

Water Right Number 4176-3

1. Considered 11-30, 19 77
2. Name of Applicant MINA LAKE SANITARY & WATER SYSTEM
3. Post Office Address ABERDEEN
4. Amount of water claimed .15
5. Source of water supply MINA LAKE
6. Water to be used for RURAL WATER SYSTEM
Acres to be irrigated _____
7. Water to be diverted and used in EDMUNDS County
about JUST W OF Miles _____ of MINA
8. Proof of Publication
Received ~~11~~ 11-28-77
Not received _____
9. Application
Approved _____
Subject to _____
Not approved _____
Action deferred _____

10. Remarks:

PROTESTORS WILL BE PRESENT

No. 4176-3
 Map No. 3404-3 Water Division No. 3 JAMES RIVER District _____
 (Blanks to be Filled by the Engineer for the W. R. C.)



APPLICATION FOR PERMIT

To Appropriate Water within the State of South Dakota

(NOTE--Draw a line through items not applicable)

1. Name of Applicant Mina Lake Sanitary and Water System
 Postoffice address Box 519, Aberdeen., State SD
 If a corporation show date and place of incorporation November 6, 1977
 2. Method of accomplishing work (contract, employment of others, or by direct labor) contract
 3. Name of diversion work complete water system
 4. Amount of water claimed (cubic feet per second) 0.15
 5. Source of water supply Mina Lake AKA Lake Pannalee
 6. Location of point of diversion NE 1/4 Section 24 T-123N-R56W-5th P.M.

- County Edmunds
 7. Annual period or periods during which water is to be used entire year
 8. Use to be made of water, (irrigation, industrial, municipal, commercial, recreation, etc.) Sanitary and Water Dist.
 9. For irrigation use, Total number of acres to be irrigated NA

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 3-5 years. Additional time required to complete application of water to the proposed beneficial use 1-4 years.
 11. Choice of newspaper for Notice of Intent to Appropriate Water, Publication Aberdeen American News
 12. Principal Features of the Proposed Water Supply System.

A. Works proposed to divert water from its natural source.
Intake structure and treatment system.

B. Works proposed to transport water to place of use.
Constant pressure system with distribution lines to the various resident of the district.

C. Works proposed to apply water to beneficial use.

Estimated Total Cost \$280,000.00

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 Brown

I, Elmer Dietrich, 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.

Subscribed and sworn to before me this

Signed

Notary Public (or other qualified officer)

DWAYNE B. PLANT, Notary Public
 State of South Dakota

Commission Expires Sept. 14, 1980

WATER RIGHT APPLICATION APPROVAL

The Water ^{Rights} Commission hereby approves Water Right Application No. 4176-3
MINA LAKE SANITARY & WATER SYSTEM Box 519, ABERDEEN
 (Applicant) (Post Office Address)
SOUTH DAKOTA 57401 With the following modifications:
 (State)

Date of first receipt of application NOVEMBER 1, 19 77
 Date of return to applicant for correction, amendments or changes required _____, 19 ____
 Date of receipt of corrected application _____, 19 ____
 Approved NOVEMBER 30, 19 77, Rec'd in Book 19 Page 278
 WATER RIGHT PERMIT NO. 4176-3

The Water ~~Commission~~ Commission hereby grants and issues this Water Right Permit No. 4176-3 authorizing the construction of the water use system and the putting of water to beneficial use as stated in the Application and as modified in the Water Right Application approval, subject, however, to the following limitations and conditions:

1. The date from which applicant may claim right is NOVEMBER 1, 19 77
2. The equivalent of at least one-fifth of the work above specified is to be completed on or before MAY 30, 19 80
3. The whole of said work is to be completed on or before NOVEMBER 30, 19 82
4. The limit of time from proof of beneficial use of water appropriated in accordance herewith is NOVEMBER 30, 19 86
5. The water appropriated shall be used for the purpose of RURAL WATER & SANITARY DISTRICT 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 .15 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 use~~ and if for the irrigation purposes said appropriation must be limited to not more than 2 cubic feet per second per acre and limited to not more than one-fifth (1/5) of available feet of water per second of time for each acre of land to which water is used for rural water & sanitary district use actually and beneficially applied for irrigation on or before NOVEMBER 30, 19 86; said water to be used, during the following described annual period: CONTINUOUSLY

Witness my hand this 28th day of FEBRUARY, 19 78

WATER RESOURCES COMMISSION

By:

