



CCR Groundwater Monitoring System



Omaha Public Power District

Nebraska City Station
NC2 Ash Disposal Area

Nebraska City, Nebraska

June 1, 2016

Updated June 2019

**OPPD Nebraska City Station
NC2 Ash Disposal Area
CCR Groundwater Monitoring System**

Revision Log

This Plan may be revised from time to time when procedures are changed. Because revisions to this document can be made on a periodic basis, document control is necessary. The most recent version of this Plan is required to be posted on the CCR website. The revision log below will be updated every time the plan is amended.

Revision No.	Revision Date	Revised Sections	Originator	Notes
0	June 1, 2016	N/A	HDR	Per CCR Rule – Certification of well network
1	June 21, 2019	Section 4	HDR	Added downgradient well (NC2-MW-8) to well network

Table of Contents

Professional Engineer Certificate	ii
1 Introduction	1
2 Facility Background.....	1
3 Site Hydrogeology Summary.....	2
4 Groundwater Monitoring System.....	3

List of Tables

Table 1: OPPD NC2 Ash Disposal Area, Groundwater Monitoring Well System	4
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List of Figures

Figure 1: NC2 Ash Disposal Area, Groundwater Monitoring Network	
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List of Appendices

Appendix A: Monitoring Well Documentation	
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Professional Engineer Certificate

"I hereby certify that the groundwater monitoring system described in this report for the CCR landfill known as the NC2 Ash Disposal Area at the Nebraska City Generating Station, owned and operated by the Omaha Public Power District, has been designed and constructed to meet the requirements of the Coal Combustion Residual Rule 40 CFR 257.91. I am a duly licensed Professional Engineer under the laws of the State of Nebraska."

Print Name: Megan B. Seymour

Signature: *Megan B. Seymour*

Date: 6-21-2019

License #: E-15931



My license renewal date is December 31, 2020.

1 Introduction

On April 17, 2015 the U.S. Environmental Protection Agency (EPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The Federal CCR Rule – effective on October 19, 2015 – applies to Omaha Public Power District’s (OPPD’s) Nebraska City Generating Station (Station). The Station, located southeast of Nebraska City, Nebraska has two coal-fired combustion units – Unit 1 and Unit 2. CCR from both units may be disposed in the NC2 Ash Disposal Area.

The CCR Rule, 40 CFR Subpart D-Standards for the Disposal of CCRs, Section §257.91 requires groundwater monitoring system that consists of sufficient number of wells at appropriate locations and depths, based on site-specific technical information, to yield groundwater samples from the uppermost aquifer that:

- Accurately represent the quality of both background groundwater, and groundwater passing the boundary of the CCR unit
- Monitor potential contaminant pathways

The groundwater monitoring system at the NC2 Ash Disposal Area was established in June 2016 to meet the requirements of the Federal CCR Rule. The groundwater monitoring network has been updated, as part of this April 2019 revision, to include an additional downgradient monitoring well (NC2-MW-8) that was required by the Nebraska Department of Environmental Quality. This report includes the following sections in support of the certification.

- Section 1.0 Introduction
- Section 2.0 Facility Background
- Section 3.0 Site Hydrogeology Summary
- Section 4.0 Groundwater Monitoring System

2 Facility Background

OPPD has a two-unit (Unit 1 and Unit 2) fossil fuel-fired generating plant at the Station southeast of Nebraska City, Nebraska. This Station has two existing CCR landfills that are permitted under the current NDEQ Title 132 regulations for fossil fuel combustion ash disposal (the NC1 Ash Disposal Area and NC2 Ash Disposal Area).

The NC2 Ash Disposal Area is an existing lined CCR landfill permitted under NDEQ Title 132 regulations for 40.7 acres; Cell 1 was constructed in 2008/2009 with a composite liner and leachate collection system. Construction for NC2 Ash Disposal Area Cells 2 and 3 started before the effective date of the CCR rule – October 19, 2015 – and construction will continue with excavation, structural fill, and installation of a composite liner and leachate collection system. NC2 Ash Disposal Area is an active, existing CCR landfill as defined by the CCR rule.

3 Site Hydrogeology Summary

Based on soil boring advanced at the Station in 2006, the bedrock, in the form of shale, was encountered at a depth of 89 feet below ground surface. The uppermost aquifer, Missouri River Alluvium, depth is anticipated to be from 2 feet to 89 feet below ground surface (bgs).

According to the hydrology assessment conducted at the site in 1995 by SCS Engineers titled *Hydrologic Investigations Report*. The broad upland areas of the Station are underlain by the unconsolidated wind-blown and glacial deposits of Pleistocene age. The surface of the site is generally overlain by fine-grained or cohesive deposits near the surface, based on a study conducted by D'Appolonia Consulting Engineers in 1975. These deposits consist of silty clays, clayey silts, silty sands and fine sands. The bedrock underlying the Station area is medium hard red to gray shale. Several areas outside the Station area are underlain by a thin formation of limestone interbedded with shale.

Data from the boring logs for the monitoring wells and soil borings at the Station indicates that the subsurface geology at the ash disposal area generally consists of the following:

- 3 feet of light brown to dark grayish brown lean clay (CL) (Fill/Topsoil), overlying,
- Approximately 9 feet of alluvium consisting of light brown to grayish brown silty clayey sand (SM), poorly graded sand with silty sand (SP-SM), silt with very fine sand to silty very fine sand (ML/SM), and high plastic clay (CH), overlying,
- 28 to 77 feet of gray poorly graded sand (SP) to the boring completion depths varying from 40 to 89 feet.
- Some borings indicate that bedrock was encountered at a depth of 103.5 feet.

In the general vicinity of the Station, two primary sources of groundwater are present, Missouri River alluvium and glacial deposits in the upland area west of the Station property. Groundwater in the Missouri River alluvium is found at starting depths of approximately 2 to 17 feet below ground surface (ft bgs) and is largely affected by the river stages. Based on the monitoring reports for the NC2 Ash Disposal Area, groundwater flow was in the south-southeasterly direction. Groundwater levels from the monitoring wells installed on the Station property in 1975 showed a flow direction generally south/southeast.

Slug tests conducted in 1995 on three monitoring wells (MW-1, MW-4 and MW-6) indicate that the horizontal hydraulic conductivity values ranged from 5.7×10^{-4} cm/sec to 8.2×10^{-3} cm/sec. A pumping test was conducted in 2003 by HDR on an 83-foot-deep, 16-inch-diameter well that was installed and pumped at a rate of 1,225 gallons per minute for 72 hours. Water levels were monitored during the pumping period and recovery period in the pumped well and in three observation wells installed for the test. The results of the test indicated that hydraulic conductivity of the aquifer is approximately 2.0×10^{-1} cm/sec, which is in the upper end of the range of literature values for clean sands. It should be noted that the tested interval in the 2003 investigation is deeper (and the sediments coarser) than was tested during the slug tests that were conducted in 1995.

The hydraulic conductivity reported near the NC2 Ash Disposal Area has a range of 1.39×10^{-2} cm/sec to 2.42×10^{-3} cm/sec as reported by HDR in the 2006 Hydrogeologic Characterization Report (HDR 2006). The geometric mean that has been used for groundwater flow velocity calculations at NC2, based on the hydraulic conductivity tests completed in 2006, is 3.4×10^{-3} cm/sec. Effective porosity was reported as 0.405 in HDR 2006. Based on monitoring reports, the gradient has been reported as 0.0017 ft/ft with a velocity of 14.9 ft/year.

From slug test data performed by Terracon (2016) on recently installed well MW-13, the hydraulic conductivity was reported as 3.38×10^{-3} cm/sec. This is within the range of previously recorded data.

4 Groundwater Monitoring System

Based on the site-specific specific hydrogeologic information and groundwater flow to the south-southeasterly direction, the groundwater monitoring system for the NC2 Ash Disposal Area for the detection monitoring program consists of three (3) upgradient/background wells, one (1) crossgradient well, and four (4) downgradient wells. This exceeds the minimum number of monitoring wells required by 40 CFR 247.91(c) (i.e. one upgradient and three downgradient). Three (3) additional wells are included for water level measurements and to serve for future 'nature and extent determinations'. The groundwater monitoring system network for the NC2 Ash Disposal Area is summarized below in Table 1.

The monitoring well locations are shown in the attached Figure 1. The groundwater monitoring wells were constructed of 2-inch-diameter, schedule 40 PVC, flush threaded riser pipe, and machine slotted 10-slot (0.010 inch) screen. The surface completion for each well consists of a steel protective casing, concrete apron, and three bollards/posts. Monitoring well construction logs, registrations or abandonment forms for the groundwater monitoring wells are contained in Appendix A of this report.

Table 1: OPPD NC2 Ash Disposal Area, Groundwater Monitoring Well System

Monitoring Well	Date Installed	Well Depth (feet bgs) ¹	Well Depth (feet from TOC) ²	Gradient	Monitoring Program Use
Monitoring Well Network					
MW-13	1/26/16	13.0	15.19	Background/Upgradient	Detection
NC2-MW-4	9/8/04	14.0	16.01	Background/Upgradient	Detection
NC2-MW-5 ³	9/16/04	15.2	18.93	Background/Upgradient	Detection
NC2-MW-6	9/7/04	11.0	14.66	Crossgradient	Detection
NC2-MW-2	9/8/04	15.0	18.35	Downgradient	Detection
NC2-MW-3	9/8/04	12.0	15.01	Downgradient	Detection
NC2-MW-7	11/6/13	21.0	23.97	Downgradient	Detection
NC2-MW-8	7/9/18	15.0	18.04	Downgradient	Detection
Water Level Measurements Only					
NC1-MW-7 (deep well)	1/20/99	40.5	42.53	Downgradient	Water Level/Nature & Extent Determinations ⁴
NC1-MW-8	1/21/99	20.0	22.46	Downgradient	Water Level/Nature & Extent Determinations ⁴
MW-14	7/12/18	18.0	21.0	Upgradient	Water Level
Abandoned Well⁵					
NC2-MW-1 (replaced with NC2-MW-7)	9/7/04 (Abandoned 11/6/13)	14.0	17.08	NA	NA

Notes:

1. Depth from ground surface to bottom of installed well (screen depth). Actual boring depth may be deeper.
2. Depth from top of casing to bottom of installed well (screen depth).
3. Well repaired on 11/6/13 which raised the top of casing and ground surface.
4. Monitoring wells to be sampled for nature and extent determinations if an Appendix IV constituent is detected in one or more of the detection monitoring wells at statistically significant level above groundwater protection standard.
5. Abandoned in accordance with State of Nebraska regulations.

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Figure 1

NC2 Ash Disposal Area
Groundwater Monitoring
Network





MONITORING WELL NETWORK				
Monitoring Well	Noting	Elevation (Top of Casing)	Well Depth (Feet BGS)	Location with Respect to Temporary Ash Disposal Area
MW-13	318186.64	2828434.68	13.0	Background/Gradient
MW-14	316786.47	2828244.03	21.0	Upgradient
NC1-MW-4	316259.86	281121.03	46.5	Downgradient
NC1-MW-8	316258.57	281121.26	15.0	Downgradient
NC2-MW-2	316854.69	280902.40	15.0	Downgradient
NC2-MW-3	316855.96	2809148.54	12.0	Downgradient
NC2-MW-4	317455.90	280530.80	14.0	Background/Gradient
NC2-MW-5	318005.54	280531.90	15.2	Background/Gradient
NC2-MW-6	317927.46	2815497.97	11.0	On gradient
NC2-MW-7	316571.78	2815647.12	21.0	Downgradient/On gradient
NC2-MW-8	316601.90	2809145.16	15.0	Downgradient


- NOTES:
1. LOCATION OF CASING ELEVATION DETERMINED BY SURVEY DATA OBTAINED JUNE 2019.
2. BGS = BELOW GROUND SURFACE
3. THE FOLLOWING MONITORING WELL LOCATIONS ARE FOR WATER LEVEL DATA ONLY: NC1-MW-7, NC1-MW-8, AND MW-14.

PROJECT MANAGER		G. WILLIAMS	
ENVIRONMENTAL		M. REYNOLDS	
CAD		W. NICHOLSON	
ISSUE		DATE	
DESCRIPTION		PROJECT NUMBER	
		10111074	



OPPD Nebraska City Ash Landfill
NC2 Ash Disposal Area - Permit Drawings
Monitoring Well Network

MONITORING WELL LOCATION MAP



SCALE 1" = 400'

FILE NAME Figure 1 - NC2.dwg
SHEET 1

A decorative graphic on the left side of the page consists of three stacked rectangles: a dark gray one at the top, a large orange one in the middle, and a medium gray one at the bottom. To the right of the orange rectangle is a large white rectangle containing the text.

Appendix A

Monitoring Well Documentation


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LOG OF BORING NO. MW-1

Page 1 of 1

BOREHOLE LOCATION		ELEVATION DATUM		DRILLER		LOGGER								
See Boring Location Plan		USGS		Abel Monnarez		Bruce Birge								
BORING STARTED		BORING COMPLETED		DRILL RIG		DRILLING METHOD								
9-7-04		9-7-04		CME-75		4.25" HSA								
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE		TOTAL DEPTH (FT.)	WELL LOG
											Berm/Soybean Field		14	
											WATER LEVEL OBSERVATIONS (FT.)			
											▽ 7.5 ATD			
											▼ 8.4 @ 1 Day AD			
											DESCRIPTION		Surface Elevation: 918.0	
1	2S	24		4.5+							Hard/Medium Dense, Slightly Moist, Mixed Low Plastic Silty Clay/Silt/and Poorly Graded Silty Sand, Very Fine Grained (CL/ML/SM) (Berm Fill)			
2	2S	24		4.5+										
3	2S	15		2.6						5.0	913.0			
4	2S	24		1.8 2.8						7.0	911.0			
5	2S	16		-						7.5	910.5			
6	2S	18		-						10				
7	2S	18		-						14.0	904.0			
											Becomes Less Silty (SP-SM/SP) Becomes Very Fine to Fine-Grained, Poorly Graded Sand with Occasional Layer of Silty Sand (SP/SP-SM)			
											Becomes Very Silty (SM), Very Fine Grained, with Some Interbeds of Sandy Silt (ML)			
											Bottom of Boring @ 14'			
											Well Completed Using 3' Stick Up and Concrete Pad			

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.

 KLEINFELDER 9312 G Court, Omaha, Nebraska 68127 (402) 331-2260	PROJECT NAME	OPPD Flyash Monofill
	LOCATION	Nebraska City, Nebraska
	PROJECT NUMBER	47962

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Mail to
DNR
PO Box 94676
Lincoln, NE 68509-4676
Phone (402)471-2363

10-26-2004-162824-WWRF
Department of Natural Resources (3)

October 2001
DNR Form 145

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date 10-26-2004 Sequence No. 162824 Registration No. Y-130442A
Owner Code No. 40221 Receipt No. R16991 Nemaha NRD

1. a. Well Owner's First Name _____ Last Name _____
b. Company Name Omaha Public Power District
c. Correspondent Name Omaha Public Power District Attention James J Krajicek
Address 444 South 16th Street Mall
City Omaha State NE Zip 68102 Telephone (402) 636-2309

2. a. Contractor's License No. 19245 Contractor's Name Kleinfelder
Contractor's Email Address locoabel@cox.net
b. Drilling Firm Name Kleinfelder
Address 9312 G Court
City Omaha State NE Zip 68127 Telephone (402) 331-2260
Drilling Firm's Email Address bhavens@kleinfelder.com

3. a. Well location SE 1/4 of the SE 1/4 of Section 25, Township 8 North, Range 14 East/West, Otoe County.
b. Natural Resources District Nemaha NRD
c. The well is _____ feet from the (North/ South) section line and _____ feet from the (East/West) section line
(circle one) (circle one)
or Latitude Degree 40 Minute 37 Second 29
Longitude Degree 95 Minute 47 Second 04
d. Street address and subdivision, if applicable _____
Block _____ Lot _____
e. Location of water use, if applicable (give legal descriptions) _____
f. If for irrigation, the land to be irrigated is _____ acres.
g. Well reference letter(s), if applicable MW-1

4. Permits
Management Area Permit Number _____ Surface Water Permit Number _____
Geothermal Permit Number _____ Industrial Permit Number _____
Municipal Permit Number _____ Transfer Out-Of-State Permit Number _____
Well Spacing Permit Number _____ Conduct Permit Number _____
Other Permit Number _____

5. Purpose of well (indicate one) Aquaculture Commercial/Industrial Dewatering (over 90 days)
Domestic Ground Heat Exchanger Groundwater Source Heat Pump Irrigation Injection
Livestock X Monitoring Observation Public Water Supply (with spacing (46-638))
Public Water Supply (without spacing) Recovery Other
(indicate use)

6. Wells in a Series.
a. Is this well a part of a series? yes Yes go to part b of this section No go to part 7 of this application
b. If one or more of the wells in the series is currently registered, give the well registration number NA
c. How many wells in the series are you registering at this time? 6

7. Replacement and abandoned well information.
a. Is this well a replacement well? Yes X No
b. Registration number of abandoned well _____ If not registered, date abandoned well was constructed (m) _____ / (d) _____ / (y) _____
c. Replacement well is _____ feet from abandoned well. d. Abandoned well last operated (m) _____ / (d) _____ / (y) _____
e. Original well pump column size _____ inches. f. Completion of original well abandonment on (m) _____ / (d) _____ / (y) _____
g. Location of water use of abandoned well _____

8. Pump Information.

a. Is pump installed at this time Yes ☒ NoIs pump installed by well owner in section 1? ☐ Yes ☐ No Is pump installed by contractor in section 2? ☐ Yes ☐ No

If pump installed by pump installer, please fill out license number below

b. Pump Installer's License No. _____ Pump Installer's Name _____

Pump Installer's Email Address _____

Pump Installer's Firm Name _____

Pump Installer's Firm Address _____

City _____ State _____ Zip _____ Telephone _____

Pump Installer's Firm Email Address _____

c. Pumping rate _____ gallons per minute _____ Measured _____ Estimated _____

d. Drop pipe diameter _____ inches e. Length of drop pipe _____ feet

f. Pumping equipment installed (m) _____ / (d) _____ / (y) _____ g. Pump Brand _____

h. This well will be used to pump less than 50 gpm ☐ Yes ☐ No

9. Well Construction Information.

a. Total well depth _____ ~ 14 _____ feet.

b. Static water level _____ ~ 8.4 _____ feet.

c. Pumping water level _____ NA _____ feet

d. Well Construction began (month) 9 / (day) 7 / (year) 2004

e. Well Construction completed (month) 9 / (day) 8 / (year) 2004 f. Bore hole diameter in inches Top 6.5 Bottom 6.5

g. Casing and Screen Joints are Welded _____ Glued _____ Threaded ☒ Other _____

10. Well Construction (Casing & Screen)- c, d, e, & g measurements should be in inches to three decimal places

a Placement Depth in Feet		b Casing or Screen	c Inside Diameter	d Outside Diameter	e Wall Thickness	f Type of Material	g Screen Slot Size	h Trade Name
From	To							
0	4	Casing	2.047	2.375	0.328	PVC	N/A	Johnson Screens
4	15	Screen	2.000	2.560	0.560	PVC	0.010	Johnson Screens

11. Grout and Gravel Pack

Placement Depth in Feet		Grout or Gravel Pack	Material Description
From	To		
0	2	Bentonite	3/8" Bentonite Holeplug
2	14	Gravel Pack	12-20 Sand

12. Geologic Materials Logged

Depth in Feet Description See Attached Boring Log
From ToDepth in Feet Description
From To

(Additional sheets may be submitted)

13. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Water Well Contractor's Signature

Date

10.13.04

LOG OF BORING NO. MW-1

Page 1 of 1

BOREHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS				DRILLER Abel Monnarez				LOGGLER Bruce Birge			
BORING STARTED 9-7-04				BORING COMPLETED 9-7-04				DRILL RIG CME-75				DRILLING METHOD 4.25" HSA			
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE Berm/Soybean Field		TOTAL DEPTH (FT.) 14		WELL LOG
											WATER LEVEL OBSERVATIONS (FT.)				
											▽ 7.5 ATD				
											▼ 8.4 @ 1 Day AD				
											DESCRIPTION				
											Surface Elevation: 918.0				
1	2S	24		4.5+							Hard/Medium Dense, Slightly Moist, Mixed Low Plastic Silty Clay/Silt and Poorly Graded Silty Sand, Very Fine Grained (CL/ML/SM) (Berm Fill)				
2	2S	24		4.5+											
3	2S	15		2.6						5	5.0	913.0			
4	2S	24		1.8 2.8							7.0	911.0			
5	2S	16		-							7.5	910.5			
6	2S	18		-						10	Very Stiff, Very Moist, Grayish Brown, Silt (ML) (Alluvium)				
7	2S	18		-							Loose, Wet, Grayish to Yellowish Brown, Silty Clay, Very Fine Grained (SM) (Alluvium)				
											Becomes Less Silty (SP-SM/SP)				
											Becomes Very Fine to Fine-Grained, Poorly Graded Sand with Occasional Layer of Silty Sand (SP/SP-SM)				
										14.0	Becomes Very Silty (SM), Very Fine Grained, with Some Interbeds of Sandy Silt (ML)		904.0		
												Bottom of Boring @ 14'			
												Well Completed Using 3' Stick Up and Concrete Pad			

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.

