

WATER PERMIT NO. 7232-3

Name of Applicant: City of Sioux Falls

Address: 224 W 9th St, Sioux Falls SD 57104

Phone: 605 373-6944

Amount of Water Claimed: 4.487

Total Acres: 3247 AF

Source of Water Supply: groundwater

Water to be used for: municipal

County: Minnehaha

Type of Waste Disposal System:

Location:

PRIORITY

Date Received: 2-24-2011

Application/License Fee: \$300

Corrected Application Received:

Period of Annual Use: January 1 – December 31

Remarks: Transfer diversion authorized of 2.65 cfs (1918 AF) from WR 1306-3 and transfer diversion authority of 1.836 cfs (1329 AF) from No. 1347-3

Diversion Point: SE ¼ SE ¼ Sec 29-T102N-R49W

Land to be Irrigated:

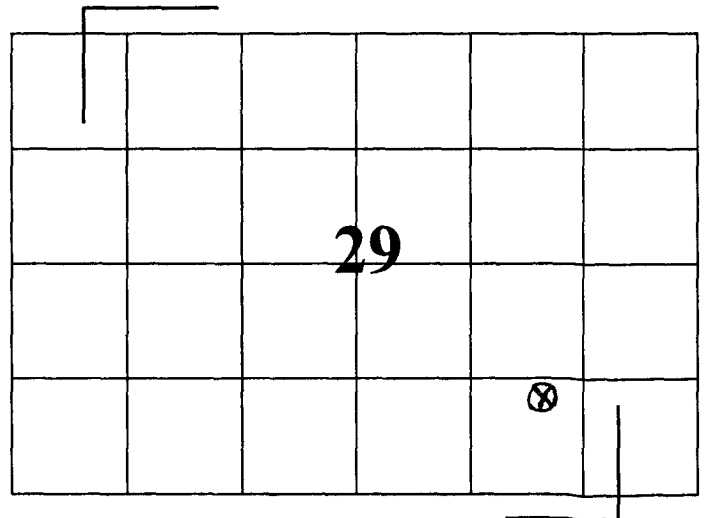
Depth of Well: 41.8 feet

Well Driller:

Remarks:

Type of Map: aerial

Prepared by: Jeffrey Dunn, PE



Reviewed and the Number Assigned on: 2-28-2011

By: Karen Schlaak

Notice of Hearing - date to intervene: _____

Mail to:
PMB 2020
DENR - Water Rights
523 E Capitol Ave
Pierre, SD 57501-3182
ph. (605) 773-3352

(office use only)
No. 7232-3 Hydrologic Unit 10170203
Basin Sioux River
Newspaper Argus Leader & Sioux Valley News

RECEIVED

FEB 24 2011

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. _____
☒ Amendment/Correction to Permit No. 1306-3, 1347-3

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.) 8

Transfer the remaining diversion authority from WR 1306-3 of 2.65 cfs and 1,919 AF.
Transfer additional diversion authority of 1.837 cfs and 1,329 AF from WR 1347-3.

1. Name of Applicant City of Sioux Falls Phone 605-373-6944(check one) ☒ Owner ☐ Tenant/lessee

Mailing Address 224 West 9th Street Sioux Falls SD 57104
(Address) (City) (State) (Zip Code)

2. Amount of water claimed 4.487 *CFS or 2014 **GPM 3248 ***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 Big Sioux Aquifer4. Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) County Minnehaha

One well in the SE 1/4 of the SE 1/4 section 29, Township 102 north, Range 49 west, Minnehaha County, South Dakota.

5. County or counties where water will be used Minnehaha and Lincoln6. Annual period during which water is to be used January 1 through December 31 annually.

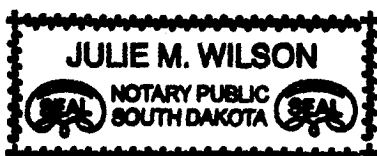
7. Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

The City of Sioux Falls completed work on a new horizontal collector well #62 constructed for domestic use by the City of Sioux Falls, SD. The well is located approximately 1,900 feet east of the Big Sioux River and 1,000 feet north of 60th street north. Well is connected to existing water main, water will be pumped to the Purification Plant for treatment. See the attached information.

STATE OF SOUTH DAKOTA)
County of Minnehaha) SS

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

I, Greg Anderson, 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 Greg AndersonSubscribed and sworn to before me this 22nd day of February 20 11

Julie M. Wilson
Notary Public signature
11/8/11

Supplemental Information

(type or print in ink)

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 19 feet Depth 41.8 feet
- b) Casing Type concrete Diameter 16 feet Thickness 1.5 feet
- c) Screen Type 304 stainless Diameter 12 inch Thickness .375 inches
- d) Gravel Pack _____ Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material 7.6 feet
- f) Depth to Water (ground surface to water level) 3.3 feet
- g) Distance to nearest existing domestic well:
- On applicant's property Yes On property owned by others _____

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

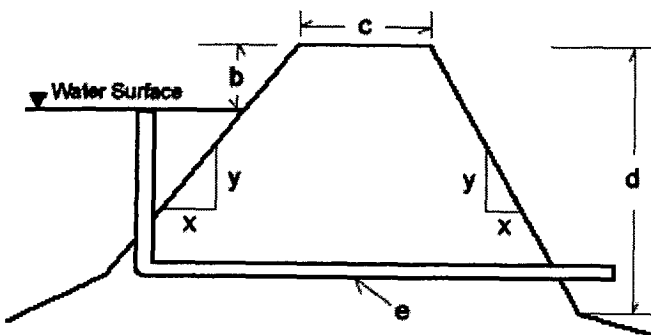
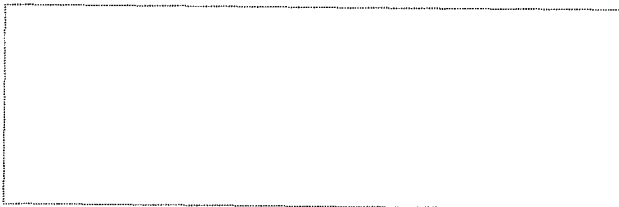
3. Dugout Information

- 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 (e.g. 3 to 1 is a typical slope)
Upstream _____
Downstream _____
- h) Surface Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres

SOUTH DAKOTA
WATER PERMIT NO. 7232-3

Date of first receipt of application February 24, 2011.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 7232-3 to the City of Sioux Falls, c/o Greg Anderson, 224 West 9th St, Sioux Falls SD 57104 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. 7232-3 amends Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the Big Sioux Aquifer. Water Right No. 1306-3 authorized diversion of 1,918 acre feet of water annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well located in the NW 1/4 Section 9-T101N-R49W. The city is requesting to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE 1/4 SE 1/4 Section 29-T102N-R49W. To maximize the horizontal collector well potential, the city is also requesting to transfer a portion of the diversion authority under Water Right No. 1347-3. Water Right No. 1347-3 authorized diversion of 5,611 acre feet of water annually and a maximum rate of 7.75 cfs from a well located in the SW 1/4 SW 1/4 Section 4-T101N-R49W. This permit authorizes the transfer of 1,329 acre-feet of the diversion authority and accompanying diversion rate of 1.837 cfs authorized by Water Right No. 1347-3 to the horizontal collector well. This permit will transfer diversion authority totaling 3,247 acre-feet of water annually at a maximum diversion rate of 4.487 cfs of existing water rights to the new horizontal collector well. No additional water is being appropriated by this permit.
2. The water appropriated shall be used for the purpose of municipal use 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 of approval of Permit No. 7232-3 is September 5, 2011.
5. The dates from which applicant may claim right are as follows:

September 8, 1966 (established by Water Right No. 1306-3) for 1,918 AF
with diversion rate of 2.65 cfs and
January 10, 1967 (established by Water Right No. 1347-3) for 1,329 AF
with diversion rate of 1.837 cfs
6. One-fifth of the construction is to be completed on or before March 5, 2014.
7. All construction is to be completed on or before September 5, 2016.
8. Water is to be put to beneficial use on or before September 5, 2020.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

(continued)

QUALIFICATIONS

1. If development and pumping of the well authorized by this permit results in impairment of adequate domestic wells or adequate wells having prior water rights, reduction of withdrawals or mitigation may be necessary. SDCL 46-1-5(1), in giving preference to domestic use over appropriative rights does so without regard to whether lowered groundwater levels are due to drought, the location of the domestic wells in the aquifer, or thickness of the water bearing sands and gravel; subject to compliance with minimum requirements for adequate wells as defined by Board Well Construction Standards, Chapter 74:02:04.
1. Water Permit No. 7232-3 authorizes a total annual diversion of 3,247 acre feet of water (1,918 ac-ft/annually established by Water Right No. 1306-3 and 1,329 ac-ft/annually established by Water Right No. 1347-3).
3. The City of Sioux Falls shall plug the existing well authorized by Water Right No. 1306-3 in accordance with Water Management Board Rules, Chapter 74:02:04 within thirty days of the new well being brought on-line.
4. The City of Sioux Falls shall report to the Chief Engineer annually the amount of water withdrawn from the Sioux Falls Management Unit of the Big Sioux Aquifer.

WATER MANAGEMENT BOARD

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

OCT 21 2011
date





Well 62

in the SE 1/4 of Section 29, T 102 N, R 49 W of the 5th P.M., Minnehaha County, South Dakota



Map Date: February 4, 2011
Image Date: April 28, 2008

0 200 400
Feet

5.0 SUMMARY AND RECOMMENDATIONS

John Reynolds & Sons, Inc. under contract to the City of Sioux Falls, South Dakota, has completed the caisson and lateral installation and performance testing of Collector Well No. 62, which is to provide the City with up to 1.8 MGD of water. The new collector was constructed with a 16-foot ID concrete caisson that is 41.8 feet deep (from top of the caisson to the top of the final floor). The collector is equipped with four (4) 12-inch ID stainless steel (type 304) wire-wrapped laterals. The laterals range in length from 177 to 187 feet, for a total lineal footage of 728 feet and a total of 700 feet of screen. Screen open area is 917 square feet, equating to an entrance velocity of 0.4 ft/min at the target yield of 1.8 MGD, assuming 50% blockage of the screen slots. The average approach velocity at the outside of the natural gravel pack would be approximately 0.06 ft/min and the average in-line velocity will be 0.9 ft/sec at the target yield.

Reynolds conducted performance testing of the new collector well to determine the installed capacity. This testing was comprised of an 8-hour multiple-rate step test and a 3-day constant-rate test on the new collector well. During the testing, water level and pumping data and other information were collected at pertinent intervals to evaluate the efficiency and productivity of the new collector well.

The multiple-rate test was successfully completed on October 11, 2010; during which the well was pumped at increasing rates of 702, 997, 1296 and 2014 gpm. The drawdowns in the collector well at the end of the steps ranged from 1.87 feet at 702 gpm to 5.31 feet at the highest rate of 2014 gpm. Analysis of the data collected show the horizontal collector well to be very efficient in delivering the available water.

The constant-rate test was successfully completed from October 12 through October 15, 2010 at an average pumping rate of 1820 gpm, with recovery monitored until October 16. During the test, the estimated maximum drawdown in the collector was about 8.05 feet, for a specific capacity of 226 gpm/ft. Projecting the trend drawdown from the end of the constant-rate test for the 16 days

estimated to reach equilibrium would have resulted in 2.2 feet of additional drawdown, equating to a specific capacity of 177 gpm/ft.

The results of the testing of the new collector well are very favorable, indicating that the collector well is capable of yielding in excess of the design target yield of 1.8 MGD; however, the long-term yield will ultimately be dependent on the available recharge. The new collector well should provide the City with an efficient, dependable source of water.

Given the inherent water quality (elevated iron and manganese), routine maintenance of the laterals will be required. It is recommended that once the well becomes operational, a record keeping program be initiated to collect such essential data as: (1) Pumping rates, (2) Pumping levels in the collector well and observation well, (3) Static water level elevations in the collector well and observation well, (4) Water temperature of the pumped water and (5) Water levels for the Big Sioux River or drainage canal. Initially this information should be collected every two weeks and reviewed on a quarterly basis by a person experienced in the analysis and evaluation of this type of operational data. It is anticipated that following the initial 6-month period the monitoring interval can be increased to once a month. This program will provide current and accurate determination of the operating trends of the collector enabling the tracking of the efficiency and yield potential of the well. This will allow future maintenance requirements to be easily assessed and scheduled at opportune times in order to minimize downtime and maximize benefit.

FIGURE 9
Collector Well No. 62
Projected Yields
Sioux Falls, South Dakota

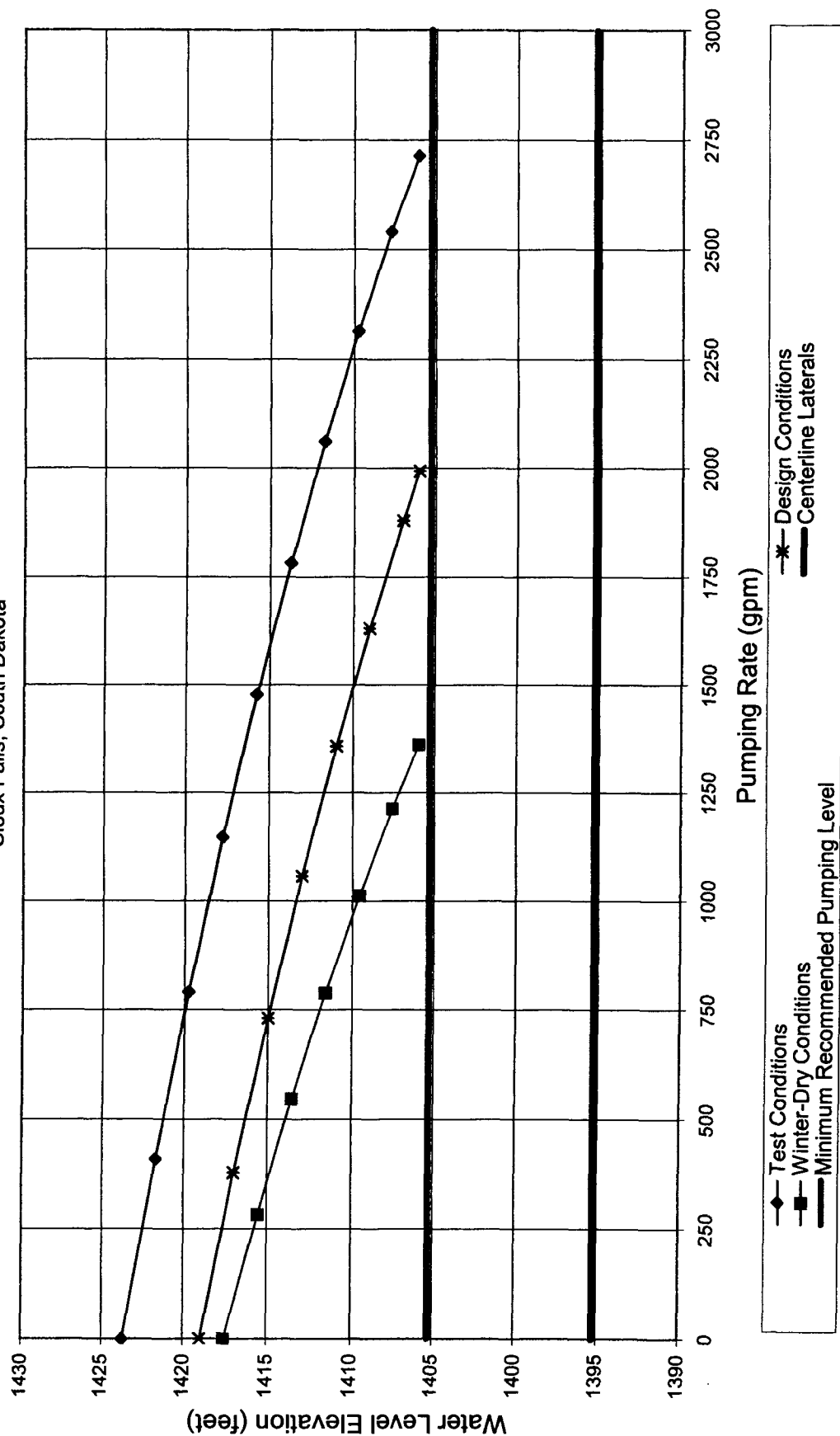
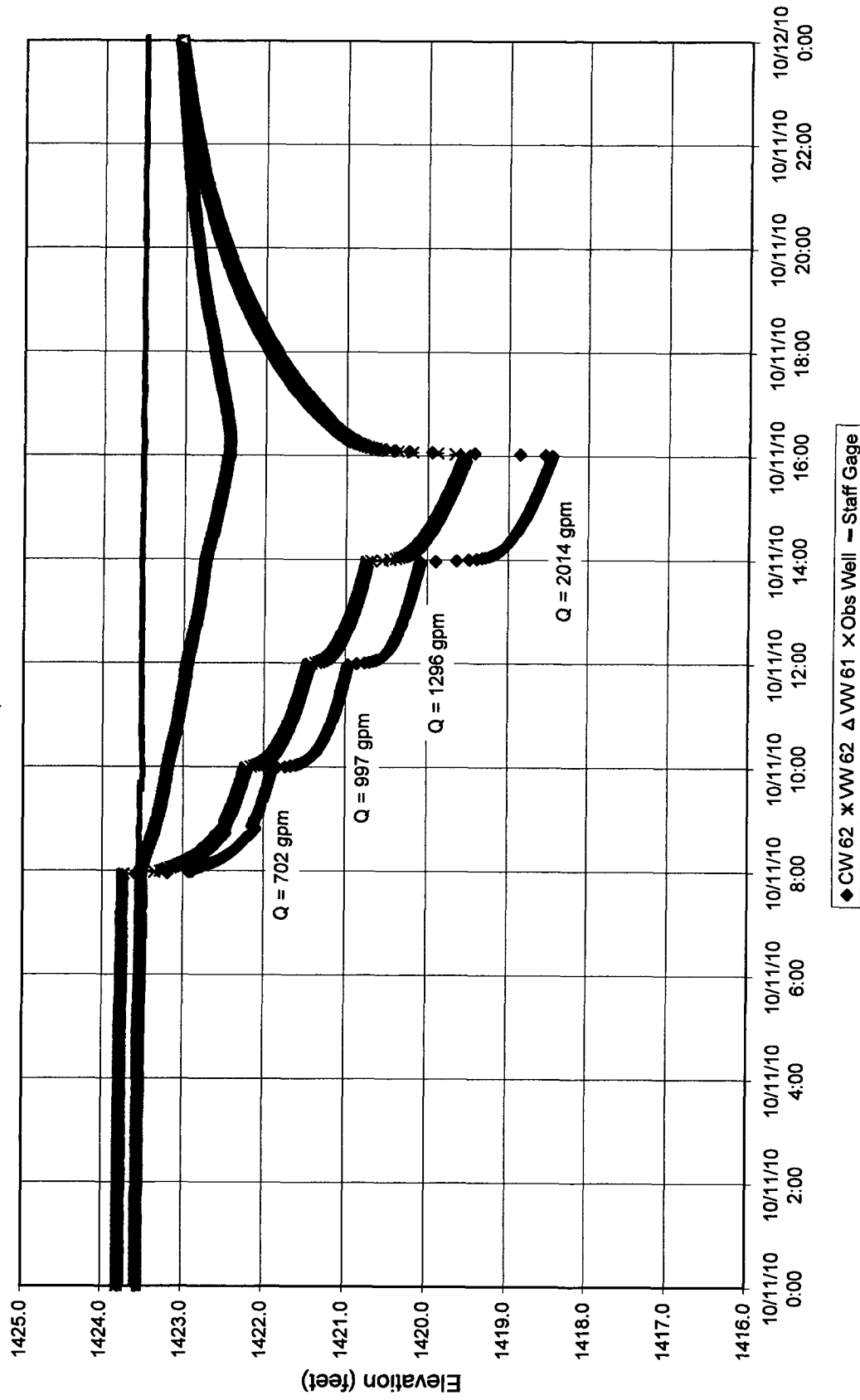
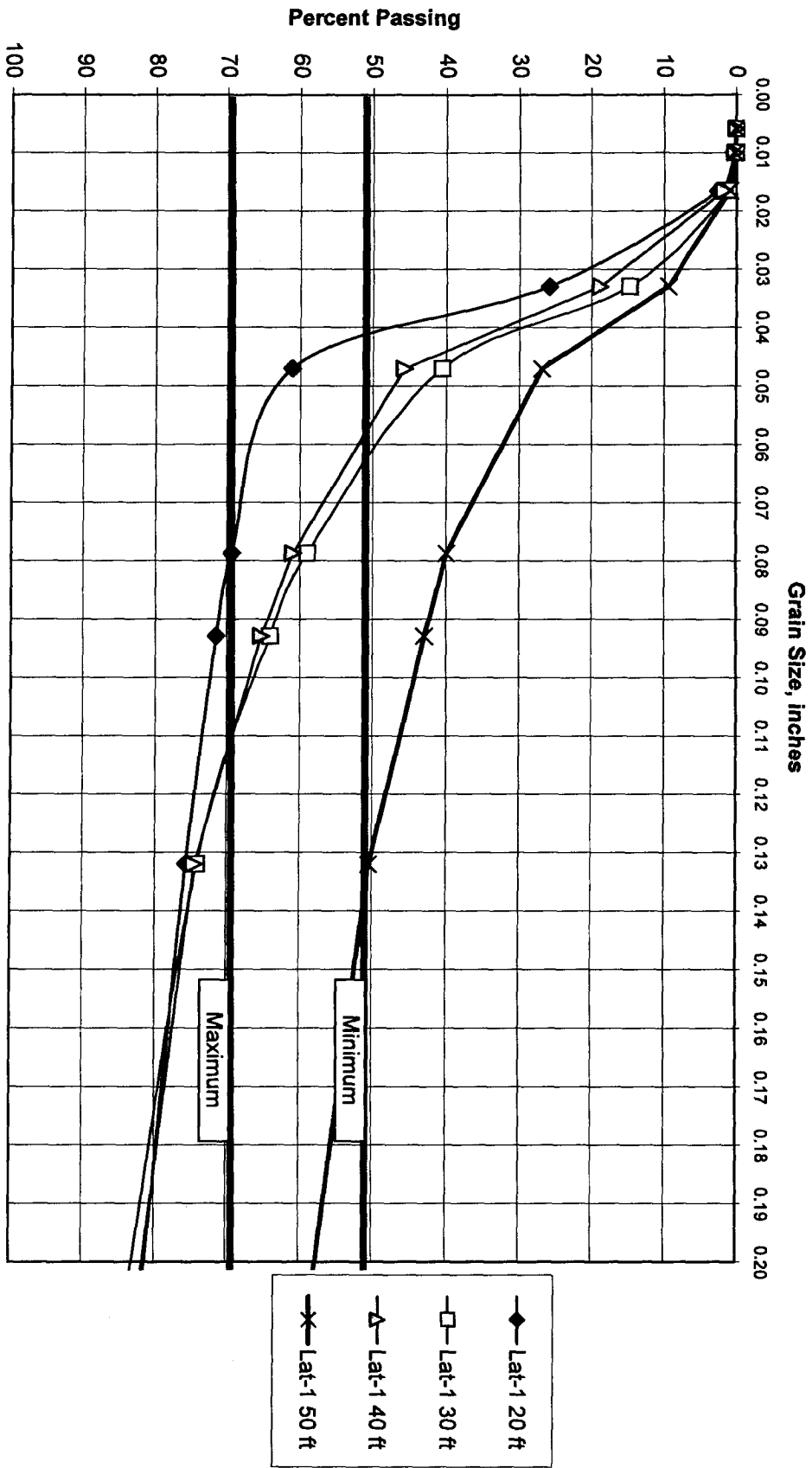