John Hatch
 Chief Engineer, Executive Officer

Certificate of Construction Issued _____, 19 ____

Water License Issued _____, 19 ____

Publish first publication, on or before November 17, 1977

NOTICE OF HEARING ON
APPLICATION TO APPROPRIATE WATER

Pierre, South Dakota 57501

November 9, 1977

Notice is hereby given that The Mina Lake Sanitary and Water
System whose post office

address is Aberdeen, South Dakota, has made an application in accordance with the provisions of SDCL 46-1-1 thru 46-1-8; 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, and Commission Rules ARSD 52:01:01:01 thru 52:01:01:13, for a permit to appropriate for beneficial use .15 cubic feet of water

per second of time from the Mina Lake through the
Mina Lake System, the point of diversion of which is to be located in the

SW 1/4 NE 1/4

of Section 24, Twp. 123N Range 66W. Said water to be used for the purpose of providing irrigation on portions of the following described lands:

supplies for suburban housing and sanitary district

This Application No. 4176-3 will be considered by the Water Rights Commission at

Pierre, South Dakota upon the 30th day of November, 1977
at 10 A. The Commission 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 Commission decision who desires to present evidence or cross-examine witnesses according to SDCL 1-26 may notify the Commission in writing prior to the hearing or orally at the hearing.

WATER RIGHTS COMMISSION

BURTON F. JONES
Water Rights Specialist III

cc: Mina Lake Sanitary & Water System, Box 519, Aberdeen, S.D. 57401

NOTE: The final proof of publication must be received before the hearing date for the Commission to take action.

AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

COUNTY OF BROWN

ss.

Sheryl Horan BEING DULY SWORN, ON HIS OATH SAYS:

That the ABERDEEN AMERICAN NEWS is a DAILY newspaper of general circulation, printed and published in Aberdeen, Brown County, South Dakota, by the Aberdeen News Company, a corporation, and has been such a newspaper during the times hereinafter mentioned, that affiant is an employee and principal clerk of said publisher and has personal knowledge of all the facts stated in this affidavit; that the advertisement headed Notice of Intent to Appropriate Water

Re: Mina Lake Sanitary & Water System

#4176-3

a printed copy of which is hereunto attached, was printed and published

in the regular and entire issue of said newspaper, and not in a supplement thereof, once each week for 2 successive weeks

The first publication being made on the 17th day of November, 1977

The second publication being made on the 25th day of November, 1977

The third publication being made on the day of

The fourth publication being made on the day of

The fifth publication being made on the day of

The sixth publication being made on the day of

The seventh publication being made on the day of

The eighth publication being made on the day of

The ninth publication being made on the day of

That said newspaper is a legal newspaper, being published five days or more each week, having a bona fide circulation of more than two hundred copies daily, having been published in the English language within the said County of Brown for more than one year next prior to the first publication of said notice, and is printed in whole in an office maintained at the place of publication of said newspaper. That the whole amount of the fee paid for the publication of the annexed notice is \$ 18.62, which inures solely to the benefit of said publisher; that no agreement or understanding for a division thereof has been made with any other person, and that no part thereof has been agreed to be paid to any person whomsoever.

Subscribed and sworn to before me this 25th day of

November 1977

Notary Public, Brown County, S. D.

My commission expires 12-19-83

Daily circulation 22,069

(No. 807—Nov. 1, 25—27)
NOTICE OF HEARING
ON APPLICATION TO
APPROPRIATE WATER

Notice is hereby given that The Mina Lake Sanitary and Water System whose post office address is Aberdeen, South Dakota, has made an application in accordance with the provisions of SDCL 46-1-1 thru 46-1-8; 46-2-9 thru 46-2-13; 46-3-1 thru 46-3-8; 46-5-10 thru 46-5-22; 46-5-41, and Commission Rules ARSD 52:01:01:01 thru 52:01:01:13, for a permit to appropriate for beneficial use .15 cubic feet of water per second of time from Mina Lake through the Mina Lake System, the point of diversion of which is to be located in the SW 1/4 NE 1/4 of Section 24, Twp. 123N Range 66W. Said water to be used for the purpose of providing supplies for suburban housing and sanitary district.