**KLEINFELDER**

9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME

OPPD Flyash Monofill

LOCATION

Nebraska City, Nebraska

PROJECT NUMBER

47962



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Nebraska City NE

US

Notes:

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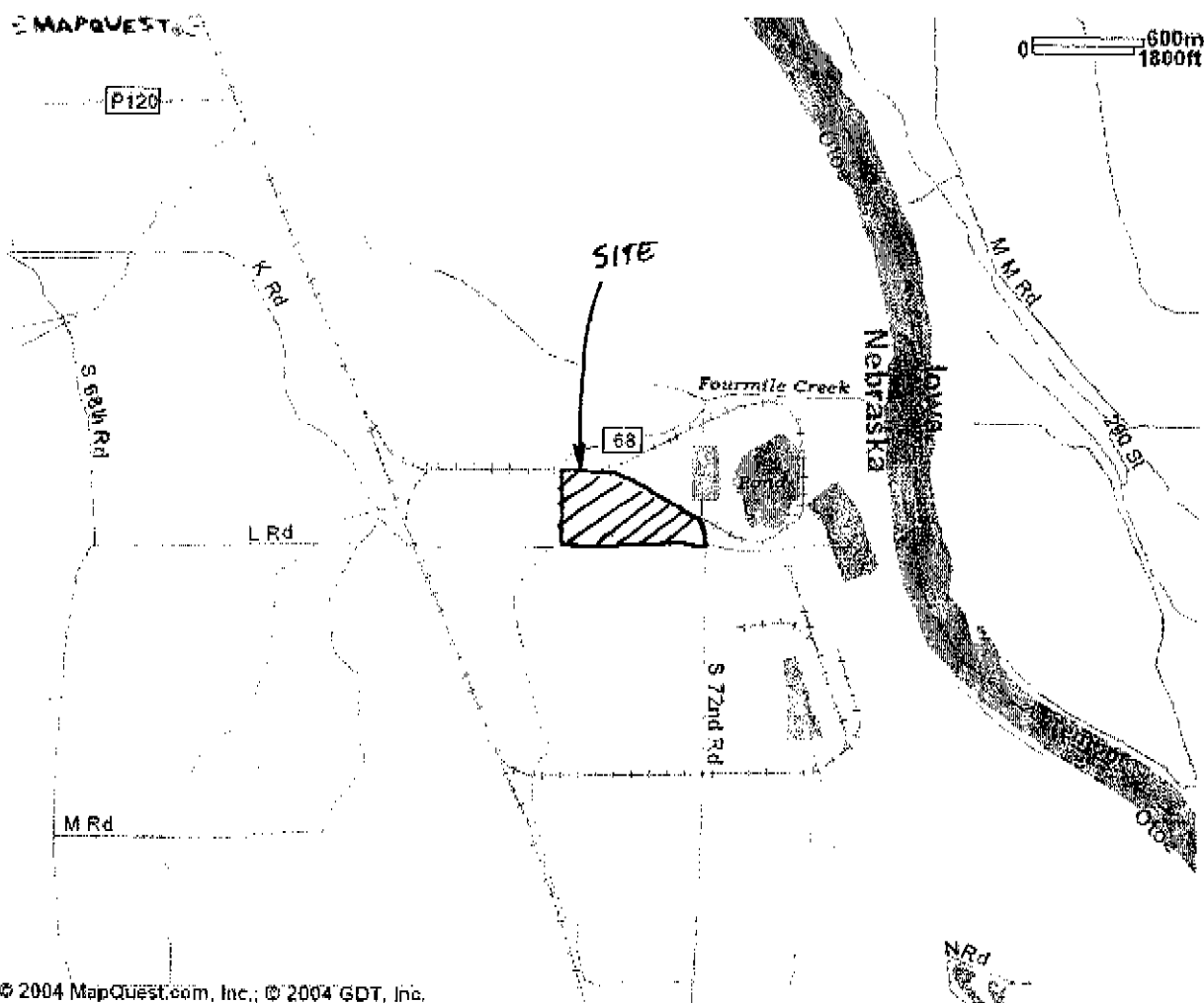
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SITE LOCATION PLAN

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OPPG Nebraska City Station Unit 2

1-033

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Submit To:
Department of Natural Resources
301 Centennial Mall South
PO Box 94676
Lincoln, Nebraska 68509-4676
Phone: (402) 471-2363

STATE OF NEBRASKA DEPARTMENT OF NATURAL RESOURCES

This form is required to be filed within
60 days of decommissioning of the
water well

NOTICE OF WATER WELL DECOMMISSIONING

FOR DEPARTMENT USE ONLY

Date Filed 1/8/14 Owner Code No. 49927 Registration No. G-130442A
01082014 - 162824 - DECF Receipt NEMAHA NRD
Well ID

1. Well Owner's First Name _____ Last Name _____
OR Company Name Omaha Public Power District
Attention Name Patrick Finigan
Address 444 South 16th Street Mall
City Omaha State NE Zip 68102 Telephone _____

2. Contractor (if applicable) Terracon Consultants, Inc. Telephone Number (402) 330-2202
Address 15080 A Circle Contractor License No. 39325
City Omaha State NE Zip 68144
Email: dmsvingen@terracon.com

3 a. Well Registration No. G-130442A
3 b. Purpose of Well: Monitoring Well
3 c. Date Well Last Operated: _____ 3d. Date of Decommissioning: 11/6/13
3 e. List complete well location: Legal, Footage and/or GPS Coordinates
Well Location: SE 1/4 of the SE 1/4 of Section 25, Township 8 North, Range 14 E ☒ W ☐, Otoe County.
The well is _____ feet from the (N ☐ S ☐) section line and _____ feet from the (E ☐ W ☐) section line
OR Latitude Degree: 40 Minute: 37 Second: 29 . 0
Longitude Degree: 95 Minute: 47 Second: 04 . 0
3 f. Location of water use Not Applicable

4. Actual Method for Decommissioning of Well

Placement Depth in Feet		Detailed Description of Material
From	To	
0	0.5	gravel/dirt
0.5	0.5	PVC cap
0.5	14	Bentonite grout

5 a. Well casing Size: 2" 5 b. Bore Hole Diameter: 6.5" (from well registration form)

I hereby certify that the information provided on this form is true and accurate to the best of my knowledge.

Daniel M. Surgen
Contractor (**owner)

1/5/14
Date

** Owner may sign on wells prior to 7/1/2001 of sandpoint or if well no longer exists and it is unknown when decommissioning occurred **RECEIVED**

The Department reserves the right to request verification of the information provided.

UG No. (if applicable):

Terracon Job No.: 05137163

Terracon Well ID: MW-1

JAN 08 2014

DEPARTMENT OF
NATURAL RESOURCES

NOTICE OF WATER WELL DECOMMISSIONING UPDATE

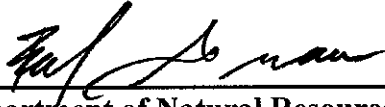
Registration Number G-130442A
Sequence Number 162824
Date January 17, 2014
Person Processing Update BJ Green

Information regarding the water well referenced above has been changed in the Department's water well registration records. Please note the following changes and the reason changes were made:

This well is located in subsection NENE, section 36, township 8, range 14. It is within the 150' allowance, as it is 39' south of the line separating the SESE of section 25 and the NENE of section 36.

This change has modified Items 3e of DNR DECO. If these changes are inaccurate, please contact the Department of Natural Resources at P.O. Box 94676, Lincoln, NE, 68509-4676, phone (402) 471-2363.

I certify that this update has been forwarded to the owner of the referenced water well and is now a part of the registration records.



Department of Natural Resources

LOG OF BORING NO. MW-2

Page 1 of 1

BOREHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS				DRILLER Abel Monnarez				LOGGER Bruce Birge			
BORING STARTED 9-8-04				BORING COMPLETED 9-8-04				DRILL RIG CME-75				DRILLING METHOD 4.25" HSA			
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE Cornfield/Berm		TOTAL DEPTH (FT.) 15		WELL LOG
											WATER LEVEL OBSERVATIONS (FT.)				
											▽ 7.7 ATD				
											▽ 10.6 AD				
											DESCRIPTION				
											Surface Elevation: 919.0				
1	2S	18		3.8							Very Stiff, Slightly Moist, Dark Gray to Yellowish Brown, Low, Medium & High Plastic Clay (CL/CH) (Berm Fill)				
2	2S	14		2.6											
										4.2			914.8		
3	2S	16		1.6						5	Stiff, Moist, Grayish Brown, High Plastic Clay (CH) (Alluvium)				
										6.0			913.0		
4	2S	24									Loose, Wet, Grayish Brown, High Plastic Clay (CH) (Alluvium)				
											▽				
5	2S	24		0.3							Becomes Soft/Loose, Wet, Brown-Grayish Brown, Interbedded Sandy Silt, Silty Very Fine Sand, and Low Plastic Clay with Some Sand (CL/SM/CL) - Clay				
										10	Layer @ 8.5-9.5				
6	2S	21									Becomes Loose/Soft, Wet, Grayish Brown, Silty Sand, Very Fine Grained to Sandy Silt (SM/ML) (Alluvium)				
											▽				
7	2S	21									Becomes Loose, Wet, Gray, Poorly Graded Sand with Some Silt				
											(SP/SP-SM) (Alluvium)				
										15			904.0		
											Bottom of Boring @ 15'				
											Well Completed Using 3' Stick Up and Concrete Pad				

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



KLEINFELDER

9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME

OPPD Flyash Monofill

LOCATION

Nebraska City, Nebraska

PROJECT NUMBER

47962

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Mail to
DNR
PO Box 94676
Lincoln, NE 68509-4676
Phone (402)471-2363

10262004-162825 WWRF
Department of Natural Resources (3) October 2001
DNR Form 145

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date 10-26-2004 Sequence No. 162825 Registration No. 1-130442B
Owner Code No. 40226 Receipt No. B16991 Nemaha NRD

1. a. Well Owner's First Name _____ Last Name _____
b. Company Name Omaha Public Power District
c. Correspondent Name Omaha Public Power District Attention James J Krajicek
Address 444 South 16th Street Mall
City Omaha State NE Zip 68102 Telephone (402) 636-2309
2. a. Contractor's License No. 19245 Contractor's Name Kleinfelder
Contractor's Email Address locoabel@cox.net
b. Drilling Firm Name Kleinfelder
Address 9312 G Court
City Omaha State NE Zip 68127 Telephone (402) 331-2260
Drilling Firm's Email Address bhavens@kleinfelder.com
3. a. Well location SE 1/4 of the SE 1/4 of Section 25, Township 8 North, Range 14 East/West, Otoe County.
b. Natural Resources District Nemaha NRD
c. The well is _____ feet from the (North/ South) section line and _____ feet from the (East/West) section line
(circle one) (circle one)
or Latitude Degree 40 Minute 37 Second 29
Longitude Degree 95 Minute 47 Second 12
d. Street address and subdivision, if applicable _____
Block _____ Lot _____
e. Location of water use, if applicable (give legal descriptions) _____
f. If for irrigation, the land to be irrigated is _____ acres.
g. Well reference letter(s), if applicable MW-2
4. Permits
Management Area Permit Number _____ Surface Water Permit Number _____
Geothermal Permit Number _____ Industrial Permit Number _____
Municipal Permit Number _____ Transfer Out-Of-State Permit Number _____
Well Spacing Permit Number _____ Conduct Permit Number _____
Other Permit Number _____
5. Purpose of well (indicate one) Aquaculture Commercial/Industrial Dewatering (over 90 days)
Domestic Ground Heat Exchanger Groundwater Source Heat Pump Irrigation Injection
Livestock X Monitoring Observation Public Water Supply (with spacing (46-618))
Public Water Supply (without spacing) Recovery Other
(indicate use)
6. Wells in a Series.
a. Is this well a part of a series? yes Yes go to part b of this section No go to part 7 of this application
b. If one or more of the wells in the series is currently registered, give the well registration number NA
c. How many wells in the series are you registering at this time? 6
7. Replacement and abandoned well information.
a. Is this well a replacement well? Yes X No
b. Registration number of abandoned well _____ If not registered, date abandoned well was constructed (m)____/(d)____/(y)____
c. Replacement well is _____ feet from abandoned well. d. Abandoned well last operated (m)____/(d)____/(y)____
e. Original well pump column size _____ inches. f. Completion of original well abandonment on (m)____/(d)____/(y)____
g. Location of water use of abandoned well _____

8. Pump Information.

a. Is pump installed at this time Yes ☐ No ☒Is pump installed by well owner in section 1? Yes ☐ No ☐ Is pump installed by contractor in section 2? Yes ☐ No ☐

If pump installed by pump installer, please fill out license number below

b. Pump Installer's License No. _____ Pump Installer's Name _____

Pump Installer's Email Address _____

Pump Installer's Firm Name _____

Pump Installer's Firm Address _____

City _____ State _____ Zip _____ Telephone _____

Pump Installer's Firm Email Address _____

c. Pumping rate _____ gallons per minute Measured ☐ Estimated ☐

d. Drop pipe diameter _____ inches e. Length of drop pipe _____ feet

f. Pumping equipment installed (m) _____ / (d) _____ / (y) _____ g. Pump Brand _____

h. This well will be used to pump less than 50 gpm Yes ☐ No ☐

9. Well Construction Information.

a. Total well depth _____ ~ 15 _____ feet.

b. Static water level _____ ~ 10.6 _____ feet.

c. Pumping water level _____ NA _____ feet

d. Well Construction began (month) _____ 9 _____ / (day) _____ 8 _____ / (year) _____ 2004

e. Well Construction completed (month) _____ 9 _____ / (day) _____ 9 _____ / (year) _____ 2004

f. Bore hole diameter in inches Top 6.5 Bottom 6.5

g. Casing and Screen Joints are Welded ☐ Glued ☐ Threaded ☒ Other ☐

10. Well Construction (Casing & Screen)- c, d, e, & g measurements should be in inches to three decimal places

a Placement Depth in Feet		b Casing or Screen	c Inside Diameter	d Outside Diameter	e Wall Thickness	f Type of Material	g Screen Slot Size	h Trade Name
From	To							
0	5	Casing	2.047	2.375	0.328	PVC	N/A	Johnson Screens
5	15	Screen	2.000	2.560	0.560	PVC	0.010	Johnson Screens

11. Grout and Gravel Pack

Placement Depth in Feet		Grout or Gravel Pack	Material Description
From	To		
0	3	Bentonite	3/8" Bentonite Holeplug
3	15	Gravel Pack	12-20 Sand

12. Geologic Materials Logged

Depth in Feet		Description	See Attached Boring Log
From	To		

Depth in Feet		Description
From	To	

(Additional sheets may be submitted)

13. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.


 Water Well Contractor's Signature

 10.13.04
 Date

G130442B

LOG OF BORING NO. MW-2

Page 1 of 1

BOREHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS				DRILLER Abel Monnarez		LOGGER Bruce Birge			
BORING STARTED 9-8-04				BORING COMPLETED 9-8-04				DRILL RIG CME-75		DRILLING METHOD 4.25" HSA			
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE Cornfield/Berm	TOTAL DEPTH (FT.) 15	WELL LOG
											WATER LEVEL OBSERVATIONS (FT.)		
											▽ 7.7 ATD		
											▼ 10.6 AD		
											DESCRIPTION Surface Elevation: 919.0		
1	2S	18		3.8							Very Stiff, Slightly Moist, Dark Gray to Yellowish Brown, Low, Medium & High Plastic Clay (CL/CH) (Berm Fill)		
2	2S	14		2.6							4.2	914.8	
3	2S	16		1.6						5	Stiff, Moist, Grayish Brown, High Plastic Clay (CH) (Alluvium)	6.0	913.0
4	2S	24									Loose, Wet, Grayish Brown, High Plastic Clay (CH) (Alluvium)		
5	2S	24		0.3						10	Becomes Soft/Loose, Wet, Brown-Grayish Brown, Interbedded Sandy Silt, Silty Very Fine Sand, and Low Plastic Clay with Some Sand (CL/SM/CL) - Clay Layer @ 8.5-9.5		
6	2S	21									Becomes Loose/Soft, Wet, Grayish Brown, Silty Sand, Very Fine Grained to Sandy Silt (SM/ML) (Alluvium)		
7	2S	21									Becomes Loose, Wet, Gray, Poorly Graded Sand with Some Silt (SP/SP-SM) (Alluvium)	15.0	904.0
										15	Bottom of Boring @ 15'		
											Well Completed Using 3' Stick Up and Concrete Pad		

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME	OPPD Flyash Monofill
LOCATION	Nebraska City, Nebraska
PROJECT NUMBER	47962



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Nebraska City NE

US

Notes:

.....

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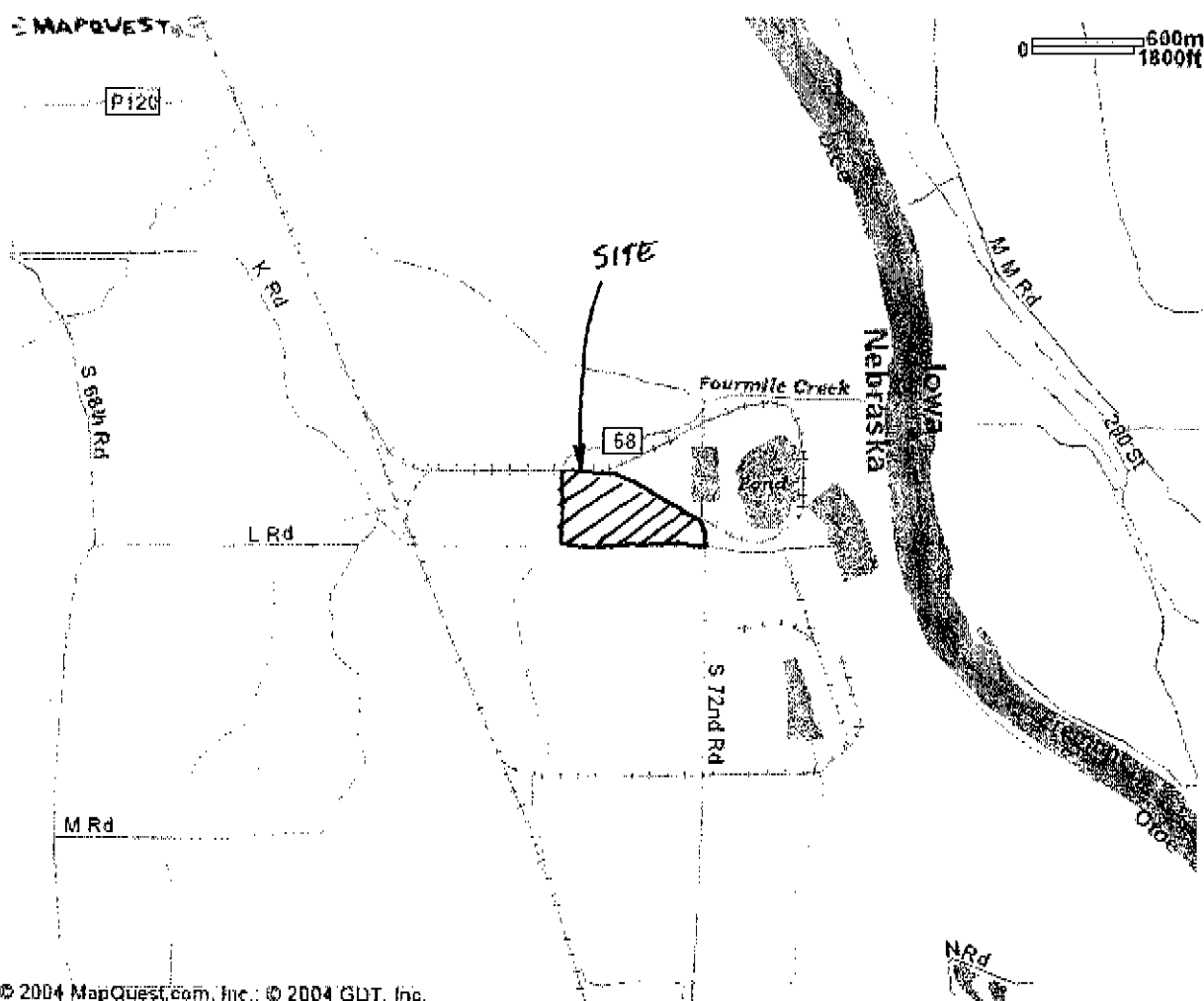
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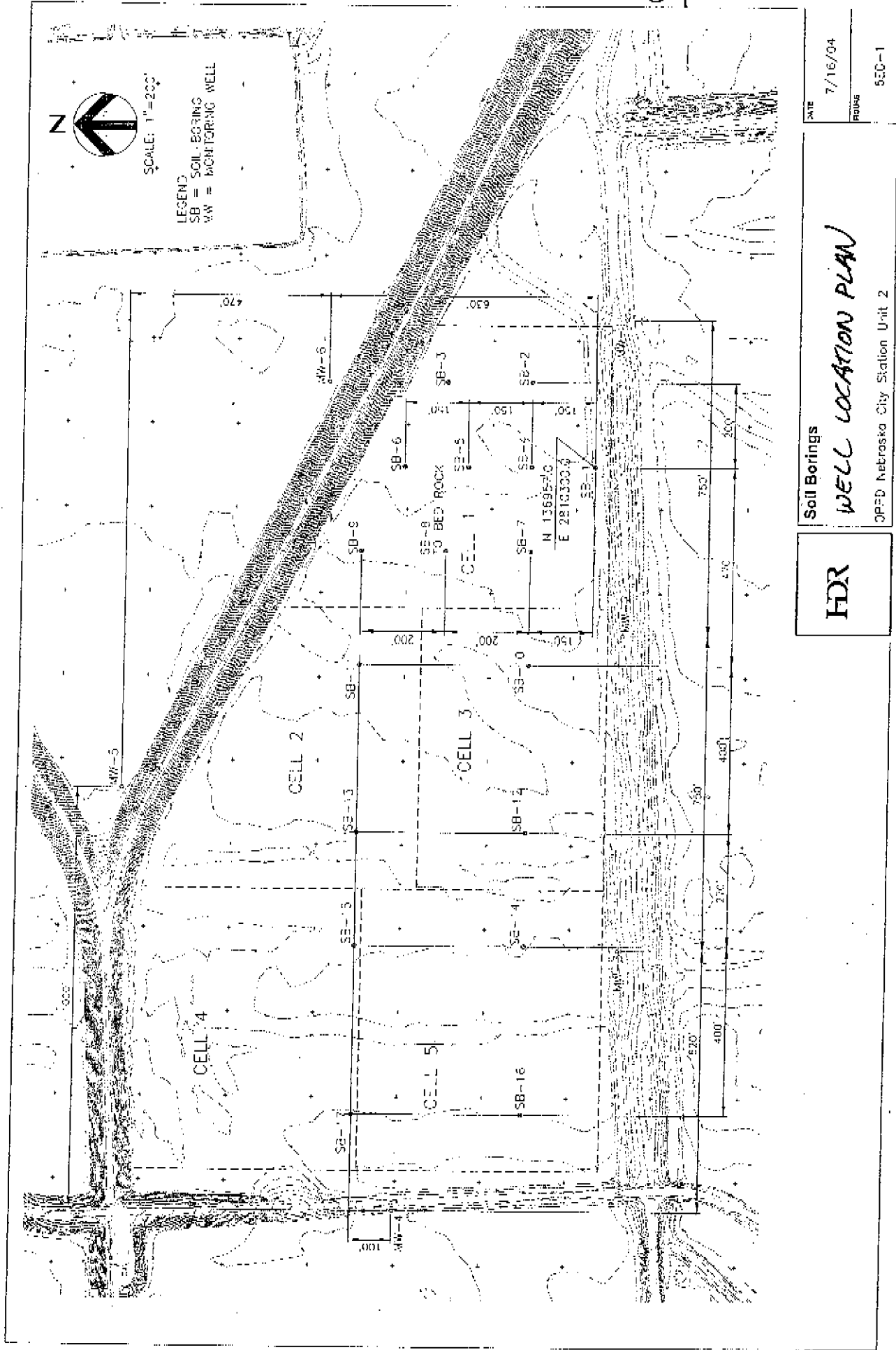
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SITE LOCATION PLAN

