

Water Right No. 12.19-1

1. Considered MAY 27 1981
2. Name of Applicant CITY OF BELLE FOURCHE
3. Post Office Address City Hall, Belle Fourche, S.D. 57717
4. Amount of Water Claimed 2.23
5. Source of Water Supply 2750' Madison (Pahasapa) Limestone
6. Water to be used for MUN
7. Acres to be irrigated — maximum — acre feet
8. Water to be diverted and used in Butte County
about IN, 2W miles of BELLE FOURCHE
9. PROOF OF PUBLICATION Received 4/27 6-2-81
Not Received —
Approved 5/27/81
Subject to flow meter
and that a meter, flow meter and pressure
gauge be placed on the well.
Not Approved —
Action deferred —

APPLICATION

Priority — Date Received 4/27/81 Application Complete yes ☒ no ☐ FEE NANA
Remarks —

Date information and/or
fee or corrected Application received —
Period of Annual use continuously
Received yes ☐ no ☐ APPROVED/CONDITIONAL (Circle one)
W-1 Description same as application yes ☐ no ☐ Remarks —

Disapproved —

Returned —

Diversion Point —

SE 1/4 SW 1/4 34-9N-2E

Lands to be Irrigated —

				34	
				*	

Remarks —

Log to be sent in upon well being drilled

Driller — Licensed yes ☐ no ☐

Depth —

WELL
LOG

*Trans etc
delivered from well
office (S.H.) about
the requirements of the
quantity of well.*

~~WATER
QUALITY~~

Page 2

Water Right No. _____

MAP

Map No. 1028-1 Map located in Water Right ✓ Map file _____

Type of Map DRAWN _____
by EARL McARDUR JR.
PE

+++++

REVIEWED This Application was reviewed within 30 days of date received, accepted as complete, Number assigned and written up for advertisement before the Board on 5-27-81

[Signature]
(Signed)

+++++

PPOTESTS Letters/Petitions in File - yes _____ no _____ Remarks _____

REMARKS

F.F. & C

OF LAW,

FINAL

DECISIONS

ETC.

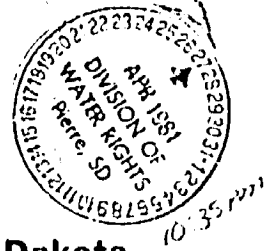
Date
Final Decision, including F.F. & C of Law were adopted _____
Date

Final Decision mailed to parties and/or parties notified that Final Decision was adopted _____

Remarks _____

No. 1219-1Map No. 1028-1 Water Division No. 1 BELLE FOURCHE District

Above for Office Use

101203.02

APPLICATION FOR PERMIT To Appropriate Water within the State of South Dakota

Check one of the following:

New ☒ Vested Right ☐ Future Use ☐Change in Diversion ☐ Additional Diversion ☐Change in Acreage ☐ Additional Acreage ☐

1. Name of Applicant City of Belle Fourche Phone No. 892-2030
 Post Office Address City Hall Belle Fourche State South Dakota 57717
 (Street, RR, or Box) (Town) (Zip Code)
 If a corporation show date and place of incorporation N/A

2. Method of accomplishing work (contract, employment of others, or by direct labor) Contract3. Name of diversion work Belle Fourche Municipal Water Well No. 14. Amount of water claimed (cubic feet per second) 2.23 cfs5. Source of water supply Deep Well to Madison (Pahasapa) Limestone

6. Location of point of diversion N 89° 40' 06" W a distance of 2968.38 feet from the Section
corner common to Section 34 and Section 35, T2N, R2E, B.H.M., S1/4 SW1/4

County Butte7. Annual period or periods during which water is to be used year round8. Use to be made of water, (irrigation, industrial, municipal, commercial, recreation, etc.) Municipal9. For irrigation use, N/A Total number of acres to be irrigated

List below each forty acre subdivision, or lot, or fraction thereof and show number of acres to be irrigated in each.

Land Description	No. Acres Irr.	Land Description	No. Acres Irr.

Attach sheet if more space is needed

10. Time required to complete construction of water supply system two years. Additional time required to complete application of water to the proposed beneficial use one years.

11. Choice of county newspaper for publication of Notice of Intent to Appropriate Water Daily Post

12. Principal Features of the Proposed Water Supply System

A. Works proposed to divert water from its natural source:

Deep Well to Madison (Pahasapa) Limestone

B. Works proposed to transport water to place of use

Install approximately 7000 feet of 8 inch water distribution main.

C. Works proposed to apply water to beneficial use:

Install 1,000,000 gallon storage tank, with chlorinator connected to
existing water distribution system, and connected to existing water distribution system,

Estimated Total Cost \$ 700,000.00

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map.
 (see instructions concerning preparation.)

STATE OF SOUTH DAKOTA)

County of Butte) ss.I, Robert L. Helmer, Mayor, City of Belle Fourche

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

Signed Robert L. HelmerSubscribed and sworn to before me this 23 day of April, 1981

Notary Public (or other qualified officer)

Belle Fourche Municipal Well No. 1 and Municipal Water System Improvements located in Section 34, T9N, R2E, B.H.M., Butte County, South Dakota, and covering lands owned by the City of Belle Fourche, South Dakota.