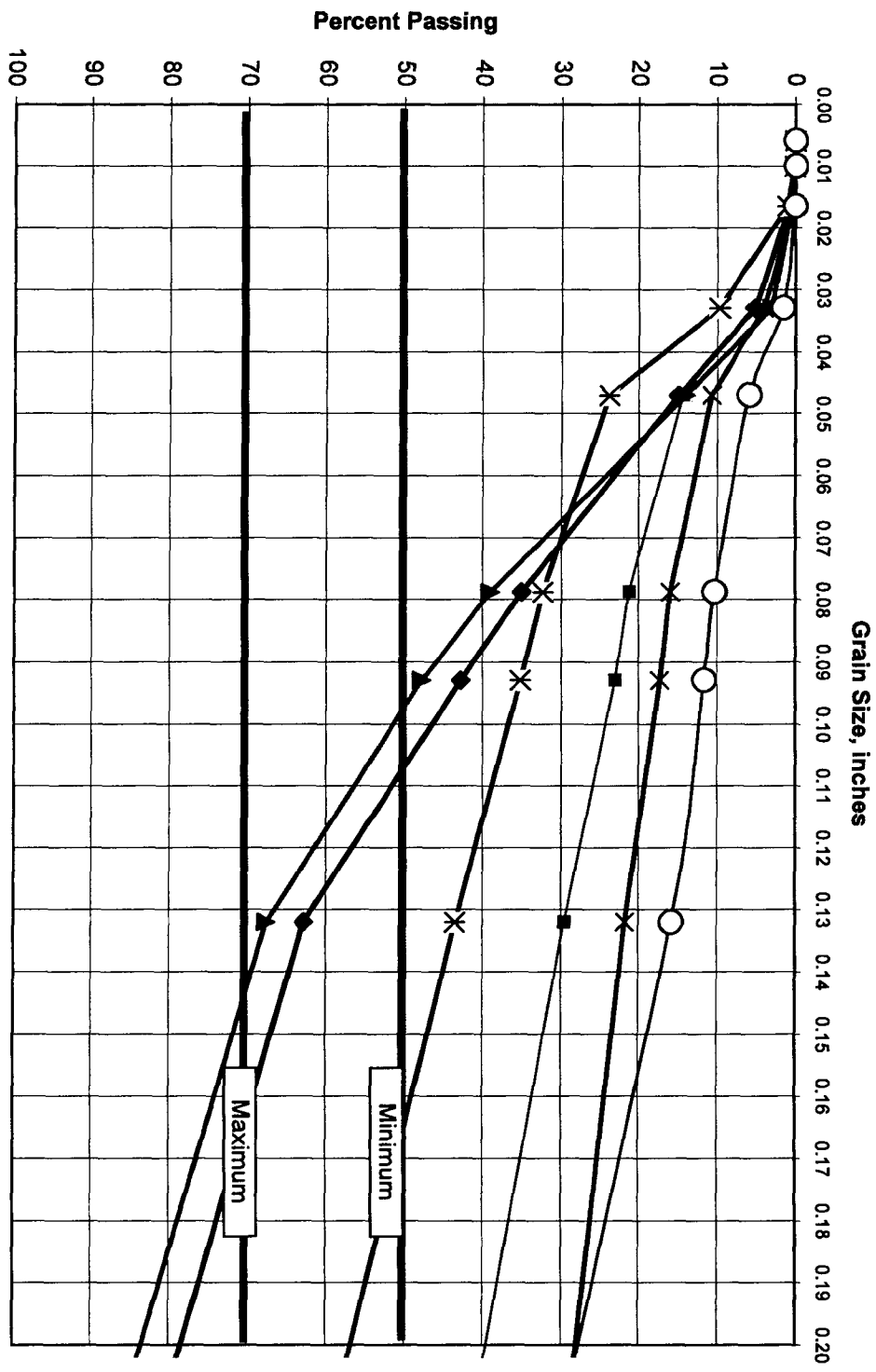
FIGURE 5
CONSTANT-RATE TEST HYDROGRAPHS
 Sioux Falls, South Dakota



Sieve Analyses-Collector Well
 Sioux Falls, South Dakota
 Collector Well #62
 Lateral 1

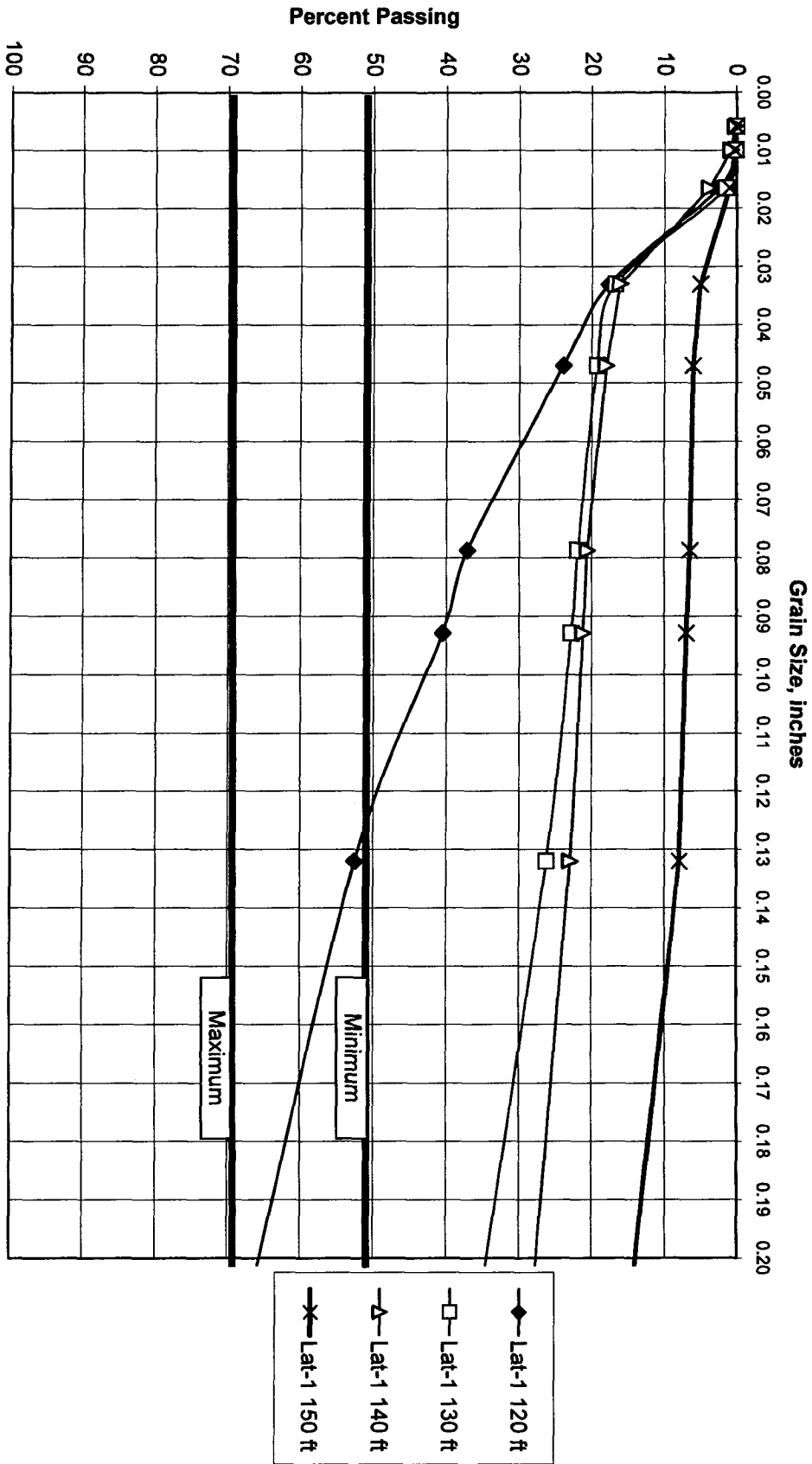


Sieve Analyses-Collector Well
 Sioux Falls, South Dakota
 Collector Well #62
 Lateral 1

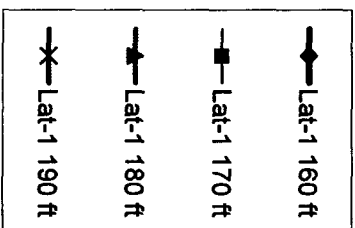


- Lat-1 60 ft
- Lat-1 70 ft
- ▲— Lat-1 80 ft
- ×— Lat-1 90 ft
- ×— Lat-1 100 ft
- Lat-1 110 ft

Sieve Analyses-Collector Well
 Sioux Falls, South Dakota
 Collector Well #62
 Lateral 1



Sieve Analyses-Collector Well
 Sioux Falls, South Dakota
 Collector Well #62
 Lateral 1



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 20 Feet Pipe No. 4

Initial Wt.	1906	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	320	320	16.8%	83.2%
6	3.353	0.132	144	464	24.4%	75.6%
8	2.360	0.094	79	543	28.5%	71.5%
10	1.999	0.079	39	582	30.6%	69.4%
16	1.194	0.047	158	740	38.9%	61.1%
20	0.838	0.033	672	1412	74.2%	25.8%
40	0.419	0.017	445	1857	97.5%	2.5%
60	0.254	0.010	39	1896	99.6%	0.4%
100	0.150	0.006	6	1902	99.9%	0.1%
Pan			2	1904	100.0%	0.0%
Total			1904	grams		
Difference			2	grams	0.1%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 30 Feet Pipe No. 6

Initial Wt.	2339	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	326	326	14.0%	86.0%
6	3.353	0.132	276	604	25.9%	74.1%
8	2.360	0.094	233	837	35.9%	64.1%
10	1.999	0.079	120	957	41.0%	59.0%
16	1.194	0.047	428	1385	59.4%	40.6%
20	0.838	0.033	603	1988	85.2%	14.8%
40	0.419	0.017	319	2307	98.9%	1.1%
60	0.254	0.010	22	2329	99.9%	0.1%
100	0.150	0.006	2	2331	100.0%	0.0%
Pan			1	2332	100.0%	0.0%
Total			2332	grams		
Difference			7	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 40 Feet Pipe No. 8

Initial Wt.	2723	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	435	435	16.0%	84.0%
6	3.353	0.132	261	696	25.6%	74.4%
8	2.360	0.094	246	942	34.7%	65.3%
10	1.999	0.079	119	1061	39.0%	61.0%
16	1.194	0.047	416	1477	54.3%	45.7%
20	0.838	0.033	731	2208	81.2%	18.8%
40	0.419	0.017	464	2672	98.3%	1.7%
60	0.254	0.010	40	2712	99.8%	0.2%
100	0.150	0.006	6	2718	100.0%	0.0%
Pan			0	2718	100.0%	0.0%
Total			2718	grams		
Difference			5	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 50 Feet Pipe No. 10

Initial Wt.	2620	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1045	1045	39.9%	60.1%
6	3.353	0.132	255	1300	49.6%	50.4%
8	2.360	0.094	195	1495	57.1%	42.9%
10	1.999	0.079	60	1575	60.1%	39.9%
16	1.194	0.047	343	1918	73.2%	26.8%
20	0.838	0.033	455	2373	90.6%	9.4%
40	0.419	0.017	222	2595	99.1%	0.9%
60	0.254	0.010	20	2615	99.8%	0.2%
100	0.150	0.006	3	2618	100.0%	0.0%
Pan			1	2619	100.0%	0.0%
Total			2619	grams		
Difference			1	grams	0.0%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 60 Feet Pipe No. 12

Initial Wt.	2470	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	402	402	16.3%	83.7%
6	3.353	0.132	510	912	37.1%	62.9%
8	2.360	0.094	496	1408	57.2%	42.8%
10	1.999	0.079	188	1596	64.9%	35.1%
16	1.194	0.047	495	2091	85.0%	15.0%
20	0.838	0.033	241	2332	94.8%	5.2%
40	0.419	0.017	110	2442	99.2%	0.8%
60	0.254	0.010	17	2459	99.9%	0.1%
100	0.150	0.006	1	2460	100.0%	0.0%
Pan			1	2461	100.0%	0.0%
Total			2461	grams		
Difference			9	grams	0.4%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 70 Feet Pipe No. 14

Initial Wt.	2653	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1512	1512	57.1%	42.9%
6	3.353	0.132	352	1864	70.4%	29.6%
8	2.360	0.094	172	2036	76.9%	23.1%
10	1.999	0.079	49	2085	78.7%	21.3%
16	1.194	0.047	182	2267	85.6%	14.4%
20	0.838	0.033	306	2573	97.1%	2.9%
40	0.419	0.017	66	2639	99.6%	0.4%
60	0.254	0.010	6	2645	99.8%	0.2%
100	0.150	0.006	3	2648	100.0%	0.0%
Pan			1	2649	100.0%	0.0%
Total			2649	grams		
Difference			4	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 80 Feet Pipe No. 16

Initial Wt.	2526	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	279	279	11.1%	88.9%
6	3.353	0.132	538	817	32.4%	67.6%
8	2.360	0.094	498	1315	52.2%	47.8%
10	1.999	0.079	224	1539	61.0%	39.0%
16	1.194	0.047	630	2169	86.0%	14.0%
20	0.838	0.033	273	2442	96.9%	3.1%
40	0.419	0.017	69	2511	99.6%	0.4%
60	0.254	0.010	8	2519	99.9%	0.1%
100	0.150	0.006	1	2520	100.0%	0.0%
Pan			1	2521	100.0%	0.0%
Total			2521	grams		
Difference			5	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 90 Feet Pipe No. 18

Initial Wt.	2482	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1730	1730	69.9%	30.1%
6	3.353	0.132	207	1937	78.3%	21.7%
8	2.360	0.094	109	2046	82.7%	17.3%
10	1.999	0.079	34	2080	84.0%	16.0%
16	1.194	0.047	130	2210	89.3%	10.7%
20	0.838	0.033	167	2377	96.0%	4.0%
40	0.419	0.017	91	2468	99.7%	0.3%
60	0.254	0.010	6	2474	100.0%	0.0%
100	0.150	0.006	1	2475	100.0%	0.0%
Pan			0	2475	100.0%	0.0%
Total			2475	grams		
Difference			7	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 100 Feet Pipe No. 20

Initial Wt.	2503	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1003	1003	38.6%	61.4%
6	3.353	0.132	462	1465	56.4%	43.6%
8	2.360	0.094	219	1684	64.8%	35.2%
10	1.999	0.079	74	1758	67.6%	32.4%
16	1.194	0.047	222	1980	76.2%	23.8%
20	0.838	0.033	367	2347	90.3%	9.7%
40	0.419	0.017	226	2573	99.0%	1.0%
60	0.254	0.010	23	2596	99.9%	0.1%
100	0.150	0.006	2	2598	100.0%	0.0%
Pan			1	2599	100.0%	0.0%
Total			2599	grams		
Difference			4	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 110 Feet Pipe No. 22

Initial Wt.	2380	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1619	1619	68.2%	31.8%
6	3.353	0.132	378	1997	84.1%	15.9%
8	2.360	0.094	100	2097	88.3%	11.7%
10	1.999	0.079	31	2128	89.6%	10.4%
16	1.194	0.047	108	2236	94.1%	5.9%
20	0.838	0.033	101	2337	98.4%	1.6%
40	0.419	0.017	35	2372	99.9%	0.1%
60	0.254	0.010	2	2374	100.0%	0.0%
100	0.150	0.006	1	2375	100.0%	0.0%
Pan			0	2375	100.0%	0.0%
Total			2375	grams		
Difference			5	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 120 Feet Pipe No. 24

