

MEMORANDUM

13 April 2021
File No. 0127960-006

TO: Scott Zoller
EnergySolutions

FROM: Haley & Aldrich, Inc.
Jeremy Gerger
Senior Scientist
Nadia Glucksberg
Program Manager

SUBJECT: Fort Calhoun Nuclear Power Station - Well Research

A search on the Nebraska Department of Natural Resources Permits & Registrations Division, Groundwater Section database and web viewer, and the Iowa Geological Survey web viewer, yielded 92 active wells within the approximate search radius identified in Figure 1 from the Fort Calhoun Nuclear Power Plant (power plant), located at Power Lane in Blair, Nebraska. The well search was concentrated in the flood plain approximately 2.5-miles upstream and 4.5-miles downstream from the power plant.

A review of the well databases revealed that there are 31 domestic/private wells, seven geothermal heating wells, 13 irrigation wells, six public water wells (for recreation areas), 27 environmental monitoring wells, and four commercial/industrial wells, within the search area identified in Figure 1. Four wells did not have an identifiable purpose. Domestic and irrigation well information is provided on Table 1. Remaining well information is provided on Table 2. A short description of each is below:

- **Domestic Wells.** Fifteen of the 31 domestic wells encountered either shale (six wells between 130 to 255 feet bgs with an average static water level of approximately 137.7 feet bgs) or limestone (nine between 34 to 279 feet bgs with an average static water level of approximately 75.2 feet bgs). Each of the 31 screens were installed in sand or straddled a sand/clay interval.
- **Irrigation Wells.** Of the 13 irrigation wells that were mainly located in Iowa, six encountered bedrock. The deepest irrigation well encountered shale at approximately 180 feet bgs and was screened in sandy clay from 165 to 175 feet bgs. The static water level for this well was approximately 148 feet bgs. Five other irrigation wells encountered limestone ranging from approximately 68 to 110 feet bgs. These wells had an average static water level of approximately 7.4 feet bgs and each were screened in sand and gravel.

- **Public Water Supply Wells.** The six public water supply wells are located in Iowa in either the Wilson Island State Recreation Area or the Desoto National Wildlife Refuge. The database was deficient with information regarding these wells; however, each was terminated less than 100-feet bgs with static water levels ranging from 14 to 36 feet bgs.
- **Geothermal Wells.** Two of the seven geothermal wells encountered bedrock. One of the wells encountered limestone at approximately 190 feet bgs, then shale at 197 feet bgs, and finally limestone again at 200 feet bgs where the boring was terminated. The other geothermal well encountered shale at approximately 200 feet bgs where the boring was terminated. There is no well screen data for these wells as they are 'closed-loop' systems with no well screen present.
- **Monitoring Wells.** Although monitoring wells are not relevant for a resident farmer scenario, they do provide state water levels of the shallow aquifer. Static water levels of the monitoring wells range/ranged between approximately 5 to 20 feet bgs. The average static water level for the monitoring wells with data available is 15.3 feet bgs. None of the monitoring wells were installed in bedrock (i.e. limestone or shale). Well screens were installed primarily in sand, with the exception of a few wells that straddled a clay and/or silt and sand interval.
- **Commercial/Industrial Wells.** One of the commercial/industrial wells identified did not have a well log available on the database; however, the static water level for the well was 10 feet bgs. Two other commercial/industrial wells were both drilled to approximately 70 feet bgs with one of the wells tagging limestone at the bottom of the boring. The static water level for one of the wells was approximately 18 feet bgs. The static water level for the other commercial/industrial well was inaccurate. Although the well was installed to approximately 70 feet bgs, the static water level was recorded as 100 feet bgs. Both wells were screened in sand and one contained a thin, approximately 2-foot, layer of clay. The final commercial/industrial well identified in the search tagged limestone at approximately 48 feet bgs, had a static water level of 12 feet bgs and was screened from 37 to 47 feet bgs in sand.
- **Other.** Three of the four Nebraska wells with an unidentified purpose tagged limestone at either 54, 74 or 90 feet bgs. Each of the well screens were installed in sand and static water levels ranged from 12 to 35 feet bgs.