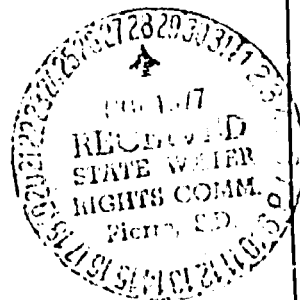
This Application No. 4176-3 will be considered by the Water Rights Commission at Pierre, South Dakota upon the 30th day of November, 1977 at 10 A.M. The Commission is authorized to make a determination on this application at the hearing. All interested persons may appear and be heard. Any person who may be affected by a Commission decision who desires to present evidence or cross examine witnesses according to SDCL 1-26 may notify the Commission in writing prior to the hearing or orally at the hearing.
WATER RIGHTS COMMISSION
BURTON F. JONES
Water Rights Specialist III

Publication Fees \$

Received Payment,

Aberdeen News Co.

By





Scott Engineering Company

Consulting Engineers

Post Office Box 1414
1904 Ninth Avenue Southeast
Watertown, South Dakota 57201



AREA CODE 605
TELEPHONE 886-5725

November 3, 1977

RECEIVED

NOV 4 1977

Mr. Vern Bulter, Sec.
Water Rights Commission
State Office Building #2
Pierre, SD 57501

DEPT. OF NATURAL
RESOURCE DEVELOPMENT

RE: Mina Lake Sanitary and
Water District

Dear Mr. Butler:

As requested by Mr. Elmer Diedtrich, president of the Mina Lake Sanitary and Water District, we are sending to you copies of the preliminary report on their proposed water system.

The initial report is dated January, 1977. This report was presented to the Board for their comments. They considered the cost too high as designed so we eliminated the water treatment and planned on using untreated deep well water. Due to the type of water that could be obtained from deep wells this was not the proper solution to the problem.

We then made a report on the treatment of water taken from Mina Lake. With the removal of iron and manganese the water will be of a much higher quality than that taken from deep wells.

At the insistance of F.H.A., the financing agency we have reduced the pipe sizes as shown in the final report of June, 1977.

We trust this information will lead to an early approval.

Very truly yours,

SCOTT ENGINEERING COMPANY

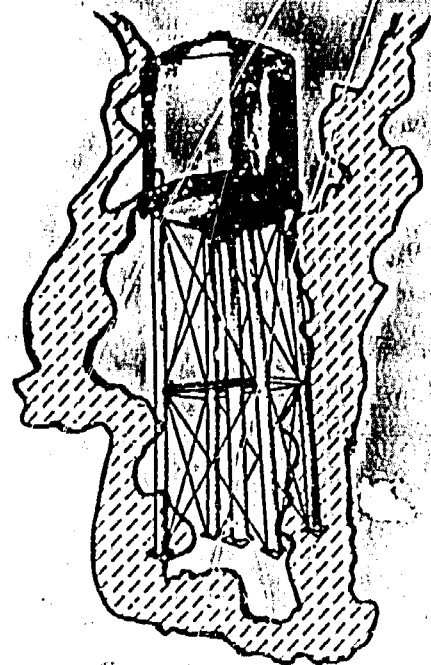
George E. Gebhart, P.E.

GEG:bw
Encl.
CC: Elmer Diedtrich

Mina Lake

Sanitary and Water District

Mina, South Dakota 57462



October 26, 1977

Mr. Jack Merwin
Department of Game, Fish and Parks
Anderson Building
Pierre, S.D. 57501

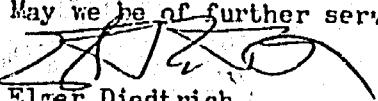
Dear Jack::

Enclosed are an application for water, a map of our district and a check for \$8.00. I understand these are the items necessary to obtain a water permit for our district. Please let me know if further information is required.

We have now completed our planning to the point where it becomes necessary to spend some money, but before we do so we would like to have the opportunity to discuss our system with you and possibly we may be of service to you. Our engineers tell us that we will be able to supply water to additional units such as the State Park.

Our regular meeting is held on the 3rd. Monday of each month but anytime that you could work us into your schedule would be OK with us.

May we be of further service to you,


Elmer Diedtrich,
Chairman, Board of Trustees



Mina Lake - Edwards County
copy sent to Water Resources
11/1/77 *(Burt Jones)*
Department of Game, Fish and Parks
Pierre, South Dakota 57501 • Phone 224-3387
Division of Administration

October 28, 1977

Mr. George E. Gebhart, P.E.
Scott Engineering Co.
Box 1414
Watertown, SD 57201

RE: Water System
Mina Lake, SD

Dear Mr. Gebhart:

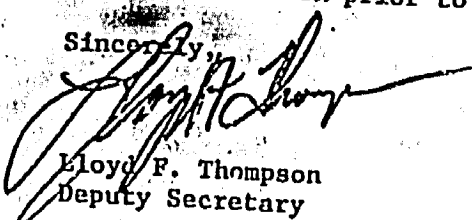
The withdrawal of water from Mina for domestic purposes in the maximum amount of 90 acre feet per year, poses no real problem from a fisheries standpoint. If at all possible, the intake pipe should be more like 20 feet deep, than at the 12 foot level indicated. Intake velocity should not exceed 0.5 feet per second.

