

- 1. Considered Jan. 28 1981
- 2. Name of Applicant St. Joseph's Indian School
- 3. Post Office Address Box 99, Chamberlain, 57326
- 4. Amount of Water Claimed 2.22
- 5. Source of Water Supply Three Dakota Formation wells 950 to 1100'
- 6. Water to be used for Geothermal Heating
- 7. Acres to be irrigated maximum acre feet
- 8. Water to be diverted and used in Brule County about miles NORTH EDGE of CHAMBERLAIN

PROOF OF PUBLICATION Received 1-23-81

APPLICATION Not Received Approved 4/26/81 5/27/81

Subject to FFC of L

Not Approved Action deferred 1/28/81 - 2/25/81

Priority Date Received 1/6/81 Application Complete yes x no FEE 325.00

Remarks

Date information and/or fee or corrected Application received Period of Annual use continuously

WATER QUALITY n/a

Received yes no APPROVED/CONDTIONAL (Circle one) WI-1 Description same as application yes no Remarks

Disapproved

Returned

Diversion Point

NW¹ NE⁴ - 10-104-71 (Three)

Lands to be irrigated

WELL LOG

Remarks

Driller Licensed yes no

Depth logs to be provided for when drilled

Nov 27 1981

Water Right No. _____

MAP Map No. 3817-5 Map located in Water Right xx Map file _____
 Type of Map Aerial Prepared by Enr. company - RA Quintal

+++++

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 1/28/81

Betty National
 (Signed)

+++++

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

REMARKS Date
 F.F. & C Final Decision, including F.F. & C of Law were adopted May 27, 1981
 OF LAW, Date
 FINAL Final Decision mailed to parties and/or parties notified that Final Decision
 DECISIONS was adopted _____
 ETC.

Remarks _____

No. 4599-3Map No. 3817-3 Water Division No. 3 MISSOURI RIVER DistrictAbove for Office Use 10140101

3:30 PM

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 St. Joseph's Indian School Phone No. 605/734-6021
 Post Office Address Box 89 Chamberlain State South Dakota 57326
 (Street, RR, or Box) (Town) (Zip Code)
 If a corporation show date and place of incorporation 3/21/25 Amended 11/26/56 Pierre

2. Method of accomplishing work (contract, employment of others, or by direct labor) Contract3. Name of diversion work St. Joseph's Geothermal Central Heating Plant4. Amount of water claimed (cubic feet per second) 1,000 gal. per minute 2.22 CFS5. Source of water supply Dakota Formation - underground water (3 wells)

6. Location of point of diversion Wells located on the grounds of St. Joseph's Indian School
Chamberlain Township; NE 1/4, Section 10 Township 104 N, Range 71 W

County Brule7. Annual period or periods during which water is to be used 12 months-peak period heating season8. Use to be made of water, (irrigation, industrial, municipal, commercial, recreation, etc.) Heating for campus9. For irrigation use, N/A Total number of acres to be irrigated N/A

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 1/2 years. Additional time required to complete application of water to the proposed beneficial use 1 years.

11. Choice of county newspaper for publication of Notice of Intent to Appropriate Water Chamberlain Register

12. Principal Features of the Proposed Water Supply System.

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

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

C. Works proposed to apply water to beneficial use. To use the ground water as the heat source for St. Joseph's Indian School Central Heating Plant using two centrifugal heat pumps.

Estimated Total Cost \$ 852,000.00

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 Brule) ss.

I, Robert J. Thompson, 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 Marion A. Jones
 Subscribed and sworn to before me this 6 day of January, 1981

WATER RIGHT APPLICATION APPROVAL

The Water Management Board hereby approves Water Right Application No. 4599-3

ST. JOSEPH'S INDIAN SCHOOL Box 89, CHAMPELAIN
(Applicant) (Post Office Address)
SOUTH DAKOTA 57326 With the following qualifications
(State)

The wells approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in wells having prior water rights.

The permit holder identify and have agreements to control or plug wells in the area with a total volume of 1,000 gpm by May 30, 1981.

That in the event that it is not feasible to enter into agreements to plug the wells by May 30, 1981 that they then abandon that option and turn to reinjection of the volume similar to what they are using back into the Dakota Formation.

The wells approved under this permit shall be valved and the flow reduced to the minimum amount required for the uses served. The wells shall also be equipped with a pressure gauge and a record kept of any pressure fluctuations. Such records shall be available to the Board upon request. If these wells are abandoned or the permit cancelled, the wells must be plugged in accordance with specifications of the JANUARY 6, 1981
water Management Board.

Date of first receipt of application _____, 19____
Date of return to applicant for correction, amendments or changes required _____, 19____

Date of receipt of corrected application _____, 19____

Approved May 27, 1981, Recorded in Book 22 Page 233

WATER RIGHT PERMIT NO. 4599-3

The Water Management Board hereby grants and issues this Water Right Permit No. 4599-3 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 January 6, 1981
2. The equivalent of at least one-fifth of the work above specified is to be completed on or before November 27, 1981
3. The whole of said work is to be completed on or before May 27, 1982
4. The limit of time from proof of beneficial use of water appropriated in accordance herewith is May 27, 1983
5. The water appropriated shall be used for the purpose of GEOTHERMAL HEATING

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 2.22 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 sevenieth (1/70) of one cubic foot of water per second of time for each acre of land~~ used for Geothermal Heating

~~for irrigation~~ on or before MAY 27, 1983, said water to be used during the following described annual period. Continuously

Witness my hand this 13th day of July, 1981

THE WATER MANAGEMENT BOARD

By John Hatch
Chief Engineer, Water Rights JOHN HATCH

Certificate of Construction Issued _____, 19____

Water License Issued _____, 19____

ROBY, QUINN & EVERSON
CONSULTING ENGINEERS
BOX 368 - 996 7543
MITCHELL, SOUTH DAKOTA 57301

PROJECT: JOSEPH TUDIAN DATE: 11-26-80
SCHOOL: CHAMBERLAIN, S.D. PAGE 1 of 1 BY: RQW

WATER QUANTITY USED ANNUALLY —
MAX USAGE @ DESIGN TEMP. — 1000 GPM.
BASED ON WEATHER DATA SYSTEM OPERATES
AT 50% CAPACITY FOR 7 MONTHS PER YEAR.
SYSTEM OPERATES AT MAX. OF 300 GPM FOR THE
REMAINING 5 MONTHS.

FOR 7 MO. S. — 500 GAL/MIN AVG. 24 HRS DAY,

$$Q = \frac{500 \text{ GAL}}{\text{MIN}} \times \frac{60 \text{ MIN}}{\text{HR}} \times \frac{24 \text{ HR}}{\text{DAY}} \times 210 \text{ DAYS} \quad \text{HEATING SEASON.}$$

$$Q = 1000 \times 30 \times 24 \times 210$$

$$Q = 151,200 \times 10^3 \text{ GAL} = 151,200,000 \text{ GAL.} \quad \text{SEASON.}$$

FOR 5 MONTHS (SPRING-SUMMER-FALL)

$$Q = \frac{300 \text{ GAL}}{\text{MIN}} \times \frac{60 \text{ MIN}}{\text{HR}} \times \frac{24 \text{ HR}}{\text{DAY}} \times 155 \text{ DAYS} \quad \text{SPRING-SUMMER-FALL}$$

$$Q = 1000 \times 18 \times 24 \times 155$$

$$Q = 66,960 \times 10^3 \text{ GAL.}$$

SPRING, THRU FALL.

$$\text{TOTAL YEARLY GALLONS} = 151,200,000 + 66,960,000 \\ = 218,160,000 \text{ GAL.}$$

$$1 \text{ ACRE FOOT} = 326,308 \text{ GAL}$$

$$\text{ACRE FEET/YEAR} = \frac{218,160,000}{326,308} = 668 \text{ ACRE FEET/YEAR}$$

APPLICATION COSTS

$$1ST 120 \text{ ACRE FEET} = 150.00$$

$$\text{NEXT } 60 \text{ ACRE FEET} = 75.00$$

$$\text{NEXT } 488 \text{ ACRE FEET} = \text{---}$$

$$\text{AT } 25.00/100 \text{ ACRE FEET} = 25 \times 8.13 = 203.25$$

$$428.25 \quad (\text{APPLICATION FEE})$$

•

Chamberlain
Address
C. J. Chamberlain
Signed By
Date 8-31-77

D Well Information

8" down 200 Ft

- (1) Drill Hole, Diameter 4-3/4" from surface Depth to ±1100 Ft.
200 ft. 5" sched. #40 steel
- (2) Casing, Type 100' 3" sched 80 PVC Diameter 3" Thickness sched. 80
 (wood, concrete, steel, etc.)
- (3) Screen, Type None Diameter 1/2" to 5/16" drilled Length ±80 Ft.
 ports
- (4) Gravel Pack, Thickness None Length of gravel pack None

E Dugout Information or Estimates

- (1) Surface dimensions, N/A Depth N/A

F Fill out for Either a Well or a Dugout.

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

Depth to top of water bearing material N/A

Depth to bottom of water bearing material N/A

Depth to water (ground surface to water level) N/A

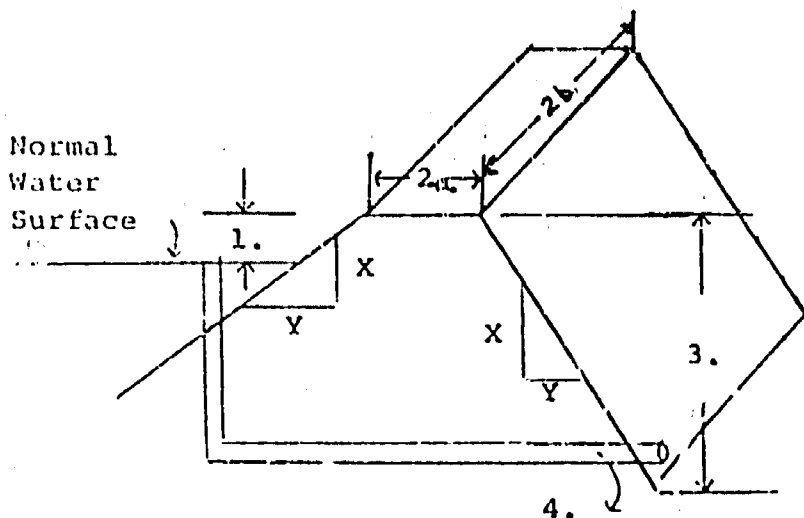
- (2) Distance to nearest existing household or livestock watering well.

