES
THROUGHOUT THE COUNTRY

December 9, 1944

Dr. H. G. Hershey
Iowa Geological Survey
Geology Annex Bldg.
Iowa City, Iowa

Dear Dr. Hershey:

We are enclosing herewith a copy of the information obtained from bailing the Duncombe well on December 7th. If you have any comments, we would be glad to have them.

Yours very truly,

LAYNE-WESTERN COMPANY


R. W. Brooks

RWB:mbb
Encl.

-- M E M O --

Duncombe, Iowa

On Thursday, December 7th, drilling had progressed to a depth of 562' and a bailing test was conducted with the following results:

Static water level before bailing, $34\frac{1}{2}$ '. Bailing was carried on continuously for a period of 37 minutes, during which time a total of 947 gallon was taken out. During the first 27 minutes it was bailed at the rate of 27.2 gallon per minute and the last 10 minutes it was bailed at the rate of 21 gallon per minute.

At the time bailing was stopped, the static water level was down to 122' and was still receding.

From this information it was estimated that the well might produce 15 gallon per minute at this depth, and it was decided to continue with the drilling.

Geology Annex
Iowa City, Iowa
December 6, 1944

Mr. W. E. Hale
Barry's Cabins
Fort Dodge, Iowa

Dear Bill:

We have just received a letter from Mr. Brooks stating that they expect to bail the Duncombe city well on December 6 or 7 in order to get a definite indication as to the quantity of water available. If you have not already done so it may be well for you to call or visit Duncombe to see what results they have obtained.

A telephone call from Mr. Jacob from Sioux Falls was received soon after you left. His plans have changed somewhat. He expects to arrive in Iowa City Thursday afternoon December 7 and will probably remain here for two days. I did not raise the question with him of a trip to Fort Dodge but in any event I will be delayed an additional day in getting there. Unless Mr. Jacob can make the trip to Fort Dodge I will delay leaving Iowa City until I get some specific report from you.

Very truly yours,

H. G. Hershey
District Geologist

HGH:KNB

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AMES, IOWA

December 5, 1944

Dr. H. G. Hershey
Iowa Geological Survey
Geology Annex Bldg.
Iowa City, Iowa

Subject: Duncombe, Iowa

Gentlemen:

We are in receipt of your letter of December 4th, regarding the above location and were glad to have this information. As of Saturday, December 2nd, drilling had progressed to 500' and the driller reports dark gray limestone, from a depth of 460'. We expect to bail the well for a sufficient period of time, December 6th or 7th, to get a definite indication as to the quantity of water available.

Yours very truly,

LAYNE-WESTERN COMPANY


R. W. Brooks

RWB:mbb

December 4, 1944

Mr. R. W. Brooks
Layne-Western Company
Box 662
Ames, Iowa

Dear Mr. Brooks:

The samples from the Duncombe city well have not been examined to a depth of 450 feet. Drilling was then proceeding in the Hampton formation.

At a short distance below 450 feet a cherty brown and gray dolomite should be reached. The dolomite has a sugary texture, is commonly porous, and is generally a little over 100 feet thick. Underlying this is the sandy dolomite of the English River which is followed by the Maple Mill-Sheffield shales. The top of the shales may be expected at about 575 feet.

The Hampton dolomites supplied the upper water in the Belmond well which you drilled several months ago. It is the source of supply for many town and farm wells in north central Iowa.

We will be glad to have additional samples from this well at your convenience.

Very truly yours,

H. G. Hershey

HGH:KNB

November 6, 1944

Mr. Cornelius Van de Steeg
Orange City, Iowa

Dear Mr. Van de Steeg:

Thank you very much for your letter of November 3 concerning the drilling of a new well at Duncombe, Iowa. The results of the drilling will yield valuable information to us and I appreciate your thoughtfulness and courtesy in writing. One of the members of our staff will call at Duncombe immediately and we will follow the progress of the drilling and testing with much interest.

Very truly yours,

H. G. Hershey

HGH:KNB

TELEPHONE 72

COR. VAN DE STEEG

ATTORNEY AT LAW

ORANGE CITY, IOWA

November 3, 1944

NOV 6 1944

Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Dear Sir:

In Re: town of Duncombe well

The town is now digging a new well in the city park, and located about three blocks east of the city well. They are keeping samples of cuttings, and will be glad to send them to you, if you will send them sacks with instructions.