The Game, Fish and Parks Commission will have to take formal action on any and all construction to take place below the easement line or ordinary high water mark. The Commission is meeting November 14 & 15, at Chamberlain and December 12-13 in Pierre. We will need drawings on formal proposal and legal description on the pipe crossing and intake locations. Shore-line disturbances due to construction will have to be restored to original conditions.

The Parks and Recreation Division would like to be included in the system design at this point. They will be able to provide a gallonage demand whenever you need it.

To give your proposal proper attention by staff, it should be in Pierre at least one week prior to a Commission meeting.

Sincerely,


Lloyd F. Thompson
Deputy Secretary

LFT/ld

cc: Schuett - Parks & Recreation
Hanten - Fisheries
Douglas - Engineer
Krumm - Region II



November 1, 1977

Mina Lake Sanitary and Water System
Box 519
Aberdeen, South Dakota 57401

Dear Sirs:

The Game, Fish and Parks Department has forwarded your Application for Permit for Sanitary and Water District on this date.

We are returning your check No. 112 in the amount of \$8.00. As of April 1, 1977 the filing fee is \$150.00 for this particular application.

Also please submit the Engineer's Preliminary Report.

Upon receipt of the above information further processing of your application will proceed.

If you have any questions please feel free to contact this office.

Sincerely,

BETTY WESTLUND
Land/Water Clerk II

bw

Encl: As stated

P.S. Also your check should be made out to the Water Rights Commission.

cc: Bob Hartner, S. F. P.

CALL FROM 11/29/77
Mrs. FRANK HOWARD
512 6th Ave. S.E.

Abr., S.D.

(PROPERTY OWNER ALONG LAKE)

Opposes taking water
from lake for water
system.

PROBABLY 300 property
owners, only 103 were
allowed to vote on the
water system

97 in favor
6 against.

Concerned with lake levels
and cost of water system to
the property owner.

Edgar Light
Melvin Hunt (SP)
represent a group of
people against
Mina Lake staff.

They believe the
Lake should be used
for recreational
purposes only. They
are unable to attend
because of weather.

CALL FROM: 11/29/77
IVAN BRILL
1102 S. JAY
Abr., S.D.

(Property owner along lake)

Opposes the issuance of
a water permit from the
lake.

(1) LAKE LEVELS

(2) Cost

MAROTHY GETSMAN (FILLED)
Aberdeen, S.D.

Will be at the HEARING
PROTESTING THE MINA
LAKE APPLICATION.

ONE OF MANY PROPERTY
OWNERS WHICH HAVE
NOT ~~HAD A VOTE~~ ~~BEEN~~
APPROVED OF THE WATER
SYSTEM ~~AND IN THE PAST~~
FROM THE LAKE.

11/29/77
Rudolph W. Carls
624 N. Klein
Aberdeen, S.D.

Opposed to the water
system — was not
given a chance to
vote on the water
system.

Call 11/29/77
Glen Humstad
1910 6th Ave, S.E.
Aberdeen, S.D.

(Property owner)

Opposed the issuance of
a water permit for
Mina Lake for water system.

(1) Plans for lot
development east
of road from him
by Hoffman, Dietrich
& Paylor

(2) Cost of system

(3) Water Levels

CALL FROM

— Dick Huffman —

— Abr. , S.D. —
(PROPERTY OWNER)

Concern — COST OF
System

— " No voice in
the water system

November 14, 1977

A.G. Westby
Box 1299
Aberdeen, South Dakota 57401

Dear Mr. Westby:

In reply to your letter pertaining to water rights on Mina Lake, the Department of Game, Fish and Parks holds water license No. 815-3 to Mina Lake for public recreation purposes.

This allows the storage of 2,568 acre-feet annually of the waters of Snake Creek for Public Recreation purposes.

The public hearing on the Application No. 4176-3 for the Mina Lake Sanitary and Water System will be held on November 30, 1977 in Pierre. The Game, Fish and Parks water right would have first priority. The water system will need permission from the Department of Game, Fish and Parks before the permit could be authorized since the permit application is from the storage of Mina Lake.