On same owner's property N/A rds.

On property owned by others N/A rds.

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 N/A
2. Crest width N/A b. length N/A
3. Height of Dam N/A
4. Outlet dimensions:
 Pipe diameter N/A
 Spillway width N/A
- X & Y slope:
 Upstream N/A
 Downstream N/A
 Surface area of impoundment N/A
 Drainage area above dam N/A

No. 4599-3

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County Brule) ss.

I, Hubert E. Alewel hereby

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

Water was taken from the Chamberlain Reservoir

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 Chamberlain

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

Jan. 15, 1981

Jan. 22, 1981

Hubert E. Alewel
(Signature)

Publication
(Title)

1/22/81
(Date Signed)

NOTICE OF HEARING ON
APPLICATION TO
APPROPRIATE WATER

Pierre, South Dakota 57501

January 8, 1981

Notice is hereby given that St.
Joseph's Indian School whose
post office address is Chamber-
lain, South Dakota, has made an

application in accordance with
the provisions of SDCL 46-1-1
through 46-1-9, 46-1-14; 46-2-9
through 46-2-11, 46-2-13; 46-5-1
through 46-5-8; 46-5-10 through
46-5-22, 46-5-41; 46-6-3, 46-6-
3.1, 46-6-5, 46-6-8.1, 46-6-10,
46-6-14 and Board Rules ARSD
52:01:01:01 through 52:01:01:13
for a permit to appropriate for
beneficial use 2.22 cubic feet of
water per second of time from
ground water (three wells, Da-
kota Formation) through the St.
Joseph's Geothermal Central
Heating Plant, the points of
diversion which are to be lo-
cated in the NW¼, NE¼ of
Section 10, Twp. 104N, Range
71W. Said water to be used for
the purpose of providing water
for geothermal use.

This Application No. 4599-3
will be considered by the Water
Management Board at Meeting
Room #1, Knelp Building,
Church and Illinois, Pierre, SD,
upon the 28th day of January,
1981 at 10 a.m. The Board is
authorized to make a determina-
tion 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. Deci-
sions of the Board may be
appealed to the Courts as pro-
vided by law.

Any handicapped person
wishing to attend this hearing
can contact the Water Rights
Division, DWRN, Joe Foss
Building Pierre, SD prior to
the hearing date for assistance
to assure access to the hearing.
Water Management Board
Betty Westlund
Water Rights Specialist
(Jan. 15-22)



No. 4599-3

Publish first publication, on or before January 14, 1981

NOTICE OF HEARING ON
APPLICATION TO APPROPRIATE WATER

Pierre, South Dakota 57501

January 8, 1981

Notice is hereby given that St. Joseph's Indian School whose post office address is Chamberlain, South Dakota, has made an application in accordance with the provisions of SDCL 45-1-1 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 ASD 52:01:01:01 thru 52:01:01:13, for a permit to appropriate for beneficial use 2.22 cubic feet of water per second of time from ground water (three wells - Dakota Formation) through the St. Joseph's Geothermal Central Heating Plant, the points of diversion which are to be located in the NW 1/4 NE 1/4

of Section 10, Twp. 104N, Range 71W. Said water to be used for the purpose of providing ~~xxxxxx~~ water for geothermal use

This Application No. 4599-3 will be considered by the Water Management Board at Meeting Room #1, Kneip Building Church & Illinois, Pierre, SD upon the 28th day of January, 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, DMNR, Joe Foss Building, Pierre SD, prior to the hearing date for assistance to assure access to the hearing.

WATER MANAGEMENT BOARD

cc: St. Joseph's Indian School
Box 89, Chamberlain, SD 57325

BETTY WESTLUND
Water Rights Specialist

4599-8(6A-7/79
GROUNDWATER

NORTH

ST. JOSEPH'S
SCHOOL
SCHOOL BLDG.
CONVENT CHAPEL
BOYS BUILDING

POWER HOUSE
DINING FACILITY
OFFICE
NEW WELLS

ASA - AERIAL PHOTO
ST. JOSEPH'S INDIAN
SCHOOL
CHAMBERLAIN, S.D.

104-11-1

Division of Water Rights

(605) 773-3352

October 29, 1980

Robert Quintal
Roby, Quintal & Everson,
Consulting Engineers
P.O. Box 368
Mitchell, SD 57301

Dear Mr. Quintal:

This letter is in regard to the telephone conversation October 28, 1980 and your request for time on the November 19 and 20, 1980 Water Management Board Meeting Agenda. We have placed "Discussion of Proposed Geothermal Heat Recovery System, St. Joseph's Indian School, Chamberlain, on the Agenda for 9:00 a.m. November 19. The meeting is to be held at the Karl Mundt Library, Dakota State College, Madison, SD.

I realize the time may be early; however, this is the best time available.

Very truly yours,

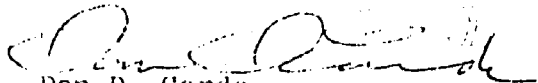
JOHN HATCH, Chief Engineer
Water Rights Division

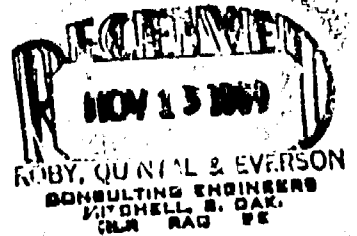
JH/gv

11 NOV 80

Dear Mr. Quintal,

I have attached my reply to your areas of concern about the Chamberlain project. I have also made a comment relative to drilling the wells. If there are any further questions do not hesitate to contact me either at the office (394-2495) or home (343-1636)


Dan D. Corda



Aquifer Pressure Decline

There has been indeed a decline in the pressure of water in the "Dakota" sandstone formation. Data for over 100 year of measurements is available. However since there appears to be a significant portion of recharge water coming from the Madison limestone in the general area of the Missouri River, there should be little concern as the availability of water for the next 20-30 yr. Because of Chamberlain's location relative to this recharge zone there should be little concern as to the amount of water which will be available.

Water Treatment

In general costs associated with removal of sodium and sulfate ions from water are not cost effective. The two principal methods of removal available are distillation and reverse osmosis. Both will do the job but in addition to being expensive to install and operate, they create an additional problem -- waste disposal. In reverse osmosis a brine will be generated which can range from $1/8$ to $1/4$ of the inlet stream and which will contain from four to eight times the dissolved solids of the inlet water. Distillation can also create a brine or sludge depending on the operating parameters. The sludge could be easily disposed of in a sanitary type land fill but brine disposal becomes more costly and complex. Therefore these procedures can not be considered at all.

There would be little improvement in water quality with the conventional treatment methods such as lime softening or ion exchange. Therefore in view of the large volume of water being generated, water treatment would be ruled out with the possible exception of dilution of perhaps 1 : 1 with river water. This would make the resulting water in general, much more suitable for irrigation purposes. Irrigation with the water direct from the well should pose no concern provided the soil is sandy enough. If the soil has a high clay content it would not be as desirable. If the end usage is

irrigation; the problem of storage for the growing season can become a major problem. In general irrigation considerations in our area of the United States are not practical unless you have a large storage reservoir.

The problem with Chamberlain's location is the Missouri River, but this can also be the solution. Direct disposal is of course the most practical. Pipelining costs and pumping costs if they are to be considered would be just about as great as costs involved in reinjection.

Unless spent water could be utilized in some form of warm (65°F) water aqua culture. Water of 65°F is ideal for the raising of many forms of fish and shrimp. This would perhaps have to be suggested to private individuals. Chamberlain would be in a good area for marketing this product and would have available a good local supply of feed. Tests on this type of agriculture have generated several lucrative businesses. The main advantage being that the fish or shrimp continue to grow all year, the same as they do in the tropics. This would be a form of agriculture and would certainly be viewed favorably by the water resources commission. If this cannot be done then it appears that there is no other real end use of the water. The best recommendation for the water resources board is that the water would be discharged until a suitable end user was found, and if none could be found reinjection would be performed if the disposal into the river was not acceptable.

In drilling the wells, I believe that there should be a bid letting to include Huron Drilling Co., Sather Drilling Co., and as many other competent drillers as possible. When you are contemplating three wells in an area you should get a very favorable reduction in price. I realize it is desirable to utilize local companies but there is nothing difficult in drilling wells to the depth required at Chamberlain and there are many competent drillers in S. D.

GEOHEMAL HEATING SYSTEM
SAINT JOSEPH'S INDIAN SCHOOL
CHAMBERLAIN, SOUTH DAKOTA

ROBY, QUINTAL & EVERSON

CONSULTING ENGINEERS

DAVE ROBY P.E.
ROBERT A. QUINTAL P.E.
BOB EVERSON P.E.

BOX 368, MITCHELL, SOUTH DAKOTA 57301
TELEPHONE 605-996-7543

November 10, 1980

South Dakota Department of Water and
Natural Resources
Division of Water Rights
Joe Foss Building
Pierre, South Dakota 57501

ATTENTION: Mr. John Hatch, Chief Engineer
Water Rights Division

RE: Water Appropriation Permit for
Geothermal Heating Plant
Saint Joseph's Indian School
Chamberlain, South Dakota

Gentlemen:

Thank you for placing the above referenced proposal on your meeting agenda at 9:00 A.M., C.S.T. November 19, 1980. We look forward to discussing the proposed project with the Board.

Attached hereto is a brief description of the proposed system, a building campus plot plan and a schematic flow diagram of the Geothermal Heating System to help familiarize you and the Board with the project.

Sincerely yours,

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS

Robert A. Quintal

Robert A. Quintal, P.E.

RAQ:jm

Enclosures

pertinent data for:

SOUTH DAKOTA WATER MANAGEMENT BOARD

regarding:

WATER APPROPRIATION PERMIT

for Geothermal Heating Plant

for:

SAINT JOSEPH'S INDIAN SCHOOL

CHAMBERLAIN, SOUTH DAKOTA

November 19, 1980

ROBY, QUINTAL & EVERSON

CONSULTING ENGINEERS

MITCHELL, SOUTH DAKOTA

PROPOSED: GEOTHERMAL HEATING SYSTEM
SAINT JOSEPH'S INDIAN SCHOOL
CHAMBERLAIN, SOUTH DAKOTA

Saint Joseph's Indian School is a parochial private boarding school owned and operated by the Roman Catholic Priests and Brothers of the Sacred Heart. Total enrollment is approximately 225 mostly South Dakota Indian children. The school is financially supported through contributions and individual benefactors. Saint Joseph's is unquestionably one of the larger energy consumers in Brule County along with employing 135 people.