Initial Wt.	2432	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	728	728	30.1%	69.9%
6	3.353	0.132	422	1150	47.5%	52.5%
8	2.360	0.094	290	1440	59.5%	40.5%
10	1.999	0.079	84	1524	62.9%	37.1%
16	1.194	0.047	318	1842	76.1%	23.9%
20	0.838	0.033	154	1996	82.4%	17.6%
40	0.419	0.017	366	2362	97.6%	2.4%
60	0.254	0.010	54	2416	99.8%	0.2%
100	0.150	0.006	4	2420	100.0%	0.0%
Pan			1	2421	100.0%	0.0%
Total			2421	grams		
Difference			11	grams	0.5%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 130 Feet Pipe No. 26

Initial Wt.	2567	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1606	1606	62.7%	37.3%
6	3.353	0.132	284	1890	73.8%	26.2%
8	2.360	0.094	88	1978	77.2%	22.8%
10	1.999	0.079	21	1999	78.1%	21.9%
16	1.194	0.047	68	2067	80.7%	19.3%
20	0.838	0.033	65	2132	83.2%	16.8%
40	0.419	0.017	391	2523	98.5%	1.5%
60	0.254	0.010	32	2555	99.8%	0.2%
100	0.150	0.006	5	2560	100.0%	0.0%
Pan			1	2561	100.0%	0.0%
Total			2561	grams		
Difference			6	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 140 Feet Pipe No. 28

Initial Wt.	2709	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1915	1915	70.8%	29.2%
6	3.353	0.132	171	2086	77.1%	22.9%
8	2.360	0.094	45	2131	78.8%	21.2%
10	1.999	0.079	17	2148	79.4%	20.6%
16	1.194	0.047	71	2219	82.0%	18.0%
20	0.838	0.033	52	2271	83.9%	16.1%
40	0.419	0.017	336	2607	96.3%	3.7%
60	0.254	0.010	77	2684	99.2%	0.8%
100	0.150	0.006	17	2701	99.8%	0.2%
Pan			5	2706	100.0%	0.0%
Total			2706	grams		
Difference			3	grams	0.1%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 150 Feet Pipe No. 30

Initial Wt.	2204	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1848	1848	84.0%	16.0%
6	3.353	0.132	178	2026	92.1%	7.9%
8	2.360	0.094	21	2047	93.1%	6.9%
10	1.999	0.079	11	2058	93.6%	6.4%
16	1.194	0.047	9	2067	94.0%	6.0%
20	0.838	0.033	21	2088	95.0%	5.0%
40	0.419	0.017	89	2177	99.0%	1.0%
60	0.254	0.010	16	2193	99.7%	0.3%
100	0.150	0.006	5	2198	100.0%	0.0%
Pan			1	2199	100.0%	0.0%
Total			2199	grams		
Difference			5	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 160 Feet Pipe No. 32

Initial Wt.	2276	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	689	689	30.4%	69.6%
6	3.353	0.132	64	753	33.2%	66.8%
8	2.360	0.094	42	795	35.1%	64.9%
10	1.999	0.079	31	826	36.5%	63.5%
16	1.194	0.047	99	925	40.8%	59.2%
20	0.838	0.033	260	1185	52.3%	47.7%
40	0.419	0.017	997	2182	96.3%	3.7%
60	0.254	0.010	79	2261	99.8%	0.2%
100	0.150	0.006	3	2264	100.0%	0.0%
Pan			1	2265	100.0%	0.0%
Total			2265	grams		
Difference			11	grams	0.5%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 170 Feet Pipe No. 34

Initial Wt.	2758	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1022	1022	37.2%	62.8%
6	3.353	0.132	123	1145	41.6%	58.4%
8	2.360	0.094	148	1293	47.0%	53.0%
10	1.999	0.079	72	1365	49.6%	50.4%
16	1.194	0.047	379	1744	63.4%	36.6%
20	0.838	0.033	481	2225	80.9%	19.1%
40	0.419	0.017	494	2719	98.8%	1.2%
60	0.254	0.010	28	2747	99.9%	0.1%
100	0.150	0.006	3	2750	100.0%	0.0%
Pan			1	2751	100.0%	0.0%
Total			2751	grams		
Difference			7	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 180 Feet Pipe No. 36

Initial Wt.	2802	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1642	1642	58.6%	41.4%
6	3.353	0.132	347	1989	71.0%	29.0%
8	2.360	0.094	121	2110	75.3%	24.7%
10	1.999	0.079	42	2152	76.8%	23.2%
16	1.194	0.047	159	2311	82.5%	17.5%
20	0.838	0.033	218	2529	90.3%	9.7%
40	0.419	0.017	235	2764	98.6%	1.4%
60	0.254	0.010	28	2792	99.6%	0.4%
100	0.150	0.006	8	2800	99.9%	0.1%
Pan			2	2802	100.0%	0.0%
Total			2802	grams		
Difference			0	grams	0.0%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 1
 Interval: 190 Feet Pipe No. 38

Initial Wt.	2286	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	864	864	37.9%	62.1%
6	3.353	0.132	96	960	42.1%	57.9%
8	2.360	0.094	102	1062	46.6%	53.4%
10	1.999	0.079	57	1119	49.1%	50.9%
16	1.194	0.047	262	1381	60.6%	39.4%
20	0.838	0.033	369	1750	76.8%	23.2%
40	0.419	0.017	495	2245	98.5%	1.5%
60	0.254	0.010	32	2277	99.9%	0.1%
100	0.150	0.006	2	2279	100.0%	0.0%
Pan			0	2279	100.0%	0.0%
Total			2279	grams		
Difference			7	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 25 Feet Pipe No. 5

Initial Wt.		2211	grams			
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	256	256	11.6%	88.4%
6	3.353	0.132	420	676	30.6%	69.4%
8	2.360	0.094	351	1027	46.6%	53.4%
10	1.999	0.079	129	1156	52.4%	47.6%
16	1.194	0.047	480	1636	74.2%	25.8%
20	0.838	0.033	209	1845	83.6%	16.4%
40	0.419	0.017	270	2115	95.9%	4.1%
60	0.254	0.010	79	2194	99.5%	0.5%
100	0.150	0.006	11	2205	100.0%	0.0%
Pan			1	2206	100.0%	0.0%
Total			2206	grams		
Difference			5	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 30 Feet Pipe No. 6

Initial Wt.		2185	grams			
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	342	342	15.7%	84.3%
6	3.353	0.132	247	589	27.1%	72.9%
8	2.360	0.094	221	810	37.2%	62.8%
10	1.999	0.079	93	903	41.5%	58.5%
16	1.194	0.047	438	1341	61.6%	38.4%
20	0.838	0.033	256	1597	73.4%	26.6%
40	0.419	0.017	477	2074	95.3%	4.7%
60	0.254	0.010	97	2171	99.7%	0.3%
100	0.150	0.006	5	2176	100.0%	0.0%
Pan			1	2177	100.0%	0.0%
Total			2177	grams		
Difference			8	grams	0.4%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 40 Feet Pipe No. 8

Initial Wt.	2904	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1559	1559	53.7%	46.3%
6	3.353	0.132	362	1921	66.2%	33.8%
8	2.360	0.094	118	2039	70.2%	29.8%
10	1.999	0.079	32	2071	71.3%	28.7%
16	1.194	0.047	91	2162	74.4%	25.6%
20	0.838	0.033	81	2243	77.2%	22.8%
40	0.419	0.017	403	2646	91.1%	8.9%
60	0.254	0.010	216	2862	98.6%	1.4%
100	0.150	0.006	37	2899	99.8%	0.2%
Pan			5	2904	100.0%	0.0%
Total			2904	grams		
Difference			0	grams	0.0%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 50 Feet Pipe No. 10

Initial Wt.	2557	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1029	1029	40.4%	59.6%
6	3.353	0.132	385	1414	55.5%	44.5%
8	2.360	0.094	272	1686	66.1%	33.9%
10	1.999	0.079	74	1760	69.0%	31.0%
16	1.194	0.047	384	2144	84.1%	15.9%
20	0.838	0.033	127	2271	89.1%	10.9%
40	0.419	0.017	194	2465	96.7%	3.3%
60	0.254	0.010	73	2538	99.6%	0.4%
100	0.150	0.006	10	2548	100.0%	0.0%
Pan			1	2549	100.0%	0.0%
Total			2549	grams		
Difference			8	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 60 Feet Pipe No. 12

Initial Wt.		2299	grams			
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	956	956	41.7%	58.3%
6	3.353	0.132	479	1435	62.7%	37.3%
8	2.360	0.094	228	1663	72.6%	27.4%
10	1.999	0.079	57	1720	75.1%	24.9%
16	1.194	0.047	183	1903	83.1%	16.9%
20	0.838	0.033	67	1970	86.0%	14.0%
40	0.419	0.017	173	2143	93.6%	6.4%
60	0.254	0.010	126	2269	99.1%	0.9%
100	0.150	0.006	20	2289	100.0%	0.0%
Pan			1	2290	100.0%	0.0%
Total			2290	grams		
Difference			9	grams 0.4%		

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 70 Feet Pipe No. 14

Initial Wt.		2633	grams			
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	273	273	10.4%	89.6%
6	3.353	0.132	126	399	15.2%	84.8%
8	2.360	0.094	96	495	18.9%	81.1%
10	1.999	0.079	89	584	22.3%	77.7%
16	1.194	0.047	282	866	33.0%	67.0%
20	0.838	0.033	313	1179	44.9%	55.1%
40	0.419	0.017	1111	2290	87.3%	12.7%
60	0.254	0.010	285	2575	98.1%	1.9%
100	0.150	0.006	47	2622	99.9%	0.1%
Pan			2	2624	100.0%	0.0%
Total			2624	grams		
Difference			9	grams 0.3%		



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 80 Feet Pipe No. 16

Initial Wt.	1729	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	79	79	4.6%	95.4%
6	3.353	0.132	62	141	8.2%	91.8%
8	2.360	0.094	61	202	11.8%	88.2%
10	1.999	0.079	34	236	13.8%	86.2%
16	1.194	0.047	196	432	25.2%	74.8%
20	0.838	0.033	289	721	42.0%	58.0%
40	0.419	0.017	847	1568	91.4%	8.6%
60	0.254	0.010	139	1707	99.5%	0.5%
100	0.150	0.006	8	1715	99.9%	0.1%
Pan			1	1716	100.0%	0.0%
Total			1716	grams		
Difference			13	grams	0.8%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 90 Feet Pipe No. 18

Initial Wt.	1821	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	376	376	20.8%	79.2%
6	3.353	0.132	468	844	46.7%	53.3%
8	2.360	0.094	312	1156	63.9%	36.1%
10	1.999	0.079	82	1238	68.4%	31.6%
16	1.194	0.047	289	1527	84.4%	15.6%
20	0.838	0.033	122	1649	91.2%	8.8%
40	0.419	0.017	124	1773	98.0%	2.0%
60	0.254	0.010	30	1803	99.7%	0.3%
100	0.150	0.006	5	1808	99.9%	0.1%
Pan			1	1809	100.0%	0.0%
Total			1809	grams		
Difference			12	grams	0.7%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 100 Feet Pipe No. 20

Initial Wt.	2257	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	132	132	5.9%	94.1%
6	3.353	0.132	31	163	7.3%	92.7%
8	2.360	0.094	40	203	9.0%	91.0%
10	1.999	0.079	30	233	10.4%	89.6%
16	1.194	0.047	221	454	20.2%	79.8%
20	0.838	0.033	394	848	37.7%	62.3%
40	0.419	0.017	1279	2127	94.6%	5.4%
60	0.254	0.010	115	2242	99.7%	0.3%
100	0.150	0.006	5	2247	100.0%	0.0%
Pan			1	2248	100.0%	0.0%
Total			2248	grams		
Difference			9	grams	0.4%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 110 Feet Pipe No. 22

Initial Wt.	2499	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	403	403	16.2%	83.8%
6	3.353	0.132	207	610	24.5%	75.5%
8	2.360	0.094	145	756	30.4%	69.6%
10	1.999	0.079	78	834	33.5%	66.5%
16	1.194	0.047	260	1094	44.0%	56.0%
20	0.838	0.033	302	1396	56.1%	43.9%
40	0.419	0.017	930	2326	93.5%	6.5%
60	0.254	0.010	153	2479	99.6%	0.4%
100	0.150	0.006	8	2487	100.0%	0.0%
Pan			1	2488	100.0%	0.0%
Total			2488	grams		
Difference			11	grams	0.4%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 120 Feet Pipe No. 24

Initial Wt.	2300	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	545	545	23.8%	76.2%
6	3.353	0.132	216	761	33.2%	66.8%
8	2.360	0.094	161	922	40.2%	59.8%
10	1.999	0.079	86	1008	44.0%	56.0%
16	1.194	0.047	268	1276	55.7%	44.3%
20	0.838	0.033	234	1510	65.9%	34.1%
40	0.419	0.017	630	2140	93.4%	6.6%
60	0.254	0.010	131	2271	99.1%	0.9%
100	0.150	0.006	20	2291	100.0%	0.0%
Pan			1	2292	100.0%	0.0%
Total			2292	grams		
Difference			8	grams	0.3%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 130 Feet Pipe No. 26

Initial Wt.	2291	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	517	517	22.7%	77.3%
6	3.353	0.132	277	794	34.9%	65.1%
8	2.360	0.094	176	970	42.6%	57.4%
10	1.999	0.079	65	1035	45.5%	54.5%
16	1.194	0.047	190	1225	53.8%	46.2%
20	0.838	0.033	156	1381	60.6%	39.4%
40	0.419	0.017	578	1959	86.0%	14.0%
60	0.254	0.010	270	2229	97.9%	2.1%
100	0.150	0.006	47	2276	100.0%	0.0%
Pan			1	2277	100.0%	0.0%
Total			2277	grams		
Difference			14	grams	0.6%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 140 Feet Pipe No. 28

Initial Wt. **2231** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	127	127	5.7%	94.3%
6	3.353	0.132	195	322	14.5%	85.5%
8	2.360	0.094	248	570	25.6%	74.4%
10	1.999	0.079	151	721	32.4%	67.6%
16	1.194	0.047	532	1253	56.3%	43.7%
20	0.838	0.033	376	1629	73.1%	26.9%
40	0.419	0.017	448	2077	93.3%	6.7%
60	0.254	0.010	126	2203	98.9%	1.1%
100	0.150	0.006	23	2226	100.0%	0.0%
Pan			1	2227	100.0%	0.0%
Total			2227	grams		
Difference			4	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 150 Feet Pipe No. 30

Initial Wt. **2421** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	813	813	33.7%	66.3%
6	3.353	0.132	344	1157	47.9%	52.1%
8	2.360	0.094	215	1372	56.9%	43.1%
10	1.999	0.079	112	1484	61.5%	38.5%
16	1.194	0.047	240	1724	71.4%	28.6%
20	0.838	0.033	148	1872	77.6%	22.4%
40	0.419	0.017	387	2259	93.6%	6.4%
60	0.254	0.010	136	2395	99.3%	0.7%
100	0.150	0.006	16	2411	99.9%	0.1%
Pan			2	2413	100.0%	0.0%
Total			2413	grams		
Difference			8	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 160 Feet Pipe No. 32

Initial Wt.		2210	grams			
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	393	393	17.9%	82.1%
6	3.353	0.132	104	497	22.6%	77.4%
8	2.360	0.094	145	642	29.2%	70.8%
10	1.999	0.079	80	702	31.9%	68.1%
16	1.194	0.047	193	895	40.7%	59.3%
20	0.838	0.033	208	1103	50.2%	49.8%
40	0.419	0.017	666	1769	80.4%	19.6%
60	0.254	0.010	376	2145	97.5%	2.5%
100	0.150	0.006	52	2197	99.9%	0.1%
Pan			2	2199	100.0%	0.0%
Total			2199	grams		
Difference			11	grams	0.5%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 170 Feet Pipe No. 34

Initial Wt.		2204	grams			
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	470	470	21.4%	78.6%
6	3.353	0.132	296	766	34.9%	65.1%
8	2.360	0.094	144	910	41.4%	58.6%
10	1.999	0.079	62	972	44.3%	55.7%
16	1.194	0.047	166	1138	51.8%	48.2%
20	0.838	0.033	154	1292	58.8%	41.2%
40	0.419	0.017	682	1974	89.9%	10.1%
60	0.254	0.010	200	2174	99.0%	1.0%
100	0.150	0.006	20	2194	99.9%	0.1%
Pan			2	2196	100.0%	0.0%
Total			2196	grams		
Difference			8	grams	0.4%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 180 Feet Pipe No. 36

Initial Wt.	2163	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	560	560	26.0%	74.0%
6	3.353	0.132	255	815	37.9%	62.1%
8	2.360	0.094	195	1010	47.0%	53.0%
10	1.999	0.079	88	1098	51.1%	48.9%
16	1.194	0.047	226	1324	61.6%	38.4%
20	0.838	0.033	166	1490	69.3%	30.7%
40	0.419	0.017	455	1945	90.5%	9.5%
60	0.254	0.010	178	2123	98.7%	1.3%
100	0.150	0.006	25	2148	99.9%	0.1%
Pan			2	2150	100.0%	0.0%
Total			2150	grams		
Difference			13	grams	0.6%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 2
 Interval: 190 Feet Pipe No. 38

Initial Wt.	2286	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	864	864	37.9%	62.1%
6	3.353	0.132	96	960	42.1%	57.9%
8	2.360	0.094	102	1062	46.6%	53.4%
10	1.999	0.079	57	1119	49.1%	50.9%
16	1.194	0.047	262	1381	60.6%	39.4%
20	0.838	0.033	369	1750	76.8%	23.2%
40	0.419	0.017	495	2245	98.5%	1.5%
60	0.254	0.010	32	2277	99.9%	0.1%
100	0.150	0.006	2	2279	100.0%	0.0%
Pan			0	2279	100.0%	0.0%
Total			2279	grams		
Difference			7	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 20 Feet Pipe No. 4

Initial Wt.	2611	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	582	582	22.4%	77.6%
6	3.353	0.132	376	958	36.8%	63.2%
8	2.360	0.094	282	1240	47.6%	52.4%
10	1.999	0.079	126	1366	52.5%	47.5%
16	1.194	0.047	408	1774	68.1%	31.9%
20	0.838	0.033	437	2211	84.9%	15.1%
40	0.419	0.017	334	2545	97.7%	2.3%
60	0.254	0.010	42	2587	99.3%	0.7%
100	0.150	0.006	11	2598	99.8%	0.2%
Pan			6	2604	100.0%	0.0%
Total			2604	grams		
Difference			7	grams	0.3%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 30 Feet Pipe No. 6

Initial Wt.	2583	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	612	612	23.7%	76.3%
6	3.353	0.132	455	1067	41.4%	58.6%
8	2.360	0.094	328	1395	54.1%	45.9%
10	1.999	0.079	154	1549	60.1%	39.9%
16	1.194	0.047	422	1971	76.4%	23.6%
20	0.838	0.033	304	2275	88.2%	11.8%
40	0.419	0.017	223	2498	96.9%	3.1%
60	0.254	0.010	48	2546	98.7%	1.3%
100	0.150	0.006	19	2565	99.5%	0.5%
Pan			14	2579	100.0%	0.0%
Total			2579	grams		
Difference			4	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 40 Feet Pipe No. 8

Initial Wt. **2503** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	882	882	35.4%	64.6%
6	3.353	0.132	465	1347	54.0%	46.0%
8	2.360	0.094	311	1658	66.5%	33.5%
10	1.999	0.079	115	1773	71.1%	28.9%
16	1.194	0.047	302	2075	83.2%	16.8%
20	0.838	0.033	185	2260	90.6%	9.4%
40	0.419	0.017	194	2454	98.4%	1.6%
60	0.254	0.010	34	2488	99.7%	0.3%
100	0.150	0.006	5	2493	99.9%	0.1%
Pan			2	2495	100.0%	0.0%
Total			2495	grams		
Difference			8	grams	0.3%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 50 Feet Pipe No. 10