Q130442



Soil Borings

DATE 7/16/04

FOUNDS

550-1

WELL LOCATION PLAN

OPED Nebraska City Station Unit 2

HDR

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LOG OF BORING NO. MW-3

Page 1 of 1

BOREHOLE LOCATION See Boring Location Plan			ELEVATION DATUM USGS			DRILLER Abel Monnarez			LOGGER Bruce Birge					
BORING STARTED 9-8-07			BORING COMPLETED 9-8-04			DRILL RIG CME-75			DRILLING METHOD 4.25" HSA					
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE Cornfield		TOTAL DEPTH (FT.) 12	
											WATER LEVEL OBSERVATIONS (FT.)			
											▽ 3.5 ATD			
											▽ 3.8 AD			
											DESCRIPTION			
										Surface Elevation: 913.0		WELL LOG		
1	2S	13		12						1.0	Stiff, Moist, Very Dark Grayish Brown to Yellowish Brown, Medium to High Plastic Clay (CL/CH) (Topsoil)		912.0	
2	2S	24									Loose, Very Moist, Light Brown, Poorly Graded Sand, Very Fine to Fine-Grained (SP) (Alluvium)		▽	
3	2S	24								5	Becomes Wet and Mostly Fine-Grained			
4	2S	24									Becomes Medium Dense			
5	2S	24								10	Becomes Loose			
6	2S	24								12.0	Bottom of Boring @ 12'	901.0		
											Well Completed Using 3' Stick Up and Concrete Pad			

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



KLEINFELDER

9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME

OPPD Flyash Monofill

LOCATION

Nebraska City, Nebraska

PROJECT NUMBER

47962

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Mail to
DNR
PO Box 94676
Lincoln, NE 68509-4676
Phone (402)471-2363

1026-2004-162826-WWRP (3)
Department of Natural Resources
October 2001
DNR Form 145

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date 1026-2004 Sequence No. 162826 Registration No. Y-130442C
Owner Code No. 40226 Receipt No. R16991 Nemaha NRD

1. a. Well Owner's First Name _____ Last Name _____
b. Company Name Omaha Public Power District
c. Correspondent Name Omaha Public Power District Attention James J Krajicek
Address 444 South 16th Street Mall
City Omaha State NE Zip 68102 Telephone (402) 636-2309

2. a. Contractor's License No. 19245 Contractor's Name Kleinfelder
Contractor's Email Address locoabel@cox.net
b. Drilling Firm Name Kleinfelder
Address 9312 G Court
City Omaha State NE Zip 68127 Telephone (402) 331-2260
Drilling Firm's Email Address bhavens@kleinfelder.com

3. a. Well location SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 25, Township 8 North, Range 14 East/West, Otoe County.
b. Natural Resources District Nemaha NRD
c. The well is _____ feet from the (North/ South) section line and _____ feet from the (East/West) section line
(circle one) (circle one)
or Latitude Degree 40 Minute 37 Second 30
Longitude Degree 95 Minute 47 Second 21
d. Street address and subdivision, if applicable _____
Block _____ Lot _____
e. Location of water use, if applicable (give legal descriptions) _____
f. If for irrigation, the land to be irrigated is _____ acres.
g. Well reference letter(s), if applicable MW-3

4. Permits
Management Area Permit Number _____ Surface Water Permit Number _____
Geothermal Permit Number _____ Industrial Permit Number _____
Municipal Permit Number _____ Transfer Out-Of-State Permit Number _____
Well Spacing Permit Number _____ Conduct Permit Number _____
Other Permit Number _____

5. Purpose of well (indicate one) Aquaculture Commercial/Industrial Dewatering (over 90 days)
Domestic Ground Heat Exchanger Groundwater Source Heat Pump Irrigation Injection
Livestock X Monitoring Observation Public Water Supply (with spacing (46-638))
Public Water Supply (without spacing) Recovery Other
(indicate use)

6. Wells in a Series.
a. Is this well a part of a series? yes Yes go to part b of this section No go to part 7 of this application
b. If one or more of the wells in the series is currently registered, give the well registration number NA
c. How many wells in the series are you registering at this time? 6

7. Replacement and abandoned well information.
a. Is this well a replacement well? Yes X No
b. Registration number of abandoned well _____ If not registered, date abandoned well was constructed (m) _____ / (d) _____ / (y) _____
c. Replacement well is _____ feet from abandoned well. d. Abandoned well last operated (m) _____ / (d) _____ / (y) _____
e. Original well pump column size _____ inches. f. Completion of original well abandonment on (m) _____ / (d) _____ / (y) _____
g. Location of water use of abandoned well _____

8. Pump Information.

a. Is pump installed at this time ☐ Yes ☒ No

Is pump installed by well owner in section 1? ☐ Yes ☐ No Is pump installed by contractor in section 2? ☐ Yes ☐ No

If pump installed by pump installer, please fill out license number below

b. Pump Installer's License No. _____ Pump Installer's Name _____

Pump Installer's Email Address _____

Pump Installer's Firm Name _____

Pump Installer's Firm Address _____

City _____ State _____ Zip _____ Telephone _____

Pump Installer's Firm Email Address _____

c. Pumping rate _____ gallons per minute _____ Measured _____ Estimated _____

d. Drop pipe diameter _____ inches e. Length of drop pipe _____ feet

f. Pumping equipment installed (m) _____ / (d) _____ / (y) _____ g. Pump Brand _____

h. This well will be used to pump less than 50 gpm ☐ Yes ☐ No

9. Well Construction Information.

a. Total well depth _____ ~ 11 _____ feet.

b. Static water level _____ ~ 3.8 _____ feet.

c. Pumping water level _____ NA _____ feet

d. Well Construction began (month) _____ 9 _____ / (day) _____ 8 _____ / (year) _____ 2004

e. Well Construction completed (month) _____ 9 _____ / (day) _____ 9 _____ / (year) _____ 2004

f. Bore hole diameter in inches Top 6.5 Bottom 6.5

g. Casing and Screen Joints are Welded _____ Glued _____ Threaded ☒ Other _____

10. Well Construction (Casing & Screen)- c, d, e, & g measurements should be in inches to three decimal places

a Placement Depth in Feet		b Casing or Screen	c Inside Diameter	d Outside Diameter	e Wall Thickness	f Type of Material	g Screen Slot Size	h Trade Name
From	To							
0	2	Casing	2.047	2.375	0.328	PVC	N/A	Johnson Screens
2	11	Screen	2.000	2.560	0.560	PVC	0.010	Johnson Screens

11. Grout and Gravel Pack

Placement Depth in Feet		Grout or Gravel Pack	Material Description
From	To		
0	1	Bentonite	3/8" Bentonite Holeplug
1	11	Gravel Pack	12-20 Sand

12. Geologic Materials Logged

Depth in Feet From	To	Description	See Attached Boring Log

Depth in Feet From	To	Description

(Additional sheets may be submitted)

13. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.


Water Well Contractor's Signature

10-13-07
Date

G130442C

LOG OF BORING NO. MW-3

Page 1 of 1

BORLHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS				DRILLER Abel Monnarez				LOGGER Bruce Birge			
BORING STARTED 9-8-07				BORING COMPLETED 9-8-04				DRILL RIG CME-75				DRILLING METHOD 4.25" HSA			
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE Cornfield		TOTAL DEPTH (FT.) 12		
											WATER LEVEL OBSERVATIONS (FT.)				
											▽ 3.5 ATD				
											▽ 3.8 AD				
											DESCRIPTION				
										Surface Elevation: 913.0					
1	2S	13		13						1.0	Stiff, Moist, Very Dark Grayish Brown to Yellowish Brown, Medium to High Plastic Clay (CL/CH) (Topsoil)		912.0		
2	2S	24									Loose, Very Moist, Light Brown, Poorly Graded Sand, Very Fine to Fine-Grained (SP) (Alluvium)		▽		
3	2S	24								5	Becomes Wet and Mostly Fine-Grained				
4	2S	24									Becomes Medium Dense				
5	2S	24									Becomes Loose				
6	2S	24								10					
										12.0	Bottom of Boring @ 12'		901.0		
										Well Completed Using 3' Stick Up and Concrete Pad					

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME

OPPD Flyash Monofill

LOCATION

Nebraska City, Nebraska

PROJECT NUMBER

47962



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Nebraska City NE

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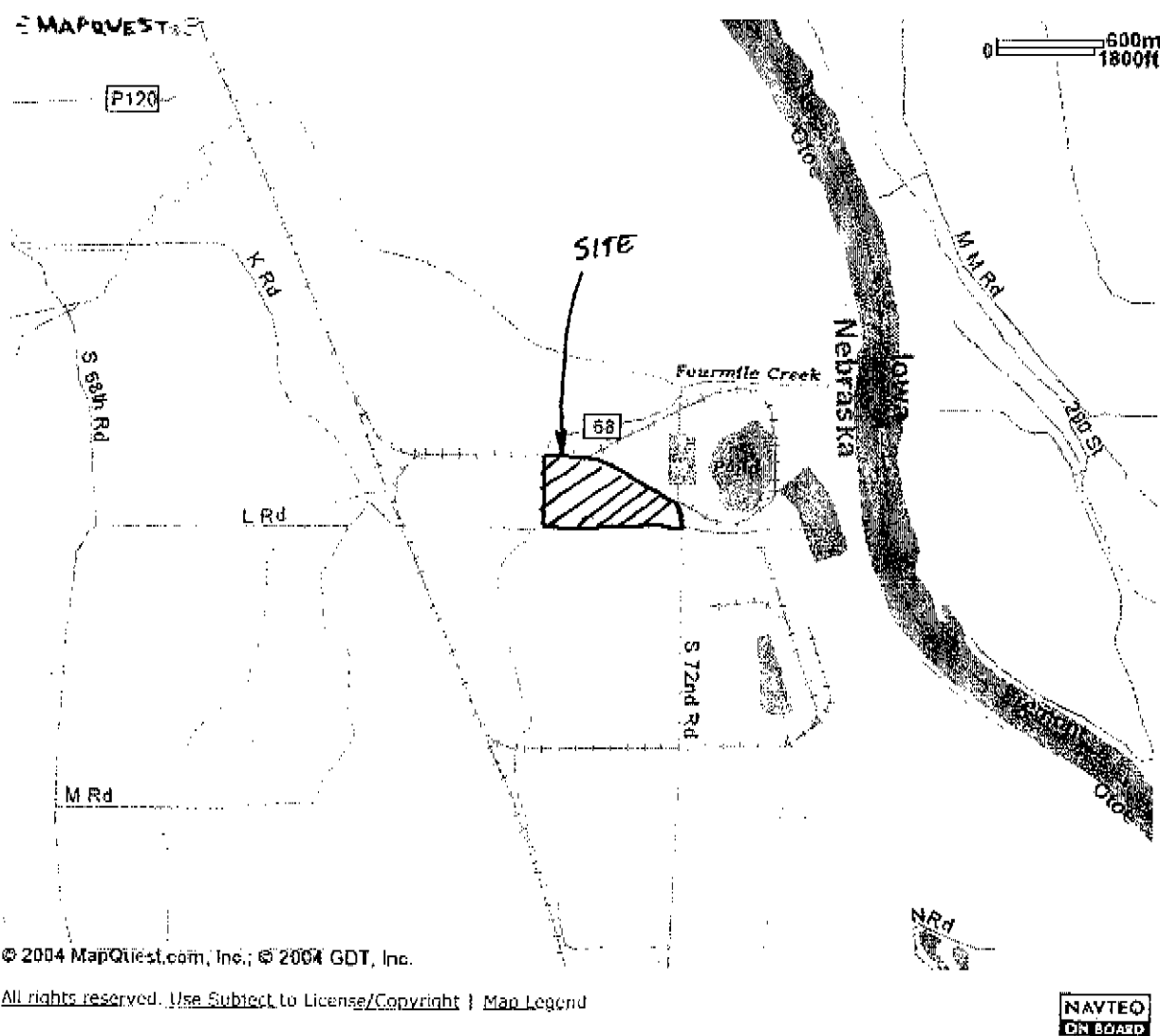
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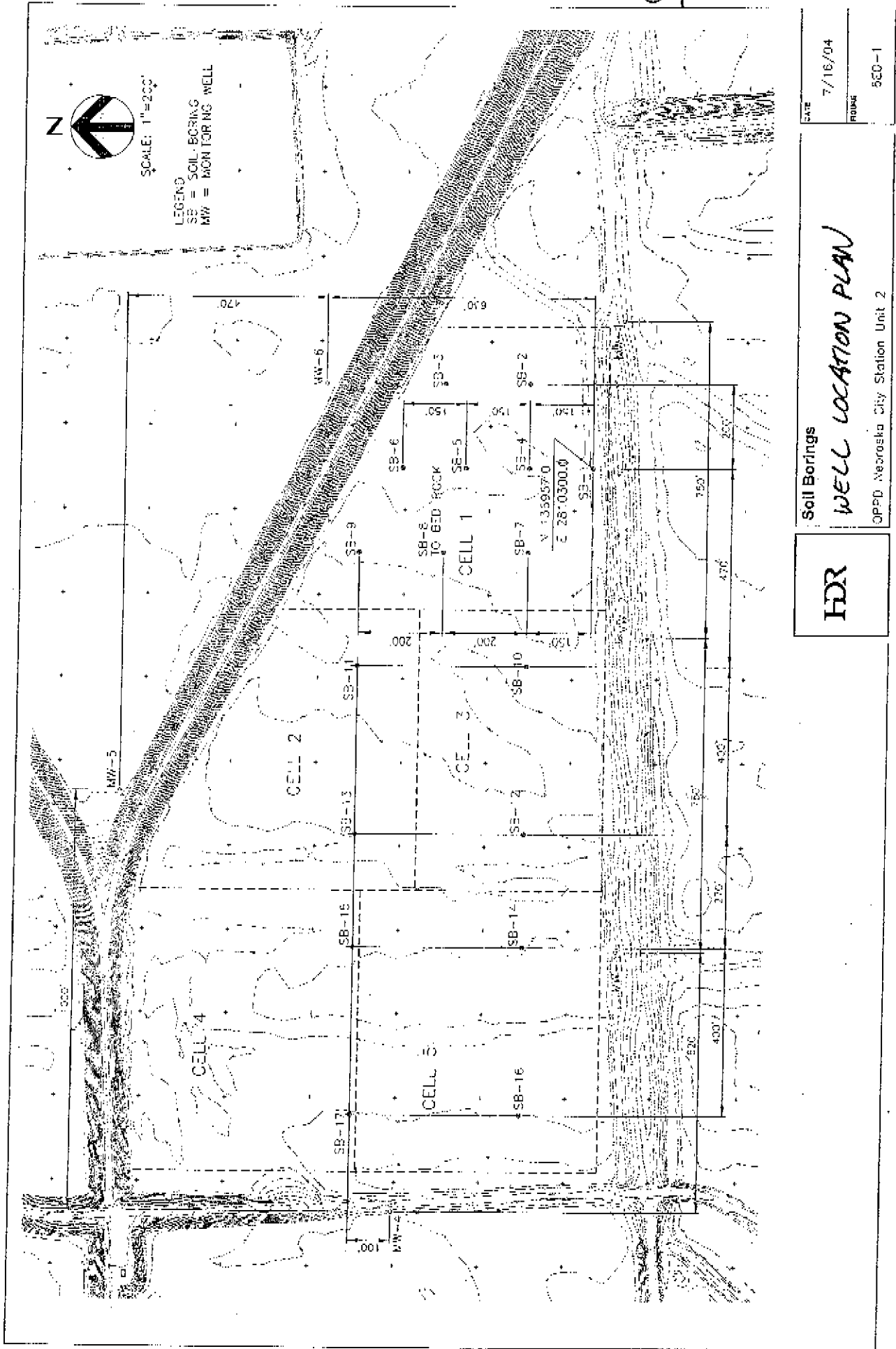
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SITE LOCATION PLAN

6130442



Soil Borings

HDR

WELL LOCATION PLAN

OP&D Nebraska City Station Unit 2

DATE

7/16/04

FOUR

500-1

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LOG OF BORING NO. MW-4

Page 1 of 1

BOREHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS				DRILLER Abel Monnarez				LOGGER Bruce Birge			
BORING STARTED 9-9-04				BORING COMPLETED 9-10-04				DRILL RIG CME-75				DRILLING METHOD 4.25" HSA			
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE		TOTAL DEPTH (FT.)	WELL LOG	
											Weedy, Grassy Shoulder of Gravel Road				
											WATER LEVEL OBSERVATIONS (FT.)				
											8.0 ATD				
											6.1 @ 1 Day AD				
DESCRIPTION											Surface Elevation: 916.5				
1	2S	16		3.0							Very Stiff, Moist, Light Brown to Grayish Brown, Low Plastic Silty Clay to Silt (CL) (Roadbed Fill)				
2	2S	5		2.1											
3	2S	18		2.6 4.5+						5	5.0		911.5		
4	2S	24		0.5						6.0	Hard, Slightly Moist, Dark Brownish Gray, Low Plastic Silty Clay (CL) (Buried Soil)		910.5		
										9.0	Firm to Soft, Well Completed Using 3' Stick Up and Concrete Padery Moist, Grayish Brown, Silt with Very Fine Sand to Silty Very Fine Sand (ML/SM) (Alluvium)		907.5		
5	2S	24								10	Becomes Wet Loose, Wet, Grayish Brown, Poorly Graded Sand with Some Silt, Very Fine-Grained (SP/SP-SM) (Alluvium)				
										14.0	Bottom of Boring @ 14' in Sandy Alluvium		902.5		
											Well Completed Using 3' Stick Up and Concrete Pad				

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



KLEINFELDER

9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME

OPPD Flyash Monofill

LOCATION

Nebraska City, Nebraska

PROJECT NUMBER

47962

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Mail to
DNR
PO Box 94676
Lincoln, NE 68509-4676
Phone (402)471-2363

10262004-162827-WWRF
Department of Natural Resources (3)

October 2001
DNR Form 145

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date 10-26-2004 Sequence No. 162827 Registration No. 1-130442D
Owner Code No. 40226 Receipt No. 816991 Nemaha NRD

1. a. Well Owner's First Name _____ Last Name _____
b. Company Name Omaha Public Power District
c. Correspondent Name Omaha Public Power District Attention James J. Krajicek
Address 444 South 16th Street Mall
City Omaha State NE Zip 68102 Telephone (402) 636-2309
2. a. Contractor's License No. 19245 Contractor's Name Kleinfelder
Contractor's Email Address locoabel@cox.net
b. Drilling Firm Name Kleinfelder
Address 9312 G Court
City Omaha State NE Zip 68127 Telephone (402) 331-2260
Drilling Firm's Email Address bhavens@kleinfelder.com
3. a. Well location SW 1/4 of the SE 1/4 of Section 25, Township 8 North, Range 14 East/West, Otoe County.
b. Natural Resources District Nemaha NRD
c. The well is _____ feet from the (North/ South) section line and _____ feet from the (East/West) section line
(circle one) (circle one)
or Latitude Degree 40 Minute 37 Second 37
Longitude Degree 95 Minute 47 Second 32
d. Street address and subdivision, if applicable _____
Block _____ Lot _____
e. Location of water use, if applicable (give legal descriptions) _____
f. If for irrigation, the land to be irrigated is _____ acres.
g. Well reference letter(s), if applicable MW-4
4. Permits
Management Area Permit Number _____ Surface Water Permit Number _____
Geothermal Permit Number _____ Industrial Permit Number _____
Municipal Permit Number _____ Transfer Out-Of-State Permit Number _____
Well Spacing Permit Number _____ Conduct Permit Number _____
Other Permit Number _____
5. Purpose of well (indicate one) Aquaculture Commercial/Industrial Dewatering (over 90 days)
Domestic Ground Heat Exchanger Groundwater Source Heat Pump Irrigation Injection
Livestock X Monitoring Observation Public Water Supply (with spacing (46 638))
Public Water Supply (without spacing) Recovery Other
(indicate use)
6. Wells in a Series.
a. Is this well a part of a series? yes Yes go to part b of this section No go to part 7 of this application
b. If one or more of the wells in the series is currently registered, give the well registration number NA
c. How many wells in the series are you registering at this time? 6
7. Replacement and abandoned well information.
a. Is this well a replacement well? Yes X No
b. Registration number of abandoned well _____ If not registered, date abandoned well was constructed (m)____/(d)____/(y)____
c. Replacement well is _____ feet from abandoned well. d. Abandoned well last operated (m)____/(d)____/(y)____
e. Original well pump column size _____ inches. f. Completion of original well abandonment on (m)____/(d)____/(y)____
g. Location of water use of abandoned well _____

G130442D

8. Pump Information.

a. Is pump installed at this time Yes ☒ NoIs pump installed by well owner in section 1? Yes ☐ No Is pump installed by contractor in section 2? Yes ☐ No

If pump installed by pump installer, please fill out license number below

b. Pump Installer's License No. _____ Pump Installer's Name _____

Pump Installer's Email Address _____

Pump Installer's Firm Name _____

Pump Installer's Firm Address _____

City _____ State _____ Zip _____ Telephone _____

Pump Installer's Firm Email Address _____

c. Pumping rate _____ gallons per minute Measured _____ Estimated _____

d. Drop pipe diameter _____ inches e. Length of drop pipe _____ feet

f. Pumping equipment installed (in) _____ / (ft) _____ / (yr) _____ g. Pump Brand _____

h. This well will be used to pump less than 50 gpm Yes ☐ No ☐

9. Well Construction Information.

a. Total well depth _____ ~ 14 _____ feet.

c. Pumping water level NA _____ feet

c. Well Construction completed (month) _____ / (day) _____ / (year) 2004

b. Static water level _____ ~ 6.1 _____ feet.

d. Well Construction began (month) _____ / (day) _____ / (year) 2004

f. Bore hole diameter in inches Top 6.5 _____ Bottom 6.5 _____

g. Casing and Screen Joints are Welded ☐ Glued ☐ Threaded ☒ Other _____

10. Well Construction (Casing & Screen)- c, d, e, & g measurements should be in inches to three decimal places

a Placement Depth in Feet		b Casing or Screen	c Inside Diameter	d Outside Diameter	e Wall Thickness	f Type of Material	g Screen Slot Size	h Trade Name
From	To							
0	4	Casing	2.047	2.375	0.328	PVC	N/A	Johnson Screens
4	14	Screen	2.000	2.560	0.560	PVC	0.010	Johnson Screens

11. Grout and Gravel Pack

Placement Depth in Feet		Grout or Gravel Pack	Material Description
From	To		
0	2	Bentonite	3/8" Bentonite Holeplug
2	14	Gravel Pack	12-20 Sand

12. Geologic Materials Logged

Depth in Feet		Description	See Attached Boring Log
From	To		

Depth in Feet		Description
From	To	

(Additional sheets may be submitted)

13. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.


 Water Well Contractor's Signature

 10.13.04
 Date

G/30442D

LOG OF BORING NO. MW-4

BOREHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS				DRILLER Abel Monnarez				LOGGER Bruce Birge			
BORING STARTED				BORING COMPLETED				DRILL RIG				DRILLING METHOD 4.25" HSA			
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE		TOTAL DEPTH (FT.)		WELL LOG
											Weedy, Grassy Shoulder of Gravel Road				
											WATER LEVEL OBSERVATIONS (FT.)				
											8.0 ATD				
											6.1 @ 1 Day AD				
DESCRIPTION											Surface Elevation: 916.5				
1	2S	16		3.0								Very Stiff, Moist, Light Brown to Grayish Brown, Low Plastic Silty Clay to Silt (CL) (Roadbed Fill)			
2	2S	5		2.1											
3	2S	18		2.6 4.5+						5	5.0		911.5		
4	2S	24		0.5						6.0			910.5		
										9.0			907.5		
5	2S	24								10					
										14.0			902.5		
											Bottom of Boring @ 14' in Sandy Alluvium				
											Well Completed Using 3' Stick Up and Concrete Pad				

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME	OPPD Flyash Monofill
LOCATION	Nebraska City, Nebraska
PROJECT NUMBER	47962



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Nebraska City NE

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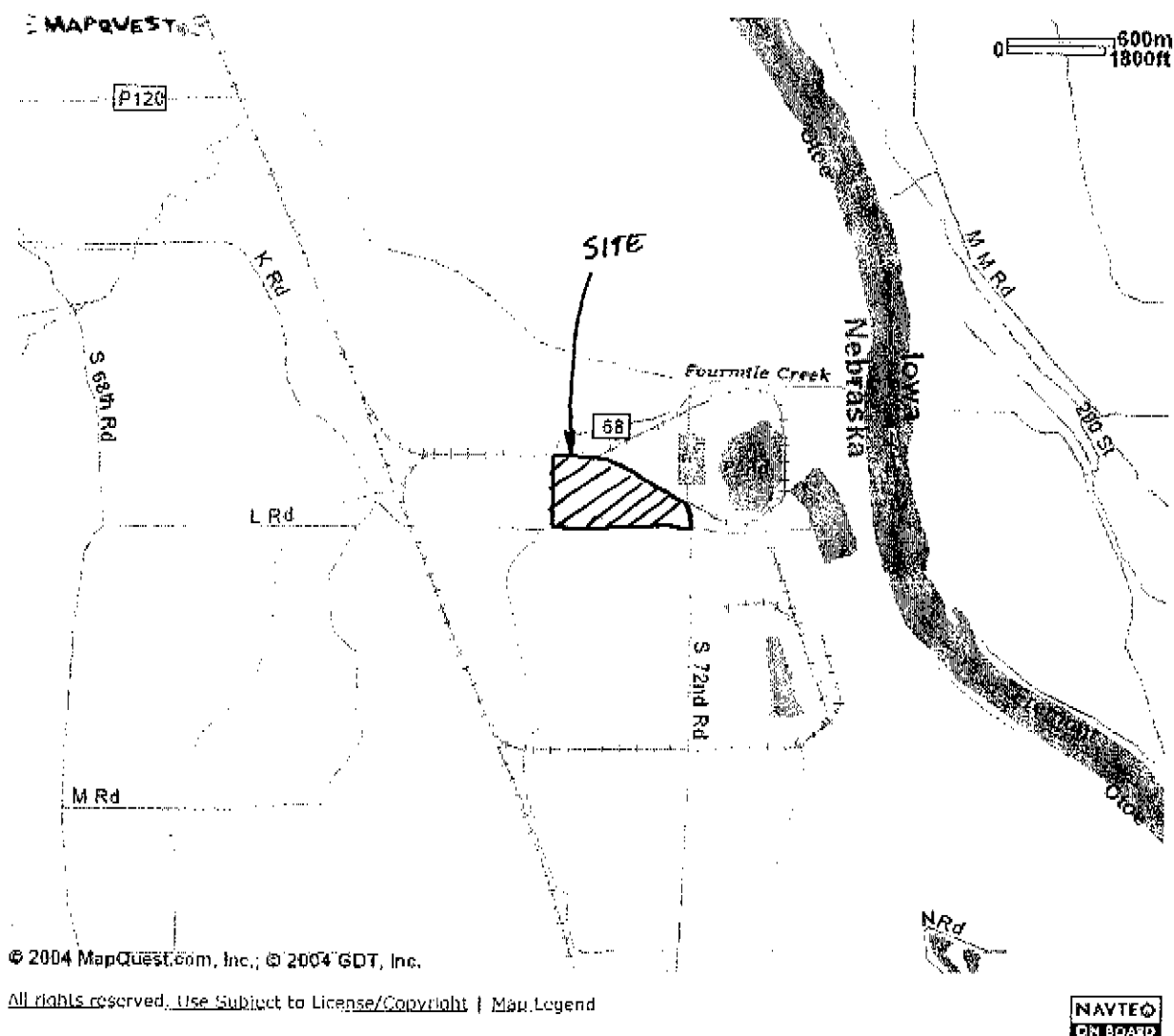
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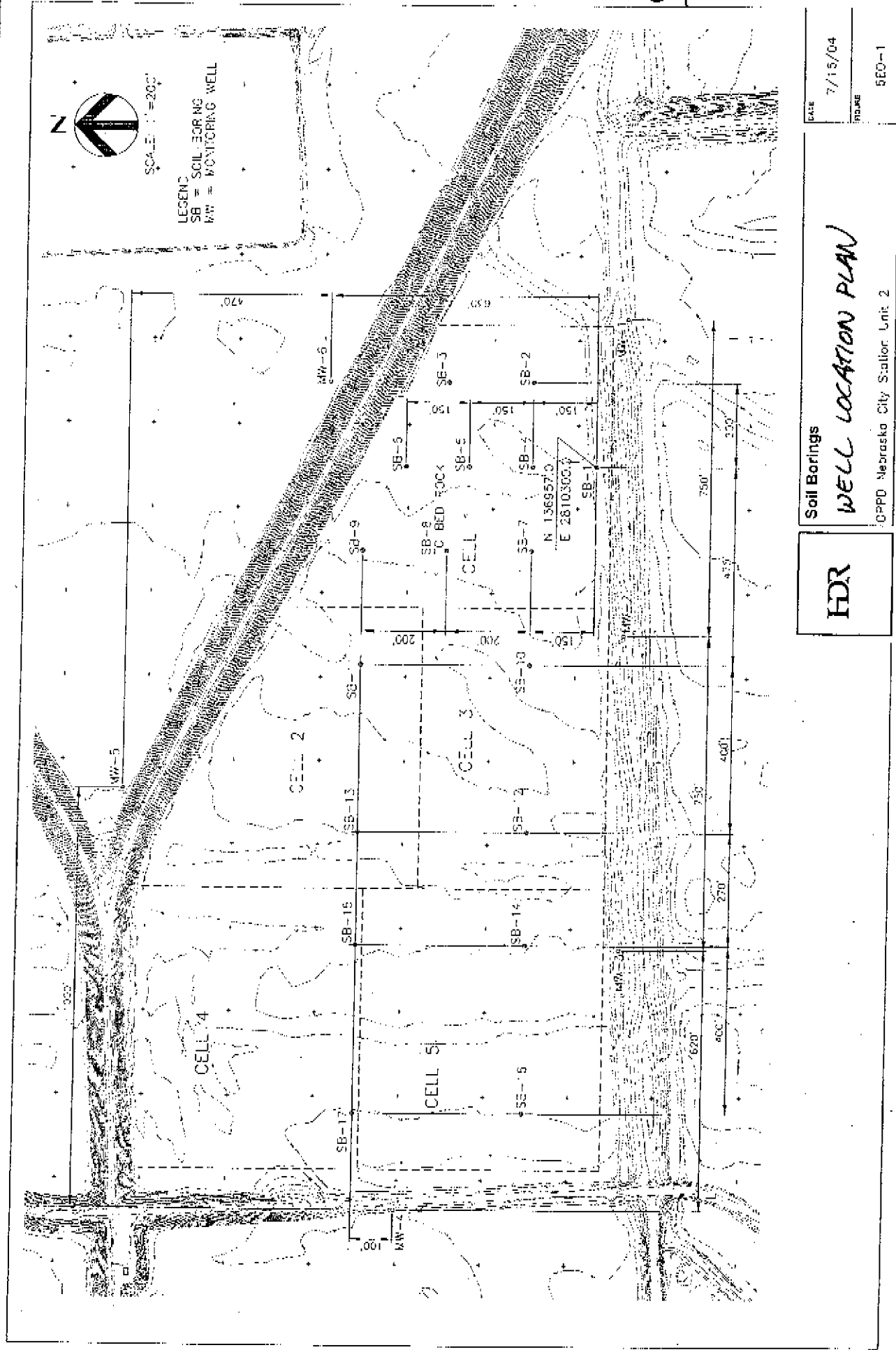
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SITE LOCATION PLAN

6130442



Soil Borings

WELL LOCATION PLAN

OPPD Nebraska City Station Unit 2

HDR

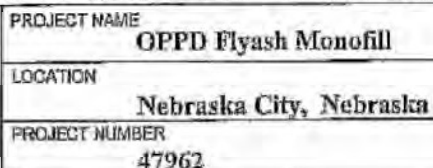
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Page 1 of 1

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

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PO Box 94676
Lincoln, NE 68509-4676
Phone (402)471-2363

10-26-2004-162828-WWR F
Department of Natural Resources (3)

October 2001
DNR Form 145

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date 10-26-2004 Sequence No. 162828 Registration No. 11-130443 E
Owner Code No. 40226 Receipt No. B16991 Nemaha NRD

1. a. Well Owner's First Name _____ Last Name _____
b. Company Name Omaha Public Power District
c. Correspondent Name Omaha Public Power District Attention James J. Krajicek
Address 444 South 16th Street Mall
City Omaha State NE Zip 68102 Telephone (402) 636-2309
2. a. Contractor's License No. 19245 Contractor's Name Kleinfelder
Contractor's Email Address locoabel@cox.net
b. Drilling Firm Name Kleinfelder
Address 9312 G Court
City Omaha State NE Zip 68127 Telephone (402) 331-2260
Drilling Firm's Email Address bhavens@kleinfelder.com
3. a. Well location SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 25, Township 8 North, Range 14 East/West, Otoe County.
b. Natural Resources District Nemaha NRD
c. The well is _____ feet from the (North/ South) section line and _____ feet from the (East/West) section line
(circle one) (circle one)
or Latitude Degree 40 Minute 37 Second 42
Longitude Degree 95 Minute 47 Second 19
d. Street address and subdivision, if applicable _____
Block _____ Lot _____
e. Location of water use, if applicable (give legal descriptions) _____
f. If for irrigation, the land to be irrigated is _____ acres.
g. Well reference letter(s), if applicable MW-5
4. Permits
Management Area Permit Number _____ Surface Water Permit Number _____
Geothermal Permit Number _____ Industrial Permit Number _____
Municipal Permit Number _____ Transfer Out-Of-State Permit Number _____
Well Spacing Permit Number _____ Conduct Permit Number _____
Other Permit Number _____
5. Purpose of well (indicate one) Aquaculture Commercial/Industrial Dewatering (over 90 days)
Domestic Ground Heat Exchanger Groundwater Source Heat Pump Irrigation Injection
Livestock X Monitoring Observation Public Water Supply (with spacing (46-638))
Public Water Supply (without spacing) Recovery Other
(indicate use)
6. Wells in a Series.
a. Is this well a part of a series? yes Yes go to part b of this section No go to part 7 of this application
b. If one or more of the wells in the series is currently registered, give the well registration number NA
c. How many wells in the series are you registering at this time? 6
7. Replacement and abandoned well information.
a. Is this well a replacement well? Yes X No
b. Registration number of abandoned well _____ If not registered, date abandoned well was constructed (m) _____ / (d) _____ / (y) _____
c. Replacement well is _____ feet from abandoned well. d. Abandoned well last operated (m) _____ / (d) _____ / (y) _____
e. Original well pump column size _____ inches. f. Completion of original well abandonment on (m) _____ / (d) _____ / (y) _____
g. Location of water use of abandoned well _____

8. Pump Information.

a. Is pump installed at this time ☐ Yes ☒ NoIs pump installed by well owner in section 1? ☐ Yes ☐ No Is pump installed by contractor in section 2? ☐ Yes ☐ No

If pump installed by pump installer, please fill out license number below

b. Pump Installer's License No. _____ Pump Installer's Name _____

Pump Installer's Email Address _____

Pump Installer's Firm Name _____

Pump Installer's Firm Address _____

City _____ State _____ Zip _____ Telephone _____

Pump Installer's Firm Email Address _____

c. Pumping rate _____ gallons per minute _____ Measured _____ Estimated _____

d. Drop pipe diameter _____ inches c. Length of drop pipe _____ feet

f. Pumping equipment installed (m) _____ / (d) _____ / (y) _____ g. Pump Brand _____

h. This well will be used to pump less than 50 gpm ☐ Yes ☐ No

9. Well Construction Information.

a. Total well depth _____ ~ 14 _____ feet.

b. Static water level _____ ~ 7 _____ feet.

c. Pumping water level _____ NA _____ feet

d. Well Construction began (month) _____ 9 _____ / (day) _____ 16 _____ / (year) 2004

e. Well Construction completed (month) _____ 9 _____ / (day) _____ 17 _____ / (year) 2004 f. Bore hole diameter in inches Top 6.5 _____ Bottom 6.5 _____

g. Casing and Screen Joints are Welded _____ Glued _____ Threaded ☒ Other _____

10. Well Construction (Casing & Screen)- c, d, e, & g measurements should be in inches to three decimal places

a Placement Depth in Feet		b Casing or Screen	c Inside Diameter	d Outside Diameter	e Wall Thickness	f Type of Material	g Screen Slot Size	h Trade Name
From	To							
0	3	Casing	2.047	2.375	0.328	PVC	N/A	Johnson Screens
3	13	Screen	2.000	2.560	0.560	PVC	0.010	Johnson Screens

11. Grout and Gravel Pack

Placement Depth in Feet		Grout or Gravel Pack	Material Description
From	To		
0	1.5	Bentonite	3/8" Bentonite Holeplug
1.5	14	Gravel Pack	12-20 Sand

12. Geologic Materials Logged

Depth in Feet		Description	See Attached Boring Log
From	To		

Depth in Feet		Description
From	To	

(Additional sheets may be submitted)

13. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.


 Water Well Contractor's Signature

 10.13.04
 Date

6130442E

LOG OF BORING NO. MW-5

Page 1 of 1

BOREHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS		DRILLER Abel Monnarez		LOGGER Bruce Birge					
BORING STARTED 9-16-04				BORING COMPLETED 9-16-04		DRILL RIG CME-75		DRILLING METHOD 4.25" HSA					
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSP	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE Cindery Road	TOTAL DEPTH (FT.) 14	WELL LOG
											WATER LEVEL OBSERVATIONS (FT.)		
											▽ 7.0 ATD		
											▽ AD		
											DESCRIPTION		
1	2S	16		3.9							Very Stiff, Slightly Moist, Reddish to Dark Grayish Brown, Low to Medium Plastic Clay with Trace of Fine Debris and Cinders (CL) (Fill)		
2	2S	15		3.3						3.5		913.5	
3	2S	18		3.3						5	5.5	911.5	
4	2S	18									Medium Dense, Wet, Grayish Brown, Poorly Graded Sand, Fine-Grained (SP) (Alluvium)		
5	2S	18								10	Becomes Loose, Poorly Graded Sand with Silt to Silty Sand, Very Fine Grained (SP-SM/SM)		
6	2S	15											
7	2S	18											
										14.0	Becomes Poorly Graded Sand, Fine to Medium Grained (SP) Bottom of Boring @ 14'	903.0	
												Well Completed using 3' Stick Up and Concrete Pad	

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



KLEINFELDER

9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME

OPPD Flyash Monofill

LOCATION

Nebraska City, Nebraska

PROJECT NUMBER

47962



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Nebraska City NE

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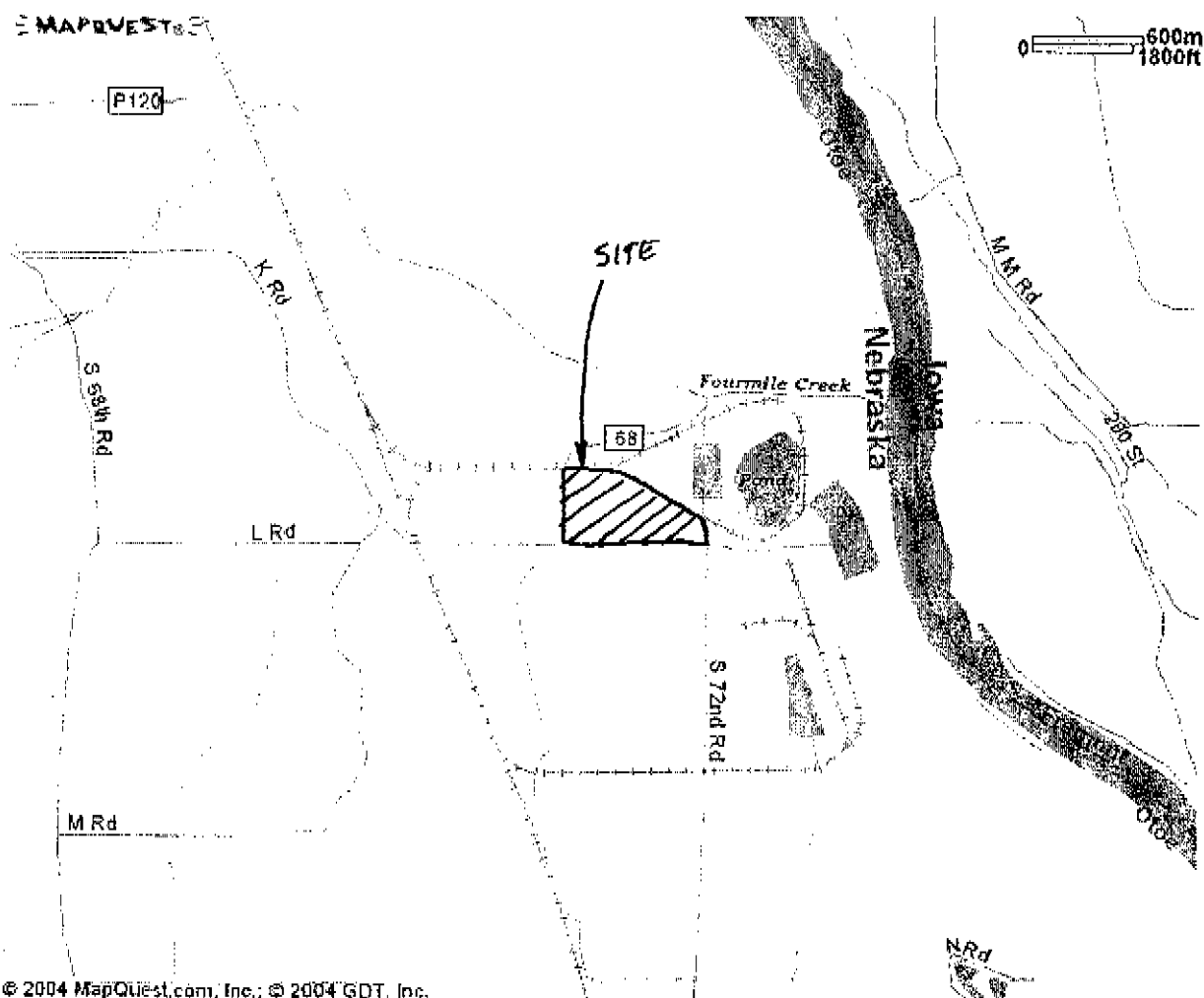
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SITE LOCATION PLAN

WELL LOCATION PLAN

CPD Nebraska City Station Unit 2

50-1

7/16/04

FLA JAG

H2R

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LOG OF BORING NO. MW-6

Page 1 of 1

BOREHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS				DRILLER Abel Monnarez				LOGGER Bruce Birge			
BORING STARTED 9-7-04				BORING COMPLETED 9-7-04				DRILL RIG CME-75				DRILLING METHOD 4.25" HSA			
SAMPLE NO.	SAMPLE TYPE	RECOVERY, i.e.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSP	UNCONFINED COMPRESSION - TSP	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE Unpaved Road		TOTAL DEPTH (FT.) 12		WELL LOG
											WATER LEVEL OBSERVATIONS (FT.)				
											▽ 5.0 ATD				
											▼ 6.5 AD				
											DESCRIPTION				
										Surface Elevation: 916.0					
1	2S	22								0.5	Very Stiff, Moist, Light Brown, Low Plastic Silty Clay with Slag Gravel Veneer (CL) (Roadbed Fill)	915.5			
2	2S	24									Medium Dense, Slightly Moist, Dark to Medium Grayish Brown, Poorly Graded Sand with Some Silt (SP-SM/SP) (Alluvium)				
3	2S	18								5	Becomes Loose and Wet		▽		
4	2S	22									With Layers of Soft, Sandy Silt to Silty Sand (ML/SM)	908.0	▼		
5	2S	24		<0.2						8.0	Very Soft, Wet, Grayish Brown to Dark Gray, Interbedded Low, Medium, & High Plastic Clay with Silt Layers (CH/CL/ML) (Alluvium)	905.0			
6	2S	21								11.0	Loose, Wet, Dark Gray, Silty Clayey Sand, Very Fine Grained (SM) (Alluvium)	904.0			
7	2S									12.0	Bottom of Boring @ 12'				

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



KLEINFELDER

9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME

OPPD Flyash Monofill

LOCATION

Nebraska City, Nebraska

PROJECT NUMBER

47962

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Mail to
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PO Box 94676
Lincoln, NE 68509-4676
Phone (402)471-2363

10262004-162829-WWR F
Department of Natural Resources (3)
October 2001
DNR Form 145

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

FOR DEPARTMENT USE ONLY

Registration Date 10-26-2004 Sequence No. 162829 Registration No. 1-130442F
Owner Code No. 40226 Receipt No. 816991 Nemaha NRD

1. a. Well Owner's First Name _____ Last Name _____
b. Company Name Omaha Public Power District
c. Correspondent Name Omaha Public Power District Attention James J. Krajciek
Address 444 South 16th Street Mall
City Omaha State NE Zip 68102 Telephone (402) 636-2309
2. a. Contractor's License No. 19245 Contractor's Name Kleinfelder
Contractor's Email Address locoabel@cox.net
b. Drilling Firm Name Kleinfelder
Address 9312 G Court
City Omaha State NE Zip 68127 Telephone (402) 331-2260
Drilling Firm's Email Address bhavens@kleinfelder.com
3. a. Well location SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 25, Township 8 North, Range 14 East/West, Otoe County.
b. Natural Resources District Nemaha NRD
c. The well is _____ feet from the (North/ South) section line and _____ feet from the (East/West) section line
(circle one) (circle one)
or Latitude Degree 40 Minute 37 Second 36
Longitude Degree 95 Minute 47 Second 07
d. Street address and subdivision, if applicable _____
Block _____ Lot _____
e. Location of water use, if applicable (give legal descriptions) _____
f. If for irrigation, the land to be irrigated is _____ acres.
g. Well reference letter(s), if applicable MW-6
4. Permits
Management Area Permit Number _____ Surface Water Permit Number _____
Geothermal Permit Number _____ Industrial Permit Number _____
Municipal Permit Number _____ Transfer Out-Of-State Permit Number _____
Well Spacing Permit Number _____ Conduct Permit Number _____
Other Permit Number _____
5. Purpose of well (indicate one) Aquaculture Commercial/Industrial Dewatering (over 90 days)
Domestic Ground Heat Exchanger Groundwater Source Heat Pump Irrigation Injection
Livestock X Monitoring Observation Public Water Supply (with spacing (46-638))
Public Water Supply (without spacing) Recovery Other
(indicate use)
6. Wells in a Series.
a. Is this well a part of a series? yes Yes go to part b of this section No go to part 7 of this application
b. If one or more of the wells in the series is currently registered, give the well registration number NA
c. How many wells in the series are you registering at this time? 6
7. Replacement and abandoned well information.
a. Is this well a replacement well? Yes X No
b. Registration number of abandoned well _____ If not registered, date abandoned well was constructed (m) _____ / (d) _____ / (y) _____
c. Replacement well is _____ feet from abandoned well. d. Abandoned well last operated (m) _____ / (d) _____ / (y) _____
e. Original well pump column size _____ inches. f. Completion of original well abandonment on (m) _____ / (d) _____ / (y) _____
g. Location of water use of abandoned well _____

G130442F

8. Pump Information.

a. Is pump installed at this time Yes ☐ No ☒

Is pump installed by well owner in section 1? Yes ☐ No ☐ Is pump installed by contractor in section 2? Yes ☐ No ☐

If pump installed by pump installer, please fill out license number below

b. Pump Installer's License No. _____ Pump Installer's Name _____

Pump Installer's Email Address _____

Pump Installer's Firm Name _____

Pump Installer's Firm Address _____

City _____ State _____ Zip _____ Telephone _____

Pump Installer's Firm Email Address _____

c. Pumping rate _____ gallons per minute Measured ☐ Estimated ☐

d. Drop pipe diameter _____ inches e. Length of drop pipe _____ feet

f. Pumping equipment installed (m) _____ / (d) _____ / (y) _____ g. Pump Brand _____

h. This well will be used to pump less than 50 gpm Yes ☐ No ☐

9. Well Construction Information.

a. Total well depth _____ ~ 12 _____ feet.

b. Static water level _____ ~ 6.5 _____ feet.

c. Pumping water level _____ NA _____ feet

d. Well Construction began (month) _____ 9 _____ / (day) _____ 7 _____ / (year) _____ 2004

e. Well Construction completed (month) _____ 9 _____ / (day) _____ 8 _____ / (year) _____ 2004

f. Bore hole diameter in inches Top 6.5 _____ Bottom 6.5 _____

g. Casing and Screen Joints are Welded ☐ Glued ☐ Threaded ☒ Other _____

10. Well Construction (Casing & Screen)- c, d, e, & g measurements should be in inches to three decimal places

a Placement Depth in Feet		b Casing or Screen	c Inside Diameter	d Outside Diameter	e Wall Thickness	f Type of Material	g Screen Slot Size	h Trade Name
From	To							
0	0.5	Casing	2.047	2.375	0.328	PVC	N/A	Johnson Screens
0.5	11	Screen	2.000	2.560	0.560	PVC	0.010	Johnson Screens

11. Grout and Gravel Pack

Placement Depth in Feet		Grout or Gravel Pack	Material Description
From	To		
0	0.5	Bentonite	3/8" Bentonite Holeplug
0.5	12	Gravel Pack	12-20 Sand

12. Geologic Materials Logged

Depth in Feet		Description	See Attached Boring Log
From	To		

Depth in Feet		Description
From	To	

(Additional sheets may be submitted)

13. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.


Water Well Contractor's Signature

10-13-04
Date

6130442F

LOG OF BORING NO. MW-6

Page 1 of 1

BOREHOLE LOCATION See Boring Location Plan				ELEVATION DATUM USGS				DRILLER Abel Monnarez				LOGGER Bruce Birge			
BORING STARTED 9-7-04				BORING COMPLETED 9-7-04				DRILL RIG CME-75				DRILLING METHOD 4.25" HSA			
SAMPLE NO.	SAMPLE TYPE	RECOVERY, in.	PENETRATION RESISTANCE - BLOWS/FT.	POCKET PENETROMETER - TSF	UNCONFINED COMPRESSION - TSF	MOISTURE CONTENT - %	DRY DENSITY - PCF	OTHER	GRAPHIC LOG	DEPTH, FT.	SURFACE TYPE Unpaved Road		TOTAL DEPTH (FT.) 12		WELL LOG
											WATER LEVEL OBSERVATIONS (FT.) ▽ 5.0 ATD ▼ 6.5 AD				
DESCRIPTION											Surface Elevation: 916.0				
1	2S	22									0.5	Very Stiff, Moist, Light Brown, Low Plastic Silty Clay with Slag Gravel Veneer (CL) (Roadbed Fill)		915.5	
2	2S	24										Medium Dense, Slightly Moist, Dark to Medium Grayish Brown, Poorly Graded Sand with Some Silt (SP-SM/SP) (Alluvium)			
3	2S	18								5		Becomes Loose and Wet		▽	
4	2S	22												▼	
5	2S	24									8.0	With Layers of Soft, Sandy Silt to Silty Sand (ML/SM)		908.0	
6	2S	21		<0.2						10		Very Soft, Wet, Grayish Brown to Dark Gray, Interbedded Low, Medium, & High Plastic Clay with Silt Layers (CH/CL/ML) (Alluvium)		905.0	
7	2S										11.0	Loose, Wet, Dark Gray, Silty Clayey Sand, Very Fine Grained (SM) (Alluvium)		904.0	
											12.0	Bottom of Boring @ 12'			

The stratification lines represent the approximate boundary lines between soil and rock types. In situ the transition may be gradual.



9312 G Court, Omaha, Nebraska 68127 (402) 331-2260

PROJECT NAME

OPPD Flyash Monofill

LOCATION

Nebraska City, Nebraska

PROJECT NUMBER

47962



[Send To Printer](#) [Back to Map](#)

Nebraska City NE

US

Notes:

.....

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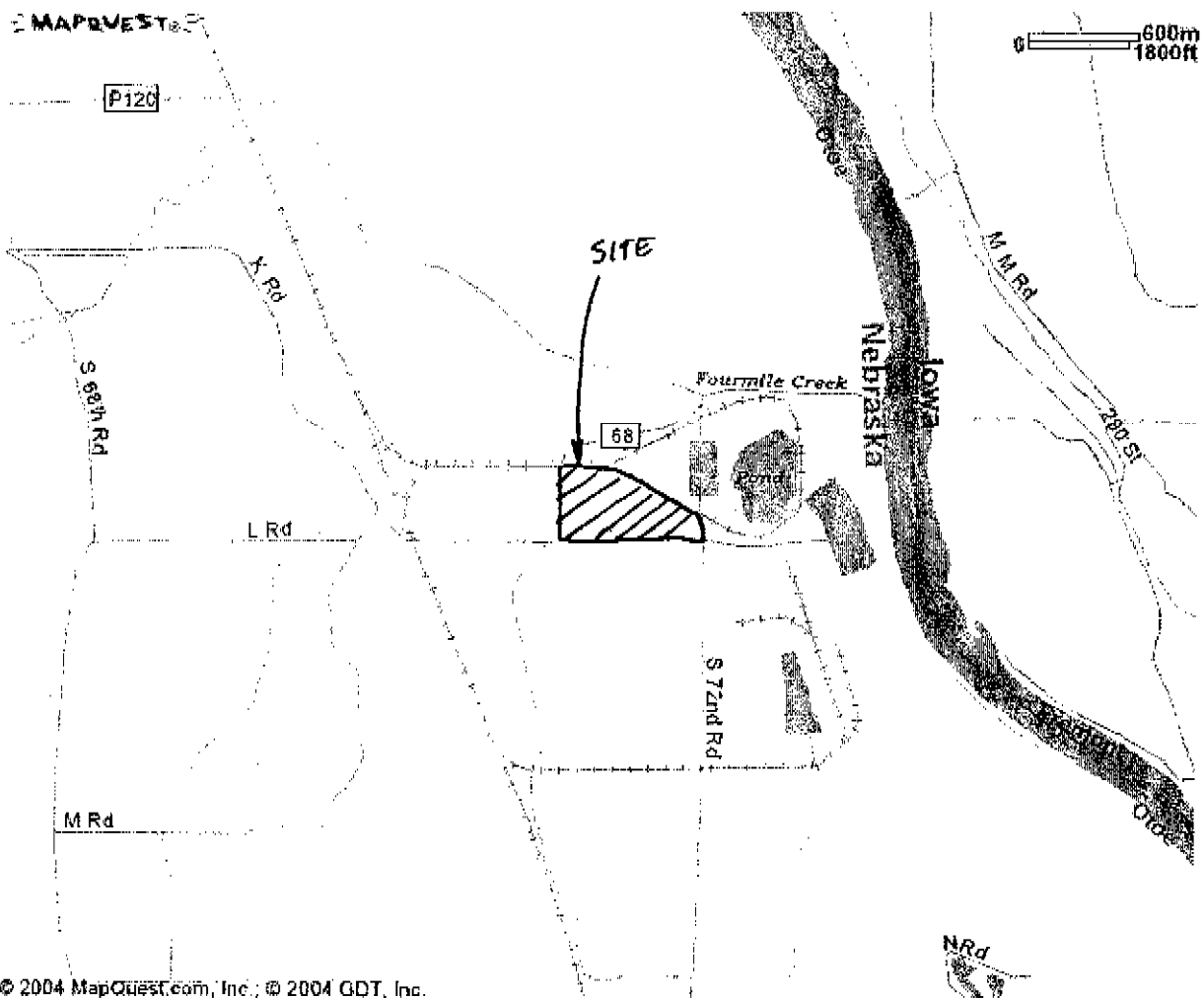
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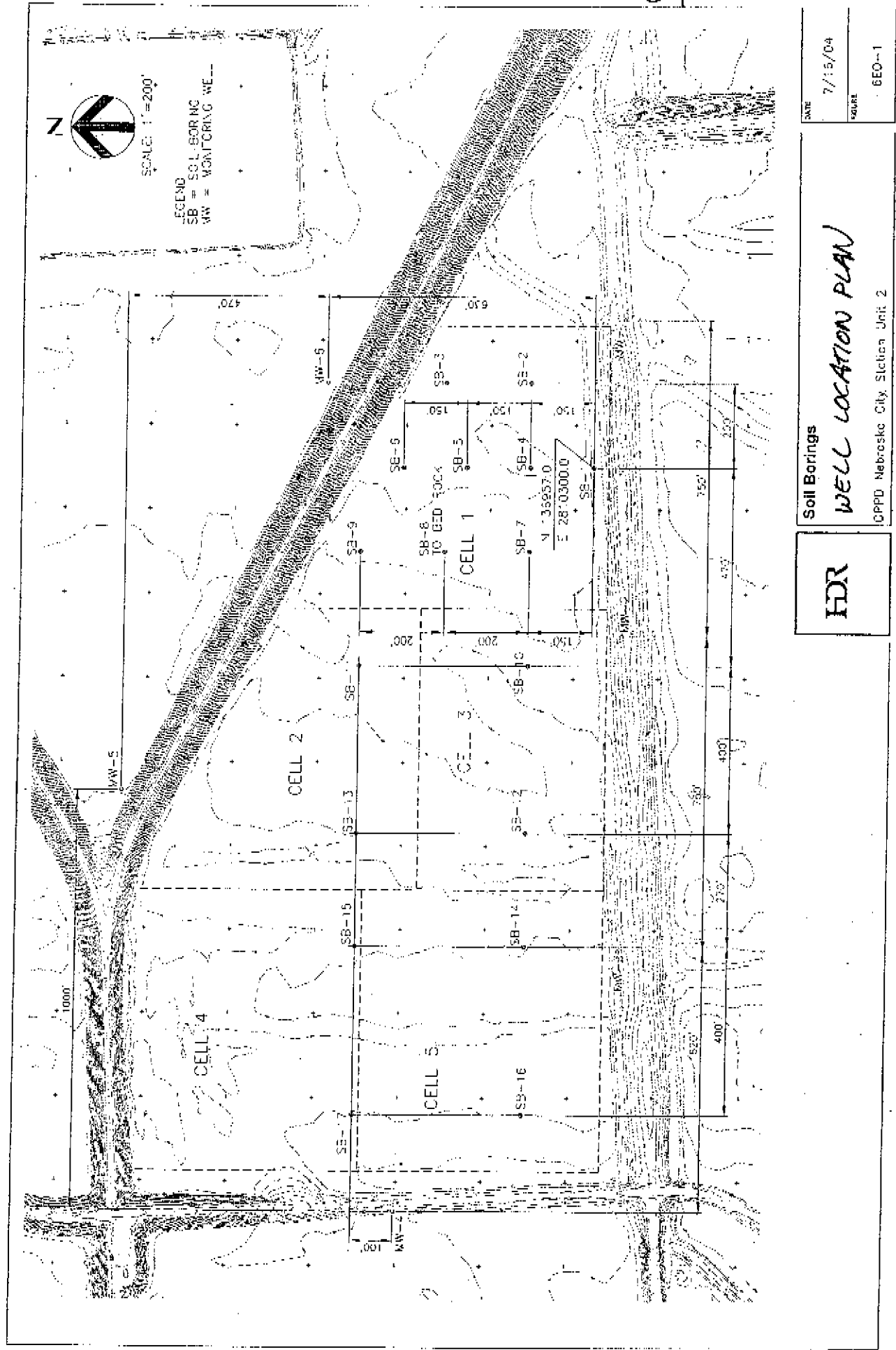
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SITE LOCATION PLAN

6130442



Soil Borings

WELL LOCATION PLAN

ICPPD Nebraska City Station Unit 2

HDR

DATE

7/15/04

SCALE

6EO-1

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WELL LOG NO. MW-7

Page 1 of 1

PROJECT: OPPD Nebraska City Station
Unit 2

CLIENT: Omaha Public Power District
Omaha, NE

SITE: 7264 L RD
Nebraska City, NE

GRAPHIC LOG	LOCATION Site Map		INSTALLATION DETAILS		DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	OVA/PID (ppm)
	DEPTH	MATERIAL DESCRIPTION	Surface Elev.: 914.8 (Ft.) ELEVATION (Ft.)	Well Completion:					
		LEAN CLAY (CL), yellowish-brown		-TOC - 917.97 Concrete Seal Bentonite 3/8" chips					
	7.0		908		5				
		MEDIUM TO FINE SAND (SM), light brown			10				
	13.0		902		15				
		FINE SAND (SM)		-Riser Pipe 2" diameter schedule 40 PVC. Flush threaded to PVC Screen, Filter Material silica sand, 20/40 grade, 10" Screen 2" diameter schedule 40 PVC slotted screen, 0.010" slot	20				
	21.0		894						
	Boring Terminated at 21 Feet								

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic

Advancement Method:
4 1/4-inch hollow stem (8 1/4-inch hole diameter)

Abandonment Method:
N/A - monitoring well installed

See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

Three concrete filled 3-inch steel bollards installed.

WATER LEVEL OBSERVATIONS

15 ft, While Drilling

Terracon

15080 A Circle
Omaha, Nebraska

Well Started: 11/6/2013

Drill Rig: DR#958

Project No.: 05137163

Well Completed: 11/6/2013

Driller: M. Ramirez

Exhibit: B-1

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Mail to
Department of Natural Resources
PO Box 94676
Lincoln, NE 68509-4676
Phone (402)471-2363

138679632229200

DRAFT

January 2011
DNR Form 145

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

Please indicate NA for items unknown

FOR DEPARTMENT USE ONLY

Date Filed _____ Owner Code No. _____ Registration No. _____

Well ID _____ Receipt _____ NRD _____

1. a. Well Owner's First Name _____ Last Name _____

OR Company Name OMAHA PUBLIC POWER DISTRICT

b. Attention Name PATRICK FINIGAN

c. Street Address 444 SOUTH 16TH ST MALL

Address 2/PO Address _____

City OMAHA State NE Zip 68102-0000 Telephone 402 636 2521

2. a. Contractor's License No 39325 Contractor's Name DAVID M SVINGEN

Contractor's Email Address LEBAZER@TERRACON.COM

b. Drilling Firm Name TERRACON CONSULTANTS, INC.

Address 15080 A CIR

City OMAHA State NE Zip 68144 Telephone 402 330 2202

Drilling Firm's Email Address DMSVINGEN@TERRACON.COM

3. a. Well location NE 1/4 of the NE 1/4 of Section 36, Township 8 North, Range 14 EAST OTOE County

Latitude Degree 40 Minute 37 Second 26.91

Longitude Degree -95 Minute 47 Second 4.47

**GPS
Required**

**Location of well for a pit is
the location of the pump**

b. Natural Resources District NEMAHA

c. The well is: _____ feet from the (North/ South) section line and _____ feet from the (East/West) section line
(circle one) (circle one)

d. Street address and subdivision, if applicable (BLOCK: LOT:)

e. Location of water use (give legal descriptions) NENE S36 T8 N14E

f. If for irrigation, the land to be irrigated is _____ acres.