Please advise this office of any further questions.

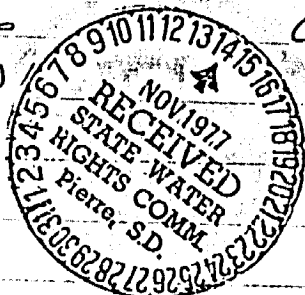
Sincerely,

JAMES WINTERTON
Water Resources Engineer III

JW/bw

Mr John Hatch
Dep Natural Resources
Recs, Box 5750

Box 1299
Aberdeen S.D.
57401



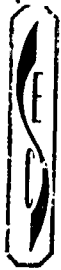
Dear Mr Hatch

I have a question pertaining to
Water rights on Minn Lake. The
Lake is 14 miles West of Aberdeen.

My question is, Minn Lake I
believe is a recreation area. Can the
Property Owners around that Lake form
a water or Sanitary district, build
a water treatment plant and use
the lake as the source of water
supply for that water plant &
delivery system?

An early reply would be appreciated.

Sincerely
J. W. D. W/c
Box 1299
Aberdeen S.D.
57401



Scott Engineering Company

Consulting Engineers

Post Office Box 1414
1904 Ninth Avenue Southeast

Watertown, South Dakota 57201



AREA CODE 605
TELEPHONE 886-5725

June 20, 1977

United States Department of Agriculture
Farmers Home Administration
P.O. Box 821
Huron, SD 57350

ATTENTION: M. L. McLinn

RE: Mina Lake Sanitary District

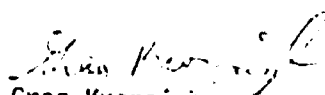
Dear Mr. McLinn:

Please find enclosed a cost estimate based on criteria discussed at a meeting May 4, 1977 held in Huron, South Dakota. The basic system consists of a 60 g.p.m. treatment plant with a constant pressure pumping unit and a 35,000 gallon storage reservoir. The system would have a minimum of 20 psi static pressure at the farthest point from the pumping source.

Please advise us as soon as your engineer reviews the calculations herein.

Very truly yours,

SCOTT ENGINEERING COMPANY


Greg Kronaizi
Mechanical Engineer

GK:bw

Encl.

HYDRAULIC CALCULATIONS EAST SIDE INSTANTANEOUS DEMAND

[illegible]

HYDRAULIC CALCULATIONS
EAST SIDE & SOUTH SIDE
INSTANTANEOUS DEMAND

	ACCUM TOTAL	G.P.M.	AV. G.P.M.	PIPE SIZE	LENGTH	HEAD LOSS PER 100'	TOTAL HEAD LOSS	ACCUM LOSS	PRESSURE LOSS
P	1	10	13	2"	500	.58	2.90	87.63	37.93
P'	5	16	20	2½	1300	.33	4.28	84.73	
0	13	23	28	2½	700	.70	4.9	80.45	
N'	22	32	36	3"	600	.38	2.3	75.55	
N	30	40	44	3"	1100	.62	6.83	73.25	
13	38	48	48	3"	3100	.70	21.70	66.42	
12	38	48	57	4"	2000	.25	5.0	44.72	
11	56	66	72	4"	1400	.37	5.18	39.72	
10	69	79	87	4"	1300	.52	6.76	34.55	
9	84	94	102	4"	1400	.69	9.66	27.78	
8	100	110							
1	175	195		6"	1400	.58	8.12	18.12	
Equip. Loss							10.00		

INSTANTANEOUS DEMAND

Equip. Loss

[illegible]

PIPE QUANTITIES FOR DEVELOPED AREAS
WITHOUT STATE PARK & WEST BRANCH OF LAKE

	6"	5"	4"	3"	2½"	2"
5 to 6			900			
6 to 7			450			
7 to 8			1400			
8 to 9			1400			
9 to 10			1300			
10 to 11			1400			
11 to 12			2000			
12 to 13				3100		
13 to N				1100		
N to N'				600		
N' to O					700	
O to P'					1300	
P' to S						500
B to C					790	
C to D				1080		
D to E				1550		
E to F				920		
F to G			1970			
G to H			450			
H to I			1630			
I to J				1000		
J to K					1400	
K to L						1470
I to 8	1400 U.W.					
TOTALS	1400		12900	9350	4190	1970

PIPE QUANTITIES FOR ENTIRE EAST LAKE
AND STATE PARK W/O RUDOLPH ADD.