Initial Wt. **2710** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1541	1541	56.9%	43.1%
6	3.353	0.132	393	1934	71.4%	28.6%
8	2.360	0.094	161	2095	77.3%	22.7%
10	1.999	0.079	76	2171	80.1%	19.9%
16	1.194	0.047	129	2300	84.9%	15.1%
20	0.838	0.033	83	2383	87.9%	12.1%
40	0.419	0.017	258	2641	97.5%	2.5%
60	0.254	0.010	57	2698	99.6%	0.4%
100	0.150	0.006	8	2706	99.9%	0.1%
Pan			4	2710	100.0%	0.0%
Total			2710	grams		
Difference			0	grams	0.0%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 60 Feet Pipe No. 12

Initial Wt. **2501** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1174	1174	47.1%	52.9%
6	3.353	0.132	175	1349	54.2%	45.8%
8	2.360	0.094	74	1423	57.1%	42.9%
10	1.999	0.079	32	1455	58.4%	41.6%
16	1.194	0.047	156	1611	64.7%	35.3%
20	0.838	0.033	299	1910	76.7%	23.3%
40	0.419	0.017	505	2415	96.9%	3.1%
60	0.254	0.010	64	2479	99.5%	0.5%
100	0.150	0.006	8	2487	99.8%	0.2%
Pan			4	2491	100.0%	0.0%
Total			2491	grams		
Difference			10	grams	0.4%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 70 Feet Pipe No. 14

Initial Wt. **2747** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1078	1078	39.3%	60.7%
6	3.353	0.132	381	1459	53.2%	46.8%
8	2.360	0.094	275	1734	63.2%	36.8%
10	1.999	0.079	92	1826	66.5%	33.5%
16	1.194	0.047	192	2018	73.5%	26.5%
20	0.838	0.033	233	2251	82.0%	18.0%
40	0.419	0.017	421	2672	97.3%	2.7%
60	0.254	0.010	58	2730	99.5%	0.5%
100	0.150	0.006	9	2739	99.8%	0.2%
Pan			6	2745	100.0%	0.0%
Total			2745	grams		
Difference			2	grams	0.1%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 80 Feet Pipe No. 16

Initial Wt. **2851** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1242	1242	43.6%	56.4%
6	3.353	0.132	258	1500	52.7%	47.3%
8	2.360	0.094	128	1628	57.1%	42.9%
10	1.999	0.079	97	1725	60.5%	39.5%
16	1.194	0.047	112	1837	64.5%	35.5%
20	0.838	0.033	405	2242	78.7%	21.3%
40	0.419	0.017	537	2779	97.5%	2.5%
60	0.254	0.010	54	2833	99.4%	0.6%
100	0.150	0.006	10	2843	99.8%	0.2%
Pan			6	2849	100.0%	0.0%
Total			2849	grams		
Difference			2	grams	0.1%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 90 Feet Pipe No. 18

Initial Wt. **2119** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	109	109	5.2%	94.8%
6	3.353	0.132	243	352	16.6%	83.4%
8	2.360	0.094	175	527	24.9%	75.1%
10	1.999	0.079	98	625	29.6%	70.4%
16	1.194	0.047	321	946	44.7%	55.3%
20	0.838	0.033	616	1562	73.9%	26.1%
40	0.419	0.017	504	2066	97.7%	2.3%
60	0.254	0.010	38	2104	99.5%	0.5%
100	0.150	0.006	9	2113	99.9%	0.1%
Pan			2	2115	100.0%	0.0%
Total			2115	grams		
Difference			4	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 100 Feet Pipe No. 20

Initial Wt. **2449** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	818	818	33.4%	66.6%
6	3.353	0.132	52	870	35.6%	64.4%
8	2.360	0.094	22	892	36.5%	63.5%
10	1.999	0.079	15	907	37.1%	62.9%
16	1.194	0.047	62	969	39.6%	60.4%
20	0.838	0.033	471	1440	58.8%	41.2%
40	0.419	0.017	935	2375	97.1%	2.9%
60	0.254	0.010	66	2441	99.8%	0.2%
100	0.150	0.006	4	2445	99.9%	0.1%
Pan			2	2447	100.0%	0.0%
Total			2447	grams		
Difference			2	grams	0.1%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 110 Feet Pipe No. 22

Initial Wt. **1861** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	411	411	22.2%	77.8%
6	3.353	0.132	71	482	26.0%	74.0%
8	2.360	0.094	34	516	27.8%	72.2%
10	1.999	0.079	12	528	28.5%	71.5%
16	1.194	0.047	66	594	32.0%	68.0%
20	0.838	0.033	329	923	49.8%	50.2%
40	0.419	0.017	868	1791	96.6%	3.4%
60	0.254	0.010	57	1848	99.7%	0.3%
100	0.150	0.006	4	1852	99.9%	0.1%
Pan			2	1854	100.0%	0.0%
Total			1854	grams		
Difference			7	grams	0.4%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 120 Feet Pipe No. 24

Initial Wt. **2147** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	550	550	25.7%	74.3%
6	3.353	0.132	231	781	36.5%	63.5%
8	2.360	0.094	161	942	44.1%	55.9%
10	1.999	0.079	71	1013	47.4%	52.6%
16	1.194	0.047	238	1251	58.5%	41.5%
20	0.838	0.033	314	1565	73.2%	26.8%
40	0.419	0.017	524	2089	97.7%	2.3%
60	0.254	0.010	41	2130	99.6%	0.4%
100	0.150	0.006	5	2135	99.9%	0.1%
Pan			3	2138	100.0%	0.0%
Total			2138	grams		
Difference			9	grams	0.4%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 130 Feet Pipe No. 26

Initial Wt. **2276** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	287	287	12.6%	87.4%
6	3.353	0.132	298	585	25.7%	74.3%
8	2.360	0.094	113	698	30.7%	69.3%
10	1.999	0.079	62	760	33.5%	66.5%
16	1.194	0.047	585	1345	59.2%	40.8%
20	0.838	0.033	731	2076	91.4%	8.6%
40	0.419	0.017	178	2254	99.2%	0.8%
60	0.254	0.010	14	2268	99.8%	0.2%
100	0.150	0.006	3	2271	100.0%	0.0%
Pan			1	2272	100.0%	0.0%
Total			2272	grams		
Difference			4	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 140 Feet Pipe No. 28

Initial Wt.		2271	grams			
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	69	69	3.0%	97.0%
6	3.353	0.132	218	287	12.7%	87.3%
8	2.360	0.094	241	528	23.3%	76.7%
10	1.999	0.079	177	705	31.1%	68.9%
16	1.194	0.047	547	1252	55.3%	44.7%
20	0.838	0.033	672	1924	84.9%	15.1%
40	0.419	0.017	321	2245	99.1%	0.9%
60	0.254	0.010	19	2264	100.0%	0.0%
100	0.150	0.006	1	2265	100.0%	0.0%
Pan			0	2265	100.0%	0.0%
Total			2265	grams		
Difference			6	grams	0.3%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 150 Feet Pipe No. 30

Initial Wt.		2395	grams			
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	442	442	18.5%	81.5%
6	3.353	0.132	183	625	26.1%	73.9%
8	2.360	0.094	280	905	37.9%	62.1%
10	1.999	0.079	227	1132	47.3%	52.7%
16	1.194	0.047	778	1910	79.9%	20.1%
20	0.838	0.033	262	2172	90.8%	9.2%
40	0.419	0.017	170	2342	98.0%	2.0%
60	0.254	0.010	46	2388	99.9%	0.1%
100	0.150	0.006	2	2390	100.0%	0.0%
Pan			1	2391	100.0%	0.0%
Total			2391	grams		
Difference			4	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 160 Feet Pipe No. 32

Initial Wt.	2371	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	711	711	30.1%	69.9%
6	3.353	0.132	216	927	39.2%	60.8%
8	2.360	0.094	164	1091	46.1%	53.9%
10	1.999	0.079	71	1162	49.1%	50.9%
16	1.194	0.047	308	1470	62.1%	37.9%
20	0.838	0.033	445	1915	80.9%	19.1%
40	0.419	0.017	353	2268	95.9%	4.1%
60	0.254	0.010	78	2346	99.2%	0.8%
100	0.150	0.006	14	2360	99.7%	0.3%
Pan			6	2366	100.0%	0.0%
Total			2366	grams		
Difference			5	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 170 Feet Pipe No. 34

Initial Wt.	2406	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	426	426	17.7%	82.3%
6	3.353	0.132	188	614	25.6%	74.4%
8	2.360	0.094	183	797	33.2%	66.8%
10	1.999	0.079	94	891	37.1%	62.9%
16	1.194	0.047	209	1100	45.8%	54.2%
20	0.838	0.033	352	1452	60.5%	39.5%
40	0.419	0.017	787	2239	93.3%	6.7%
60	0.254	0.010	110	2349	97.8%	2.2%
100	0.150	0.006	39	2388	99.5%	0.5%
Pan			13	2401	100.0%	0.0%
Total			2401	grams		
Difference			5	grams	0.2%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 180 Feet Pipe No. 36

Initial Wt.	2299	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	765	765	33.3%	66.7%
6	3.353	0.132	322	1087	47.3%	52.7%
8	2.360	0.094	124	1211	52.7%	47.3%
10	1.999	0.079	52	1263	55.0%	45.0%
16	1.194	0.047	217	1480	64.5%	35.5%
20	0.838	0.033	348	1828	79.6%	20.4%
40	0.419	0.017	386	2214	96.4%	3.6%
60	0.254	0.010	62	2276	99.1%	0.9%
100	0.150	0.006	13	2289	99.7%	0.3%
Pan			7	2296	100.0%	0.0%
Total			2296	grams		
Difference			3	grams	0.1%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 3
 Interval: 190 Feet Pipe No. 38

Initial Wt.	2524	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	626	626	24.9%	75.1%
6	3.353	0.132	285	911	36.2%	63.8%
8	2.360	0.094	185	1096	43.6%	56.4%
10	1.999	0.079	89	1185	47.1%	52.9%
16	1.194	0.047	297	1482	58.9%	41.1%
20	0.838	0.033	529	2011	79.9%	20.1%
40	0.419	0.017	418	2429	96.5%	3.5%
60	0.254	0.010	74	2503	99.5%	0.5%
100	0.150	0.006	9	2512	99.8%	0.2%
Pan			4	2516	100.0%	0.0%
Total			2516	grams		
Difference			8	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD

Job No.: 10034-150

Well Number: Collector Well #62

Lateral Number: 4

Interval: 20 Feet

Pipe No. 4

Initial Wt. 1801 grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	265	265	14.8%	85.2%
6	3.353	0.132	263	528	29.5%	70.5%
8	2.360	0.094	216	744	41.6%	58.4%
10	1.999	0.079	96	840	46.9%	53.1%
16	1.194	0.047	425	1265	70.7%	29.3%
20	0.838	0.033	282	1547	86.4%	13.6%
40	0.419	0.017	200	1747	97.6%	2.4%
60	0.254	0.010	34	1781	99.5%	0.5%
100	0.150	0.006	6	1787	99.8%	0.2%
Pan			3	1790	100.0%	0.0%

Total 1790 grams
Difference 11 grams 0.6%

Client: City of Sioux Falls, SD

Job No.: 10034-150

Well Number: Collector Well #62

Lateral Number: 4

Interval: 30 Feet

Pipe No. 6

Initial Wt. 1824 grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	165	165	9.1%	90.9%
6	3.353	0.132	250	415	22.8%	77.2%
8	2.360	0.094	253	668	36.7%	63.3%
10	1.999	0.079	113	781	42.9%	57.1%
16	1.194	0.047	520	1301	71.5%	28.5%
20	0.838	0.033	256	1557	85.6%	14.4%
40	0.419	0.017	226	1783	98.0%	2.0%
60	0.254	0.010	29	1812	99.6%	0.4%
100	0.150	0.006	5	1817	99.9%	0.1%
Pan			2	1819	100.0%	0.0%

Total 1819 grams
Difference 5 grams 0.3%



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 40 Feet Pipe No. 8

Initial Wt. **2256** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	592	592	26.3%	73.7%
6	3.353	0.132	585	1177	52.3%	47.7%
8	2.360	0.094	340	1517	67.4%	32.6%
10	1.999	0.079	110	1627	72.3%	27.7%
16	1.194	0.047	309	1936	86.0%	14.0%
20	0.838	0.033	108	2044	90.8%	9.2%
40	0.419	0.017	180	2224	98.8%	1.2%
60	0.254	0.010	25	2249	99.9%	0.1%
100	0.150	0.006	1	2250	100.0%	0.0%
Pan			1	2251	100.0%	0.0%
Total			2251	grams		
Difference			5	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 50 Feet Pipe No. 10

Initial Wt. **2475** grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	1548	1548	62.6%	37.4%
6	3.353	0.132	390	1938	78.3%	21.7%
8	2.360	0.094	140	2078	84.0%	16.0%
10	1.999	0.079	40	2118	85.6%	14.4%
16	1.194	0.047	93	2211	89.4%	10.6%
20	0.838	0.033	55	2266	91.6%	8.4%
40	0.419	0.017	165	2431	98.3%	1.7%
60	0.254	0.010	40	2471	99.9%	0.1%
100	0.150	0.006	2	2473	100.0%	0.0%
Pan			1	2474	100.0%	0.0%
Total			2474	grams		
Difference			1	grams	0.0%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 60 Feet Pipe No. 12

Initial Wt.	1840	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	670	670	36.5%	63.5%
6	3.353	0.132	359	1029	56.0%	44.0%
8	2.360	0.094	208	1237	67.3%	32.7%
10	1.999	0.079	40	1277	69.5%	30.5%
16	1.194	0.047	202	1479	80.5%	19.5%
20	0.838	0.033	71	1550	84.4%	15.6%
40	0.419	0.017	222	1772	96.5%	3.5%
60	0.254	0.010	63	1835	99.9%	0.1%
100	0.150	0.006	1	1836	99.9%	0.1%
Pan			1	1837	100.0%	0.0%
Total			1837	grams		
Difference			3	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 70 Feet Pipe No. 14

Initial Wt.	2001	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	222	222	11.6%	88.4%
6	3.353	0.132	75	297	15.5%	84.5%
8	2.360	0.094	60	357	18.6%	81.4%
10	1.999	0.079	6	363	19.0%	81.0%
16	1.194	0.047	132	495	25.8%	74.2%
20	0.838	0.033	186	681	35.6%	64.4%
40	0.419	0.017	1076	1757	91.7%	8.3%
60	0.254	0.010	150	1907	99.6%	0.4%
100	0.150	0.006	6	1913	99.9%	0.1%
Pan			2	1915	100.0%	0.0%
Total			1915	grams		
Difference			86	grams	4.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 80 Feet Pipe No. 16

Initial Wt.	2392	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	785	785	32.9%	67.1%
6	3.353	0.132	127	912	38.2%	61.8%
8	2.360	0.094	78	990	41.5%	58.5%
10	1.999	0.079	40	1030	43.2%	56.8%
16	1.194	0.047	120	1150	48.2%	51.8%
20	0.838	0.033	107	1257	52.7%	47.3%
40	0.419	0.017	840	2097	87.9%	12.1%
60	0.254	0.010	270	2367	99.2%	0.8%
100	0.150	0.006	17	2384	99.9%	0.1%
Pan			2	2386	100.0%	0.0%
Total			2386	grams		
Difference			6	grams	0.3%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 90 Feet Pipe No. 18

Initial Wt.	2117	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	540	540	25.5%	74.5%
6	3.353	0.132	156	696	32.9%	67.1%
8	2.360	0.094	90	786	37.2%	62.8%
10	1.999	0.079	39	825	39.0%	61.0%
16	1.194	0.047	120	945	44.7%	55.3%
20	0.838	0.033	114	1059	50.1%	49.9%
40	0.419	0.017	877	1936	91.6%	8.4%
60	0.254	0.010	170	2106	99.6%	0.4%
100	0.150	0.006	6	2112	99.9%	0.1%
Pan			2	2114	100.0%	0.0%
Total			2114	grams		
Difference			3	grams	0.1%	



Sieve Analysis Results

Client: City of Sioux Falls, SD

Job No.: 10034-150

Well Number: Collector Well #62

Lateral Number: 4

Interval: 100 Feet

Pipe No. 20

Initial Wt. 2063 grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	491	491	23.9%	76.1%
6	3.353	0.132	195	686	33.3%	66.7%
8	2.360	0.094	175	861	41.8%	58.2%
10	1.999	0.079	85	946	46.0%	54.0%
16	1.194	0.047	240	1186	57.6%	42.4%
20	0.838	0.033	142	1328	64.5%	35.5%
40	0.419	0.017	611	1939	94.2%	5.8%
60	0.254	0.010	111	2050	99.6%	0.4%
100	0.150	0.006	6	2056	99.9%	0.1%
Pan			2	2058	100.0%	0.0%
Total			2058	grams		
Difference			5	grams	0.2%	

Client: City of Sioux Falls, SD

Job No.: 10034-150

Well Number: Collector Well #62

Lateral Number: 4

Interval: 110 Feet

Pipe No. 22

Initial Wt. 2191 grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	625	625	28.6%	71.4%
6	3.353	0.132	210	835	38.2%	61.8%
8	2.360	0.094	83	918	42.0%	58.0%
10	1.999	0.079	32	950	43.5%	56.5%
16	1.194	0.047	108	1058	48.4%	51.6%
20	0.838	0.033	130	1188	54.4%	45.6%
40	0.419	0.017	843	2031	93.0%	7.0%
60	0.254	0.010	144	2175	99.5%	0.5%
100	0.150	0.006	8	2183	99.9%	0.1%
Pan			2	2185	100.0%	0.0%
Total			2185	grams		
Difference			6	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 120 Feet Pipe No. 24

Initial Wt.	2071	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	494	494	23.9%	76.1%
6	3.353	0.132	195	689	33.3%	66.7%
8	2.360	0.094	136	825	39.9%	60.1%
10	1.999	0.079	64	889	43.0%	57.0%
16	1.194	0.047	175	1064	51.5%	48.5%
20	0.838	0.033	157	1221	59.1%	40.9%
40	0.419	0.017	711	1932	93.5%	6.5%
60	0.254	0.010	125	2057	99.5%	0.5%
100	0.150	0.006	10	2067	100.0%	0.0%
Pan			0	2067	100.0%	0.0%
Total			2067	grams		
Difference			4	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 130 Feet Pipe No. 26

Initial Wt.	2051	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	501	501	24.5%	75.5%
6	3.353	0.132	210	711	34.8%	65.2%
8	2.360	0.094	161	872	42.7%	57.3%
10	1.999	0.079	84	956	46.8%	53.2%
16	1.194	0.047	190	1146	56.1%	43.9%
20	0.838	0.033	166	1312	64.2%	35.8%
40	0.419	0.017	620	1932	94.5%	5.5%
60	0.254	0.010	103	2035	99.6%	0.4%
100	0.150	0.006	7	2042	99.9%	0.1%
Pan			2	2044	100.0%	0.0%
Total			2044	grams		
Difference			7	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 140 Feet Pipe No. 28

Initial Wt.	2003	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	597	597	29.9%	70.1%
6	3.353	0.132	200	797	39.9%	60.1%
8	2.360	0.094	144	941	47.2%	52.8%
10	1.999	0.079	75	1016	50.9%	49.1%
16	1.194	0.047	186	1202	60.3%	39.7%
20	0.838	0.033	163	1365	68.4%	31.6%
40	0.419	0.017	472	1837	92.1%	7.9%
60	0.254	0.010	135	1972	98.8%	1.2%
100	0.150	0.006	20	1992	99.8%	0.2%
Pan			3	1995	100.0%	0.0%
Total			1995	grams		
Difference			8	grams	0.4%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 150 Feet Pipe No. 30

Initial Wt.	1751	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	520	520	29.8%	70.2%
6	3.353	0.132	165	685	39.3%	60.7%
8	2.360	0.094	180	865	49.6%	50.4%
10	1.999	0.079	0	865	49.6%	50.4%
16	1.194	0.047	147	1012	58.0%	42.0%
20	0.838	0.033	128	1140	65.3%	34.7%
40	0.419	0.017	512	1652	94.7%	5.3%
60	0.254	0.010	76	1728	99.0%	1.0%
100	0.150	0.006	15	1743	99.9%	0.1%
Pan			2	1745	100.0%	0.0%
Total			1745	grams		
Difference			6	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 160 Feet Pipe No. 32

Initial Wt.	2013	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	536	536	26.7%	73.3%
6	3.353	0.132	163	699	34.8%	65.2%
8	2.360	0.094	143	842	41.9%	58.1%
10	1.999	0.079	94	936	46.6%	53.4%
16	1.194	0.047	243	1179	58.7%	41.3%
20	0.838	0.033	212	1391	69.2%	30.8%
40	0.419	0.017	530	1921	95.6%	4.4%
60	0.254	0.010	75	1996	99.4%	0.6%
100	0.150	0.006	11	2007	99.9%	0.1%
Pan			2	2009	100.0%	0.0%
Total			2009	grams		
Difference			4	grams	0.2%	

Client: City of Sioux Falls, SD Job No.: 10034-150
 Well Number: Collector Well #62
 Lateral Number: 4
 Interval: 170 Feet Pipe No. 34

Initial Wt.	2121	grams				
Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	386	386	18.3%	81.7%
6	3.353	0.132	273	659	31.2%	68.8%
8	2.360	0.094	140	799	37.8%	62.2%
10	1.999	0.079	102	901	42.6%	57.4%
16	1.194	0.047	280	1181	55.8%	44.2%
20	0.838	0.033	220	1401	66.2%	33.8%
40	0.419	0.017	600	2001	94.6%	5.4%
60	0.254	0.010	100	2101	99.3%	0.7%
100	0.150	0.006	11	2112	99.9%	0.1%
Pan			3	2115	100.0%	0.0%
Total			2115	grams		
Difference			6	grams	0.3%	



Sieve Analysis Results

Client: City of Sioux Falls, SD

Job No.: 10034-150

Well Number: Collector Well #62

Lateral Number: 4

Interval: 180 Feet

Pipe No. 36

Initial Wt. 1861 grams

Sieve No.	Sieve size (mm)	Sieve size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3.5	5.664	0.223	435	435	23.4%	76.6%
6	3.353	0.132	210	645	34.7%	65.3%
8	2.360	0.094	156	801	43.1%	56.9%
10	1.999	0.079	69	870	46.8%	53.2%
16	1.194	0.047	210	1080	58.1%	41.9%
20	0.838	0.033	177	1257	67.6%	32.4%
40	0.419	0.017	488	1745	93.9%	6.1%
60	0.254	0.010	94	1839	98.9%	1.1%
100	0.150	0.006	18	1857	99.9%	0.1%
Pan			2	1859	100.0%	0.0%

Total 1859 grams
Difference 2 grams 0.1%

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 2/28, 20 11

RECEIVED OF City of Sioux Falls PO Box 7402 Sioux Falls SD 57117-7402

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

Fee for Application for Permit No. <u>7232-3</u> to Appropriate Water, to construct and to put water to beneficial use	100	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>7232-3</u>	200	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	300 00

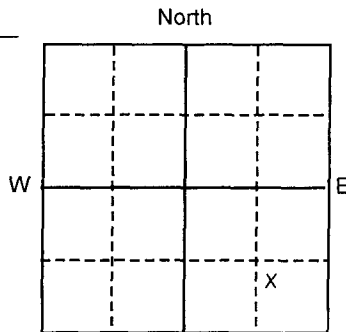
No. 004937

By

[Signature]
Chief Engineer

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE ¼ SE ¼ Sec 29 Twp 102N Rg 49WCounty MinnehahaPlease mark well
location with an "X"

Well Completion Date

16 October 2010

1 Mile

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

800.0 ft. from Farm (identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

Caisson sinking; vertical
Lateral projection, Horizontal

CASING DATA:

☐ Steel ☐ Plastic ☒ OtherIf other describe Reinforced concrete caisson 16' x 19'

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
12,370 LB/FT	228.00 IN	0.0 FT	43.0 FT	228.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
		Lb/gal	Ft	Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

Bentonite slurry was added as caisson was sunk

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 12.75 inches Length 400.0 Feet
 Material 304 Stainless Steel
 Slot Size 30-150 Set From 37.0 Feet to 38.0 Feet
Other information 4 laterals were installed, 2 - 177' overall length;
2 - 187' overall length; 7' blank pipe, eachWAS A PACKER OR SEAL USED? ☐ Yes ☒ No

If so, what material?

Describe packer(s) and location

DISINFECTION: Was well disinfected upon completion?

☒ Yes, How? Calcium Hypochlorite☐ No, Why Not?Lab to which water
quality sample sent for analysis
Energy Lab
Rapid City, South DakotaWell Owner: City of Sioux Falls, South DakotaBusiness Name: Water DepartmentAddress: 224 West 9th StreetCity, State, Zip: Sioux Falls SD 57117

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Lean Clay, top soil	0	6
Sand, Medium Grained, Brown	6	20
Sand, Tr. Gravel, Med Gr., Grey	20	30
Sand w/Gr. Med Grained, Brown	30	40
Lean Clay	40	43

STATIC WATER LEVEL 8.7 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ Inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate _____

Can well be completely shut in?

RECEIVED

MAR 21 2011

WATER RIGHTS
PROGRAM

WELL TEST DATA:

☒ Pumped Describe: 8 Hour step Test and 72 hour constant rate test run with vertical turbine pump☐ Bailed☐ Other

Pumping Level Below Land Surface

15.3 Ft. After 24.0 Hrs. pumped 1,800.0 GPM1,608.0 Ft. After 72.0 Hrs. pumped 1,800.0 GPMIf pump installed, pump rate: 1,250.0 GPM

REMARKS

This is Sioux Falls Well #62. It is a horizontal collector well; 16' ID x 19' OD. 4 horizontal laterals are installed 90 degrees apart near the bottom of the well shaft.

This well was drilled under license # 716 and this report is true and accurate.Drilling firm: Ranney Collector Wells, John Reynolds & Sons

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

Date: 3-15-11

City of Sioux Falls



CITY OF SIOUX FALLS
PUBLIC WORKS

Providing a Better Quality of Life for You!

Administration
224 West Ninth Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8600 F: 367-4605

Engineering/Real Estate
224 West Ninth Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8601 F: 367-4310

Environmental
1203 North Western Avenue
Sioux Falls, SD 57104-1201
T: 605-367-8276 F: 367-4886

Fleet Management
1000 East Chambers Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8240 F: 367-8239

GIS
132 North Dakota Avenue
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8651 F: 367-8113

**Household Hazardous
Waste Facility/Sustainability**
1015 East Chambers Street
Sioux Falls, SD 57104-7200
T: 605-367-8695 F: 367-4993

Landfill
224 West Ninth Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8162 F: 367-8167

Light
2000 North Minnesota Avenue
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-373-6979 F: 373-6974

Street
1000 East Chambers Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8255 F: 367-7010

Utility Billing
1201 North Western Avenue
P.O. Box 7401
Sioux Falls, SD 57117-7401
T: 605-367-8131 F: 367-7341

Utility Maintenance
668 West Algonquin Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8810 F: 367-7883

Water Purification
2100 North Minnesota Avenue
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-373-6940 F: 373-6941

Water Reclamation
4500 North Sycamore Avenue
Sioux Falls, SD 57104-9612
T: 605-367-8188 F: 367-8484

February 9, 2011

Mr. Eric Gronlund
PMB 2020
Water Rights Program
523 E. Capitol
Pierre, SD 57501

Dear Mr. Gronlund:

Enclosed is the application to amend the appropriation of water for the City of Sioux Falls. Work was completed on a new horizontal collector Well No. 62. This request is to appropriate water in the amount of 4.487 cfs with an annual volume limit of 3248 acre feet of water for domestic use by the City.

The City is requesting to transfer the remaining diversion authority granted under permit 1306-3 in the amount of 2.65 cfs and 1919 AF to this new horizontal collector well. The City is also requesting to transfer additional diversion authority of water granted under permit 1347-3 in the amount of 1.837 cfs and 1329 AF. The City requests this transfer to maximize the potential of the new horizontal collector well. Pumping tests show that the new Well No. 62 can produce up to 2,014 gallons of water per minute.

When the transfer is complete, water right 1306-3 will no longer have diversion authority and the City will plug the intake structure on DC-I. Granting the partial diversion authority from permit 1347-3 will leave a total of 6.113 cfs and 4,425.812 acre feet of diversion authority for DC-II. At this time it is the intent of the City to keep DC-II operational and put to beneficial use the remaining diversion authority. If in the event the work scheduled on the diversion channel levee impacts this structure unfavorably, the City is investigating options to put to use the diversion authority that is remaining with permit 1347-3.

If you have any questions, please contact me at 605-373-6944. Thank you for your attention to this matter.

Sincerely,

Greg Anderson
Water Superintendent

RECEIVED

FEB 24 2011

WATER RIGHTS
PROGRAM

Water Rights Program - DENR
Conversation File Documentation

NAME OF PERSON OR FILE: Water Permit Application No. 7232-3, city of Sioux Falls

ADDRESS: COUNTY: Minnehaha County

DATE: March 3, 2011 TELEPHONE:

RE: remaining diversion under Water Right No. 1306-3

The description of amendment portion of the application states the remaining diversion authority under WR 1306-3 is 2.65 cfs and 1,919 acre feet.

However, when Water Permit No. 7170-3, the amount remaining in Water Right No. 1306-3 was determined to be 1,918 acre feet of water. Technically, it was 1,918.8 acre feet of water that was rounded down instead of rounded up. The logic was to have rounded up would have provide more, albeit very small, additional water to the originating water right.

Based in this conclusion, the application filed by the city (No. 7232-3) was amended to the 1,918 acre foot of water amount.

NAME: Eric Stenlund



**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. 7232-3, City of Sioux Falls**

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. 7232-3, City of Sioux Falls, c/o Greg Anderson, 224 West 9th Street, Sioux Falls SD 57104.

The Chief Engineer is recommending APPROVAL of Application No. 7232-3 because 1) existing rights will not be unlawfully impaired, 2) the proposed use is a beneficial use, and 3) it is in the public interest with the following qualifications:

1. If development and pumping of the well authorized by [this permit] results in impairment of adequate domestic wells or adequate wells having prior water rights, reduction of withdrawals or mitigation may be necessary. SDCL 46-1-5(1), in giving preference to domestic use over appropriative rights does so without regard to whether lowered groundwater levels are due to drought, the location of the domestic wells in the aquifer, or thickness of the water bearing sands and gravel; subject to compliance with minimum requirements for adequate wells as defined by Board Well Construction Standards, Chapter 74:02:04.
2. Water Permit No. 7232-3 authorizes a total annual diversion of 3,247 acre feet of water (1,918 ac-ft/annually established by Water Right No. 1306-3 and 1,329 ac-ft/annually established by Water Right No. 1347-3).
3. The City of Sioux Falls shall plug the existing well authorized by Water Right No. 1306-3 in accordance with Water Management Board Rules, Chapter 74:02:04 within thirty days of the new well being brought on-line.
4. The City of Sioux Falls shall report to the Chief Engineer annually the amount of water withdrawn from the Sioux Falls Management Unit of the Big Sioux Aquifer.

See report on application for additional information.

Garland Erbele, Chief Engineer
June 13, 2011

WATER PERMIT APPLICATION NO. 7232-3
CITY OF SIOUX FALLS
APRIL 18, 2011

Water Permit Application No. 7232-3 proposes to amend Water Right Nos. 1306-3 and 1347-3 by transferring the water rights' existing diversion authority to a new diversion point. Water Right No. 1306-3 authorizes diversion of 1,918 acre-feet annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well completed into the Sioux Falls management unit of the Big Sioux aquifer. The existing well is located in the NW¼ Section 9, T101N-R49W. This permit application proposes to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE¼ SE¼ Section 29, T102N-R49W. This application also proposes to transfer the diversion authority for 1,329 acre-feet annually at a maximum diversion rate of 1.837 cfs from Water Right No. 1347-3 to the new horizontal collector well. Water Right No. 1347-3 authorizes diversion of 5,611 acre-feet annually at a maximum diversion rate of 7.75 cfs from a well located in the SW¼ SW¼ Section 4, T101N-R49W. This application, if approved, will transfer the diversion authority for 3,247 acre-feet annually at a maximum rate of 4.487 cfs for municipal use by the city. No additional water is being appropriated by this application.

AQUIFER: Big Sioux: Sioux Falls

GEOLOGY AND AQUIFER CHARACTERISTICS:

The Sioux Falls Management Unit of the Big Sioux Aquifer is an alluvium mantled, glacial outwash deposit, which consists of silt, fine to coarse sand, and gravel. The management unit underlies approximately 22,900 acres in Minnehaha County and contains an estimated 103,050 acre-feet of recoverable water in storage in the county (Hedges, 1982). The aquifer is restricted to the Big Sioux Alluvial Valley, and is bounded both to the north (near Dell Rapids) and on the south (Sioux Falls) by the relatively impermeable Sioux Quartzite (see figure 1). The aquifer is predominately under unconfined conditions. The direction of water movement in the aquifer is generally to the south and towards the Big Sioux River (Lindgren, 1992). The aquifer attains a maximum thickness of approximately 48 feet. The completion report submitted for Sioux Falls Well #62 identifies a saturated thickness of the aquifer in this location of 31.3 feet (Water Rights, 2011c)

The DENR-Water Rights Program monitors 13 observation wells completed into the Big Sioux: Sioux Falls. Three of these observation wells are located within approximately one and three-fourths of a mile from the well site proposed by this application. Hydrographs for these wells are shown in figures 1-3.

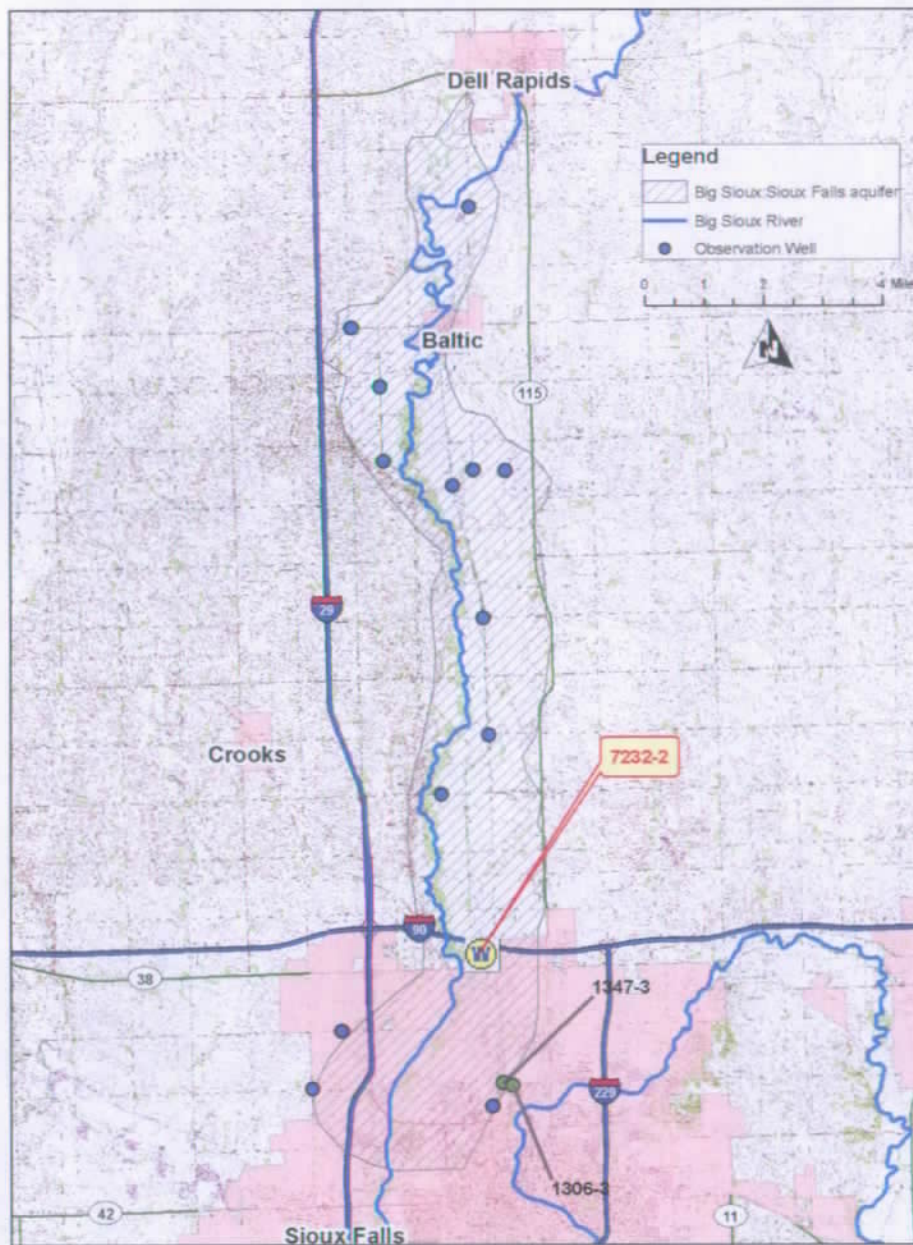


Figure 1. Vicinity map

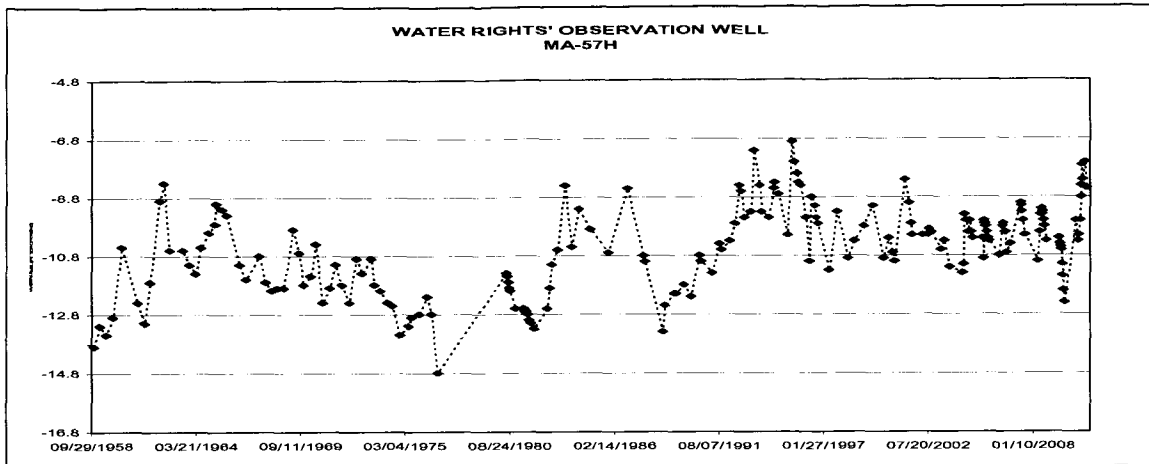


Figure 2. DENR-Water Rights Program observation well located approximately 2.5 miles south of the well site proposed by Application No. 7232-3

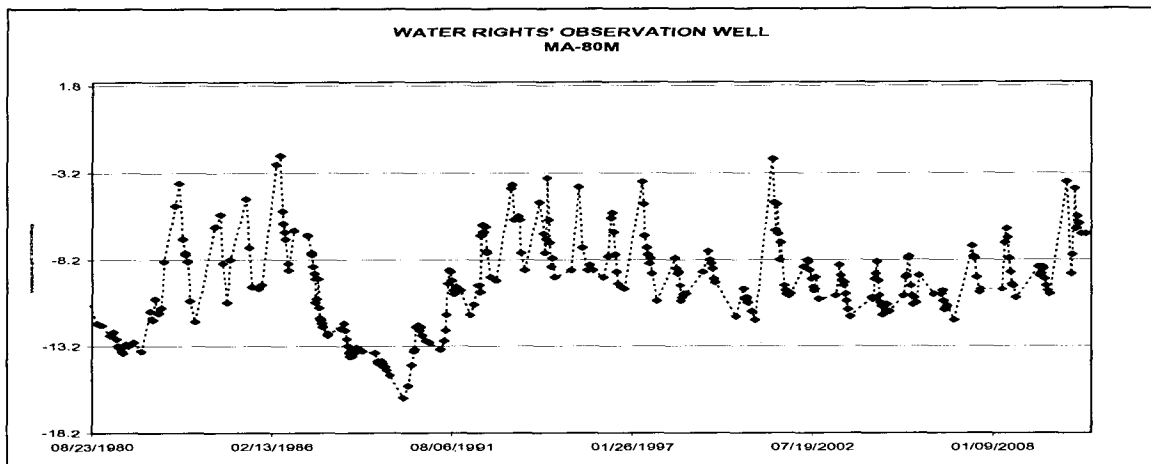


Figure 3. DENR-Water Rights Program observation well located approximately 2.75 miles north of the well site proposed by Application No. 7232-3

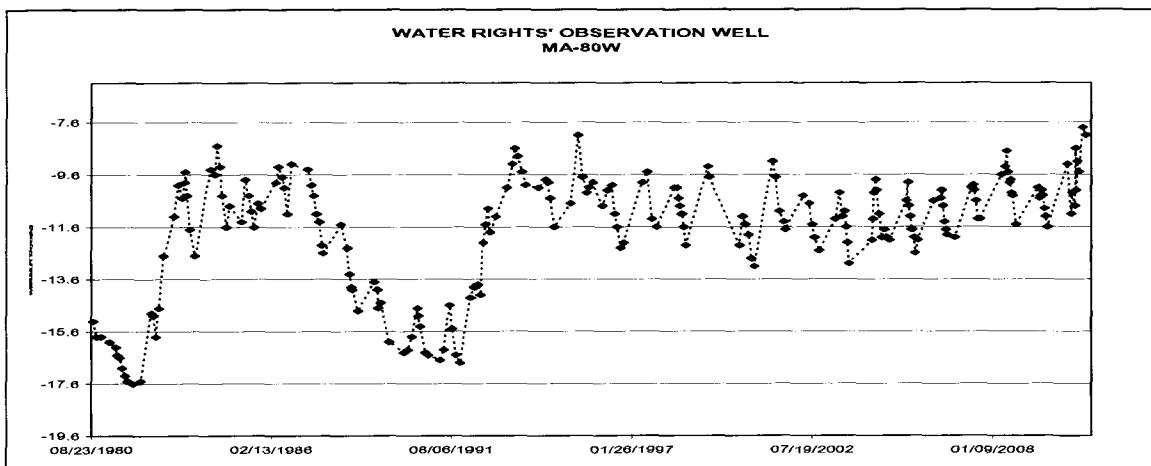


Figure 4. DENR-Water Rights Program observation well located approximately 3.75 miles southwest of the well site proposed by Application No. 7232-3

The observation well hydrographs show that the highest annual water level generally occurs around April- June, and the lowest annual water level generally occurs around August - October. The decline of water levels during the summer months is due to increased evapotranspiration, reduced recharge, and increased pumpage. Water levels rise during the late winter and spring due to reduced pumping and recharge, if available. The hydrographs show that the water level of the aquifer fluctuates rapidly in response to recharge. The response to withdrawals is less obvious and tends to be represented by a slow gradual decline.

AMENDMENT OF PERMIT OR LICENSE

SDCL 46-2A-12 allows that an amendment of an existing permit or license may be granted for a change in point of diversion (e.g. Water Right No. 1306-3) or to add a diversion point (e.g. Water Right No 1347-3) only if the change does not unlawfully impair existing rights and is for a beneficial use and in the public interest.

REVIEW OF EXISTING WATER RIGHTS

There are currently a total of 69 groundwater appropriations from Sioux Falls management unit of the Big Sioux aquifer, including 57 Water Rights, four Water Permits, three Temporary Use Water Permits pursuant to SDCL 46-5-39 and five Future Use Permits. The majority of the appropriations from the management unit belong to the City of Sioux Falls (47) compared to the 22 appropriations held by others.

Water Rights/Permits within approximately three miles of the well that Application No. 7232-3 proposes to use that do not belong to Sioux Falls, are shown in figure 5 and identified in table 1.

PERMIT NO	NAME	STATUS	USE	CFS	ACRES
4843-3	KOA KAMPGROUNDS OF SIOUX FALLS	LC	COM	0.15	
5681-3	ST MICHAEL CEMETERY	LC	COM	0.06	
7174-3	THE TRUCK WASHOUT	PE	COM	0.78	
4880-3	HENRY CARLSON	LC	GEO	0.06	
6719-3	SD AIR NATIONAL GUARD	PE	GEO	0.17	
1270-3	R C SWEETMAN	LC	IRR	1.66	116.00
4232-3	SIOUX FALLS	LC	IRR	0.71	50.00
5556-3	ELMWOOD GOLF COURSE	LC	IRR	2.13	238.00
6612-3	DEAN FOODS/LAND O LAKES MILK	LC	IRR	0.03	0.30
5966-3	MICHAEL G WILLIAMS	PE	IRR	1.56	118.50
6008-3	HERMAN BRENDE	PE	IRR	1.00	69.00
LC=Water Right, PE= Water Permit, COM= Commercial, GEO= Geothermal, IRR= Irrigation					

Table 1. Water Rights/Permits within approximately 3 miles of 7232-3

EFFECTS ON EXISTING WATER RIGHTS

Unlawful impairment of groundwater rights may be due to "well interference", which is the overlapping of drawdown cones of depression of two or more wells; or from a "cumulative affect" in which the water level throughout the entire aquifer is lowered, as the result of an extended interim between withdrawal and recharge causing an "overdraft" from storage. In either case mitigation may be necessary, if the pumping authorized by junior priority rights is to continue.

Well interference:

None of the Water Rights/Permits that belong to others are located within one mile of the well that is to be used for this appropriation. Therefore, well interference is not expected to be adverse.

Cumulative affect:

To ensure protection of domestic users and prior appropriators from any cumulative withdrawal impacts, since 1991, most of the appropriations from the Sioux Falls management unit have included the following qualification:

"If development and pumping of Sioux Falls Management Unit of the Big Sioux Aquifer water reserved by Future Use Permit No. 5523-3 results in adverse impairment of adequate domestic wells or adequate wells having prior rights, reduction of withdrawals or mitigation may be necessary. SDCL 46-1-5(1), in giving preference to domestic use over appropriative rights does so without regard to 1) whether lowered groundwater levels are due to drought, 2) the location of the domestic wells in the aquifer, or 3) the thickness of the water bearing sands and gravel; subject to compliance with minimum requirements for adequate wells as defined by Board Well Construction Standards, Chapter 74:02:04."

This application, if approved will not increase the annual appropriation from the Sioux Falls management unit but will merely change the location of two diversion points. This redistribution of the points of withdrawal will affect the cumulative impact of withdrawals from the management unit on existing water rights.

SURFACE WATER/GROUNDWATER INTERACTION

The well site proposed by this application is located approximately 1,900 feet from the Big Sioux River. It is unlikely that withdrawals from this well will capture flows from the river at this distance. However, since the river and the aquifer are hydrologically connected, the impact of the combined withdrawals of all groundwater pumping from the aquifer could theoretically influence the flows in the river.

The Water Rights Commission, the Water Management Board and the Chief Engineer have at various times dealt with the issue of conjunctive use in a range of ways (Buhler, 2009). The conjunctive nature of the river and the aquifer has at times been considered either a benefit or a detriment depending on perspective.

The groundwater/surface water exchange between the River and the aquifer is not at a one-for-one ratio, (i.e. a well diverting near the Big Sioux River will capture only a small percentage of its total withdrawals from the river). Many Water Rights/Permits appropriating water from the Big Sioux River contain “low flow bypasses” to protect prior appropriations and domestic users. There have been over 100 Water Permit Applications approved with wells located within approximately 1,000 feet of the Big Sioux River. Barring a small number of exceptions, permits to appropriate groundwater have typically not been conditioned with any recognition of the connection between the river and the aquifer, and groundwater appropriations generally do not contain qualifications that protect prior surface water appropriations (Buhler, 2009).

Pumping the City’s wellfield at maximum capacity could dry up the Big Sioux River under low flow conditions (Buhler, 2009). However, the Sioux Falls Wastewater Treatment Plant discharges 15-20 MGD (23-31 cfs) to the Big Sioux River downstream of their well field thus mitigating the affects of river capture on downstream water rights/permits (Buhler, 2009).

There are only two water rights diverting water from the Big Sioux River between the Sioux Falls Well Field and the Sioux Falls Wastewater treatment plant that do not belong to the city. They are US31-3 and US386-3 held by USDA. The status of the US withdrawals is unknown but they have likely been abandoned.

It may be possible during extended dry periods for pumping from the Sioux Falls management unit to cause low-flow or no-flow conditions in a short stretch the Big Sioux River up stream of the wastewater treatment plant. Low-flow or no-flow conditions should not result in impairment of existing water rights; however it may raise concerns under a “public interest” criteria. The City of Sioux Falls’ waste water treatment plant discharges to Big Sioux River through a surface water discharge permit. The limits (concentration) of the permit are established based on historic river flows. If groundwater withdrawals reduce

flows in the Big Sioux River, more stringent limits to the discharge permits may be required by DENR-Surface Water Quality program to reflect new flow conditions.

At this time, groundwater permits appropriating water from the Sioux Falls management unit belonging to the City of Sioux Falls do not need to contain conditions to protect flows in the Big Sioux River because of the mitigating affects of the City's discharge from the wastewater treatment plant.

CONCLUSIONS:

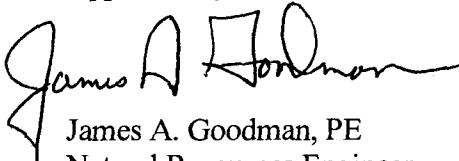
1. This application proposes to add a diversion points to Water Right Nos. 1306-3 and 1347-3.
2. This permit application does not propose any additional appropriation.
3. Water Right No. 1347-3 has a priority date of January 10, 1967 and Water Right No. 1306-3 has a priority date of September 8, 1966.
4. If approved, the priority dates of the originating Water Rights should be reflected in Water Permit No. 7232-3. Therefore 1,918 ac-ft/yr with a diversion rate of 2.65 cfs should have a September 8, 1966 priority date and 1,329 ac-ft/yr with a diversion rate of 1.837 cfs should have a January 10, 1967 priority date.
5. If Permit Application No. 7232-3 is approved, 4,282 ac-ft/yr at a maximum diversion rate of 5.913 cfs remains authorized by Water Right No. 1347-3, for a well located in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 4, T101N-R49W.
6. Amendments to Water Right Nos. 1347-3 and 1306-3 as proposed by this application will not adversely impact existing water rights.
7. Diversions from horizontal collector well #62 are not expected to have any direct affect on flows in the Big Sioux River due to the distance from the river ($\cong$ 1,900 feet).
8. This application does not need to be held to the same standard as the surface water diversions regarding low flow bypasses of the Big Sioux River since the City of Sioux Falls mitigates the impacts of groundwater withdrawals with discharge from their wastewater treatment plant.
9. If groundwater withdrawals reduce flows in the Big Sioux River, more stringent limits to the discharge permits may be required by DENR-Surface Water Quality program to reflect new flow conditions.
10. If approved this permit should contain the same qualifications as Future Use Permit No. 448-3 and Water Rights issued since the Water Management Board's declaratory ruling hearing regarding impairment. The qualification reads:

"If development and pumping of the well authorized by [this permit] results in impairment of adequate domestic wells or adequate wells having prior water rights, reduction of withdrawals or mitigation may be necessary. SDCL 46-1-5(1), in giving preference to domestic use over appropriative rights does so without regard to whether lowered groundwater levels are due to drought, the location of the domestic wells in the aquifer, or thickness of the water bearing sands and gravel; subject to compliance with minimum requirements for adequate wells as defined by Board Well Construction Standards, Chapter 74:02:04".



Ken Buhler
Natural Resources Engineer

Approved by



James A. Goodman, PE
Natural Resources Engineer

REFERENCES:

Buhler, K.A., 2009, Report for Water Permit No. 7170-3, December 16, 2009: SD DENR-Water Rights Program

Hedges, L.S., Burch, S.L., Iles, D.L., Barari, R.A., and Schoon, R.A., 1982, Evaluation of Ground-Water Resources Eastern South Dakota and Upper Big Sioux River, South Dakota and Iowa: SD DENR-Geological Survey U.S. Army Corps of Engineers Contract DAWC 45-80-C-0185

Lindgren, R.J., and Niehus, C.A., 1992, Water Resources of Minnehaha County, South Dakota: USGS, Water-Resources Investigations Report 91-4101

Water Rights, 2011a, Observation Well Files, SD DENR-Water Rights Program, Joe Foss Bldg, Pierre, SD.

Water Rights, 2011b, Water Right/Permit Files, SD DENR-Water Rights Program, Joe Foss Bldg, Pierre, SD.

Water Rights, 2011c, Water Well Completion Report Files, SD DENR-Water Rights Program, Joe Foss Bldg, Pierre, SD.



**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.

June 14, 2011

City of Sioux Falls
Greg Anderson
224 W 9th St
Sioux Falls SD 57104

Dear Mr. Anderson:

Water Permit Application No. 7232-3 for municipal use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Publishers of the following papers:

Argus Leader printed at Sioux Falls SD (Ph # 605-331-2200)
Sioux Valley News printed at Canton SD (Ph # 605-764-2000)

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 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 papers can eliminate delays. Upon receiving authorization, the publishers have been instructed to publish your notice once each week for two consecutive weeks. The newspapers have 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
eric.gronlund@state.sd.us

enclosures

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.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

June 14, 2011

Argus Leader
PO Box 5034
Sioux Falls SD 57117

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7232-3 to Appropriate Water to be published twice. Please publish the first notice on June 23, 2011 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.

The applicant must verify to you that the notice is to be published, before you make the first publication. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is City of Sioux Falls, c/o Greg Anderson, 224 W 9th St., Sioux Falls SD 57104 (Ph # 605-373-6944).

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-----

No. 7232-3

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

Date _____

We are in receipt of your letter of June 14, 2011 enclosing Notice to Appropriate Water by Application No. 7232-3 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

June 14, 2011

Sioux Valley News
PO Box 255
Canton SD 57013

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7232-3 to Appropriate Water to be published twice. Please publish the first notice on June 23, 2011 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.

The applicant must verify to you that the notice is to be published, before you make the first publication. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is City of Sioux Falls, c/o Greg Anderson, 224 W 9th St., Sioux Falls SD 57104 (Ph # 605-373-6944).

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-----

No. 7232-3

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

Date _____

We are in receipt of your letter of June 14, 2011 enclosing Notice to Appropriate Water by Application No. 7232-3 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper

Instruction to Newspaper - Publish first Notice on June 23, 2011 with the second publication 7 days later. The applicant is responsible for payment. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352 or email: Karen.schlaak@state.sd.us.

NOTICE OF APPLICATION NO. 7232-3 to Amend Existing Water Rights

Notice is given that the City of Sioux Falls, c/o Greg Anderson, Water Superintendent, 224 W 9th St, Sioux Falls SD 57104 has filed an application for a water permit to amend Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the Big Sioux Aquifer. Water Right No. 1306-3 authorized diversion of 1,918 acre feet of water annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well located in the NW ¼ Section 9-T101N-R49W. The city is requesting to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE ¼ SE ¼ Section 29-T102N-R49W. To maximize the horizontal collector well potential, the city is also requesting to transfer a portion of the diversion authority under Water Right No. 1347-3. Water Right No. 1347-3 authorized diversion of 5,611 acre feet of water annually and a maximum rate of 7.75 cfs from a well located in the SW ¼ SW ¼ Section 4-T101N-R49W. This application proposes to transfer 1,329 acre-feet of the diversion authority and accompanying diversion rate of 1.837 cfs authorized by Water Right No. 1347-3 to the horizontal collector well. This application, if approved, will transfer diversion authority totaling 3,247 acre-feet of water annually at a maximum diversion rate of 4.487 cfs of existing water rights to the new horizontal collector well. No additional water is being appropriated by this application.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7232-3 because 1) existing rights will not be unlawfully impaired, 2) it is a beneficial use of water, and 3) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation 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 July 11, 2011.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published twice at the total approximate cost of _____.

CUSTOMER NUMBER:	078340	Argus Leader P.O. Box 677349, Dallas, TX 75267-7349
INVOICE NUMBER:	1338328	
RUN DATES	6/23, 6/30, 2011	AMOUNT DUE: \$147.88

RECEIVED

JUL - 1 2011

WATER RIGHTS PROGRAM

Dept of Environment & Natural Resources
Water Rights Program
Attn: Eric Gronlund
523 E Capitol Avenue, Joe Foss Building
Pierre, SD 57501

DETACH THIS STUB AND RETURN WITH PAYMENT

PAYMENT DUE UPON RECEIPT

Water Permit - City of Sioux Falls

AFFIDAVIT OF PUBLICATION-

Customer Number: 078340
Invoice Number: 1338328

Dept of Environment & Natural Resources

Argus Leader
AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

COUNTY OF MINNEHAHA } ss

Linda Schulte 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 23 day of June 2011,
Thursday, the 30 day of June 2011,
_____, the _____ day of _____ 2011,
_____, the _____ day of _____ 2011,
_____, the _____ day of _____ 2011,
_____, the _____ day of _____ 2011,
_____, the _____ day of _____ 2011,
_____, the _____ day of _____ 2011,

and that \$147.88 was charged for publishing the same

Linda Schulte
Subscribed and sworn to before me 6/30/2011

J. Zimmerman
Notary Public, South Dakota

My Commission expires December 22, 2015

NOTICE OF APPLICATION
NO. 7232-3 to Amend Existing
Water Rights

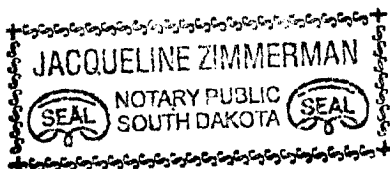
Notice is given that the City of Sioux Falls, c/o Greg Anderson, Water Superintendent, 224 W 9th St, Sioux Falls SD 57104 has filed an application for a water permit to amend Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the Big Sioux Aquifer. Water Right No. 1306-3 authorized diversion of 1,918 acre feet of water annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well located in the NW 1/4 Section 9-T101N-R49W. The city is requesting to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE 1/4 SE 1/4 Section 29-T102N-R49W. To maximize the horizontal collector well potential, the city is also requesting to transfer a portion of the diversion authority under Water Right No. 1347-3. Water Right No. 1347-3 authorized diversion of 5,611 acre feet of water annually and a maximum rate of 7.75 cfs from a well located in the SW 1/4 SW 1/4 Section 4-T101N-R49W. This application proposes to transfer 1,329 acre-feet of the diversion authority and accompanying diversion rate of 1.837 cfs authorized by Water Right No. 1347-3 to the horizontal collector well. This application, if approved, will transfer diversion authority totaling 3,247 acre-feet of water annually at a maximum diversion rate of 4.487 cfs of existing water rights to the new horizontal collector well. No additional water is being appropriated by this application.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7232-3 because 1) existing rights will not be unlawfully impaired, 2) it is a beneficial use of water, and 3) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation 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 July 11, 2011.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pinner, Secretary, Department of Environment and Natural Resources.