The central heating plant for the campus provides building heating and domestic hot water for most campus buildings. The central plant is equipped with oil fired boilers. The Institution has reduced its annual No. 2 oil consumption to 151,000 gallons but with present day fuel costs escalating almost monthly, heating costs are creating almost unbearable strain on the school's operating budget. Due to its location, the only other abundant source of conventional energy available to the school is electrical energy but it is more expensive than No. 2 fuel oil.

The Institution has an existing 2" artesian well drilled many years ago for domestic and irrigation use and it still provides approximately 200 GPM at 75°F at full flow. Since it is not now being used, the flow has been reduced and it is flowing into the Missouri River which is adjacent to the school.

The consulting engineering firm of Roby, Quintal & Everson has been investigating methods of using the heat from the well water for the past year

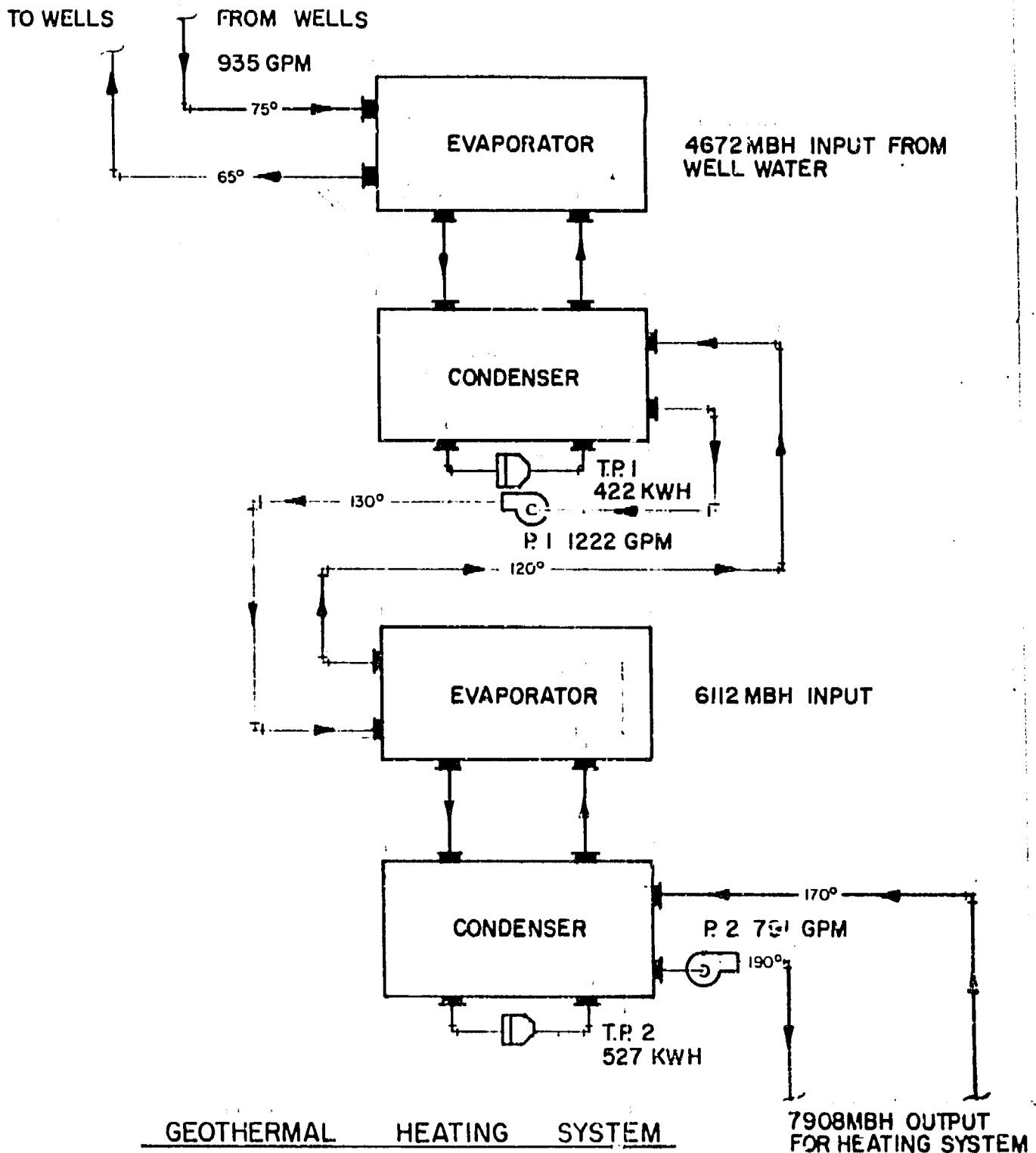
or so. Until the recent past, commercial heat pumps have only been capable of providing heating water at approximately 130°F when using 75°F source water, so there was little practical application for an institution such as Saint Joseph's. Recently, however, high temperature heat pumps have become available which will provide 190°F leaving water while using 75°F source water.

Our studies indicate that a centrifugal heat pump system utilizing approximately 1000 GPM of well water will provide the Institution with 4,672,170 Btu/Hr continuously. The peak heating load for seven of the major campus buildings is 7,538,000 Btu/Hr so heat from the well water would produce 59% of the heating energy for the campus.

Reduced to practical terms, the installation of a centrifugal heat pump system will save the Institution \$97,100 per year at present energy costs. Even though the cost of installing the heat pump system is about \$353,000, the simple payback period for the investment at present rates of inflation is less than 6½ years. For this reason, the Institution is most anxious to pursue the design and installation of the system.

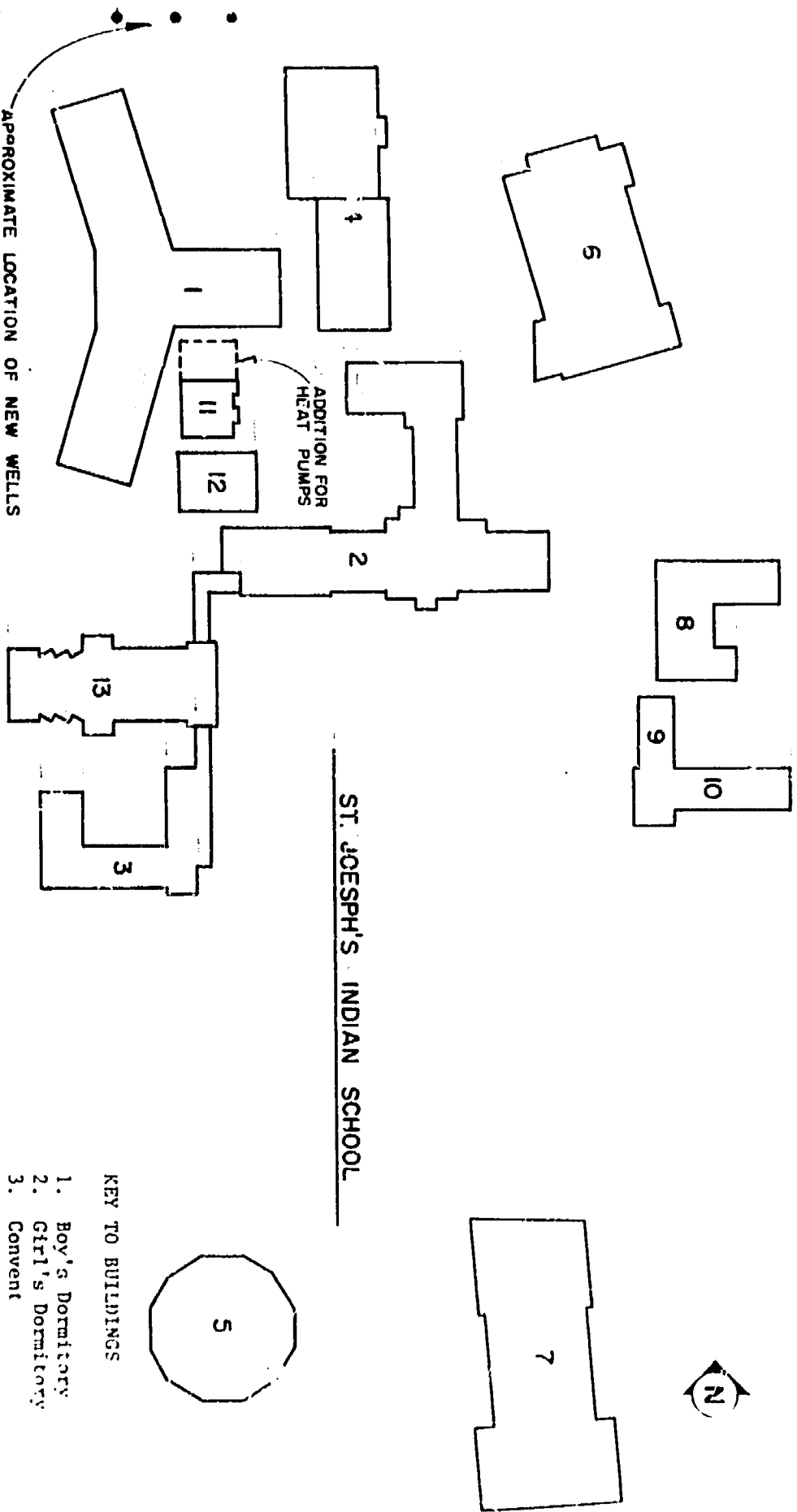
Final well drilling plans are not complete but discussions with well drilling experts familiar with the aquifer below Saint Joseph's indicate that three 3" wells will provide the necessary 1000 GPM at the least cost. The existing 2" well will be kept as a standby to provide some backup for the new wells. The existing central heating plant boilers will also remain as a back-up for the new system.

It is of critical importance to the Institution that the State Water Board approve Saint Joseph's application permit for water appropriation.



ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

1. Boy's Dormitory
2. Girl's Dormitory
3. Convent
4. Office Building
5. Elementary School
6. Kitchen & Dining Facility
7. Gymnasium



ST. JOSEPH'S INDIAN SCHOOL

KEY TO BUILDINGS

1. Boy's Dormitory
2. Girl's Dormitory
3. Convent
4. Office Building
5. Elementary School
6. Kitchen & Dining Facility
7. Gymnasium
8. Priest's Quarters
9. Garage
10. Old Gymnasium
11. Power House
12. Laundry
13. Chapel

PLOT PLAN

SCALE: 1" = 100'

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

Rapid City, So. Dak.
Dec. 2, 1980

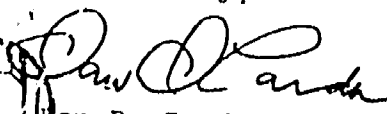
Bob Quintal
Roby, Quintal & Everson
Box 368
Mitchell, So. Dak. 57301

Dear Mr. Quintal:

As per our telephone conversation, I have included several copies on recent aquaculture articles. It appears at this time the fresh water malaysian prawn (shrimp) and the catfish are currently being grown and harvested successfully in geothermal waters are the best candidates. Further documentation on these projects may be obtained from Jon Strawn, EG&G Idaho, 528 Secon St., Idaho Falls, Ida. EG&G is DOE's prime contract supervisor for our area.

In addition I have included two figures which help to depict the believed mechanism whereby the Madison Limestone is recharging the Dakota Aquifer. The first article on the topic was by Frank Swenson who is with the US Geological Survey it was published in 1968 in Vol. 79 of the Geological Society of America Bulletin. Later in 1972, Bob Schoon with the S.D. Geological Survey published Report of Investigations #104 which expanded and refined on Swenson's work (Figure 19). Both of these articles give strong evidence of the method whereby the water directly leaks up into the Dakota. In a subsequent Report of Investigation #110 by Duncan McGregor & B. Schcon more evidence is brought forward for the upward recharge. The evidence appears to be clear enough that there is a major portion of the recharge to the Dakota from the Madison Limestone. The Madison appears to have a significant amount of water available. That does not mean an unlimited amount, but sufficient that there will be little concern about the water for at least the next 20 years. Therefore I do not see any reason for concern about developing a well field in the Dakota Sandstone at Chamberlain and withdrawing up to 1000 gpm.

Yours truly,


Dan D. Carda
DEC 05 1980
ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, S. DAK.
RLR RAD SE

Division of Water Rights (605) 773-3352

4599-3

February 2, 1981

St. Joseph's Indian School
Box 89
Chamberlain, SD 57326

Dear Sirs:

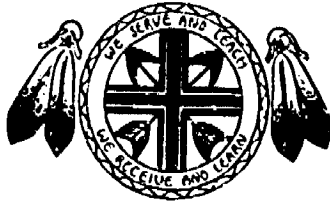
The Water Management Board deferred action on your Application No. 4599-3 at the January 28, 1981 Board Meeting. The Application is scheduled to be brought up again at the March 25-26, 1981 Board Meeting.

If you have any questions, please contact this office.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Division

JH/gy



St Joseph Indian School

Chamberlain, South Dakota 57226

March 9, 1981

John Hatch
Department of Water and Natural Resources
Pierre, South Dakota 57501

Dear John:

Pursuant to the conversation you had with Lowell, please find enclosed our brief report prepared for you and the members of the board regarding the two options we have developed as means of protecting the aquifer as St. Joseph's seeks its permit. On March 2nd we had a meeting with our eight local ranchers and farmers explaining the geothermal system as well as the two options we have come up with and will offer to the Water Resource Board. Without trying to put words in their mouths either option would seem acceptable to them, but if there was a preference it would be to plug some of the wild wells equal to 1,000 gpm.

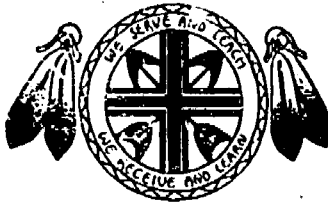
Copies of this letter and the report are being sent to the local people. After our meeting we agreed to keep them posted and to send them whatever we would address to the board. According to Earl Biskeborn some of them will be present when the Water Resource Board meets. Frankly, St. Joseph's understands their position. We have found them to be reasonable and concerned on this matter. Their help and support is sought and appreciated. Water is a valuable resource which needs to be protected. We believe the two options offered answer that need and may be of help to your board regarding future permits.

If we can be of any assistance in preparation for the meeting please let us know. Naturally we are most concerned that the permit be granted as it truly concerns the financial well-being of this institution. If we maintain the status quo it may well be that in two years it will cost us more to heat this place per child then it does to educate them - that would be a sad state of affairs.

CC. Earl Biskeborn
Leroy Speckels
Ray Stemmerman
James Petrak
Bernard Yeaton
Alvin Werner
John Blum
Kent Hamiel
Dr. Dan Carda
Phil Lidel
Bob Quintal

Sincerely yours,

Rev. Thomas Cassidy
Rev. Thomas Cassidy, S.C.J.
Superintendent



St Joseph Indian School

Chamberlain, South Dakota
57326

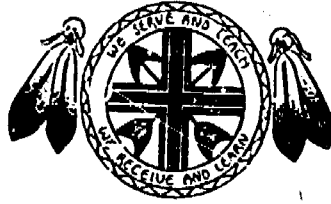
To: State Water Resource Board
From: St. Joseph's Indian School
Subject: Alternative Solutions to Protection of Aquifer

At the January meeting of the board it was decided to postpone a decision on the water application of St. Joseph's until the March meeting to allow the institution to investigate ways and means of protecting the aquifer, with a particular emphasis on the question of reinjection of the water after the heat has been extracted. Several local farmers and ranchers were present at that meeting to express their concerns about the proposed project at St. Joseph's. The school has been in contact with these individuals as will become evident in the course of this report. Copies of this letter are being sent to all the concerned individuals, at their request.

REVIEW

St. Joseph's is requesting authority to use up to 1,000 gallons a minute of water from the Dakota Aquifer. This water would be used to heat the entire campus and would represent substantial savings to the institution. At present fuel oil prices without reinjection it would mean a savings of \$110,130.00 at current fuel prices to the institution of \$1.08 per gallon and based on an annual consumption of 151,000 gallons of fuel oil. The appendix will give an appropriate chart showing the fuel savings for various levels of number two fuel oil costs.

The Water Resource Board expressed concern about protecting the aquifer.



St Joseph Indian School

Chamberlain, South Dakota
57726

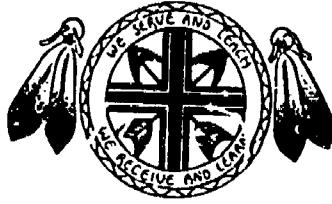
fer and directed the institution to investigate alternative uses of the water once the heat has been extracted. St. Joseph's along with the firm of Roby, Quintal and Everson have investigated several options: Reinjection/or plugging of non-used wells equal to what the institution is asking for, namely 1,000 gallons per minute.

Reinjection

The engineering firm, after doing its examination of the question of reinjection have come up with the following facts. Reinjection will cost St. Joseph's \$115,000.00 to install in addition to the cost of the original geothermal project. This cost would cover the establishment of three injection wells, the piping needed to these wells and the three sixty horse power pumps needed to operate. Several other methods were discussed including one large well. However, on a cost and performance basis, the three injection well approach offers the best alternative with the technology of today. In addition to the installation cost the pump operation would add between \$28,000 and \$29,000 to the operational cost of the system each year. Comparing the savings available to the system without injection would reduce the yearly savings at present fuel cost to \$87,130 and current rates.

Plugging Wells

Working with local people the institution has also investigated the possibility of plugging wells equal to 1,000 gpm. This actually would put



St Joseph Indian School

Chamberlain, South Dakota
57326

more water into the aquifer than St. Joseph's would remove. First, during the summer months little water is needed and second, during parts of the heating season much less than 1,000 gpm would be needed to run the geothermal system. Operating on the assumption of protection of the aquifer this method offers greater savings to the institution and does not burden it with the yearly operational cost of injection. Several possible wells exist. The school would like to work with the local farmers and ranchers as well as with the State Water Resource Board to determine which wells would best suit this approach.

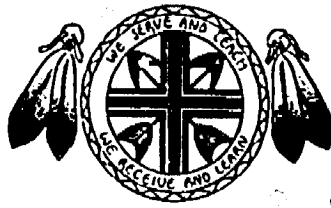
This method will also allow the institution possible secondary uses of the water that may develop. However, at this point in time none seem economical or practical given the location of St. Joseph's.

Recommendation

Based on the discussion with local people and on the sheer economic weight the institution would request the Water Resource Board grant its permit based on either of these two options:

1. In return for its permit St. Joseph's will plug a well or wells equal to 1,000 gpm.
2. In return for its permit St. Joseph's will design the geothermal system based on reinjection of water used.

If at all possible the first option would be preferred by the institution, again based on the matter of economics and as shown the institution would actually put more water in the aquifer than it takes out. If this option



St Joseph Indian School

Chamberlain, South Dakota
57326

were granted, St. Joseph's would need the assistance of the State Water Resource Board in determining which wells to plug. This would be particularly true if such wells are located on Army Corp of Engineers land or are in some way connected with other state governmental agencies such as Game, Fish and Parks Department.

St. Joseph's believes either method will protect the aquifer and would present the board with several options in dealing with future geothermal permits.