	6"	5"	4"	3"	2½"	2½"
1 to 2						1600
2 to 3					1500	
3 to 4				1400		
4 to 5				800		
5 to 6			900			
6 to 7			450			
7 to 8			1400			
8 to 9			1400			
9 to 10			1300			
10 to 11			1400			
11 to 12			2000			
12 to 13				3100		
13 to N				1100		
N to N'				600		
N' to O					700	
O to P'					1300	
P' to P						500
A to B						1180
B to C					790	
C to D				1080		
D to E				1550		
E to F				920		
F to G			1970			
G to H			450			
H to I			1630			
I to J				1000		
J to K				1400		
K to L					1470	
L to M						1900
I to 8	1400					
TOTALS	1400		12900	12950	5760	5180

COST ESTIMATE
Constant Pressure System

FOR DEVELOPED AREAS ONLY AND WITHOUT STATE PARK

ITEM	QUANTITY	UNIT PRICE	EXTENDED
1. Class 160 Water Pipe Complete & In Place			
6" P.V.C. (Water Crossing)	1,400 LF	\$ 6.00	\$ 8,400.00
4" P.V.C.	12,900 LF	2.20	28,380.00
3" P.V.C.	9,350 LF	1.90	17,765.00
2½" P.V.C.	4,190 LF	1.60	6,704.00
2" P.V.C.	1,970 LF	1.40	2,758.00
2. 1" Service Line With T Saddle & Curb Stop With Riser & Meter	200 Ea	250.00	50,000.00
3. Gate Valves	5 Ea	250.00	1,250.00
4. Gate Valves With Valves Pit & Sampling Tap	2 Ea	650.00	1,300.00
5. Flush Hydrants	4 Ea	350.00	1,400.00
6. Pressure System & Controls	1 Ea	16,500.00	16,500.00
7. Pressure Release Valves	2 Ea	550.00	1,100.00
8. Storage	35,000 Ga	LS	12,000.00
9. Treatment Plant	60 G.P.M.	LS	42,000.00
10. Building	LS	LS	14,500.00
11. Intake Str. & Pumps	LS	LS	6,000.00
12. Land	LS	LS	2,000.00
13. Backwash Water Pond	LS	LS	225.00
Estimated Const. Cost			\$212,282.00
Basic Engineering			19,921.00
Inspection			10,800.00
Staking			4,000.00
Easements			3,000.00
Administration & Legal			6,370.00
Contingencies			21,230.00
Total Estimated Cost			\$277,603.00

COST ESTIMATE
Constant Pressure System

ENTIRE EAST BRANCH OF LAKE WITH STATE PARK

ITEM	QUANTITY	UNIT PRICE	EXTENDED
1. Class 160 Water Pipe Complete & In Place			
6" P.V.C. (Water Crossing)	1,400 LF	\$ 6.00	\$ 8,400.00
4" P.V.C.	12,950 LF	2.20	28,380.00
3" P.V.C.	12,950 LF	1.90	24,605.00
2½" P.V.C.	5,760 LF	1.60	9,216.00
2" P.V.C.	5,180 LF	1.40	7,252.00
2. 1" Service Line with "T" Saddle & Curb Stop With Riser & Meter	200 Ea	250.00	50,000.00
3. Gate Valves With Valve Box	5 Ea	250.00	1,250.00
4. Gate Valves With Valve Pit & Sampling Tap	2 Ea	650.00	1,300.00
5. Flush Hydrants	4 Ea	350.00	1,400.00
6. Pressure System & Controls	1 Ea	16,500.00	16,500.00
7. Pressure Release Valves	2 Ea	550.00	1,100.00
8. Storage	35,000 Ga	LS	12,000.00
9. Treatment Plant	60 GPM	LS	42,000.00
10. Building	LS	LS	14,500.00
11. Intake Structure & Pump	LS	LS	6,000.00
12. Land	LS	LS	2,000.00
13. Backwash Water Pond	LS	LS	225.00
Estimated Construction Costs			\$226,128.00
Basic Engineering			20,960.00
Inspection			11,500.00
Staking			4,500.00
Easements			3,000.00
Administration & Legal			6,800.00
Contingencies			22,600.00
Total Cost			\$295,488.00

E. OPERATING COSTS
Constant Pressure System

Raw Water Pumping Per 1,000 Gallons

$$\frac{.189 \times \text{Power Cost/Kwhr} \times \text{Head}}{\text{Pump Eff.} \times \text{Motor Eff.} \times 60}$$

$$\frac{.189 \times .045 \times 10}{.65 \times .83 \times 60} = \frac{0.340}{32.37} = 0.011$$