Appl 1219-1

WATER RIGHT APPLICATION APPROVAL

The Water Management Board hereby approves Water Right Application No. 1219-1

CITY OF BELLE FOURCHE CITY HALL BELLE FOURCHE
(Applicant) (Post Office Address)
SOUTH DAKOTA 57717 (State) With the following qualifications.

The well approved under this Permit shall be valved and the flow reduced to a minimum when not being used directly or for storage purposes. If this well is abandoned or the Permit cancelled, the well must be plugged in accordance with specifications of the Water Management Board, and that a ~~flow~~ flow meter and pressure gauge be placed on the well. Records of any pressure fluctuations and water supplies by the well shall be kept and such records shall be available to the Board, upon request.

Date of first receipt of application April 27, 19 81
 Date of return to applicant for correction, amendments or changes required _____, 19 _____
 Date of receipt of corrected application _____, 19 _____
 Approved May 27, 19 81 Recorded in Book 22 Page 223

WATER RIGHT PERMIT NO. 1219-1

The Water Management Board hereby grants and issues this Water Right Permit No. 1219-1 authorizing the construction of the water use system and the putting of water to beneficial use as stated in the Application and as qualified in the Water Right Application approval, subject, however, to the following limitations and conditions:

1. The date from which applicant may claim right is April 27, 19 81
2. The equivalent of at least one-fifth of the work above specified is to be completed on or before May 27, 19 81
3. The whole of said work is to be completed on or before May 27, 19 82
4. The limit of time from proof of beneficial use of water appropriated in accordance herewith is May 27, 19 83
5. The water appropriated shall be used for the purpose of MUNICIPAL USE
6. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.
7. The amount of the appropriation herein granted shall not exceed 2.23 cubic feet per second; neither shall it exceed the capacity of the above described water supply system, nor shall it exceed the amount of water needed for beneficial uses served; and if for irrigation purposes said appropriation must be limited to not more than 2 acre-feet per acre per year and be limited to not more than one-seventieth (1/70) of one cubic foot of water per second of time for each acre of land to which water is actually and beneficially applied used for Municipal purposes
~~for irrigation on or before~~ May 27, 19 83, said water to be used during the following described annual period: continuous

Witness my hand this 10th day of June, 19 81

THE WATER MANAGEMENT BOARD

By John Hatch
Civil Engineer, Water Rights
 JOHN HATCH

Certificate of Construction Issued _____, 19 _____

Water License Issued _____, 19 _____

D Well Information

- (1) Drill Hole, Diameter $13\frac{1}{2}"$ and $9\frac{7}{8}"$, Depth, $13\frac{1}{2}" = 1050'$ $9\frac{7}{8}" = 1700'$
 (2) Casing, Type Steel, Diameter $10\frac{3}{4}"$ & $7\frac{5}{8}"$, Thickness $10\frac{3}{4}" = \frac{1}{2} .365"$
 (wood, concrete, steel, etc)
 (3) Screen, Type N/A, Diameter _____, Length _____
 (4) Gravel Pack, Thickness N/A, Length of gravel pack _____

E Dugout Information or Estimates

- (1) Surface dimensions, _____, Depth _____

F Fill out for Either a Well or a Dugout

NOTE: Information requested in (1) will be provided when well is completed.

- (1) Water Bearing Materials (Attach a copy of test well log)

Depth to top of water bearing material 2700 feet (Estimated)

Depth to bottom of water bearing material Drilled into 400 feet (Estimated)

Depth to water (ground surface to water level) Anticipate flr. at well head.

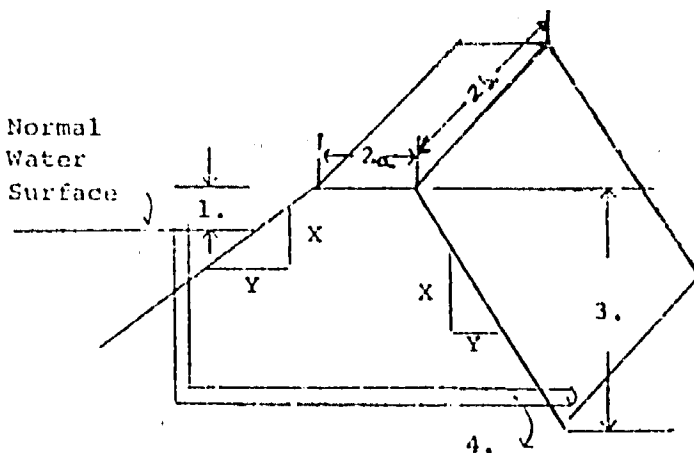
- (2) Distance to nearest existing household or livestock watering well

On same owner's property N/A rds

On property owned by others Nearest well to Madison is 3 miles south.