Appendix A

1. Cost Increase For Fuel Oil
2. Geothermal Cost Comparison

COST INCREASE FOR FUEL OIL

GALLONS	# P. GAL	TOTAL	INCREASE
151000	1.07	161570	
151000	1.08	163080	1510
151000	1.09	164590	3020
151000	1.1	166100	4530
151000	1.11	167610	6040
151000	1.12	169120	7550
151000	1.13	170630	9060
151000	1.14	172140	10570
151000	1.15	173650	12080
151000	1.16	175160	13590
151000	1.17	176670	15100
151000	1.18	178180	16610
151000	1.19	179690	18120
151000	1.2	181200	19630
151000	1.21	182710	21140
151000	1.22	184220	22650
151000	1.23	185730	24160
151000	1.24	187240	25670
151000	1.25	188750	27180
151000	1.26	190260	28690
151000	1.27	191770	30200
151000	1.28	193280	31710
151000	1.29	194790	33220
151000	1.3	196300	34730
151000	1.31	197810	36240
151000	1.32	199320	37750
151000	1.33	200830	39260
151000	1.34	202340	40770
151000	1.35	203850	42280
151000	1.36	205360	43790
151000	1.37	206870	45300
151000	1.38	208380	46810
151000	1.39	209890	48320
151000	1.4	211400	49830
151000	1.41	212910	51340
151000	1.42	214420	52850
151000	1.43	215930	54360
151000	1.44	217440	55870
151000	1.45	218950	57380
151000	1.46	220460	58890
151000	1.47	221970	60400
151000	1.48	223480	61910
151000	1.49	224990	63420
151000	1.5	226500	64930
151000	1.51	228010	66440
151000	1.52	229520	67950
151000	1.53	231030	69460
151000	1.54	232540	70970
151000	1.56	235560	73990
151000	1.57	237070	75500
151000	1.58	238580	77010
151000	1.59	240090	78520

GEO THERMAL COST COMPARISON

FUEL	TOTAL	GEO.	+/-
1.07	161570	46950	114620
1.08	163080	46950	116130
1.09	164590	46950	117640
1.1	166100	46950	119150
1.11	167610	46950	120660
1.12	169120	46950	122170
1.13	170630	46950	123680
1.14	172140	46950	125190
1.15	173650	46950	126700
1.16	175160	46950	128210
1.17	176670	46950	129720
1.18	178180	46950	131230
1.19	179690	46950	132740
1.2	181200	46950	134250
1.21	182710	46950	135760
1.22	184220	46950	137270
1.23	185730	46950	138780
1.24	187240	46950	140290
1.25	188750	46950	141800
1.26	190260	46950	143310
1.27	191770	46950	144820
1.28	193280	46950	146330
1.29	194790	46950	147840
1.3	196300	46950	149350
1.31	197810	46950	150860
1.32	199320	46950	152370
1.33	200830	46950	153880
1.34	202340	46950	155390
1.35	203850	46950	156900
1.36	205360	46950	158410
1.37	206870	46950	159920
1.38	208380	46950	161430
1.39	209890	46950	162940
1.4	211400	46950	164450
1.41	212910	46950	165960
1.42	214420	46950	167470
1.43	215930	46950	168980
1.44	217440	46950	170490
1.45	218950	46950	172000
1.46	220460	46950	173510
1.47	221970	46950	175020
1.48	223480	46950	176530
1.49	224990	46950	178040
1.5	226500	46950	179550
1.51	228010	46950	181060
1.52	229520	46950	182570
1.53	231030	46950	184080
1.54	232540	46950	185590
1.55	234050	46950	187100
1.56	235560	46950	188610
1.57	237070	46950	190120
1.58	238580	46950	191630

 **Department of
Water & Natural Resources**
Joe Foss Building
Pierre, South Dakota 57501

Date: March 10, 1981

To : Persons Interested In Application 4599-3

From : John Hatch, Chief Engineer, Water Rights Division

John Hatch

Subject: Reconsideration of Application 4599-3

The Water Management Board will reconsider deferred water permit Application No. 4599-3, in St. Joseph Indian School, Brule County, at the Holiday Inn, Sandy Shore Room, Watertown, South Dakota on March 26, 1981 at 11:00 a.m.

This reconsideration hearing will be conducted 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; 46-6-5; 46-6-6.1; 46-6-10; 46-6-3.1; 46-6-14 and Board Rules ARSD 52:01:01:01 thru 52:01:01:13.

After reconsideration of the deferred application the Board can approve, conditionally approve, defer, or deny all or part of the Application.

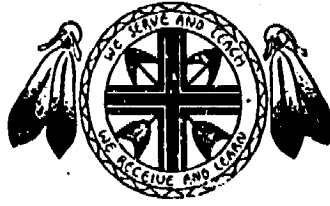
This hearing is an adversary proceeding. Any person has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised at the hearing. Decisions of the Board may be appealed to the Courts as provided by law.

You are also notified that SDCL 1-26 provides any interested party the opportunity to meet informally with the Water Rights Division Staff to discuss proposed recommendations by the staff to the Board prior to the scheduled hearing. If we do not hear from you, we will assume that the opportunity for an informal meeting is being waived and you wish to proceed directly to the hearing on the application before the Board.

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.

B32114JH

Equal Opportunity Employer



St Joseph Indian School

Chamberlain, South Dakota 57326

March 31, 1981

Dear

I would like to thank you and all the other local ranchers and farmers for your assistance in our obtaining the water permit needed to proceed with the planned central geothermal heating system for St. Joseph's. Your initial concern and willingness to work with us on this project is a reminder that as friends and neighbors it is important to work together for the good of all and for the protection and use of such a valuable resource, i.e., water.

We will make every effort to keep all of you informed about the progress of this project. Your assistance in locating uncontrolled wells in our area will be appreciated. This is especially true of wells that Ray speaks about along the river. Lowell Thomas will be working with John Hatch of the Water Resource Board on this. If you can be of assistance please feel free to contact him. As things progress on the location of wells and the securing of owners consent we will attempt to keep you posted.

We hope our project can proceed smoothly so that as soon as is practical we can be operating our geothermal heating system. Each day we wait does cost us money that could be used to support the educational endeavors of St. Joseph's. The fact that you were able to sit down with us and work this project out to a mutual satisfaction is something I personally appreciate and on behalf of all of us here at St. Joseph's, especially our children we offer our thanks.

It is hoped final plans can be ready by the end of the school year. A project of this magnitude does take time. I am hoping all the pieces will fit together but one can never tell given all of its components. Please feel free to contact us regarding any questions you may have and feel free to stop in anytime to visit. I know this is the beginning of a busy time of year for all of you and I hope and pray the Lord will grace our land with plenty of moisture.

Sincerely,

Rev. Thomas Cassidy S.C.J.
Rev. Thomas Cassidy, S.C.J.
Superintendent

TC:vs

CC: John Hatch ✓
Bob Quintal

April 7, 1981

St. Joseph's Indian School
Box 89
Chamberlain, South Dakota 57325

Dear Sir:

You are aware that the Water Management Board requested that proposed Findings of Fact, Conclusions of Law and a proposed Decision regarding Water Right Application No. 4599-3 approval be prepared. The Water Management Board will be meeting in the Knisp Building, Meeting Room #1, Pierre, SD, May 27 & 28, 1981. We have tentatively placed consideration of the proposed Findings of Fact, Conclusions of Law and Decision on the agenda for 3:00 p.m., May 27, 1981.

The Attorney General's Office will prepare proposed Findings, Conclusions and Decision for consideration by the Board. This notice is provided to you in the event you wish to prepare or have prepared your own proposed Findings, Conclusions and Decision for consideration by the Board.

Please have any proposed Findings, Conclusions and Decision in this Office by May 19, 1981. We will be mailing information concerning the Board meeting to the Board members May 20, 1981.

Very truly yours,

John Hatch, Chief Engineer
Water Rights Division
Phone: (605) 773-3352

cc: Jer Harvden
Dwight Peterson
Robert Quantal
Ray Starneman
DeLoras Creaner
Roy A. Kenobblo
Kenneth Pusseau
Boyd King
Mr. & Mrs. Donald E. Blackner

Earl Biskerborn
Idell Dozerk
Lowell C. Thomas
LeRoy Speckels
John Glun
Kent P. Hantel
Scott Pattison
James Dominkack

D42204K

DATE: May 7, 1981

To: Water Management Board

From: Mr. Alvin Werner

Since the two wells which have been designated for plugging are located on Corps land I hereby give my permission for the firm of Hutmacher Brothers, Oacoma, South Dakota, to cross my land to reach said wells. It is my understanding the Hutmacher Brothers represent St. Joseph's Indian School and that this project is in conjunction with the School's efforts to locate and plug uncontrolled wells in our area.



Mr. Alvin Werner

May 7 1981
Date

AGREEMENT

THIS AGREEMENT made and entered into this 7th day of May, 1981, by and between E.W. & Darlene Duling (husband & wife), of Dixon, Gregory County, South Dakota, hereinafter designated the Owner, and the CONGREGATION OF THE PRIESTS OF THE SACRED HEART, INC., a South Dakota non-profit corporation, of Chamberlain, Brule County, South Dakota, doing business under the name and style of St. Joseph's Indian School, hereinafter designated the Supplier, WITNESSETH:

WHEREAS, Supplier has entered into an agreement with the State of South Dakota to supply certain services to land owners in the State in connection with the plugging of wild artesian water wells; and

WHEREAS, Owner E.W. & Darlene Duling desirous of availing themselves/himself of such services; and

WHEREAS, Supplier and Owner wish to reduce their mutual understandings and agreements in writing; it is therefore mutually agreed as follows:

1. For and in consideration of the mutual covenants as hereinafter to be performed, Supplier agrees to plug two wild artesian wells, the location of which is described as follows
#1. N.W $\frac{1}{4}$ Sec 23 T99 R 72
#2. S.W $\frac{1}{4}$ Sec 13 T99 R 72

2. Owner hereby grants unto Supplier, and Supplier's agents, representatives, and employees, the right of access to such location for the purposes of carrying out the purposes of this agreement.

3. As further consideration for the services to be supplied by Supplier, Owner agrees to indemnify and hold harmless Supplier, its agents, representatives and employees, from all liability arising out of or in connection with the services to be supplied hereunder.

4. It is mutually understood and agreed by and between the parties hereto that the services to be supplied are uncertain of success, and while Supplier agreed to conduct the project herein described in a workmanlike manner and to the best of the ability of professionals in the field, no success of the operation can be guaranteed. The Supplier will employ the firm of Hutmacher Brothers as professionals in the field.

5. As further consideration of the covenants made by the Owner, the Supplier agrees to supply the services described herein at no expense to the Owner, except as otherwise specifically provided for herein. Those items to be supplied at the expense of the Owner shall include the following:

None

6. Supplier hereby reserves the right to abandon the project described herein at such time as the professionals employed to conduct the project, in consultation with the representatives of the State of South Dakota, shall determine

That the success of the project is unlikely, unjustified by the expense, or dangerous. Such determination shall in all cases be final.

7. If this agreement is for the replacement of a well, the Supplier shall cause to be drilled a N.A. inch diameter well.

8. This Agreement shall not be changed, modified or revoked unless reduced to writing and signed by the parties hereto.

9. This agreement shall insure to the benefit of and be binding upon the parties hereto, their representatives, heirs, assigns and successors with like force and effect as upon the parties themselves.