Wells Near Ft. Calhoun Power Station



Legend

- Counties
- NRDs
- SubSections
- Active, Registered Wells
- X Unregistered Wells

Well Use Descriptions

- X Aquaculture
- X Commercial/Industrial
- X Dewatering (>90 Days)
- X Domestic
- X Geothermal
- X Ground Heat Exchange
- X Heat Pump Well (Open)
- X Injection
- X Irrigation
- X Livestock
- X Monitoring (Quality)
- X Observation (Quantity)
- X Other
- X Pit (Excavation)
- X Recovery
- X Unspecified

0 1.5 3
mi



Disclaimer

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Printed Date

Fort Calhoun Flood Plain Search

2/15/2021 12:51:00 PM

Well ID	Registration Number	Well Type	LAT	LONG	Top of Well Screen	Bottom of Well Screen	Static WL
97900	G-086412	Domestic	41.501357	-96.046138	50	55	9
97575	G-086200	Domestic	41.500798	-96.050597	23	30	9
118425	G-100661	Domestic	41.498117	-96.054085	10	23	9
99336	G-087486	Domestic	41.496799	-96.06209	117	122	100
119033	G-101202	Domestic	41.503439	-96.065526	110	120	92
113251	G-097504	Domestic	41.503929	-96.0667	80	120	53
118170	G-100951	Domestic	41.502898	-96.066919	188	198	160
118965	G-101572	Domestic	41.506907	-96.067862	15	48	11
252761	G-185127	Domestic	41.49475	-96.06394444	45	50	32
95059	G-084528	Domestic	41.4878	-96.044883	30	35	12
142842	G-117591	Domestic	41.496518	-96.067019	245/265	255/275	219
161227	G-129224	Domestic	41.50877778	-96.07216667	120/133	130/138	103
103934	G-093764	Domestic	41.50241	-96.074563	75	85	46
156437	G-125696	Domestic	41.51163889	-96.07325	128	138	100
150630	G-122178	Domestic	41.49830556	-96.07391667	185	195	157
173135	G-137745	Domestic	41.51091667	-96.07602778	164	174	100
187925	G-146499	Domestic	41.48331667	-96.06065	63	73	24
97304	G-085929	Domestic	41.50872	-96.093593	177	187	135
106589	G-091509	Domestic	41.509112	-96.095403	282	292	242
148284	G-120479	Domestic	41.512833	-95.998314	25	35	19
166467	G-132787	Domestic	41.51075	-96.09816667	260	270	218
166184	G-132632	Domestic	41.51369444	-96.09805556	180	200	145
171372	G-136447	Domestic	41.51088889	-96.09891667	238	248	213
262595	G-190170	Domestic	41.51219444	-96.09991666	237	247	194
158928	G-127456	Domestic	41.51177778	-96.10008333	218	228	185
150838	G-122369	Domestic	41.522992	-95.998326	23	33	15
196267	G-151743	Domestic	41.51222222	-96.10138889	241	248	204
243020	G-179398	Domestic	41.51169444	-96.10166667	208	218	183
129525	G-109543	Domestic	41.514705	-96.10278	228	233	195
114634	G-097796	Domestic	41.520023	-96.103383	137	142	92
222614	G-165811	Domestic	41.54251667	-96.09916111			
90060		Irrigation	41.53972222	-96.0805555600	40	60	12
19909		Irrigation	41.545264	-96.069234			5
39044		Irrigation	41.555762	-96.066524	62	82	11
33137		Irrigation	41.556847	-96.060487	70	90	11
33136		Irrigation	41.553427	-96.050821	60	80	10
50940		Irrigation	41.545195	-96.061682	58	78	4
30178		Irrigation	41.527839	-96.060558	54	69	11
29285		Irrigation	41.4952990000	-95.989589	86	110	10
63931		Irrigation	41.4877	-95.9882	61	101	10
29284		Irrigation	41.4858100000	-95.9823110000	61	101	7
36669		Irrigation	41.481306	-95.976588	72	95	4
29283		Irrigation	41.477113	-95.9839950000	41	81	7

Well ID	Registration Number	Well Type	LAT	LONG	Top of Well Screen	Bottom of Well Screen	Static WL
251574	G-184477	Other	41.50192778	-96.03978056	54	74	12
251575	G-184478	Other	41.50172222	-96.03487778	61/69.5	67/89.5	14
95060	G-084529	Other	41.4891851	-96.05205481	41	51	35
131716	G-109803	Commercial/Industrial	41.51418056	-96.06813333	50.9	60.9	101
94474	G-084129	Livestock	41.487771	-96.060769	165	175	148
140317	G-115791	Ground Heat Exchanger well - Closed Loop Heat Pump well	41.50563889	-96.07472222			
131715	G-109802	Commercial/Industrial	41.521254	-96.06706			10
211531	G-159683	Ground Heat Exchanger well - Closed Loop Heat Pump well	41.50366667	-96.07733333			
131708	G-109801A	Monitoring (Ground Water Quality)	41.519811	-96.074618			18
235784	G-174730	Ground Heat Exchanger well - Closed Loop Heat Pump well	41.47882778	-96.0532			
131709	G-109801B	Monitoring (Ground Water Quality)	41.520634	-96.074622			18
214519	G-161564C	Monitoring (Ground Water Quality)	41.52081111	-96.07563889			10
264053	G-191156C	Monitoring (Ground Water Quality)	41.52000833	-96.076475			13.4
214518	G-161564B	Monitoring (Ground Water Quality)	41.51858889	-96.07773056			5
264051	G-191156A	Monitoring (Ground Water Quality)	41.52005833	-96.076475			13.4
189482	G-147837A	Monitoring (Ground Water Quality)	41.52036667	-96.07621111			15.1
189489	G-147837H	Monitoring (Ground Water Quality)	41.52035278	-96.076225			15
189491	G-147837J	Monitoring (Ground Water Quality)	41.52066389	-96.07602778			15.1
189490	G-147837I	Monitoring (Ground Water Quality)	41.52067778	-96.07601667			13.8
189487	G-147837F	Monitoring (Ground Water Quality)	41.52059444	-96.07653056			16.9
189488	G-147837G	Monitoring (Ground Water Quality)	41.52058333	-96.07654167			17.3
189492	G-147837K	Monitoring (Ground Water Quality)	41.52108889	-96.07611667			15.8
189485	G-147837D	Monitoring (Ground Water Quality)	41.52022222	-96.07704167			17.1
189486	G-147837E	Monitoring (Ground Water Quality)	41.52020833	-96.07705556			17.2
189494	G-147837M	Monitoring (Ground Water Quality)	41.52029722	-96.07723333			
264052	G-191156B	Monitoring (Ground Water Quality)	41.5197	-96.07793611			14.7
133206	G-110639	Monitoring (Ground Water Quality)	41.51908624	-96.07867716			13
251573	G-184476	Other	41.51812778	-96.01452222	76	116	14
189483	G-147837B	Monitoring (Ground Water Quality)	41.52033889	-96.07809722			17.3
214517	G-161564A	Monitoring (Ground Water Quality)	41.51666111	-96.08096944			15
189484	G-147837C	Monitoring (Ground Water Quality)	41.52032222	-96.07839444			17.5
192700	G-149467	Ground Heat Exchanger well - Closed Loop Heat Pump well	41.50775	-96.08461111			
189493	G-147837L	Monitoring (Ground Water Quality)	41.52141667	-96.07801389			14.7
177042	G-140336	Commercial/Industrial	41.52005556	-96.0795	50	70	18
107934	G-092618	Ground Heat Exchanger well - Closed Loop Heat Pump well	41.509412	-96.094423			
262597	G-190173	Ground Heat Exchanger well - Closed Loop Heat Pump well	41.51208333	-96.09944444			194
93726	G-083661A	Monitoring (Ground Water Quality)	41.520549	-96.096737			8
185771	G-145222	Ground Heat Exchanger well - Closed Loop Heat Pump well	41.51663889	-96.10316667			
217573	G-163030	Monitoring (Ground Water Quality)	41.52846667	-96.09792778			13
113636	G-097024	Commercial/Industrial	41.531049	-96.103693	37	47	12
234869	G-174034A	Monitoring (Ground Water Quality)	41.53291389	-96.11023333			5
234870	G-174034B	Monitoring (Ground Water Quality)	41.5345	-96.11011111			4.3
200353	G-153892B	Monitoring (Ground Water Quality)	41.53702	-96.109819			
16911		Public Water Supply	41.548545	-96.027979	50	70	