Chemical for Filtration
\$500.00/year ÷ 36,500 yr/gal = \$0.013

Chlorine @ 5 lb/24 hr @ \$30.00/cwt.

$$\frac{1000 \text{ gal.} \div 60 \text{ Min} \times 5 \text{ lb} \times \$30}{24 \text{ hr} \times 100 \text{ lb}} = \$0.017$$

$$\frac{.189 \times .045 \times 134}{.65 \times .83 \times 60} = \frac{1.140}{32.37} = \$0.035$$

Estimated Cost of Water Production Per 1000 Gallons = \$.076

Depreciation

Pump and Equipment - 10 years
\$16,500 x .10 = \$ 1,650.00 per year

Intake Str. & Pumps
\$6,000 x .05 = 300.00 per year

Distribution System @ 50 years
\$82,757 x .02 = 1,655.14 per year

Storage & Pump House @ 25 years
\$28,500 x .04 = 1,140.00 per year

Estimated Total Depreciation \$ 4,745.14 per year

Maintenance & Repair (Labor)
2 hr per day at \$3.00 per hour
2 x 3.00 x 300 = \$ 1,800.00

Meter Reading & Billing
\$3.00 per meter x 200 = \$ 600.00

Testing = \$ 240.00

Insurance, Legal & Administrative = 900.00

(Constant Pressure System)

Loan Repayment Based On

100% F.H.A. Loan for 40 years @ 5%

Estimated Project Cost \$277,603.00

Meter Deposit & Hookup Fee 200 x \$200.00 = \$40,000.00

Loan \$237,603.00

Annual Payment

\$237,603.00 x .05828 = \$13,847.50

RECAPITULATION

Estimate 35 M gallons production 30 M Gallons usage

Annual water production @ 35 M gallons/ day

35 x .076 x 365 =

= \$ 970.90

DEPRECIATION

= \$ 4,745.14

Maintenance & Repair (Labor)

= \$ 1,800.00

Meter Reading & Billing

= \$ 600.00

Testing

= \$ 240.00

Insurance, Legal & Administrative

= 900.00

Annual Loan Repayment

= 13,847.50

Estimated Total Annual Costs

\$23,058.54

Estimated Monthly Costs

23,058.54 ÷ 12

= \$ 1,921.54

Assume 200 Users

Estimated Monthly Average Billing

1,921.54 ÷ 200

= \$ 9.61

TO ABERDEEN

RANGE 65W

5400'

6000'