10. Upon completion of the services described herein, Supplier agrees to furnish to Owner such statements of work completed as may be required to comply with South Dakota law or regulations.

IN WITNESS WHEREOF, we have hereunto set our respective hands the year and date first above written.

OWNER:

SUPPLIER:

Ch. Duling

CONGREGATION OF THE PRIESTS OF THE
SACRED HEART, INC.

By: Sydney L. Duling

By: Rev. Thom Caspary
Representative

Notation - The flow of the two described wells has been estimated by the owner and Hutmacher Brothers to be approximately 200 gallons per minute, per well.

May 15, 1981

John Hatch Chief Engineer
Water Rights Division
Joe Foss Building
Pierre, S. Dakota 57326



Dear Mr. Hatch,

This letter is in regards to your letter of April 7, 1981 to St. Joseph's Indian School pertaining to their Water Rights application No. 7599-3. Copies of the letter were mailed to farmers and ranchers who attended the Water Managers Board meeting at Watertown.

The farmers and ranchers remain much concerned that if a permit is issued to St. Joseph's Indian School to use artesian wells for geothermal purposes that the permit require re-injection of water into the artesian basin or the plugging of wild wells along the Missouri River. The re-injection or plugging should be equal to the flow of the wells used by St. Joseph Indian School.

Respectfully

Earl Biskeborn

R.R.1 Box 83

Chamberlain, S. Dak. 57325

 **Department of
Water & Natural Resources**
Joe Foss Building
Pierre, South Dakota 57501
Water Rights Division
605 773-3352

May 19, 1981

St Joseph's Indian School
Box 89
Chamberlain SD 57326

Dear Sir:

Enclosed please find a copy of the proposed Findings of Fact, Conclusions of Law and Final Decision on Application No. 4599-3, St Joseph's Indian School as prepared by the Attorney General's office.

Very truly yours, .

JOHN HATCH, Chief Engineer
Water Rights Division

kw

enclosure

cc: Jer Hayden
Dwight Peterson
Robert Quental
Ray Stemmerman
Delores Creamer
Roy A Kenobbie
Kenneth Pusseau
Boyd King
Mr & Mrs Donald Bickner

Earl Biskeborn
Idell Dozard
Lowell C Thomas
LeRoy Speckels
John Blum
Kent F Hamiel
Scott Pattison
James Doniniack

Equal Opportunity Employer

STATE OF SOUTH DAKOTA
WATER MANAGEMENT BOARD

APPLICATION OF ST. JOSEPH'S	)	FINDINGS OF FACT,
INDIAN SCHOOL FOR WATER	)	CONCLUSIONS OF LAW
PERMIT NO. 4599-3	)	FINAL DECISION

Having heard and considered all of the evidence in the above-entitled matter at the March 25 and 26, 1981 Water Management Board meeting held at the Watertown Holiday Inn, Watertown, South Dakota, the Board hereby makes the following

FINDINGS OF FACT

1. That on January 6, 1981, the Board received water permit application No. 4599-3 from St. Joseph's Indian School of Chamberlain, South Dakota.
2. That St. Joseph requested 2.22 c.f.s. of water from three Dakota formation wells.
3. That the water is to be used for geothermal heat for several buildings on the school grounds.
4. That the application was duly advertised in the Chamberlain Register on January 15 and 22, 1981.
5. That on January 23, 1981 testimony was offered before the Board in support of and in opposition to the granting of the permit
6. That considerable concern was expressed at that meeting about the declining head pressure of the Dakota in the Chamberlain area.
7. That the applicant was unable to find a secondary use for the water after its use for geothermal purposes.

8. That the Board deferred action on application No. 4599-3 at the January 28, 1981 Board meeting.

9. That there are numerous flowing artesian Dakota wells in the south central South Dakota region.

10. That these flowing wells are, in part, the cause of the decreasing head pressure of the Dakota in the Chamberlain area.

11. That to compensate for any loss of Dakota head pressure due to St. Joseph's proposed diversion, the school offered to plug up to 1,000 gallons per minute of flowing Dakota wells.

12. That the plant average daily diversion rate of the applicant's project will be 500 to 700 g.p.m.

13. That, under the proposal submitted by the applicant, the head pressure of the Dakota should experience a net gain.

14. That there are flowing wells within a reasonable distance of St. Joseph that can be plugged.

15. That reinjection is a feasible alternative to plugging flowing wells.

16. That approving the application is in the public interest and the plan of the project is feasible.

CONCLUSIONS OF LAW

1. That the Board has jurisdiction to consider the granting or denying of this application.

2. That extraction of heat from underground water is a beneficial use of the waters of the state.

3. That the Board has the authority to condition a permit such that it serves to protect adequate or inadequate well owners from potential harm caused by the pumping of the applicant.

4. That it is in the best interest to the people of this state to maximize to the fullest extent the beneficial use of the waters of this state.

5. That all legal requirements for a water permit have been met and Application No. 4599-3 should be approved.

FINAL DECISION

Water Permit No. 4599-3 is hereby approved subject to the following qualifications:

1. The wells approved under this permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under this permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in wells having prior water rights.

2. That the permit holder identify and have agreements to control or plug wells in the area with a total volume of 1,000 g.p.m. by May 30, 1981.

3. That in the event that it is not feasible to enter into agreements to plug the wells by May 30, 1981 that they then abandon that option and turn to reinjection of the volume similar to what they are using back into the Dakota Formation.

4. The well approved under this permit shall be valved and the flow reduced to the minimum amount required for the uses served. The well shall also be equipped with

a pressure gauge, and a record kept of any pressure fluctuations. Such records shall be available to the Board upon request. If this well is abandoned or the permit cancelled, the well must be plugged in accordance with specifications of the Water Management Board.

Dated this 27th day of May, 1981.

[Signature]
CHAIRMAN

[Signature]
SECRETARY

MROFO-SD

27 May 1981

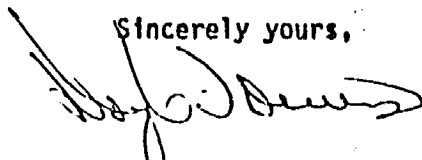
Mr. Gale H. Selken
South Dakota Department of
Water & Natural Resources
Water Rights Division
Joe Foss Building
Pierre, South Dakota 57501

Dear Mr. Selken:

Reference your letter to Mr. Dave Lupp concerning flowing wells on Corps land south of Chamberlain. Mr. Lowell Thomas of the St. Joseph's Indian School in Chamberlain has been in contact with us concerning plugging two of these wells to offset their proposed new well production.

We understand there is also an artesian well near Red Lake, southeast of Chamberlain, that could have the flow reduced and then the wells on Corps land would not require plugging. We would like to see this option pursued, however if this well near Red Lake cannot be controlled, then you can proceed to plug the two wells on Corps land located in Section 2, T. 102 N., R. 72 W. Work on Corps land will be coordinated with our local Park Manager, Dale Lundquist. Any disturbed areas will be repaired and reseeded to native vegetation.

Sincerely yours,



DOYLE F. OWENS
Area Engineer

CF:

✓ Mr. Lowell Thomas
St. Joseph's Indian School
Chamberlain, South Dakota

Pierre Real Estate Ofc

Water Rights Division (605) 773-3352

May 28, 1981

Rev. Thomas Cassidy
St. Joseph's Indian School
Chamberlain, SD 57325

RE: Conditions on Permit No. 4599-3

Rev. Cassidy:

The condition "that the permit holder of 4599-3 identify and have agreements to control or plug wells in the area with a total volume of 1000 gpm by May 30, 1981" has been met. This condition was met by obtaining permission to plug the following wells:

2 wells owned by Corps of Engineers	= 600 gpm
2 wells owned by Game, Fish & Parks	= 40 gpm
2 wells owned by E.W. Duling Ranch	= <u>400 gpm</u>
	1,040 gpm

As soon as a contract and plugging schedule is arranged with the drilling contractor, please inform this office. Water Rights will have an engineer on the site during all plugging operations.

If you have any questions, please contact Gale Selken, Division of Water Rights.

Very truly yours.

JOHN HATCH, Chief Engineer
Water Rights Division

JH/GNS/gy

 **South Dakota Department of
Water & Natural Resources**
Joe Foss Building
Pierre, South Dakota 57501
Water Rights Division
605 773-3352

June 2, 1981

St. Joseph's Indian School
Box 89
Chamberlain SD 57326

Dear Sir:

This is to notify you that final Decisions including Findings of Fact and Conclusions of Law were adopted as amended by the Water Management Board for Application No. 4599-3 which was considered at the May 27 & 28, 1981 meeting.

The Final Decision, Findings and Conclusions are on file in this office and signed copies will be furnished upon request. South Dakota Statutes provide that the decisions of the Board may be appealed to the Courts.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Division

kw

cc: Jer Hayden
Dwight Peterson
Robert Quental
Ray Stemmerman
Dolores Creamer
Roy/A Kenobbie
Kenneth Pusseau
Boyd King
Mr & Mrs Donald Bickner

Earl Biskeborn
Idell Dozard
Lowell C Thomas
LeRoy Speckels
John Blum
Kent P Hamiel
Scott Pattison
James Doniniack

Equal Opportunity Employer

August 10, 1981

TO: St. Joseph's Indian School File

FROM: Gale N Selken

RE: Well plugging

As part of the requirement that the Indian School plug 1000 gpm of flowing wells, two wells on the E.W. Duling Ranch (SW $\frac{1}{4}$ Section 13, T99N, R72W, NW $\frac{1}{4}$, Section 13, T99N, R72W) were plugged on August 7, 1981.

Well #1 - NW $\frac{1}{4}$ Section 13, T99N, R72W

On site @ 8:00 a.m., August 7, 1981

placed 322 feet of 1 $\frac{1}{2}$ " steel pipe inside of 3" casing
water temperature 36°C (96.8°F)

23 bags of Dactoah, high early type III cement were mixed to a weight
of 14.5 lbs/gal (109 lbs/ft³)

grout was pumped in one continuous operation,
pipe was pulled and site was cleaned up.

Well considered plugged.

