Iowa Department of Natural Resources Geological Survey Bureau
109 Trowbridge Hall, Iowa City, IA 52242-1319 PH (319) 335-1575

WELL RECORD [redacted] 2525

Permit No. 98-010-W

Site identification

Property Owner City of THOR Well Number 2
Address THOR, Iowa
Tenant
Well Depth 660 ft Date completed 3/28/98

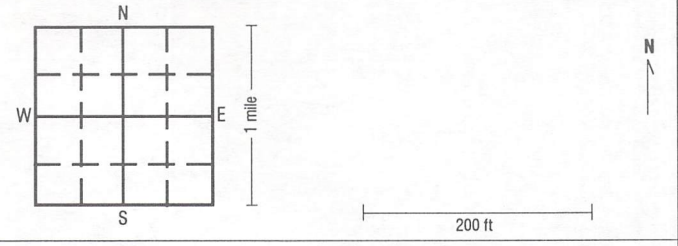
Location

County Humboldt

____ mi. N/S and ____ mi. E/W of intersection of ____ and ____

____ 1/4 of the ____ 1/4 of the ____ 1/4 of Sec ____ TWP ____ RNG ____ E/W

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



☐ upland ☐ hillside ☐ valley Elevation (if known) ____

Formation log

From	To	Color	Hardness	Formation description
0	398	red Black	S	Iron & rock cutting
398	411	Tan	MH	limestone
411	411 1/2	gray	S	Shale
411 1/2	417	White	MH	Limestone
417	417 1/2	green	S	Shale
417 1/2	422	Tan	MH	limestone
422	423	gray	S	Shale
423	428	Tan	MH	limestone
428	436	gray	S	Shale
436	447	Tan	MH	Limestone
447	448	gray	S	Shale
448	459	Tan	MH	limestone
459	459 1/2	gray	S	Shale
459 1/2	468	White	MH	limestone
468	468 1/2	gray	S	Shale
468 1/2	547	White	H	limestone
547	660	Tan White	H	limestone

use additional sheets as needed

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

Shale streaks vary soft

Well use

☐ Domestic ☐ Municipal ☐ Commercial
☐ Livestock ☒ Public supply ☐ Monitoring
☐ Test well ☐ Irrigation ☐ Other ____ (explain)

Drill method

☒ rotary ☐ auger ☐ cable other ____

Hole size

9 7/8 inch from 0 ft to 398 ft
7 7/8 inch from 398 ft to 471 ft

hole size continued

5 7/8 inch from 471 ft to 660 ft
____ inch from ____ ft to ____ ft

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

Casing

Drive shoe (yes / no) Pitless adapter (yes / no)

Size (ID/OD)	Type / Wt	Depth top	Depth bottom	Amount (length)
8"	PVC 250#	+1	398'	399'
6"	PVC 250#	379	471	96

Perforated or slotted casing? (yes / no)

Perforated / slotted from ____ ft to ____ ft
Perforated / slotted from ____ ft to ____ ft

Casing grouted? (yes / no)

Placement method Tremie Line

Type	Depth Top	Depth bottom	Amount (vol/wt)
Bentonite	7'	398	1400#

Well screen? (yes / no)

Diameter	Slot size	Depth Top	Depth Bottom	Length	Material
	0.___				
	0.___				

Bottom capped (yes / no) with ____
Seals / Packers (yes / no) kind P608 L depth 379 ft
Gravel packed (yes / no) from ____ ft to ____ ft
type ____ amount ____

Well developed? (yes / no)

Explain airlifted
(pumped, airlifted, bailed) for 8 1/2 hrs at 100 GPM.

Pump installed? (yes / no)

Date ____/____/____
Installer's name ____
Type of pump ____ Depth to intake ____ ft
Pump diameter ____ Rated capacity ____ GPM

Water information

Aquifer: ☐ sand / gravel ☒ limestone ☐ sandstone
Main water-supply zone from 475 ft to 547 ft ☐ seepage well
Static water level 36 ft (below / above) GL; ☒ tape ☐ airline ☐ E-line ☐ estimate
Pumping water level 127 ft below GL; ☐ tape ☐ airline ☒ E-line ☐ estimate
At yield of 85 GPM; ☒ orifice ☐ volumetric ☐ estimate
Measurements taken at 12:25 (AM / PM) Date ____/____/____