Published twice at the total approximate cost of \$147.88.
1338328 June 23 & 30, 2011



Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF LINCOLN

ANDY WILCOX

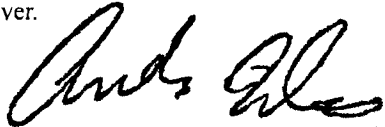
being first duly sworn on his oath says; that the Sioux Valley News is a legal weekly newspaper of general circulation as required by South Dakota Code of Nineteen Hundred Thirty-Nine, and any acts amendatory thereto, printed and published by the Sioux Valley News, Inc., in Canton, in said county and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

**City of Sioux Falls
Notice of Application No. 7232-3**

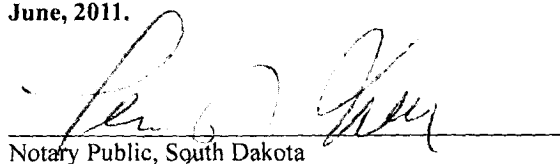
a printed copy of which is hereto attached, was printed and published in said newspaper for **TWO** successive week(s) upon the following dates, to-wit:

**June 23, 2011
June 30, 2011**

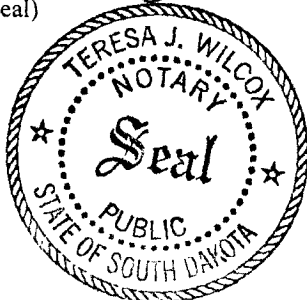
that the full amount of the fees charged for publishing the same to-wit: the sum of **\$57.18** insures solely to the benefit of the publishers of said newspaper; that no agreement or understanding for any division of this sum has been made with any other person; and that no part of said sum has been agreed to be paid to any person whomsoever.



Subscribed and sworn to before me this **30th** day of
June, 2011.


Notary Public, South Dakota

(Seal)



**My Commission Expires
12/9/2014**

RECEIVED

JUL 13 2011

**WATER RIGHTS
PROGRAM**

**NOTICE OF APPLICATION
NO. 7232-3 to Amend Existing
Water Rights**

Notice is given that the City of Sioux Falls, c/o Greg Anderson, Water Superintendent, 224 W 9th St, Sioux Falls SD 57104 has filed an application for a water permit to amend Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the big Sioux Aquifer. Water Right No. 1306-3 authorized diversion of 1,918 acre feet of water annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well located in the NW 1/4 Section 9-T102N-R49W. The city is requesting to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE 1/4 Se 1/4 section 29-T102N-R49W. To maximize the horizontal collector well potential, the city is also requesting to transfer a portion of the diversion authority under Water Right No. 1347-3. Water Right No. 1347-3 authorized diversion of 5,611 acre feet of water annually and a maximum rate of 7.75 cfs from a well located in the SW 1/4 SW 1/4 Section 4-T101N-R49W. This application proposes to transfer 1.329 acre -feet of the diversion authority and accompanying diversion rate of 1.837 cfs authorized by Water Right No. 1347-3 to the horizontal collector well. This application if approved will transfer diversion authority totaling 3,247 acre-feet of water annually at a maximum diversion rate of 4.487 cfs of existing water rights to the new horizontal collector well. No additional water is being appropriated by this application.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL

of Application No. 7232-3 because 1) existing rights will not be unlawfully impaired, 2) it is a beneficial use of water, and 3) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water management board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition of 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 July 11, 2011.

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 Water Rights Program address to request copies of information pertaining to this application.

Steven M. Pirner

Published in the Sioux Valley News on June 23 and 30, 2011 at the total approximate cost of \$57.18.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

July 19, 2011

Sioux Valley News
PO Box 255
Canton SD 57013

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 7232-3 to Appropriate Water to be published twice. Please publish the first notice on July 28, 2011 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.*

This Notice was originally published June 23 and 30, 2011 in your paper. There was a typographical error in the first paragraph regarding a legal description. Therefore, the notice needs to be readvertised to correct the error. Enclosed is a copy of the notice with the error underlined.

It is important to 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**

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

No. 7232-3

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

Date _____

We are in receipt of your letter of July 19, 2011 enclosing Notice to Appropriate Water by Application No. 7232-3 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper

Instruction to Newspaper - Publish first Notice on July 28, 2011 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 or email: Karen.schlaak@state.sd.us.

NOTICE OF APPLICATION NO. 7232-3 to Amend Existing Water Rights

Notice is given that the City of Sioux Falls, c/o Greg Anderson, Water Superintendent, 224 W 9th St, Sioux Falls SD 57104 has filed an application for a water permit to amend Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the Big Sioux Aquifer. Water Right No. 1306-3 authorized diversion of 1,918 acre feet of water annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well located in the NW 1/4 Section 9-T101N-R49W. The city is requesting to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE 1/4 SE 1/4 Section 29-T102N-R49W. To maximize the horizontal collector well potential, the city is also requesting to transfer a portion of the diversion authority under Water Right No. 1347-3. Water Right No. 1347-3 authorized diversion of 5,611 acre feet of water annually and a maximum rate of 7.75 cfs from a well located in the SW 1/4 SW 1/4 Section 4-T101N-R49W. This application proposes to transfer 1,329 acre-feet of the diversion authority and accompanying diversion rate of 1.837 cfs authorized by Water Right No. 1347-3 to the horizontal collector well. This application, if approved, will transfer diversion authority totaling 3,247 acre-feet of water annually at a maximum diversion rate of 4.487 cfs of existing water rights to the new horizontal collector well. No additional water is being appropriated by this application.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7232-3 because 1) existing rights will not be unlawfully impaired, 2) it is a beneficial use of water, and 3) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation 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 August 15, 2011.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published twice at the total approximate cost of _____.

Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF LINCOLN

ANDY WILCOX

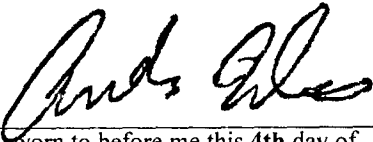
being first duly sworn on his oath says; that the Sioux Valley News is a legal weekly newspaper of general circulation as required by South Dakota Code of Nineteen Hundred Thirty-Nine, and any acts amendatory thereto, printed and published by the Sioux Valley News, Inc., in Canton, in said county and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

Notice of Application NO. 7232-3

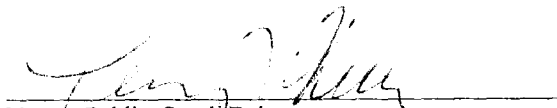
a printed copy of which is hereto attached, was printed and published in said newspaper for **TWO** successive week(s) upon the following dates, to-wit:

July 28, 2011
August 4, 2011

that the full amount of the fees charged for publishing the same to-wit: the sum of **\$57.18** 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 **4th** day of
August, 2011.


Notary Public, South Dakota

(Seal)



My Commission Expires
12/9/2014

RECEIVED

AUG - 8 2011

WATER RIGHTS
PROGRAM

NOTICE OF APPLICATION NO. 7232-3 to Amend Existing Water Rights

Notice is given that the City of Sioux Falls, c/o Greg Anderson, Water Superintendent, 224 W 9th St, Sioux Falls SD 57104 has filed an application for a water permit to amend Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the big Sioux Aquifer. Water Right No. 1306-3 authorized diversion of 1,918 acre feet of water annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well located in the NW 1/4 Section 9-T101N-R49W. The city is requesting to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE 1/4 Se 1/4 section 29-T102N-R49W. To maximize the horizontal collector well potential, the city is also requesting to transfer a portion of the diversion authority under Water Right No. 1347-3. Water Right No. 1347-3 authorized diversion of 5,611 acre feet of water annually and a maximum rate of 7.75 cfs from a well located in the SW 1/4 SW 1/4 Section 4-T101N-R49W. This application proposes to transfer 1,329 acre -feet of the diversion authority and accompanying diversion rate of 1.837 cfs authorized by Water Right No. 1347-3 to the horizontal collector well. This application if approved will transfer diversion authority totaling 3,247 acre-feet of water annually at a maximum diversion rate of 4.487 cfs of existing water rights to the new horizontal collector well. No additional water is being appropriated by this application.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL

of Application No. 7232-3 because 1) existing rights will not be unlawfully impaired, 2) it is a beneficial use of water, and 3) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water management board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition of 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 July 11, 2011.

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 Water Rights Program address to request copies of information pertaining to this application.

Steven M. Pirner

Published in the Sioux Valley News on **July 28 and August 4, 2011** at the total approximate cost of \$57.18.



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 9, 2011

Sioux Valley News
PO Box 255
Canton SD 57013

ATTENTION: Legal Public Notice

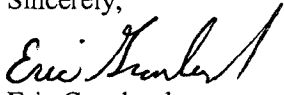
Enclosed is a Notice on Application No. 7232-3 to Appropriate Water to be published twice. Please publish the first notice on August 18, 2011 with the second publication 7 days later. *The text of the notice has been e-mailed to your paper.*

This Notice was originally published June 23 and 30, 2011 with an error. The notice was republished on July 28 and August 4, 2011. When republished there was an error in the third paragraph regarding the date for petitions to be filed. Therefore, the notice needs to be readvertised to correct the error. Enclosed is a copy of the notice with the error underlined.

It is important to 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**

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

No. 7232-3

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

Date _____

We are in receipt of your letter of August 9, 2011 enclosing Notice to Appropriate Water by Application No. 7232-3 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper

Instruction to Newspaper - Publish first Notice on August 18, 2011 with the second publication 7 days later. The text of the notice has been e-mailed to your paper.

NOTICE OF APPLICATION NO. 7232-3 to Amend Existing Water Rights

Notice is given that the City of Sioux Falls, c/o Greg Anderson, Water Superintendent, 224 W 9th St, Sioux Falls SD 57104 has filed an application for a water permit to amend Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the Big Sioux Aquifer. Water Right No. 1306-3 authorized diversion of 1,918 acre feet of water annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well located in the NW 1/4 Section 9-T101N-R49W. The city is requesting to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE 1/4 SE 1/4 Section 29-T102N-R49W. To maximize the horizontal collector well potential, the city is also requesting to transfer a portion of the diversion authority under Water Right No. 1347-3. Water Right No. 1347-3 authorized diversion of 5,611 acre feet of water annually and a maximum rate of 7.75 cfs from a well located in the SW 1/4 SW 1/4 Section 4-T101N-R49W. This application proposes to transfer 1,329 acre-feet of the diversion authority and accompanying diversion rate of 1.837 cfs authorized by Water Right No. 1347-3 to the horizontal collector well. This application, if approved, will transfer diversion authority totaling 3,247 acre-feet of water annually at a maximum diversion rate of 4.487 cfs of existing water rights to the new horizontal collector well. No additional water is being appropriated by this application.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7232-3 because 1) existing rights will not be unlawfully impaired, 2) it is a beneficial use of water, and 3) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation 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 September 5, 2011.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published twice at the total approximate cost of _____.

Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF LINCOLN

RECEIVED

AUG 29 2011

WATER RIGHTS
PROGRAM

ANDY WILCOX

being first duly sworn on his 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 he is and during all of said time was publisher of said newspaper and has personal knowledge of the facts stated in this affidavit; that the advertisement headed:

DENR

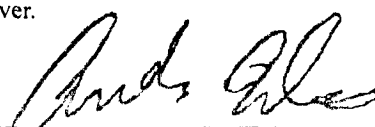
Notice of Application 7232-3

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

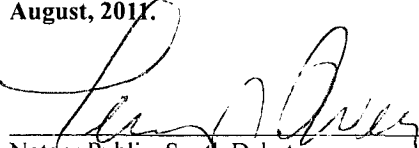
August 18, 2011

August 25, 2011

that the full amount of the fees charged for publishing the same to-wit: the sum of **\$59.13** 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 **25th** day of
August, 2011.



Notary Public, South Dakota

(Seal)



My Commission Expires
12/9/2014

NOTICE OF APPLICATION NO. 7232-3 to Amend Existing Water Rights

Notice is given that the City of Sioux Falls, c/o Greg Anderson, Water Superintendent, 224 W 9th St, Sioux Falls SD 57104 has filed an application for a water permit to amend Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the Big Sioux Aquifer. Water Right No. 1306-3 authorized diversion of 1,918 acre feet of water annually at a maximum rate of 2.65 cubic feet of water per second (cfs) from a well located in the NW 1/4 Section 9-T101N-R49W. The city is requesting to transfer the entire remaining diversion authority held under Water Right No. 1306-3 to a horizontal collector well (41.8 feet deep) located in the SE 1/4 SE 1/4 Section 29-T102N-R49W. To maximize the horizontal collector well potential, the city is also requesting to transfer a portion of the diversion authority under Water Right No. 1347-3. Water Right No. 1347-3 authorized diversion of 5,611 acre feet of water annually and a maximum rate of 7.75 cfs from a well located in the SW 1/4 SW 1/4 Section 4-T101N-R49W. This application proposes to transfer 1,329 acre-feet of the diversion authority and accompanying diversion rate of 1.837 cfs authorized by Water Right No. 1347-3 to the horizontal collector well. This application, if approved, will transfer diversion authority totaling 3,247 acre-feet of water annually at a maximum diversion rate of 4.487 cfs of existing water rights to the new horizontal collector well. No additional water is being appropriated by this application.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 7232-3 because 1) existing rights will not be unlawfully impaired, 2) it is

a beneficial use of water, and 3) it is in the public interest. In accordance with SDCL 46-2A-23, the Chief Engineer will act on this application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation 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 September 5, 2011.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

Published in the Sioux Valley News on August 18 and 25, 2011 at the total approximate cost of \$59.13.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

OCT 21 2011

City of Sioux Falls
Greg Anderson
224 W 9th St
Sioux Falls SD 57104

Dear Mr. Anderson:

Enclosed is Water Permit No. 7232-3 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

**NOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USE**

MAIL TO: PMB 2020
DENR - Water Rights Program
523 E Capitol Ave
Pierre, SD 57501-3182
ph. (605) 773-3352

Date 10-28-2011

FROM: Greg Anderson
(name)

2100 north Minnesota Avenue
(address)

Sioux Falls SD 57104 605-373-6944
(city) (state) (zip) (phone)

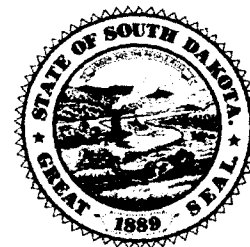
I have completed the construction of the water use system and I have put the water to beneficial use to the maximum extent it is going to be used.

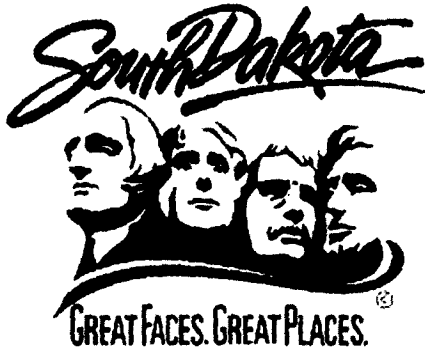
Water Permit No. 7232-3 states that the water use system is to be constructed by
September 5-2016, and water is to be put to beneficial use by September 5-2020
(date) (date)

The water use system was completed on 10-31-2010
(date)

Applying the water to beneficial use was completed on 11-01-2010
(date)

You may schedule an investigation so that the water license may be issued.





DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
PMB 2020
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
<http://denr.sd.gov>

November 1, 2011

7232-3

Greg Anderson
City of Sioux Falls
2100 N Minnesota Ave
Sioux Falls SD 57104

Dear Mr. Anderson:

I am writing to acknowledge receipt of the "Notice of Completion of Works" form that you sent in to let us know the city is completed with the system authorized by Water Permit No. 7232-3.

The system is now ready for inspection. Inspections are done on a county-by-county basis as staff time permits. You have done everything you need to do and the intervening time between the completion of your project and the staff inspection has no bearing on your water permit.

Someone from our office will contact you prior to the inspection to set up a time that is convenient for you. If you have any questions, please contact me.

Sincerely,

A handwritten signature in black ink that reads "Genny McMath".

Genny McMath
Environmental Scientist
Water Rights Program
(605) 773-3352
email: genny.mcmath@state.sd.us

City of Sioux Falls



CITY OF SIOUX FALLS
PUBLIC WORKS

Providing a Better Quality of Life for You!

Administration

224 West Ninth Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8600 F: 367-8114

Engineering/Real Estate

224 West Ninth Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8601 F: 367-4310

Environmental

1203 North Western Avenue
Sioux Falls, SD 57104-1201
T: 605-367-8276 F: 367-4886

Fleet Management

1000 East Chambers Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8240 F: 367-8239

GIS

132 North Dakota Avenue
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8651 F: 367-8113

Household Hazardous Waste Facility/Sustainability

1015 East Chambers Street
Sioux Falls, SD 57104-7200
T: 605-367-8695 F: 367-4893

Landfill

224 West Ninth Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8162 F: 367-8167

Light

2000 North Minnesota Avenue
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-373-6979 F: 373-6974

Street

1000 East Chambers Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8255 F: 367-8200

Utility Billing

1201 North Western Avenue
P.O. Box 7401
Sioux Falls, SD 57117-7401
T: 605-367-8131 F: 367-7341

Utility Maintenance

668 West Algonquin Street
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-367-8810 F: 367-7883

Water Purification

2100 North Minnesota Avenue
P.O. Box 7402
Sioux Falls, SD 57117-7402
T: 605-373-6940 F: 373-6941

Water Reclamation

4500 North Sycamore Avenue
Sioux Falls, SD 57104-9612
T: 605-367-8188 F: 367-8484

May 7, 2012

Eric Gronlund

SD Department of Environment and Natural Resources

Water Rights Program

Joe Foss Building

523 Capitol

Pierre, SD 57501

Dear Eric,

As you are aware, the City of Sioux Falls completed work on horizontal collector well (No. 62) in October, 2010. The DENR granted water rights to this well in October of 2011 (Water Permit No. 7232-3). This well is located in the SE1/4, SE 1/4, Sec 29, Twp 102N, Rg 49W.

The City of Sioux Falls has six existing small diameter gravel pack wells with water rights in the same general area of the new collector well No. 62. These small wells have water rights (Water Permits No. 5235-3 & 5710-3). The gravel pack wells, No. 60, 61, & 62 are located very close to the new collector well. The location of these wells is listed as SE1/4, SE1/4, Sec 29, Twp 102N, Rg 49W.

City staff has determined, in the best interest of the new collector well, that it didn't make sense to keep the three small gravel pack wells operational. In late October, 2011, the three wells No. 60, 61, 62 were taken out of service and plugged as required by the DENR. I have attached the South Dakota Well and Test Hole Plugging Report to document that the small wells have been plugged. Attached is an exhibit identifying the location of the three gravel pack wells and the new collector well.

If you have any questions, please let me know.