Very cordially yours,

Cor Van de Steeg

CVS:jh

MEMORANDUM

By: W. E. Hale

Date: November 30, 1944

Subject: Duncombe Town Well

The Duncombe town well has reached a depth of 450 feet. They are apparently drilling in the Hampton formation. Samples were brought in to a depth of 450 feet. There is apparently very little water in the well and they are considering drilling deeper.

I told Brooks we could study samples probably Saturday and get a report to him on Monday on a forecast to the St. Peter and water possibilities to that depth.

I picked up a partial analysis from Brooks of the water in the sand aquifer at a depth of about 180 feet in this well.

November 29, 1944

Mr. R. W. Brooks
Layne-Western Company
Box 662
Ames, Iowa

Dear Mr. Brooks:

We have received and examined the samples from Duncombe covered by your letter of November 25. The examination indicates that there is no gypsum present and that the white material is limestone.

I appreciate the memorandum which accompanied your letter. It will be useful to us in our work on the well.

Very truly yours,

H. G. Hershey

HGH:KNB

WFT.

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THROUGHOUT THE COUNTRY

AMES, IOWA

November 25, 1944

Dr. H. G. Hershey
Iowa Geological Survey
Geology Annex Bldg.
Iowa City, Iowa

Dear Dr. Hershey:

LS not GYP
SM

We are sending you today, a sample of the drill cuttings from Duncombe, Iowa, taken at a depth of 375'. According to our driller this formation was encountered at 360' and they were still in it at the time this sample was collected. I am wondering if this might be gypsum and if so, what effect it might have on the quality of water to be obtained from the well.

We are attaching a memo from our files on this well. We would appreciate your comments.

Yours very truly,

LAYNE-WESTERN COMPANY


R. W. Brooks

RWB:mbb
Encl.

" M E M O "

Duncombe, Iowa

November 25, 1944

On Friday afternoon, November 24th, drilling had progressed to a depth of 375' and drilling was stopped to bail the well in an effort to determine whether or not a sufficient quantity of water might be available.

The well was bailed five times to clear out the cuttings from the lower part of the hole and after standing approximately fifteen minutes the static water level was 34'. Bailing was then started and a total of 260 gallon was taken out over a period of ten minutes, after which time the water level was down to 89'.

It's possible that the water in the well had not been sufficiently cleared up to relieve the head pressure and allow the water to come in, however it seems quite apparent that very little, if any, water was available to this depth.

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AMES, IOWA

November 30, 1944

Dr. H. G. Hershey
Iowa Geological Survey
Geology annex Bldg.
Iowa City, Iowa

Duncombe, Iowa


Dear Dr. Hershey:

I was glad to receive your letter of the 29th, with regard to the sample sent to you from the above location.

We went out of this soft limestone at approximately 390' and drilling has been much harder and slower since then. As of Tuesday, November 28th, drilling had progressed to 425'.

Yours very truly,

LAYNE-WESTERN COMPANY


R. W. Brooks

RWB:mbb

*Duncombe
Webster H. D.*

October 9, 1944

Mr. X. P. Boyles
Public Health Engineer
District Health Service No. 5
Fort Dodge, Iowa

Dear Mr. Boyles:

Your letter of September 25 was received in my absence from the office. I appreciate very much having the information on the well situations at Duncombe and Ruthven. We will keep an eye on both projects and will be glad to hear from you on any developments that may come to your attention.

Very truly yours,

H. G. Hershey

HGH:KNB

SEP 26 1944

Iowa

State Department of Health

DISTRICT HEALTH SERVICE

NO. 5

WALTER L. BIERRING, M. D.
COMMISSIONER
DES MOINES, IOWA

IN REPLYING
ADDRESS

X. P. Boyles

Public Health Engineer

Fort Dodge, Iowa

September 25, 1944

Mr. H. G. Hershey
Associate State Geologist
Geology Annex
Iowa City, Iowa

Dear Mr. Hershey:

It is my understanding that the City of Duncombe will drill a new well in the near future. The final contract will be decided on September 28, and the Thorpe well contractor of Des Moines will start work shortly thereafter. This, no doubt, will be a deep well and will be located within four blocks of the present well.