Water quality test? (yes / no)

Date tested ____/____/____
Tested by ____

Contractor Schumacher Well
Address 2206 Eagle Dr
Driller Jim Schumacher Certification no. CD-40097

white copy – **Iowa DNR, Geological Survey Bureau** blue copy – **Well Contractor** pink copy – **Customer** yellow copy – **County Health Officer**

297971-DQ

091-27W-17 DDB

WRD Exp. (GW)
Aug. 1964

Verified ERC

Punched FCH

U. S. DEPARTMENT OF THE INTERIOR — GEOLOGICAL SURVEY

Water Resources Division Well Schedule Form

MASTER CARD

Record by D. AARONSON | Source of data FILE | Date 11/26/65 | Map FT. DODGE, QUAD. 1:62,500

State IOWA (16) | County (or town) HUMBOLDT (46)

Latitude: 42 41 28 N | Longitude: 094 03 09 | Sequential number: 1

Lat-long accuracy: 2 | T 91 N, R 27 W | Sec 17, NW ¼, SE ¼, SE ¼ 5

Local well number: 091 27W 17 DDB | Other number: W-2525 B & M

Local use: 02525 46 CITY 1 | Owner or name: THOR TOWN WELL

Owner or name: THØR IØWA | Address: THOR, IA

Ownership: (C) County, (F) Fed Gov't, (M) City, (N) Corp or Co, (P) Private, (S) State Agency, (W) Water Dist — M

Use of water: (A) Air cond, (C) Comm, (D) Dewatering, (F) Fire, (H) Dom, (I) Irr, (N) Ind, (P) PS, (S) Stock, (T) Instit, (U) Unused — P

Use of well: (A) Anode, (D) Drain, (G) Seismic, (O) Obs, (P) Oil-gas, (R) Recharge, (S) Spring, (T) Test, (U) Unused, (W) Withdraw, (X) Waste, (Z) Destroyed — W

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

Hyd. lab. data:

Qual. water data; type: COMPLETE — C

Freq. sampling: INTERMITTENT I | Pumpage inventory: yes, no, period:

Aperture cards: yes

Log data: GEOLOGIST LOG — 6

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD | Depth well: 373 ft | Meas. rept | accuracy 6

Depth cased (first perf.): 166 ft | Casing type: STEEL | Diam. 6 in — 6

Finish: (C) porous concrete, (F) gravel w. (perf.), (G) gravel w. (screen), (H) horiz. open gallery, end, (O) open perf., screen, sd. pt., (P) shored, (S) open hole, (T) other, (Z) other — X

Method Drilled: (A) air rot, (B) bored, (C) cable, dug, (D) hyd jetted, (H) air rot., (J) percussion, (P) reverse rotary, (R) trenching, (T) driven, (V) drive wash, (W) other, (Z)

Date Drilled: SEPT. 1946 9 46 | Pump intake setting: ft

Driller: GUY BEEMER (name), LAKOTA, IA (address)

Lift (type): (A) air, (B) bucket, (C) cent, (J) jet, (L) multiple (cent.), (M) multiple (turb.), (N) none, (P) piston, (R) rot, (S) submerg, (T) turb, (Z) other; Deep / Shallow — D

Power (type): diesel, elec, gas, gasoline, hand, nat gas, LPG, wind; H.P. | Trans. or meter no.

Descrip. MP: LSD ft above/below lsd, Alt. MP 1149

Alt. LSD: 1149 | Accuracy (source): ALTIMETER — 7

Water Level 30 ft above/below MP; Ft above/below lsd | Accuracy: DRILLER'S LOG — 3

Date meas: SEPT. 1946 9 46 | Yield: 50 gpm | Method determined — 3

Drawdown: 0 ft | Accuracy: | Pumping period hrs

QUALITY OF WATER DATA: Iron 2.9 ppm 5 | Sulfate 32 ppm 2 | Chloride 3.0 ppm 0 | Hard. 376 ppm 7

Sp. Conduct 750 K x 10^6 4 | Temp. °F | Date sampled DEC. 30, 1955 D 5 9

Taste, color, etc.