Location of water use is required on all wells

g. Well reference letter(s), if applicable MW-7 HHSS PWSID _____

4. Permits

Management Area Permit Number _____

Geothermal Permit Number _____

Municipal Permit Number _____

Well Spacing Permit Number _____

HHSS _____

Surface Water Permit Number _____

Industrial Permit Number _____

Transfer Out-Of-State Permit Number _____

Conduct Permit Number _____

Other Permit Number _____

NDEQ _____

5. Purpose of well (indicate one) _____ Aquaculture _____ Commercial/Industrial _____ Dewatering (over 90 days)

_____ Domestic _____ Ground Heat Exchanger _____ Groundwater Source Heat Pump _____ Irrigation _____ Injection

_____ Livestock ☒ Monitoring _____ Observation _____ Pit (for irrigation) _____ Public Water Supply (with spacing (46-638))

_____ Public Water Supply (without spacing) _____ Recovery _____ Other _____

(further description of use can be provided under other)

(indicate use)

6. Wells in a Series.

a. Is this well a part of a series? _____ Yes go to part b of this section ☒ No go to part 7 of this application (Y/N required)

b. If one or more of the wells in the series is currently registered, give well registration number _____

c. How many wells in the series are you registering at this time? _____ d. How many total wells in the series? _____

7. Replacement and decommissioned/modified well information.

- a. Is this well a replacement well? ☐ Yes ☒ No go to part 8 of this application
- b. Registration number of original well _____ If not registered, date original well was constructed (m)____/(d)____/(y)____
- c. Original well last operated (m)____/(d)____/(y)____ d. Replacement well is _____ feet from original well.
- e. Location of water use of original well _____

Please Select One:

- f.1. ☐ Original water well decommissioned on (m)____/(d)____/(y)____ **OR**
2. ☐ I hereby certify that the original water well will be decommissioned within 180 days after such construction of the replacement water well. **OR**
3. ☐ I hereby certify that the original water well will be modified and equipped to pump 50 gallons per minute or less within 180 days after such construction of the replacement water well. It will be used for one of the following: a. ☐ Livestock
- b. ☐ Monitoring c. ☐ Observation
- d. ☐ nonconsumptive or de minimus use approved by the applicable natural resources district. State use: _____

If 3d is chosen, NRD signature is required. (Signature can be submitted on NRD Approval form to DNR prior to registration)

NRD signature _____ **Date** _____ **OR**

4. ☐ Decommission/Modification Certification form is submitted by landowner. (Must be submitted before registering well)

8. Pump Information. (Pump information is required if registering a pit)

- a. Is pump installed at this time ☐ Yes ☒ No
- Is pump installed by well owner in section 1? ☐ Yes ☐ No
- Is pump installed by contractor in section 2? ☐ Yes ☐ No
- Is this a free flowing well ☐ Yes(no pump to be installed) ☒ No

If pump installed by pump installer, please fill out license number below

- b. Pump Installer's License No. _____ Pump Installer's Name _____
- Pump Installer's Email Address _____
- Pump Installer's Firm Name _____
- Pump Installer's Firm Address _____
- City _____ State _____ Zip _____ -0000 Telephone _____
- Pump Installer's Firm Email Address _____
- c. Measured Pumping rate _____ gallons per minute d. Pumping water level _____ feet
- e. Drop pipe diameter _____ inches f. Length of drop pipe _____ feet
- g. Pumping equipment installed (m)____/(d)____/(y)____
- h. Pump Brand _____
- i. This well is designed and constructed to pump less than 50 gpm ☒ Yes ☐ No **(8H is required on ALL wells)**

9. Well Construction Information.

- a. Total well depth 21 feet. b. Static water level 15 feet. **(required)**
- c. Well Construction Began (m) 11/06/2013 d.. Well Construction Completed (m) 11/06/2013

Wells drilled prior to stays or moratoriums require NRD signature	NRD signature _____ Date _____
(Signature can be submitted on NRD Approval form to DNR prior to registration)	

- e. Bore hole diameter in inches Top 8.25 Bottom 8.25
- f. Casing and Screen Joints are Welded _____ Glued _____ Threaded ☒ Other _____
- g. Capacity of Well _____ gallons per minute (to be used to determine sustainability of aquifer)
- h. Pumping water level at this capacity _____ feet

10. Well Construction (Casing & Screen)- c, d, e, & f measurements should be in inches to three decimal places (From not less than zero)

[illegible]

Additional information for Double cased or Nested wells:

[illegible]

11. Grout and Gravel Pack (must start at zero)

[illegible]

Desc: Description of gravel pack i.e. engineered gravel pack, or gravel pit description (¼ down), or brand name (Best Sand), natural formation, drilling cuttings, soil backfill

Quantity #cubic yards, #tons, #sacks, - (for drilling cuttings and soil backfill estimate quantity) Calculation assistance available on web

Volume & Type: #gallons of a slurry, #barrels of a slurry, #sacks used in the slurry, #bags of non-slurry bentonite (chip-pellet –granular)

Additional information for Double cased or Nested wells:

[illegible]

WELL CONSTRUCTION LOG - 138679632229200

To -	From	Case/Screen	I.D.	O.D.	Thk.	Mat.	Slot Trade Name
0.0 -	11.0	Casing	2.07	2.38	0.15400	PVC	0.000 Titan
11.0 -	21.0	Screen	2.07	2.38	0.15400	PVC	0.010 Titan

GROUT AND GRAVEL PACK - 138679632229200

From -	To	Grout/Gravel	Material Desc.	Qty Gravel	Volume/Type Grout
00.0 -	00.5	Grout	Concrete	0	0, NA
00.5 -	09.0	Grout	Bentonite grout	3 bags	3 bags, 3/8" chips
09.0 -	21.0	Gravel	#20-40 Sand	8 bags	8 bags, NA

GEOLOGICAL LOGS - 138679632229200

From -	To	Type	Hardness	Color	Other/Drilling Action
00.0 -	07.0	Clay		Brown	
07.0 -	13.0	Sand fine-med		Brown	
13.0 -	21.0	Fine Sand		Brown	

12. **Geologic Materials Logged (must start at zero) - Use only options provided below for Type, Hardness and Color**

[illegible]

<u>Type</u>		<u>Hardness</u>	<u>Color</u>	
Clay	Sand fine-med	Cemented	Black	Pepper
Clay Stone	Sand med-coarse	Consolidated	Blue	Red
Cobbles	Sand with grave	Dense/Stiff	Brown	Tan
Fine Sand	Sandstone	Hard	Gray	White
Gravel	Shale	Soft	Green	Yellow
Limestone	Silt	Unconsolidated	Orange	
Loss Circulation	Siltstone	Very Hard		
Ochre (weathered shale)	Top Soil			
Sandy Clay	Other			
Sand with Clay/Silt				

(Additional sheets may be submitted)

13. I hereby certify that the information provided on this registration is true and accurate to the best of my knowledge.

DRAFT

Water Well Contractor's Signature
(not required for pits)

Date _____

Well Owner's Signature _____

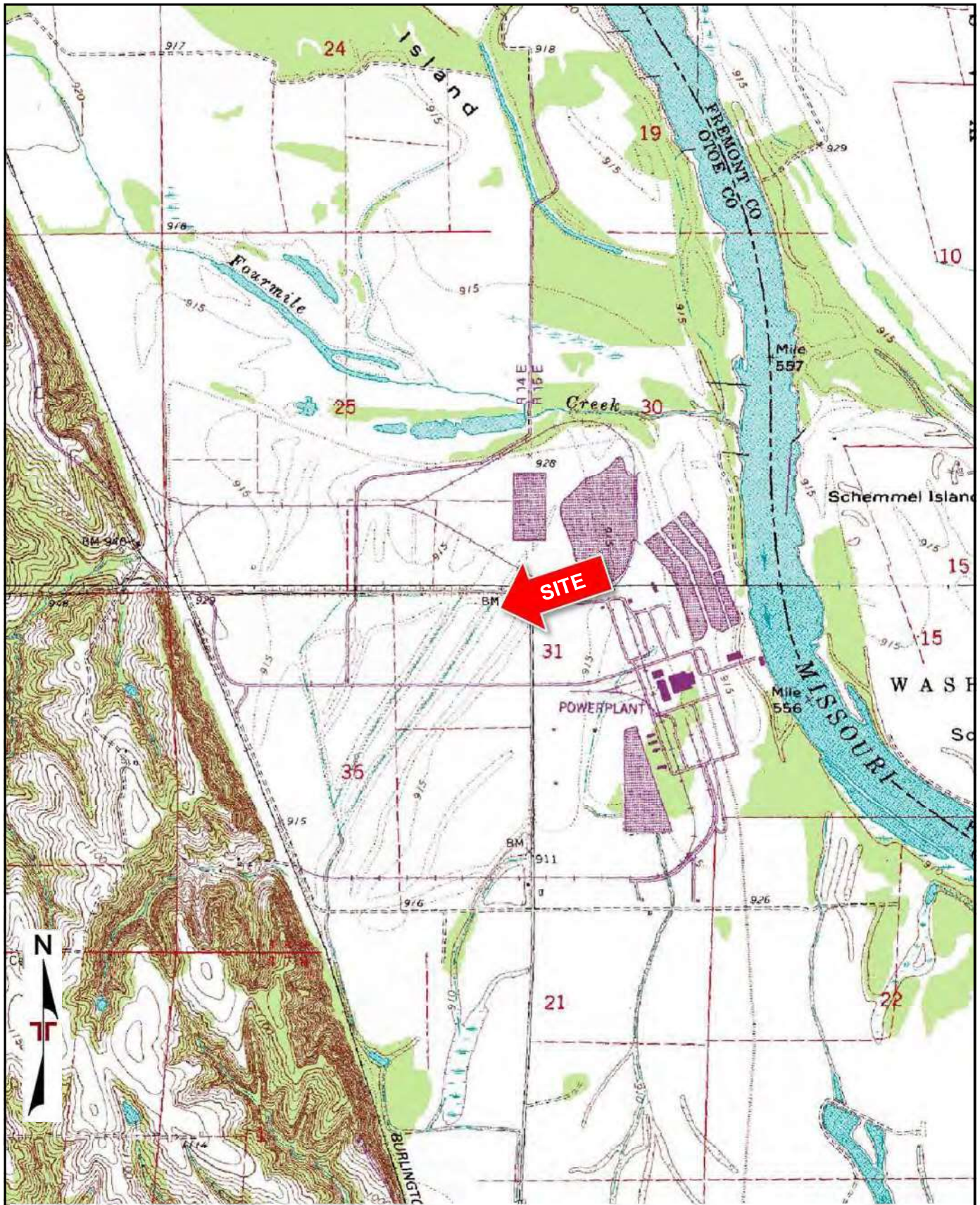
(if Contractor is unknown or Deceased or for pits)
(Not required if signed by Contractor)

Date _____

Please note this document contains four pages.

Sections 9F, 9G, 10, 11 & 12 are not required if registering a pit.

Owner Registering well drilled prior to 2002: Minimum Required Sections - 1, 3(a,b,c,e,f), 5, 6, 7, 8(a,f,h), 9e



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
 QUADRANGLES INCLUDE: NEBRASKA CITY, NE (1/1/1984) and JULIAN, NE (1/1/1984).

Project Manager: MR	Project No. 05137163	 15080 A Circle Omaha, NE 68144	SITE LOCATION	Exhibit
Drawn by:	Scale: 1:24,000		OPPD Nebraska City Station Unit 2 7264 L RD Nebraska City, NE	A-1
Checked by:	File Name:			
Approved by:	Date: 12/2013			



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager: MR	Project No. 05137163	 <p>15080 A Circle Omaha, NE 68144</p>	<p>AERIAL PHOTOGRAPH</p> <p>OPPD Nebraska City Station Unit 2 7264 L RD Nebraska City, NE</p>	Exhibit
Drawn by:	Scale: AS SHOWN			A-2
Checked by:	File Name:			
Approved by:	Date: 12/2013			







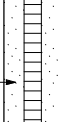

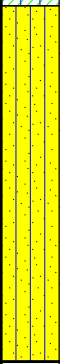
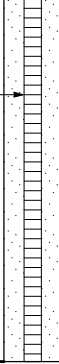



WELL LOG NO. MW-13

Page 1 of 1

PROJECT: OPPD Nebraska City Station

CLIENT: Omaha Public Power District

SITE: 7264 L RD
Nebraska City, Nebraska

GRAPHIC LOG	LOCATION -		INSTALLATION DETAILS		DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE
	Latitude: 40.6286073° Longitude: -95.7921889°	Surface Elev.: 915.5 (Ft.) ELEVATION (Ft.)	Top Casing Elev: 917.69	Well Completion: Aboveground					
DEPTH	MATERIAL DESCRIPTION								
	2.0	<u>LEAN CLAY (CL)</u> , with organics, brown, Grass at surface	- Concrete		5			10	2-2-2-3 N=4
			- Seal hydrated chip bentonite						
	5.0	<u>LEAN CLAY (CL)</u> , light brown	- Riser Pipe 2" diameter schedule 40 PVC. Flush threaded to PVC Screen					12	3-4-4-4 N=8
	7.0	<u>SILTY CLAY WITH SAND (CL-ML)</u> , fine	- Filter Material silica sand, 16/30 grade		10			18	2-2-2-2 N=4
	13.0	<u>SILTY SAND (SM)</u> , fine	- Screen 2" diameter schedule 40 PVC slotted screen, 0.010" slot					20	1-2-2-5 N=4
	Boring Terminated at 13 Feet								
The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.					Hammer Type: Automatic				
Advancement Method: Hollow Stem Auger, 8.25-inch diameter borehole		See Appendices for explanation of symbols and abbreviations.		Notes: Soil descriptions are based on visual observations made by the field crew. Actual conditions may vary.					
Abandonment Method: NA - Well installed									
WATER LEVEL OBSERVATIONS				Well Started: 1/26/2016		Well Completed: 1/26/2016			
 5 ft while sampling				Drill Rig: 770		Driller: JM			
 1 ft bgs on 2/4/16				Project No.: 05157663		Exhibit: --1			

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 05157663 LOGS.GPJ TERRACON2012.GDT 2/4/16

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Well Registration or Area Permit

Fee Paid: \$70.00 HHSS Fee: \$30.00
DNR Cash Fund: \$18.50 WWDF: 21.50
Billing ID: 53636

Source:	Nebraska On Line	Import Status:	Accepted	Use:	Monitoring (Ground Water Quality)	Owner ID:	49927
Import ID:	14551191495806	Status:	Active Registered Well	Decommission Date:	—	Registration Number:	G-178697
Well ID:	241806	NRD:	Nemaha			Registration Date:	2/19/2016
Last Change User:	hmcpherson	Call Up Code:	—	Call Up Date:	—	Last Change Date:	2/19/2016

Owner:

Select Contact

ContactID	Type	SeqNum	Begin Date	End Date	Name
49927	Owner 1		2/19/2016		Omaha Public Power District,

Contractor:

Certificate ID	FirstName	LastName
39570	Michael B	Reif

Drilling Firm:

EmployerID	Employer
159781	Terracon Consultants, Inc.

A. Well Location: NW1/4SE1/4 of Section 25
Township 8 North, Range 14 (East E/W), Otoe County

B. Natural Resource District: Nemaha

Latitude	Longitude
Well GPS Coordinates: 40° 37' 42.99"	-095° 47' 31.88"
Lat/Long DD 40.62861	-95.79219

C. The well is: feet from the Section line and feet from the section line.

D. Street address or block, lot and subdivision: Addr/Sub Div 7264 L Road Block No Lot

E. Location of water use, if applicable (give legal description): NWSE S25 T8 R14E

G. Well reference letter(s) if applicable: MW-13

Well In A Series

Well Part of a Series with Site Plan: Yes

Series	# of Wells Reg	Total # Wells	Acres	Acres Cert	NRD Appr	StartDate	EndDate	Comment	Series Reg Num (External Source)	Code	Description	Wells in the Series			
244881	1	2	No	No		1/26/2016			G-126717	DEQ	Part of a DEQ site plan for spill or underground storage	WellID	RegCD	StartDate	EndDate
												158167	G-	2/19/2016	
													126717		
												241806	G-	1/26/2016	
													178697		

Permits

Area Permit	—	—	Aprvd Date(s)	SWater App Code	—	—	—
GeoPermit	—	—	—	Industrial	—	—	—
MWF	—	—	—	Transfer	—	—	—
WSP	—	—	—	Swater Conduct Code	—	—	—
HHSS	—			Other	—	—	
HHSS PWS ID	—			ITN	—	—	
NDEQ							

NE0054712, NE0204421

5. Purpose of Well Monitoring (Ground Water Quality)

Other Use

Notes

7. Replacement well information.

Well Considered a replacement by NRD(WellID, RegCD)

A. Is this well a Replacement well? No Repl No NRD Approval Date Well Replacement Reg CD

B. Registration number of abandoned well: If not registered, date abandoned well was constructed

C. Abandoned well last operated D. Replacement well is feet from abandoned well.

E. Original well pump column size: inches.

F. [] Original water well decommissioned

[] I hereby certify that the original water well will be decommissioned within 180 days after such construction of the replacement water well.

[] I hereby certify that the original water well will be modified and equipped to pump 50 gallons per minute or less within 180 days after such construction of the replacement water well.

[] Livestock

[] Monitoring

☐ Observation
☐ Nonconsumptive or de minimus use approved by the applicable natural resources district. ____
☐ Decommission/Modification certification form is submitted by landowner (Must be submitted before registering well)
G. Location of water use of original well: ____

Decommission Information
Decommission Date: ____ By ____

8. Pump Information.
A. Is Pump installed at this time? No Pump present but Well Inactive: No
Free Flowing Well: No Well active, no pump installed: Yes
B. License No. ____
C. Pumping Rate ____ gallons per minute. D. Pumping water level ____ feet.
E. Drop pipe diameter ____ inches. F. Length of pipe ____ in feet.
G. Pump equipment installed: ____ H. Pump Brand/Type ____
I. Will this well be used to pump 50 gpm or less? Yes

9. Well Construction Information
A. Total well depth: 13 feet. B. Static water level 1 feet.
C. Well Construction began: 1/26/2016 D. Well Construction Completed: 1/26/2016
E. Bore hole diameter in inches. Top 8.25 Bottom 8.25
F. Casing and Screen Joints are: Threaded Other Joints description: ____
H. Total Estimate Capacity of Well ____ gallons per minute. I. Pumping water level at capacity: ____ feet.

10. Well Construction (Casing & Screen) - c, d, e & f measurements should be in inches to three decimal places
Record Count = 2

WellID	FromDepth*	ToDepth*	Case/Screen	InsideDiam	OutsideDiam	CaseThickness	ScrnSlotSize	Material	ScreenTname
241806	0	3	casing	2.07	2.38	0.154		PVC	EMI
241806	3	13	screen	2.07	2.38	0.154	0.01	PVC	EMI

* are in Feet, all else is in inches

11. Grout and Gravel Pack
Record Count = 3

WellID	FromDepth	ToDepth	Grout/Gravel	Material Description ¹	Quantity Gravel ²	Volume &Type Grout ³
241806	0	0.5	grout	Concrete and well vault		Concrete and well vault
241806	0.5	2	grout	non-slurry bentonite		1.5 bags
241806	2	13	gravel	#16-30 Silica sand	5 bags	

* are in Feet, all else is in inches

¹Description of gravel pack, i.e. engineered gravel pack, or gravel pit description (1/4 down) or brand name (best sand) natural formation, drilling cuttings, soil backfill
²Quantity #cubic yards, #Tons, #Sacks - (for drilling cuttings and soil backfill estimate quantity) Calculation assistance available on web
³Volume & Type: #gallons of a slurry, #Barrels of a slurry, #sacks used in the slurry, #Bags of non-slurry bentonite (chip-pellet-granular)

12. Well Geologic Materials Logged

WellID	FromDepth*	ToDepth*	Type	Hardness	Color	Other/Drilling Action
241806	0	5	Other		Brown	Lean Clay
241806	5	7	Other		Brown	Sily Clay w/sand
241806	7	13	Other		Brown	Silty Sand

* are in Feet.