The town of Ruthven is also contemplating a new drilled well to be located approximately 50 ft. south of the present well. I believe this work will be handled by Mr. Rassmussen of Ida Grove. Present plans are to tap the same source supplying the present 179 ft. well.

Information pertinent to these two wells, if not already submitted to the city officials, would be appreciated.

I have not as yet had the opportunity to contact Mr. M. E. Ellefson of Thompson, Iowa.

Very truly yours,

DISTRICT HEALTH SERVICE NO. 5



X. P. Boyles
Public Health Engineer

XPB:DES

October 3, 1944

Mr. R. W. Brooks
Layne-Western Company
Box 662
Ames, Iowa

Dear Mr. Brooks:

As Dr. Hershey has not yet returned to the office, your letter of September 29 concerning the drilling of a well at Duncombe has been referred to me for reply.

We have no information on the strata penetrated in the present town well and no records of any wells in the immediate locality which penetrate the limestones of Mississippian age. Although our control is far from adequate I believe the following forecast will be reasonably accurate.

General Geology in vicinity of Duncombe. In and around Duncombe glacial sand usually occurs within a few feet of surface and extends to a depth of between 40 and 50 feet. In places, a few feet of gravel is found below the sand. The thickness of the drift should be about 55 feet.

Bedrock is composed of sandstone and shale of Pennsylvanian age. There may be considerable sandstone in this section. A well two miles to the east of Duncombe penetrated 45 feet of sandstone below the drift. This system of rocks may be as much as 125 feet thick.

The Mississippian section is composed almost entirely of limestone and dolomite which in places is cherty. The base of the Mississippian rocks may extend to a depth of 500 feet. The base is called at the top of a shale 20 to 30 feet thick which is thought to be the Sheffield formation of Devonian age.

The forecast is based on a starting elevation of 1109 feet, the elevation of the present town well.

Mr. R. W. Brooks

-2-

October 3, 1944

<u>Formation & Description</u>	<u>Thickness</u>	<u>From</u>	<u>To</u>
Pleistocene			
Drift (sand with some gravel near base)	55'	0	55'
Pennsylvanian			
Des Moines series (sandstone and shale)	125'	55'	180'
Mississippian			
(limestone and dolomite, <i>cherty</i> in places)	320	180'	500±'
Devonian			
Sheffield (shale)	20-30		

If you care to send in samples during the course of drilling we shall be happy to study them and keep you informed of any changes that may need to be made in the above forecast.

Very truly yours,

William E. Hale

WEH:KNB

Copy for Washington.

LAYNE-WESTERN COMPANY

SEP 30 1944

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THROUGHOUT THE COUNTRY

AMES, IOWA

September 29, 1944

Dr. H. G. Hershey
Iowa Geological Survey
Geology Annex Bldg.
Iowa City, Iowa

Dear Dr. Hershey:

We would appreciate having a forecast, based on whatever information you have readily available, on a well at Duncombe, Iowa, to a depth of 500 feet.

We have a contract for this well and will be starting work within the next three weeks, and will see that samples are saved for your records.

We are particularly interested in any information you may have as to the depth to the top of the limestone and the formations to be encountered to this depth.

Yours very truly,

LAYNE-WESTERN COMPANY



R. W. Brooks

RWB:mbb

Memorandum
Sept. 25, 1944

From: W. E. Hale

Subject: Forecast of Geologic section and general ground-water conditions at
Duncombe, Iowa

L. F. Whitney called and asked for forecast for Duncombe Iowa 100 gpm desired
I called him Monday evening Sept 25 and gave him the following information

Geologic Section - Starting elevation 1109± Thickness from 40

Drift			
fine sand	60	0	60
Pennsylvanian shale + sandstone	140	60	200
Mississippian limestone + dolomite	[should be 300] 230	200	430
Devonian shale	20	430	450
limestone + dolomite with possibly some gypsum near base	533	450	983
Ordovician Maquoketa shale	20	983	1003
dolomite + limestone with chert	237	1003	1240
Galena			
Dolomite with chert in lower part	205	1240	1445
Decorah-Plalville			
dolomite + shale	30	1445	1475
shale	35	1475	1510
St. Peter			
sandstone	50	1510	- 1560

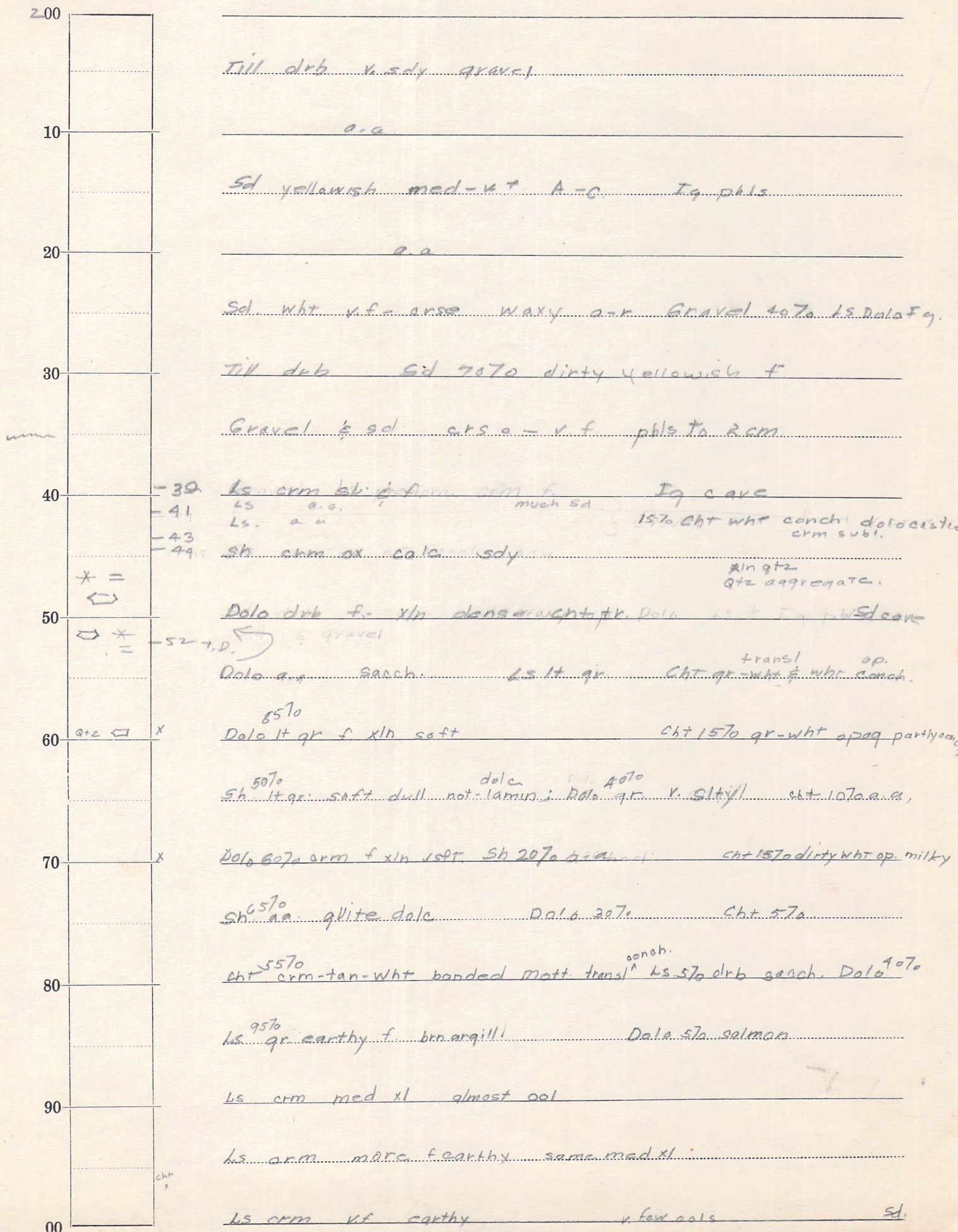
I stated that best place to pick up 100 gpm was near base of
Wapsipinnac and in St. Peter sandstone. The static water level should
not be over 20 feet and 1 gpm/ft might be expected from ^{each of these} ~~these~~ two
horizons.

Location Duncom Webster Date Drilled Oct '44 Analyst SCHULTZ

00
10
20
30
40
50
60
70
80
90
100

100
Scl. black sdy Till drb
Till bff ox not leach much sd & pbls a.a
a.a a.a
Till gr not ox sdy pbls crse 120 a.a
Till drb a.a a.a
a.a 130 a.a
a.a a.a
a.a v. crse pbls 140 a.a
a.a less sd a.a
a.a 150 a.a
a.a a.a
a.a 160 a.a
5-25 mm v. crse Gravel
a.a 170 a.a
a.a Scl brn, mainly f. A.a Mica
a.a 180 Scl wht mainly med a-r fr Gravel
a.a a.a
a.a 190 Till drb
a.a a.a
200 a.a
Scl glacial crse-slt a-r pol & fr 5/8 Tq pbls

Location Duncombe (Webster) Date Drilled Analyst Schulta



Till drb v. sdy gravel

a.g.

Sd yellowish med-vt A-o Tg plis

a.g.

Sd wht v.f. coarse waxy a-r Gravel 40% Ls Dolo f.g.

Till drb Sd 70% dirty yellowish f.

Gravel & sd. coarse - v.f. plis to 2 cm

-39 Ls crm blk. ... much sd Iq care

-41 Ls. a.u. 15% ch. wht conch. dolocastic crm subl.

-43 sh crm ox. calc. sdy xln qtz qtz aggregate.

Dolo drb f. xln dense wght fr. Dolo Ls + Tg plis care

-52 Dolo a.g. Saach. Ls lt. qr. ch. qr-wht & wht conch.

85% Dolo lt qr f xln soft ch. 15% qr-wht opaq partly

50% Sh lt qr. soft dull not lamin. Dolo gr. v. silty ch. 10% a.g.

Dolo 60% crm f xln soft Sh 20% a.g. ch. 15% dirty wht op. milky

65% sh a.g. quite dolo Dolo 20% ch. 5% a.g.

cht 55% crm-tan-wht banded matt transl. Ls 5% drb saach. Dolo 40%

95% Ls gr. earthy f. brn argill. Dolo 5% salmon

Ls crm med xl almost ool

Ls crm more f. earthy same med xl

Ls crm kf earthy v. few ools sd.

Location DUNCOMBE (Webster) Date Drilled Nov 94 Analyst SCHULTZ



ls. a.a. ool. (x)

ls crm-wht f. ool. dolc xl

much calc. (square symbol)

a.a.

calc

a.a.

calc

ls. crm. wht. v. f. pseudo-ool. frag. (circle symbol)

(square symbol)

ls crm f-med ool. (circle with cross symbol) foramin.

(square symbol)

ls crm f. xln. earthy.

ls tan-crm xln f ool xl imbed

a.a.

50 (x)

ls crm f xln

a.a.

60

ls crm f. xl imbed (circle with cross symbol) foramin.

ls crm f. earthy

70

a.a.

a.a. xl. imbed

80 (x)

ls crm f xln xl imbed ool.

a.a.

90

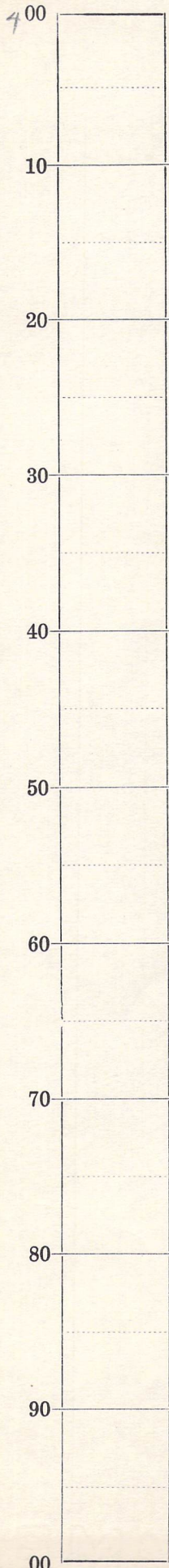
a.a.

a.a.

00

ls drb-crm med v.v. ool.

Location DUNCOMBE (Webster) Date Drilled Analyst Schultz



Handwritten geological descriptions: a.a., ls drb f earthy xl imbed some ool, ls drb f earthy dense, ls beige lt crm v.f. sublit h xl imbed, ls beige f. earthy xl, ls 9070 a.a. Dolo 1070 drb f gran, ls beige f. earthy dense, ls 5070 a.a. Dolo 5070 drb f gran, ls 9070 a.a. gradings Dolo 1070.