Well Number 42 41 28 N 094 03 09 (d m s d m s)

HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD | Physiographic Province: CENTRAL LOWLAND 12 | Section: WESTERN

LAKE B | Drainage Basin: DES MOINES 25 B | Subbasin:

Topo of well site: (D) local depression, (F) flat surface, (H) hilltop, (S) hillside, (T) terrace, (V) valley flat,

MAJOR AQUIFER: MISSISSIPPIAN system, LOWER series, M 1, MAYNES CREEK FM. aquifer, formation, group — K Y

Lithology: CHERTY DOLOMITE Q D | Origin: MARINE 6 | Aquifer Thickness: ft

Length of well open to: 98 ft | Depth to top of: 275 ft — 2 7 5

MINOR AQUIFER: MISSISSIPPIAN system, LOWER series, M 1, HAMPTON FM aquifer, formation, group — K H

Lithology: FINE LIMESTONE Z L | Origin: MARINE 6 | Aquifer Thickness: 30 ft

Length of well open to: 30 ft | Depth to top of: 245 ft — 2 4 5

Intervals Screened: NONE

Depth to consolidated rock: 120 ft — 1 2 0 | Source of data: WELL CUTTINGS — C

Depth to basement: ft | Source of data:

Surficial material: SANDY MIX — S T | Infiltration characteristics: POOR — 4

Coefficient Trans: gpd/ft | Coefficient Storage:

Coefficient Perm: gpd/ft²; Spec cap: 50% gpm/ft; Number of geologic cards:

CASING:

8" CASING 0 - 135'

6" CASING 0 - 166'

WELL DEEPENED IN 1948 TO 373'.

ORIGINAL DEPTH ?

17

0

GPO 844-225

John C. Moore Corporation, Rochester, N. Y. Binder and holes in leaves Patented. FORM 422057

MOORE'S MODERN METHODS

Thor Town Test Hole No. 1

DRILLER - Bussy

Loc. NW¼ SE¼ SE¼ Sec. 17, T91N. R.27W

Elev. - Level with RR. stem

Hole drilled to depth of 235' in loose sand. Lower part contained numb pyrite and was definitely Cret or older in age.

Bussy abandoned hole - could not get through sand.

To be Visited
file under ~~Thor~~ Gen. data
Humboldt till complete
received

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

1

SEP 16 '46

Fort Dodge, Iowa
September 14, 1946

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

Dear Mr. Hershey:

Re: Thor Public Water Supply Source.

On September 12, 1946, Mr. Guy Bemer, well-driller from Lakota, Iowa, completed drilling on the new Thor water supply. This well was started September 3d. In the general construction, an 8-inch casing was to a depth of 135 ft. and this casing completely encircles the 6-inch casing which is continuous from the ground line to a point 166 ft. below. At this 166 ft. depth, rock was encountered and drilling continued an additional 43 ft. making a total depth of the well 209 ft.

A bailer test was run on September 12th and resulted in 47 to 50 gallons per minute capacity with no draw down. Static level remained at the original 30 ft. It was suggested to the city council that a pumping test be run on this well prior to the time of making their final installation and it is believed that this will be done. Mr. M. O. Anderson, mayor of the city, will notify either your department of this office at the time this is done.

Drill samples were collected during the process of construction and are on hand at Thor. If you or Mr. Hale are in the vicinity you may wish to pick up these samples. If however you would like them sent to you, I could collect them on my next visit and ship them to Iowa City.

Mr. Hale will be interested in the fact that the original well drilled by Mr. Busey in July of this year was abandoned, at a depth of 220 ft. without apparently striking rock. The present drilling is located approximately 25 ft. from the point of the abandoned hole and rock was encountered at the 166 ft. level. This particular level is only 9 ft. above your predicted top of Gilmore City lime stone formation.

The city is planning to go ahead with the development of this supply. However it is doubtful if pumping equipment will be available for several months.

A mineral sample was collected from the bailing water at the time the well was completed. This sample has been forwarded to the State Hygienic Laboratory at Iowa City. Although this particular sample cannot be considered as a definite conclusion on mineral determinations, it will however give a relative value of the water quality.

I will attempt to keep you informed on any future developments.

Very truly yours,
DISTRICT HEALTH SERVICE NO. 5

X. P. Boyles
Public Health Engineer.

XPB:mcl

Humboldt Co.
G-W

Office Copy 3

August 24, 1945

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

Dear Mr. Boyles:

In response to your letter regarding the proposed town well at Thor we have reviewed the data applicable to the area and prepared the following forecast.