Well #2 - SW $\frac{1}{4}$ Section 13, T99N, R72W

217 feet of 1 $\frac{1}{2}$ " steel was placed inside 3" casing

20 bags of Dactoah, high early type III cement was mixed to a weight
of 14.5 lbs/gal (109 lbs/ft³)

slurry was pumped down casing with a slight (less than 5 minutes) delay
due to blown hose

water temperature was 36°C (96.8°F)

Well cease to flow and was considered plugged.

Louis Hutmacker, contracted by St. Joseph's completed the plugging operations.

RECEIPT

WATER RIGHTS COMMISSION

State of South Dakota

No 4 7895

PIERRE, January 9, 1910

RECEIVED OF St. Joseph's Indian School, Chamberlain, SD 57326
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit to appropriate Water No. (examination, processing, recording and filing)	325.	00
Fee for inspecting Construction, and Issuing Cert. of Construction No.		
Fee for inspecting Beneficial Use, and Issuing Water License No.		
Fee for Issuing Location Certificate-Dry Draw, No.		
Fee for filling		
Fee for certified copy of		
Fee for Print copy of map		
Fee for Certifying		
Fee for		
(any other work as provided by law)		
TOTAL	325.	00

WATER RIGHTS COMMISSION

By *(John Hatch)*
Chief Engineer, Executive Officer
JOHN HATCH / C.E.

SOUTH DAKOTA Department of
Water & Natural Resources
Joe Foss Building Water Rights Division
Pierre, South Dakota 57501 (605) 773-3352

December 6, 1982

St. Joseph Indian School
Box 89
Chamberlain SD 57325

Dear Sir:

The inspection of your water use system and inspection of the extent of your application of water to beneficial use, as developed under your Water Right No. 4599-3 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.

You will also receive the Certificate of Construction as required by statute.

Sincerely,

 KAREN SCHLAACK
Administrative Secretary

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

WHR-R14-7/79
Notification of Water License Ready for Issuing (\$50.00)

Permit No. 4599-3Water Division 3 Missouri River Water DistrictREPORT OF EXAMINATION OF WORKS
AND/OR APPLICATION OF WATER TO BENEFICIAL USE

TO: WATER RIGHTS, WATER MANAGEMENT BOARD / FOSS BLDG., PIERRE, SOUTH DAKOTA 57501

I have this day made a thorough examination of the water use system constructed by ST. Joseph's Indian School of Box 89 Chamberlain, S.D. holder of Permit No. 4599-3, bearing date of priority of 6 January, 1981 authorizing the diversion of 2.22 cu. ft. per second of the waters of The Dakota Formation for geothermal heating purposes, in Brule County.

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

The Water Use System consists of,

A. Works used to divert the water:

- 3 Dakota Formation Wells
- Well no. 1: 860 feet deep
- Well no. 2: 860 feet deep
- Well no. 3: 820 feet deep

} each well will flow 360 gpm
flows are reduced
shot off as necessary

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

1100 feet 8 inch steel pipe

C. Works used to apply water to beneficial use.

2 Westinghouse centrifugal heat pumpsThe system is in the following condition: excellent

The point of diversion is located Well no. 1: 440 ft. South 2150 ft. West, Well no. 2: 770 ft. S. 2200 ft. W., and Well no. 3: 1107 ft. S. 2227 ft. W. of N.E. corner S. 10 T 104 N R 71 W.

The works are capable of diverting and conveying to the place of use 2.22cu. ft. per second of water which is to be used for geothermal heating

Water has been put to beneficial use to the maximum extent as follows: Water from the wells is run through 2 heat pumps, and then is discharged into the Missouri River by means of a submerged pipeline.

comprising a total of _____ acres of land.

Date 9 February, 1983

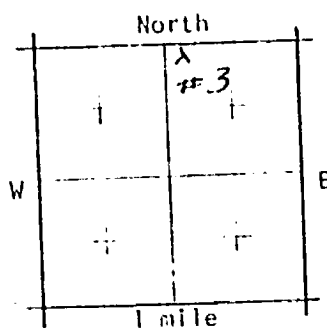
David E. Smith
(Signature)

STATE OF SOUTH DAKOTA WELL DRILLERS REPORT

Location NW 1/4 NE 1/4 Sec 10 Twp 104 Rg 71

County Brule

Please mark well location with an "X"



Well Completion Date 7-2-81

PROPOSED USE:
☐ Domestic ☐ Municipal ☐ Test holes
☐ Irrigation ☒ Industrial ☐ Stock

Method of Drilling:
Forward Rotary

WELL CONSTRUCTION:
 Diameter of hole 8 3/4 inches Depth 293 feet
 Casing: ☒ Steel ☒ Plastic ☐ Other
 Specify _____

Pipe Weight Diameter From To
Steel lb/ft 5 inches 0 feet 293 feet
PVC lb/ft 3 inches 0 feet 870 feet

Was a well screen used? ☒ Yes ☐ No
 If Not Specify 3/8" holes drilled
 Screen Type _____ Slot Size 3/8" round
 Length _____ Diameter 3

Was Casing left open end? ☐ Yes ☒ No
 Was a Packer or seal used? ☐ Yes ☐ No
 If so what material? _____
 Was well gravel packed? ☐ Yes ☒ No
 Was well grouted? ☒ Yes ☐ No
 Describe grouting procedure _____

To what depth? _____ Feet
 What was grouting material? _____
 If cement, how many sacks? _____
 Location of packer(s) and screen or perforated pipe _____

WAS WELL PLUGGED OR ABANDONED ☐ Yes ☐ No
 If so how and with what material? _____

Well Owner:
 Name St. Joseph Indian School

Address Chamberlain

Well Log:	Depth	
	From	To
<u>Pierre</u>	<u>0</u>	<u>127</u>
<u>Nobria</u>	<u>127</u>	<u>358</u>
<u>Carlile</u>	<u>358</u>	<u>547</u>
<u>Greenhorn</u>	<u>547</u>	<u>561</u>
<u>Graneros</u>	<u>561</u>	<u>622</u>
<u>Dakota</u>	<u>622</u>	<u>870</u>

STATIC WATER LEVEL _____ Feet
 If flowing: closed in pressure 82 PSI
 GPM flow 360 through _____ inch pipe
 Controlled by ☒ Valve ☒ Reducers ☐ Other
 If other; specify _____
 Can well be completely shut off? _____

WELL TEST DATA:
☐ Pumped
☐ Bailed Describe: _____
☐ Other _____

Pumping Level Below Land Surface
 _____ ft. After _____ Hrs. pumped _____ GPM
 _____ ft. After _____ Hrs. pumped _____ GPM
 _____ ft. After _____ Hrs. pumped _____ GPM

Remarks:
This log transferred from original received 11 Jan 82. Transfer made by Gale N. Selken
17 Jan 82
Shale

This well was drilled under license # 213
 and this report is true and accurate.
Huttmacher Bros. James Huttmacher
 Drilling Firm Signed by
7-6-81
 Date

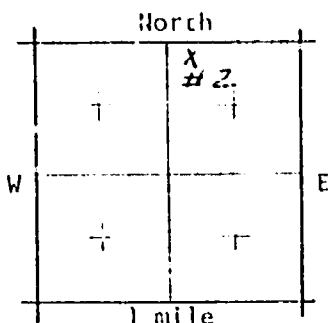
STATE OF SOUTH DAKOTA WELL DRILLERS REPORT

Location NW 1/4 NE 1/4 Sec 10 Twp 104 Rg 71

County

Bruce

Please mark well location with an "X"



Well Completion Date 6-23-81

PROPOSED USE:

☐ Domestic ☐ Municipal ☐ Test Holes
☐ Irrigation ☒ Industrial ☐ Stock

Method of Drilling:

Forward Rotary

WELL CONSTRUCTION:

Diameter of hole 8 1/4 inches Depth 293 feet

Casing: ☒ Steel ☒ Plastic ☐ Other
 Specify Steel

Pipe Weight Steel lb/ft 5 inches 0 feet 293 feet
0 lb/ft 0 inches 0 feet 860 feet

Was a well screen used? ☐ Yes ☐ No

If Not Specify _____

Screen Type Plastic Slot Size 3/8" Round
 Length _____ Diameter 3"

Was Casing left open end? ☐ Yes ☒ No

Was a Packer or seal used? ☐ Yes ☐ No

If so what material? _____

Was well gravel packed? ☐ Yes ☒ No

Was well grouted? ☒ Yes ☐ No

Describe grouting procedure _____

To what depth? _____ Feet

What was grouting material? _____

If cement, how many sacks? _____

Location of packer(s) and screen or perforated pipe _____

WAS WELL PLUGGED OR ABANDONED ☐ Yes ☐ No

If so how and with what material? _____

Well Owner:

Name St. Joseph Indian School

Address Chamberlain

Well Log:

Formation	Depth	
	From	To
<u>Pierre</u>	<u>0</u>	<u>127</u>
<u>Nebraska</u>	<u>127</u>	<u>358</u>
<u>Carlisle</u>	<u>358</u>	<u>547</u>
<u>Greenhorn</u>	<u>547</u>	<u>561</u>
<u>Graneros</u>	<u>561</u>	<u>622</u>
<u>Dakota</u>	<u>622</u>	<u>860</u>

STATIC WATER LEVEL _____ Feet

If flowing: closed in pressure 82 PSI

GPM flow 360 through _____ inch pipe

Controlled by ☒ Valve ☒ Reducers ☐ Other

If other; specify _____

Can well be completely shut off? _____

WELL TEST DATA:

☐ Pumped
☐ Bailed Describe: _____
☐ Other _____

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

Remarks: The original of this log could not be refilmed for this file so J. Gale N. Selken transcribed log from original to this form
17 Jun 83 Gale N. Selken

This well was drilled under license # 213

and this report is true and accurate.