G Water Storage Dams

If the proposed water use system contains one or more water storage dams, please show in the space below, the height, length, maximum water depth, surface area, drainage area, storage capacity, dam slope, dimensions, location and size of outlet works, of each storage dam. The location of each water storage dam should be shown on the water right map



1. Freeboard _____
 2a. Crest width _____, b. length _____
 3. Height of Dam _____
 4. Outlet dimensions:
 Pipe diameter _____
 Spillway width _____
 X & Y slope:
 Upstream _____
 Downstream _____
 Surface area of impoundment _____
 Drainage area above dam _____

Robert D. Helmer
 Signature of Applicant

Robert D. Helmer, Mayor

No. 1219-1

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County Butte) ss.

I, Marion Quacco hereby

certify that the annexed printed copy of Notice of Intent to Appropriate

Water was taken from the Daily Belle Fourche

A newspaper which during the whole time of publication of said notice
herein after stated, has been and is printed and published in the

City of Belle Fourche

County of Butte and State of South Dakota;
that the said notice was published in said newspaper on the following
two dates:

May 2, 1981

May 9, 1981

Marion Quacco

(Signature)

Editor

(Title)

May 20, 1981

(Date Signed)

Cost of Printing: 1852

Public Notice

No. 1219-1
NOTICE OF HEARING
ON APPLICATION TO
APPROPRIATE WATER
Pierre, South Dakota 57501
April 27, 1981

Notice is hereby given, that the City of Belle Fourche, South Dakota, has made an application in accordance with the provisions of SDCL 46-1-1 thru 46-1-9, 46-1-14; 46-2-9 thru 46-2-11, 46-2-13; 46-5-1 thru 46-5-8; 46-5-10 thru 46-5-22; 46-5-41; 46-6-3, 46-6-3.1, 46-6-5, 46-6-6.1, 46-6-10, 46-6-14 and Board Rules ARSD 52:01:01 thru 52:01:01:13, for a permit to appropriate for beneficial use 2.23 cubic feet of water per second of time from ground-water (one well) through the Belle Fourche Municipal Water Well No. 1, the point of diversion of which is to be located in the SE 1/4 SW 1/4 of Section 34, Twp. 9N, Range 2E. Said water to be used for the purpose of providing water supplies for municipal use.

This application No. 1219-1 will be considered by the Water Management Board at Meeting Room #1, Kneip Building, Pierre, SD upon the 27th day of May, 1981 at 10 A.M. The Board is authorized to make a determination on this application at the hearing. All interested persons may appear and be heard. Any person who may be affected by a Board decision who desires to present evidence or cross-examine witnesses according to SDCL 1-26 may notify the Board in writing prior to the hearing or orally at the hearing.

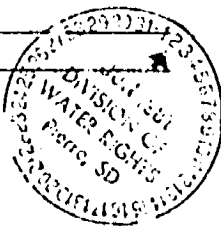
This hearing is an adversary proceeding. Any person has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised at the hearing. Decisions of the Board may be appealed to the Courts as provided by law.

Any handicapped person wishing to attend this hearing can contact the Water Rights Division, DWR, Joe Foss Building, Pierre, SD, prior to the hearing date for assistance to assure access to the hearing.

WATER MANAGE-
MENT BOARD

Betty Westlund,
Water Rights Specialist

2/3-9



No. 1219-1

Publish first publication, on or before May 8, 1981

NOTICE OF HEARING ON
APPLICATION TO APPROPRIATE WATER

Pierre, South Dakota 57501

April 27, 1981

Notice is hereby given that the City of Belle Fourche

~~address only~~, South Dakota, has made an application in accordance with the provisions of SDCL 46-1-1 thru 46-1-9, 46-1-14; 46-2-9 thru 46-2-11, 46-2-13; 46-5-1 thru 46-5-8; 46-5-10 thru 46-5-22, 46-5-41; 46-6-3, 46-6-3.1, 46-6-5, 46-6-6.1, 46-6-10, 46-6-14 and Board Rules ARSD 52:01:01:01 thru 52:01:01:13, for a permit to appropriate for beneficial use 2.23 cubic feet of water per second of time from groundwater

(one well) through the Belle Fourche Municipal
Water Well No. 1, the point(x) of diversion of which is ~~(one)~~ to be located in the S1/4 SW1/4

of Section 34, Twp. 9N, Range 2E. Said water to be used for the purpose of providing ~~XXXXXX~~
water supplies for municipal use

This Application No. 1219-1 will be considered by the Water Management Board at Meeting Room #1, Knapp Building, Pierre SD upon the 27th day of May, 1981

at 10 A.. The Board is authorized to make a determination on this application at the hearing. All interested persons may appear and be heard. Any person who may be affected by a Board decision who desires to present evidence or cross-examine witnesses according to SDCL 1-26 may notify the Board in writing prior to the hearing or orally at the hearing.

This hearing is an adversary proceeding. Any person has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised at the hearing. Decisions of the Board may be appealed to the Courts as provided by law.

Any handicapped person wishing to attend this hearing can contact the Water Rights Division, DWR, Joe Foss Building, Pierre SD, prior to the hearing date for assistance to assure access to the hearing.

WATER MANAGEMENT BOARD

cc: City of Belle Fourche
City Hall
Belle Fourche SD 57717

BETTY WESTLUND
Water Rights Specialist

WNR-206A-7/79 Notice of Intent to Appropriate Water
GROUNDWATER

Water Rights Division
605 773-3352

September 4, 1981

City of Belle Fourche
City Hall
Belle Fourche SD 57717

Dear Sir:

Enclosed herewith is your Water Right Permit No. 1219-1 as approved by the Water Management Board authorizing you to construct your water diversion system and apply the water to beneficial use, not exceeding the limits as specified in said Water Rights Permit No. 1219-1.

Please be advised that all flowing wells shall be constructed and fitted so that the water flow may be safely limited to the amount needed. For large diameter wells into the Madison formation in your area where ground surface pressures are expected to exceed 140 psi, pressure cement grout must be placed in a continuous length through all artesian aquifers above the producing aquifer with a minimum of 300 linear feet of pressure cement grout at the surface.

Also enclosed is Form 10, Notice of Completion of Works and Application of Water to Beneficial Use, which you are to complete and submit to the Water Management Board when you have completed the system and/or have put the water to beneficial use. The Board can then schedule an inspection so that your Certificate of Construction and/or Water License may be issued to you, thus completing your acquisition of a Water Right.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Division

JH:kw

enclosure

Belle Fourche Municipal Well

10/81

Belle Fourche, S.D. 2200ECL 300ECL sec. 34 9N 2E

Total Depth 3320

1520' 10 3/4" OD Casing

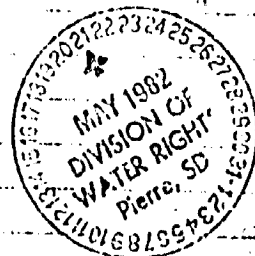
1500' 7 5/8" OD Casing

650 GPM Flow

Shut in Pressure 175 PSI

PERMIT # 1219-1

0-868	black shale
868-874	Newcastle
874-1018	Scull Creek
1018-1110	Pali River-Lakota
1110-1118	Morrison
1118-1462	Sundance
1462-2305	Spearfish
2305-2343	Minnekahta
2343-2459	Opecho
2459-2830	Minnelusa
2830-3320	Madison



NOTICE OF COMPLETION OF WORKS AND/OR
APPLICATION OF WATER TO BENEFICIAL USEPost Office City of Belle FourcheDate February 15, 1983TO: Water Rights Commission
Joe Foss Building
Pierre, South Dakota 57501

Dear Sirs:

This is to inform you that I have completed the construction of the water diversion system and/or that I have put the water to beneficial use to maximum extent it is going to be used, not exceeding the amounts as specified in Water Right No. 1219-1.

Water Right Permit No. 1219-1 states that the diversion system is to be constructed by May 27, 1982, and that the water is put to beneficial use by May 27, 1983.

The diversion system was completed on January 13, 1983. Applying the water to beneficial use was completed on February 14, 1983.

You may schedule an inspection so that the Certificate of Construction and/or the Water License may be issued, thus completing my acquisition of a water right.


(Signature)Earl T. McArthur, P.E.
City Engineer
City Hall
Belle Fourche, S.D. 57717

cc: File



State of South Dakota
Water License No. 1219-1

(1) the City of Belle Fourche
of City Hall, Belle Fourche, South Dakota 57717
made Application No. 1219-1, April 27, 1981 for a water permit to appropriate
2.23 cubic feet per second of water from groundwater - one well (Hadison Formation)
Burke County, South Dakota for municipal purposes.
Permit No. 1219-1, with a priority date of April 27, 1981
was approved May 27, 1981 and issued to applicant(s) for diversion of water with construction of the described
water supply system to be completed on or before May 27, 1982 and for the application to beneficial use of said
water on or before May 27, 1983.

and

(2) It is certified that the application has complied with the provisions of South Dakota State Law relating to completion of
the construction of the water supply system and is entitled to divert 1.63 cubic feet per second of water
for beneficial use. The location of the diversion point(s) is N89°40'06"W, 2968.38 feet from the
SE corner of Section 34, T9N, R2E, BHM (CD)

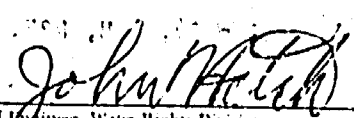
and

(3) The applicant has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use to the following extent, water to be used for municipal purposes for the
City of Belle Fourche

(4) Pursuant to §46-5-30.1 the City of Belle Fourche
of City Hall, Belle Fourche, South Dakota 57717

the holder(s) and/or owner(s) of Water Permit No. 1219-1 is issued a license to appropriate water, the right to use
1.63 cubic feet per second of water from groundwater (Madison Formation) with a priority date
of April 27, 1981 from the location specified in (2) of this license. The water to be
conducted to and upon lands specified in (3) of this license for the purpose of municipal use

This license is subject to any limitations or qualifications listed in Water Permit No. 1219-1 and subject
to South Dakota State Law.