The town of Thor, located in T. 91 N., R. 27 W., is situated on a small knob. The elevation of land surface, 1150 feet, which we have used as the starting elevation for this forecast is based on topographic maps of the area. At present the town does not have a public water supply.

General Geology

The Mankato drift forms the surface topography at Thor with other drift sheets occurring below it. The drift is composed mostly of clay with perhaps a few lenses of sand and gravel. The drift is about 120 feet thick in this vicinity.

The bedrock surface is composed of dolomite and shale belonging to the Warsaw formation. In a well two miles west of Thor bedrock consisted of 9 feet of dolomite underlain by 22 feet of shale all in the Warsaw formation. The lower part of the Warsaw is dolomite with perhaps a little shale. The Warsaw formation at Thor should be about 55 feet thick and extend to a depth of 175 feet.

Underlying the Warsaw formation is limestone of the Gilmore City formation. The limestone is oolitic and is an excellent aquifer in wells to the east and southeast. This formation is expected to be 100' thick at Thor.

The underlying Hampton formation consists mainly of dolomite, with some layers of limestone, and occasional cherty layers. At Thor the Hampton is about 200 feet thick with the base at about 475'. Near the base of the Hampton there is a 10-foot sandstone.

Shales of the Maple Mill formation underlie the Hampton.

Forecast of the Geologic Section at Thor, Iowa, based on a starting elevation of 1150 feet

Formation and description	Thickness	From	To
Pleistocene system (undifferentiated)	120	0	120
Mississippian system			
Warsaw (dolomite and shale)	55	120	175
Gilmore City (limestone)	100	175	275
Hampton (dolomite and limestone, sadnstone at base)	200	275	475
Maple Mill (shale)		475	

Ground Water Conditions

Nearly all the formations named are potentially water-bearing. Pleistocene sand and gravel may yield an adequate supply. We do not have enough information on the immediate area to be certain how deep sand and gravel zones would be found or what the available supply from them is.

If the drift is not as thick as predicted the St. Louis formation may be present. In northern Webster County this formation is a good aquifer.

At Humboldt and in northern Webster County several wells end in the Warsaw dolomite above the shale of that formation. This dolomite horizon, however, is not likely to be as good an aquifer as some of the underlying rocks.

The best chance for water is in the Gilmore City formation at a depth of from 175 to 275 feet. The oolitic and sometimes cavernous limestone of this formation is one of the most dependable aquifers for moderate needs in north central Iowa and should produce 10 to 25 gallons per minute with a static water level of about 60 feet. At Eagle Grove and west of Humboldt the Gilmore City produces 30 gallons per minute. At the Kirchoff farm well 2 miles west of Thor water from the Gilmore City had a strong odor. This may have been only local, or the same may prevail in the town of Thor.

Dolomites of Hampton age are also water-bearing. The sandstone near the base of the Hampton also should yielf some water.

Summary

The most promising aquifer is the Gilmore City formation. Wells nearby obtain an adequate supply from this horizon. The water is hard and the iron content high but the iron could be removed by installing a filter. There is a possibility that the water will have a strong odor.

The Hampton formation should also yield a moderate water supply. The water is quite hard, but the iron content may not be so high as that from the Gilmore City.

If sufficient water is not obtained above the Maple Mill formation, we shall be glad to forecast the geologic section to a greater depth and discuss the water possibilities in the underlying formations. If you have any questions concerning this forecast or if we can be of further assistance we shall be glad to hear from you.

Very truly yours,

hgh'm

H. G. Hershey

August 18, 1945

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

Dear Mr. Boyles:

Your letter of August 17 in regard to the proposed town well at Thor has just been received. It will take a short time to prepare the information which you request but the work will be done and a report sent to you just as soon as possible.

Very truly yours,

hgh'm

H. G. Hershey

7

Iowa
State Department of Health
DISTRICT HEALTH SERVICE
NO. 5
Fort Dodge, Iowa

IN REPLYING
ADDRESS

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

August 17, 1945

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

Dear Mr. Hershey:

The town of Thor, having a population of approximately 265, is planning the development of a water supply. Two tentative sites have been investigated, one being in the east part of town and the other one in the west part of towm, the two sites are approximately 2000 ft. apart.

I would appreciate a forecast on possibilities of development of the supply for this town. I have very little information on wells in the vicinity, however it is reported that the general depth of these three or four wells known ranges from 90 to 135 ft. It is understood that the 135 ft. well taps a rock formation however this is not confirmed and perhaps cannot be relied upon.

Any information you can give me on this problem will be appreciated.

Very truly yours,

DISTRICT HEALTH SERVICE NO. 5

X. P. Boyles
Public Health Engineer

XPB:DES
cc: Mr. A. H. Wieters

SAME LOCATION
New well.

IOWA GEOLOGICAL SURVEY
Iowa City, Iowa
WELL OR WATER SAMPLE DATA Bottle No.

TOWN Thor COUNTY HUMBOLDT

LOCATION NW-SE-SE sec. 17 T. 91 N., R. 27 X W. Twp

OWNER OF WELL TOWN OF THOR WELL NO. #2

USE OF WATER: City Supply (X); Private-Domestic ( ); Public Drinking ( ); Livestock ( ); Industrial ( ); School Supply ( ); Air Conditioning ( ); Cooling ( ); ( ).

CONSTRUCTION OF WELL: Drilled (X); Gravel-Pack type ( ); Driven ( ); Dug ( ); Bored ( ); Jetted ( ) ( )

CONTRACTOR THORPE DATE STARTED FEB-62
DATE FINISHED FEB-62

CASING OR CURBING DATA: (Show by diagram on opposite side of sheet the kind, length and depth of top and bottom of each size of pipe, the amount of overlaps, position of seals or packers, pipe perforation and screens, etc.)

10" CASING +3 TO -245 - FULL CEMENT GROUT TO 5' BELOW PIP
1000 GAL. OF ACID USED - SOME IMPROVEMENT

WELL DATA

	Present	Final
Curb Elevation	Ft. Depth	Ft. Depth 378 Ft.

Ground Elevation 1149 Ft. Topographic Position

Static Level (Depth to Water (Above) (Below) (Curb) 36 Ft. Pumping Level 115 Ft

Amount of Drawdown 79 Ft. pumping at 100 g.p.m. in hrs. minutes.

Specific Capacity g.p.m. per ft. drawdown

Type of Pump SUB Power 7½ HP ELEC

Depth of Bottom of Pump ft. with ft. of suction pipe

TEMPERATURE: Air 39 °F.; Water 51 °F., measured after well had pumped 0 hours 15 mins. at 100 g.p.m.; 80 ft. from pump after water had passed through the following pipe IRON PIPE + HOSE Time 1430

SOURCE OF WATER: Recent (Type and Depth)
Glacial Formations (Type) at ft. to ft.
Limestone or Dolomite (Age) at ft. to ft.
Sandstone (Age) at ft. to ft.
Principal Producing Formation

REMARKS:

Sample taken for: Mineral Analysis (X); Sanitary Analysis ( ) Data collected by LLS
Date 10-23-62
REPORT Analysis to H. G. Hershey, Iowa Geological Survey, Iowa City
LEONARD ANDERSON N/S THOR

UNITED STATES DEPARTMENT OF THE INTERIOR
Geological Survey
Water Resources Division

Water Quality
(ppm)

Local Well No. 091-27W-17 DDB
Aquifer Code(s) MIKY
Owner's Name THOR TOWN WELL (1946)
W Number 02525

Card Q

State: IOWA (19) County: HUMBOLDT (46) Town: THOR, IOWA

Well No. Latitude 42 41 28 N (5–11) Longitude 094 03 09 (12–18) Seq. No. 1 (19) Date M 10 D 26 Y 48 (20–25)

Sampling Depth 373 (26–29) Type 1 (30) Kx10⁶ (31–35) pH 7.6 (36–38) Temp. °F (39–41)

SiO_2 (42–44) Ca 104 (45–49) Mg 36 (50–53) Na +K 21 (54–58) K .C (59–61)

HCO_3 466 (62–65) CO_3 0 (66–67) SO_4 68 (68–72) Cl 1 (73–78) Source No. 3 (79) Q (80)

Card R

Duplicate Columns 1-25 from Card Q

F .5 (26–28) NO_3 0 (29–32) PO_4 (33–35) B (36–38) Al (39–41) Fe .13 (42–45)

Mn .13 (46–49) Cu (50–52) Pb (53–54) Zn (55–57)

Solids Determined 498 (58–63) Calc. (64–69) Hardness Ca,Mg 533 (70–73) Non-Carb. 151 (74–77)

Color (78–79) No. R (80)

Card S

Duplicate Columns 1-25 from Card Q

Br (26–28) I (29–31) Alk. as $CaCO_3$ 382 (32–35) Free CO_2 (36–38) SAR (39–41)

RSC (42–44) ABS (45–47) (48–50)

Alpha (pc/l) (55–57) Beta (pc/l) (58–60) Ra (pc/l) (61–63) U (ug/l) (64–66)

No. S (80)

Recorded by: D. AARONSON

Punched by: I Date: 1W

Published:

2525

Name: Thor town well pop. 234 (1960)

Loc: NW SE SE 17-91N-27W, Humboldt Co.

T.D: 373'

Drilled: Guy Beemer Sept 1946 209'; well was deepened Oct 1948 to 373'

Log: W-2525 Hale & Wehner

Casing: 8" csg 0-135'; 6" csg 0-166'

Prod. data:

SWL 30' Sept 1946

PWL 30'

Yield 47-50 gpm bailer 100 gpm for 12 hrs 10/26/48

1149
30
piezometric 1119

Pumps 75 GAL MIN - 5HP TUR - NO METERS

Analyses: No: I-719 9/12/46 No. 15383 10/26/48 No. 1472 (1795) 12/30/59

Need: SWL, PWL, Yield, consumption

Elevation curb 1149

Formation	Depth	Top	Base
Osage (k-D)	160	989	961
Gil. City	188	961	904
Hampton	245	904	874
Maynes Crk.	275	874	

NAME - THOR

LOC 75' WEST OF OLD WELL

T.D. 375

DRILLED - T HORPE - FEB - 62

LOG

CASING - 10" CASING +3 TO -245 FULL CEMENT GROUT TO 5' BELOW PIPE

1000 GAL OF ACID USED - SOME IMPROVEMENT

PROD DATA

SWL 36'

PWL 115'

YIELD 100 GPM

PUMP SET 140 - 7½ HP SUB

PRESSURE TANK - PUMP RUNS 1 MINUTE AT A TIME

85 WATER TAPS IN TOWN

ALMOST ALL ON CITY SYS

ALTERNATE WELLS BY WEEK

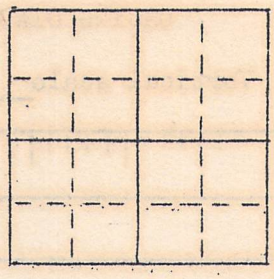
NO INDUSTRY

No meters to measure consumption

W-2525

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

RECORD OF WELL



Location:

Town: Thor (N E / S W): County Humboldt

NW¼SE¼SE¼ sec. 17 T 91 N., R. 27 W. E. Twp.

Well name and number Thor City (1946)

Owner _____ Address _____

Tenant _____ Address _____

Contractor Guy Beemer Address Lakota

Drillers _____

Drilling dates _____

Well data:
Elevations: Drilling curb _____ feet; Land surface 1149 feet

Determined by _____

Topographic position _____

Total depth: Reported _____ feet, Measured _____ feet

Drilling method _____

Hole and casing data _____

Original depth to water _____ ft. above / 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_2O_3+ Mn_2O_3+Al_2O_3				
Alkali as sodium				
Calcium				
Magnesium				
Iron (unfiltered)				
Manganese				
Nitrate				
Fluoride				
Chloride				
Sulfate				
Bicarbonate				
Hardness (ppm)				
Hardness (gpg)				

Remarks _____

Laboratory data: Sample storage location 233-373 CBS-2 / 100-210 WOB-2

Sample range 233-373 deepened / 100-210 No. spls. 21 / 22 No. dupls. & cond. 1 / 1 22 Gto F

Spls. prepared by RKS P.H. Washed range. 233-373 / 145-210 by RKS P.H.

Driller's log and cond. _____

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

Microscopic study 233-373 strip log 1-20-49

Gen. log _____ Correl. by R.W.