Hutmacher Bros James Hutmacher
 Drilling Firm Signed by

7/6/81
 Date

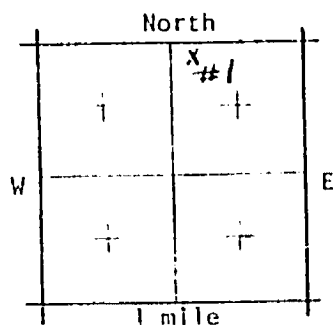
STATE OF SOUTH DAKOTA WELL DRILLERS REPORT

Location NW 1/4 NE 1/4 Sec 10 Twp 104 Rg 71

County

Brule

Please mark well location with an "X"

Well Completion Date 6/16/81

PROPOSED USE:

☐ Domestic ☐ Municipal ☐ Test Holes
☐ Irrigation ☒ Industrial ☐ Stock

Method of Drilling:

Forward Rotary

WELL CONSTRUCTION:

Diameter of hole 8 inches Depth 860 feetCasing: ☒ Steel ☒ Plastic ☐ Other
Specify _____

Pipe Weight Diameter From To

5" Steel 16# 5 inches 0 feet 293 feet3" PVC 16# 3 inches 0 feet 860 feetWas a well screen used? ☒ Yes ☐ No

If Not Specify _____

Screen Type Steel Slot Size 3/8" RoundLength _____ Diameter 3"Was Casing left open end? ☐ Yes ☒ NoWas a Packer or seal used? ☐ Yes ☐ No

If so what material? _____

Was well gravel packed? ☐ Yes ☒ NoWas well grouted? ☒ Yes ☐ No

Describe grouting procedure _____

To what depth? _____ Feet

What was grouting material? _____

If cement, how many sacks? _____

Location of packer(s) and screen or perforated pipe _____

WAS WELL PLUGGED OR ABANDONED ☐ Yes ☒ No

If so how and with what material? _____

Well Owner:

Name St Joseph Indian SchoolAddress Chamberlain

Well Log: Depth

Formation	From	To
<u>Pierre</u>	<u>0</u>	<u>135</u>
<u>Niobrara</u>	<u>135</u>	<u>369</u>
<u>Charlie</u>	<u>369</u>	<u>557</u>
<u>Greenhorn</u>	<u>557</u>	<u>571</u>
<u>Graneros</u>	<u>571</u>	<u>622</u>
<u>Dakota</u>	<u>622</u>	<u>860</u>

STATIC WATER LEVEL _____ Feet

If flowing: closed in pressure 79 PSIGPM flow 36.0 through _____ inch pipeControlled by ☒ Valve ☒ Reducers ☐ Other

If other; specify _____

Can well be completely shut off? _____

WELL TEST DATA:

☐ Pumped _____☐ Bailed Describe: _____☐ Other _____

Pumping Level Below Land Surface

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

Remarks:

This log was copied from original log received 11 Jan 1982. The original log could not be refiled for this file so I Gale N. Selken transferred log from original to this form Gale N. Selken

This well was drilled under license # 213

and this report is true and accurate.

Hutmacher Bros Drilling Firm James Hutmacher Signed by

7/6/81
 Date

CASE RIVER

FRANCIS
MISSOURI

Well No. 11
Well No. 2
Well No. 8
Heat Plant

All three wells located in NE 1/4 S. 10
T 104 N R. 71 W

Chamberlain

Map of geothermal well locations,
ST. Josephs Indian School.

Application NO. 4599-3

Prepared by:

Frank Smith
Water Resources Engineer

WATER LICENSE NO. 4599-3

(1) WHEREAS, On the 6th day of January A. D. 19 81
St. Joseph's Indian School

made Water Right Application No. 4599-3 for a permit to use 2.22 cubic feet per second of the waters of groundwater (three Dakota Formation Wells)

County of Brule State of South Dakota, for geothermal heating purposes; and

(2) WHEREAS, On the 27th day of May A. D. 19 81
Permit No. 4599-3 with a date of priority of January 6, 1981

was issued to said applicant for the diversion of said water, and provided for the completion of construction of the water supply system therein described on or before the 27th day of May A. D. 19 82 and for the application to beneficial use of said water on or before the 27th day of May A. D. 19 83

and:

(3) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota relating to completion of the construction of the water supply system and is entitled to divert 2.22 cubic feet per second of water for beneficial use and,

(4) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota relating to the application of water to beneficial use of the following extent:
water is ran through heat exchangers from the wells and then discharged into the Missouri River by means of a submerged pipeline

(5) NOW, THEREFORE, By the virtue of the authority vested in us by the laws of the State of South Dakota, We hereby grant and confirm to St. Joseph's Indian School

_____ of Box 89, Chamberlain, South Dakota 57325
the holder _____ and owner _____ of said permit No. 4599-3 a water right, dating from January 6, 1981

_____ to use of 2.22 cubic feet per second of the waters
of groundwater (three Dakota Formation wells)

in the County of Brule and State of South Dakota, or so much thereof as may be necessary for the
purposes hereinbelow mentioned, to be diverted at Well #1 440'S and 2150'W, Well #2 770'S and 2200'W,

Well #3 1107'S and 2227'W all of the NE corner of Section 10, T104N, R71W

and conducted to and from through the school heat exchange system
~~XXXXXXXXXX~~

for the purpose of geothermal heating

Subject to any limitations listed in Water Right Permit No. 4599-3 and subject to the laws of the State of South Dakota.

WITNESS, My hand and seal of our office at Pierre, South Dakota
this 5th day of January A. D.
Nineteen Hundred and Eighty-three

WATER MANAGEMENT BOARD

By:

John Hatch
Chief Engineer, Executive Officer

JOHN HATCH

4599-3
Permit No. _____

Water Diversion No. 3 Missouri River Water District
10140101

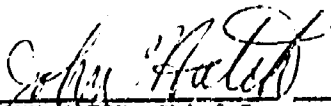
CERTIFICATE OF CONSTRUCTION

This is to Certify, That St. Joseph's Indian School

_____ the holder _____ of
Permit No. 4599-3, issued upon Application No. 4599-3, bearing date of priority of January 6,
1981 authorizing the diversion of 2.22 cu. ft. per second of the waters of _____
groundwater (three Dakota formation wells) County of Brule, State of South Dakota at _____
Well #1 440'S and 2150'W, Well #2 770'S and 2200'W, Well #3 1107'S and
2227'W all of the NE corner of Section 10, T104N, R71W
_____, for geothermal heating

_____ has _____ complied with the provisions of the laws of the State of South Dakota relating to proof of
completion of the works of diversion set out and described in said Permit; that said works are found in satisfactory
condition for diverting and conveying to the place of intended use 2.41 (360 gpm each) cu. ft. per second of water.

Date January 5, 1983



JOHN HATCH, Chief Engineer
Water Rights Division

RECEIPT

WATER RIGHTS COMMISSION

No 4 9066

State of South Dakota

PIERRE, December 13, 1982

RECEIVED OF St. Joseph Indian School, Box 89, Chamberlain, SD 57325

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

Fee for Application for Permit to appropriate Water No. (examination, processing, recording and filing)		
Fee for inspecting Construction, and issuing Cert. of Construction No. 4599-3	50	00
Fee for inspecting Beneficial Use, and issuing Water License No. 4599-3		
Fee for issuing Location Certificate-Dry Draw, No.		
Fee for filling		
Fee for certified copy of		
Fee for Print copy of map		
Fee for Certifying		
Fee for (any other work as provided by law)		
TOTAL	50	00

WATER RIGHTS COMMISSION

By John Hatch
Chief Engineer, Executive Officer
JOHN HATCH (ms)



Department of Water & Natural Resources

Joe Foss Building Water Rights Division
Pierre, South Dakota 57501

(605) 773-3352

January 6, 1983

St. Joseph Indian School
Box 891
Chamberlain SD 57325

Dear Sir:

Enclosed herewith are, Water License No. 4599-3 and Certificate of Construction.

Water License No. 4599-3 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,

A handwritten signature in cursive script, reading "John Hatch".

JOHN HATCH, Chief Engineer
Water Rights Division

JH:ks

enclosures

WNR-817-7/79

Transmittal of Water License

REPORT ON PERMIT NO. 4599-3
St. Joseph Indian School

February, 1983

Permit No. 4599-3 for St. Joseph Indian School of Chamberlain was approved March 26, 1981 with the following qualification:

"The permit holder will identify and have agreements to control or plug wells in the area with a total volume of 1000 gpm by May 30, 1981, that in the event that it is not feasible to enter into agreements to plug the wells by May 30, 1981, that they then abandon that option and turn to reinjection of the volume similar to what they are using back into the Dakota Formation".

To meet the stated qualification St. Joseph Indian School representative Lowell Thomas obtained an agreement to plug two wells flowing 200 gpm each on the E.W. Duling Ranch, two wells flowing 20 gpm each on Game, Fish and Parks Land in Lyman County and two wells flowing 300 gpm each on Corps of Engineers Land (copies of agreements attached). All agreements were obtained by the May 30, 1981 deadline stated in the qualification.

Mr. Thomas then proceeded to contract with the firm of Hutmacher Bros. Well Drilling of Oacoma SD to complete the plugging operation. All work was supervised by DWRN, Division of Water Rights Personnel.

The two wells on the Duling ranch were successfully plugged on August 7, 1981.

An attempt was made to plug the two flowing wells on Game, Fish and Parks land on September 29, 1981, but due to casing deterioration and being unable to find the original hole, plugging of these two holes was abandoned. A substitute well was plugged at Al's Oasis in Oacoma. This well was flowing 230 gpm. The action to substitute this well was approved by field personnel.

An attempt to plug the flowing wells on Corps of Engineers Land was made in November, 1981. An adequate depth could not be reached with the tremie line and pumping of 3 loads of neat grout failed to slow the flow. A decision was made that the two wells were not feasible to plug without a great financial burden on the Indian School.

Permission was then obtained from the Corps of Engineers to plug another well on Corps land, Section 5, T120N, R72W. This well had an estimated flow of 400 gpm. This well was successfully plugged on December 7, 1982 (report attached).

The wells plugged and flow rates are as follows:

Duling Ranch	2 @ 200 gpm = 400 gpm
Al's Oasis	1 @ 230 gpm = 230 gpm
Corp of Engineers	1 @ 400 gpm = 400 gpm
	TOTAL = 1030 gpm

46

46015-17



NORTH

— GYMNASIUM
— ROUND SCHOOL
— GIRLS BLDG.
— CONVENT & CHAPEL
— BOY'S BUILDING

— POWER HOUSE
— DINING FACILITY
— OFFICE
— NEW WELLS

(67-R)

ASC - AERIAL PHOTO
ST. JOSEPH'S INDIAN
SCHOOL
CHAMBERLAIN, S.D.

MAP # 3819-3 APR 4599-3

104-71

ROBERT A. QUANTAL
ROBERT A. QUANTAL
RE: