

WATER PERMIT NO. 6736-3

Name of Applicant: Lewis & Clark Rural Water System

Address: 401 E 8th St, Suite 306, Sioux Falls SD 57103

Phone: 605 336-8688

Amount of Water Claimed: 20,165 AF annually

Total Acres: NA

Source of Water Supply: groundwater (6 wells)

Water to be used for: rural water system use

County: Clay

Type of Waste Disposal System:

Location: 2 miles southwest of Vermillion near Missouri River

PRIORITY Date Received: 6-12-06

Application/License Fee: \$4450

Corrected Application Received: 6-23-06

Period of Annual Use: January 1 – December 31

Remarks: Place to beneficial use water reserved by Future Use Permit No. 5832-3

Diversion Point: W ½ Sec 22-T32N-R4E

Land to be Irrigated: NA

Depth of Well: 95 feet deep

Well Driller: : Layne-Western

Remarks:

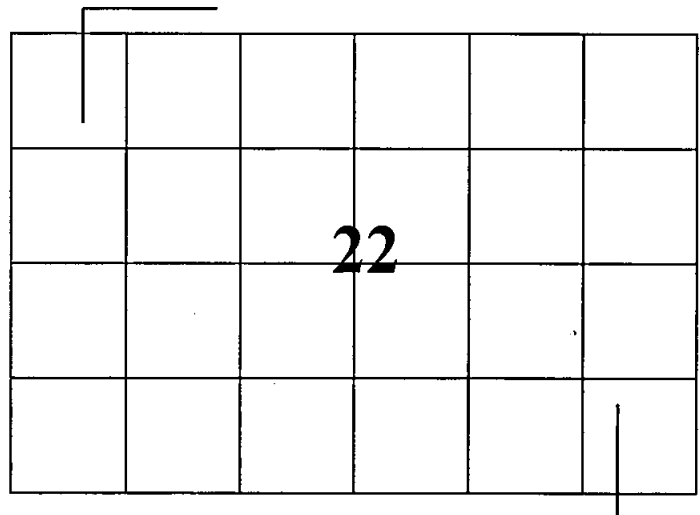
Type of Map: topo

Prepared by: Daniel Graber, PE

Reviewed and the Number Assigned on: 6-28-06

By: Karen Schlaak

Notice of Hearing - date to intervene: _____



SD EForm - 1585 V1
FORM 2: Application for uses other than irrigation
(type or print)

Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	No. <u>6736-3</u> (office use only) Hydrologic Unit <u>10170101</u>
	Basin <u>Missouri River</u>
	Newspaper _____

RECEIVED
JUN 12 2006
WATER RIGHTS
PROGRAM

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use(s) of water:

- | | | | |
|--|---|--|--|
| ☒ Municipal | ☐ Suburban Housing | ☐ Recreational | ☐ Institutional |
| ☒ Rural Water System | ☐ Commercial | ☐ Fish & Wildlife | ☐ Geothermal Heat |
| ☐ Domestic (over 18 gpm) | ☐ Industrial | ☐ Other _____ | |

Type of Application: (check one)

- ☐ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
☒ Place to Beneficial Use Water Reserved by Future Use Permit No. 5832-3
☐ Amendment/Correction to Permit No. _____

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.)

1. Name of Applicant Lewis and Clark Rural Water System Phone (605) 336-8688
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address 401 East 8th St., Suite 306, Sioux Falls State SD 57103
(Street, RR, or Box and City) (Zip Code)

2. Amount of water claimed _____ *CFS or 12,500 **GPM 20,165 ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply Missouri Elk Point Aquifer

4. Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) County Clay
Six wells in Section 22, T32N, R4E, Nebraska survey. Wells will be located west of SD Hwy 19 south of Vermillion in Mulberry Point. (w1/2) Clay, McCook

5. County or counties where water will be used SD - Turner, Lincoln, Minnehaha, Union, Lake, (see 7)

6. Annual period during which water is to be used Year round use as municipal water supply Jan 1-Dec 31

7. Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

Water will be used as water supply for the Lewis and Clark rural Water System serving 20 public water systems in South Dakota, Iowa, and Minnesota. Iowa counties served include Lyon, Sioux, O'Brien, and Osceola. Minnesota counties served include Rock and Nobles. Well system design memorandum is attached.

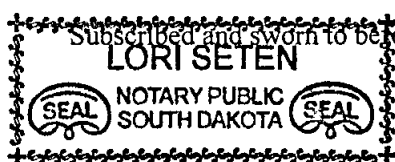
STATE OF SOUTH DAKOTA)

County of Clay Minnehaha SS

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Attach map and any other technical information. (see instructions)

I, Troy Larson, the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.

Applicant's signature Troy Larson



Lori Seten
Notary Public signature

Expires: Feb. 6, 2011

**SOUTH DAKOTA
WATER PERMIT NO. 6736-3**

Date of first receipt of application June 12, 2006.

Date of return to applicant for corrections, amendments or changes June 20, 2006.

Date of receipt of corrected application June 28, 2006.

The Water Management Board approved Water Permit No. 6736-3 on October 11, 2006 for Lewis and Clark Rural Water System, 401 E 8th St, Suite 306, Sioux Falls SD 57103 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 6736-3 authorizes placing to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri:Elk Point Aquifer (approximately 95 feet deep) located in the W ½ Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second. This water was appropriated and reserved by Future Use Permit No. 5832-3.
2. The water appropriated shall be used for the purpose of serving 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date from which applicant may claim right is July 8, 1994 (established by Future Use Permit No. 5832-3).
5. One-fifth of the construction is to be completed on or before April 11, 2009.
6. All construction is to be completed on or before October 11, 2011.
7. Water is to be put to beneficial use on or before October 11, 2015.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. The wells approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The wells authorized by Permit No. 6736-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. Lewis and Clark Rural Water System shall report to the Chief Engineer annually the amount of water withdrawn from the Missouri:Elk Point Aquifer.

WATER MANAGEMENT BOARD

By: Garland Erbele
Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

NOV 01 2006
date



(type or print in ink)

Site C Vertical Well #1
Well ID: 06-4

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 36" Depth 95'
- b) Casing Type Steel Diameter 24" Thickness 0.50"
- c) Screen Type 304 Stainless Steel Diameter 24" Thickness
- d) Gravel Pack 6" Siliceous Gravel Length of Gravel Pack 75'
- e) Depth to Top of Water Bearing Material Approximately 5'
- f) Depth to Water (ground surface to water level) Approximately 13'
- g) Distance to nearest existing domestic well:
On applicants property Approximately 550' On property owned by others
Distance to nearest irrigation well, approximately 3,500'

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field)
- b) System Capacity (gallons) Year Constructed
- c) Connected to the City of Sanitary System

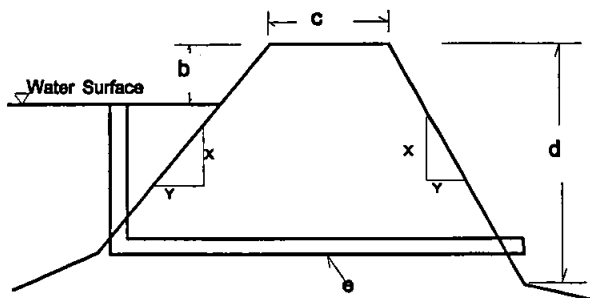
3. Dugout Information

- a) Surface Dimensions Depth
- b) Depth to water (ground surface to water level)

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:



- b) Freeboard
- c) Crest Width
Crest Length
- d) Height
- e) Primary Outlet Capacity
If pipe, diameter
- f) Secondary Spillway Capacity
Spillway Width
- g) X & Y Slope
Upstream
Downstream
- h) Surface Area of Impoundment
- i) Storage Acre Feet
- j) Drainage Area Above Dam Acres

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date June 15, 2006

RECEIVED OF Lewis & Clark Rural Water System Inc., 401 E 8th St Ste 306, Sioux Falls SD

57103-

The following amount in fees for services rendered as provided for by law:

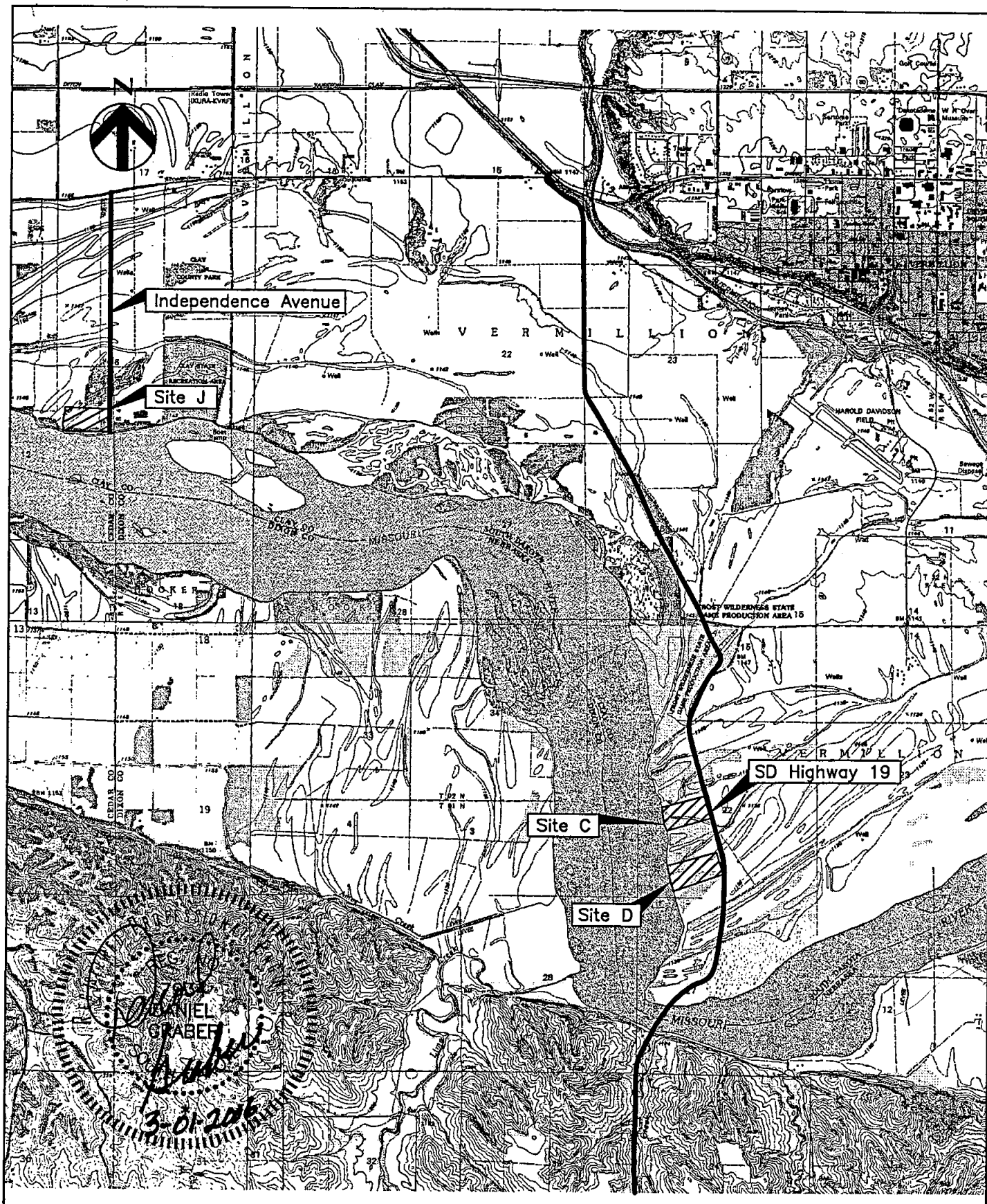
Fee for Application for Permit No. <u>6736-3</u> to Appropriate Water, to construct and to put water to beneficial use	4,350.00
Fee for Application for Permit No. _____ to Appropriate Water for Future use	
Fee to retain Future Use Permit No. _____ after period of seven years.	
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>6736-3</u>	50.00
Fee for Filing Transfer Form _____	
Fee for _____	
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____	
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____	
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____	
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____	
(Any Other Work Provided by Law)	
TOTAL	4,400.00

No.

02492

By

David E. Ebele
Chief Engineer



HDR

Project Overview Vicinity Map

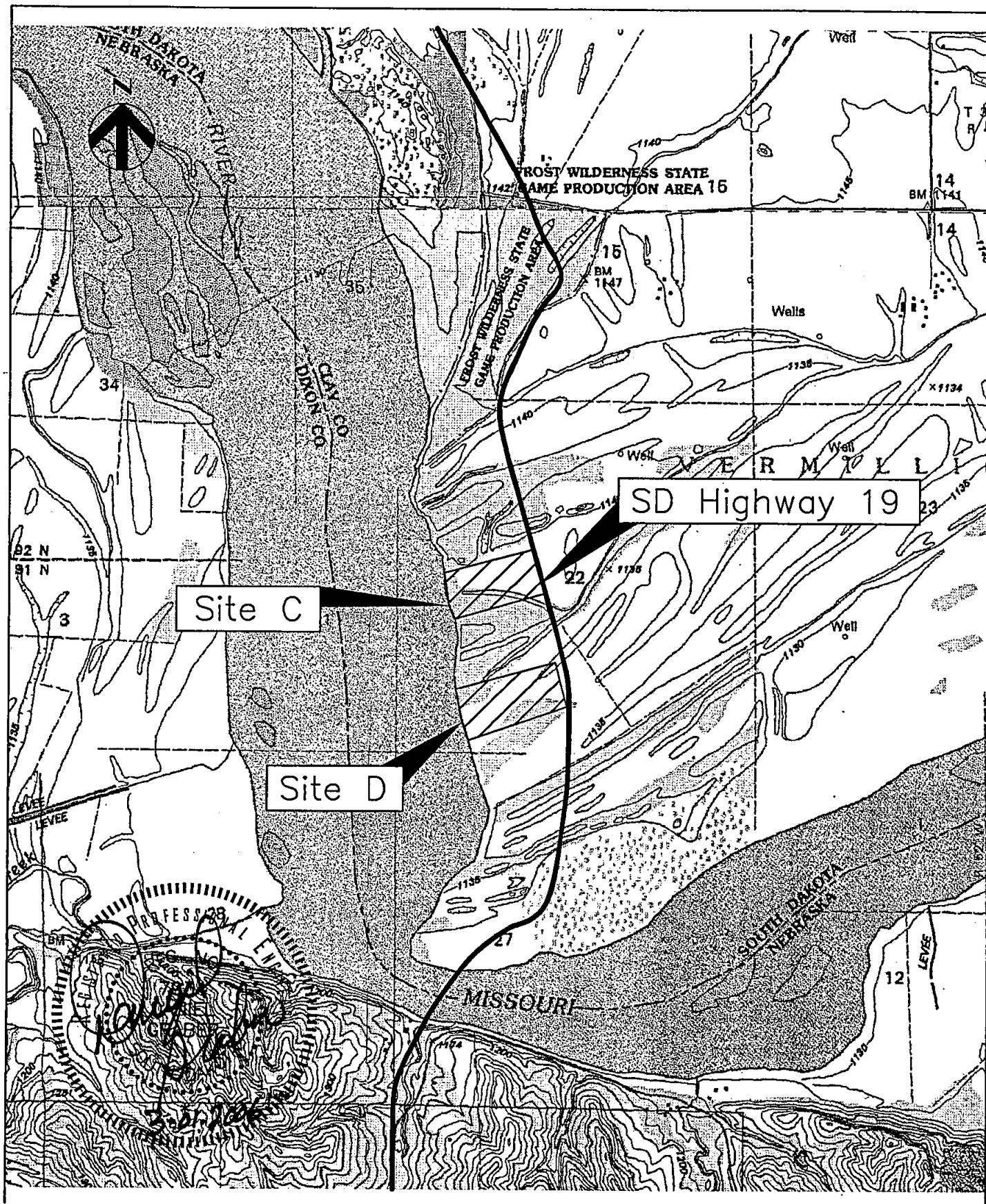
Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

Mar. 2006

SHEET

1 of 12



HDR

Location Map

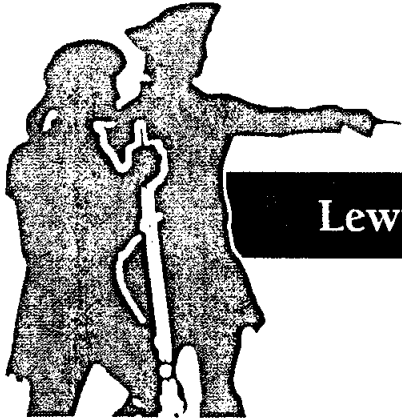
Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

Mar. 2006

SHEET

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Lewis & Clark Rural Water System

WATER RIGHT PERMIT APPLICATION FOR WELL SITE C AND WELL SITE D

JUNE 2006

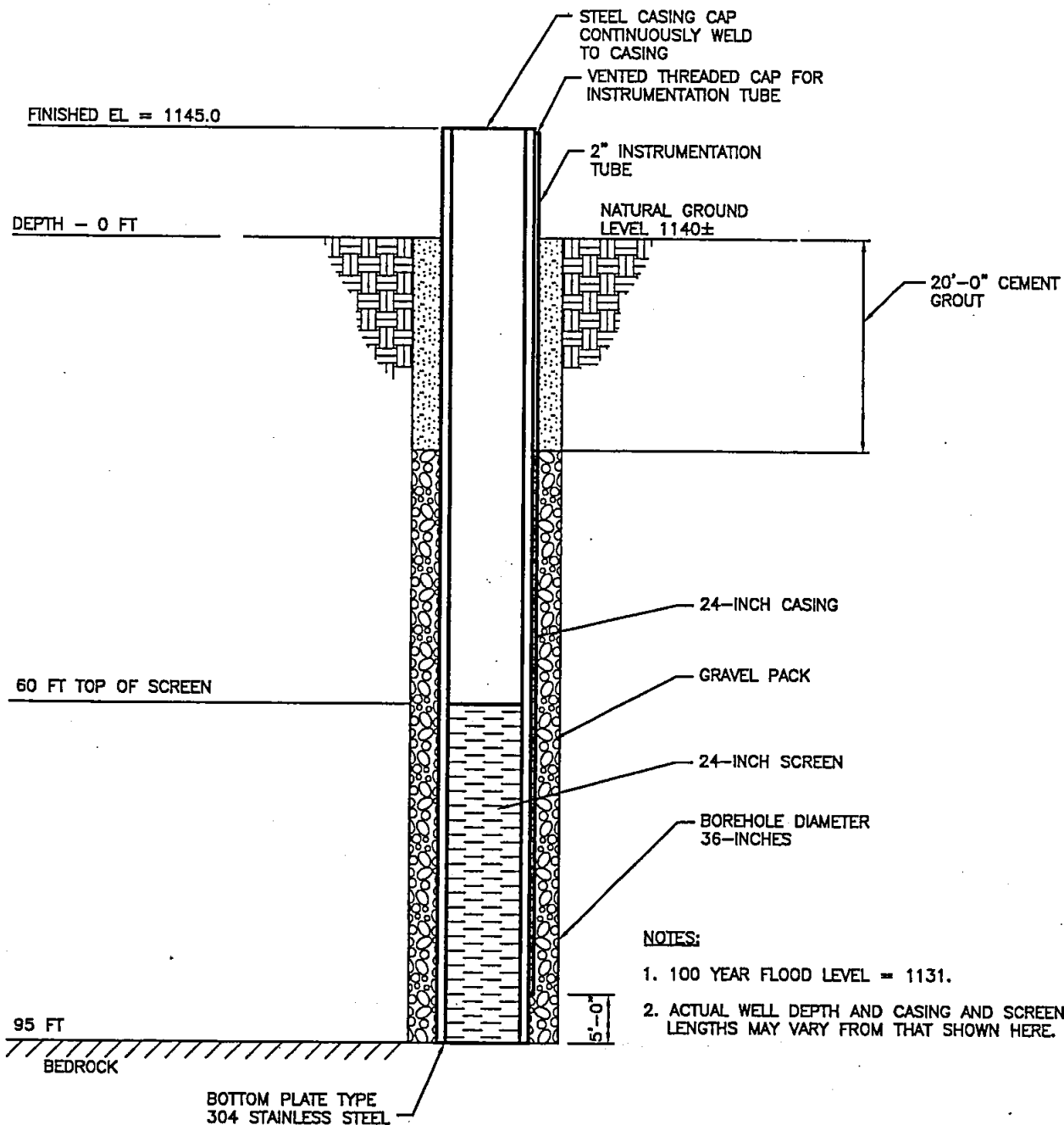
PREPARED BY:

BANNER

Consulting Engineers and Architects

BAI# 20000-15-01

C:\P\work\10\QMA\ms51850\FIG100F12.DWG, Plot, 5/25/2006 11:22:30 AM, mchrisi



VERTICAL WELL 06-4
NOT TO SCALE

HDR

Vertical Well 06-4
Site C

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

Mar. 2006

SHEET

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(type or print in ink)

Site C Angle Well #1
Well ID: 06-5

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 24" Depth 95'
- b) Casing Type Steel Diameter 18" Thickness 0.375"
- c) Screen Type 304 SS, Johnson Hi-Flow Diameter 18" Thickness
- d) Gravel Pack 3" Siliceous Gravel Length of Gravel Pack 111'
- e) Depth to Top of Water Bearing Material Approximately 5'
- f) Depth to Water (ground surface to water level) Approximately 13'
- g) Distance to nearest existing domestic well:
On applicants property Approximately 550' On property owned by others
Distance to nearest irrigation well, approximately 3,500'

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field)
- b) System Capacity (gallons) Year Constructed
- c) Connected to the City of Sanitary System

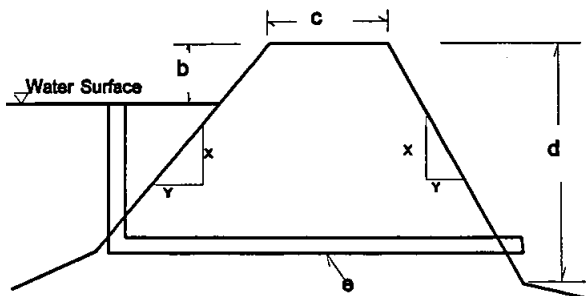
3. Dugout Information

- a) Surface Dimensions Depth
- b) Depth to water (ground surface to water level)

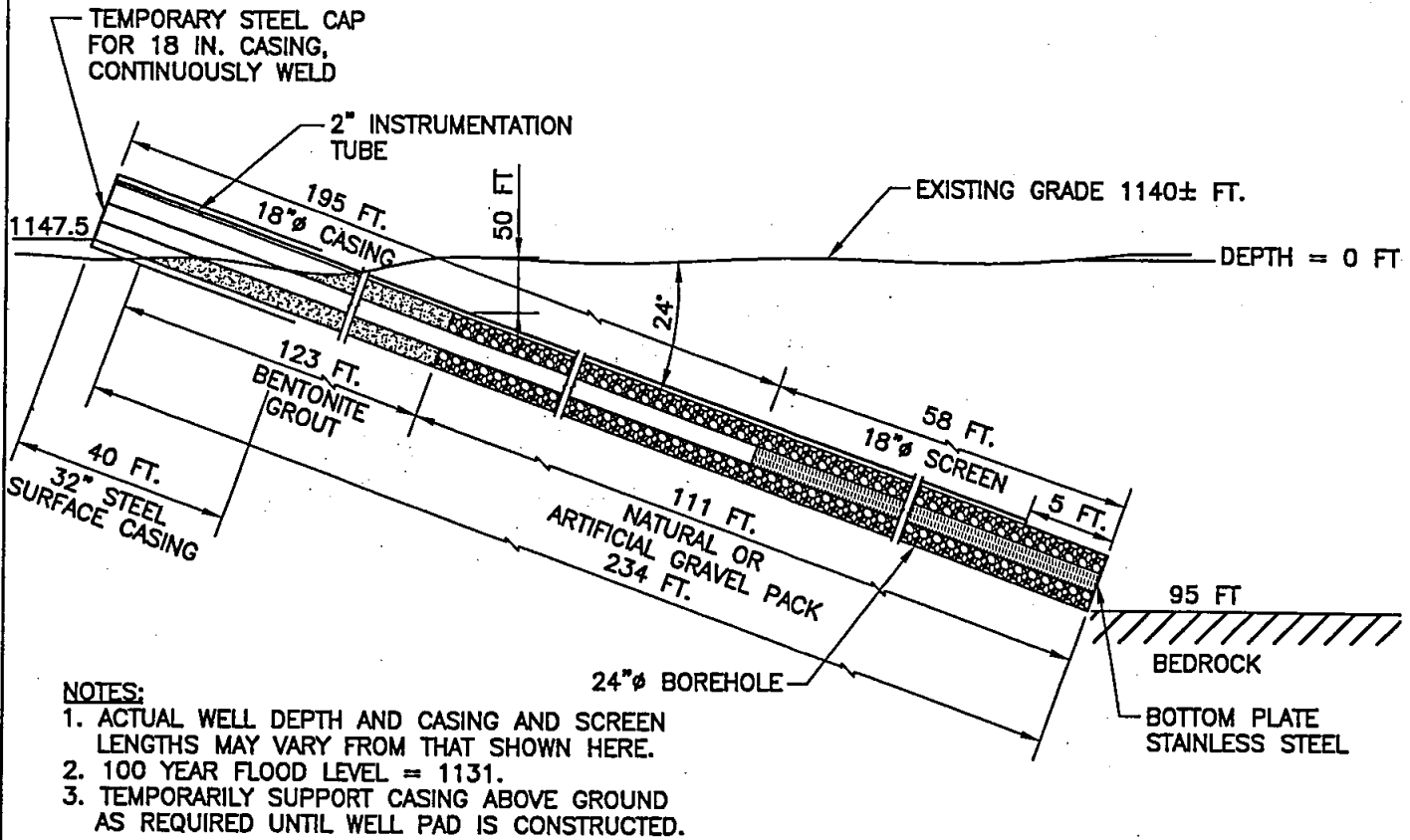
4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:



- b) Freeboard
- c) Crest Width
Crest Length
- d) Height
- e) Primary Outlet Capacity
If pipe, diameter
- f) Secondary Spillway Capacity
Spillway Width
- g) X & Y Slope
Upstream
Downstream
- h) Surface Area of Impoundment
- i) Storage Acre Feet
- j) Drainage Area Above Dam Acres



NOT TO SCALE



Angle Well 06-5 Section Site C

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

Mar. 2006

SHEET

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**LAYNE-WESTERN
VALLEY, NEBRASKA
(402) 359-2042**

Contract Name		Lewis & Clark		Test Hole No. TH C 1-02	
Job No.		726026		Date 09/11/2002	
City		Vermillion		State SD	
				Driller: Trask	
Test Hole Location MWC1-02					
Distance and Direction from Permanent Landmark or Previous Test Hole					
Test Log					
FROM	TO	MARSH FUNNEL VISCOSITY SECONDS	MUD PIT LOSS INCHES	STATIC WATER LEVEL	MEASURED
				HOURS AFTER COMPLETION	
FORMATION					
0	60			Fine Sand	
60	63			Gray Clay	
63	70			Fine Sand	
70	72			Sandy Clay	
72	92			Sand & Gravel, some Rough	
92				Fractured Lime	
				Set 2" well to 88'	
				w/20' x .020 screen	
				pumped air 1 Hr	
NOTES: Size of Pit _____ X _____ X _____ DEEP COMMENTS _____					

(type or print in ink)

Site C Angle Well #2
Well ID: 06-6

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 24" Depth 95'
- b) Casing Type Steel Diameter 18" Thickness 0.375"
- c) Screen Type 304 SS, Johnson Hi-Flow Diameter 18" Thickness
- d) Gravel Pack 3" Siliceous Gravel Length of Gravel Pack 111'
- e) Depth to Top of Water Bearing Material Approximately 5'
- f) Depth to Water (ground surface to water level) Approximately 13'
- g) Distance to nearest existing domestic well:
On applicants property Approximately 550' On property owned by others
Distance to nearest irrigation well, approximately 3,500'

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field)
- b) System Capacity (gallons) Year Constructed
- c) Connected to the City of Sanitary System

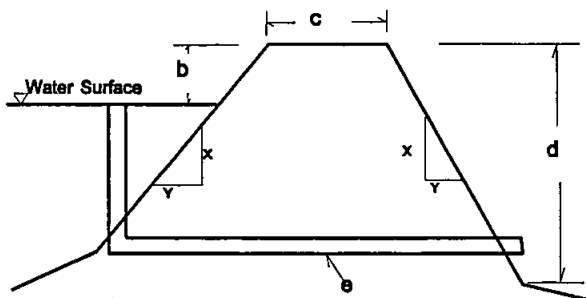
3. Dugout Information

- a) Surface Dimensions Depth
- b) Depth to water (ground surface to water level)

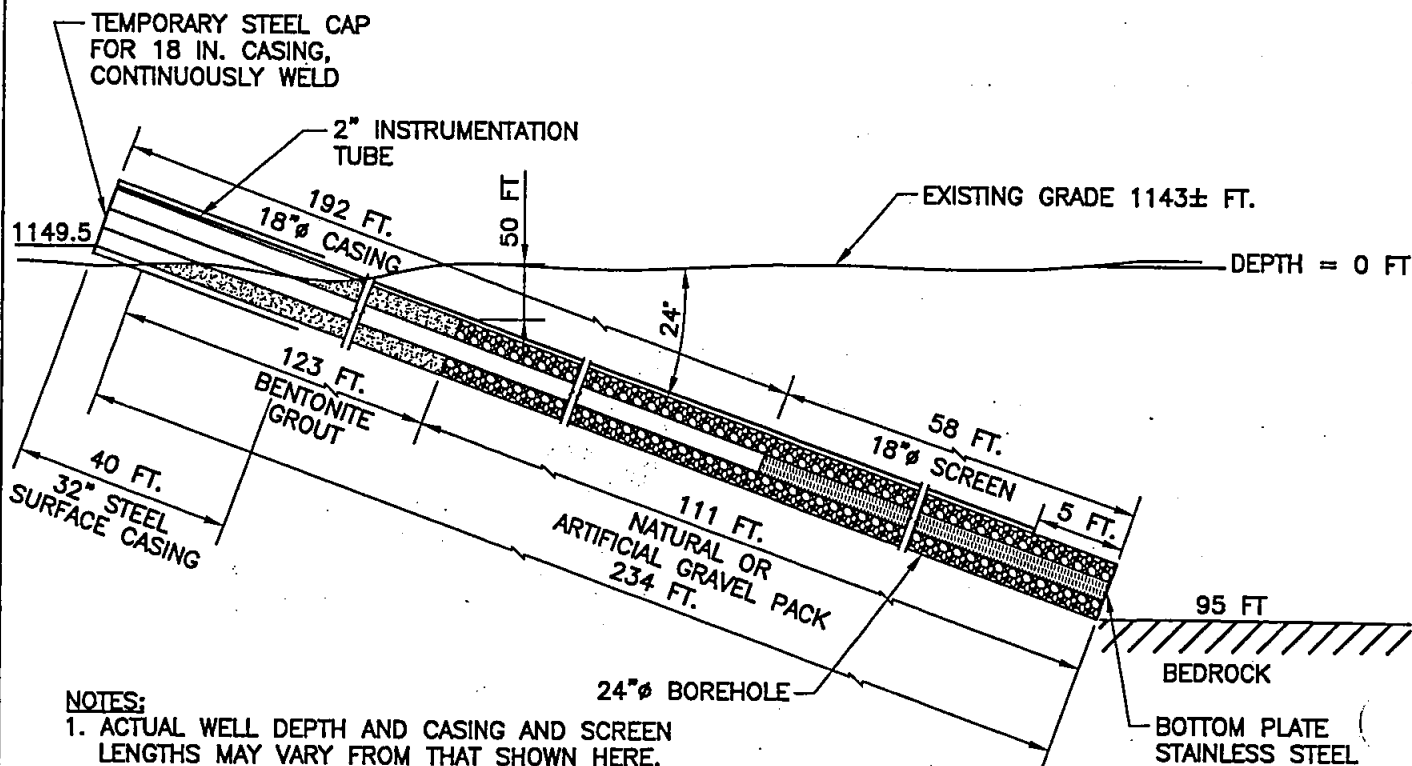
4. Water Storage Dams

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- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:



- b) Freeboard
- c) Crest Width
Crest Length
- d) Height
- e) Primary Outlet Capacity
If pipe, diameter
- f) Secondary Spillway Capacity
Spillway Width
- g) X & Y Slope
Upstream
Downstream
- h) Surface Area of Impoundment
- i) Storage Acre Feet
- j) Drainage Area Above Dam Acres



NOTES:

1. ACTUAL WELL DEPTH AND CASING AND SCREEN LENGTHS MAY VARY FROM THAT SHOWN HERE.
2. 100 YEAR FLOOD LEVEL = 1131.
3. TEMPORARILY SUPPORT CASING ABOVE GROUND AS REQUIRED UNTIL WELL PAD IS CONSTRUCTED.

NOT TO SCALE



**Angle Well 06-6 Section
Site C**

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

Mar. 2006

SHEET

8 of 12

**LAYNE-WESTERN
VALLEY, NEBRASKA
(402) 359-2042**

Contract Name		Lewis & Clark		Test Hole No. TH C 1-02	
Job No.		726026		Date 09/11/2002	
City		Vermillion		State SD	
				Driller: Trask	
Test Hole Location MWC1-02					
Distance and Direction from Permanent Landmark or Previous Test Hole					
Test Log					
FROM	TO	MARSH FUNNEL VISCOSITY SECONDS	MUD PIT LOSS INCHES	STATIC WATER LEVEL	MEASURED
				HOURS AFTER COMPLETION	
FORMATION					
0	60			Fine Sand	
60	63			Gray Clay	
63	70			Fine Sand	
70	72			Sandy Clay	
72	92			Sand & Gravel, some Rough	
92				Fractured Lime	
				Set 2" well to 88'	
				w/20' x .020 screen	
				pumped air 1 Hr	
NOTES: Size of Pit _____ X _____ X _____ DEEP COMMENTS _____					

(type or print in ink)

Site D Angle Well #1
Well ID: 03-1

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 24" Depth 95'
- b) Casing Type Steel Diameter 18" Thickness 0.375"
- c) Screen Type 304 Stainless Steel Diameter 18" Thickness
- d) Gravel Pack 3" Siliceous Gravel Length of Gravel Pack 106'
- e) Depth to Top of Water Bearing Material Approximately 5'
- f) Depth to Water (ground surface to water level) Approximately 13'
- g) Distance to nearest existing domestic well:
On applicants property Approximately 650' On property owned by others
Distance to nearest irrigation well, approximately 4,200'

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field)
- b) System Capacity (gallons) Year Constructed
- c) Connected to the City of Sanitary System

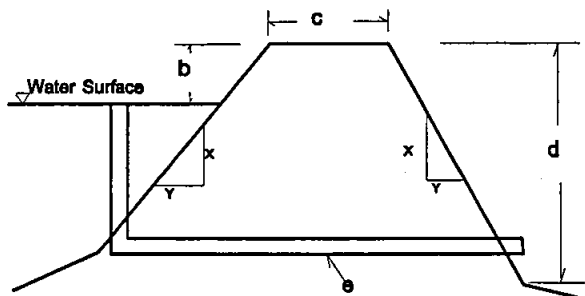
3. Dugout Information

- a) Surface Dimensions Depth
- b) Depth to water (ground surface to water level)

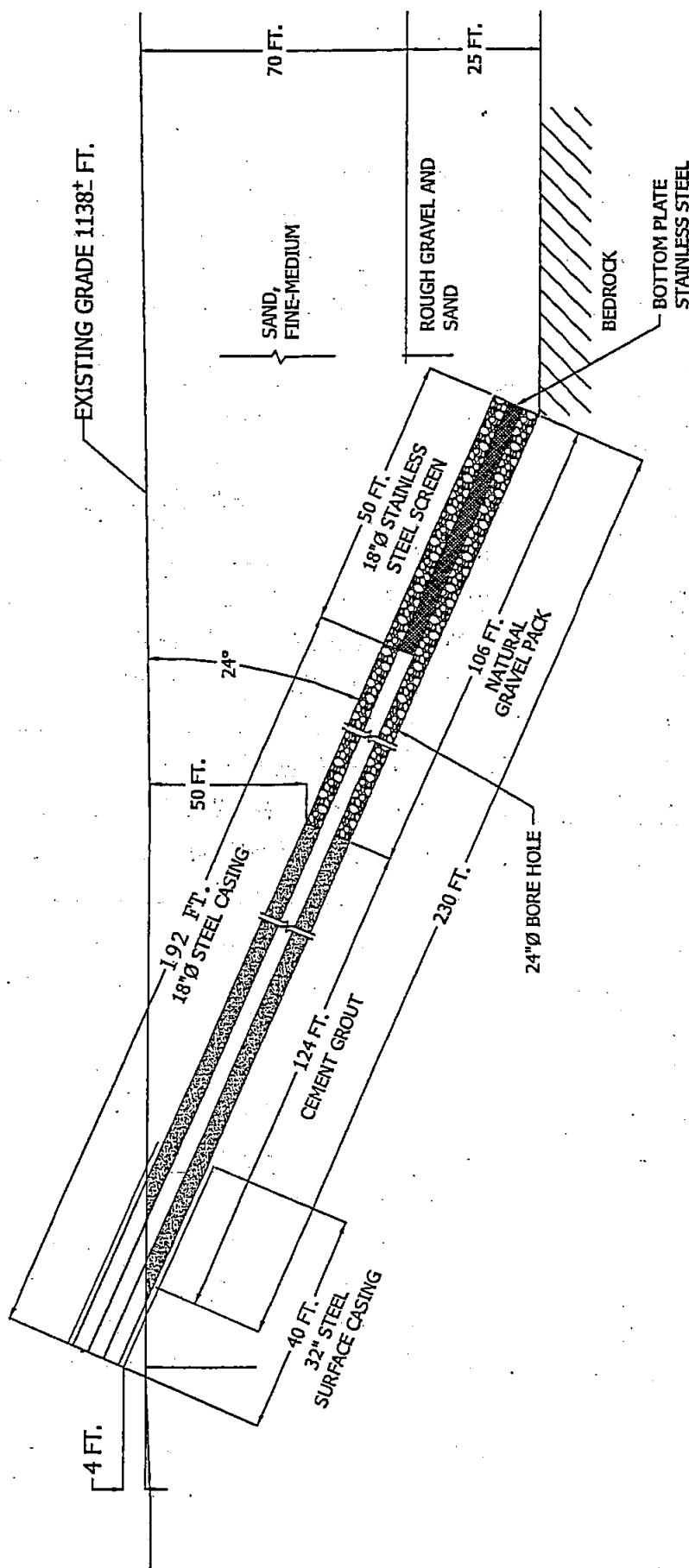
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- c) Crest Width
Crest Length
- d) Height
- e) Primary Outlet Capacity
If pipe, diameter
- f) Secondary Spillway Capacity
Spillway Width
- g) X & Y Slope
Upstream
Downstream
- h) Surface Area of Impoundment
- i) Storage Acre Feet
- j) Drainage Area Above Dam Acres



NO SCALE

SCREEN: STAINLESS STEEL CONTINUOUS
WIRE WRAP 0.100 IN. OPENING

Section-Production Test Angle Well Site 'D'-Section of Angle Well

Lewis and Clark Rural Water System
Site D Production Pump Test Well
Vermillion, South Dakota

Date

Figure

**LAYNE-WESTERN
VALLEY, NEBRASKA
(402) 359-2042**

[illegible]

(type or print in ink)

Site D Angle Well #2
Well ID: 06-2

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 24" Depth 93'
- b) Casing Type Steel Diameter 18" Thickness 0.375"
- c) Screen Type 304 Stainless Steel Diameter 18" Thickness
- d) Gravel Pack 3" Siliceous Gravel Length of Gravel Pack 106'
- e) Depth to Top of Water Bearing Material Approximately 5'
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- g) Distance to nearest existing domestic well:
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- c) Connected to the City of Sanitary System

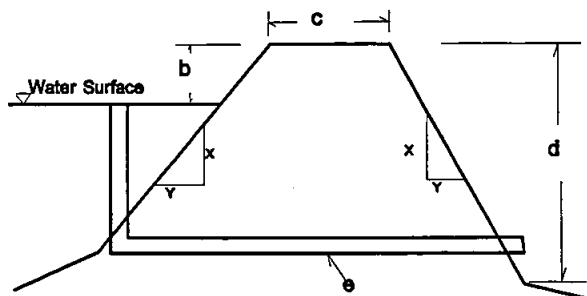
3. Dugout Information

- a) Surface Dimensions Depth
- b) Depth to water (ground surface to water level)

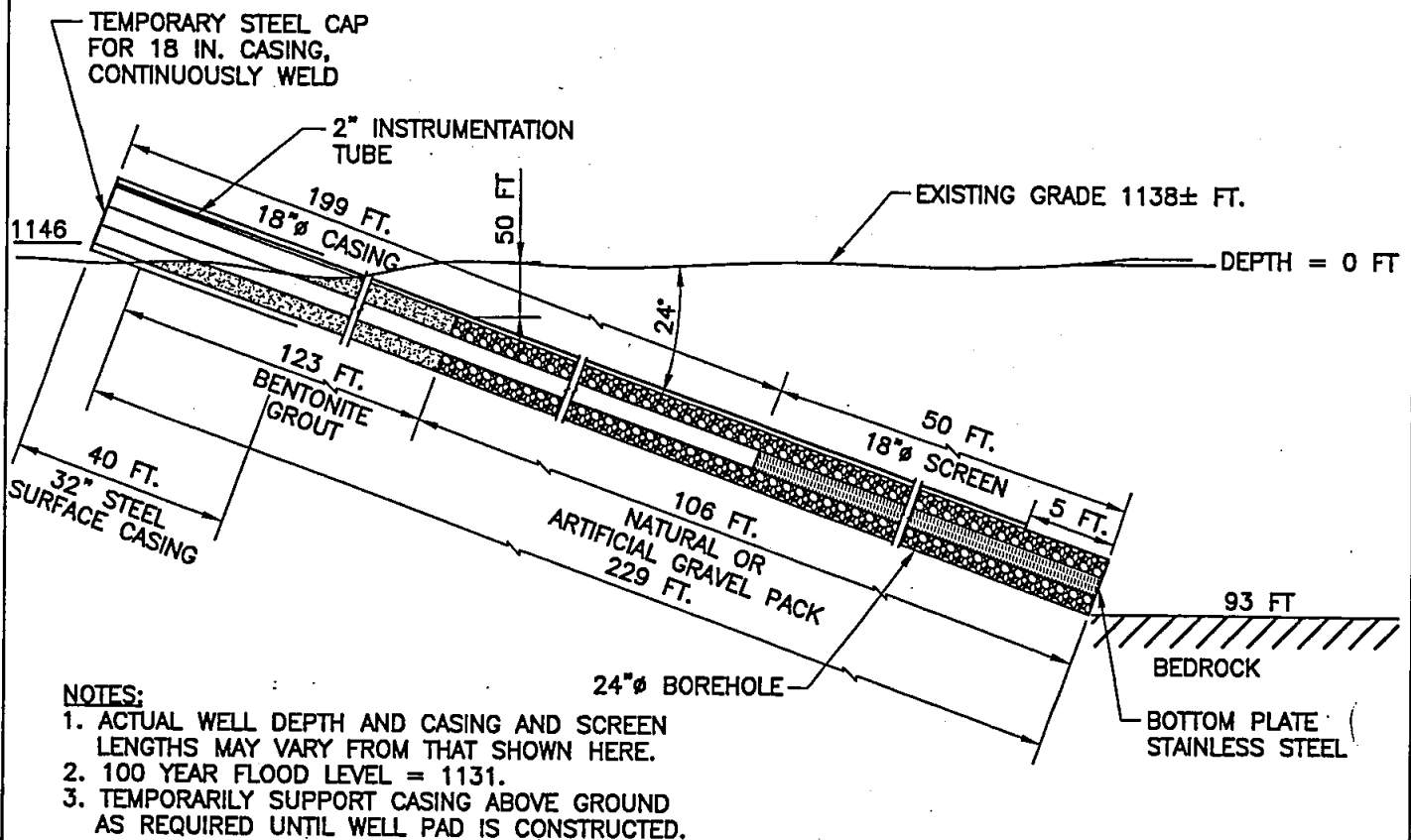
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Crest Length
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- e) Primary Outlet Capacity
If pipe, diameter
- f) Secondary Spillway Capacity
Spillway Width
- g) X & Y Slope
Upstream
Downstream
- h) Surface Area of Impoundment
- i) Storage Acre Feet
- j) Drainage Area Above Dam Acres



NOT TO SCALE



Angle Well 06-2 Section Site D

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

Mar. 2006

SHEET

6 of 12

**LAYNE-WESTERN
VALLEY, NEBRASKA
(402) 359-2042**

Contract Name		Lewis & Clark		Test Hole No. TH D 1-02	
Job No.		726026		Date 09/03/2002	
City		Vermillion		State SD	
				Driller: Trask	
Test Hole Location D1-02					
Distance and Direction from Permanent Landmark or Previous Test Hole					
Test Log					
FROM	TO	MARSH FUNNEL VISCOSITY SECONDS	MUD PIT LOSS INCHES	STATIC WATER LEVEL	MEASURED
				HOURS AFTER COMPLETION	
FORMATION					
0	70			Fine to Medium Sand	
70	92			Sand & Gravel some Rough	
92				Lime	
				Set 4" well to 82'	
				with 20' x .020 screen	
				pumped w/ air 1 Hr	
NOTES: Size of Pit _____ X _____ X _____ DEEP COMMENTS _____					

(type or print in ink)

Site D Vertical Well #1
Well ID: 06-3

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 36" Depth 93'
- b) Casing Type Steel Diameter 24" Thickness 0.50"
- c) Screen Type 304 Stainless Steel Diameter 24" Thickness
- d) Gravel Pack 6" Siliceous Gravel Length of Gravel Pack 73'
- e) Depth to Top of Water Bearing Material Approximately 5'
- f) Depth to Water (ground surface to water level) Approximately 13'
- g) Distance to nearest existing domestic well:
On applicants property Approximately 650' On property owned by others
Distance to nearest irrigation well, approximately 4,200'

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field)
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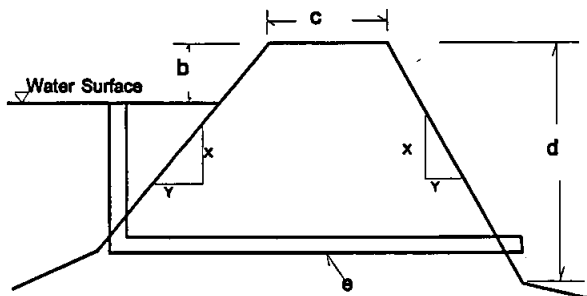
3. Dugout Information

- a) Surface Dimensions Depth
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4. Water Storage Dams

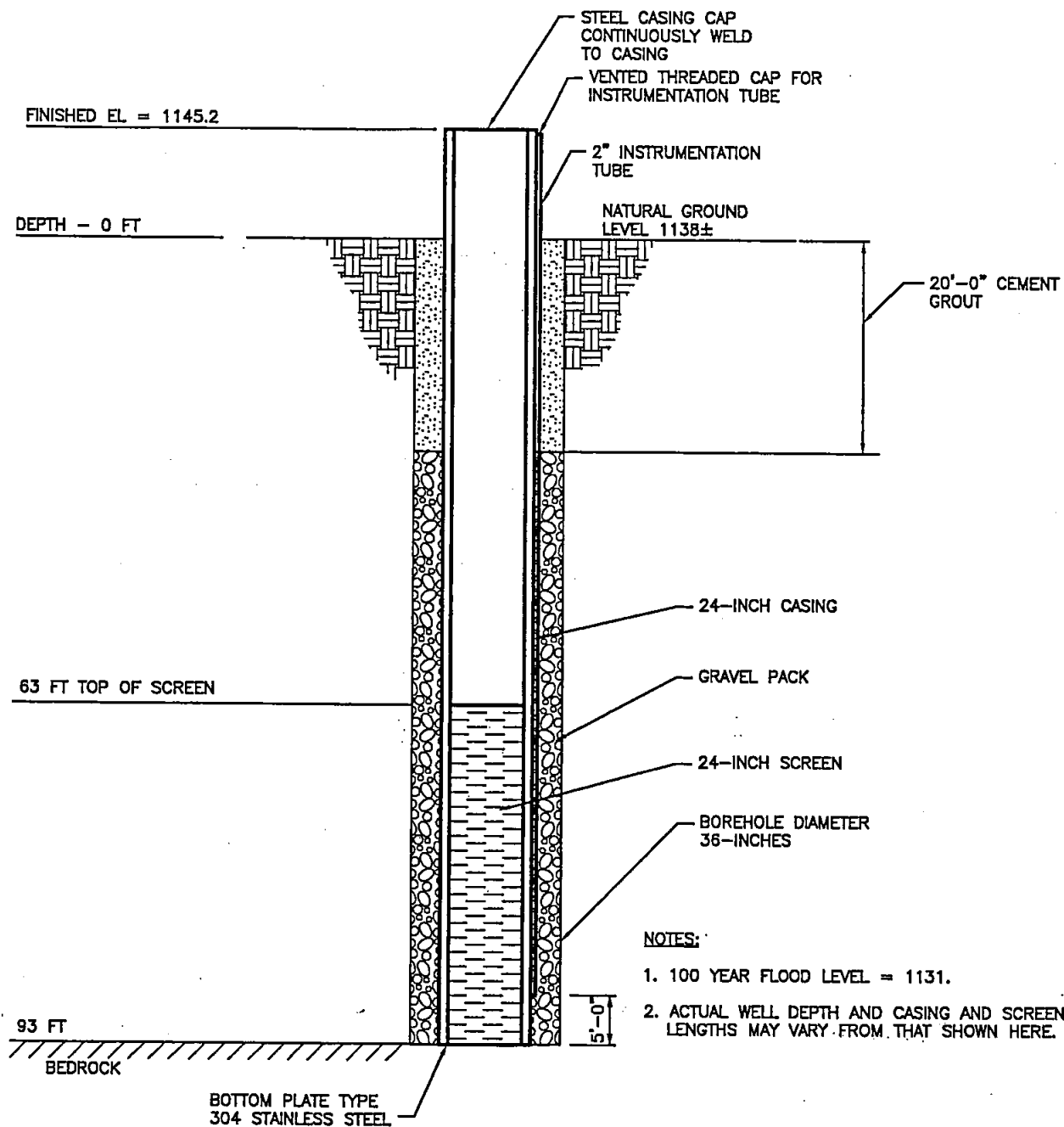
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Spillway Width
- g) X & Y Slope
Upstream
Downstream
- h) Surface Area of Impoundment
- i) Storage Acre Feet
- j) Drainage Area Above Dam Acres

C:\PW\work\A\dms51950\FIG90\F12.DWG, Plot, 5/25/2006 11:22:03 AM, mchrisd



VERTICAL WELL 06-3
NOT TO SCALE

HDR

Vertical Well 06-3
Site D

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

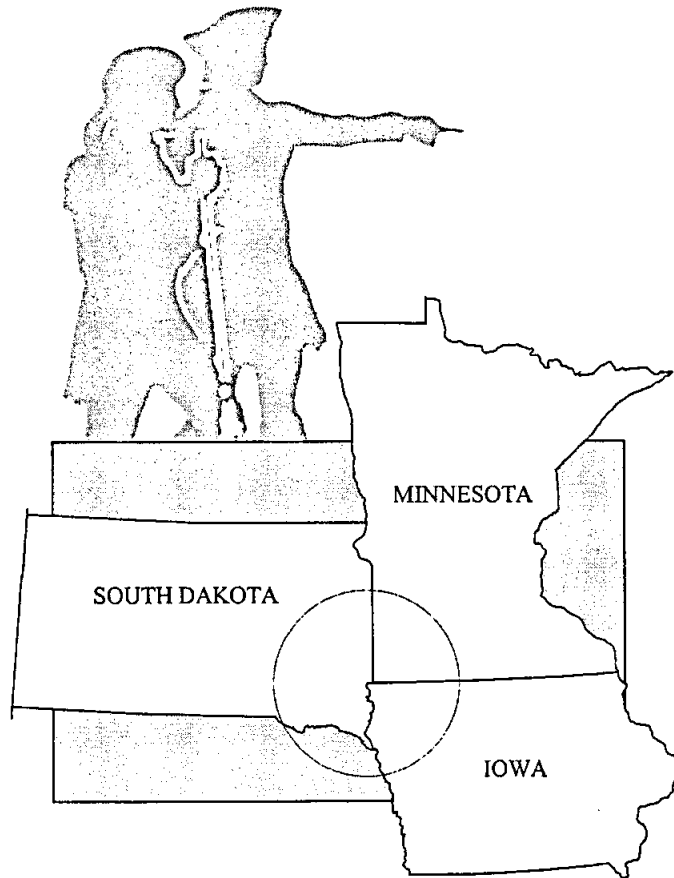
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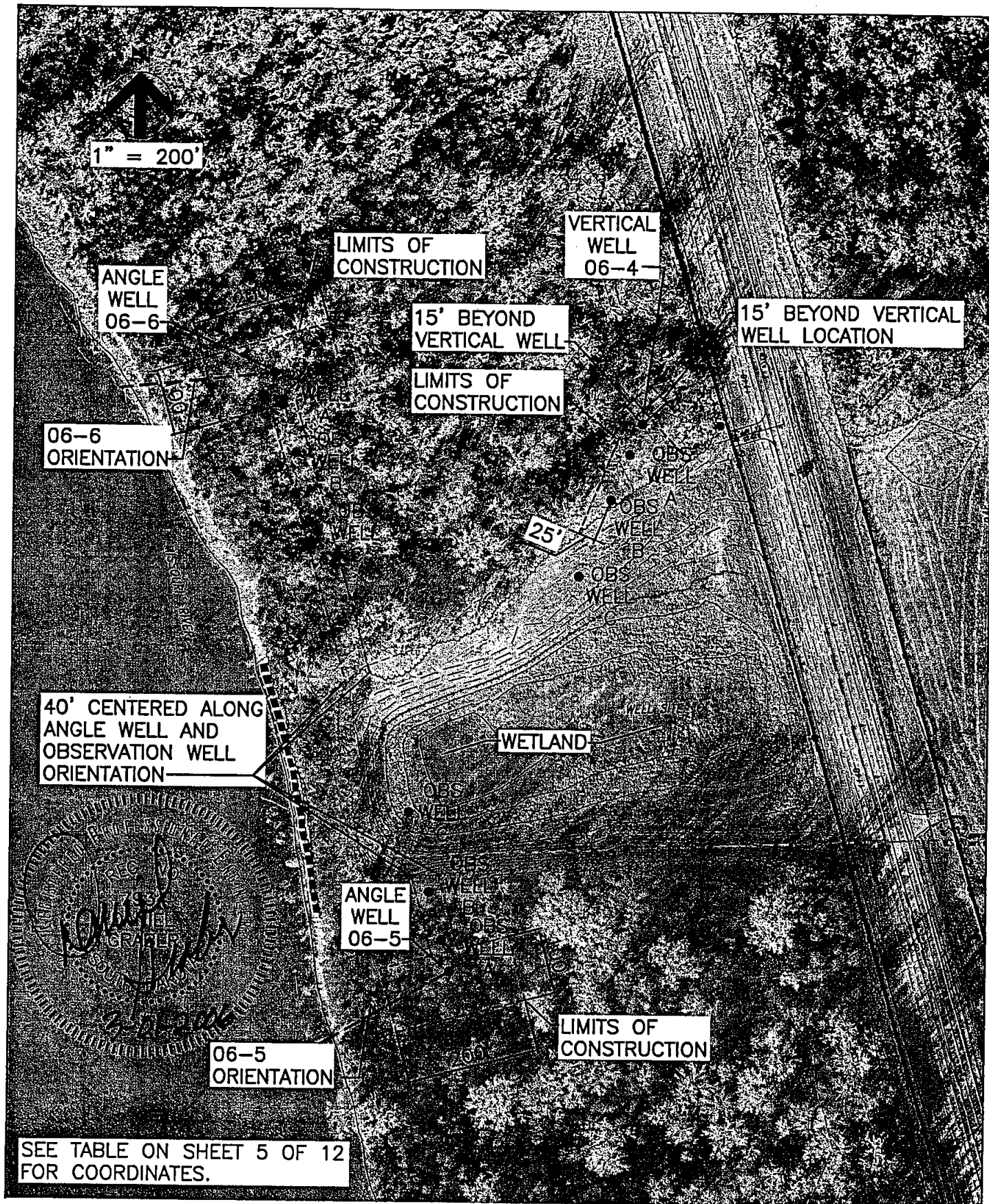
9 of 12

**LAYNE-WESTERN
VALLEY, NEBRASKA
(402) 359-2042**

[illegible]



MAPS



HDR

Site Plan Site C

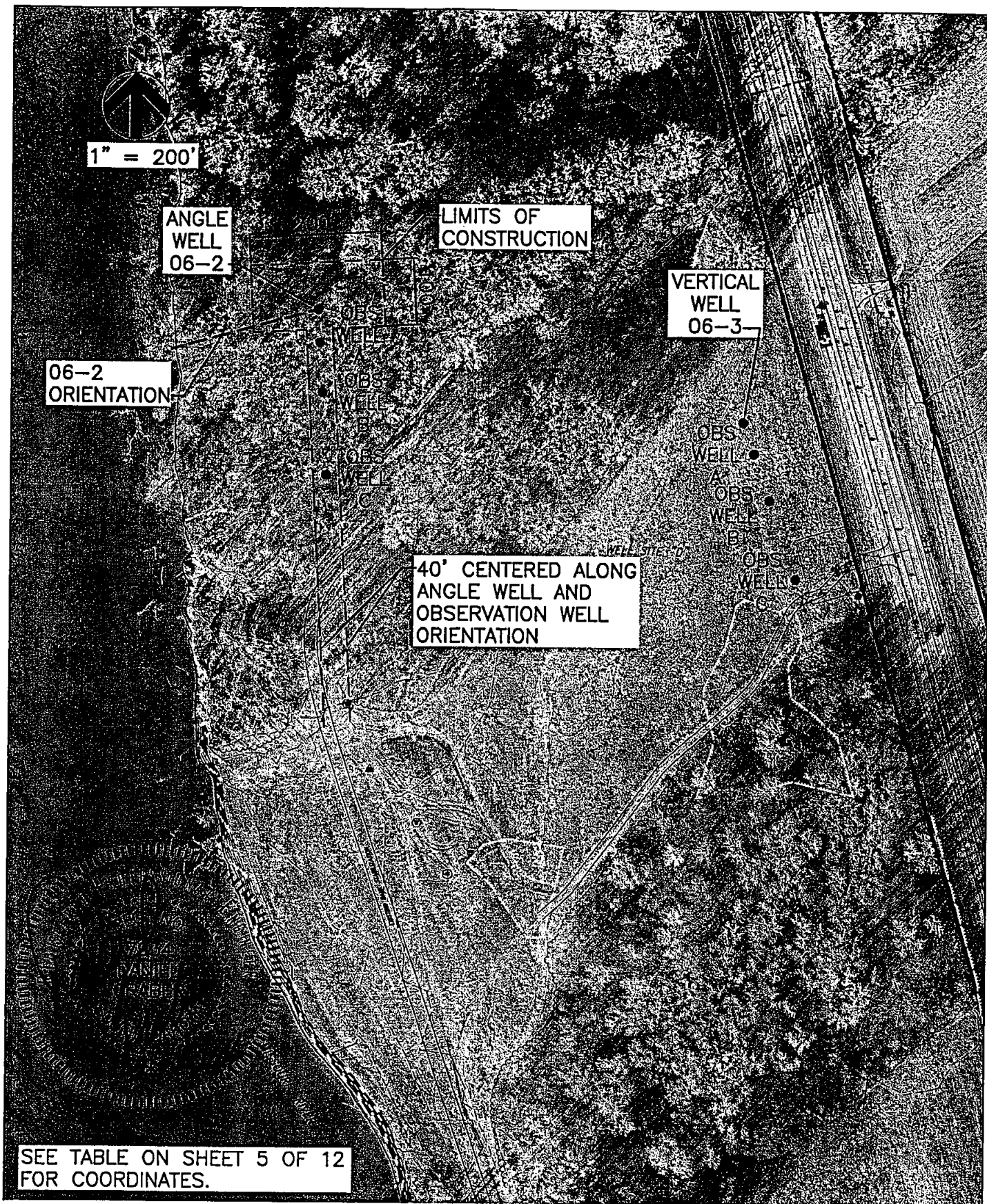
Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

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SHEET

3 of 12



SEE TABLE ON SHEET 5 OF 12
FOR COORDINATES.

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Site Plan Site D

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

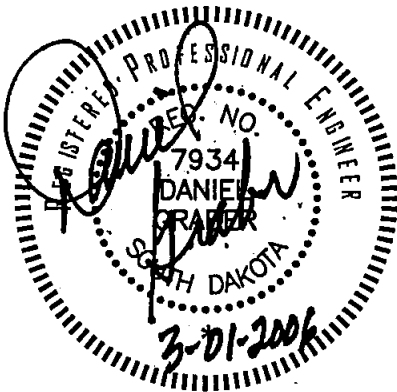
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<u>SITE C</u>	<u>NORTHING</u>	<u>EASTING</u>
06-4 HEAD	165354.05	2876683.55
06-4 OBS A	165307.67	2876664.87
06-4 OBS B	165238.10	2876636.85
06-4 OBS C	165122.15	2876590.16
06-5 HEAD	164522.11	2876400.54
06-5 ORIENTATION	164448.03	2876270.11
06-5 OBS A	164570.43	2876387.70
06-5 OBS B	164642.92	2876368.44
06-5 OBS C	164763.73	2876336.35
06-6 HEAD	165426.55	2876124.71
06-6 ORIENTATION	165410.43	2875975.58
06-6 OBS A	165378.47	2876138.44
06-6 OBS B	165306.35	2876159.02
06-6 OBS C	165186.15	2876193.33

<u>SITE D</u>	<u>NORTHING</u>	<u>EASTING</u>
06-2 HEAD	163624.77	2876609.12
06-2 ORIENTATION	163585.26	2876464.42
06-2 OBS A	163574.85	2876611.80
06-2 OBS B	163499.95	2876615.81
06-2 OBS C	163375.13	2876622.49
06-3 HEAD	163458.47	2877253.16
06-3 OBS A	163411.14	2877269.29
06-3 OBS B	163340.15	2877293.47
06-3 OBS C	163221.83	2877333.78



HDR

Coordinate Schedule for Well Location Sites C and D

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

Mar. 2006

SHEET

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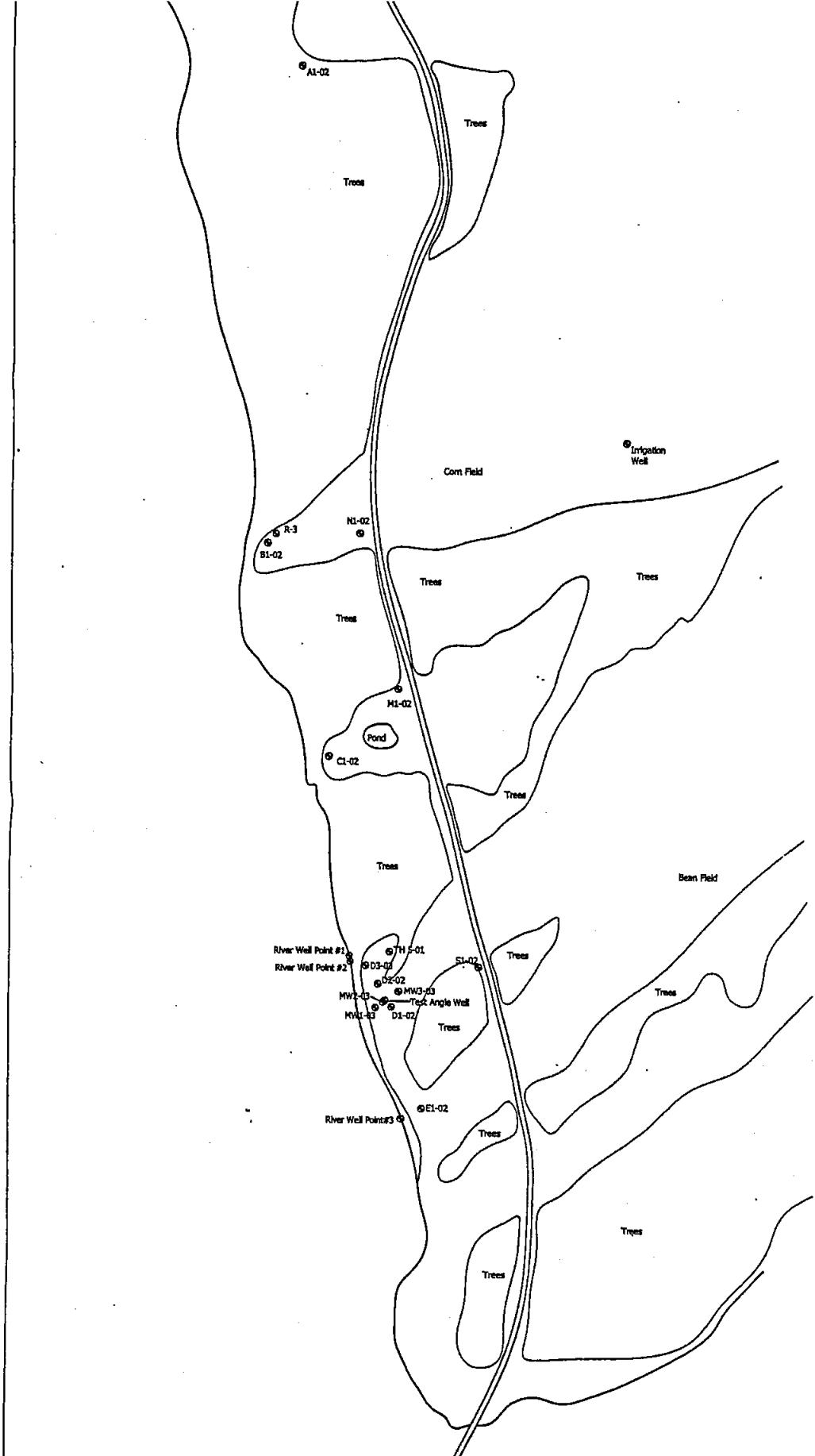


FIGURE TITLE: Location of Wells Based On Survey Coordinates	DOCUMENT TITLE: Well and Well Field Design Report Lewis & Clark Rural Water District #1 Vermillion, South Dakota	PREPARED BY: AJL CHECKED BY: MJS PROJECT No: 200315
 chatman&Associates incorporated	CLIENT: HDR Engineering, Inc. SITE LOCATION: Vermillion, SD FILE NAME: M:\river\hrc\project\CAD\Project\200315-Lewis_Clark_Rural\Well_Products\ACAD_LID_Project.dwg Site Map	DATE: 01/19/04 FIGURE No: 2

TECHNICAL MEMORANDUM

**LEWIS AND CLARK RURAL WATER SYSTEM
(LCRWS)**

WELL FIELD DEVELOPMENT PRE-DESIGN

February 28, 2006



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LIST OF ABBREVIATIONS

AWWA – American Water Works Association
bgs – below ground surface
BHP – brake horsepower
CAI – Chatman and Associates, Inc.
COE – Corps of Engineers
DIP – ductile iron pipe
EA – Environmental Assessment
FEMA – Federal Emergency Management Agency
FER – Final Engineering Report
IERT – Interagency Environmental Review Team
IN – inches
kw – kilowatts
LCRWS – Lewis and Clark Rural Water System
LGS – Layne GeoSciences
MGD – million gallons per day
NEMA – National Electrical Manufacturers Association
psi – pounds per square inch
PVC – polyvinylchloride
ROW – right of way
SCADA – Supervising Control and Data Acquisition
SD DENR – South Dakota Department of Environment and Natural Resources
SPD – surge protection device
TRC – TRC Mariah Associates, Inc.
TM – Technical Memorandum
USFWS – United States Fish and Wildlife Services
WF – Well Field

**DRAFT Technical Memorandum
Lewis and Clark Rural Water System (LCRWS)
Well Field Development Pre-Design**

1.0 INTRODUCTION

1.1 Background

The Final Engineering Report (FER) dated May 2002 for the Lewis and Clark Rural Water System (LCRWS) and subsequent safe yield analysis identified the approximate well locations, types, and capacities as source water for the water treatment plant. The well field is along the Missouri River in an area referred to as Mulberry Point (Sites A, B, C, D and E) and Sites J, U, and W to the west of Mulberry Point. These well locations are shown on Figure 1.1-1.

A summary of the work conducted at the well sites to date is summarized in Figure 1.1-1 and below:

- ◆ All sites – test holes
- ◆ Site B – 12 IN vertical test well completed in 2001 and test pumped
- ◆ Site D – 18 IN angle production well completed in 2003 and test pumped
- ◆ Site J – 12 IN vertical test well completed in 2005 and test pumped

1.2 Purpose

The purpose of this Technical Memorandum (TM) is to evaluate the development of wells and facilities at Sites A, B, C, D, E, J, U and W for three well-type options; radial collector wells, vertical wells and angle wells.

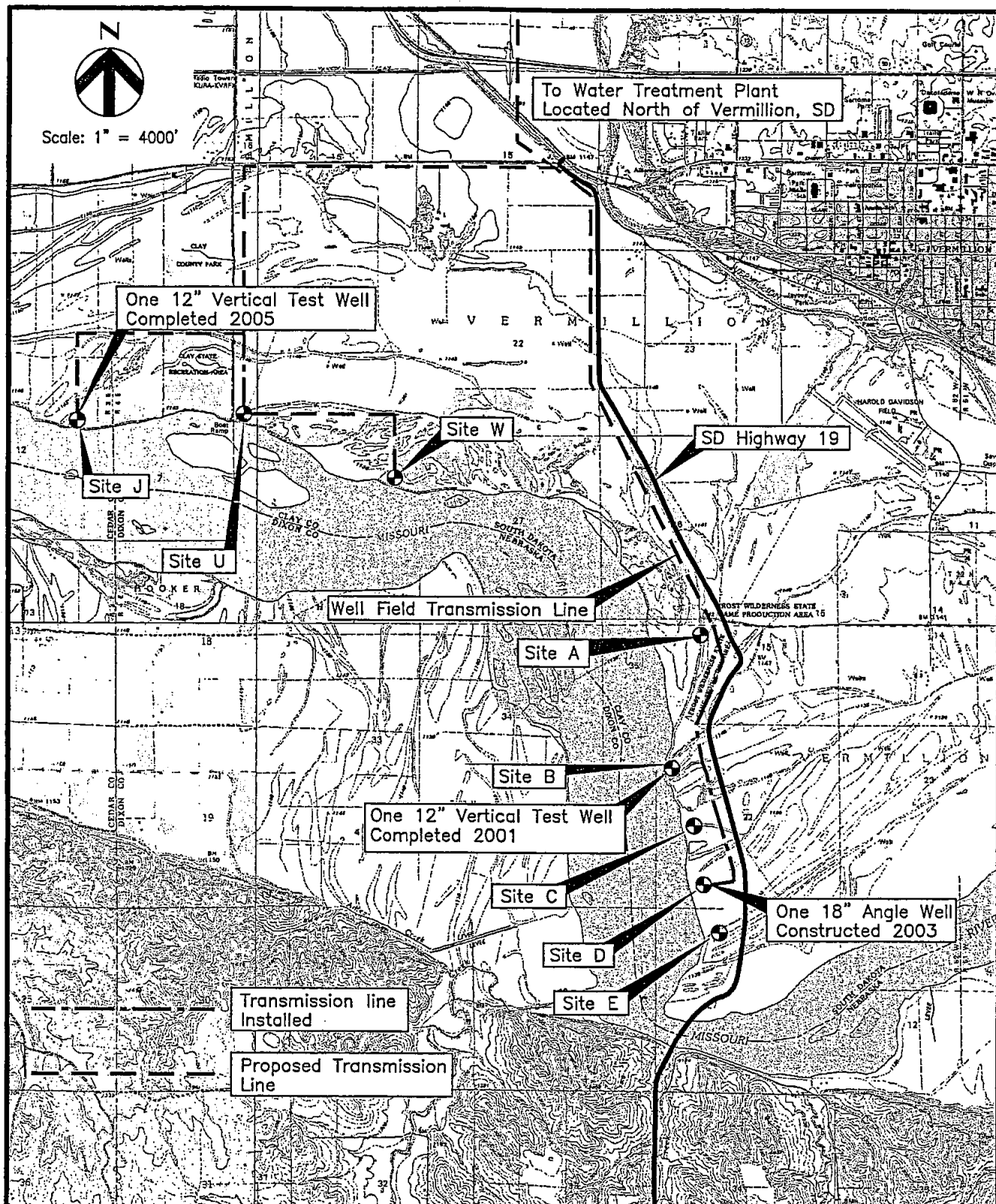
The evaluation includes estimated costs, discussion of important issues, and selection of a development plan including construction priority that will ultimately result in a well field with a firm capacity of 49 MGD.

2.0 WELL FIELD EVALUATION (Sites A, B, C, D, E, J, U and W)

2.1 Well Field Production Requirements and Schedule

The production requirements and schedule for the well field development will depend on many factors such as availability of funding for the water treatment plant and future demand requirements for major users such as the City of Sioux Falls.

LCRWS is under contract to deliver 10 MGD to Sioux Falls, SD by January 2012. If the treatment plant is not built, 10 MGD of raw water could still be delivered to Sioux Falls through the series of booster stations intended for use on the potable water delivery system.



Banner Associates, Inc.
HDR Engineering, Inc.
TRC Mariah Associates, Inc.

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LEWIS AND CLARK RURAL
WATER SYSTEM

FIGURE 1.1-1
Wellfield Site Location
and
Development History

Provided funding becomes available for the water treatment plant and it is constructed, the goal would be to develop the well field to a firm capacity of 28 MGD by January 2012.

After January 2012, the well field will be expanded incrementally as demand from the users requires to an ultimate firm demand of 49 MGD.

Table 2.1-1 summarizes the firm production requirements and estimated schedule for the well field development.

Table 2.1-1
Well Field Schedule for Production Requirements

Date	Well Field Production Requirements
	Firm, MGD
January 2012	10, with a goal of 28
Ultimate	49

2.2 Well Type Options and Opinions of Costs

2.2.1 Well Types

Three main well types are considered. They are radial collector wells, vertical wells, and angle wells.

2.2.1.1 Radial Collector Wells

Horizontal radial collector wells are comprised of a large diameter reinforced concrete caisson that serves as a wet well/pumping station. The collector is equipped with a series of well screens that are projected horizontally in a radial pattern into the aquifer from near the bottom of the caisson. The caisson is constructed to the desired depth using the open-end caisson sinking method and a bottom-sealing plug is poured to make the caisson watertight. The radial collectors can be installed at one or more elevations and may be placed in a variety of patterns and lengths depending upon aquifer characteristics and project requirements. The caisson is extended above known or anticipated flood elevations and the well is typically completed with a pump house and controls mounted above the caisson.

The radial collector type of well was evaluated for the LCRWS for several reasons. The most important reason was to maximize well yields, exceeding the yield of several vertical wells, because of the large effective well screen area radius. Potential yield from the radial collector well can be further enhanced due to induced infiltration of surface water.

Also, because the lengths of the lateral well screens are not restricted by aquifer thickness, increased well screen area results in a highly efficient well with low entrance velocities and reduced maintenance. Collector well construction is illustrated in Figure 4.2-3 of the FER.

Radial collector wells will use vertical turbine pumps. Each collector well will have three pumps, two duty and one standby with the head and motor mounted above the caisson and pump column suspended into the wet well

2.2.1.2 Vertical Wells

Vertical and angle wells will be evaluated as alternatives to the collector well design. Vertical wells are least expensive to construct of the three options. However, since their production capacity is less, more vertical wells would be required as compared to the other types.

Vertical wells could be constructed to gain maximum benefit of both groundwater and surface water from the river. Vertical wells could be constructed away from the river, while angle wells and radial collector wells would be constructed close to the riverbed to maximize production.

Locating vertical wells further away from the river (1,000 feet) may result in a well that initially removes more water from aquifer storage than a well located adjacent to the river. However, once the well field reaches steady state conditions, which could take several months, it is likely that the same (or similar) percentage of river water will be obtained by a well that is located a few hundred feet further away from the river as a well that located adjacent to the river. A preliminary evaluation of the impact of the well field on other water users was presented as part of the Safe Yield Analysis (CAI, April 2005). A groundwater flow model was developed as part of the Safe Yield Analysis in order to estimate the total drawdown induced in the aquifer as a result of operating the well field. The simulations performed using the groundwater model included a 50 mgd steady-state scenario, using a well field pumping configuration similar to Option 1 (See Table 2.8-1). The results of this simulation are shown on Figure 5 of the Safe Yield Analysis (CAI, 2005) and indicate that the 1-foot drawdown contour will extend out a distance of approximately two miles from the Mulberry Point pumping center of the well field. It is highly unlikely that relocating several vertical wells closer to the river will have a significant impact of the total drawdown induced by a fully operating well field.

Locating vertical wells further away from the river may not necessarily result in a change in water quality from those wells near the river. A total of three pumping tests were performed in the well field: Sites B, D and J. The groundwater at Sites B and D had hardness of 275 to 375 mg/l, while the hardness at J was considerably higher, about 850 to 900 mg/l.

Each of the three pumping wells were located within 300 feet of the river. Since the wells are located at similar distances from the river, it appears the distance from the river may not be the parameter governing the relative water quality at the sites. However, this conclusion will have to be verified by additional water quality testing conducted on the wells located farther from the river.

Vertical well construction is illustrated in Figure 4.2-5 of the FER. Vertical wells will use vertical turbine pumps with the column pipe suspended in the well casing pipe. However, where well sites are visible from the river, consideration will be given to using submersible pumps and motors with pitless adapters.

2.2.1.3 Angle Wells

Angle wells are more expensive to construct than vertical wells, but cost less to construct than radial collector wells. However, the production capacity from angle wells should be higher than vertical wells, but less than radial collector wells.

Angle well construction is illustrated in Figure 4.2-6 of the FER. Angle wells use submersible pumps.

2.2.2 Opinion of Probable Well Costs

2.2.2.1 Introduction

Well construction costs are developed below for horizontal collector wells, angle wells, and vertical wells.

2.2.2.2 Radial Collector Wells

Typical costs for developing radial collector wells are provided below in Table 2.2-1 entitled "Estimated Collector Well Costs". The estimated well construction cost at each site is \$2,240,000.

Table 2.2-1
Estimated Radial Collector Well Construction Costs⁽¹⁾

Item	Estimated Cost
1. Collector Well Caisson and Laterals	\$2,040,000
2. Three Well Pumps and Motors	\$ 380,000
Estimated Well Construction Cost	\$2,420,000

Note:

- (1) Costs do not include contingencies, pump house building, site development, electrical, mechanical, HVAC, or instrumentation.

2.2.2.3 Vertical and Angle Wells Costs

Typical costs for developing vertical and angle wells are provided below in Table 2.2-2, entitled "Estimated Vertical and Angle Well Costs".

Table 2.2-2
Estimated Vertical and Angle Well Construction Costs

Item	Estimated Cost ⁽¹⁾	
	Vertical Well	Angle Well
1. Well, Casing and Screen	\$144,000	\$360,000
2. Pump and Motor	\$130,000	\$144,000
Estimated Well Construction Cost	\$274,000	\$504,000

Note:

(1) Costs do not include contingencies, pump house building, structures, site development, electrical, mechanical, HVAC, or instrumentation.

The angle well cost of \$360,000 is considerably higher than the cost used in the FER, Table 4.2-9. This higher cost is based on the actual cost of the angle well at Site D, which was about \$360,000 and recent estimates from water supply contractors.

The vertical well cost of \$144,000 is also higher than the FER. This higher cost is based on recent bid tabulations from similar type well construction.

2.3 Floodway/Flood Plain Issues

2.3.1 Floodway

The concept of establishing a floodway is used as a tool to assist local communities in flood plain management. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free from development in order that the 100-year flood may be carried without substantial increases in flood water elevations.

There are no designated floodways in the well field areas based on the April 1, 1987 U.S. Department of Housing and Urban Development Flood Hazard Boundary Map. Also, there does not appear to be any local flood way designations in the well field area.

2.3.2 100-Year Flood Level

The 100-year flood has been adopted by FEMA as the base flood for purposes of flood plain management. Also, the 100-year flood level impacts the design of the upper well terminus.

The most recent Missouri River stage information is dated 2003 from the Corps of Engineers (COE). Table 2.3-1 summarizes the estimated 100-year flood levels and ground elevations at each well site.

Table 2.3-1
Estimated Missouri River Flood Level
Lewis and Clark Well Field

COE River Mile	Well Site	Ground Elevation	100 Year ^a
776			1130.4
	E	1138	1130.7 ^b
	D	1139	1130.9 ^b
777			1131.1
	C	1125 – 1139 ^c	1131.3 ^b
	B	1142	1131.5 ^b
778			1131.9
	A	1141	1132.2 ^b
779			1132.9
	W	1135	1134.1 ^b
780			1134.1
	U	1142	1135.2 ^b
781			1135.5
	J	1145	1136.6 ^b
782			1137.1

a COE elevations adjusted to NAVD 88 (NGVD 29+0.20 FT)

b Interpolated elevations between COE river miles.

c Variation due to excavation for fill to construct Highway 19.

Based on the estimated flood levels, all sites (except Site C) are above the 100-year flood plain. The 100-year flood level will have to be accounted for when developing Site C.

2.4 Well Field Electrical Distribution and Standby Power Requirements

Clay-Union Electrical Cooperative will provide distribution power to the well field by a combination overhead and underground distribution. Existing overhead power lines follow State Highway 19 and can serve Sites A, B, C, D, and E. New overhead power lines will be needed to serve Sites J, U, and W. From the overhead, medium voltage primary service will be distributed to each well site through underground duct bank. The duct banks in most cases will require two (2) 4 IN PVC conduits extended to the transformer location.

Each well site will have a pad-mounted transformer located above the 100-year flood level and secondary metering and main service electrical equipment that will distribute power to each well. Secondary service will be distributed in underground conduit to the well pumps and structures.

The FER concluded that about 16 MGD of the well field should be equipped with standby power. Since the FER, the water plant capacity has increased by 50 percent. Therefore, 24 MGD of firm capacity of the well field will be equipped with standby power.

2.5 River Bank Erosion

The Missouri River at the project location is a dynamic system which has experienced channel degradation and bank erosion due to variations in river flow, ice jams, etc. Mechanisms for further erosion include continued channel degradation and subsequent lateral migration, which can result in the river channel outflanking the well field structures. The potential for well damage due to ice and debris also exists. Any design must consider these factors in the siting of the wells.

Parts of the riverbank were stabilized during construction of South Dakota Highway 19. The area stabilized is near Sites D and E. The stabilization method involved buried riprap installed in a trapezoidal section trench parallel to the river. The trench is positioned about 100 feet from the river bank. Sites A, B, C, J, U and W are not protected by the Highway 19 stabilization. Sites A, B and C will most likely need to be stabilized. Sites J, U and W are on the northern bank of the Missouri River upstream of the river bend. They may need stabilization also.

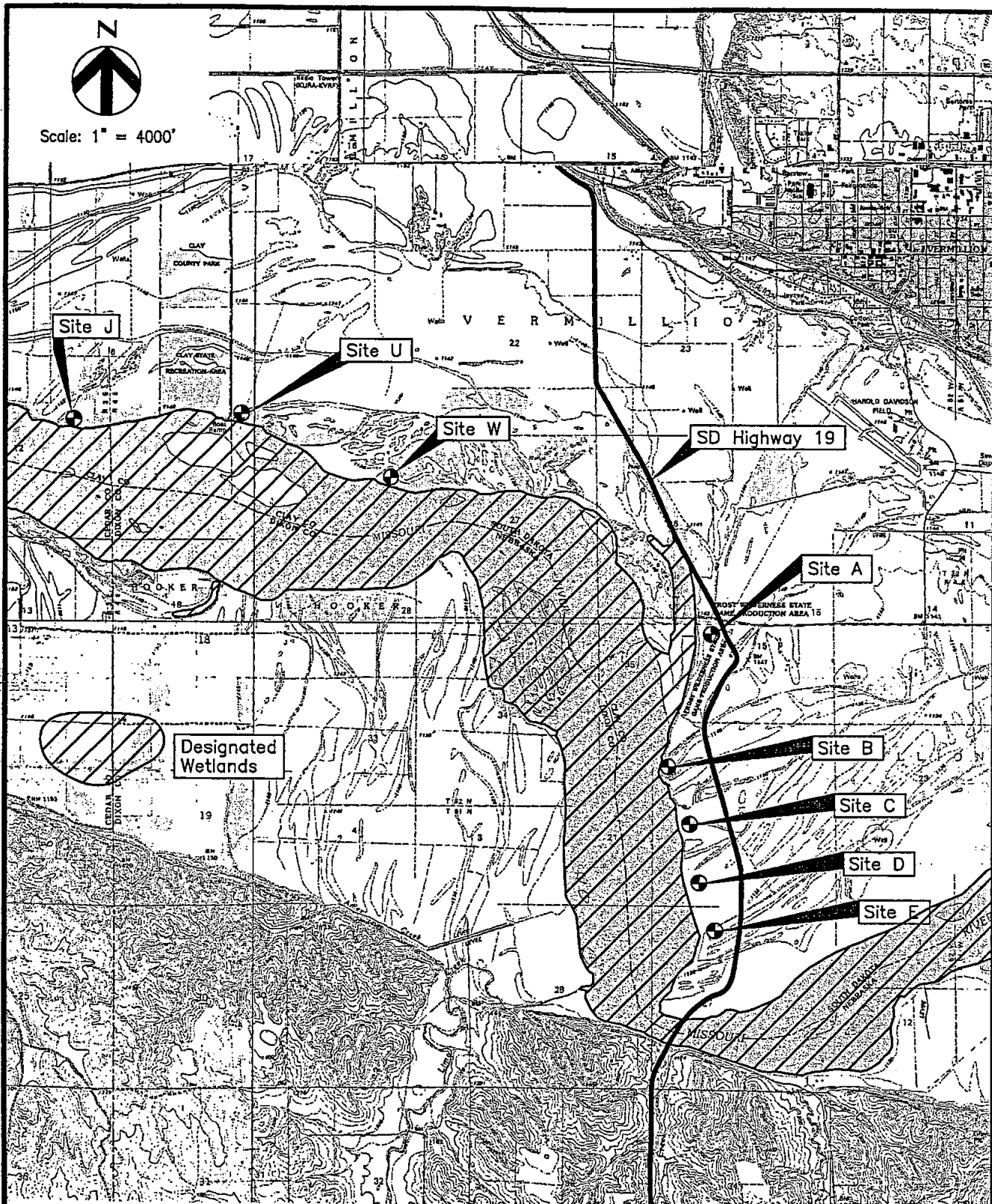
Missouri River bank stabilization measures may be subject to an environmental review. River bank stabilization will be addressed as each site is developed.

2.6 Wetlands

The National Wetlands Inventory was reviewed for inventoried wetlands. Figure 2.6-1 shows that inventoried wetlands will not be impacted by any of the well sites.



Scale: 1" = 4000'



Source: United States Geological Survey; Meckling, S. Dak.-Nebr., 1994, Maskell, Nebr.-S. Dak., 1994, Vermillion, S. Dak.-Nebr., 1994, Obert, Nebr., 1968 Quadrangles

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TRC Mariah Associates, Inc.

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FIGURE 2.6-1
National Wetland
Inventory

2.7 Project Planning to Avoid/Minimize or Mitigate Environmental Impacts

Project planning is a necessity to avoid, minimize, or mitigate construction and operation impacts on the environment. A draft Environmental Assessment (EA) prepared by TRC Mariah Associates, Inc. (TRC) in June 2002 identifies proposed project-wide mitigation/environmental protection measures on all impacted lands (public and private) to avoid or mitigate potential project impacts.

Well field construction activities will need to comply with all appropriate federal, state, and local regulations as outlined in Appendix B of the EA.

Environmental issues addressed in the EA are listed below:

- Wildlife habitat, wetlands, etc.
- Threatened and endangered species
- Other wildlife
- Vegetation, soils and watersheds
- Cultural and historical resources
- Hazardous materials
- Other (noise, visual, etc.)

Some of the restrictions placed on project activities due to the EA are briefly summarized later in this TM.

2.8 Site Development Alternatives and Costs

2.8.1 Well Site Development Alternatives

Table 2.8-1 summarizes three well site development alternatives for each site. This table is based on an earlier well field conceptual design developed by CAI in April 2005 and later refined in January 2006 by Terranext, LLC. The table incorporates three well types and estimates total and firm production capacity for each scenario. Each alternative provides a minimum firm capacity of at least 49 MGD.

In estimating well yields, the limitations of the available drilling methods for vertical, angle, and collector wells were considered. The presence of cobbles and boulders near the base of the aquifer at many of the sites complicates the installation of water supply wells.

Table 2.8-1
Well Field Development Alternatives and Estimated Well Yields

Well Field Site	Well Site Depth to Bedrock (ft bgs)	Well Type	Est. Well Yield	Option 1 – One Collector Well (Site B)		Option 2 – Three Collector Wells (B, E, and D)		Option 3 – One Collector Well (Site E)		Est. Well Spacing (feet)
				# of Wells	Rate (MGD)	# of Wells	Rate (MGD)	# of Wells	Rate (MGD)	
Site A	115	Angle	3.0			1	3	1	3	1,200
		Vertical	3.1	3	9.3	2	6.2	2	6.2	1,000
Site B	110	Collector	11.1	1	11.1	1	11.1			
		Vertical	3.6	1	3.6	1	3.6	3	10.8	1,200
Site C	95	Angle	3.3	2	6.6	2	6.6	1	3.3	1,100
		Vertical	2.4	1	2.4			2	4.8	1,000
Site D	95	Angle ⁽²⁾	3.1	2	6.2	1	3.1	3	9.3	1,100
		Vertical	2.6	1	2.6					1,000
		Collector	8.6			1	8.6			
Site E	78	Angle	2.2							900
		Vertical	1.8	2	3.6					850
		Collector	7.1			1	7.1	1	7.1	
Site J	104	Angle	1.7					1	1.7	800
		Vertical	1.3	2	2.6			1	1.3	700
Site U	99	Angle	1.7					1	1.7	800
		Vertical	1.3	2	2.6	2	2.6	1	1.3	700
Site W	94	Angle	1.7							800
		Vertical	1.3	2	2.6	2	2.6	2	2.6	700
WF Design Capacity				19	53.2	14	54.5	19	53.1	
Firm WF Capacity ⁽¹⁾					49.6		50.9		49.5	

Notes:

(1) Firm well capacity is well field design yield with the largest non-collector well out of service.

(2) One angle well constructed in 2003.

2.8.1.1 General Assumptions

The following is a list of general assumptions regarding the placement of the well screens for the various well types:

- Vertical wells can be installed in cobbles and boulders using standard reverse rotary drilling. Using this method, cobbles and boulders are typically not an issue and the total well depth will approximately equal the top of bedrock.

- Angle wells are installed using either DR-24, DR-24HD, or DR-40 Barber drilling rigs. The angle well installed at Site D was drilled using a DR-40, which is capable of generating more torque than the DR-24 or DR-24 HD models, making it more capable of drilling through cobbles and boulders. The Site D angle well was installed at a vertical depth of 95 feet and reaching bedrock as planned was reported to be difficult. Total length of the well was 230 feet and it was drilled at a 24° angle from the horizontal. Based on those observations, a maximum vertical depth of 95 feet was used for angle wells in the well yield calculations.
- The laterals for radial collector wells cannot typically be installed in cobbles or boulders. Therefore, for the estimates of well yields, it was assumed that the laterals would be installed above any continuous unit of cobbles or boulders.
- A site characterization to identify potential locations for radial collector wells was performed by Layne GeoSciences. A report summarizing the findings of the site characterization was prepared by LGS in June 2001. The conclusions of the report indicated that Sites B, C, and D were the most favorable for radial collector wells while Site J had moderate development potential for a radial collector well and Sites U, W, A and E were generally unfavorable for radial collector well development.

In January 2006, Terranext, LLC re-evaluated the LGS recommendations for radial collector well locations. They concluded that Sites B, C and D were still excellent locations from the standpoint of geology. However, Terranext concluded that installing and pumping three radial collector wells on consecutive sites (B, C and D) could cause interference drawdown at each well (additional drawdown) and significant loss of production in each well. Therefore, Site C was dropped for consideration as a radial collector well site.

Terranext, LLC concluded that Site E could make a better radial collector well site than originally thought. The main reason for this conclusion is the site has a significant length of river perimeter which the radial collector well design can take advantage of for good production even though the formation is not as deep as the other well sites.

2.8.1.2 Site-Specific Assumptions

The following sections describe the site specific assumptions used for each well site:

- **Site A**
Boring logs for Site A indicate that the aquifer interval from 75 to 115 feet bgs contains coarse gravel and boulders. Vertical well yield is expected to be slightly higher than for the angle well. Well yields were estimated at Site A assuming traditional well drilling techniques associated with vertical wells can penetrate the coarse gravel, cobbles, and boulders portion of the aquifer encountered below 95 feet and that, based on the angle well installation at Site D, angle well drilling techniques cannot. This 15 to 20 foot section of extremely coarse material, which has similar geology to Site A, is likely much more permeable than the overlying sand. A well screened across this portion of the formation (vertical) should yield more water than a well that is not (angle).
- **Site B**
Boring logs for Site B indicate that the aquifer interval from 85 to 110 feet bgs contains coarse gravel and boulders. Well yield estimates for Site B were developed assuming vertical wells would be able to fully penetrate the aquifer down to the bedrock. Estimates for angle wells assumed the total depth of the angle well would be approximately 95 feet for the same reasons as described in Site A. Collector well estimates were developed assuming laterals would be placed above the cobbles and boulders at a depth of approximately 85 feet (LGS, 2001).
- **Site C**
Boring logs for Site C do not indicate a coarse boulder or cobble unit near the base of the aquifer, as observed at Sites A and B. Therefore, well yields calculated for this site assume both vertical and angle wells will be able to fully penetrate the aquifer to bedrock.
- **Site D**
Boring logs for Site D indicate that coarse boulder or cobble occurs from 80 to 95 feet bgs. The well yields developed for this site assume that both vertical and angle wells will fully penetrate the aquifer. The angle well installed at Site D is evidence that an angle well can fully penetrate the aquifer at this site.
- **Site E**
Boring logs for Site E do not indicate that coarse boulder or cobble occur near the base of the aquifer. Therefore, well yields for both vertical and angle wells were calculated assuming the wells would fully penetrate the aquifer. Collector well yields were developed assuming the radials could be installed near the base of the aquifer, due to the absence of cobbles or boulders at this depth.

- **Sites J, U, and W**

Boring logs for Sites J, U, and W indicate that the aquifer materials at these sites are finer than the aquifer materials at Sites A through E. Coarse gravel was observed at Site J. Boulders and cobbles were not observed at Sites U or W. Therefore, well yields for both vertical and angle wells were calculated assuming the wells would fully penetrate the aquifer. Collector well yields were developed assuming the radials will be installed near the base of the aquifer, due to the absence of cobbles or boulders at this depth.

2.8.1.3 Changes by Terranext, LLC in the CAI April 2005 projected well yields

- The projected well yields estimated in Table 2.8-1 are similar to those developed by CAI in April 2005. However, several important changes in the estimated well yields from the conceptual design were utilized in this study, as described below:
 - Collector well yields – the collector well yields presented in the conceptual design were the lowest documented seasonal value presented in previous project documents. Site specific collector well yields for average conditions were utilized in this evaluation.
 - Angle well at Site B – estimates assume an angle well could not fully penetrate the cobbles and boulders observed at this site. Therefore, the saturated thickness used in developing the angle well estimates was lower than the saturated thickness value used previously by CAI.
 - Sites J, U, and W well estimates – estimates developed included an estimated transmissivity for Site J, which was also used for Sites U and W, from the pumping test conducted in the fall of 2005. Transmissivity values previously used for these sites were estimated values and were higher than the values estimated from the limited test data available.

2.8.2 Alternative Cost Comparisons

The estimated costs for developing the well field for the three alternatives are summarized in Table 2.8-2. Detailed cost estimates for each site are provided in Appendix "A".

Table 2.8-2
Estimated Well Site Development Costs^a

Site	Option 1 (One Collector Well at Site B)	Option 2 (Three Collector Wells at Sites B, D & E)	Option 3 (One Collector Well at Site E)
A	3 vertical wells \$2,529,000	1 angle & 2 vertical wells \$2,630,000	1 angle & 2 vertical wells \$2,630,000
B	1 collector & 1 vertical well \$4,353,000	1 collector & 1 vertical well \$4,353,000	3 vertical wells \$2,676,000
C	2 angle & 1 vertical well \$2,627,000	2 angle wells \$2,251,000	1 angle & 2 vertical wells \$2,508,000
D	2 angle & 1 vertical well \$2,042,000	1 angle & 1 collector well \$3,654,000	3 angle wells \$2,227,000
E	2 vertical wells \$1,253,000	1 collector well \$3,150,000	1 collector well \$3,150,000
J	2 vertical wells \$1,609,000		1 vertical & 1 angle well \$1,680,000
U	2 vertical wells \$1,531,000	2 vertical wells \$1,531,000	1 vertical & 1 angle well \$1,632,000
W	2 vertical wells \$1,762,000	2 vertical wells \$1,762,000	2 vertical wells \$1,762,000
Subtotal	\$17,706,000	\$19,331,000	\$18,265,000
Contingencies - 10%	\$ 1,771,000	\$ 1,933,000	\$ 1,827,000
Estimated Costs	\$19,477,000	\$21,264,000	\$20,092,000

a Development costs include wells, pumps and motors, all structures and associated mechanical, HVAC and electrical, standby power at Sites B, C and D, site piping, roads, site improvements, site electrical distribution, and \$200,000 per site allowance for bank stabilization at Sites A, B, C, J, U and W.

b Costs at Site D do not include cost of construction of angle well installed in 2003.

From Table 2.8-2, the least costly alternative is Option 1 (one collector well at Site B) at \$19,477,000, followed by Option 3 (one collector well at Site E) at \$20,092,000, and Option 2 (three collector wells at Sites B, D and E) at \$21,264,000.

Option 2 is the most costly option because it incorporates three collector wells which are more expensive to construct than vertical and angle wells. Option 3 is slightly more costly than Option 1 because it uses more angle wells. Angle wells are more costly than vertical well construction.

Option 1 is the recommended plan because it is the least costly. However, the cost difference between Option 1 and 3 is \$615,000 or about 3 percent. As the well field is developed and the capacities of vertical and angle wells are better defined, some of the well components of the Option 3 plan could be incorporated into Option 1 to optimize well field development.

The well site development costs are higher than the FER for the following reasons:

- The FER costs were based on a well field capacity of 39.3 MGD. The well field capacity is now 53.2 MGD.
- The FER costs included six well sites. The well field has expanded to a total of 8 sites.
- The FER costs were based on 13 wells. The number of wells has increased to 19.

The first well sites to be developed within Option 1 are Sites C and D.

3.0 WELL SITE DEVELOPMENT

3.1 Option 1 Well Field Development Summary

Option 1 well field development plan and costs are summarized in Table 3.1-1.

**Table 3.1-1
Option 1 Well Field
Development Summary
(One Collector Well at Site B)**

Well Field Site	Well Type	Estimated Well Yield	# of Wells	Rate (MGD)	Estimated Construction Costs
Site A	Vertical	3.1	3	9.3	\$2,529,000
Site B	Collector	11.1	1	11.1	\$4,353,000
	Vertical	3.6	1	3.6	
Site C	Angle	3.3	2	6.6	\$2,627,000
	Vertical	2.4	1	2.4	
Site D	Angle ⁽²⁾	3.1	2	6.2	\$2,042,000
	Vertical	2.6	1	2.6	
Site E	Vertical	1.8	2	3.6	\$1,253,000
Site J	Vertical	1.3	2	2.6	\$1,609,000
Site U	Vertical	1.3	2	2.6	\$1,531,000
Site W	Vertical	1.3	2	2.6	\$1,762,000
WF Design Capacity			19	53.2	
Firm WF Capacity ⁽¹⁾				49.6	
Subtotal					\$17,706,000
Contingencies @ 10%					\$1,771,000
Estimated Cost					\$19,477,000

Notes:

- (1) Firm capacity is capacity of well field with largest non-collector well out of service.
(2) One angle well constructed in 2003.

Option 1 will incorporate a total of 19 wells producing an estimated total of 53.2 MGD to the water treatment plant. Firm capacity is estimated to be 49.6 MGD.

The breakdown on the well types and corresponding production are summarized below:

Well Type	Number	Production, MGD
Collector Well	1	11.1
Angle Wells	4	12.8
Vertical Wells	14	29.3
Total	19	53.2

3.2 Well Types and Design Standards

3.2.1 Well Types

Three well types will be constructed in the well field: vertical, angle, and radial collector wells.

The wells will be designed in accordance with SD DENR regulations and Recommended Standards for Water Works.

3.2.2 Vertical Wells

Vertical wells will be constructed by the reverse circulatory rotary drilling. Design standards are summarized below:

- Casing – casing material will be carbon steel (API 5L, Grade B) having minimum weight, thickness, and diameters to be determined during final design.
- Screen – screen material will be Type 304 stainless steel. The screen will be of the wire wrapped pipe size. Screen diameter will be determined during final design. Screen slot size/interval will be determined during construction based on location, size, and gradation of water bearing formation.
- Sanitary seal – after the well is test pumped, it shall be sealed by pressure grouting. Seal material will be cement grout and it shall be placed between the casing and borehole. Seal depth shall be no more than 4 feet above the top of the aquifer or to a depth of 20 feet below grade, whichever is nearest to the ground surface.
- Upper well terminal – each vertical well, pump, and motor will be housed in an above ground pump house. The well casing will extend at least 12 inches above the pump house floor and at least 18 inches above final ground surface. For sites subject to flooding, the top of casing will be at least 3 feet above the 100-year flood level.
- Upper well terminal (alternative) – where well sites are visible from the river, submersible pumps and motors with pitless adapters will be considered. Pitless adapter will terminate 18 inches above final grade or 3 feet above flood level, whichever is greater.

3.2.3 Angle Wells

Angle wells will be constructed by dual reverse circulatory rotary drilling. Design standards are summarized below:

- Casing material – casing material shall be carbon steel similar to that discussed for vertical wells. Casing weight, thickness and diameter to be determined during final design.
- Screen – screen material will be Type 304 stainless steel. The screen will be of the wire wrapped pipe size. Screen diameter will be determined during final design. Screen slot size/interval will be determined during construction based on location, size, and gradation of water bearing formations.

- Sanitary seal – after the well is test pumped, it shall be sealed. Seal material will be a combination of cement grout and bentonite. The length of seal will be based on the angle of the well from the horizontal, but its vertical length will be generally as discussed for vertical well
- Upper terminus of the well – the upper end of each well will terminate with a pitless adapter. It will terminate 18 inches above final grade or 3 feet higher than the 100-year flood level, whichever is higher.

3.2.4 Radial Collector Wells

Radial collector wells will be constructed using a poured in place central caisson. A pump house will be located over the top of the well. Design standards are summarized below:

- Caisson – interior diameter will be 13 feet. Depth below grade will be 90 to 100 feet, depending on the location of laterals determined during final design.
- Laterals – laterals will be Type 304 stainless steel construction wire wrapped. Their diameter will be about 12 inches. Screen slot size, diameter, length and location will be determined during final design.
- Upper terminus of the well – the top of the caisson be covered with a water tight floor. For sites subject to flooding, the top of the caisson will be at least three feet above the 100-year flood level.

3.3 Typical Structure Design Standards

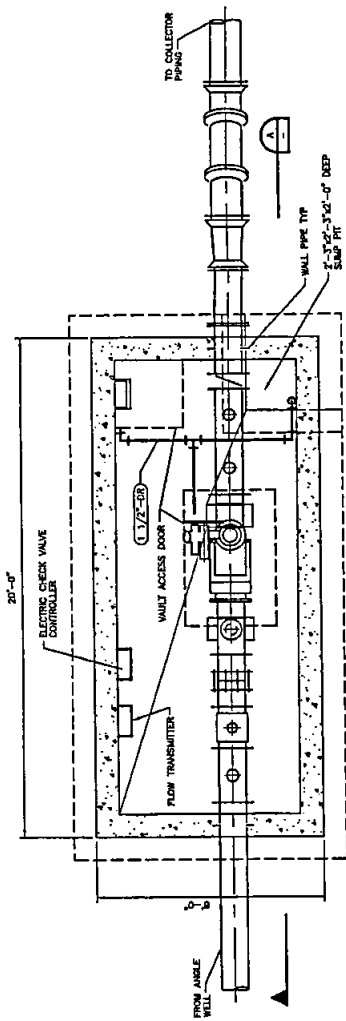
3.3.1 Valve Vaults

Valve vaults will be used in association with each angle well and where submersible pumps and motors are used in vertical wells. A typical valve vault is shown in Figure 3.3-1. The vaults will be cast-in-place structures and will house the discharge valving and flow meter for each angle well. The vaults will be constructed below ground.

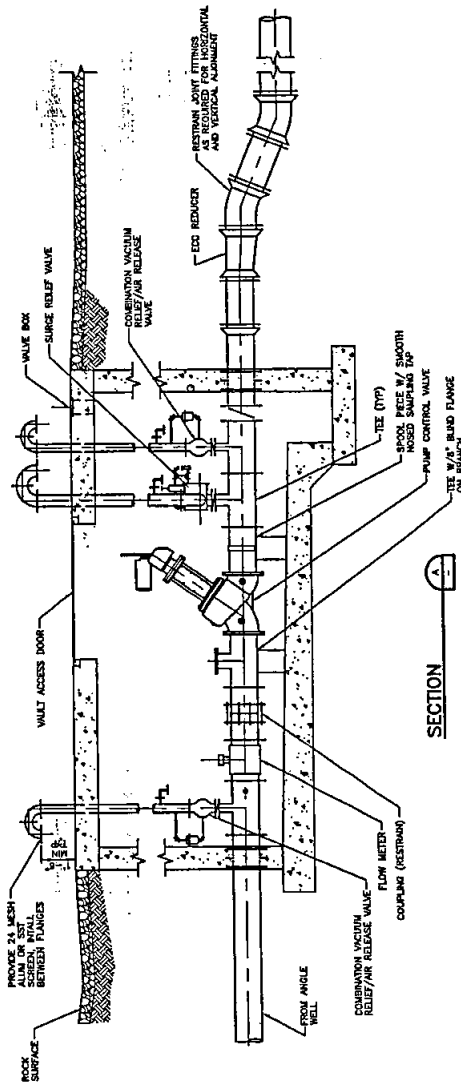
3.3.1.1 *Valves and Primary Elements*

The valving and primary elements expected to be included in each vault are summarized below:

- Air/Vacuum Valve – Air/vacuum valve will be installed between the pump discharge and pump control valve and shall automatically exhaust air from the pump discharge piping on pump start-up and allow air to enter the pipe line as the pump turns off.



VALVE VAULT PLAN



SECTION

FIGURE 3.3-1

Typical Valve Vault
For Angle Well
Plan and Section

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- Pump Control Valve – Pump control valve will serve two functions. It will serve as a check valve to prevent backflow when the pump is not operating. In addition to functioning as a check valve, the valve operates in concert with the pump motor to impart a controlled, gradual change of fluid velocity during normal pump start-up and shutdown so that damaging surge pressures are prevented. If the valve is open when the power fails, the electric motor actuator holds position, but the check automatically separates from the actuator and quickly closes to prevent backflow to the pump. The type of pump control valve considered for this installation will have an electric motor actuator to eliminate the need of complex electro-hydraulic controls, or compressed air systems.
- Surge Relief Valve – Surge relief valve shall be installed downstream of the pump control valve. The surge relief valve will open quickly when the system pressure exceeds the setting of the valve. The valve shall close slowly at an adjustable speed once the system pressure subsides below the valve setting.
- Air/Vacuum Valve – Air vacuum valve will be installed downstream of the surge relief valve. This valve will protect the pipeline from cavitation pressures created during a down surge by allowing air to enter the pipeline.
- Flow Meter – Flow meters will be of the magnetic type and will have a remote mounted transmitter mounted on the wall of the valve vault. Indication of flow rate and totalized flow rate will be provided at the transmitter and at the water treatment plant by SCADA.
- Discharge Pressure – Pump discharge pressure will be indicated by a pressure transmitter.

3.3.1.2 Structure

The vault will be a poured-in-place structure and be installed below ground. Vault features are summarized below:

- Vault will have two access hatches. One hatch will allow equipment to be removed from the vault. The other hatch will allow personnel to egress and ingress. Both hatches will be equipped with intrusion alarms.
- Vault floor will have a sump where drain water will accumulate. A sump pump will pump water from the sump to the exterior of the vault.

3.3.1.3 Electrical

A stainless steel pad-mounted enclosure will be mounted on one corner of the vault. Approximate size of enclosure is 44" x 36" x 24". It will house the power panel for the vault and controls.

3.3.2 Angle Wells

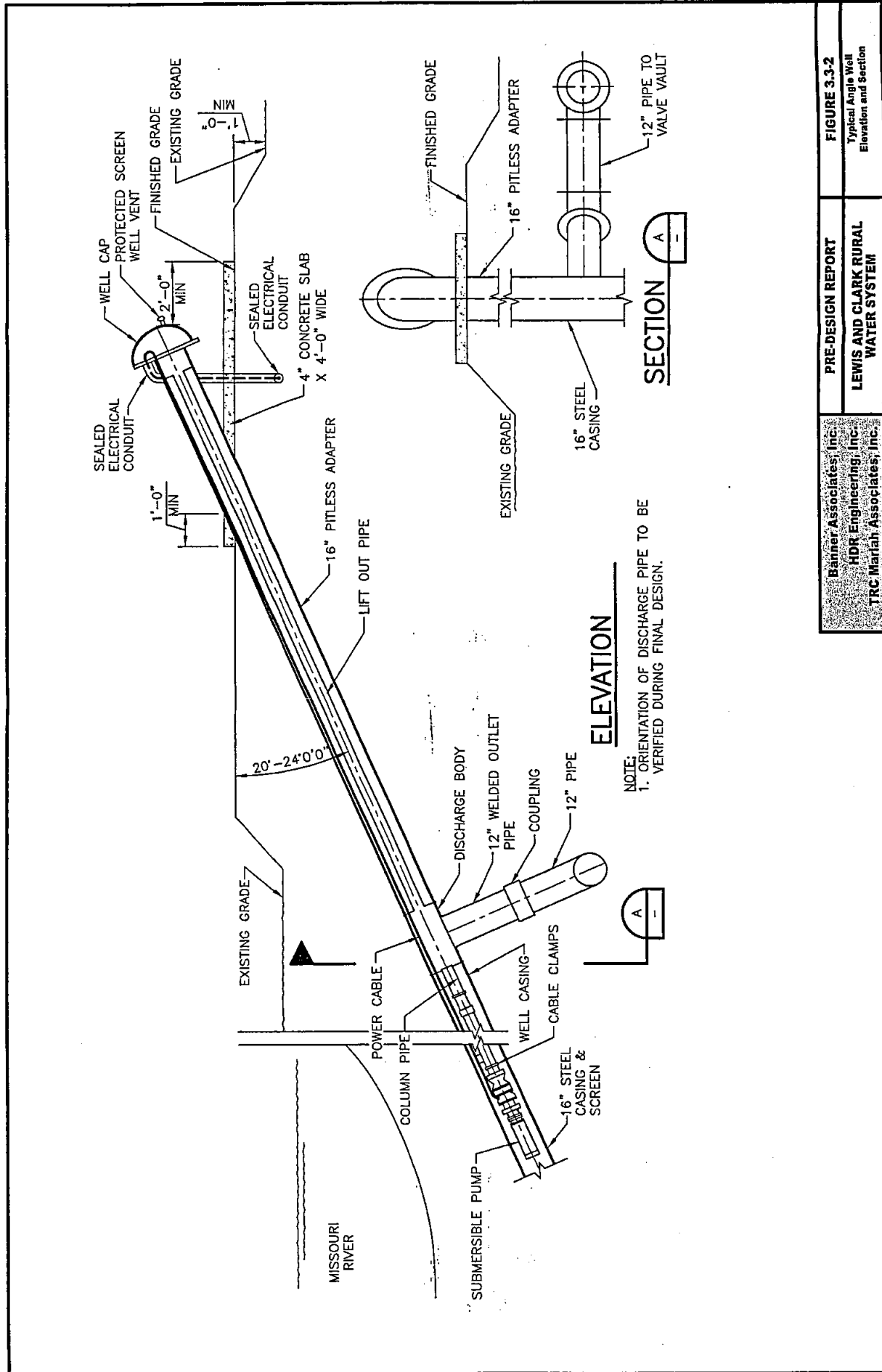
Figure 3.3-2 illustrates a typical angle well. Major components and features are summarized below:

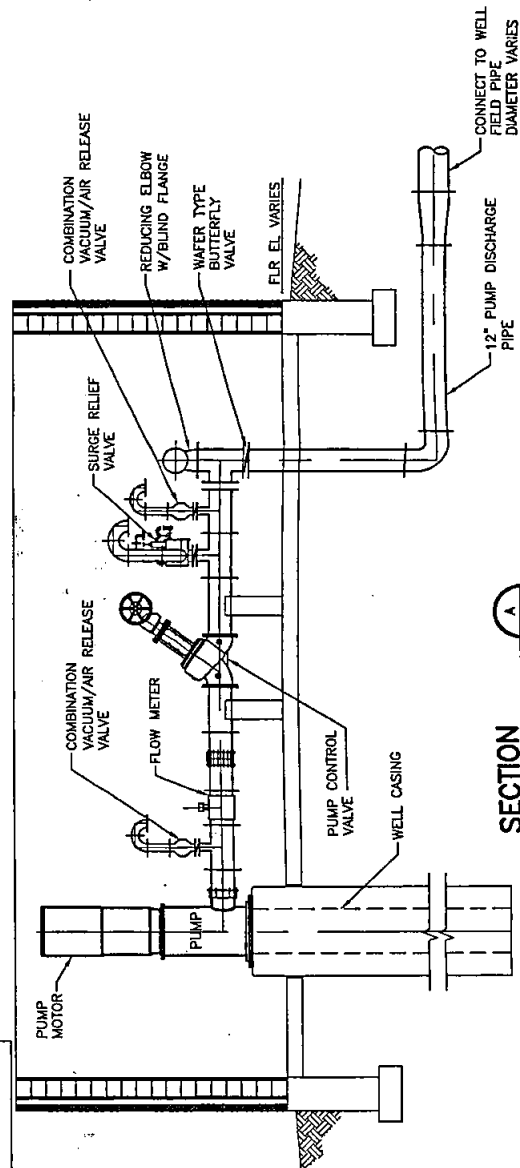
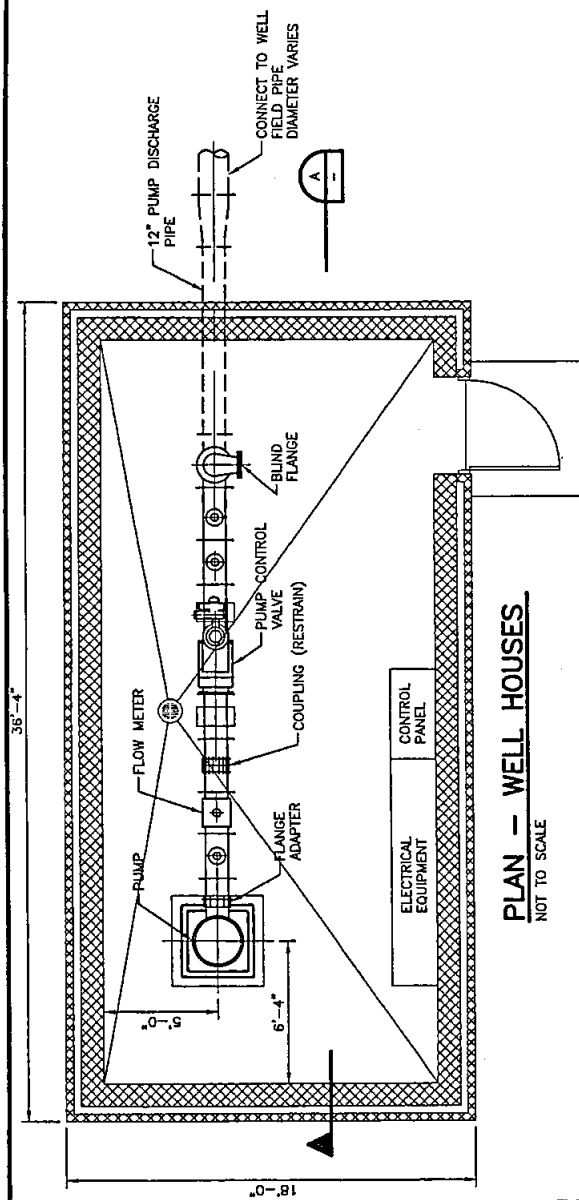
- Well will be drilled on an angle of about 20 degrees to the horizontal.
- Pumps and motors will be submerged near the bottom of the well.
- Top of well will be fitted with a pitless adapter attached to the well casing. The discharge from the well will be underground to the valve vault.
- Well water level will be provided by a submersible hydrostatic level transmitter to monitor and transmit pumping levels to the water treatment plant by SCADA.
- Motor control centers for the angle wells will be housed in the closest vertical well house.

3.3.3 Vertical Wells and Houses

Figures 3.3-3 and 3.3-4 illustrate a typical well house for a vertical well. Major components and characteristics of the structure are provided below:

- Well house will be a split-face concrete masonry building with a cavity type wall.
- Well house roof will be a standing seam metal roof system.
- Well house roof will have two sky lights to remove well pump/motor and pump control valve.
- Well house will include motor control centers for vertical pump as well as angle wells when angle wells are used at the site.
- Air/vacuum valves, pump control valves, surge relief valves, and flow and pressure measurements will be identical to that described for the valve vaults.





Banner Associates, Inc. HDR Engineering, Inc. TRC Mariah Associates, Inc.	PRE-DESIGN REPORT LEWIS AND CLARK RURAL WATER SYSTEM	FIGURE 3.3-3 Well House For Vertical Wells Plan and Section
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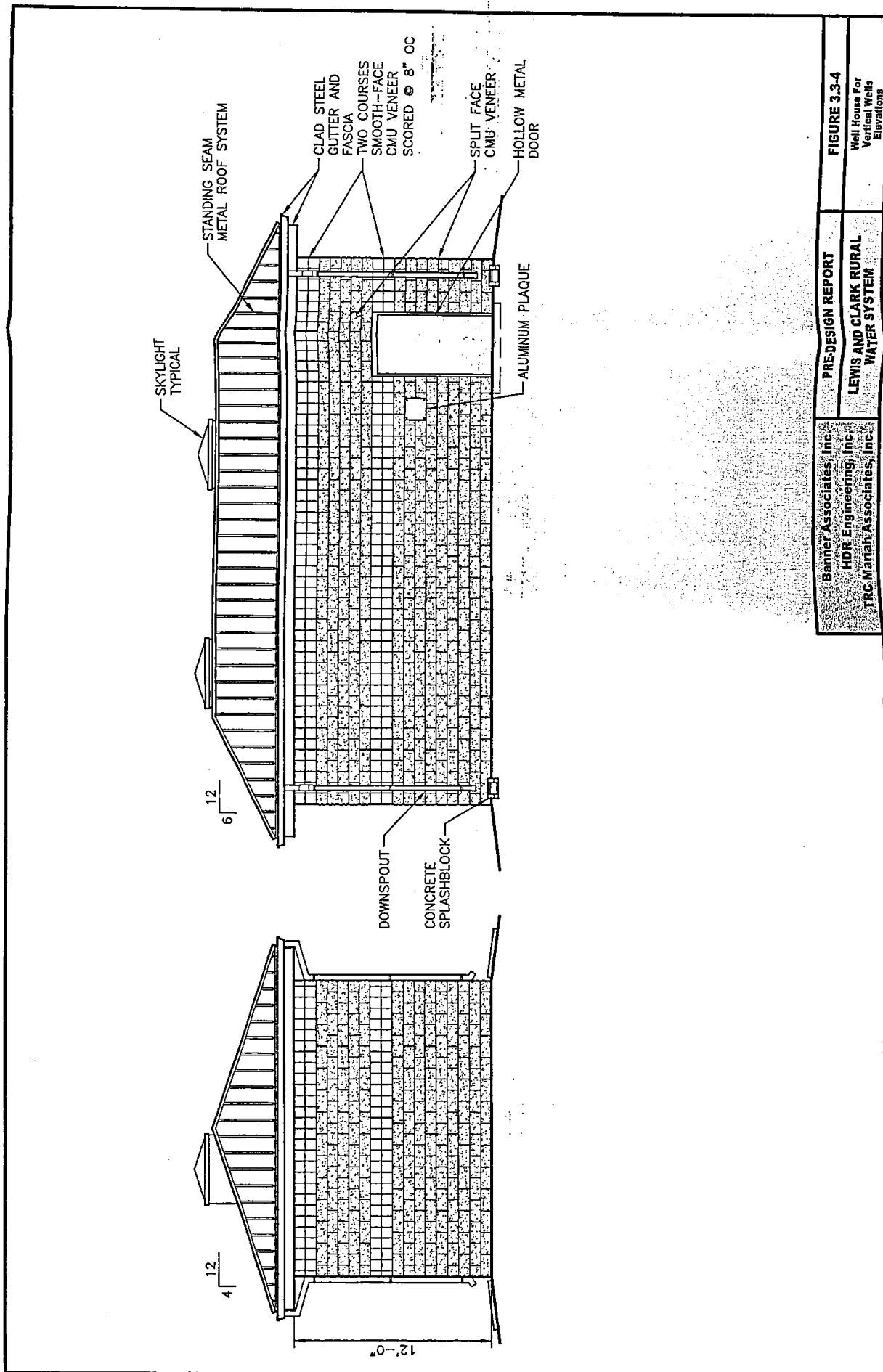


FIGURE 3.3-4
Well House For Vertical Wells Elevations

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- Well water level will be provided by a submersible hydrostatic level transmitter to monitor and transmit pumping level to the water treatment plant by SCADA.
- Well house door will be equipped with an intrusion alarm.
- Pumps will be vertical turbine with the column pipe suspended in the well. However, where the wells are visible from the river, consideration will be given to using submersible pumps and motors with pitless adapters.

3.3.4 Collector Wells and Houses

Collector well houses will be similar construction to that of the vertical well houses. Major characteristics and components of the structure are summarized below:

- Well house will be a split-face concrete masonry building with a cavity wall.
- Well house will contain three vertical turbine pumps, two duty and one standby.
- Air/vacuum valves, pump control valves, surge relief valves, and flow and pressure measurements will be similar to that described for the valve vaults.
- Well house door will be equipped with an intrusion alarm.
- Collector well will have its own motor control center.
- Well water level will be provided by a submersible hydrostatic level transmitter to monitor and transmit pumping level to the water treatment plant by SCADA.
- Skylights will be provided in the roof over each pump/motor to allow for pump removal.

3.4 **Standby Power**

Standby power will be provided to the well field to provide at least 26 MGD of water production in the event of a power outage. Standby power will be provided at Well Sites C, D, and B.

Each site will have a permanently installed diesel generator. Generators will be installed outside above flood level next to a well house in a weather-proof enclosure with a sub-base fuel tank.

The generator will be sized to power loads at the well site. The fuel tank will be sized for 36 to 48 hours of run time at full load. The generator will be connected to the electrical system via an automatic transfer switch that will turn the generator on after a utility power outage.

The standby generators will create noise through the air exhaust and engine mechanical noise. To reduce exhaust noise, generators are usually specified with a non-walk-in weatherproof enclosure with a critical grade silencer on the exhaust. However, this does not reduce the engine noise. During final design, additional noise attenuation will be evaluated:

- Adding ductwork on the engine radiator to turn the air up.
- Install silencers on the radiator.
- Install a noise attenuation enclosure (walk-in) for the complete generator.

Table 3.4-1 summarizes the standby generators and connected loads at Sites C, D, and B.

Table 3.4-1
Standby Generator and Connected Load Summary

Well Field Site	Well Type	Well Yield, MGD	# of Wells Connected to Standby Generator	Yield From Site, MGD ^b	Accumulated Well Yield, MGD ^b	Accumulated Firm Capacity, MGD ^{a, b}	Electrical BHP Input to Motor		Size of Standby Generator
							Each ^c	Total	
C	Angle Well	3.3	2				2 @ 167		
	Vertical Well	2.4	1	9.0	9.0	5.7	1 @ 116	450	600 kw
D	Angle Well	3.1	2				2 @ 157		
	Vertical Well	2.6	1	8.8	17.8	14.5	1 @ 128	442	600 kw
B	Collector Well	11.1	1	11.1			2 @ 311 ^d	622	
	Vertical Well	3.6	0	0	28.9	25.6			800 kw

^a Assumes largest non collector well out of service.

^b Well yield connected to standby generator.

^c Assumes wire to water efficiency of 75%.

^d Two pumps operational.

3.5 Collector Piping

3.5.1 General and Background

The well field collector piping for this discussion is assumed to be that piping from each individual well to the edge of the well site where raw water transmission mains have been or will be constructed. The diameter of this pipe network varies from 12 IN to 36 IN diameter. Pressures in the collector piping will average about 75 to 80 psi.

3.5.2 Pipeline Sizing Criteria

Pipeline sizing is based on the criteria from the FER:

- Head loss limited to less than 4 feet per 1,000 feet.
- Pipeline velocity limited to less than 4 fps.

3.5.3 Materials

Typical pipe materials for water lines are PVC, DIP, and steel.

For pipe sizes above 18 IN, ductile iron and steel will be considered more economical than steel.

For pipe sizes above 18 IN, both steel and ductile iron will be considered. Requirements for ductile iron are as follows:

1. Conform to AWWA C150 and 151 for thickness design.
2. Include cement mortar lining per AWWA C104.
3. Coating system shall be as required by BOR TM No. 8140-CC-2004-1 Corrosion Considerations for Buried Metallic Water Pipe.

Requirements for steel pipe include the following:

1. Conform to AWWA C200 for wall thickness.
2. Pipe lining shall be cement mortar in accordance with AWWA C205.
3. Coating system shall be as required by BOR TM No. 8140-CC-2004-1 Corrosion Considerations for Buried Metallic Water Pipe.

3.5.4 Bury Depth

Minimum bury depth is 6 feet.

3.6 Well Site Access and Access Roads

Access to Sites A, B, C, D and E will be from State Highway 19. All sites are state owned.

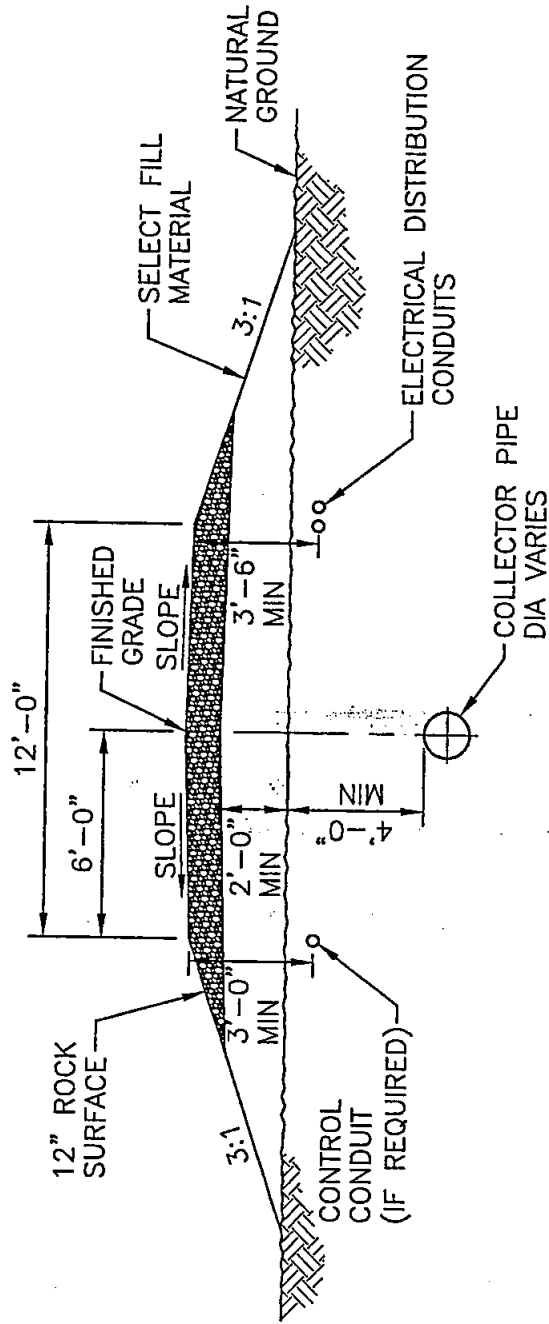
Sites U and W are on private property. Negotiations with the property owners for the well sites and access has not been conducted yet. However, for this evaluation, the assumption is made that access to both sites will be from 460th Avenue (gravel road to boat ramp) and will follow the north tree line along the river to each site.

Site J is owned by LCRWS. Access to the site will be directly from Independence Avenue.

In general, the access roads will be constructed about 2 to 3 feet higher than existing grade in the area. Roads will be constructed of crushed limestone and gravel 12 inches thick on top of a compacted subgrade. Roads will have a minimum width of 12 feet with 3:1 backslopes. Each well site will have a parking area for operating personnel and maintenance vehicles. Where feasible, roads will follow adjacent to river bank stabilization to minimize tree removal.

Water pipeline, electrical ductbank, and conduit for control wire (if required) will be buried under the road where possible to reduce utility trenching depths and reduce ROW widths.

Figure 3.6-1 illustrates a typical access road cross section with utilities.



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FIGURE 3.6-1

Wellfield Access Road
Typical Section

3.7 Floodway Mitigation

As discussed in Section 2.3.1, no designated floodways exist. Therefore, floodway mitigation is not required.

3.8 Wetlands Mitigation

As discussed in Section 2.6, wetlands will not be disturbed or destroyed. Therefore, wetlands mitigation is not required.

3.9 Other Environmental Issues

Wetlands avoidance, floodplain and floodway, and river bank erosion have been previously discussed. However, there are mitigation/avoidance criteria for other environmental concerns addressed in the EA. Some of the avoidance criteria from the EA that could significantly impact project construction schedule are summarized below:

- Surveys for nesting piping plovers and least terns would be performed by a qualified biologist prior to any construction near the Missouri River if construction activities are scheduled to occur during the breeding or nesting season (April 15 and August 15). In the event an active nest is found, consultation with the USFWS would be initiated and activities that are determined to potentially disrupt or otherwise adversely affect breeding or nesting activities would not take place within 0.25 mile or other USFWS-identified distance of active nests.
- Raptor nest surveys would be conducted by a qualified biologist prior to disturbance as deemed necessary during IERT reviews if construction activities are proposed to be conducted between January 1 and July 31.
- All surface-disturbing activities would be seasonally restricted from January 15 to August 1 within 0.25 mile of any active bald eagle nest.
- No construction work would occur during January and February of any year within 0.5 mile of identified bald eagle communal roost areas or within 0.25 mile of any active bald eagle forage, perch, or roost trees. Construction activities may occur in these areas from November 15 to December 31 or March 1 to March 15 only between the hours of 10:00 a.m. and 3:00 p.m. and only when temperatures exceed 20°F.
- Additional mitigations for nesting raptors and/or other migratory birds may be provided on a site-specific basis during construction in consultation with Bureau of Reclamation, USFWS, and state wildlife agencies.
- Construction activities would be avoided from May 15 to July 31 in potential Topeka shiner habitat.

- Substrate disturbance in streams occupied by Topeka shiner and/or with a high potential to be occupied by the species would be minimized and would only occur after July 31 and before May 15 in any year. No removal of stream bottom substrates for construction material would occur.
- Trenched crossings of intermittent streams would occur only in dry areas and/or during periods of flow outside of the spawning period.
- Some of the most important visual features within the project are associated with the Missouri River below Gavins Point Dam. These features contributed to the river's classification within the Wild and Scenic River System.

Visually important features located within the project will be preserved by avoidance as deemed necessary during IERT reviews. Possible mitigation measures include: avoidance of disturbance to most native grassland, wetland, and riparian areas and appropriate revegetation to reduce visual impacts (annually cultivated cropland would not be revegetated); minimization of construction area size; visual screening of permanent facilities utilizing natural topographic features or vegetation; landscaping permanent facility sites with trees, shrubs, and grasses; and designing permanent facility form and coloration to match that of surrounding areas.

Prior to start of any construction activities at the well sites, a reconnaissance survey of the well site should be conducted by qualified personnel to determine the probability of species occurrence so that appropriate avoidance/mitigation criteria are met.

3.10 Electrical, Controls, Telemetry and Power Requirements

Each well site will have two or three wells. Vertical wells and collector wells will have well houses enclosing vertical turbine pumps, motors and discharge piping/valves. Angle wells will not be housed since the associated pump and motor is submerged in the well. Angle well discharge piping/valves will be enclosed in buried valve vaults near each angle well. Typical electrical, controls, and telemetry for the well field are discussed below for Sites C and D, and Site B.

3.10.1 Sites C and D

At Sites C and D, the well house for the vertical well will house the main electrical service equipment and control equipment. The electrical equipment will consist of the service disconnect, automatic transfer switch (as required), disconnect for each well pump motor, reduced voltage solid state starters for the vertical and angle well pumps, step down transformer and panelboard for 120 volt loads. The remote valve vaults will be powered by a 480 volt feeder from the well house to a packaged power supply (combination step down transformer and panelboard). A surge protection device shall be incorporated into each motor control center.

The disconnects for the angle well pump motors will be located at motor control center in the well house for the vertical well. Each disconnect will be able to be locked in the open position for safety when maintenance work is occurring on the submersible pumps.

The remote angle well and packaged power supply feeders will be sized for the voltage drop to compensate for the long distance to the well house. All power conductors and control wires from the angle wells and valve vaults will be placed in a direct buried Schedule 40 PVC conduit(s). Handholes will be located in the duct bank at a maximum of 500 feet.

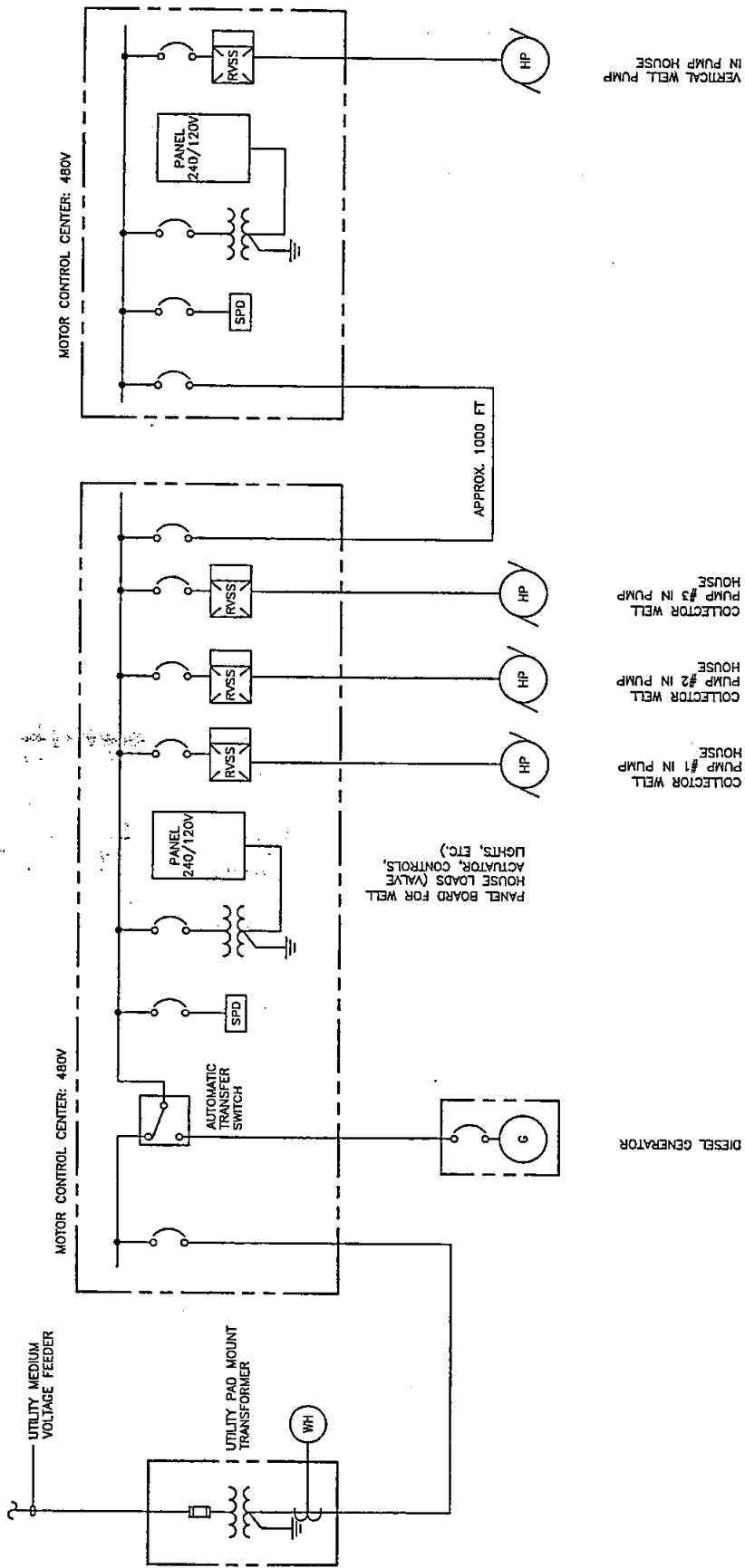
A typical one line diagram is shown in Figure 3.10-1.

3.10.2 Site B

The well site will consist of three vertical well pumps in a collector well house and a vertical well pump in a separate well house.

The collector well house will house the main electrical service equipment and control equipment for both well facilities. The electrical equipment will consist of the service disconnect, automatic transfer switch, reduced voltage solid state starters for the collector well pumps, step down transformer and panelboard for 120 volt loads. The vertical well house will be powered by a 480 volt feeder from the collector well house. The vertical well house will house the electrical equipment for the vertical well pump and will consist of the main disconnect, reduced voltage solid state starters for the vertical well pumps, step down transformer and panelboard for 120 volt loads. A typical one line diagram is shown in Figure 3.10-2.

The remote vertical well house feeder will be sized for the voltage drop to compensate for the long distance to the well house. All power conductors and control wires between the well houses will be placed in a direct buried Schedule 40 PVC conduit(s). Handholes will be located in the duct bank at a maximum of 500 feet.



Scale: NONE

PRE-DESIGN REPORT	FIGURE 3.10-2
LEWIS AND CLARK RURAL WATER SYSTEM	Typical One-line Diagram Well Site B Conceptual
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3.10.3 Telemetry

A system of remotely controlling and monitoring the wells is essential. The wells will be controlled remotely from the water treatment plant by radio with the option of local control. The monitoring of various operational parameters will be done at each well and the water treatment plant.

The proposed control and monitoring at each well are described as follows:

• Pump Control	Run/Stop on step
• Pump Power Failure	Alarm
• Well Water Level	0 to 100, alarm (low)
• Pump Operating Pressure	0 to 150 psi, alarms (low and high)
• Pumping Rate	0 to 11.1 MGD, depending on well capacity
• HOA Switch "Hand"	Status
• HOA Switch "Auto"	Status
• Power Consumption	0 to 300 kw
• Standby Generator Failure	Alarm
• Standby Generator Status	Run/Stop
• Pump Control Valve Activation	Open/Close
• Room Temperature	Alarm (low and high)
• Intrusion	Alarm
• Pump Run Time	Hours
• Room Flood Alarm	Alarm
• Sump Pump Alarm Failure	Alarm

3.10.4 Power Requirements

Table 3.10-4 summarizes the well pump motor requirements for each well site.

Table 3.10-4
Estimated Well Site Power Requirements

Well Field Site	Well Type	Est. Well Yield	Option 1 - One Collector Well (Site B)		Electrical BHP Input to Motor		Motor Horse Power Sizes
			# of Wells	Rate (MGD)	Each ³	Total at Site	
Site A	Vertical	3.1	3	9.3	3 @ 152	456	3 @ 175 HP
Site B	Collector	11.1	1	11.1	2 @ 311	622	3 @ 350 HP
	Vertical	3.6	1	3.6			
Site C	Angle	3.3	2	6.6	2 @ 167	450	2 @ 175 HP
	Vertical	2.4	1	2.4	1 @ 116		1 @ 125 HP
Site D	Angle ⁽²⁾	3.1	2	6.2	2 @ 157		2 @ 175 HP
	Vertical	2.6	1	2.6	1 @ 128	442	1 @ 150 HP
Site E	Vertical	1.8	2	3.6	2 @ 87	174	2 @ 100 HP
Site J	Vertical	1.3	2	2.6	2 @ 55	110	2 @ 75 HP
Site U	Vertical	1.3	2	2.6	2 @ 55	110	2 @ 75 HP
Site W	Vertical	1.3	2	2.6	2 @ 57	114	2 @ 75 HP
WF Design Capacity			19	53.2			
Firm WF Capacity ⁽¹⁾				49.6			

Note:

- (1) Firm well capacity is well field design yield with the largest non-collector well out of service.
- (2) One angle well constructed in 2003.
- (3) Assumes wire to water efficiency of 75%.

3.11 Site Security

The production wells remotely located in a rural area along the Missouri River south of Vermillion will provide the source water for the water treatment plant. The total number of well sites (estimated at 19), however, represents substantial redundancy. Destruction of any given well would impact a small amount of the source of water to the water treatment plant. A significant number of wells would have to be compromised before the production of water would be impacted. However, due to the rural remoteness of the site, some site security should be implemented.

SCADA monitoring at each well site will provide detection of tampering/intrusion of valve vaults and pump houses. The access hatches for the valve vaults and doors to the pump houses should be provided with roller arm limit switches to monitor for intrusion. NEMA 4 switches are needed for the moisture environment.

Each well site should be provided with area security lighting to make the areas more visible at night.

3.12 Recommended Well Site Development Plan

3.12.1 Priority of Construction

Table 3.12-1 summarizes the recommended well construction priority.

Construction should start first in the most productive part of the well field, which is Site A, B, C, D and E followed by the other sites.

Sites C and D will be constructed first with an estimated total yield of 17.8 MGD and a firm capacity of 14.5 MGD. This is more firm yield than initially required, however, it is important that all six (6) wells be constructed and test pumped so that the hydraulic conductivity of the aquifer and the capacities of angle wells and vertical wells can be verified with actual data. Currently, aquifer data are very preliminary. Based on the well test data, the recommended plan could change in terms of well site construction priority and well types.

By 2012, the well field needs to deliver at least 28 MGD (see Table 2.1-1). This demand can be met by development of Site B with one collector and one vertical well.

The balance of the well field will be developed as system demands grow. However, Sites A and E should be developed next since they offer the most yield. The last sites to be developed are J, U, and W because they appear to be the least productive and require construction of a 36-inch transmission line to connect back to the system.

Table 3.12-1
Recommended Well Construction Priority

Construction Priority	Well Field Site	Well Type	Well Yield, MGD	# of Wells	Total Yield From Site, MGD	Accumulated Total Well Yield, MGD	Accumulated Firm Capacity, MGD ^a
First	C	Angle Well	3.3	2			
		Vertical Well	2.4	1	9.0	9.0	
	D	Angle Well	3.1	2			
		Vertical Well	2.6	1	8.8	17.8	14.5
Second	B	Collector Well	11.1	1			
		Vertical Well	3.6	1	14.7	32.5	28.9
Third	A	Vertical Well	3.1	3	9.3	41.8	38.2
Fourth	E	Vertical Well	1.8	2	3.6	45.4	41.8
Fifth	J	Vertical Well	1.3	2	2.6	48.0	44.4
Sixth	U	Vertical Well	1.3	2	2.6	50.6	47.0
Seventh	W	Vertical Well	1.3	2	2.6	53.2	49.6

^a Assumes largest non collector well out of service.

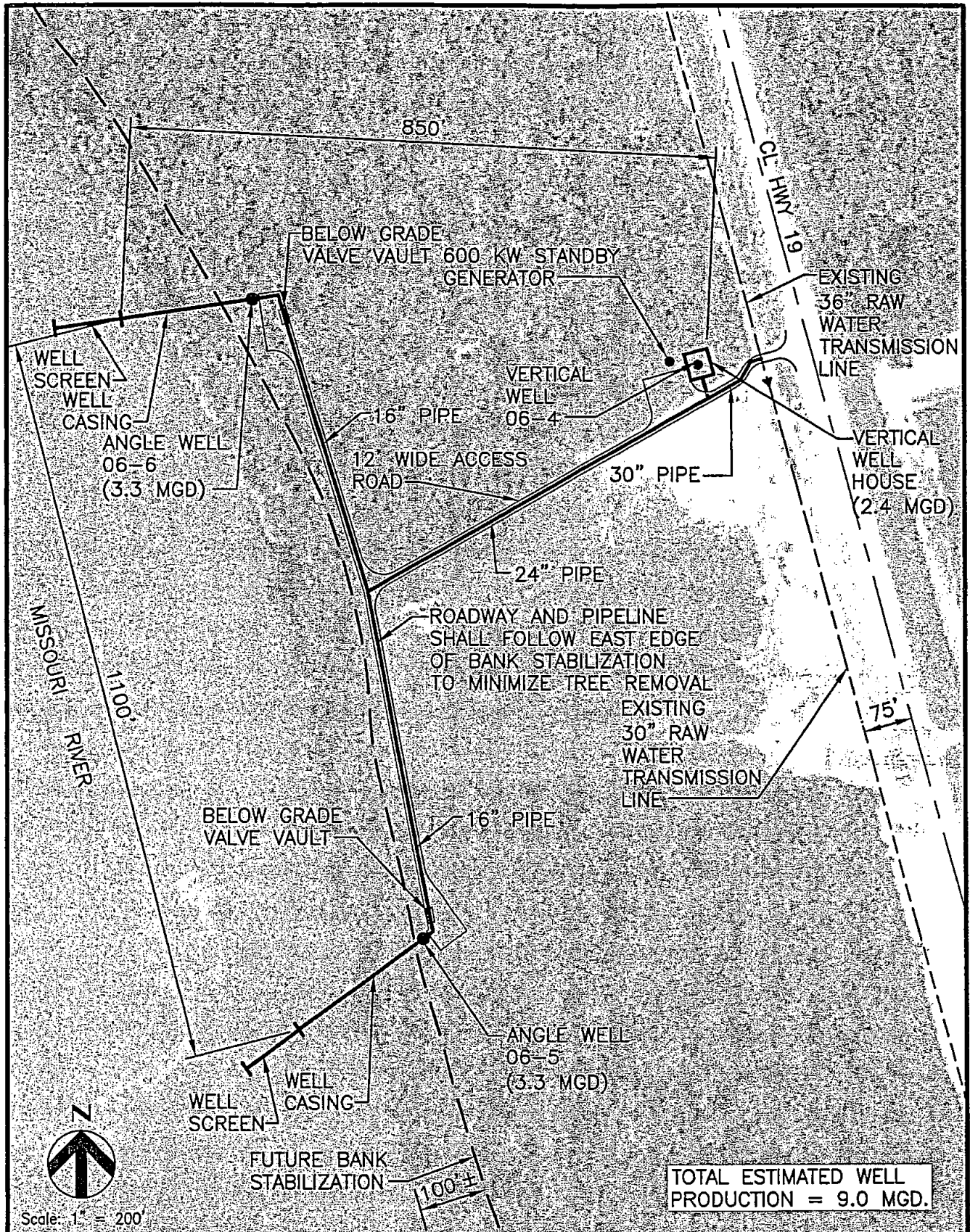
3.12.2 Well Site Development

Well site development plans for each site are shown in Figures 3.12-1 through 3.12-8.

3.12.2.1 *Sites C and D*

Figures 3.12-1 and 3.12-2 illustrate the proposed well development for Sites C and D. Key points are summarized below:

- Three wells will be constructed at each site where shown, with two angle wells and one vertical well.
- Estimated spacing between the three wells is 800 to 1,000 feet.
- Each angle well will be provided with a valve vault that will contain discharge piping and valves.
- Each site will have one well house and it will be constructed at the vertical well. The well house will contain the vertical well pump and its associated discharge piping and valves.
- The well houses will also house the main electrical service equipment and control equipment for all three well pumps. All power conductors and control wires between the well house and angle wells and valve vaults will be placed in direct buried Schedule 40 PVC conduits.
- A fire hydrant will be located near each well house to allow flushing of wells and pipe periodically.
- Each site will have a permanently installed diesel generator and will be located outside in a weatherproof enclosure, next to the well house. The size of the generator is estimated at 600 kw and will power all well pumps.
- A road system will be provided to each well facility with parking space provided.
- Each well will be provided with security fencing and a vehicular lockable access gate.
- Bank stabilization will be required for Site C as shown.

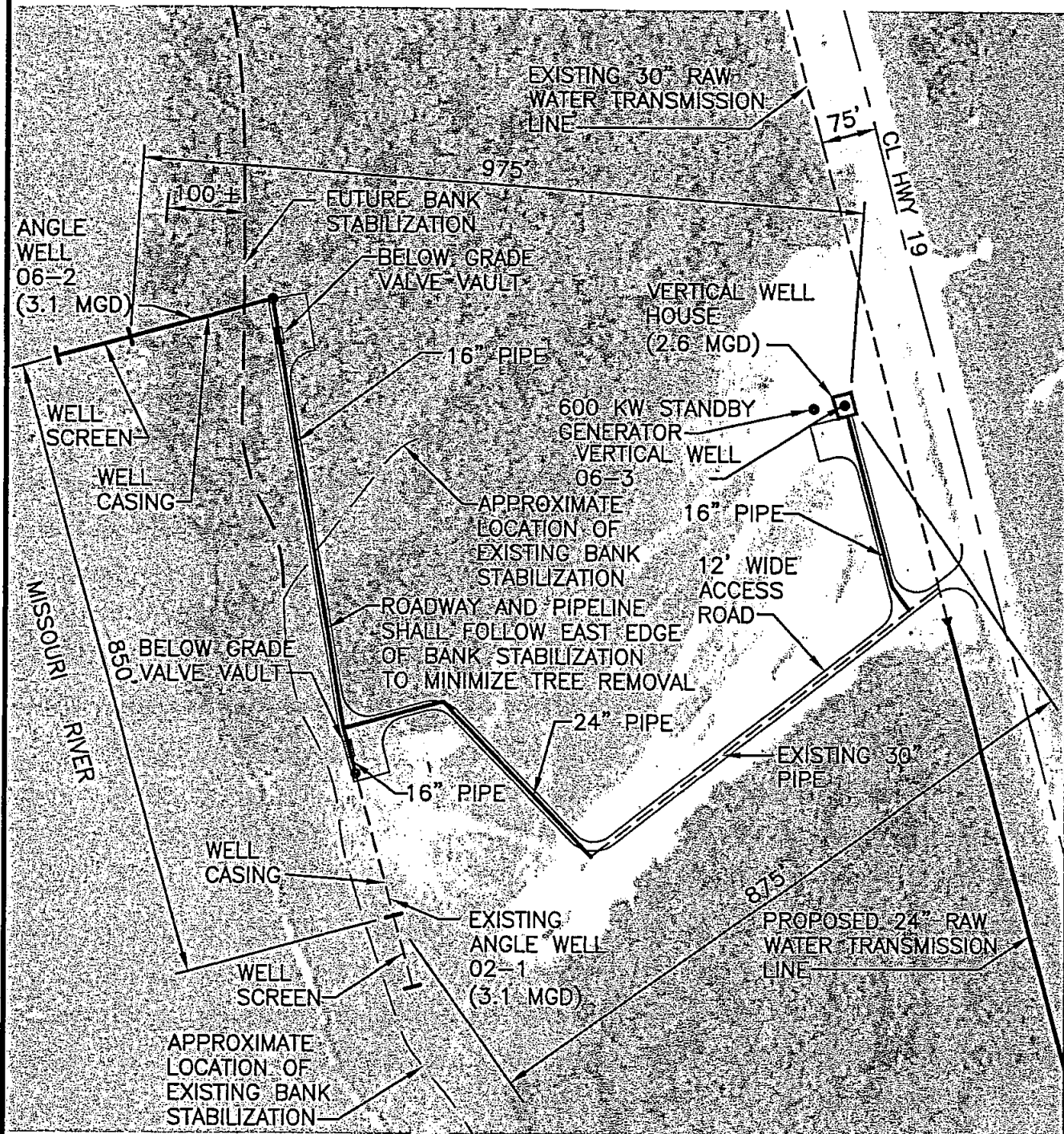


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LEWIS AND CLARK RURAL
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FIGURE 3.12-1

Well Site 'C'
Proposed
Development Plan



Scale: 1" = 200'

TOTAL ESTIMATED WELL PRODUCTION = 8.8 MGD.

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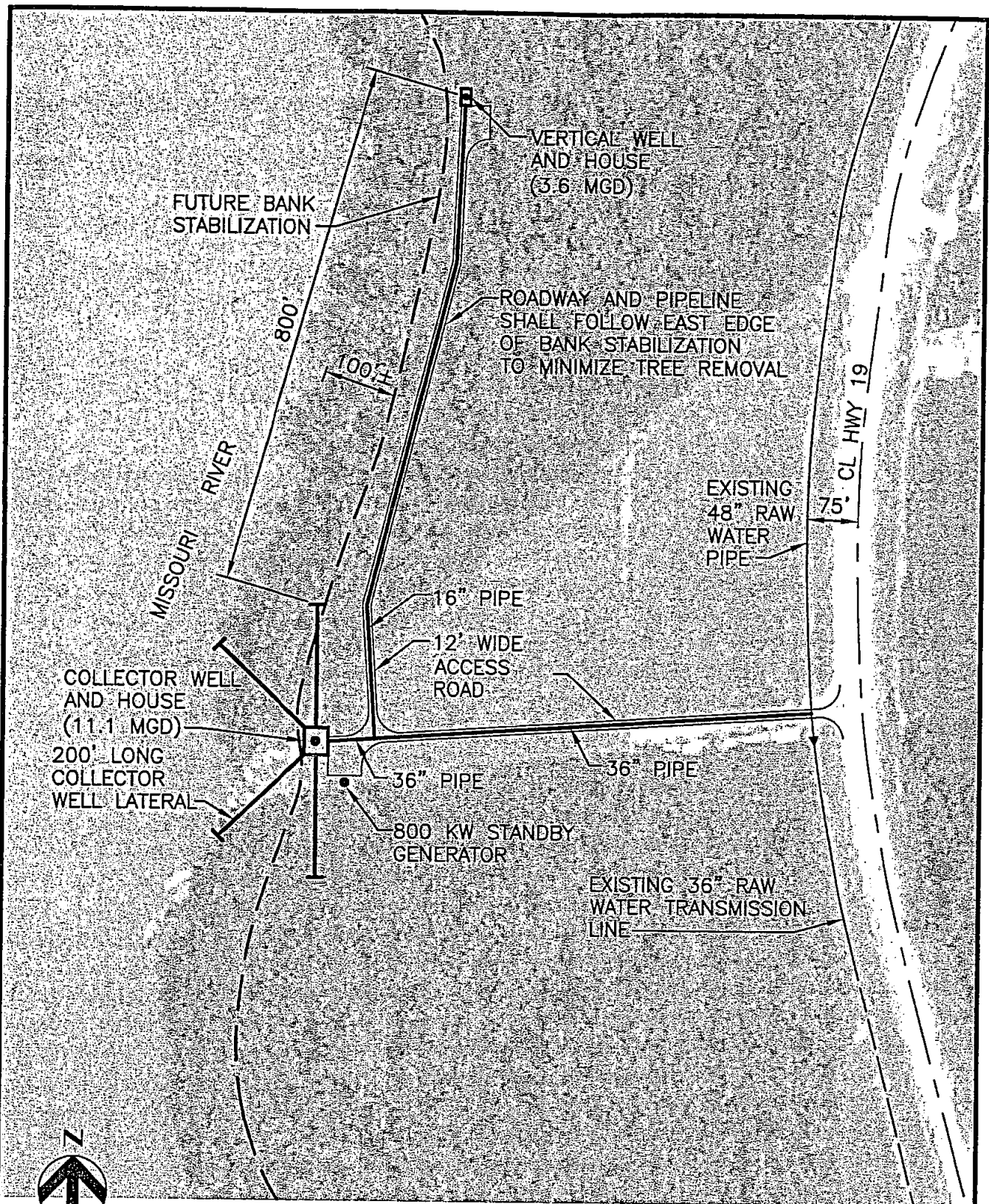
FIGURE 3.12-2

Well Site 'D'
Proposed
Development Plan

3.12.2.2 Site B

Figure 3.12-3 illustrates the proposed well development plan for Site B. Comments on the plan are provided below:

- One collector and one vertical well will be constructed at the site.
- Spacing between the two wells is 800 feet (between the vertical well screen and northern-most lateral of the collector well).
- Two well houses will be constructed, one at the collector well and one at the vertical well. Each well house will contain vertical turbine pumps and discharge piping for each pump. Motor control centers will be provided in both well houses.
- A road system will be provided to each facility, with parking space provided.
- Each well will be provided with security fencing and a lockable vehicular access gate.
- Bank stabilization will be required.
- The collector well house will be furnished with a diesel powered generator which will be located adjacent to the collector well in a weatherproof enclosure. The size of the generator is estimated at 800 kw and will operate two collector well pumps.
- A fire hydrant will be located at each site to allow flushing of wells and pipe periodically.



Scale: 1" = 200'

TOTAL ESTIMATED WELL PRODUCTION = 14.7 MGD.

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FIGURE 3.12-3

Well Site 'B'
Proposed
Development Plan

3.12.2.3 Sites A, E, J, U, and W

Figures 3.12-4 through 3.12-8 illustrate proposed development plans for the remaining sites. A fire hydrant will be located at each site to allow flushing of wells and pipe periodically. Comments on the sites are summarized below:

- Site A – Figure 3.12-4
 - Well site is located in 100-year flood plain, so roads and well heads will need to be elevated above the flood level.
 - Designated wetlands are between the wells and Highway 19. Electrical conduit could be bored under the wetlands. The 30 IN pipe could be open trenched, which would temporarily disturb, but not destroy the wetlands.
 - Bank stabilization probably required.
- Site E – Figure 3.12-5
 - Bank stabilization in place.
 - Raw water transmission line must be extended south.
- Site J – Figure 3.12-6
 - LCRWS owns the site.
 - Bank stabilization probably required.
 - New raw water transmission line must be constructed to the site.
 - Power company must construct distribution power line to the site.
- Sites U and W – Figures 3.12-7 and 3.12-8
 - Both sites are on private property. Sites must be secured and access to each site negotiated for road and pipe line.
 - Bank stabilization probably required.
 - New raw water transmission line must be constructed to Site J.
 - Power company must construct distribution power line to at least Site U.

3.12.3 Well Sites C and D Implementation Plan and Costs

Well Sites C and D will be constructed in two phases. The first phase will commence construction in 2006 and include wells, valve vaults, well houses, roads, buried piping, electrical ductbank, and river bank erosion control.

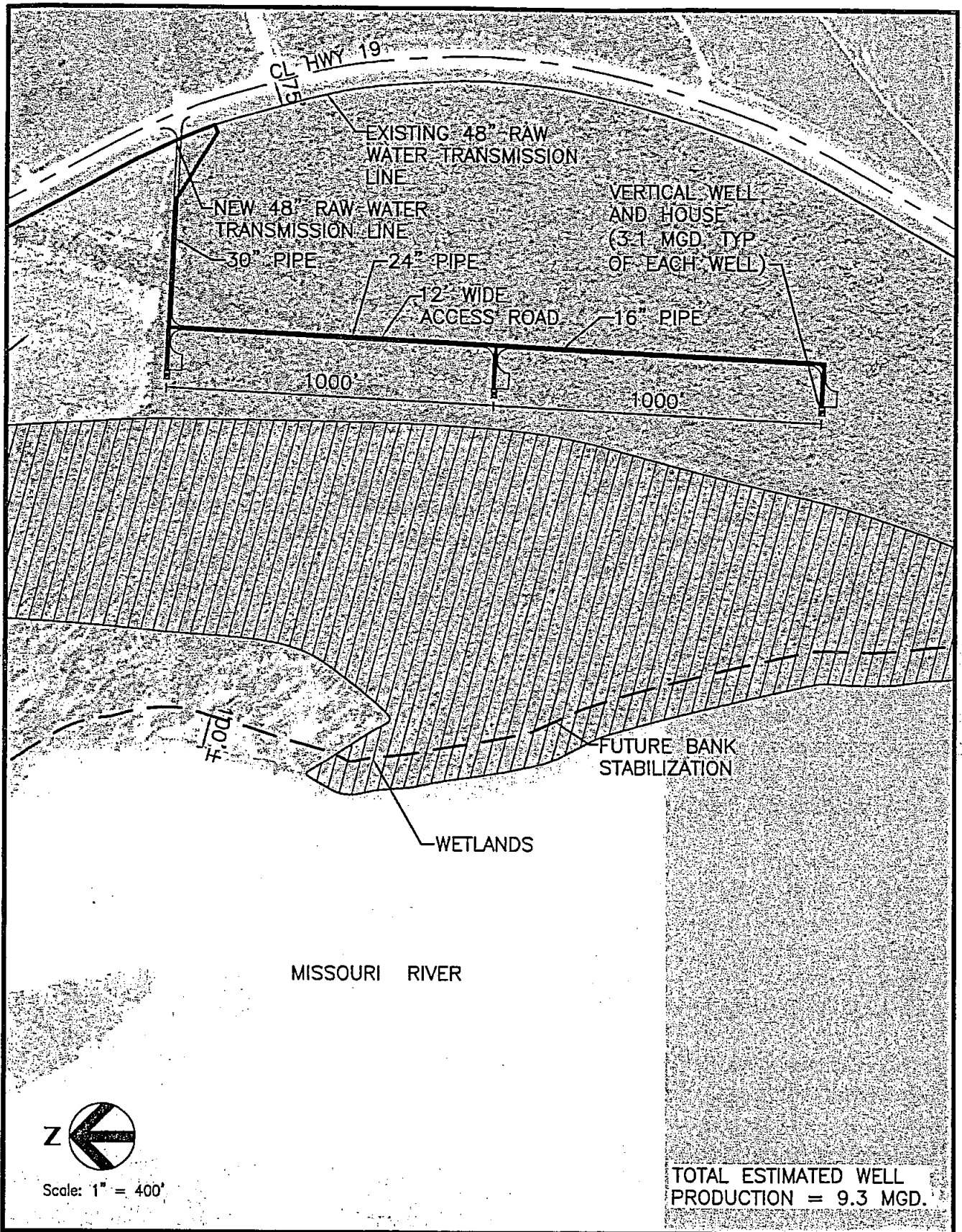
The second phase will be constructed in a few years and will include well pumps and motors, electrical switchgear, instrumentation and control, standby generators, electrical cable pulling, pump control valves and other special valves.

Table 3.12-2 summarizes the costs for Phase 1 and Phase 2 construction.

**Table 3.12-1
Cost Summary for Phase 1 and Phase 2 Construction**

Phase	Cost ^c	Accumulated Cost ^c
1 ^a (2006 Construction)	\$2,969,000	\$2,969,000
2 ^b (Later Construction)	\$2,167,000	\$5,136,000

- a Includes wells, valve vaults, well houses, roads, buried piping, electrical duct bank and river bank erosion.
- b Includes well pumps and motors, electrical switchgear, instrumentation and control, standby generators, electrical cable pulling, pump control valves and other special valves.
- c Includes contingencies.



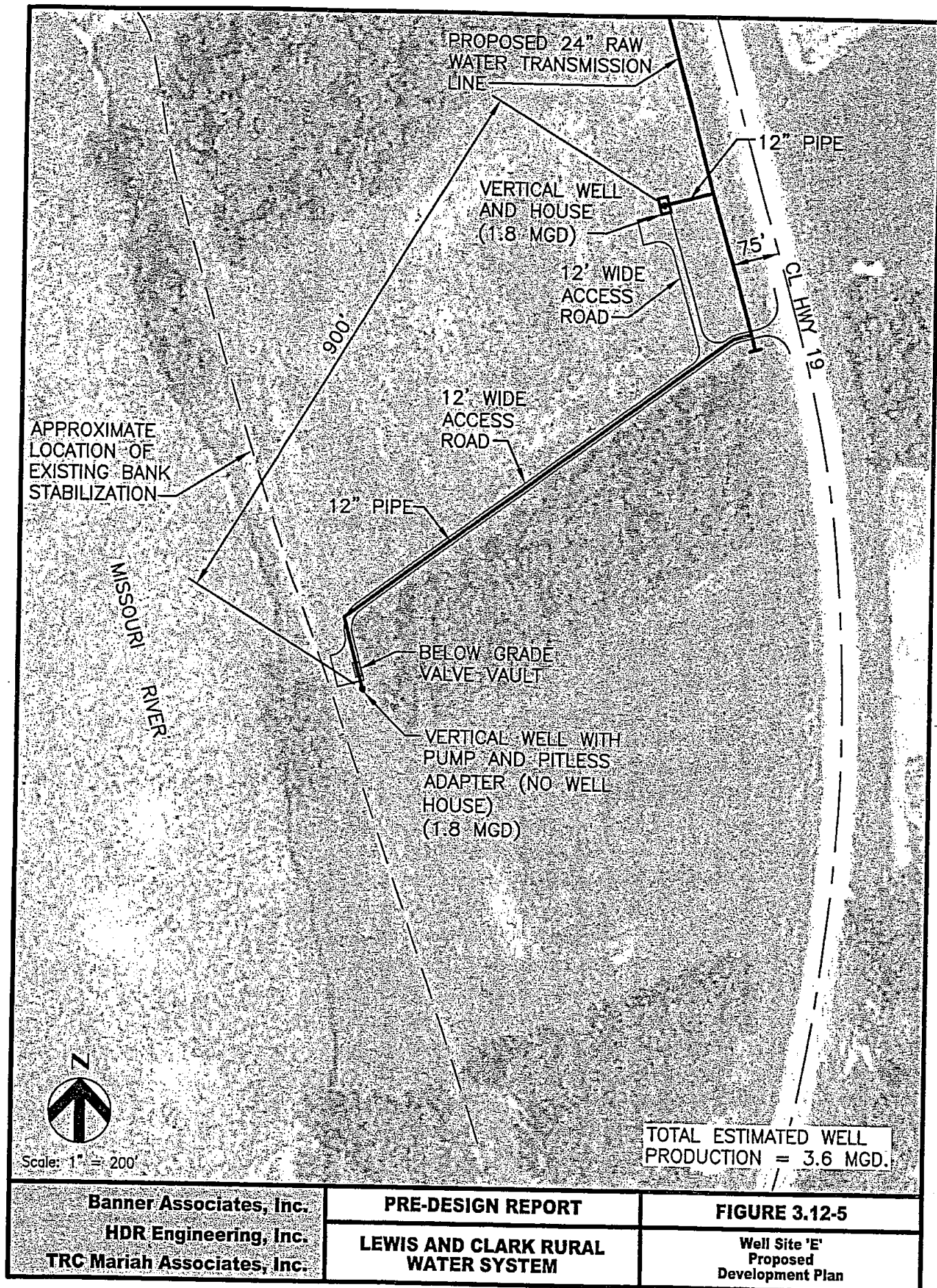
Scale: 1" = 400'

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FIGURE 3.12-4

Well Site 'A'
Proposed
Development Plan

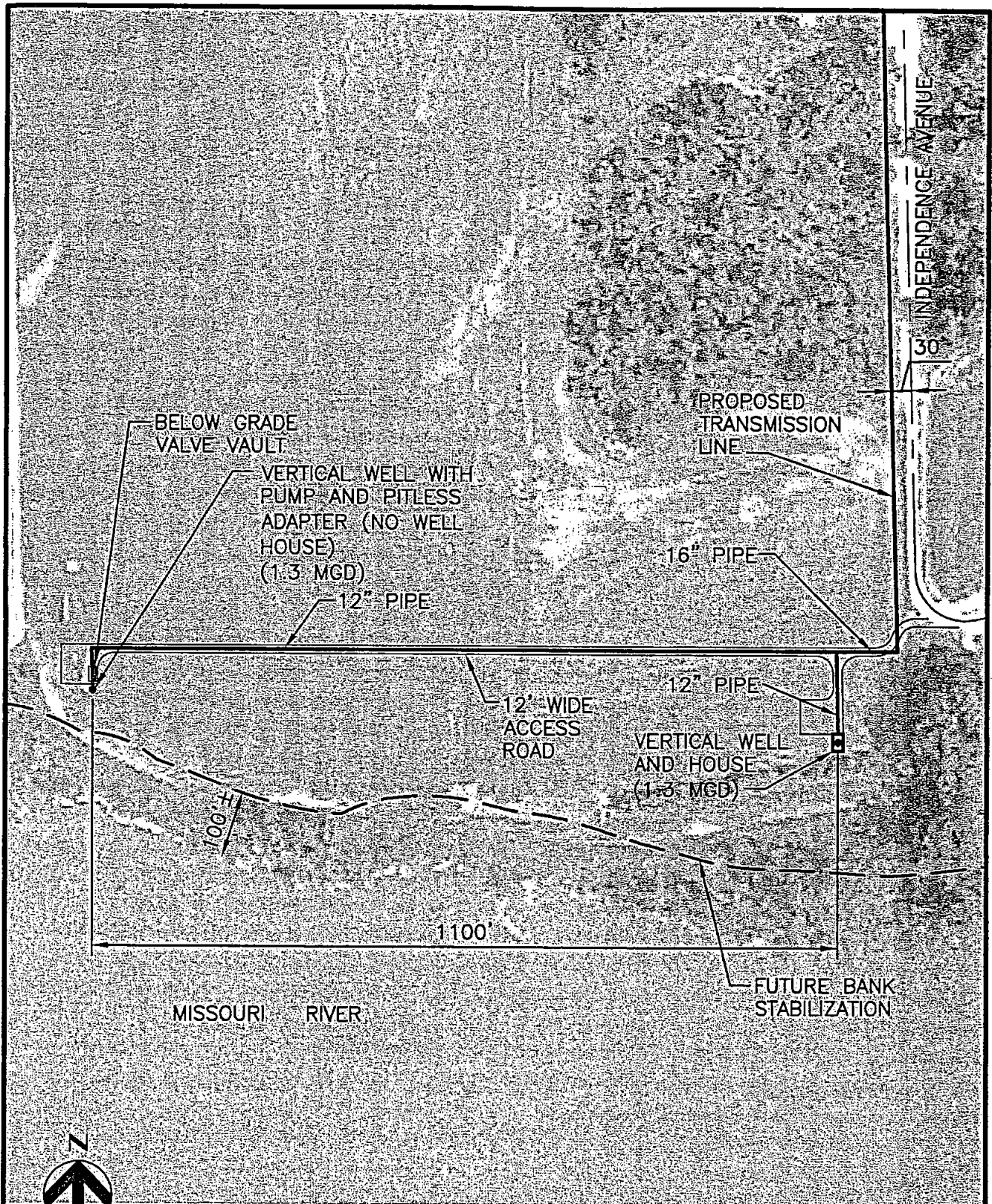


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FIGURE 3.12-5

Well Site 'E'
Proposed
Development Plan



Scale: 1" = 200'

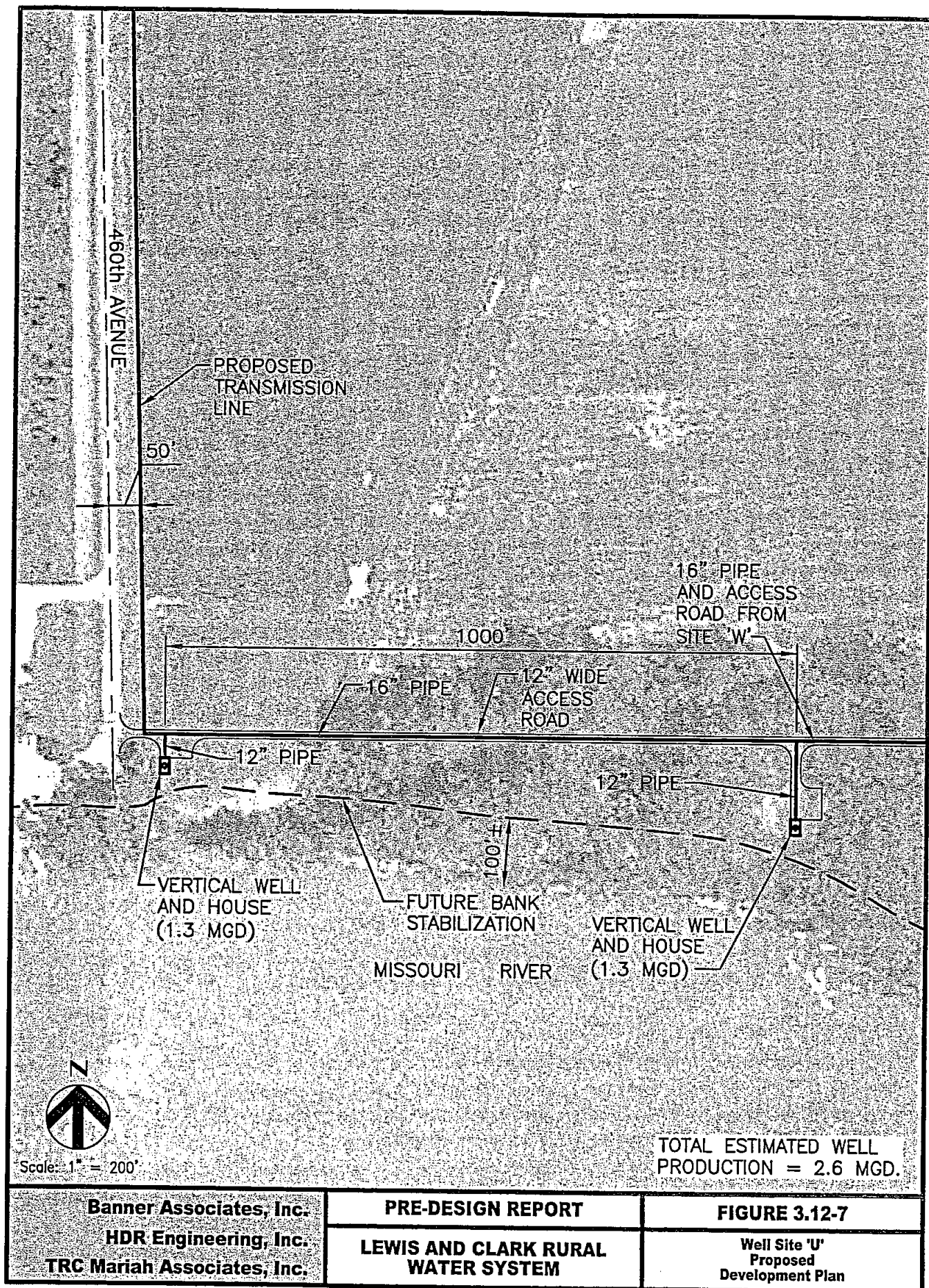
TOTAL ESTIMATED WELL
PRODUCTION = 2.6 MGD.

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FIGURE 3.12-6

Well Site 'J'
Proposed
Development Plan



Scale: 1" = 200'

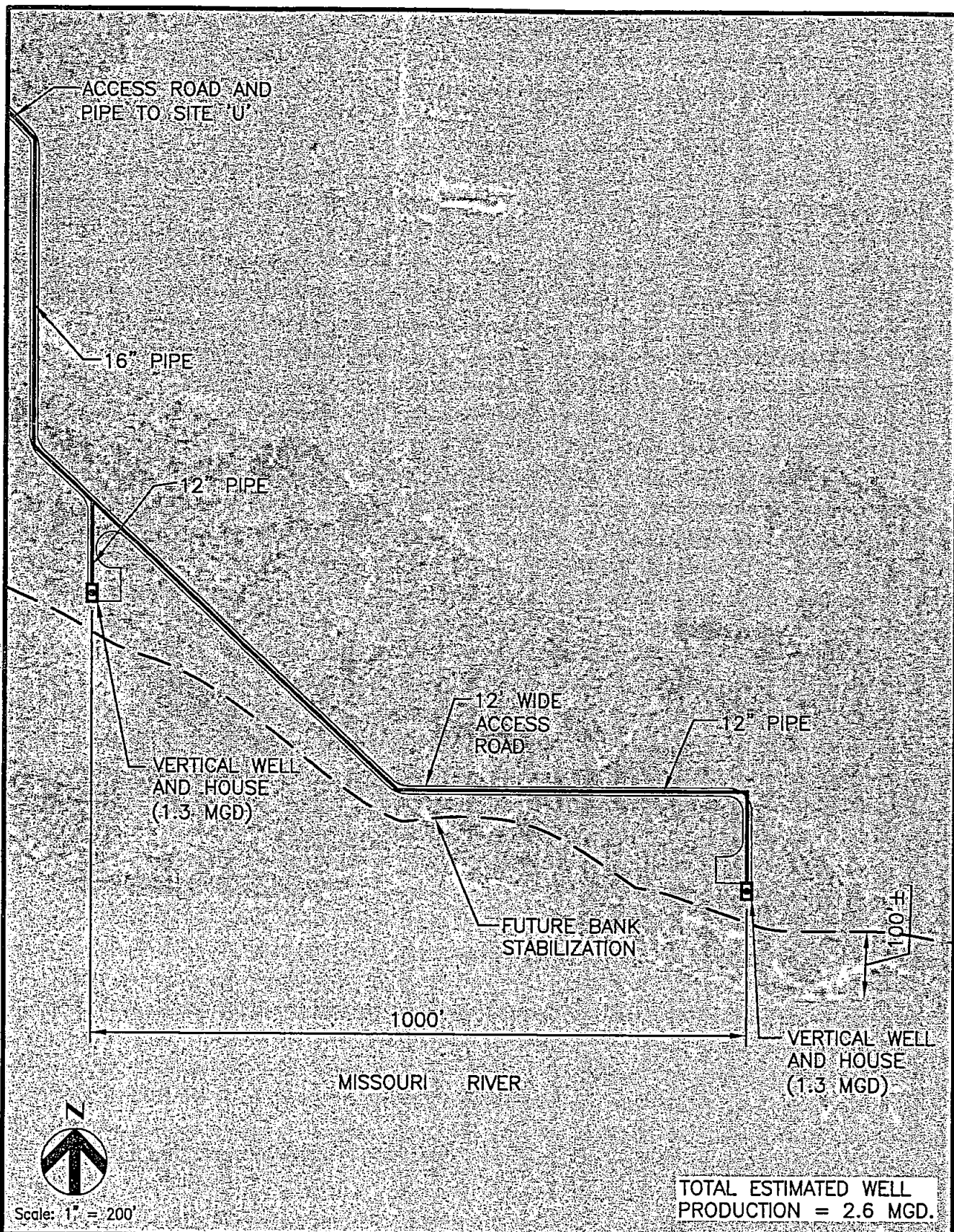
TOTAL ESTIMATED WELL
PRODUCTION = 2.6 MGD.

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FIGURE 3.12-7

Well Site 'U'
Proposed
Development Plan



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FIGURE 3.12-8

Well Site 'W'
Proposed
Development Plan

Appendix A

Site Development Cost Estimates Sites A, B, C, D, E, J, U and W

2/27/2006

				Option 1 One Collector Well (Site B)		Option 2 Three Collector Wells (Sites B, D, E)		Option 3 One Collector Well (Site E)		2/27/2000			
Site	Item	Estimated Unit Cost		Total Yield, MGD		Yield, MGD		Total Yield, MGD					
SITE A		Quantity	Estimated Cost	Quantity	Estimated Cost	Quantity	Estimated Cost	Quantity	Estimated Cost				
SITE A	1 Well Construction	3	EA	9.3	\$432,000	1	EA	3	\$360,000	1	EA	3	\$360,000
	2 Pump and Motor					2	EA	6.2	\$288,000	2	EA	6.2	\$288,000
	3 Pump House Building	3	EA	200 HP	\$390,000	1	EA	150 HP	\$144,000	1	EA	150 HP	\$144,000
	4 Site Piping	3	Bldgs		\$342,720	2	Bldg		\$228,480	2	Bldg		\$228,480
	5 Mechanical	750	LF		\$126,000	750	LF		\$126,000	750	LF		\$126,000
	6 HVAC	1,000	LF		\$120,000	1,000	LF		\$120,000	1,000	LF		\$120,000
	7 Building Electrical	1,000	LF		\$72,000	1,000	LF		\$72,000	1,000	LF		\$72,000
	8 Instrumentation	3	EA		\$34,272	3	EA		\$25,440	3	EA		\$25,440
	9 Standby Generator	3	EA		\$79,200	3	EA		\$79,200	3	EA		\$79,200
	10 Electrical Distribution	1	EA		\$51,408	1	EA		\$38,160	1	EA		\$38,160
	11 Site Improvements	3	EA		\$90,000	1	EA		\$30,000	1	EA		\$30,000
					1	EA		\$48,000	1	EA		\$48,000	
					2	EA		\$12,000	2	EA		\$12,000	
					3	EA		\$54,000	3	EA		\$54,000	
					1	EA		\$24,000	1	EA		\$24,000	
						</							

[illegible]

Site Development Costs

3

Site	Item	Estimated Unit Cost	Option 1: One Collector Well (Site B)			Option 2: Three Collector Wells (Sites B, D, E)			Option 3: One Collector Well (Site E)		
			Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost
SITE C	1 Well Construction										
	Angle Well	\$360,000	2 EA	6.6	\$720,000	2 EA	6.6	\$720,000	1 EA	3.3	\$360,000
	Vertical Well	\$144,000	1 EA	2.4	\$144,000				2 EA	4.8	\$288,000
	2 Pump and Motor										
	Angle Well	\$144,000 EA	2 EA 200 HP		\$288,000	2 EA 200 HP		\$288,000	1 EA 200 HP		\$144,000
	Vertical Well	\$130,000 EA	1 EA 125 HP		\$130,000				2 EA 150 HP		\$260,000
	3 Pump House Building										
	L, ft W, ft Square Ft										
	Angle Well, 1 well	\$210 /SF									
	Valve Vault	\$162 /SF	2 EA		\$51,840	1 EA		\$25,920	1 EA		\$25,920
	Vertical Well	\$210 /SF	1 Bldg		\$114,240				2 Bldg		\$228,480
	4 Site Piping										
	Class 250, 30 IN DIP	\$188 /LF	180 LF		\$30,240						
	Class 250, 24 IN DIP	\$120 /LF	600 LF		\$72,000	740 LF		\$88,800	180 LF		\$30,240
	Class 250, 16 IN DIP	\$72 /LF	1,120 LF		\$80,640	1,120 LF		\$80,640	600 LF		\$72,000
	5 Mechanical								1,120 LF		\$80,640
	Percent of Building Cost										
	Control valve	\$26,400 EA	3 EA		\$79,200	2 EA		\$52,800	3 EA		\$79,200
	6 HVAC										
	Percent of Building Cost										
	15%				\$24,912			\$21,024			\$38,160
	7 Building Electrical										
	MCC per well house, Vertical + Angle Well or 2										
	Angle Wells	\$48,000 EA	1 EA		\$48,000	1 EA		\$48,000	1 EA		\$48,000
	Well house lights, recept. etc	\$6,000 EA	3 EA		\$18,000	1 EA		\$6,000	3 EA		\$18,000
	8 Instrumentation										
	Instrumentation for each vault or pump house	\$18,000 EA	3 EA		\$54,000	2 EA		\$36,000	3 EA		\$54,000
	RTU at each site	\$24,000 EA	1 EA		\$24,000	1 EA		\$24,000	1 EA		\$24,000
	9 Standby Generator										
	600 KW	\$159,600 EA	1 EA		\$159,600	1 EA		\$159,600	1 EA		\$159,600
	10 Electrical Distribution										
	Primary Ductbank - from road to well house	\$24 /LF	150 LF		\$3,600	150 LF		\$3,600	150 LF		\$3,600
	Secondary direct buried conduits - from well house to other wells	\$54 /LF	1,600 LF		\$86,400	1,600 LF		\$86,400	1,600 LF		\$86,400
	Secondary / service cable - from well house to other wells										
	Manholes	\$96 LF	1,600 LF		\$153,600	1,600 LF		\$153,600	1,600 LF		\$153,600
	11 Site Improvements										
	Access Road	\$4,800 EA	4 EA		\$19,200	4 EA		\$19,200	4 EA		\$19,200
	Well Pad	\$41 /LF	1,700 LF		\$69,360	1,700 LF		\$69,360	1,700 LF		\$69,360
	Site Stabilization										
	Well Pad	\$43,200 EA	1 EA		\$43,200	1 EA		\$43,200	1 EA		\$43,200
Site Subtotal		\$240,000 LS	1 LS		\$240,000	1 LS		\$240,000	1 LS		\$240,000
				9.0	\$2,627,440		6.6	\$2,251,200		8.1	\$2,507,840

Site	Item	Option 1 One Collector Well (Site B)			Option 2 Three Collector Wells (Sites B, D, E)			Option 3 One Collector Well (Site E)		
		Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost
SITE D	1 Well Construction									
	Angle Well	1 EA	6.2	\$360,000	0 EA	3.1	\$0	2 EA	9.3	\$720,000
	Vertical Well	1 EA	2.6	\$144,000	1 EA	8.6	\$2,040,000			
	Collector Well			\$2,040,000						
	2 Pump and Motor									
	Angle Well	2 EA		\$144,000 EA	1 EA		\$2,040,000	3 EA		\$432,000
	Vertical Well	1 EA		\$130,000 EA	1 EA		\$144,000			
	Collector Well, 3 pumps and motors									
	Pump House Building			\$380,400 EA	1 EA		\$380,400			
	Angle Well, 1 well									
	Valve Vault	2 EA		\$210 /SF	1 EA		\$25,920	1 Bldg		\$114,240
	Collector Well									
	Vertical Well	1 Bldg		\$210 /SF	1 Bldg		\$294,000	2 EA		\$51,840
	4 Site Piping									
	Class 250, 30 IN DIP, existing	600 LF		\$168 /LF	600 LF			600 LF		\$28,800
	Class 250, 24 IN DIP	240 LF		\$120 /LF	240 LF			240 LF		\$28,800
	Class 250, 16 IN DIP	930 LF		\$72 /LF	930 LF			930 LF		\$66,960
	5 Mechanical									
	Percent of Building Cost									
	Control valve	3 EA		\$26,400 EA	2 EA		\$31,992	3 EA		\$16,608
	6 HVAC									
	Percent of Building Cost									
	7 Building Electrical									
	MCC per well house, Vertical Well			\$30,000 EA						
	MCC per well house, 3 Angle Wells or Angle Well +									
	Vertical Well	1 EA		\$48,000 EA				1 EA		\$48,000
	MCC per well house, Collector Well (3 motors) +									
	Angle Well	3 EA		\$63,600 EA	1 EA		\$63,600	3 EA		\$18,000
	Well house lights, recept, etc									
	Instrumentation	3 EA		\$18,000 EA	2 EA		\$36,000	3 EA		\$54,000
	Instrumentation for each vault or pump house	1 EA		\$24,000 EA	1 EA		\$24,000	1 EA		\$24,000
	RTU at each site									
	Standby Generator									
	600 KW	1 EA		\$159,600 EA				1 EA		\$159,600
	800 KW									
	Electrical Distribution									
	Primary Ductbank - from road to well house	400 LF		\$24 /LF	1,000 LF		\$24,000	400 LF		\$9,600
	Secondary direct buried conduits - from well house to other wells	1,800 LF		\$54 /LF	1,000 LF		\$54,000	1,800 LF		\$97,200
	Secondary / service cable - from well house to other wells	1,800 LF		\$86 LF	1,000 LF		\$86,000	1,800 LF		\$154,800
	Manholes	5 EA		\$4,800 EA	3 EA		\$14,400	5 EA		\$24,000
	Site Improvements									
	Access Road	2,100 LF		\$41 /LF	2,100 LF		\$85,680	2,100 LF		\$85,680
	Well Pad									
	Site Subtotal			\$3,653,580			\$3,653,580			\$3,653,580
			8.8	\$2,041,840		11.7	\$3,653,580		9.3	\$2,227,440

Site Development Costs

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Site	Item	Estimated Unit Cost	Option 1 One Collector Well (Site B)			Option 2 Three Collector Wells (Sites B, D, E)			Option 3 One Collector Well (Site E)		
			Quantity	Total Yield, MGD	Estimated Cost	Quantity	Total Yield, MGD	Estimated Cost	Quantity	Total Yield, MGD	Estimated Cost
SITE E	1 Well Construction Collector Well	\$2,040,000 EA	2 EA	3.6	\$288,000	1 EA	7.1	\$2,040,000	1 EA	7.1	\$2,040,000
	2 Pump and Motor Collector Well, 3 pumps and motors	\$144,000 EA	2 EA 100 HP		\$260,000	1 EA 250 HP		\$380,000	1 EA 250 HP		\$380,000
	3 Pump House Building Collector Well	\$380,000 EA	1 Bldg		\$114,240	1 Bldg		\$294,000	1 Bldg		\$294,000
	Collector Well	\$210 /SF	1 EA		\$25,920						
	Valve Vault	\$162 /SF	1 EA		\$31,000						
	Vertical Well Pileless Adaptor	\$31,000 EA	1,170 LF		\$56,160	1,100 LF		\$132,000	1,100 LF		\$132,000
	Class 250, 24 IN DIP	\$120 /LF									
	Class 250, 12 IN DIP	\$48 /LF									
	5 Mechanical Percent of Building Cost	\$26,400 EA	2 EA		\$11,424	1 EA		\$29,400	1 EA		\$29,400
	Control valve				\$52,800			\$26,400			\$26,400
	6 HVAC Percent of Building Cost				\$17,136			\$44,100			\$44,100
	7 Building Electrical MCC per well house, Vertical Well	\$30,000 EA	2 EA		\$60,000	1 EA		\$48,000	1 EA		\$48,000
	MCC per well house, Collector Well (3 motors)	\$48,000 EA	2 EA		\$12,000	1 EA		\$6,000	1 EA		\$6,000
	Well house lights, recept, etc	\$6,000 EA									
	8 Instrumentation Instrumentation for each vault or pump house	\$18,000 EA	2 EA		\$36,000	1 EA		\$18,000	1 EA		\$18,000
	RTU at each site	\$24,000 EA	1 EA		\$24,000	1 EA		\$24,000	1 EA		\$24,000
	9 Standby Generator 600 KW	\$159,600 EA									
	800 KW	\$204,000 EA									
	10 Electrical Distribution Primary Ductbank - from road to well house	\$24 /LF	400 LF		\$9,600	1,000 LF		\$24,000	1,000 LF		\$24,000
	Secondary direct buried conduits - from well house to other wells	\$54 /LF	1,200 LF		\$64,800	200 LF		\$10,800	200 LF		\$10,800
	Secondary / service cable - from well house to other wells	\$96 LF	1,200 LF		\$115,200	200 LF		\$19,200	200 LF		\$19,200
	Manholes	\$4,800 EA	4 EA		\$19,200	2 EA		\$9,600	2 EA		\$9,600
	11 Site Improvements Access Road	\$41 /LF	1,350 LF		\$55,080	1,100 LF		\$44,880	1,100 LF		\$44,880
	Well Pad	\$43,200 EA			\$0			\$0			\$0
	Site Subtotal			3.6	\$1,252,560		7.1	\$3,150,380		7.1	\$3,150,380

Site	Item	Estimated Unit Cost	Option 1 One Collector Well (Site B)			Option 2 Three Collector Wells (Sites B, D, E)			Option 3 One Collector Well (Site E)		
			Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost
SITE J	1 Well Construction										
	Angle Well	\$380,000	2	EA					1	EA	\$360,000
	Vertical Well	\$144,000							1	EA	\$144,000
	Pump and Motor	\$144,000 EA	2	EA 75 HP	\$288,000				1	EA 150 HP	\$144,000
	Angle Well	\$130,000 EA	2		\$260,000				1	EA 75 HP	\$130,000
	Vertical Well	\$210 /SF	2	Bldg	\$228,480				1	Bldg	\$25,920
	Valve Vault	\$162 /SF	1	EA	\$31,000				1	Bldg	\$114,240
	Vertical Well Pitless Adaptor	\$210 /SF	180	LF	\$12,960				180	LF	\$12,960
	Site Piping	\$48 /LF	1,270	LF	\$60,960				1,270	LF	\$60,960
	Class 250, 16 IN DIP	\$72 /LF	2	EA	\$22,848				2	EA	\$14,016
	Class 250, 12 IN DIP	\$52,800			\$52,800						\$52,800
5	Mechanical										
	Percent of Building Cost 10%										
6	HVAC										
	Control valve	\$26,400 EA	2	EA	\$34,272						\$21,024
7	Building Electrical										
	Percent of Building Cost 15%										
	MCC per well house, Vertical Well	\$30,000 EA	2	EA	\$60,000				1	EA	\$48,000
	MCC per well house, Vertical + Angle Well	\$48,000 EA	2	EA	\$12,000				1	EA	\$6,000
	Well house lights, recept, etc	\$6,000 EA	2	EA	\$36,000				2	EA	\$36,000
8	Instrumentation								1	EA	\$24,000
	Instrumentation for each vault or pump house	\$18,000 EA	2	EA	\$24,000						
9	RTU at each site	\$24,000 EA	1	EA	\$159,600 EA						
	Sstandby Generator										
	600 kW										
10	Electrical Distribution										
	Primary Ductbank - from road to well house	\$24 /LF	300	LF	\$7,200				300	LF	\$7,200
	Secondary direct buried conduits - from well house to other wells	\$54 /LF	1,100	LF	\$59,400				1,100	LF	\$59,400
	Secondary / service cable - from well house to other wells	\$96 LF	1,100	LF	\$105,600				1,100	LF	\$105,600
	Manholes	\$4,800 EA	4	EA	\$19,200				4	EA	\$19,200
11	Site Improvements										
	Access Road	\$41 /LF	1,330	LF	\$54,264				1,330	LF	\$54,264
	Well Pad	\$43,200 EA	1	LS	\$240,000				1	LS	\$240,000
	Site Stabilization	\$240,000 LS									
Site Subtotal				2.6	\$1,608,984		0.0	\$0		3.0	\$1,679,584

Site	Item	Estimated Unit Cost	Option 1: One Collector Well (Site B)			Option 2 Three Collector Wells (Sites B, D, E)			Option 3 One Collector Well (Site E)		
			Quantity	Total Yield, MGD	Estimated Cost	Quantity	Total Yield, MGD	Estimated Cost	Quantity	Total Yield, MGD	Estimated Cost
SITE U	1 Well Construction Angle Well Vertical Well	\$360,000 \$144,000	2 EA	2.6	\$288,000	2 EA	2.6	\$288,000	1 EA	1.7	\$360,000
	2 Pump and Motor Angle Well Vertical Well	\$144,000 EA \$130,000 EA	2 EA			2 EA			1 EA	1.3	\$144,000
	3 Pump House Building L, ft W, ft Square Ft.		2 EA	75 HP	\$260,000	2 EA	75 HP	\$260,000	1 EA	75 HP	\$144,000
									1 EA	75 HP	\$130,000
	4 Site Piping Angle Well, 1 well Angle Well Valve Vault Vertical Well	\$210 /SF \$162 /SF \$210 /SF	2 Bldg		\$228,480	2 Bldg		\$228,480	1 EA		\$25,920
									1 Bldg		\$114,240
	5 Mechanical Class 250, 16 IN DIP Class 250, 12 IN DIP	\$72 /LF \$48 /LF	30 LF 1,130 LF		\$2,160 \$54,240	30 LF 1,130 LF		\$2,160 \$54,240	30 LF 1,130 LF		\$2,160 \$54,240
	6 HVAC Percent of Building Cost Control valve	10% \$26,400 EA	2 EA		\$22,848 \$52,800	2 EA		\$22,848 \$52,800	2 EA		\$14,016 \$52,800
	7 Building Electrical Percent of Building Cost MCC per well house, Vertical Well MCC per well house, Vertical + Angle Well Well house lights, recept, etc	15% \$30,000 EA \$48,000 EA \$6,000 EA	2 EA		\$34,272	2 EA		\$34,272			\$21,024
	8 Instrumentation Instrumentation for each vault or pump house RTU at each site	\$18,000 EA \$24,000 EA	2 EA 1 EA		\$36,000 \$24,000	2 EA 1 EA		\$36,000 \$24,000	1 EA 1 EA		\$48,000 \$6,000
9 Standby Generator 600 KW	\$159,600 EA							2 EA 1 EA		\$36,000 \$24,000	
10 Electrical Distribution Primary Ductbank - from road to well house Secondary direct buried conduits - from well house to other wells Secondary / service cable - from well house to other wells Manholes	\$24 /LF \$54 /LF \$96 LF \$4,800 EA	100 LF 1,000 LF 1,000 LF 3 EA		\$2,400 \$54,000 \$96,000 \$14,400	100 LF 1,000 LF 1,000 LF 3 EA		\$2,400 \$54,000 \$96,000 \$14,400	100 LF 1,000 LF 1,000 LF 3 EA		\$2,400 \$54,000 \$96,000 \$14,400	
10 Site Improvements Access Road Well Pad	\$41 /LF \$43,200 EA	1,200 LF		\$48,960	1,200 LF		\$48,960	1,200 LF		\$48,960	
	Site Stabilization	\$240,000 LS	1 LS		\$240,000	1 LS		\$240,000	1 LS		\$240,000
	Site Subtotal			2.6	\$1,530,560		2.6	\$1,530,560		3.0	\$1,632,160

Site Development Costs

8

Site	Item	Estimated Unit Cost	Option 1 One Collector Well (Site B)			Option 2 Three Collector Wells (Sites B, D, E)			Option 3 One Collector Well (Site E)		
			Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost
SITE W	1 Well Construction										
	2 Pump and Motor	\$144,000	2 EA	2.6	\$288,000	2 EA	2.6	\$288,000	2 EA	2.6	\$288,000
	3 Pump House Building	\$130,000 EA	2 EA 75 HP		\$260,000	2 EA 75 HP		\$260,000	2 EA 75 HP		\$260,000
	4 Site Piping	\$210 /SF	2 Bldg		\$228,480	2 Bldg		\$228,480	2 Bldg		\$228,480
	Class 250, 16 IN DIP	\$72 /LF	1,610 LF		\$115,920	1,610 LF		\$115,920	1,610 LF		\$115,920
	Class 250, 12 IN DIP	\$48 /LF	1,210 LF		\$58,080	1,210 LF		\$58,080	1,210 LF		\$58,080
	5 Mechanical										
	Percent of Building Cost	10%									
	Control valve										
	6 HVAC	\$26,400 EA	2 EA		\$52,800	2 EA		\$52,800	2 EA		\$52,800
	Percent of Building Cost	15%									
	7 Building Electrical										
	MCC per well house, Vertical Well	\$30,000 EA	2 EA		\$60,000	2 EA		\$60,000	2 EA		\$60,000
	Well house lights, recept, etc	\$6,000 EA	2 EA		\$12,000	2 EA		\$12,000	2 EA		\$12,000
	8 Instrumentation										
	Instrumentation for each vault or pump house	\$18,000 EA	2 EA		\$36,000	2 EA		\$36,000	2 EA		\$36,000
	RTU at each site	\$24,000 EA	1 EA		\$24,000	1 EA		\$24,000	1 EA		\$24,000
	Standby Generator										
	600 KW	\$159,600 EA									
	9 Electrical Distribution										
	Primary Ductbank - from road to well house	\$24 /LF	1,000 LF		\$24,000	1,000 LF		\$24,000	1,000 LF		\$24,000
	Secondary direct buried conduits - from well house	\$54 /LF	1,200 LF		\$64,800	1,200 LF		\$64,800	1,200 LF		\$64,800
	Secondary / service cable - from well house to Manholes	\$96 LF	1,200 LF		\$115,200	1,200 LF		\$115,200	1,200 LF		\$115,200
	Manholes	\$4,800 EA	5 EA		\$24,000	5 EA		\$24,000	5 EA		\$24,000
	11 Site Improvements										
	Access Road	\$41 /LF	2,500 LF		\$102,000	2,500 LF		\$102,000	2,500 LF		\$102,000
	Well Pad	\$43,200 EA									
	Site Stabilization	\$240,000 LS	1 LS		\$240,000	1 LS		\$240,000	1 LS		\$240,000
Site Subtotal				2.6	\$1,762,400		2.6	\$1,762,400		2.6	\$1,762,400

Site	Item	Estimated Unit Cost	Option 1 One Collector Well (Site B)			Option 2 Three Collector Wells (Sites B, D, E)			Option 3 One Collector Well (Site E)		
			Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost	Quantity	Yield, MGD	Estimated Cost
SUBTOTAL											
	Well Field Design Yield Capacity			53.2	\$17,704,884		54.5	\$19,330,820		53.1	\$18,265,444
	Well Field Firm Yield Capacity			47.7			49.0			49.6	
	Sites C and D Design Yield Capacity			17.8			18.3			17.4	
	Sites C and D Firm Yield Capacity			11.6			14.0			12.8	
CONTINGENCIES					\$1,770,488			\$1,933,082			\$1,826,544
TOTAL					\$19,475,372			\$21,263,902			\$20,091,988

Notes

1. Standby power assumed at well sites B, C, and D only.

Schlaak, Karen

From: Gronlund, Eric
Sent: Monday, June 12, 2006 1:35 PM
To: 'Dave Odens'
Cc: Schlaak, Karen
Subject: Lewis and Clark Rural Water System's water right permit application

Dave - the Water Rights Program received the application to place to beneficial use water reserved by Future Use Permit No. 5832-3. The application states the amount of water claimed is 12,500 gpm. the annual volume to be diverted in acre feet is also necessary to complete the application.

A direct conversion of 12,500 gpm to an annual volume equates to 20,165 ac-ft. However, most diversions are not continuous. Whatever volume is requested will be the amount taken out of the System's future use permit. Also the fee is based on the volume.

Eric Gronlund
Water Rights Program,DENR
605 773-3352

06/20/2006



June 20, 2006

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

Dave Odens
Banner Associates, Inc.
PO Box 298
Brookings SD 57006-0298

RE: Lewis and Clark Rural Water System

Dear Mr. Odens:

Thank you for submitting the *Application for a Permit to Appropriate Water* for Lewis and Clark Rural Water System.

The application states that amount of water claimed is 12,500 gallons per minute (gpm). In order to complete the application, the annual volume of water to be diverted in acre-feet is also necessary.

A direct conversion of 12,500 gpm to an annual volume equates to 20,165 acre-feet. However, most diversions are not on a continuous basis. Whatever volume is requested is the amount that will be taken out of Future Use Permit No. 5832-3.

We have receipted the \$4,400 application/license fee submitted. The fee is based on the annual volume. Once the acre-feet amount is determined the correct fee can be calculated.

If you have any questions, please contact Eric Gronlund or me.

Sincerely,

Karen Schlaak
Water Rights Program
605 773-3352
karen.schlaak@state.sd.us

Schlaak, Karen

From: Dave Odens [daveo@bannerbkgs.com]
Sent: Friday, June 23, 2006 1:18 PM
To: Schlaak, Karen
Cc: Gronlund, Eric; Troy Larson; Red Arndt
Subject: Lewis and Clark application for permit to appropriate water - 5832-3

Dear Ms. Schlaak

Thank you for your letter and request for clarification dated June 20, 2006. I reviewed the water right application with the Lewis and Clark Construction Committee made up of members of the Board of Directors and explained the request and typical ranges for annual volume of diversion. Following our discussion, the committee directed that the appropriation be made for the full amount represented by the pumping capacity, i.e. 20,165 acre-feet per year.

The basis for this request is that this permit represents the first of a series of appropriations that will be made from this permit and it is expected that the annual water use of the system will equal or exceed the amount permitted for withdrawal under this permit almost as soon as the system becomes operational. Operational status is still several years in the future however good progress is being made on construction.

I will send this response via regular mail as well but wished to relay this information to you as soon as practical. If you have any further questions, comments or recommendations, please let us know.

Thank you

David Odens, Vice President
Banner Associates, Inc.
409 22nd Ave. S.
PO Box 298
Brookings, SD 57006-0298
605-692-6342
daveo@bannerbkgs.com

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06/27/2006

BANNER ASSOCIATES, INC.
409 22nd Avenue South • P.O. Box 298
Brookings, South Dakota 57006-0298
(605) 692-6342
FAX: (605) 692-5714

June 23, 2006

Department of Environment and
Natural Resources
PMB 2020
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3182

RECEIVED
JUN 29 2006
WATER RIGHTS
PROGRAM

Attn. Karen Schlaak, Water Rights Program
RE: Lewis and Clark RWS Appropriation permit 5832-3
Banner Project File No. 20000.15.01

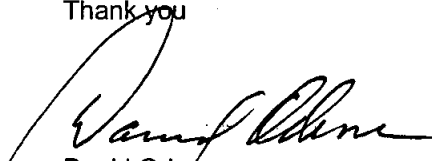
Dear Ms. Schlaak

Thank you for your letter and request for clarification dated June 20, 2006. Banner Associates staff reviewed the water right application with the Lewis and Clark Construction Committee, made up of members of the Board of Directors, to explain the request and typical ranges for annual volume of diversion. Following our discussion, the committee directed that the appropriation be made for the full amount represented by the pumping capacity, i.e. 20,165 acre-feet per year.

The basis for this request is that this permit represents the first of a series of appropriations that will be made from this permit and it is expected that the annual water use of the system will equal or exceed the amount permitted for withdrawal under this permit shortly after the system becomes operational. Operational status is still several years in the future, however, good progress is being made on construction. The wells that will enable the pumping rate requested will be constructed later this year and the connecting piping and facilities to connect them to the water system are scheduled to be constructed in 2007.

If you have any further questions, comments or recommendations, please let us know.

Thank you



David Odens,
Vice President

Cc: Troy Larson, Executive Director, Lewis and Clark RWS, Sioux Falls



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

June 28, 2006

Lewis & Clark Rural Water System, Inc.
c/o Troy Larson
401 E 8th, Suite 306
Sioux Falls SD 57103

Dear Mr. Larson:

We have received your *Application for a Permit to Appropriate Water* for rural water system use.

A \$4,400 application filing fee was also submitted with the application. In addition to the application filing fee, the Water Rights Program collects the \$50 licensing fee at the time of filing. Please submit \$50 for the licensing of the water permit.

If you have any questions, please contact me.

Sincerely,

A handwritten signature in cursive script that reads "Karen Schlaak".

Karen Schlaak
Water Rights Program
605 773-3352
karen.schlaak@state.sd.us

c: Dave Odens, Banner Associates, Inc.

Schlaak, Karen

From: Schlaak, Karen
Sent: Wednesday, July 05, 2006 9:43 AM
To: 'Troy Larson'
Cc: Dave Odens (Dave Odens)
Subject: RE: Letter from DENR regarding an additional \$50 fee

Eric and I have reviewed the calculations for determining the fee. Based on the 12,500 gpm, the filing fee of \$4400 would include the license fee as you stated. We figured the fee based on the 20,165 acre-feet amount.

The two calculations differ by \$50. The \$4400 submitted on June 12th will cover the application and license filing fee. I will send the check for \$50 back to you today.

Karen Schlaak
Water Rights Program
605 773-3352

-----Original Message-----

From: Troy Larson [mailto:tlarson@lcrws.org]
Sent: Friday, June 30, 2006 8:08 AM
To: Schlaak, Karen
Cc: Dave Odens (Dave Odens)
Subject: FW: Letter from DENR regarding an additional \$50 fee

Karen,

Thank you for your June 28 letter in response to our Application for a Permit to Appropriate Water. You indicate Lewis & Clark needs to submit another \$50. Please find below some thoughts from Dave Odens of Banner Associates on this subject. I would appreciate your review of his calculations to double-check whether we indeed owe this \$50. As you will note, we believe the \$50 is already included in what we have paid. However, we may have missed something. Thanks in advance for double-checking this.

Troy Larson
Executive Director
Lewis & Clark RWS
605-336-8688

From: Dave Odens [mailto:daveo@bannerbkgs.com]
Sent: Thursday, June 29, 2006 1:47 PM
To: Troy Larson
Cc: Tim Conner
Subject: Letter from DENR regarding an additional \$50 fee

Troy

I received the letter from Karen Schlaak requesting an additional \$50 licensing fee for the water rights permit for Lewis and Clark.

I must have missed it in reading the requirements for fees on their web site. The fee already submitted

07/05/2006

was calculated in accordance with the form provided on their web site and I did not see the reference to the licensing fee. The fee submitted does include \$50 for inspection.

A copy of the information I used as a basis for the amount is repeated below.

1. The department recommends that the project sponsor apply to obtain a water right permit to construct and place to beneficial use water reserved by Future Use Permit No. 5832-3 for the wells that have been completed and the well anticipated to be completed with these specifications. South Dakota statute (§46-5-9) provides that a permit shall be obtained prior to beginning "any construction of works for the storing or carrying water until a permit to appropriate the water has been issued." Additionally, §46-5-10 provides: "Any person intending to acquire a right to beneficial use of water shall, before starting construction or placement of works for that purpose or before taking the water from any constructed works, make an application to the Water Management Board for a permit to appropriate water, in the form required by rules promulgated pursuant to chapter 1-26 by the board." For more information on obtaining a water right permit, contact Eric Gronlund with the Water Rights Program at 605.773.3352.

The Well capacity at sites C and D is summarized as follows:

Well Identifier	Year Constructed	Well Size/Type	Capacity
Site C – Angle 1	2006	Angle well, 18" screen	2300 gpm
Site C – Angle 2	2006	Angle well, 18" screen	2300 gpm
Site C – Vertical	2006	Vertical well, 24" screen	1700 gpm
Site D – Angle 1	2003	Angle well, 18" screen	2200 gpm
Site D – Angle 2	2006	Angle well, 18" screen	2200 gpm
Site D - Vertical	2006	Vertical well, 24" screen	1800 gpm
Total			12,500 gpm

A water rights application has been completed to place to beneficial use 12,500 gallons per minute for the combined capacity of the wells at sites C and D. The permitted well capacity will include both the wells proposed for construction in 2006 and the full scale test well constructed in 2003. The project that will enable use of this water is currently under construction and the pipelines from the treatment plant site to the first customer are scheduled for construction in 2007 and 2008. It is expected that the first beneficial use of the water for public water supply will be in 2011 or 2012, depending on the pace of funding and construction.

A completed application for the appropriated water right is enclosed. The application is accompanied by a check for payment of fees associated with the appropriated water right. The fee was calculated based on the above listed capacity and the following calculation.

Total Capacity Reserved	12,500 gallons per minute	
Fee for first 75 gpm		\$ 150
Fee for next 75 gpm		\$ 75
Fee for remaining capacity	\$25/75 gpm x 165	\$4,125
Fee for Inspection		\$ 50
TOTAL FEE DUE		\$4,400

David Odens, Vice President
Banner Associates, Inc.

daveo@bannerbkgs.com

The form for calculating fee taken directly from their web site is listed below:

Step 8: Application Fee

The application fee is calculated using a graduated fee system that is dependent upon the amount of water specified on your application plus a \$50.00 inspection/licensing fee. Please refer to the table below to calculate the amount of your fee:

Fee Amount	Amount of Water
\$150.00	First *120 acre-feet of water (75 gallons per minute) or **fraction thereof
\$75.00	Next 120 acre-feet of water (75 gallons per minute) or fraction thereof
\$25.00	Each subsequent 120 acre-feet of water (75 gallons per minute) or fraction thereof
Fee Amount	Inspection/licensing of approved application
\$50.00	If your application is approved, a licensing inspection will be completed following development of your water use project. Issuance of a water license is the final step in obtaining a water right in South Dakota .
*The application fee for an irrigation permit can be calculated using the above graduated fee structure by substituting 60 acre increments in place of the 120 acre-feet increments in the table. This is assuming that you are applying for the statutory standard of 2 acre-feet per acre. In addition, the \$50.00 inspection/licensing fee will also need to be submitted with your application.	
**The fee for an application to appropriate 0.1 cubic feet per second (45 gpm) or less is \$50.00 plus a \$50.00 inspection/licensing fee. A total fee of \$50.00 is needed for an application to amend an existing water right permit with no increase in the existing water appropriation.	
To apply for a future use permit, the application fee is equal to 10% of the fee calculated using the above graduated fee structure <u>excluding</u> the \$50.00 inspection/licensing fee.	
The total fee to file a vested water right claim is \$15.00 regardless of the amount of water being claimed.	

In my opinion, the \$50 requested in the letter dated June 20 should have been considered a part of the \$4400 fee already submitted. The form above lists the fee as a licensing inspection fee. I don't think they are two separate fees.

It might be worth a check before sending a check. You are welcome to forward this e-mail to Karen as an explanation or I could do it as well. please let me know what your wishes are.

Dave Odens

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07/05/2006



DEPARTMENT of ENVIRONMENT
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**TEMPORARY PERMIT TO USE PUBLIC WATERS
FOR CONSTRUCTION AND TESTING PURPOSES**

This temporary permit to use public waters for construction and testing purposes is issued to the Lewis and Clark Rural Water System, Inc, 401 E 8th St, Suite 306, Sioux Falls SD 57103.

The project involves construction of three angle wells and two vertical wells which will be production wells for the Lewis and Clark RWS (Sites C & D located in Section 2, T91N, R52W and Section 35, T92N, R52W). The first phase of construction is to drill, develop and perform pump tests on the wells. An existing test well at Site J (Section 20, T91N, R52W) was drilled and pumped in the fall of 2005. An additional pump test for this well is needed to determine if water quality will improve.

The drilling contractor will perform a step-drawdown test on the five production wells at 1,400 gpm, 1,600 gpm, 1,800 gpm and 2,000 gpm at each flow rate of two hours. A recovery observation period will follow after the step test until the original static water level is reached. Site J will be pumped at a rate of 1,000 gpm for 336 hours with the flow rate recorded every 12 hours.

An aquifer test pattern comprised of 15 temporary observation wells will be installed (3 for each production well). Drilling water will also be required for drilling the production wells. The temporary water supply well (s) will be constructed to a depth of approximately 40-50 feet deep.

This temporary water permit authorizes withdrawal of water as follows:

- 180,000 gallons of water at a rate of 100 gallons per minute (gpm) for drilling purposes;
- 75,000,000 gallons of water at a rate of 1,400-2,000 gpm for the pump tests.

The RWS does not plan to discharge the drilling water. The water from the pump test will be discharged to the Missouri River. Any discharge of water must comply with the "*General Permit for Temporary Dewatering*" issued by this Department.

- The wells authorized by this temporary water use permit shall be constructed by a licensed well driller and construction shall comply with Water Management Board Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) from the producing formation to the surface pursuant to Section 74:02:04:28.
- The wells authorized under this temporary water use permit may be located near domestic wells and other wells which may obtain water from the same aquifer. The well owners, under this temporary water permit, shall control his withdrawals so there is not a reduction of needed water supplies in other adequate wells.
- When the project is completed and the water is no longer needed for testing purposes, all wells that will not become production wells or used for monitoring purposes must be plugged pursuant to Board Rules, Chapter 74:02:04 or turned over to a private land owner.

Page 2

Temporary Permit to Use Public Waters
Lewis & Clark RWS

- Pursuant to ARSD 74:02:04:21, Lewis and Clark RWS is authorized to construct test wells and/or production wells at sites C & D prior to approval of a water permit.

This temporary permit becomes effective August 1, 2006 and expires on December 16, 2006.

This permit does not provide necessary right-of-way. Such arrangements should be made with the proper land owner.

Issued: July 19, 2006



Ron Duvall, Natural Resources Engineer
for Garland Erbele, Chief Engineer
Water Rights Program
605 773-3352



c: Dan Graber, HDR, 6300 S Old Village Place, Suite 100, Sioux Falls SD 57108
David Odens, Banner & Associates, 409 22nd Ave S, Brookings SD 57006-0298

REPORT ON WATER PERMIT APPLICATION NO. 6736-3
For Lewis and Clark RWS
August 9, 2006

Application No. 6736-3 proposes to construct and place to beneficial use 20,165 acre-feet of water annually from six wells approximately 95 feet deep and located in the W ½ of section 22, T32N R4E (Nebraska Survey). The proposed diversion rate will be 27.85 cfs. This water has been reserved by Future Use Permit No. 5832-3. The water will be used to supply the Lewis and Clark Rural Water System serving 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

AQUIFER – MISSOURI ELK POINT (M-EP)

The Missouri Elk Point is an alluvium mantled outwash (sand and gravel) that is under water table conditions in this area. The aquifer underlies 74,500 acres and contains an estimated 1.12 million acre-feet of recoverable water in storage in Clay County (Hedges, 1982). The aquifer is hydraulically connected to both the Missouri and Vermillion Rivers and extends into Yankton County to the west, Union County to the east and blends into the Upper Vermillion Missouri aquifer to the north. Ground water movement is probably from west to east in the area of this application (Christensen, 1967). The proximity of these wells to the Missouri River and their location on a bend of the river insure that the flow of the Missouri River will maintain the ground water level levels in this area.

The Water Rights Program monitors an observation well CL-80C located about one mile east of this application. Water levels for this well show good response to climatic conditions, that is, rising water levels during wet years (recharge) and gradually declining water levels during dry years. The water level record indicates that the aquifer is capable of sustaining additional withdrawals (Water Rights, 2006). A hydrograph for this observation well is included with this report.

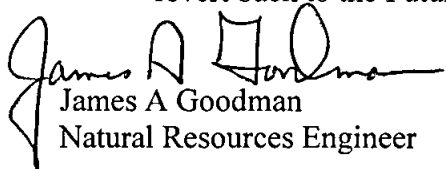
The hydrograph reveals some interesting information. The water levels in this area have been declining gradually for years. The graph shows a total decline of about seven feet since the late 1950's. The decline has been a slow steady process that has been interrupted a few times by wet climatic conditions (recharge) as shown in the mid 1980's and the middle 1990's. It appears that the entrenching of the Missouri River is responsible for these phenomena. This concept was proposed as a reason for declining lake levels for McCook Lake in southern Union County (Iles, 1979). Other observation wells in Union, Clay and Yankton Counties located near the river exhibit the same general characteristics. However, observation wells located a few miles from the river while they show the same general climatic effects do not show the decline.

REVIEW OF EXISTING WATER PERMITS/RIGHTS

The nearest existing irrigation well is about ½ mile northeast of site rural water system site C. This is Water Right No. 5541-3. There are three other irrigation wells located about one mile east and north of both rural water system sites C and D. Interference is not expected to be a concern. Even though the proposed diversion rate is large it is not expected that drawdown will be significant. The nearness of the Missouri River will help maintain the water levels in the production wells. Four of these six wells will be angled wells out under the Missouri River. Two of the proposed wells will be vertical wells one at each site.

CONCLUSIONS

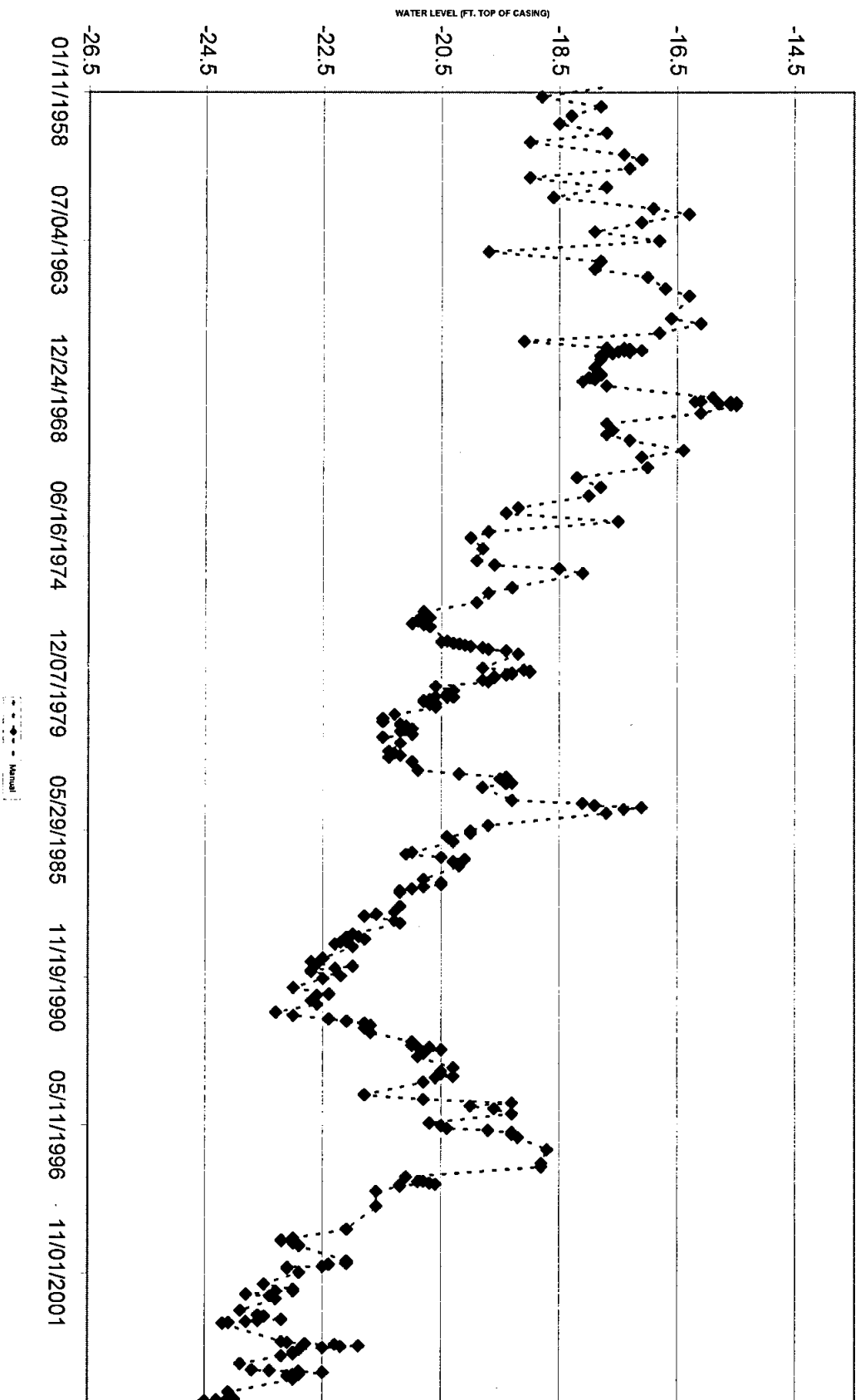
1. Water is available from the Missouri Elk Point aquifer.
2. At this site the aquifer is under water table conditions. Drawdown is not expected to be significant because of the design of the production wells and the close proximity to the Missouri River. Interference is not a concern.
3. The wells authorized by this application must be constructed in accordance with SD Well Construction Standards.
4. This application is to put water to beneficial use that has been reserved by Future Use Permit No. 5832-3. Any water not developed under this application will revert back to the Future Use Permit.


James A Goodman
Natural Resources Engineer

BIBLIOGRAPHY

- Christensen, C.M., J.C. Stephens, 1970, Geology and Water Resources of Clay County, South Dakota, Bulletin 19, SD DENR, SDGS, Vermillion, SD, 57069.
- Hedges, L.S. and others, 1982, Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa, for US Army Corps of Engineers, SD DENR, SDGS, Vermillion, SD, 57069.
- Iles, D.L., 1979, Ground-Water Study for Southern Union County, UR-28, SD DENR, SDGS, Vermillion, SD, 57069.
- Water Rights, 2006, Unpublished Observation Well Records for the Missouri Elk Point Aquifer, SD DENR, DES, Water Rights Program, Pierre, SD, 57501.

WATER RIGHTS' OBSERVATION WELL CL-80C





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 6736-3, Lewis and Clark Rural Water System**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 6736-3, Lewis and Clark Rural Water System, c/o Troy Larson, 401 East 8th Street, Suite 306, Sioux Falls SD 57103.

The Chief Engineer is recommending APPROVAL of Application No. 6736-3 because 1) water is appropriated for future use by Permit No. 5832-3, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. The wells approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. The wells authorized by Permit No. 6736-3 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
3. Lewis and Clark Rural Water System shall report to the Chief Engineer annually the amount of water withdrawn from the Missouri:Elk Point Aquifer.

See report on application for additional information.

Garland Erbele, Chief Engineer
August 15, 2006



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

August 16, 2006

Canistota Clipper
PO Box 128
Canistota SD 57012-0128

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 6736-3 to Appropriate Water to be published twice. Please publish the first notice on August 24, 2006 with the second publication 7 days later. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

Please BILL the APPLICANT for the cost of publication. The APPLICANT is Lewis & Clark Rural Water System, % Troy Larson, 401 East 8th St, Suite 306, Sioux Falls SD (Ph # 605-336-8688).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, please send us an affidavit or use the enclosed Proof of Publication form. The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

No. 6736-3

Date _____

We are in receipt of your letter of August 16, 2006 enclosing Notice to Appropriate Water by Application No. 6736-3 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

August 16, 2006

Leader Courier
PO Box 31
Elk Point SD 57025-0310

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Newspaper



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

August 16, 2006

Daily Leader
PO Box 348
Madison SD 57042-0348

ATTENTION: Legal Public Notice

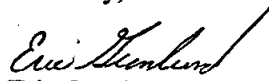
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PMB 2020
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523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

August 16, 2006

Argus Leader
PO Box 5034
Sioux Falls SD 57117

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Joe Foss Building
Pierre SD 57501-3181

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Newspaper



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and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

August 16, 2006

Sioux Valley News
PO Box 255
Canton SD 57013-0255

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Natural Resources Engineer
605 773-3352

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Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

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DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

August 16, 2006

The New Era
PO Box 579
Parker SD 57053

ATTENTION: Legal Public Notice

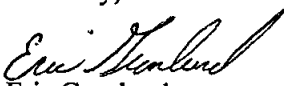
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Natural Resources Engineer
605 773-3352

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TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

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Name

Newspaper

Instruction to Newspaper - Publish first Notice on August 24, 2006 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF HEARING on Application No. 6736-3 to Develop Reserved Water

Notice is given that Lewis and Clark Rural Water System, 401 E 8th St, Suite 306, Sioux Falls SD 57103 has filed an application to construct and place to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri-Elk Point Aquifer (approximately 95 feet deep) located in the W ½ Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second. This water was appropriated and reserved by Future Use Permit No. 5832-3. The Lewis and Clark Rural Water System will be used to serve 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6736-3 because 1) water is reserved by Future Use Permit No. 5832-3, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 2, 2006. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

The Water Management Board will consider this application at 10:00 A.M. October 11, 2006 in the Visitor Center, 650 E Capitol Avenue, Pierre SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The October 11, 2006 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by October 2, 2006.

Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by October 2, 2006, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

Since this application does not involve a monetary controversy in excess of \$2,500.00 or termination of a property right in accordance with SDCL 1-26-18.3, the Chief Engineer has determined this contested case may not be referred to the Office of Hearing Examiners. If any party disagrees with this determination, the Chief Engineer shall be notified by October 2, 2006.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

August 16, 2006

Plain Talk
PO Box 256
Vermillion SD 57069-0256

ATTENTION: Legal Public Notice

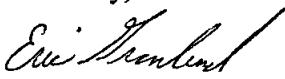
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Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----

No. 6736-3

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of August 16, 2006 enclosing Notice to Appropriate Water by Application No. 6736-3 which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

www.state.sd.us/denr

**NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPERS RIGHT AWAY.**

August 16, 2006

Lewis & Clark Rural Water System
% Troy Larson
401 East 8th St, Suite 306
Sioux Falls SD 57103

Dear Mr. Larson:

Water Permit Application No. 6736-3 for rural water system use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Publisher of the Plain Talk printed at Vermillion, SD (Ph # 605-624-2695), the New Era printed at Parker, SD (Ph #605-297-4419), the Sioux Valley News printed at Canton, SD (Ph # 605-764-2000), the Argus Leader printed at Sioux Falls, SD (Ph # 605-331-2200), the Leader-Courier printed at Elk Point, SD (Ph # 605-356-2632) the Daily Leader printed at Madison, SD (Ph # 605-256-6190) and the Canistota Clipper printed at Canistota, SD (Ph #605-296-3181). You will need to contact the newspapers and authorize publication of this notice. For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspapers to authorize publication of your Notice and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization, the publisher has been instructed to publish your notice once each week for two consecutive weeks. The newspaper has also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

cc: David Odens, Banner Associates Inc, PO Box 298, Brookings SD 57006

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.

AFFIDAVIT OF PUBLICATION-

Customer Number: **078340**
 Invoice Number: **964298**

Water Rights Program

Argus Leader
AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

COUNTY OF MINNEHAHA } ss

Betty Jones being duly sworn, says: That The Argus Leader is, and during all the times hereinafter mentioned was, a daily legal newspaper as defined by SDCL 17-2-21, as amended published at Sioux Falls, Minnehaha County, South Dakota; that affiant is and during all of said times, was an employee of the publisher of such newspaper and has personal knowledge of the facts stated in this affidavit; that the notice, order or advertisement, a printed copy of which is hereto attached, was published in said newspaper upon

Thursday, the 24 day of August 2006,
Thursday, the 31 day of August 2006,
 _____, the _____ day of _____ 2006,
 _____, the _____ day of _____ 2006,
 _____, the _____ day of _____ 2006,
 _____, the _____ day of _____ 2006,
 _____, the _____ day of _____ 2006,

and that \$178.91 was charged for publishing the same

Betty Jones
 Subscribed and sworn to before me 8/31/2006

JACQUELINE ZIMMERMAN
 NOTARY PUBLIC
 SOUTH DAKOTA

J. Zimmerman
 Notary Public, South Dakota

My Commission expires December 22, 2009

State Notices

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State Notices

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Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by October 2, 2006, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

Since this application does not involve a monetary controversy in excess of \$2,500.00 or termination of a property right in accordance with SDCL 1-26-18.3, the Chief Engineer has determined this contested case may not be referred to the Office of Hearing Examiners. If any party disagrees with this determination, the Chief Engineer shall be notified by October 2, 2006.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

964298 Aug. 24 & 31, 2006

RECEIVED
 SEP - 5 2006
 WATER RIGHTS
 PROGRAM

Form 8

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
) SS
County of Lake)

I, Deanna D. Bergheim

certify that the attached printed Notice was
taken

from the Madison Daily Leader

printed and published in City of Madison

County of Lake and

state of South Dakota. The notice was
published

in the newspaper on the following two dates:

Thursday, August 24, 2006

Thursday, August 31, 2006

Cost of Printing _____

Deanna Bergheim
(Signature)

Secretary
(Title)

81.40

(Date Signed)

NOTICE OF HEARING on Application No. 6736-3 to Develop Reserved Water

Notice is given that Lewis and Clark Rural Water System, 401 E 8th St., Suite 306, Sioux Falls, SD 57103 has filed an application to construct and place to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri: Elk Point Aquifer (approximately 95 feet deep) located in the W 1/2 Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second.

This water was appropriated and reserved by Future Use Permit No. 5832-3. The Lewis and Clark Rural Water System will be used to serve 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6736-3 because 1) water is reserved by Future Use Permit No. 5832-3, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre, SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 2, 2006. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

The Water Management Board will consider this application at 10:00 A.M. October 11, 2006 in the Visitor Center, 650 E Capitol Avenue, Pierre, SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The October 11, 2006 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by October 2, 2006.

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These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by October 2, 2006, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

Since this application does not involve a monetary controversy in excess of \$2,500.00 or termination of a property right in accordance with SDCL 1-26-18.3, the Chief Engineer has determined this contested case may not be referred to the Office of Hearing Examiners. If any party disagrees with this determination the Chief Engineer shall be notified by October 2, 2006.

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STEVEN M. PIRNER,
Secretary, Department
of Environment and
Natural Resources

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WATER RIGHTS
PROGRAM

Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF LINCOLN

JULIE GERBER

being first duly sworn on her oath says; that the Sioux Valley News is a legal weekly newspaper of general circulation as required by South Dakota Code of Nineteen Hundred Thirty-Nine, and any acts amendatory thereto, printed and published by the Sioux Valley News, Inc., in Canton, in said county and State, and has been such legal newspaper during the time hereinafter mentioned; that she is and during all of said time was bookkeeper of said newspaper and has personal knowledge of the facts stated in this affidavit; that the advertisement headed:

NOTICE OF HEARING ON APPLICATION NO 6736-3

a printed copy of which is hereto attached, was printed and published in said newspaper for **TWO** successive weeks upon the following dates, to-wit:

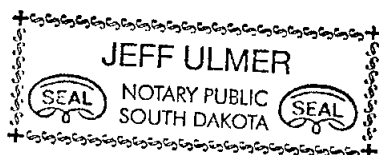
AUGUST 24, 2006
AUGUST 31, 2006

that the full amount of the fees charged for publishing the same to-wit: the sum of **\$56.61** insures solely to the benefit of the publishers of said newspaper; that no agreement or understanding for any division of this sum has been made with any other person; and that no part of said sum has been agreed to be paid to any person whomsoever.

Subscribed and sworn to before me this **31st** day of
AUGUST, 2006.

Jeff Ulmer
Notary Public, South Dakota

(Seal)



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SEP - 5 2006
WATER RIGHTS
PROGRAM

NOTICE OF HEARING on Application No. 6736-3 To Develop Reserved Water

Notice is given that Lewis and Clark Rural Water System, 401 E 8th St, Suite 306, Sioux Falls SD 57103 has filed an application to construct and place to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri: Elk Point Aquifer (approximately 95 feet deep) located in the W 1/2 Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second. This water was appropriated and reserved by Future Use Permit No. 5832-3. The Lewis and Clark Rural Water System will be used to serve 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6736-3 because 1) water is reserved by Future Use Permit No. 5832-3, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 2, 2006. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

The Water Management Board will consider this application at 10:00 A.M. October 11, 2006 in the Visitor Center, 650 E Capitol Avenue, Pierre SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The October 11, 2006 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by October 2, 2006.

Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by October 2, 2006, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

Since this application does not involve a monetary controversy in excess of \$2,500.00 or termination of a property right in accordance with SDCL 1-26-18.3, the Chief Engineer has determined this contested case may not be referred to the Office of Hearing Examiners. If any party disagrees with this determination, the Chief Engineer shall be notified by October 2, 2006.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru

AFFIDAVIT OF PUBLICATION

State of South Dakota, County of Clay, ss.

Penny Tucker

Being first duly sworn, deposes and says: That he/she is a resident of the County of Clay and State of South Dakota; that

THE PLAIN TALK

is a legal newspaper of general circulation, printed and published in Vermillion, in said County and State, by Broadcaster Press, Inc., and is now and has been such newspaper continuously during all the times hereinafter mentioned; that affiant is and was during all the time hereinafter mentioned in charge of the advertising department thereof, and has personal knowledge of all the facts stated in this affidavit: and that the notice and advertisement headed:

NOTICE OF HEARING

APPLICATION NO. 6736-3

a printed copy of which is hereunto attached and made a part hereof, was printed and published in the said newspaper at least once in each week

for 2 successive weeks; that said newspaper at the time of the first publication of said notice hereinafter stated, had, and still has, a bona fide circulation of over two-hundred paid copies weekly, and had been published in the said county of Clay for more than one year immediately prior to the date of the said publication of said notice, and that said newspaper during said times, was, and is, printed in part in an office maintained at said city of Vermillion, the said place of publication; that the first publication of said notice in said newspaper as aforesaid

was on Friday, the 25th day of August, 20 06, and that the succeeding publications were severally

on Friday, the 1st day of September, 20 06,

on Friday, the _____ day of _____, 20 _____,

on Friday, the _____ day of _____, 20 _____,

on Friday, the _____ day of _____, 20 _____,

that the fees charged for the printing and publication of the said notice and advertisement in said newspaper as aforesaid were

Seventy-one dollars and 06 cents

and that said fees for the printing and publishing of said notice and advertisement have been fully paid; that the full amount of the fee charged for the publishing of the said attached annexed notice and advertisement inures to the benefit of the publisher of the said newspaper, that no agreement or understanding for the division thereof has been made with any other person and that no part thereof has been agreed to be paid to any other person whomsoever.

Penny Tucker

Subscribed and sworn to before me

this

1st day of September, 20 06
JOAN E. WILLEROTH

NOTARY PUBLIC
SOUTH DAKOTA

My Commission Expires 04/17/2011

NOTICE OF HEARING ON APPLICATION NO. 6736-3 TO DEVELOP RESERVED WATER

Notice is given that Lewis and Clark Rural Water System, 401 E 8th St, Suite 306, Sioux Falls SD 57103 has filed an application to construct and place to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri: Elk Point Aquifer (approximately 95 feet deep) located in the W 1/2 Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second. This water was appropriated and reserved by Future Use Permit No. 5832-3. The Lewis and Clark Rural Water System will be used to serve 20 public water systems in Turner, Lincoln, Minneha-ha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6736-3 because 1) water is reserved by Future Use Permit No. 5832-3, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605-773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 2, 2006. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

The Water Management Board will consider this application at 10:00 A.M. October 11, 2006 in the Visitor Center, 650 E Capitol Avenue, Pierre SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The October 11, 2006 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by October 2, 2006.

Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court

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Notary Public
SEP - 8 2006
WATER RIGHTS
PROGRAM

and State Supreme Court as provided by law. Contact Eric Gronlund by October 2, 2006, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

Since this application does not involve a monetary controversy in excess of \$2,500.00 or termination of a property right in accordance with SDCL 1-26-18.3, the Chief Engineer has determined this contested case may not be referred to the Office of Hearing Examiners. If any party disagrees with this determination, the Chief Engineer shall be notified by October 2, 2006.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Publish: August 25 & September 1, 2006

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)

County of Union) SSI, Susan Odson

certify that the attached printed Notice was taken

from the Leader-Courierprinted and published in Elk PointCounty of Union and

state of South Dakota. The notice was published

in the newspaper on the following two dates:

August 31, 2006September 7, 2006Cost of Printing \$ 61.25

(Signature)

Affidavits Coordinator

(Title)

(Date Signed)

**NOTICE OF HEARING ON
APPLICATION NO. 6736-3
TO DEVELOP
RESERVED WATER**

Notice is given that Lewis and Clark Rural Water System, 401 E. 8th St, Suite 306, Sioux Falls SD 57103 has filed an application to construct and place to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri: Elk Point Aquifer (approximately 95 feet deep) located in the W1/2 Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second. This water was appropriated and reserved by Future Use Permit No. 5832-3. The Lewis and Clark Rural Water System will be used to serve 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6737-3 because 1) water is reserved by future Use Permit No. 5832-3, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E. Capitol, Pierre, SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by October 2, 2006. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-16. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by October 2, 2006, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

Since this application does not involve a monetary controversy in excess of \$2,500.00 or termination of a property right in accordance with SDCL 1-26-18.3, the Chief Engineer has determined this contested case may not be referred to the Office of Hearing Examiners. If any party disagrees with this determination, the Chief Engineer shall be notified by October 2, 2006.

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Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Publish August 31 and September 7, 2006
35-4

RECEIVED

SEP 11 2006

WATER RIGHTS
PROGRAM

Affidavit of Publication

STATE OF SOUTH DAKOTA)

:SS

COUNTY OF McCOOK:)

The undersigned, being first duly sworn, on his oath says: THE CANISTOTA CLIPPER is a weekly newspaper of general circulation, printed and published in the City of Canistota, McCook County, South Dakota, by MATTHEW ANDERSON, and has been such newspaper during the times hereinafter mentioned: that it has bona fide circulation of more than 200 copies weekly; that it has been published within said County of McCook in the English language and admitted to the United States mail under the second class mailing privilege for more than one year next prior to the publication of the notice hereinafter mentioned, and has been printed during such period and at the present time in part in an office maintained at the said place of publication: that I, the undersigned, am either the publisher or an employee of the said publisher of said newspaper and have personal knowledge of all the facts stated in the affidavit: that the advertisement headed

Notice of Hearing

a printed copy of which is hereto attached, was printed and published in the said newspaper for two (2) successive weeks; that said notice was published in the issues of said paper on the dates as follows, to-wit:

The first publication be made on 8-21

The second publication on 8-31

The third publication on _____

The fourth publication on _____

that 77.98 Being the full amount of the fee for publication of the annexed notice, insured solely to the benefit of the publisher of the said newspaper, that no agreement or understanding for the division thereof have been made with any other person whomsoever, and that said newspaper is a legal newspaper under the law of the state of South Dakota.

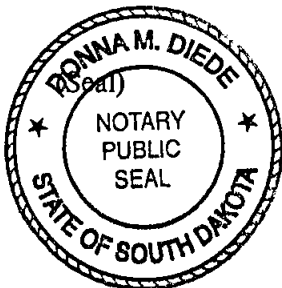
Matthew Anderson

Subscribed and sworn to before me this 7

day of September 20 06

Donna M. Diede
Notary Public, South Dakota

My commission expires 2-2-2010



RECEIVED

SEP 11 2006

WATER RIGHTS
PROGRAM

Notice of Hearing

on Application No. 6736-3 to Develop
Reserved Water

Notice is given that Lewis and Clark Rural Water System, 401 E. 8th St, Suite 306, Sioux Falls, SD 57103 has filed an application to construct and place to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri: Elk Point Aquifer (approximately 95 feet deep) located in the W ½ Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second. This water was appropriated and reserved by Future Use Permit No. 5832-3. The Lewis and Clark Water System will be used to serve 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

Pursuant to SDCL 46-2A-2 the Chief Engineer recommends APPROVAL of Application No. 6736-3 because 1) water is reserved by Future Use Permit No. 5832-3; 2) existing rights will not be unlawfully impaired; 3) it is a beneficial use of water; and 4) it is in the public interest.

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The Water Management Board will consider this application at 10:00 am October 11, 2006 in the Visitor Center, 650 E. Capitol Avenue, Pierre, SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The October 11, 2006 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by October 2, 2006.

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Steven M. Pirner, Secretary,
Department of Environment and Natural
Resources 8-24-2tc

Affidavit of Publication

STATE OF SOUTH DAKOTA } :ss
COUNTY OF TURNER }

RECEIVED

SEP 21 2006

WATER RIGHTS
PROGRAM

I, **Lisa Joffer** of the City of Parker, County of Turner, State of South Dakota, being first duly sworn on oath, deposes and says:

The New Era is a weekly legal newspaper of general circulation, printed and published in the City of Parker, in said County of Turner, by The New Era, Lyon Sioux Press, publishers, and has been such legal newspaper during the times hereinafter mentioned; that the said newspaper has been in existence as such legal newspaper for more than one year prior to the publication of the notice hereunto attached, and has during all of said publication of the notice hereunto attached, and has during all of said time had, and now has, more than 200 bona fide subscribers; that the undersigned, The affiant, is the **Office Manager** of the said newspaper, in charge of the advertisement department thereof and has personal knowledge of all the facts stated in this affidavit and the advertisement headed:

#4060 - application to appropriate
water (Lewis + Clark Rural Water)

See
attached

printed copy of hereto attached, is printed and published in the said newspaper for two successive weeks, once each week and on the same day of the week, on the following dates, to-wit:

On Thursday, the 24th day of Aug., 2006;

On Thursday, the 31st day of Aug., 2006;

On Thursday, the _____ day of _____, 200____;

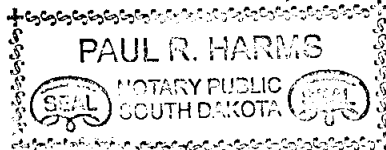
On Thursday, the _____ day of _____, 200____;

On Thursday, the _____ day of _____, 200____;

That \$ 87.52 being the full amount of the fees for publication of the attached notice insures solely for the benefits of the publishers of the said newspaper, that no arrangement or understanding for a division thereof has been made with any other person and that no part thereof has been agreed to be paid to any other person whomsoever.

Lisa Joffer
Subscribed and sworn to before me this 19th
day of September 2006
Paul R Harms

Notary Public, Turner County, South Dakota



My Commission

Expires:

07/10

20 12.

Publication Fees .\$. _____

Notary Fees\$. _____

Total\$ 87.52
1st wk 48.64, 2nd wk 38.88
Received Payment,

**Notice of hearing on
Application No. 6736-3 to
Develop Reserved Water**

Notice is given that Lewis and Clark Rural Water System, 401 E 8th St, Suite 306, Sioux Falls S.D. 57103 has filed an application to construct and place to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri:Elk Point Aquifer (approximately 95 feet deep) located in the W 1/2 Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second. This water was appropriated and reserved by Future Use Permit No. 5832-3. The Lewis and Clark Rural Water System will be used to serve 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6736-3 because 1) water is reserved by Future Use Permit No. 5832-3, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre S.D. 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by Oct. 2, 2006. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

The Water Management Board will consider this application at 10:00 A.M. Oct. 11, 2006 in the Visitor Center, 650 E Capitol Avenue, Pierre SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The Oct. 11, 2006 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by Oct. 2, 2006.