Sincerely,

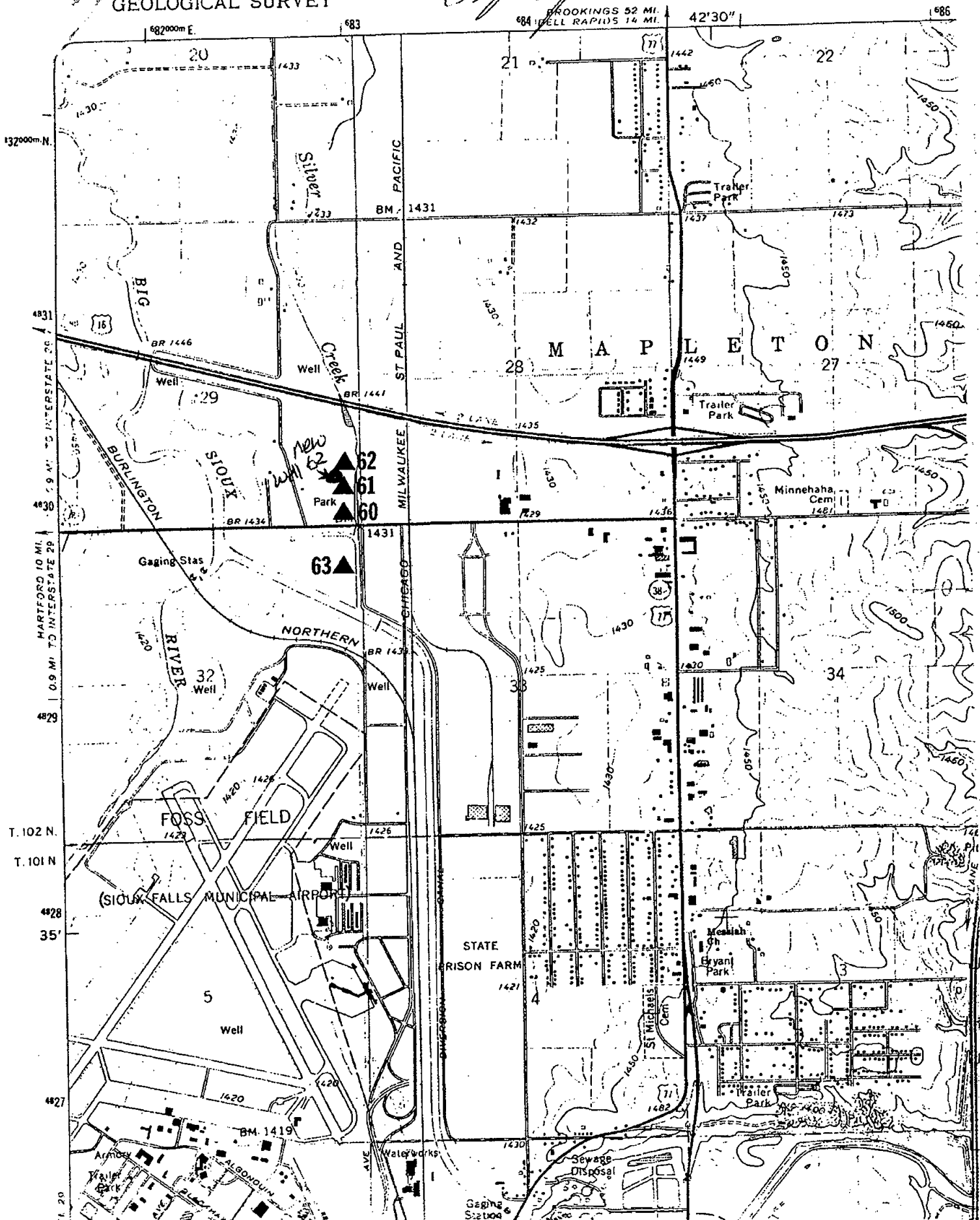
Greg Anderson

Water Superintendent

City of Sioux Falls

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

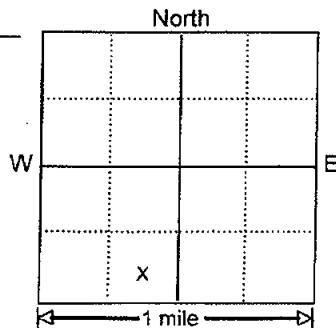
Lytle D. Johnson, PE



SOUTH DAKOTA WELL AND TEST HOLE PLUGGING REPORT 11-02

Location SE ¼ SE ¼ Sec 29 Twp 102N Rg 49W

Well Owner:

County MinnehahaPlease mark well
location with an "X"Name: City of Sioux FallsAddress: 2100 N Minnesota AvenueCity, State, Zip: Sioux Falls SD 57104

Comments:

Abandoned gravel pack Well 61, it was located in the same area as the new collector well 62.
Well 61 pumping rate reduced due to plugged screen.

Plugging Completion Date 11-18-2011

CHECK APPROPRIATE BOX

EXISTING WELL ☒TEST HOLE ☐Well depth 37 feetCasing material plasticCasing size(s) 12 inchCasing condition 80% plugged

Hole depth _____

Hole size _____

Describe plugging procedure:

1. Placed clean washed gravel in casing to the top of existing water table - static level.
2. Place cement grout in casing to a level 3 feet above water table to cover the washed gravel.
3. Removed the top three feet of casing and filled hole with compacted clay and covered with top soil.

Describe grout or plugging material:

Mixed cement grout and water with hand mixer and poured into the casing and let cure.

Type of non-slip plug: _____

This well or test hole was plugged under license # _____ and this report is true and accurate.

Drilling firm: _____

Signature of Licensed Representative: _____

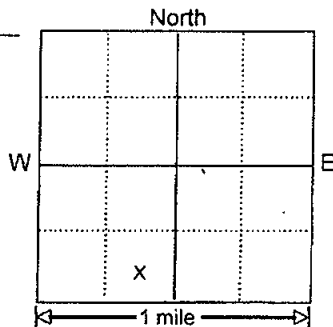
Signature of Well Owner: _____

Date: _____

SOUTH DAKOTA WELL AND TEST HOLE PLUGGING REPORT 11-02

Location SE ¼ SE ¼ Sec 29 Twp 102N Rg 49W

Well Owner:

County MinnehahaPlease mark well
location with an "X"Name: City of Sioux FallsAddress: 2100 N Minnesota AvenueCity, State, Zip: Sioux Falls SD 57104

Comments:

Abandoned gravel pack Well 62, it was located in the same area as the new collector well 62.
Well 62 pumping rate reduced due to plugged screen.

Plugging Completion Date 11-18-2011

CHECK APPROPRIATE BOX

EXISTING WELL ☒TEST HOLE ☐Well depth 37 feetCasing material plasticCasing size(s) 12 inchCasing condition 80% plugged

Hole depth _____

Hole size _____

Describe plugging procedure:

1. Placed clean washed gravel in casing to the top of existing water table - static level.
2. Place cement grout in casing to a level 3 feet above water table to cover the washed gravel.
3. Removed the top three feet of casing and filled hole with compacted clay and covered with top soil.

Describe grout or plugging material:

Mixed cement grout and water with hand mixer and poured into the casing and let cure.

Type of non-slip plug: _____

This well or test hole was plugged under license # _____ and this report is true and accurate.

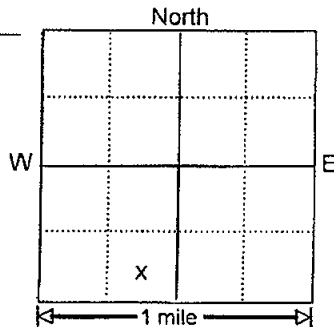
Drilling firm: _____

Signature of Licensed Representative: _____

Signature of Well Owner: _____

Date: _____

SOUTH DAKOTA WELL AND TEST HOLE PLUGGING REPORT 11-02

Location SE ¼ SE ¼ Sec 29 Twp 102N Rg 49WCounty MinnehahaPlease mark well
location with an "X"Plugging Completion Date 11-18-2011

Well Owner:

Name: City of Sioux FallsAddress: 2100 N Minnesota AvenueCity, State, Zip: Sioux Falls SD 57104

Comments:

Abandoned gravel pack Well 60, it was located in the same area as the new collector well 62.
Well 60 pumping rate reduced due to plugged screen.

CHECK APPROPRIATE BOX

EXISTING WELL ☒TEST HOLE ☐Well depth 37 feetCasing material plasticCasing size(s) 12 inchCasing condition 80% plugged

Hole depth _____

Hole size _____

Describe plugging procedure:

1. Placed clean washed gravel in casing to the top of existing water table - static level.
2. Place cement grout in casing to a level 3 feet above water table to cover the washed gravel.
3. Removed the top three feet of casing and filled hole with compacted clay and covered with top soil.

Describe grout or plugging material:

Mixed cement grout and water with hand mixer and poured into the casing and let cure.

Type of non-slip plug: _____

This well or test hole was plugged under license # _____ and this report is true and accurate.

Drilling firm: _____

Signature of Licensed Representative: _____

Signature of Well Owner: _____

Date: _____

Permit No. 7232-3
Big Sioux River - Water District

Report of Examination of Works and/or Application of Water to Beneficial Use

TO: Chief Engineer, Water Rights Program, DENR, Foss Bldg., Pierre, SD 57501

I have this day, **October 17, 2013**, made a thorough examination of the water use system constructed by **City of Sioux Falls** of **224 West 9th Street, Sioux Falls, SD 57104** holder of Permit No. **7232-3**, bearing the priority of **September 8, 1966 (established by Water Right No. 1306-3) for 1,918 ac-ft with a diversion rate of 2.65 cu. ft. per second and January 10, 1967 (established by Water Right No. 1347-3) for 1,329 ac-ft with a diversion rate of 1.837 cu. ft. per second for a combined 3,247 ac-ft and 4.487-cfs** of the waters of **Sioux Falls Management Unit of the Big Sioux Aquifer** for **municipal** purposes, in **Minnehaha and Lincoln** County.

Inspection contact & relationship to permit holder, if applicable: **Greg Anderson – Sioux Falls Water Superintendent**
605.367.8600

A. Works used to divert the water:

Well Information: Horizontal Collector Well

- 1) Well Drilling Firm: **Ranney Collector Wells, John Reynolds & Sons**
- 2) No. of Wells **1**
- 3) Depth(s) **43** feet
- 4) Well log is available **yes**
- 5) Comment: **completed October 16, 2010**

Casing:

- 1) Diameter **19** feet OD and **16** feet ID
- 2) Length **41.8** feet
- 3) Type **reinforced concrete caissons**

Screen: 4 – laterals installed, 12" ID ranging in length from 177' to 187'.

- 1) Type **304 stainless steel**
- 2) Length **700** feet
- 3) Static water level **26.7** feet

Pump:

- 1) Make **Christensen**
- 2) Model
- 3) Size **12 F DL0**
- 4) Capacity **2014** GPM

Motor:

- 1) Make **US Motors**
- 2) Model No. **H0100U25Lg**
- 3) Horsepower rating **60** hp

B. Works used to transport water to place of use:

- 1) Type pvc 2) Size 10 inches 3) Length 1040 feet from well to existing water main
1) Type ductile iron 2) Size 12 inches 3) Length _____ feet existing water main

C. Works used to apply water to beneficial use:

Water is transported to the City's Purification Plant for treatment and use for municipal purposes.

D. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by yes
2) Exceptions to compliance are: none

The system is in good condition with the point of diversion located as follows: SE¼ SE¼ Section 29-T102N-R49W (43.60500216, -96.73234837). The works are capable of diverting and conveying to the place of use 4.476 cu. ft. per second of water up to 3,247 acre-feet of water annually which is to be used for municipal purposes. Water has been put to beneficial use to the maximum extent as follows:

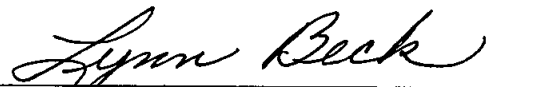
Water supply for the City of Sioux Falls

The license should be issued for 4.476 cfs and 3,247 acre-feet annually.

All structures, wells and lands on map yes

Comments or other permit(s) associated with the project:

This water right is for no additional water but rather transfers appropriation from 1306-3, which was subsequently cancelled, and a portion of appropriation from 1347-3.



Lynn Beck

Natural Resources Engineer III
DENR, Water Rights Program

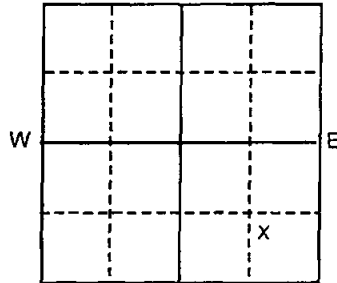
Date report completed: December 11, 2013

SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location SE ¼ SE ¼ Sec 29 Twp 102N Rg 49WCounty Minnehaha

North

Please mark well
location with an "X"

Well Completion Date

16 October 2010

1 Mile

Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)?
800.0 ft. from Farm (identify source)

PROPOSED USE:

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

METHOD OF DRILLING:

 Caisson sinking; vertical
 Lateral projection, Horizontal

CASING DATA:

☐ Steel ☐ Plastic ☒ Other
 If other describe Reinforced concrete caisson 16' x 19'

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
12,370 LB/FT	228.00 IN	0.0 FT	43.0 FT	228.00 IN
LB/FT	IN	FT	FT	IN
LB/FT	IN	FT	FT	IN

GROUTING DATA:

Grout Type	No. of Sacks	Grout Weight	From	To
		Lb/gal	Ft	Ft
		Lb/gal	Ft	Ft

Describe grouting procedure

Bentonite slurry was added as caisson was sunk

SCREEN:

☐ Perforated pipe ☒ Manufactured
 Diameter 12.75 inches Length 400.0 Feet
 Material 304 Stainless Steel
 Slot Size 30-150 Set From 37.0 Feet to 38.0 Feet

 Other information 4 laterals were installed, 2 - 177' overall length;
2 - 187' overall length; 7' blank pipe, each

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? Calcium Hypochlorite☐ No, Why Not?
 Lab to which water
 quality sample sent for analysis
 Energy Lab
 Rapid City, South Dakota
Well Owner: City of Sioux Falls, South DakotaBusiness Name: Water DepartmentAddress: 224 West 9th StreetCity, State, Zip: Sioux Falls SD 57117

WELL LOG:

FORMATION	DEPTH	
	FROM	TO
Lean Clay, top soil	0	6
Sand, Medium Grained, Brown	6	20
Sand, Tr. Gravel, Med Gr., Grey	20	30
Sand w/Gr. Med Grained, Brown	30	40
Lean Clay	40	43

STATIC WATER LEVEL 8.7 FEET

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

Reduced flow rate _____

Can well be completely shut in?

RECEIVED

MAR 21 2011

WATER RIGHTS
PROGRAM

WELL TEST DATA:

☒ Pumped Describe: 8 Hour step Test and 72 hour constant rate test run with vertical turbine pump
☐ Bailed
☐ Other

Pumping Level Below Land Surface

15.3 Ft. After 24.0 Hrs. pumped 1,800.0 GPM1,608.0 Ft. After 72.0 Hrs. pumped 1,800.0 GPMIf pump installed, pump rate: 1,250.0 GPM

REMARKS

This is Sioux Falls Well #62. It is a horizontal collector well; 16' ID x 19' OD. 4 horizontal laterals are installed 90 degrees apart near the bottom of the well shaft.

 This well was drilled under license # 716 and this report is true and accurate.
Drilling firm: Ranney Collector Wells, John Reynolds & Sons

Signature of License Representative:

Signature of Well Owner or Equitable Property Holder:

[Signature]
 Date: 3-15-11



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



APR 14 2014

7232-3

Greg Anderson
City of Sioux Falls
224 W 9th St
Sioux Falls SD 57117

Dear Mr. Anderson:

Enclosed is Water License No. 7232-3. This is the final water right document completing the process of obtaining a Water Right. Included with the license is a map prepared by the staff engineer who conducted the field investigation.

For your information SDCL 46-6-27 requires that if the owner of an existing well, such as the well authorized by Water Right No. 7232-3, constructs a replacement well and does not plan to use the old well, the old well is considered abandoned and must be plugged. Also, any well that is being used or is not considered abandoned must be valved and controlled, if flowing, or sealed and capped so that no leaking occurs either underground or at the surface.

As long as you use the water beneficially, as stated in the Water License, the State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Sincerely,

Jeanne Goodman, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

STATE OF SOUTH DAKOTA
WATER LICENSE NO. 7232-3

(1) The City of Sioux Falls, 224 W 9th St, Sioux Falls SD 57104 made Application No. 7232-3, February 24, 2011 for a water permit to amend Water Right Nos. 1306-3 and 1347-3 by transferring existing diversion authority within the Sioux Falls Management Unit of the Big Sioux Aquifer, located in Minnehaha County, SD. No additional water was appropriated. Permit No. 7232-3, with priority dates of September 8, 1966 (established under No. 1306-3) and January 10, 1967 (established under No. 1347-3) was approved September 5, 2011 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before September 5, 2016 and the application to beneficial use of said water on or before September 5, 2020.

A "*Notice of Completion of Works and Application of Water to Beneficial Use*" submitted by the city indicated the water use system was completed on October 31, 2010 and the water placed to beneficial use on November 1, 2010.

The entire diversion authority of 1,918 acre feet of water as authorized under Water Right No. 1306-3 was transferred to Water Permit No. 7232-3. The diversion authority for 1,329 acre feet of water as authorized under Water Right No. 1347-3 was also transferred to Water Permit No. 7232-3.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the water supply system and is entitled to divert 4.476 cubic feet of water per second with an annual volume of 3,247 acre feet for beneficial use. The priority dates are as follows:

- September 8, 1966 (established by No. 1306-3) for 1,918 acre feet annually and a diversion rate of 2.650 cfs;
- January 10, 1967 (established by No. 1347-3) for 1,329 acre feet annually and a diversion rate of 1.826 cfs.

The diversion point (collector well No. 62) is located 1,150 feet north and 275 feet west of the SE corner of Section 29, T102N, R49W (SE ¼ SE ¼).

(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use.

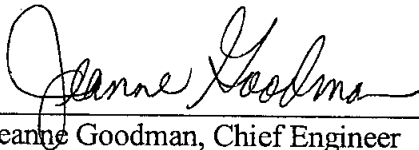
(4) Pursuant to South Dakota Water Law 46-5-30.1 the City of Sioux Falls, 224 W 9th St, Sioux Falls SD 57104 the holder and/or owner of Water Right No. 7232-3 is issued a license to appropriate water, the right to use 4.476 cubic feet of water per second from ground water (one well – Big Sioux - Sioux Falls) with priority dates of September 8, 1966 and January 10, 1967 from the location specified in (2) of this license for municipal purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 7232-3 and subject to the following qualifications:

- If development and pumping of the well authorized by this permit results in impairment of adequate domestic wells or adequate wells having prior water rights, reduction of withdrawals or mitigation may be necessary. SDCL 46-1-5(1), in giving preference to domestic use over appropriative rights does so without regard to whether lowered ground water levels are due to drought, the location of the domestic wells in the aquifer, or thickness of the water bearing sands and gravel; subject to compliance with minimum requirements for adequate wells as defined by Board Well Construction Standards, Chapter 74:02:04.

Water License No. 7232-3

- Water Permit No. 7232-3 authorizes a total diversion of 3,247 acre feet of water (1,918 acre feet annually established by Water Right No. 1306-3 and 1,329 acre feet annually established by Water Right No. 1347-3).
- The City of Sioux Falls shall plug the existing well authorized by Water Right No. 1306-3 in accordance with Water Management Board Rules, Chapter 74:02:04 within thirty days of the new well being brought on-line. *The city notified the Water Rights Program that the well was taken out of service and plugged in late October, 2011.*
- The City of Sioux Falls shall report to the Chief Engineer annually the amount of water withdrawn from the Sioux Falls Management Unit of the Big Sioux Aquifer.



Jeanne Goodman, Chief Engineer
Water Rights Program

Department of Environment and Natural Resources

APR 14 2014

date