DRILLING LOG

Project Name Omaha Public Power District - Nebraska City, Nebraska					Project Number 08 94037.01		Boring Number MW-7	
Boring Location Description N of fly ash disposal area				Boring Location NE 1/4 NW 1/4 SEC 31, T8N, R15E		Page 1 of 3		
Ground Surface Elevation ft above NGVD (surv.)		Top of well Casing Elevation 918.9 ft above NGVD (surv.)		Boring Location Coordinates 4056.8 North 6694.9 East			Total Footage 42.0 ft.	
Drilling Method (s)		Borehole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	
6 1/4" ID HSA		8	42.0 feet	0 feet	None	None	See Remarks	
Drilling Co. Layne, Inc, Omaha, Nebraska					Driller (s) Lyle Porter, Rick Keith			
Drilling Rig Acker Soilmax 80 Truck Mounted					Type of Sampler Continuous			
Date Started 01/20/99			Date Completed 01/20/99		Field Observer (s) JOHN BUCKLEY			

Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks
1	SANDY SILT, brownish grey, loose, well graded, fine sand and silt, moist	ML			1			AUGER CUTTINGS WET AT 9.0 feet
2								
3								
4	SILTY SAND, brownish grey, well graded, medium density quartz and rock grains, moist.	SM			4			
5								
6								
7	SAME AS ABOVE	SM			7			
8								
9								
10	SAND, dark grey, med to fine grained, well graded, medium density, wet, mostly quartz with rock grains	SW			10			
11								
12								
13								
14								

Drilling Log, continued

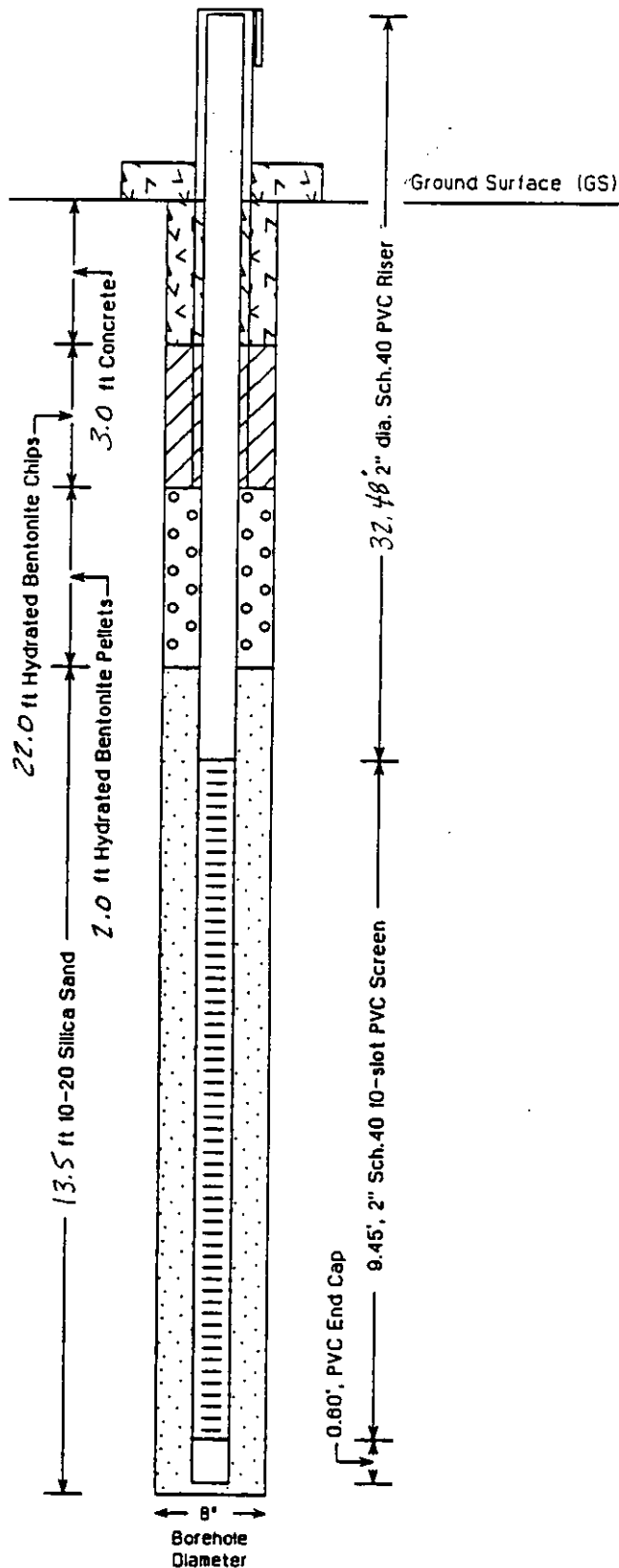
Project Name Omaha Public Power District - Nebraska City, Nebraska					Project No. 08 94037.01		Boring Number MW-7	
Boring Location Description N of fly ash disposal area				Boring Location NE 1/4, NW 1/4, SEC 31, T8N, R15E			Page 2 of 3	
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks
15	SAME AS ABOVE				15			
16								
17								
18								
19								
20	SAME AS ABOVE				20			
21								
22								
23								
24								
25	SAND, light grey, medium to coarse grained, well graded, medium to loose, wet, quartz and rock grains with oval shaped, rounded pebble size rock grains				25			
26								
27								
28								
29								
30	SAME AS ABOVE				30			
31					31			

Drilling Log, continued

Project Name Omaha Public Power District - North Omaha, Nebraska						Project No. 08 94037.02		Boring Number MW-7	
Boring Location Description N of fly ash disposal area				Boring Location NE 1/4, NW 1/4, SEC 31, T8N, R15E			Page 3 of 3		
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks	
32	SAME AS ABOVE	SW			32				
33									
34									
35									
36	SAME AS ABOVE	SW			36				
37									
38									
39									
40	SAME AS ABOVE	SW			40				
41									
42									
43									
44	BOTTOM OF BORING				44				
45									
46									
47									
48									

MONITORING WELL CONSTRUCTION RECORD

Project Name Omaha Public Power District - Nebraska City, Nebraska		Project Number 08 94037.01	Well Number MW-7
Location Description N of fly ash disposal area		Location NE 1/4, NW 1/4, SEC 31, T8N, R15E	Total Depth (TOC) 42.53 feet
Ground Surface Elevation ft above NGVD	Marker in Concrete Well Pad EL	Boring Location Coordinates 4056.8 North 6694.9 East	Date Installed 01/20/99



Elevation Top of Well Casing: 918.93 ft above NGVD

Elevation Top of Well Screen: 886.45 ft above NGVD

Elevation Bot. of Well Screen: 877.0 ft above NGVD

Total Depth of Boring: 42.0 ft below GS

Total Depth of Well: 40.5 ft below GS

Well Casing Above GS: 2.03 feet

STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

Registration Date 7-1-99 Sequence No. 118729 Registration No. G-10111A
Owner Code No. 40226 Receipt No. 102038 Nemaha NRD
102039

1. Well Owner Omaha Public Power District Telephone Number (402) 636-2304
Address 444 South 16th Street Mail
City Omaha State NE Zip Code 68102 + 2247

2. Drilling Firm Layne-Western Company Telephone Number (402) 359-2042
Address 25450 Highway 275, P.O. Box 597 Contractor's License No. 39286
City Valley State NE Zip Code 68064 + 0597

3. Permit Number(s) _____

4. Purpose of well(indicate one): Dewatering (over 90 days) Domestic Geothermal Ground Heat Exchanger
Ground Water Source Heat Pump Industrial Injection Irrigation Livestock X Monitoring
Observation Public Water Supply (with spacing (46-638)) Public Water Supply (without spacing) Recovery Aquaculture
Other (Indicate use)

5. Replacement and abandoned well information.

A. Is this well a replacement well? Yes X No B. Registration number of abandoned well: _____
C. Replacement well is _____ feet from abandoned well. D. Abandoned well last operated _____, 19____
E. Original well pump column size: _____ inches. F. Completion of original well abandonment on _____, 19____
G. Location of water use of abandoned well: _____

6. A. Well location: NE 1/4 of the NE 1/4 of Section 31, Township 8, North, Range 15 (East or West), Otoe County.

B. The well is 550 feet from the (North or South) section line and 1450 feet from the (East or West) section line

C. Street address or block, lot and subdivision, if applicable: Omaha Public Power District

Nebraska City Station

D. Location of water use, if applicable (give legal descriptions): N/A

E. If for irrigation, the land to be irrigated is N/A acres.

F. Well reference letter(s), if applicable: Monitoring Well 1

7. Pump Information.

Is pump installed at this time? Yes X No

If Yes, complete items A through F.

If No, complete items A and D with estimated information for those wells in which pump will be installed.

A. Actual pumping rate, if applicable: _____ gallons per minute. Measured ☐ Estimated ☐

B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet

D. Pumping equipment installed: _____, 19____ E. Brand/Type: _____

F. Pump installed by: Contractor ☐ Owner ☐ Pump Installer ☐ License No. _____

AWI

G-10111 A

8. Geologic Materials Logged

[illegible]

(Additional sheets may be submitted)

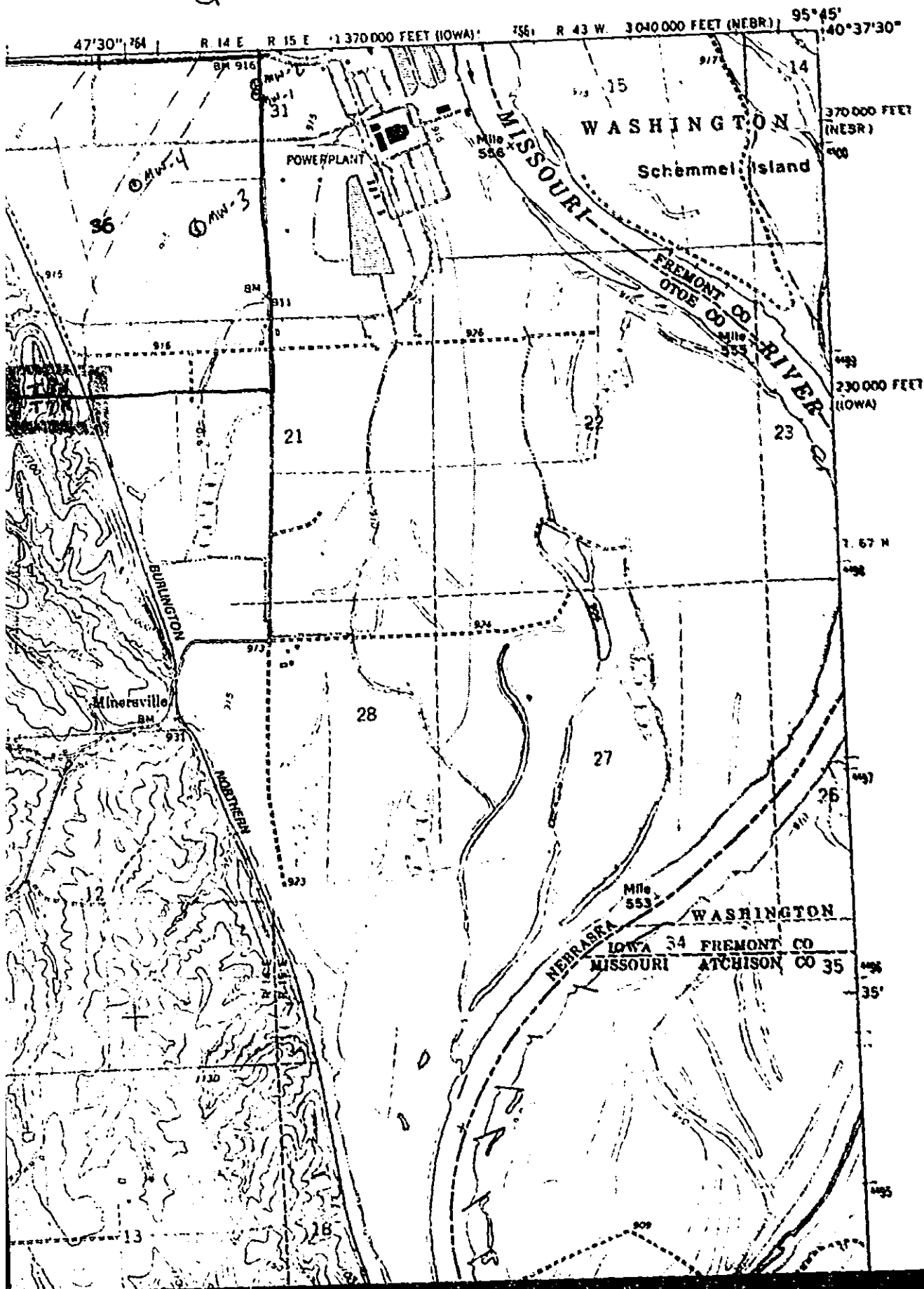
10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.

Shirley C. Harkness 6-1-99
Water Well Owner's Signature Date

G-10111A-D

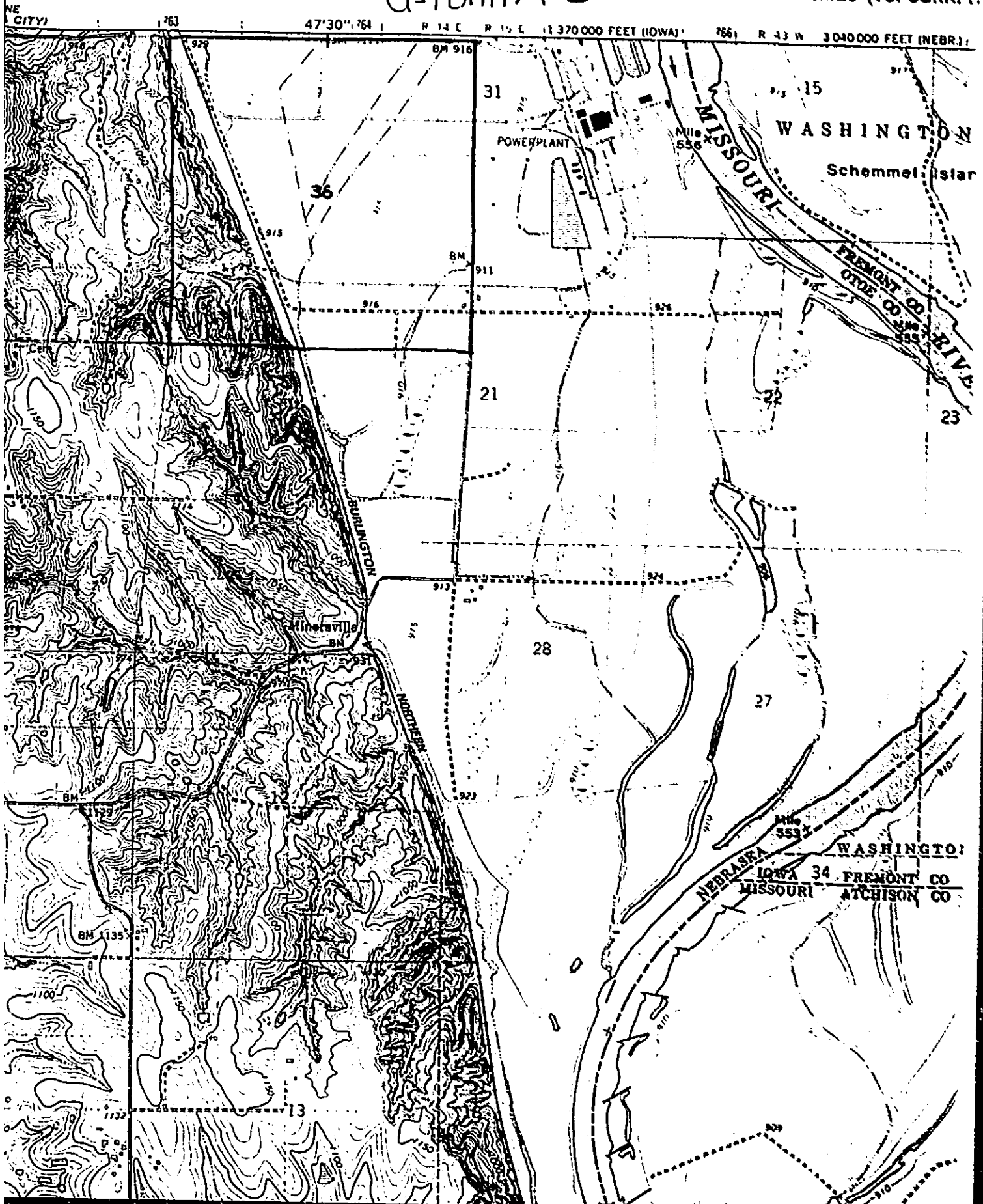
JULIAN QUADRANGLE
NEBRASKA-MISSOURI-IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)

ONE INCH
(60000)



JULIAN QUADRANGLE
NEBRASKA-MISSOURI-IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)

G-10111A-D



STATE OF NEBRASKA

G-10111A-D



DEPARTMENT OF WATER RESOURCES
Roger K. Patterson
Director

Mike Johanns
Governor

June 10, 1999

IN REPLY REFER TO:

Omaha Public Power District
444 South 16th St. Mall
Omaha, NE 68102-2247

LOCATION OF THE WELLS:

Otoe County

The following items were submitted to register the four wells but are being returned to you:

- Water Well Registration Forms
- \$120.00 Fee (State Auditors require that checks be returned for all unregistered wells.)
- Quadrangle map

The four wells have not been registered for the following reasons:

- The Water Well Registration form is incomplete. Please complete items 6A and 6B.
- Township 67 is not in Nebraska. The wells are either in Township 7 North or Township 8 North.
- Please mark the location of the wells on the map.
- The fee should be \$240.00. Please refer to the enclosed instruction sheet.

Please resubmit the enclosures along with the items requested by July 12, 1999. As required by law, we are obligated to inform you that failure to register the well is a Class IV misdemeanor. If not promptly resolved, matters involving unregistered wells may be sent to the county attorney for possible prosecution. If you have any questions, please call me.

Sincerely,

A handwritten signature in cursive script that reads "Stacey Evans".

Stacey Evans
Accounting Clerk, Ground Water
(402) 471-4084

pjb



Omaha Public Power District
444 South 16th Street Mall
Omaha, Nebraska 68102-2247

G-10111A-D

June 29, 1999
99-EA-143

State of Nebraska
Department of Water Resources
P.O. Box 94676
Lincoln, NE 68509-4676

Please find enclosed Water Well Registration forms for four groundwater monitoring wells installed at our Nebraska City Station. Also enclosed are two checks, each for \$120 for the registration fees.

If you have any questions regarding the enclosed material, please contact John Buckley at (402)636-2318 or me directly at (402)636-2313.

Sincerely,

A handwritten signature in cursive script, appearing to read "D. C. Hutchens", is written over a horizontal line.

D. C. Hutchens
Manager - Environmental Affairs
Environmental & Governmental Affairs

JEB:dn

Encl.

WATER WELL REGISTRATION CORRECTION
FOR DEPARTMENT USE ONLY

Registration Number G-101111A
Sequence Number 118729
Correction Date September 13, 1999
Person Processing Correction Wendy Evans

Information regarding the water well referenced above has been changed in the Department's water well registration records. Please note the following changes and the reason changes were made:

Well Location (Item 6A) and Footage (Item 6B): According to the marking on the quadrangle map, the well is estimated to be located in Range 14E, Section 36 in the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$, 475 feet from the North section line, and 10 feet from the East section line (475S 10W).

This correction has modified section(s) 6A and 6B of DWR Registration Form #145. If these changes are inaccurate, please contact the Department of Water Resources at P.O. Box 94676, Lincoln, NE, 68509-4676.
Phone (402)471-3458.

I certify that this Correction Form has been forwarded to the owner of the referenced water well and is now a part of the registration records.

Wendy Evans
Department of Water Resources

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DRILLING LOG

Project Name Omaha Public Power District - Nebraska City, Nebraska				Project Number 08 94037.01		Boring Number MW - 8	
Boring Location Description N of fly ash disposal area				Boring Location NE 1/4, NW 1/4, SEC 31, T8N, R15E		Page 1 of 2	
Ground Surface Elevation 916.8 ft above NGVD (surv.)		Top of Well Casing Elevation 919.3 ft above NGVD (surv.)		Boring Location Coordinates 4064.5 North 6695.7 East		Total Footage 22.0 ft.	
Drilling Method (s)	Borehole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	
6 1/4" ID HSA	8	22.0 feet	0 feet	None	None	See Remarks	
Drilling Co. Layne, Inc. Omaha, Nebraska				Driller (s) Lyle Porter, Rick Keith			
Drilling Rig Acker Soilmax 80 Truck Mounted				Type of Sampler Continuous			
Date Started 01/21/99		Date Completed 01/21/99		Field Observer (s) JOHN BUCKLEY			

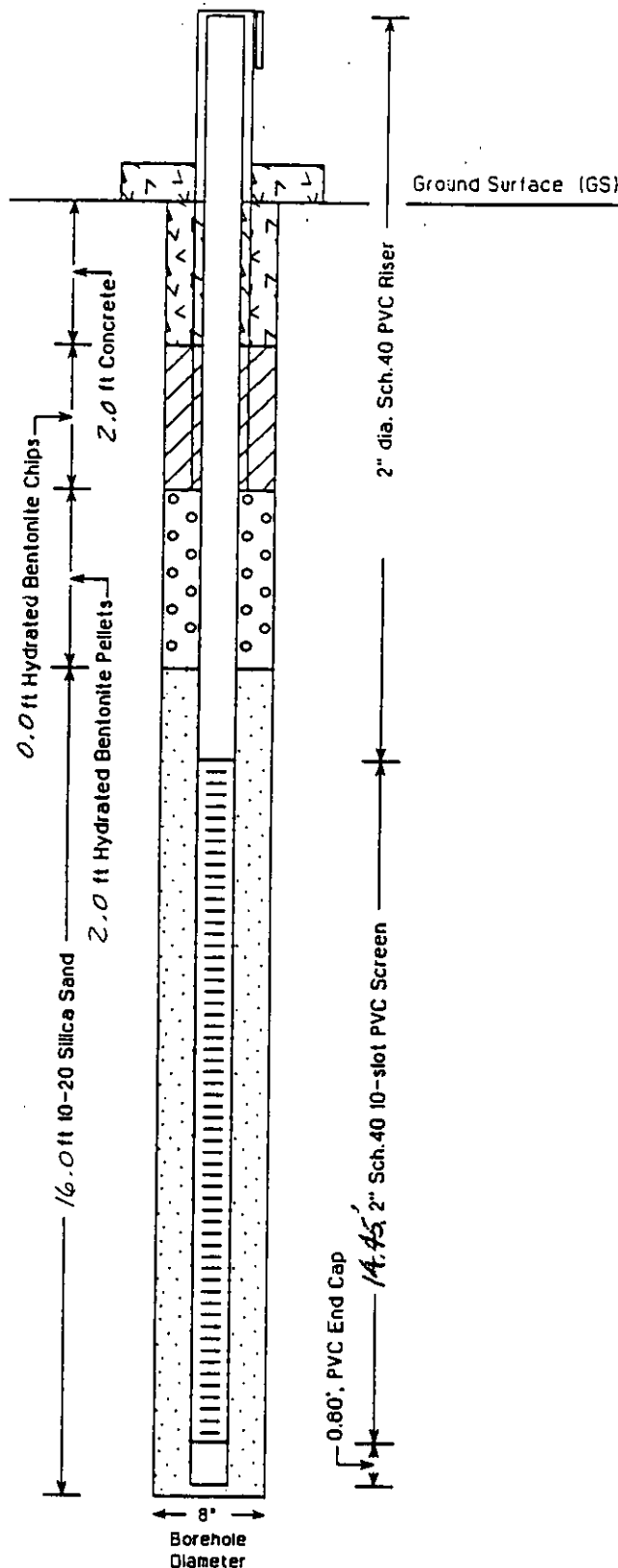
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	PID (ppm)	Remarks
1	SANDY SILT, brownish grey, loose, well graded, fine sand and silt, moist	ML			1			AUGER CUTTINGS WET AT 9.0 feet
2								
3								
4	SILTY SAND, brownish grey, well graded, medium density quartz & rock grains	SM			4			
5								
6	SAME AS ABOVE	SM			6			
7								
8								
9								
10	SAND, dark grey, med. to fine grained, well graded, medium density, wet, mostly quartz with rock grains.	SW			10			
11								
12								
13								
14								