Any hearing will be an adversary

proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by Oct. 2, 2006, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

Since this application does not involve a monetary controversy in excess of \$2,500 or termination of a property right in accordance with SDCL 1-26-18.3, the Chief Engineer has determined this contested case may not be referred to the Office of Hearing Examiners. If any party disagrees with this determination, the Chief Engineer shall be notified by Oct. 2, 2006.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.

Steven M. Pirmer,
Secretary,
Department of Environment and
Natural Resources.
(#4060, 8/24/06, 8/31/06,
The New Era)

Instruction to Newspaper - Publish first Notice on August 25, 2006 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF HEARING on Application No. 6736-3 to Develop Reserved Water

Notice is given that Lewis and Clark Rural Water System, 401 E 8th St, Suite 306, Sioux Falls SD 57103 has filed an application to construct and place to beneficial use 20,165 acre-feet of water annually from six wells completed into the Missouri:Elk Point Aquifer (approximately 95 feet deep) located in the W ½ Section 22-T32N-R4E (Nebraska Survey). The diversion rate from the wells will be 27.85 cubic feet of water per second. This water was appropriated and reserved by Future Use Permit No. 5832-3. The Lewis and Clark Rural Water System will be used to serve 20 public water systems in Turner, Lincoln, Minnehaha, Union, Clay, McCook and Lake Counties in South Dakota as well as Lyon, Sioux, O'Brien and Osceola Counties in Iowa and Rock and Nobles Counties in Minnesota.

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The Water Management Board will consider this application at 10:00 A.M. October 11, 2006 in the Visitor Center, 650 E Capitol Avenue, Pierre SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The October 11, 2006 hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by October 2, 2006.

Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by October 2, 2006, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

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This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-6-3, 46-6-3. 1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

NOV 01 2006

Lewis & Clark Rural Water System
% Troy Larson
401 E 8th St Suite 306
Sioux Falls SD 57103

Dear Mr. Larson:

Enclosed is Water Permit No. 6736-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

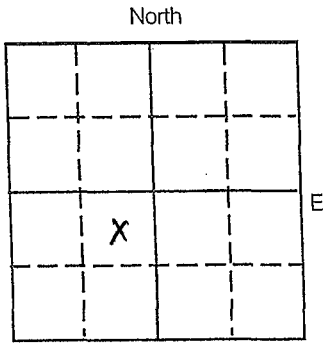
6736-3

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE 1/4 SW 1/4 Sec 22 Twp 91 N Rg 52 W

County Clay



Please mark well location with an "X"

Well Completion Date 10-31-06

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)
? None Known within 1 mile (Identify source)

PROPOSED USE:
☐ Domestic/Stock Irrigation ☒ Rural Water ☐ Municipal ☐ Business ☐ Test Holes ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:
Reverse-Circulation Rotary

CASING DATA: ☒ Steel ☐ Plastic ☐ Other
If other describe _____

EWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
LB/FT	<u>24</u> IN	<u>+8</u> FT	<u>64</u> FT	<u>36</u> IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:	Grout Type	No. of Sacks	Grout Weight	From	To
	<u>Neat Cement</u>	<u>60</u>	Lb/gal	<u>0</u> Ft	<u>20</u> Ft
			Lb/gal	Ft	Ft

Describe grouting procedure _____

SCREEN: ☐ Perforated pipe ☒ Manufactured
Diameter 24 Inches Length 45 Feet
Material #304 Stainless Steel
Slot Size 70 Set From 64 Feet to 109 Feet
Other information Stainless Steel plate on bottom of screen

WAS A PACKER OR SEAL USED? ☐ Yes ☒ No
If so, what material? _____
Describe packer(s) and location _____

DISINFECTION: Was well disinfected upon completion?
☒ Yes, How? Chlorination
☐ No, Why Not? _____
Lab sample sent to for water quality analysis _____

Well Owner: Lewis and Clark Rural Water System
Business Name: Lewis and Clark Rural Water System
Address: 401 E. 8th Street, Suite 306
City, State, Zip: Sioux Falls, S.D. 57103

WELL LOG:	DEPTH	
	FROM	TO
Brown silt	0	3
Gray sand, gravel; wood particles @ 27'; clay seams set 27-35 and 47-55	3	63
Gray sand, gravel with cobbles and boulders	63	121
Limestone	121	

STATIC WATER LEVEL 15 FEET
If flowing: closed in pressure N/A PSI
GPM flow _____ through _____ Inch pipe
Controlled by ☐ Valve ☐ Reducers ☐ Other _____
Reduced flow rate _____ GPM
Can well be completely shut in? _____

WELL TEST DATA:
☒ Pumped Describe: Test Pumped at 2,010 GPM
☐ Bailed
☐ Other
Pumping Level Below Land Surface
34 Ft. After 24 Hrs. pumped 2,010 GPM
34 Ft. After 72 Hrs. pumped 2,010 GPM
If pump installed, pump rate: 2,010 GPM

REMARKS

This well was drilled under license # 735
And this report is true and accurate.
Drilling firm: Cahoy Pump Service
Signature of License Representative: Mark Claassen
Signature of Well Owner or Equitable Property Holder: _____

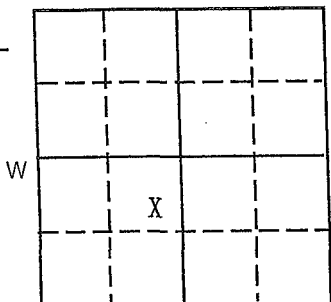
Date: _____ RECEIVED
DEC 26 2006
WATER RIGHTS PROGRAM

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NE ¼ SW ¼ Sec 22 Twp 91N Rg 52W

County Clay

SITE D
06-2Please mark well
location with an "X"Well Completion Date
11-20-06Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)
? 200 ft. from Missouri River (identify source)

PROPOSED USE:

☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Dual Rotary

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

WEIGHT LB/FT	DIAMETER IN	FROM FT	TO FT	HOLE DIAMETER IN
70.59	18	+8	183	24
157.53	30	0	100	30

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight Lb/gal	From Ft	To Ft
Portland	276	15	0	100

Describe grouting procedure Neat cement pumped through
theimi pipe 100' to 0' at 24 degree angled
well.

SCREEN:

☐ Perforated pipe ☒ Manufactured

Diameter 18 Inches Length 55 Feet

Material Stainless V-Slot Johnson

Slot Size Set From 183 Feet to 238 Feet

Other information 183-203 .050 Slot, 203-215 .070 Slot,
215-223 .060 Slot, 223-230 .020 Slot,
230-238 .050 Slot

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? chlorine solution☐ No, Why Not?* ab sample sent to for
water quality analysis

yes

Well Owner: Lewis & Clark Rural Water Association, Inc

Business Name: Lewis & Clark Rural Water Association, Inc

Address:

City, State, Zip: Sioux Falls, SD

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Silty Clay - Brown	0	5
Silty Sand - Brown	5	20
Silty Clay - Gray	20	30
Sand (Med.) - Brown	30	82
Silty Sand w/Clay & Coal Lenses	82	107
Sand & Gravel - Brown	107	126
Sand & Gravel w/Silt Layers	126	141
Sand & Gravel w/Clay Layers	141	171
Sand (Coarse) - Grey	171	180

STATIC WATER LEVEL 14' Vertical FEET

CONT..

If flowing: closed in pressure PSI

GPM flow through Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: Submersible Pump☐ Bailed☐ Other

Pumping Level Below Land Surface

33' Vertical After 72 Hrs. pumped 2,000 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: GPM

REMARKS

Well Drilled at 24 degree angle

← Surface

This well was drilled under license # 600

And this report is true and accurate.

Drilling firm: Mark J. Traut Wells, Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

RECEIVED

Date: 11-22-06

JAN - 5 2007

WATER RIGHTS
PROGRAM

1-5-07

DEPTH

[illegible]

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 22 Twp 91N Rg 52W

County

Clay

SITE C

06-5 Please mark well location with an "X"

Well Completion Date

Oct. 2006

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? 150 ft. from wetland (identify source)

PROPOSED USE:

☐ Domestic/Stock
☐ Irrigation
☒ Municipal
☐ Industrial
☐ Business
☐ Institutional
☐ Test Holes
☐ Monitoring well

METHOD OF DRILLING:

Dual Rotary

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

WEIGHT LB/FT	DIAMETER IN	FROM FT	TO FT	HOLE DIAMETER IN
157.53	30	0	160	30
70.59	18	+4	187	24

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight Lb/gal	From Ft	To Ft
Portland	322	15	160	to surface

Describe grouting procedure

Continuous pump through trimie pipe

SCREEN:

☐ Perforated pipe ☒ ManufacturedDiameter 18 Inches Length 66 FeetMaterial Stainless SteelSlot Size Varied Set From 185 Feet to 251 Feet

Other information .025 from 185-190', .080 from 190-216'
 .065 from 216-227', .045 from 227-230',
 tight wrap from 230'-245', .025 from 245-251'

WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? Flushed with Chlorine☐ No, Why Not?

Lab sample sent to for water quality analysis

Well Owner: Lewis & Clark Rural Water AssociationBusiness Name: Lewis & Clark Rural Water Association

Address:

City, State, Zip: Sioux Falls, SD

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Fine tan sand	0	30
Tan to grey silty sand	30	40
Grey Silty Sand	40	60
Grey Silty Sand & Coal Layers	60	88
Grey Silty Sand, Clay, Gravel	88	100
Grey Silty Sand	100	125
Grey Silty Sand & Gravel	125	130
Grey Silty Sand	130	155
Grey Silty Sand & Clay Layers	155	160

cont...

STATIC WATER LEVEL 16" Vertical FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

15 Ft. After 72 Hrs. pumped 2,200 GPM

Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

+6' 24° Angle
185'
251'

This well was drilled under license # 600

And this report is true and accurate.

Drilling firm: Mark J. Traut Wells, Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

RECEIVED

JAN - 5 2007

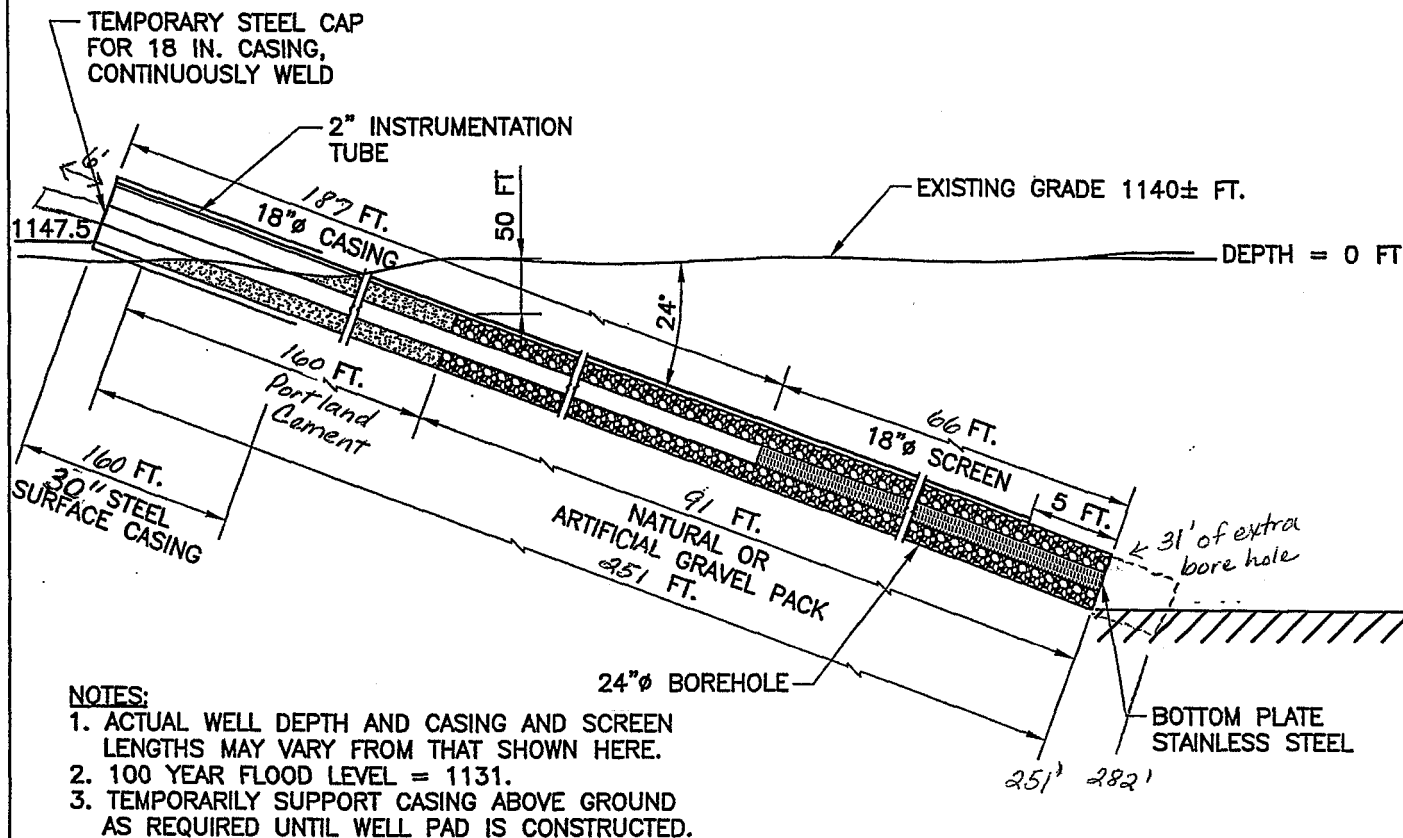
Date: 12-13-06WATER RIGHTS
PROGRAM

1-5-07

DEPTH

[illegible]

06-5



NOT TO SCALE

RECEIVED
JAN - 5 2007
WATER RIGHTS
PROGRAM



Angle Well 06-5 Section Site C

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE
Mar. 2006
SHEET
7 of 12

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE 1/4 NW 1/4 Sec 22 Twp 91N Rg 52W

County

Clay

North

Site C
06-6Please mark well
location with an "X"

W

E

Well Completion Date
11-15-06

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)
? 400 ft. from wetland (identify source)

PROPOSED USE:

☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Dual Rotary

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

WEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
157.53 LB/FT	30 IN	0 FT	160 FT	30 IN
70.59 LB/FT	18 IN	+2 FT	210 FT	24 IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Portland	405	15 Lb/gal	0 Ft	160 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

Continuous pumping thru triemi pipe

SCREEN:

☐ Perforated pipe ☒ ManufacturedDiameter 18 Inches Length 92 FeetMaterial Stainless V-SlotSlot Size Varied Set From 210 Feet to 302 FeetOther information 210-217' .040, 217-229' .025, 229-249' .010, 249-268' .050, 268-273' .060, 273-293' .050, 293-298' .040, 298-302' .035WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? flushed with chlorine☐ No, Why Not?Lab sample sent to for
water quality analysisWell Owner: Lewis & Clark Rural Water Association, Inc.Business Name: Lewis & Clark Rural Water Association, Inc

Address:

City, State, Zip: Sioux Falls, SD

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Fine Sand - Brown	0	50
Fine Sand - Grey	50	60
Fine Sand - Dark Grey	60	70
Silty Sand - Grey	70	105
Gravel/Sand & Clay	105	120
Fine Sand - Grey	120	145
Fine Sand/Clay Lenses - Grey	145	155
Med. Sand - Grey	155	169
Fine Silt & Sand - Grey	169	184

cont..

STATIC WATER LEVEL 17' vertical FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:☐ Bailed☐ Other

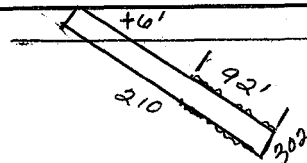
Pumping Level Below Land Surface

16 Ft. After 80 Hrs. pumped 2,200 GPM

Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

This well was drilled under license # 600

And this report is true and accurate.

Drilling firm: Mark J. TrautWells, Inc.

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date: 12-12-06

RECEIVED

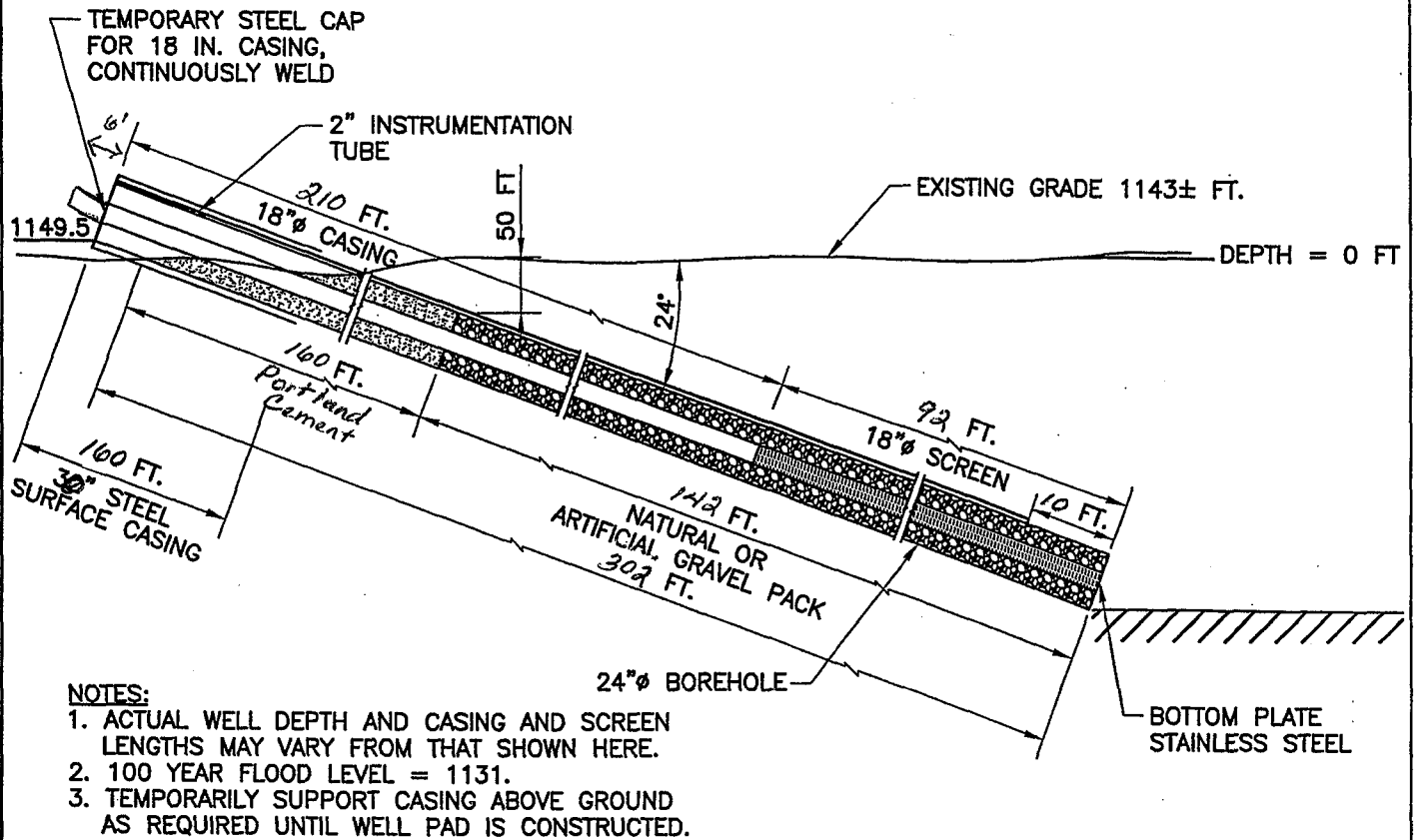
JAN - 5 2007

WATER RIGHTS
PROGRAM

1-5-07

DEPTH

[illegible]



NOT TO SCALE



Angle Well 06-6 Section Site C

Lewis and Clark Rural Water System
Well Field Production Wells—Sites C and D
Sioux Falls, South Dakota

DATE

Mar. 2006

SHEET

8 of 12

SOUTH DAKOTA WATER WELL COMPLETION REPORT

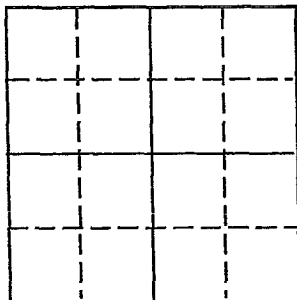
11-02

Location SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 22 Twp 91N Rg 52W

County

Claynorthing 165354.05
easting 2876683.55

07-4 Please mark well location with an "X"

Well Completion Date
8-31-07

1 Mile

Distance to nearest potential pollution source (Septic tank, abandoned well, feed lot, etc.)

? 750 ft. from River (identify source)

PROPOSED USE:

☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test Holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Dual Rotary

CASING DATA: ☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
125.49/FT	24 IN	+2 FT	81 FT	30 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
neat cement	27	18 Lb/gal	0 Ft	20 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 24 Inches Length 46 Feet
 Material Stainless
 Slot Size .070 Set From 81 Feet to 127 Feet
 Other information

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? granular chlorine☐ No, Why Not?

Lab sample sent to for water quality analysis

Well Owner: Lewis & Clark Rural Water Dist.Business Name: SameAddress: 401 East 8th St., Suite 306City, State, Zip: Sioux Falls, SD 57103

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Brown Silty Sand	0	5
Brown Sand Fine	5	45
Gray Coarse Sand	45	50
Gray Clay & Gravel	50	63
Gray Sand & Gravel w/clay lyers	63	80
Gray Coarse Sand & Gravel w/rcks	80	127

STATIC WATER LEVEL 17' below FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☐ Pumped Describe:☐ Bailed☐ Other

Pumping Level Below Land Surface

44' Ft. After 30 Hrs. pumped 800 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: _____ GPM

REMARKS

RECEIVED

SEP 24 2007

WATER RIGHTS
PROGRAMThis well was drilled under license # 600

And this report is true and accurate.

Drilling firm: MARK J TRAUT WELLS, INC.

Signature of License Representative

Signature of Well Owner or Equitable Property Holder:

Date: _____

McMath, Genny

From: McMath, Genny
Sent: Tuesday, August 23, 2011 9:37 AM
To: McMath, Genny
Subject: FW: Lewis & Clark Rural Water Info Update

Water Permits this pertains to: 5832-3, 6736-3, 6869-3, 6869A-3, 7207-3, 7208-3

From: Froelich, Stacy
Sent: Tuesday, August 23, 2011 9:30 AM
To: DENR FINANCIAL & TECH ASSIST; DENR ENVIRONMENTAL SERVICES
Subject: Lewis & Clark Rural Water Info Update

Effective Monday, August 29, the mailing address will be 46986 Monty Street, Tea, SD 57064. Telephone lines will not be installed until Sept. 1. The calls to the office will be forwarded to a cell phone for a few days. **The new telephone number will be 605-368-2400 and our fax number will be 605-368-2800.** The e-mail addresses will not change.

6736-3

SD EForm - 1621LD V1

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

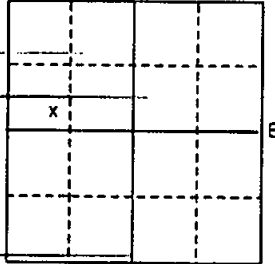
Location SW 1/4 NW 1/4 Sec 22 Twp 32N Rg 4E
SE 1/4 SW 1/4 35 92N 52WCounty ClayNorth AM 1/28/19Please mark well
location with an "X"

42° 44' 1.76" N

96° 57' 13.74" W

per driller

AM 1/28/19



Well Completion Date

November 3, 2018

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
7,000.0 ft. from Farm in Section 14 (identify source)

PROPOSED USE:

☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test holes
☐ Irrigation ☒ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Reverse circulation

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
189.7 LB/FT	36.00 IN	9.0 FT	92.0 FT	48.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Neat Cement	69	10.0 Lb/gal	12.0 Ft	20.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

Pumped using tremie pipe.

SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 36.00 Inches Length 40.0 FeetMaterial Stainless steel wire wrapSlot Size 0.050" Set From 92.0 Feet to 132.0 FeetOther information SST plate attached to bottom of screen.WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? w/50 ppm residual☐ No, Why Not?

Lab to which water

quality sample sent for analysis

Public Health Lab in Sioux Falls

Well Owner: Lewis & Clark Regional Water System

Business Name:

Address: 46986 Monty StreetCity, State, Zip: Tea SD 57064

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Brown sand w/clay streaks	0	38
Fine sand w/trace coarse sand	38	87
Med-coarse sand w/fines & gravel	87	113
Med-coarse sand w/gravel & boulders	113	132
Gray clay & shale	132	137

STATIC WATER LEVEL 24.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: Complete 8-hour step test followed by a 72-hour constant-rate test at 2445 gpm.☐ Bailed☐ Other

Pumping Level Below Land Surface

38.0 Ft. After 72.0 Hrs. pumped 2,445.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: 2,445.0 GPM

REMARKS

The well casing was cut off approximately 9' below existing grade after completion to allow for installation of a below-grade vault by others.

This well was drilled under license # 513 and this report is true and accurate.Drilling firm: Layne Christensen Company

Signature of License Representative:

R. Bowles - R. Bowles

Signature of Well Owner or Equitable Property Holder:

J. OwenDate: 1-28-19

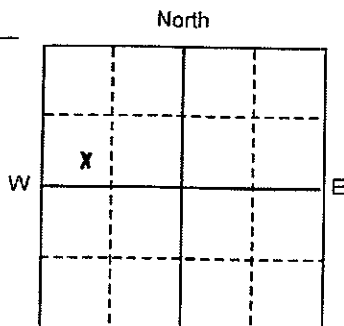
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JAN 28 2019

WATER RIGHTS
PROGRAM

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW ¼ NW ¼ Sec 22 Twp 32N Rg 4ECounty ClayPlease mark well
location with an "X"

Well Completion Date

November 3, 2018

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
7,000.0 ft. from Farm in Section 14 (identify source)

PROPOSED USE:

☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Reverse circulation

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
189.7 LB/FT	36.00 IN	9.0 FT	92.0 FT	48.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Neat Cement	69	10.0 Lb/gal	12.0 Ft	20.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

Pumped using tremie pipe.

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 36.00 Inches Length 40.0 Feet
Material Stainless steel wire wrapSlot Size 0.050" Set From 92.0 Feet to 132.0 FeetOther information SST plate attached to bottom of screen.

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION:

Was well disinfected upon completion?

☒ Yes, How? w/50 ppm residual
☐ No, Why Not?

Lab to which water

quality sample sent for analysis

Public Health Lab in Sioux Falls

Well Owner: Lewis & Clark Regional Water System

Business Name:

Address: 46986 Monty StreetCity, State, Zip: Tea SD 57064

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Brown sand w/clay streaks	0	38
Fine sand w/trace coarse sand	38	87
Med-coarse sand w/fines & gravel	87	113
Med-coarse sand w/gravel & boulders	113	132
Gray clay & shale	132	137

STATIC WATER LEVEL 24.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe:

Complete 8-hour step test followed by a 72-hour constant-rate test at 2445 gpm.

☐ Bailed☐ Other

Pumping Level Below Land Surface

38.0 Ft. After 72.0 Hrs. pumped 2,445.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: 2,600.0 GPM

REMARKS

This is LCRWS Well 06-06.

The well casing was cut off approximately 9' below existing grade after completion to allow for installation of a below-grade vault by others.

This well was drilled under license # 513 and this report is true and accurate.Drilling firm: Layne Christensen Company

Signature of License Representative:

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Signature of Well Owner or Equitable Property Holder:

DEC 11 2019

Date: 12-9-19WATER RIGHTS
PROGRAM

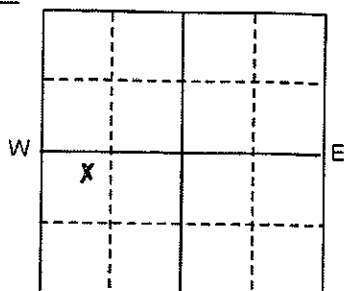
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location NW ¼ SW ¼ Sec 22 Twp 32N Rg 4E

County Clay

North

Please mark well
location with an "X"

Well Completion Date

July 24, 2019

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
7,300.0 ft. from Farm in Section 14 (identify source)

PROPOSED USE:

☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Reverse circulation

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
189.7 LB/FT	36.00 IN	10.0 FT	97.0 FT	48.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Neat Cement	69	10.0 Lb/gal	12.0 Ft	20.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
Pumped using tremie pipe.

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 36.00 Inches Length 40.0 Feet

Material Stainless steel wire wrap

Slot Size 0.050" Set From 97.0 Feet to 137.0 Feet

Other information SST plate attached to bottom of screen.

WAS A PACKER OR SEAL USED?

☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? w/50 ppm residual

☐ No, Why Not?
Lab to which water
quality sample sent for analysis

Public Health Lab in Sioux Falls

Well Owner: Lewis & Clark Regional Water System

Business Name:

Address: 46986 Monty Street

City, State, Zip: Tea SD 57064

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Fill	0	3
Brown & gray clay	3	18
Brown-gray fine-medium sand	18	49
Gray clay	49	52
Med-fine sand w/coarse	52	65
Gray clay	65	69
Fine, medium & coarse sand	69	98
Med-coarse sand w/fines, gravel and boulders	98	137

STATIC WATER LEVEL 23.1 FEET

If flowing: closed in pressure PSI

GPM flow through Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: Complete 8-hour step test followed by a 72-hour constant-rate test at 2445 gpm.
☐ Bailed
☐ Other

Pumping Level Below Land Surface

39.7 Ft. After 72.0 Hrs. pumped 2,400.0 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: 2,325.0 GPM

REMARKS

This is LCRWS Well 06-05.

The well casing was cut off approximately 10' below existing grade after completion to allow for installation of a below-grade vault by others.

This well was drilled under license # 513 and this report is true and accurate.

Drilling firm: Layne Christensen Company

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date: 12-9-19

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WATER RIGHTS
PROGRAM

SOUTH DAKOTA WATER WELL COMPLETION REPORT

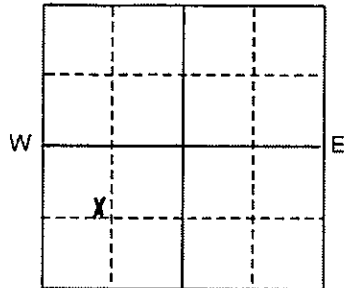
11-02

Location NW ¼ SW ¼ Sec 22 Twp 32N Rg 4E

County Clay

North

Please mark well location with an "X"



Well Completion Date

May 3, 2019

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?

7,800.0 ft. from Farm in Section 14 (identify source)

PROPOSED USE:

☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Reverse circulation

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
189.7 LB/FT	36.00 IN	10.0 FT	94.0 FT	48.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Neat Cement	69	10.0 Lb/gal	12.0 Ft	20.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
Pumped using tremie pipe.

SCREEN:

☐ Perforated pipe ☒ Manufactured

Diameter 36.00 Inches Length 35.0 Feet

Material Stainless steel wire wrap

Slot Size 0.060" Set From 94.0 Feet to 129.0 Feet

Other information SST plate attached to bottom of screen.

WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? w/50 ppm residual☐ No, Why Not?

Lab to which water quality sample sent for analysis

Public Health Lab in Sioux Falls

Well Owner: Lewis & Clark Regional Water System

Business Name:

Address: 46986 Monty Street

City, State, Zip: Tea SD 57064

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Brown silty clay	0	23
Fine gray sand	23	52
Medium-coarse sand	52	68
Fine/medium sand w/trace clay	68	87
Medium-coarse sand & gravel	87	104
Med-coarse sand, gravel & boulders	104	129

STATIC WATER LEVEL 22.7 FEET

If flowing: closed in pressure PSI

GPM flow through Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: Completed 8-hour step test followed by a 72-hour constant-rate test at 2400 gpm.☐ Bailed☐ Other

Pumping Level Below Land Surface

41.4 Ft. After 72.0 Hrs. pumped 2,400.0 GPM

Ft. After Hrs. pumped GPM

If pump installed, pump rate: 2,137.0 GPM

REMARKS

This well is LCRWS Well 06-02.

The well casing was cut off approximately 10' below existing grade after completion to allow for installation of a below-grade vault by others.

This well was drilled under license # 513 and this report is true and accurate.

Drilling firm: Layne Christensen Company

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

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WATER RIGHTS PROGRAM

Date

12-9-19

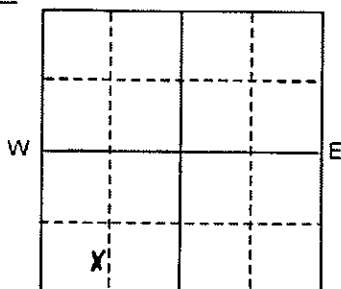
SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SW ¼ SW ¼ Sec 22 Twp 32N Rg 4ECounty Clay

North

Please mark well location with an 'X'



Well Completion Date

August 14, 2019

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?

8,200.0 ft. from Farm in Section 14 (identify source)

PROPOSED USE:

☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test holes
☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well

METHOD OF DRILLING:

Reverse circulation

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
189.7 LB/FT	36.00 IN	10.0 FT	82.0 FT	48.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
Neat Cement	69	10.0 Lb/gal	12.0 Ft	20.0 Ft
		Lb/gal	Ft	Ft

Describe grouting procedure
Pumped using tremie pipe.

SCREEN:

☐ Perforated pipe ☒ Manufactured
Diameter 36.00 Inches Length 35.0 FeetMaterial Stainless steel wire wrapSlot Size 0.050" Set From 82.0 Feet to 117.0 FeetOther information SST plate attached to bottom of screen.WAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? w/50 ppm residual☐ No, Why Not?

Lab to which water quality sample sent for analysis

Public Health Lab in Sioux FallsWell Owner: Lewis & Clark Regional Water System

Business Name:

Address: 46986 Monty StreetCity, State, Zip: Tea SD 57064

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Fill, clay and debris (trees)	0	16
Gray clay	16	22
Fine-medium brown sand	22	48
Gray clay	48	51
Fine-medium gray sand	51	77
Med-coarse gravel	77	87
Coarse sand to fine gravel	87	97
Med-coarse sand w/gravel & cobbles	97	107
Fine gray sand	107	117

STATIC WATER LEVEL 23.0 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other _____

Reduced flow rate _____ GPM

Can well be completely shut in?

WELL TEST DATA:

☒ Pumped Describe: Completed 8-hour step test followed by a 72-hour constant-rate test at 2400 gpm.
☐ Bailed
☐ Other

Pumping Level Below Land Surface

34.3 Ft. After 72.0 Hrs. pumped 2,100.0 GPM

_____ Ft. After _____ Hrs. pumped _____ GPM

If pump installed, pump rate: 2,034.0 GPM

REMARKS

This well is LCRWS Well 03-01.

The well casing was cut off approximately 10' below existing grade after completion to allow for installation of a below-grade vault by others.

This well was drilled under license # 513 and this report is true and accurate.Drilling firm: Layne Christensen Company

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date: 12-9-19

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WATER RIGHTS PROGRAM

Lewis & Clark RWS

Well Sites C & D

Legend

-  LCRWS Well
-  Well Site C
-  Well Site D

42.736405°
-96.953844°

LCRWS Well 06-06

42.734201°
-96.953181°

LCRWS Well 06-05

42.731426°
-96.952641°

LCRWS Well 06-02

42.729494°
-96.952235°

LCRWS Well 03-01

Well Site C

Well Site D

19

Google Earth

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1000 ft