Chief Engineer, Water Rights Division
Department of Water and Natural Resources

December 27, 1983

Permit No. 1219-1Belle Fourche Water District**Report Of Examination Of Works And/Or Application Of Water To Beneficial Use**

TO: Chief Engineer, Division of Water Rights, DWR, 2055 Bldg., Pierre, SD 57501

I have this day made a thorough examination of the water use system constructed by City of Belle Fourche of City Hall Belle Fourche, SD holder of Permit No. 1219-1, bearing the priority of April 27, 1981 authorizing the diversion of 2.23 cu. ft. per second of the waters of groundwater (Madison) for Municipal purposes, in Belle County.

I have to report on the conditions of the same as follows:

A. Works used to divert the water:

<u>Madison Well</u>	<u>17.4 ft.</u>	<u>16" steel casing</u>
<u>Flow Rate - 730 gpm</u>	<u>1496.6 ft.</u>	<u>10 3/4" " "</u>
<u>Shut-in Pressure - 175 psi</u>	<u>1530.2 ft.</u>	<u>7 5/8" " "</u>
	<u>308.0 ft.</u>	<u>Uncased Borehole</u>

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

approx. 7000' - 8" water distribution main (PVC) &
existing water distribution system

C. Works used to apply water to beneficial use:

1 million gallon Aqua-Store storage tank
connected to distribution system

The system is in the following condition GoodThe point of diversion is located SE 1/4 SW 1/4 Section 34-T9N-R2EThe works are capable of diverting and conveying to the place of use 1.63cu. ft. per second of water which is to be used for Municipal

Water has been put to beneficial use to the maximum extent as follows: Well completed on
October 15, 1981 and system fully completed
March 23, 1983.

comprising a total of _____ acres of land and the license should be issued for 1.63 cfsApplicable permit qualifications have been complied with ☒ Yes ☐ NoExceptions to compliance are: _____ Date October 17, 1983

Timothy H. Schaal
 (signature)

LICENSE FOR PERMIT NUMBER 1219-1

1. Legal location of wells: SE 1/4 SW 1/4 Section 34 - T9N-R2E

Dams & structures: _____

2. Well Information: Well Drilling Firm Taylor Drilling

No. of wells 1 Depth 3319'

Casing a) diameter 1500' 10 3/4" Screen a) type _____
b) length 1530 7 5/8" b) length _____
c) type steel Static Water Level _____

Pump a) make _____ Motor a) make _____
b) model _____ b) model no. _____
c) size _____ c) horsepower rating _____
d) capacity _____ GPM d) motor efficiency rating _____
e) turbine pump
no. of stages _____

3. Distribution lines:

a) size of lines 8"
b) type PVC
c) length approx. 7000'

4. Dam Information:

a) height to crest _____
b) height to spillway _____
c) crest width _____
d) crest length _____
e) spillway length _____
f) spillway width _____
g) approx. storage _____
h) Distribution lines or canals:

1) size _____
2) type _____
3) length _____

i) Outlet tubes:

1) diameter _____
2) type _____
3) valued (Y/N) _____
4) valve type _____
5) location on structure _____

5. System Type: a) sideroll:

1) length _____ feet
2) diameter of pipe _____
3) make, model & number of sprinklers _____
4) spacing of sprinklers _____
5) nozzle size _____

b) towline:

1) length _____ feet
2) make, model & number of sprinklers _____
3) spacing of sprinklers _____
4) nozzle size _____

5. System Type: c) center pivot

- 1) make _____
- 2) number of towers _____
- 3) distance between towers _____
- 4) overall length _____
- 5) End gun (Y/N) _____
- 6) high or low pressure _____
- 7) make & size of nozzles _____
- 8) PSI reading while system is running _____
- 9) GPM _____

g) Gun

- 1) make _____
- 2) serial number _____
- 3) nozzle size _____
- 4) capacity (GPM) _____
- 5) PSI _____
- 6) hose size _____
- 7) hose length _____

d) Gate Pipe

- 1) length _____
- 2) diameter _____
- 3) spacing of gates _____

e) Siphons

- 1) number _____
- 2) size _____

f) Portable Boom

- 1) make _____
- 2) serial number _____
- 3) nozzle size _____
- 4) capacity (GPM) _____
- 5) PSI _____

h) Hydromatic

- 1) make _____
- 2) model _____
- 3) serial number _____
- 4) length _____
- 5) nozzle size _____
- 6) spacing _____
- 7) PSI _____
- 8) capacity (GPM) _____

YES	NO	Check Items
-----	----	-------------

<u>X</u>	___	1. Soil and water permit lands agree with lands being irrigated and lands listed on permit.
----------	-----	---

<u>X</u>	___	2. Special Qualifications to permit being abided by.
----------	-----	--

<u>X</u>	___	3. All Structures, wells and lands on map.
----------	-----	--

REMARKS: 1-18-84

Called Earl McArthur (City Eng.) and asked him about the valves on the well. He said they have 2-8" Gate valves. One has never been opened and is available for expansion of the project. The other is on line to chlorinator and opened according to their needs. They are currently using about 200,000 gpd.

Tim Dehaal

CITY OF BELLE FOURCHE,

BELLE FOURCHE, SOUTH DAKOTA



At the New Center of the Nation

EQUAL OPPORTUNITY EMPLOYERS

December 10, 1981

Mr. Assad Barrari
S.D. Geological Survey
University Science Center
Vermillion, S.D. , 57069

Dear Assad:

As per your request, the following information is provided:

Elevation at Well Head = 3175 H.S.L.

16" O.D. Surface Casing = 17.4 Feet

10 3/4" O.D. Casing = 1496.6 Feet

7 5/8" O.D. Casing = 1530.2 Feet

6 3/4" Uncased Borehole = 308 Feet

Total Depth From Well Head to Hole Bottom = 3319 Feet

Total Depth into Madison Formation = 338 Feet

Sincerely yours,

Earl T. McArthur

Earl T. McArthur
City Engineer

cc: Project File
Water Rights File

1-16-84
TALKED TO
RANDY TAYLOR

CEMENTED — BOTH STRINGS TO SURFACE
1450 BAGS TOTAL

10 3/4" WAS SEPARATE
9 7/8" HOLE SET 7 5/8"

LEFT HAND THREAD
CEMENTED THAT —

TURNED OFF — THEN
DRILLED THE HOLE
OUT —

J.A.G.

Belle Fourche Municipal Well

10/81

Belle Fourche, S.D. 2200FNL 300FSL sec. 3W 9N 2E

Total Depth 3320

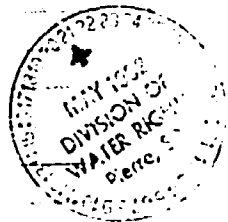
1520' 10 3/4" CD Casing } Backwards

1500' 7 5/8" CD Casing

650 GPM Flow

Shut in Pressure 175 PSI

0-868	black shale
868-874	Newcastle
874-1018	Scull Creek
1018-1110	Fall River-Lakota
1110-1118	Morrison
1118-1462	Sundance
1462-2305	Spearfish
2305-2343	Minnekahta
2343-2459	Opeche
2459-2830	Minnelusa
2830-3320	Madison



Bulla

JOHN PAUL GRIES

Consulting Geologist

238 ST. CHARLES STREET
RAPID CITY, SOUTH DAKOTA

October 19, 1981

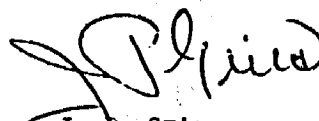
Mr. Earl McArthur
City Engineer, Belle Fourche
Belle Fourche, SD 57717

Dear Mac:

Enclosed please find description of sample cuttings from the new Belle Fourche Madison well. A washed set of cuttings has been placed on permanent file here at the School of Mines, and the butts have been delivered to the State Geological Survey for transmittal to Vermillion.

The attached statement covers the night spent on the well picking the casing seat, and the final description of the cuttings.

Sincerely,



J. R. Gries
Certified Professional Geologist
No. 77

JPG/me

JOHN PAUL GRIES

Consulting Geologist

238 S. CHARLES STREET
RAPID CITY, SOUTH DAKOTA

City of Belle Fourche - Madison Well
Sec. 3, T. 8 N., R. 2 E., Butte County
Drilled September-October 1981
Sample cuttings described by J. P. Gries
Electric log by State Geological Survey
Drilling contractor: Taylor Drilling Co.

Electric log tops picked by J. P. Gries:

Newcastle sandstone	868
Skull Creek shale	874
Fall River-Lakota sandstones	1018
Morrison shale	1110
Sundance formation	1118
Spearfish redbeds	1462
Goose Egg member	2113
Minnekahta limestone	2305
Opeche redbeds	2343
Minnelusa formation	2459
Madison formation	2830

Sample descriptions:

- 1030-1060 sandstone, fine calcareous, green to white, 2/3; clay, gray, 1/3
1060-1090 clay, greenish gray
1120 clay, greenish gray, some sandstone streaks
1150 clay, gray, silty
1180 sandstone and siltstone, greenish gray, tight, glauconitic
1210 clay, silty, greenish gray, some sandy
1240 shale, medium to dark greenish gray
1270 shale, same to very sandy, 2/3; sandstone, fine, gray to white, glauconitic, 1/3
1300 shale, light greenish gray, more or less sandy; trace limestone
1330 same, 1/2; sandstone, fine, calcareous, pale orange (LAK member)
1360 sandstone, gray, glauconitic, tight, 1/2; shale, gray, 1/2
1390 sandstone, fine to very fine, white, calcareous
1420 limestone, gray-fossiliferous; some shale and sandstone
1450 clay, light greenish gray; traces of limestone from above
1480 sandstone, fine greenish gray to nearly white, glauconitic; redbeds contact within this sample
1528 redbeds, red sandy siltstone, argillaceous
1640 redbeds, fine sandstone and clay
1740 redbeds, mostly clay with secondary gypsum
1820 redbeds, silt to sand size
1850 redbeds - siltstone, micaceous
1970 redbeds, some green, some gypsy
2030 redbeds, shale, silty to smooth
2060 same with traces of finely crystalline pink limestone
2090 redbeds, silty clay

JOHN PAUL GRIES

Consulting Geologist

238 ST. CHARLES STREET

RAPID CITY, SOUTH DAKOTA

- 2090-2180 redbeds, 75%; anhydrite, finely crystalline, white to pink, 25%
- 2240 redbeds, clay, silty, anhydritic
- 2270 redbeds, 70%, anhydrite, 30%
- 2285 anhydrite, coarsely crystalline, white, 1/2; limestone, gray-brown 1/2
- 2300-2300 limestone, finely crystalline, gray and limestone chalky, gray to pink, anhydritic
- 2345 redbeds; trace caved limestone and anhydrite
- 2375 sandstone, fine, white, calcareous. Note: this sample, and those below for an undetermined depth are mislabeled as to footage
- 2405 sandstone, fine to medium, white, anhydritic; much caved redbeds
- 2435 anhydrite, medium crystalline, white; trace light gray dolomite
- 2465 sand, fine, free - typical Minnelusa
- 2495 dolomite, very finely crystalline, light gray to slightly pink
- 2525 dolomite, very finely crystalline, light gray to greenish gray
- 2555 dolomite, same, 20%; anhydrite, medium crystalline, white, 80%
- 2585 anhydrite, 40%; dolomite, finely crystalline, earthy, 60%
- 2615 anhydrite, 60%, dolomite, same, 40%
- 2645 dolomite, very finely crystalline, gray to slightly pink
- 2675 dolomite, finely crystalline, pink, 80%; sand, medium, frosted, 20%
- 2705 dolomite, same, 20%; sand as above, 80%
- 2735 dolomite, finely crystalline, light brownish-gray
- 2765 dolomite, finely crystalline, dense; white to slightly pink & brown
- 2783 dolomite, same
- 2800 sand, fine to medium, white
- 2812 sand, same; dolomite, finely crystalline, light gray-brown
- 2835 dolomite, very finely crystalline, cream to slightly pink & yellow
- 2870 dolomite, fine- to medium crystalline, pink to white Madison
- 2885 dolomite, finely crystalline, light yellow; mostly cement and old cave
- 3015-3030 dolomite, medium crystalline, rhombic crystals, flesh pink to white very porous
- 3045 dolomite, same, and dolomite, very finely crystalline, dense, pink
- 3060 dolomite, very finely crystalline, dense, pink to yellow
- 3075 dolomite, medium crystalline, rhombic xtals, pink, porous
- 3090 dolomite, same and much dolomite very finely crystalline, cream
- 3105 dolomite, very finely crystalline, pink, tan, cream
- 3120 dolomite, very finely crystalline to medium crystalline, rhombic, cream to white
- 3135 dolomite, same, mostly dense
- 3150 dolomite, very finely crystalline pink to white; trace porosity
- 3165 dolomite, peletal, pink to cream; some rhombic crystals w/ porosity
- 3165-3210 no samples
- 3225 dolomite, finely crystalline, glassy, light gray brown
- 3240 dolomite, same and some medium crystalline, rhombic, porous
- 3255 dolomite same, and some spar calcite
- 3270 dolomite, finely crystalline, very light brown, dense
- 3285 dolomite, same, more spar calcite
- 3300 dolomite, very finely crystalline, chalky, light gray
- 3315 dolomite, fine to medium crystalline, pink & light brown; some porosity
- 3320 dolomite, medium crystalline, light gray brown, vuggy porosity

T.D.

NEW BELLE FOURCHE WATER SYSTEM

OPEN HOUSE FACT SHEET

April 6, 1983

I. GENERAL

After more than two years of study and research to determine possible new water sources for the City of Belle Fourche, the Mayor and City Council decided in June, 1981, to proceed with a deep well to the Madison Aquifer. The new well was successfully completed on October 15, 1981, and the results were phenomenal. The City had a high quality water supply in sufficient quantity to meet the City's needs far into the future.

On February 2, 1982, the people of Belle Fourche approved a \$ 595,000.00 bond issue to finance the new well, storage tank, chlorination facility, and supply line to the existing water system. On March 23, 1983, all work was completed and the entire new system was accepted by the City as fully operational. To date, the system has been performing beautifully and is an economical and abundant source of high quality water for the people of Belle Fourche.

II. COSTS

The original cost estimate to complete the entire project which was done in December, 1981 was \$ 703,000.00. The following is a listing of the final actual costs to complete the entire project:

WELL -----	\$ 250,670.70
1,000,000 GALLON STORAGE TANK -----	\$ 285,202.00
WELLHOUSE AND CHLORINATION FACILITY -----	\$ 102,115.38
NEW SUPPLY LINE TO EXISTING SYSTEM -----	\$ 51,856.00
LAND PURCHASE -----	\$ 9,000.00
BONDING AND BOND ATTORNEY FEES -----	\$ 7,200.00
TOTAL COST -----	\$ 706,044.08
FINANCED BY BONDS -----	\$ 595,000.00
AMOUNT PAID FROM WATER FUND -----	\$ 111,044.08

III. WATER QUALITY

The following is a comparison between the various parameters which determine good quality for both sources of water now being used by the City of Belle Fourche:

<u>PARAMETER</u>	<u>PRESENT GALLERY SOURCE</u>	<u>NEW WELL</u>	<u>MAXIMUM ALLOWABLE</u>
BACTERIA	None	None	None
NITRATE	.19 mg/l	.10 mg/l	10 mg/l
FLUORIDE	.30 mg/l	1.10 mg/l	.90 to 1.7 mg/l
(The new well water is within the allowable and no fluoride is added)			
CHLORIDE	3 mg/l	1.6 mg/l	250 mg/l
COPPER	.01 mg/l	.005 mg/l	1 mg/l
IRON	.05 mg/l	.14 mg/l	.3 mg/l
MANGANESE	.03 mg/l	.02 mg/l	.05 mg/l
SULFATE	64 mg/l	117 mg/l	250 mg/l
ZINC	.01 mg/l	.006 mg/l	5 mg/l
DISSOLVED SOLIDS	338 mg/l	394 mg/l	500 mg/l
pH	7.80	7.76	6.5 to 8.5
CALCIUM	83 mg/l	70.8 mg/l	No Limit
SODIUM	1.7 mg/l	2.4 mg/l	No Limit
MAGNESIUM	31 mg/l	34 mg/l	No Limit
POTASSIUM	2.0 mg/l	1.7 mg/l	No Limit
GROSS ALPHA (Radioactivity)	4.8	6.5	15
RADIUM 226-228 (Radioactivity)	None Taken	0.4	5
HARDNESS	19 Grains	18.5 Grains	No Limit

(mg/l = milligrams per liter)

IV. WELL DATA

FLOW = 730 Gallons per Minute = 1,051,200 Gallons per day

SHUTIN WELL HEAD PRESSURE = 175 Pounds per Square Inch

TEMPERATURE = 83° F

ELEVATION AT WELL HEAD = 3175 M.S.L.

DEPTH = 3319 Feet

DIAMETERS =

17.4 Feet @ 16 inch - Cased

1496.6 Feet @ 10 3/4 inch - Cased

1530.2 Feet @ 7 5/8 inch - Cased

308.0 Feet @ 6 3/4 inch - Uncased Borehole

* Length of different sizes do not coincide with total depth due to overlaps of casing sizes.

TOTAL DISTANCE INTO MADISON AQUIFER = 338 Feet



Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501

Division of Water Rights
605 773-3352

No. 1219-1

December 19, 1983

City of Belle Fourche
City Hall
Belle Fourche, South Dakota 57717

Dear Sir:

The inspection of your water use system and inspection of the extent of the application of water to beneficial use, as developed under your Water Right No. 1219-1 has been completed. Your final water right document, the Water License, can now be issued.

Statutes require that we charge a \$50.00 fee for the inspection and issuing of the Water License. Upon receipt of the \$50.00 fee from you, your Water License will be sent to you.

South Dakota Water Law 46-5-30.1 requires that a permit holder may not divert water until this \$50.00 license fee has been paid. Please contact us if you have any questions.

Sincerely,

Genny McMath
Water Rights Specialist

GM:ms

NOTE: On form of payment, please include the number of the water permit. This insures proper handling of the fee.

DWNR-814 8/83

RECEIPT

Division of Water Rights

No 4 9454

South Dakota Department of Water and Natural Resources

Pierre, December 23, 1983

RECEIVED OF City of Belle Fourche, City Hall, Belle Fourche, SD 57717

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

Fee for Application for Permit No. _____ to Appropriate Water, to construct works and to put water to beneficial use _____		
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. _____	50	00
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for Certified Copy of _____		
Fee for Print Copy of Map _____		
Fee for Certifying _____		
Fee for _____		
(Any Other Work Provided by Law)	Total	50 00

By John Hatch
Chief Engineer JOHN HATCH/ms

No. 1219-1

SOUTH DAKOTA Department of
Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501

WATER RIGHTS DIVISION
Phone (605) 773-3352

December 30, 1983

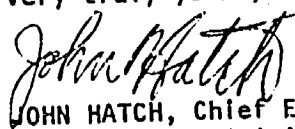
Robert Helmer, Mayor
City of Belle Fourche
City Hall
Belle Fourche SD 57717

Dear Mr. Helmer:

Enclosed herewith is, Water License No. 1219-1. This is the final water right document completing your process of obtaining a water right.

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.

Very truly yours,



JOHN HATCH, Chief Engineer
Water Rights Division

JH:ks

Enclosures

WNR-817 3/83
Transmittal of Water License