Drilling Log, continued

Project Name Omaha Public Power District - Nebraska City, Nebraska					Project No. 08 94037.01		Boring Number MW - 8	
Boring Location Description N of fly ash disposal area				Boring Location NE 1/4, NW 1/4, SEC 31, T8N, R15E			Page 2 of 2	
Depth in Feet	Description	USCS Class.	Blow Count	Recovery	Depth in Feet	Sample No.	P10 (ppm)	Remarks
15	SAME AS ABOVE	SW			15			
16					16			
17					17			
18					18			
19	SAME AS ABOVE	SW			19			
20					20			
21					21			
22					22			
23	BOTTOM OF BORING				23			
24					24			
25					25			
26					26			
27					27			
28					28			
29					29			
30					30			
31					31			

MONITORING WELL CONSTRUCTION RECORD

Project Name Omaha Public Power District - Nebraska City, Nebraska		Project Number 08 94037.01	Well Number MW-8
Location Description N of fly ash disposal area		Location NE 1/4, NW 1/4, SEC 31, T8N, R15E	Total Depth (TOC) 22.46 feet
Ground Surface Elevation ft above NGVD	Marker in Concrete Well Pad El.	Boring Location Coordinates 4064.5 North 6695.7 East	Date Installed 01/21/99



Elevation Top of Well Casing: 919.26 ft above NGVD

Elevation Top of Well Screen: 911.85 ft above NGVD

Elevation Bot. of Well Screen: 877.40 ft above NGVD

Total Depth of Boring: 22.0 ft below GS

Total Depth of Well: 20.0 ft below GS

Well Casing Above GS: 2.46 feet

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STATE OF NEBRASKA
DEPARTMENT OF WATER RESOURCES
WATER WELL REGISTRATION

Registration Date 7-1-99 Sequence No. 118730 Registration No. G-10111B
Owner Code No. 40226 Receipt No. 02038 Nemaha NRD
102039

1. Well Owner Omaha Public Power District Telephone Number (402) 636-2304
Address 444 South 16th Street Mail
City Omaha State NE Zip Code 68102 + 2247

2. Drilling Firm Layne-Western Company Telephone Number (402) 359-2042
Address 25450 Highway 275, P.O. Box 597 Contractor's License No. 39268
City Valley State NE Zip Code 68064 + 0597

3. Permit Number(s) _____

4. Purpose of well(indicate one): ☐ Dewatering (over 90 days) ☐ Domestic ☐ Geothermal ☐ Ground Heat Exchanger
☐ Ground Water Source Heat Pump ☐ Industrial ☐ Injection ☐ Irrigation ☒ Livestock ☐ Monitoring
☐ Observation ☐ Public Water Supply (with spacing (48-838)) ☐ Public Water Supply (without spacing) ☐ Recovery ☐ Aquaculture
☐ Other _____ (Indicate use)

5. Replacement and abandoned well information.

A. Is this well a replacement well? Yes ☒ No ☐ B. Registration number of abandoned well: _____
C. Replacement well is _____ feet from abandoned well. D. Abandoned well last operated _____, 19____
E. Original well pump column size: _____ inches. F. Completion of original well abandonment on _____, 19____
G. Location of water use of abandoned well: _____

6. A. Well location: NE 1/4 of the NW 1/4 of Section 31, Township 8 North, Range 15 East West, Otoe County.

B. The well is 545 feet from the (North or South) section line and 1950 feet from the (East or West) section line.

C. Street address or block, lot and subdivision, if applicable: Omaha Public Power District
Nebraska City Station

D. Location of water use, if applicable (give legal descriptions): N/A

E. If for irrigation, the land to be irrigated is N/A acres.

F. Well reference letter(s), if applicable: Monitoring Well 2

7. Pump Information.

Is pump installed at this time? Yes ☒ No ☐

If Yes, complete items A through F.

If No, complete items A and D with estimated information for those wells in which pump will be installed.

A. Actual pumping rate, if applicable: _____ gallons per minute. Measured ☐ Estimated ☐

B. Pump column diameter: _____ inches. C. Length of pump column: _____ feet

D. Pumping equipment installed: _____, 19____ E. Brand/Type: _____

F. Pump installed by: Contractor ☐ Owner ☐ Pump Installer ☐ License No. _____

G-10111B

8. Well Construction Information.

- A. Total well depth: 20 feet. B. Static water level: 9 feet. C. Pumping water level: feet.
☒ Estimated or ☐ Measured
D. Well Construction began: 21-Jan, 1999 E. Well Construction completed: 21-Jan 1999
F. Bore hole diameter: 8 inches.
G. Plain casing: Diameter 2.1 ID 2.4 OD inches. Type of Material: PVC
Wall thickness: 0.15 inches. Joints: Welded/Glued/Threaded/Other.
Length(s) and placement(s) depth from 0' to 5 feet. feet to 0 feet.
H. Screen: 2.1 ID 2.4 OD inches. Type of Material: PVC
Screen openings (slot size): 0.010" Trade Name: Monoflex Guides at feet.
Length(s) and placement(s) depth from 15 ft. to 20 feet from feet to feet.
I. Gravel pack interval(s) from 4 feet to 20 feet. feet to feet. Grade size: 20-40
J. Grouted/Sealed from 0 feet to 3 feet with Cement Grout
 (type)
from 3 feet to 4 feet with Bentonite
 (type)
K. Drilling method: Hollow Stem Auger L. Drilling fluid: None
M. Well development technique (total time and method): Surge, ball, pump -- 1 hour
N. Will chemicals, fertilizer or antifreeze be injected or utilized in the system? Yes X No
If yes, what will be used:

9. Geologic Materials Logged

Depth in Feet		DESCRIPTION	Depth in Feet		DESCRIPTION
From	To		From	To	
<u>0</u>	<u>5</u>	<u>Topsoil</u>	<u> </u>	<u> </u>	<u> </u>
<u>5</u>	<u>10</u>	<u>Clay -- brown</u>	<u> </u>	<u> </u>	<u> </u>
<u>10</u>	<u>20</u>	<u>Fine Sand</u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
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<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

(Additional sheets may be submitted)

10. I am familiar with the information submitted on this registration, and to the best of my knowledge it is true.


 Water well Contractor's Signature

3-1-99
 Date

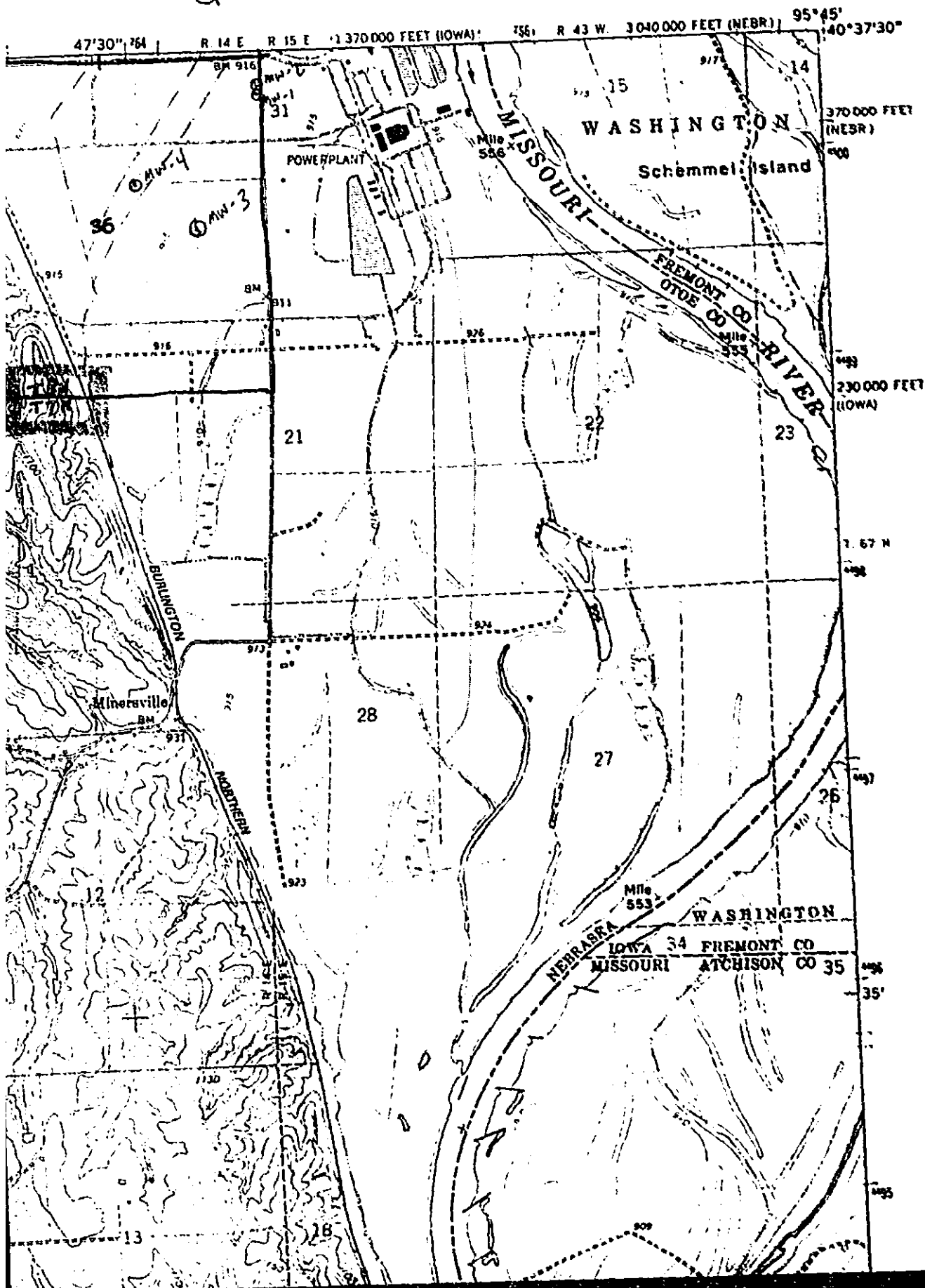

 Water Well Owner's Signature

6-1-99
 Date

G-10111A-D

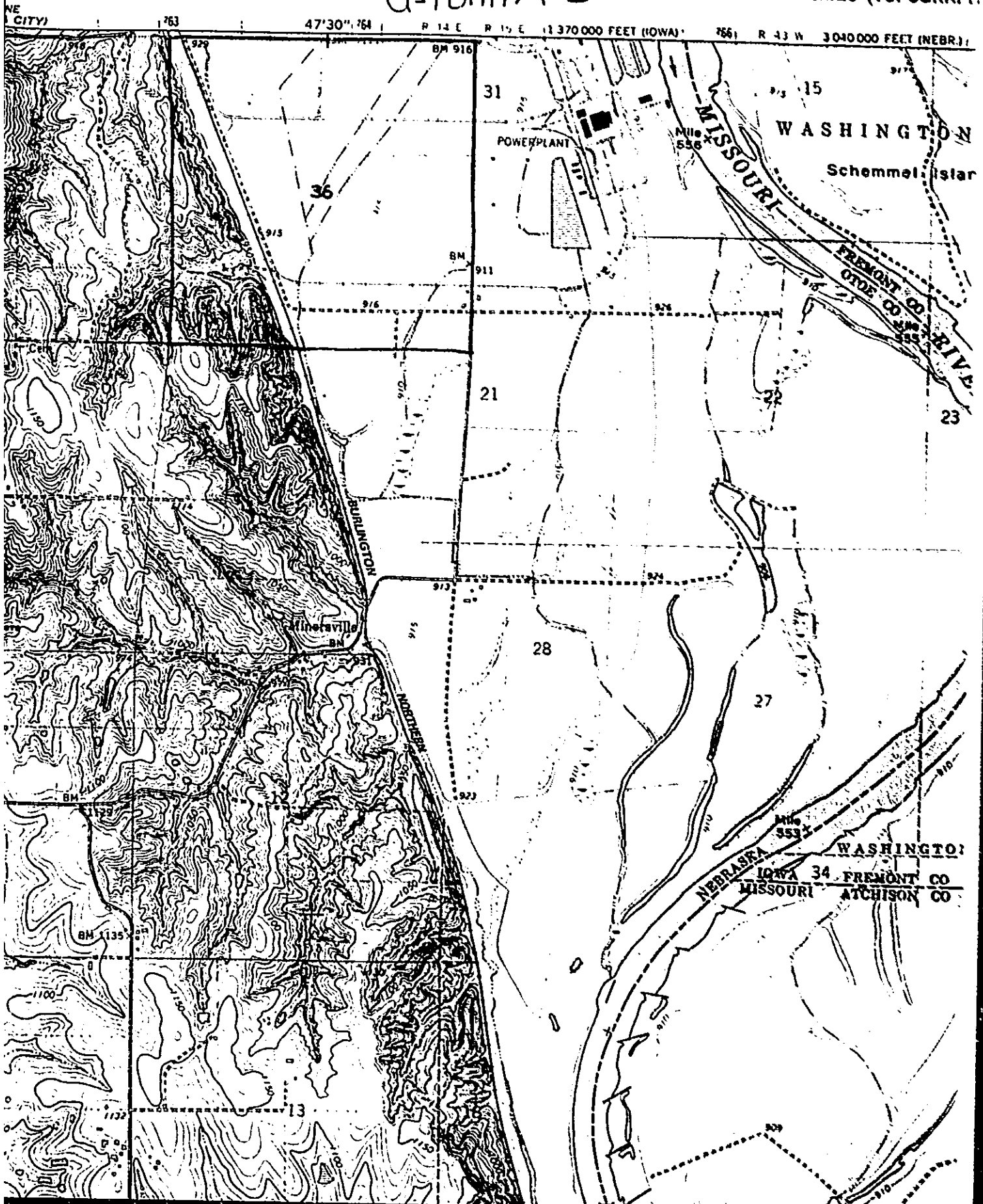
JULIAN QUADRANGLE
NEBRASKA-MISSOURI-IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)

ONE INCH
(60,000')



JULIAN QUADRANGLE
NEBRASKA-MISSOURI-IOWA
7.5 MINUTE SERIES (TOPOGRAPHIC)

G-10111A-D





Omaha Public Power District
444 South 16th Street Mall
Omaha, Nebraska 68102-2247

G-10111A-D

June 29, 1999
99-EA-143

State of Nebraska
Department of Water Resources
P.O. Box 94676
Lincoln, NE 68509-4676

Please find enclosed Water Well Registration forms for four groundwater monitoring wells installed at our Nebraska City Station. Also enclosed are two checks, each for \$120 for the registration fees.

If you have any questions regarding the enclosed material, please contact John Buckley at (402)636-2318 or me directly at (402)636-2313.

Sincerely,

A handwritten signature in cursive script, appearing to read "D. C. Hutchens", is written over a horizontal line.

D. C. Hutchens
Manager - Environmental Affairs
Environmental & Governmental Affairs

JEB:dn

Encl.

STATE OF NEBRASKA

G-10111A-D



DEPARTMENT OF WATER RESOURCES
Roger K. Patterson
Director

Mike Johanns
Governor

June 10, 1999

IN REPLY REFER TO:

Omaha Public Power District
444 South 16th St. Mall
Omaha, NE 68102-2247

LOCATION OF THE WELLS:

Otoe County

The following items were submitted to register the four wells but are being returned to you:

- Water Well Registration Forms
- \$120.00 Fee (State Auditors require that checks be returned for all unregistered wells.)
- Quadrangle map

The four wells have not been registered for the following reasons:

- The Water Well Registration form is incomplete. Please complete items 6A and 6B.
- Township 67 is not in Nebraska. The wells are either in Township 7 North or Township 8 North.
- Please mark the location of the wells on the map.
- The fee should be \$240.00. Please refer to the enclosed instruction sheet.

Please resubmit the enclosures along with the items requested by July 12, 1999. As required by law, we are obligated to inform you that failure to register the well is a Class IV misdemeanor. If not promptly resolved, matters involving unregistered wells may be sent to the county attorney for possible prosecution. If you have any questions, please call me.

Sincerely,

A handwritten signature in cursive script that reads "Stacey Evans".

Stacey Evans
Accounting Clerk, Ground Water
(402) 471-4084

pjb

WATER WELL REGISTRATION CORRECTION
FOR DEPARTMENT USE ONLY

Registration Number G-101111B
Sequence Number 118730
Correction Date September 13, 1999
Person Processing Correction Wendy Evans

Information regarding the water well referenced above has been changed in the Department's water well registration records. Please note the following changes and the reason changes were made:

Well Location (Item 6A) and Footage (Item 6B): According to the marking on the quadrangle map, the well is estimated to be located in Range 14E, Section 36 in the NE¼ of the NE¼, 600 feet from the North section line, and 10 feet from the East section line (600S 10W).

Casing Length & Placement Depth (Item 8G): Based on the total well depth and the length and placement depth of the screen, the length and placement depth of the casing is estimated to be 0 feet to 15 feet.

This correction has modified section(s) 6A, 6B and 8G of DWR Registration Form #145. If these changes are inaccurate, please contact the Department of Water Resources at P.O. Box 94676, Lincoln, NE, 68509-4676. Phone (402)471-3458.

I certify that this Correction Form has been forwarded to the owner of the referenced water well and is now a part of the registration records.

Wendy Evans
Department of Water Resources

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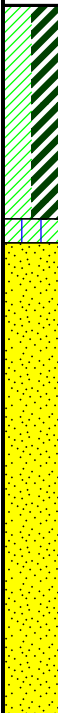

BORING LOG NO. NC2-MW-8

Page 1 of 1

PROJECT: OPPD Nebraska City- Monitoring Well Installation

CLIENT: HDR Engineering, Inc.
Omaha, NE

SITE: 7264 L Rd
Nebraska City, NE

GRAPHIC LOG	LOCATION: See Exhibit A-1 Latitude: 40.6242° Longitude: -95.7899°		INSTALLATION DETAILS		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS
	DEPTH	ELEVATION (Ft.)						
		Surface Elev.: 913.5 (Ft.)	-3' stick up →					
			-Concrete					2-2-4-2 N=6
			-Seal hydrated bentonite chips					2-3-3-3 N=6
	4.5	909	-Riser Pipe 2" diameter schedule 40 PVC, Flush threaded to PVC Screen					2-6-6-5 N=12
	5.0	908.5	-Screen 2" diameter schedule 40 PVC slotted screen, 0.010" slot					2-6-6-5 N=12
			-Filter Material silica sand 16/30 grade					2-1-1-2 N=2
								1-2-2-3 N=4
								1-2-2-1 N=4
	15.0	898.5			15			
Boring Terminated at 15 Feet								
Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic								
Advancement Method: 4½-inch ID Hollow Stem Auger			Notes: Bottom of well at depth of 14.9 feet. Concrete pad, protector pipe, and 3 bollards installed at ground surface. Top of casing elevation of 916.54 feet reported by client. Energy Transfer Ratio 84.6%. Hammer Efficiency Correction = 1.41 (October, 2017).					
Abandonment Method: Well installed								
WATER LEVEL OBSERVATIONS					Boring Started: 07-09-2018		Boring Completed: 07-09-2018	
▽ 5 ft. after boring completion					Drill Rig: 929		Driller: K. Smithhisler	
					Project No.: D9185019			
			15080 A Cir Omaha, NE					

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL D9185019 OPPD NEBRASKA CIT.GPJ TERRACON_DATATEMPLATE.GDT 8/13/18

BORING LOG NO. MW-14



Page 1 of 1

PROJECT: OPPD Nebraska City- Monitoring Well Installation

CLIENT: HDR Engineering, Inc.
Omaha, NE

SITE: 7264 L Rd
Nebraska City, NE

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL D9185019 OPPD NEBRASKA CIT.GPJ TERRACON_DATATEMPLATE.GDT 8/13/18

GRAPHIC LOG	LOCATION: See Exhibit A-1 Latitude: 40.6248° Longitude: -95.7929°		INSTALLATION DETAILS		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS
	DEPTH	ELEVATION (Ft.)						
	Gravel at surface		-Concrete					1-3-3-2 N=6
	SILTY CLAY (CL/ML) , dark gray		-Seal hydrated bentonite chips					4-7-7-11 N=14
	4.0	913			5			3-5-5-7 N=10
	LEAN TO FAT CLAY (CL/CH) , dark gray		-Riser Pipe 2" diameter schedule 40 PVC. Flush threaded to PVC Screen					3-5-8-8 N=13
	8.0	909			10			2-1-1-2 N=2
	SILTY CLAY (CL/ML) , gray		-Filter Material silica sand, 16/30 grade					1-1-1-1 N=2
					15			1-1-1-1 N=2
	18.0	899	-Screen 2" diameter schedule 40 PVC slotted screen, 0.010" slot					0-0-0-0 N=0
Boring Terminated at 18 Feet								
Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic								
Advancement Method: 4½-inch ID Hollow Stem Auger		 15080 A Cir Omaha, NE		Notes: Bottom of well at depth of 18 feet. Concrete pad, protector pipe, and 3 bollards installed at ground surface. Ground elevation estimated using Google Earth. Energy Transfer Ratio 84.6%. Hammer Efficiency Correction = 1.41 (October, 2017).				
Abandonment Method: Well installed								
WATER LEVEL OBSERVATIONS				Boring Started: 07-12-2018		Boring Completed: 07-12-2018		
 6 ft. while drilling				Drill Rig: 929		Driller: K. Smithhisler		
				Project No.: D9185019				