COUNTY DISTRICT BOUNDARIES

AS SHOWN

CAM

LAKE

MINA

SEC. 14 SEC. 27

SEC. 23

SEC. 25

SEC. 20

MINA

LAKE

MINA LAKE

165

660 2ND D

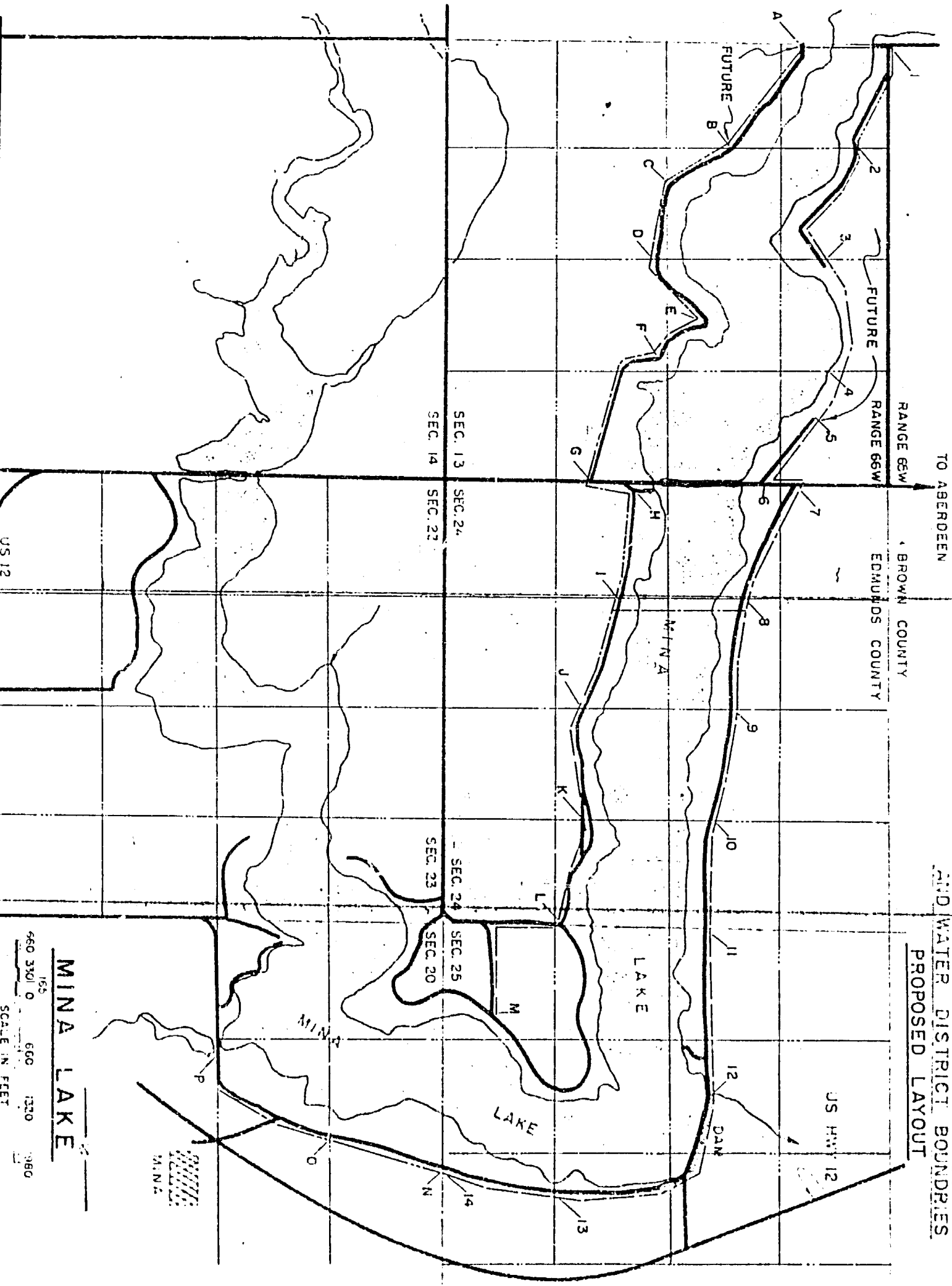
600

1000

1400

SCALE IN FEET

MINA LAKE SANITARY AND WATER DISTRICT BOUNDARIES PROPOSED LAYOUT



Prepared By
SCOTT ENGINEERING COMPANY
Consulting Engineers
Watertown, South Dakota

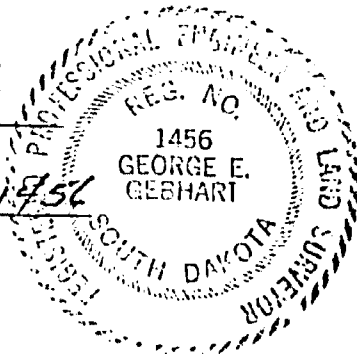
January, 1977

Project No. 2255

I hereby certify that this report
has been prepared under my direct
supervision and that I am a duly
registered engineer under the laws
of the State of South Dakota.

George E. Gebhart

Dated January 3, 1977 Reg. No. 1456



Preliminary Engineering Report
on a
Proposed Water System
for
Mina Lake Sanitary And
Water District
Edmunds County, South Dakota

PRELIMINARY ENGINEERING REPORT

WATER FACILITIES

Mina Lake Sanitary and Water District
Edmunds County, South Dakota

The Board of Directors of the Mina Lake Sanitary and Water District retained the Scott Engineering Company of Watertown, South Dakota to make a feasibility study of a water facility for the district and write the following preliminary report.

A. AREA SERVED & EXISTING FACILITIES

The District consists of Sections 13 & 24 and parts of Sections 23, 25, and 26, Township 123 North Range 66 West of the 5th P.M., Edmunds County, South Dakota as shown on the map listed as Page I of the appendix.

The ground elevations along the proposed route of the water system will vary from M.S.L. Elevation of 1416 to 1435. The need of two (2) lake crossings on the initial build and an additional one in the future are the most difficult terrain features.

The area is served by private wells. The majority of these wells produce a very poor quality of water. Many of the existing wells are becoming contaminated by surface waters that seep through the fractured shale that underlies most of the area carrying the contaminants to the shallow water bearing strata.

To protect the health of this community it will be necessary to provide an adequate supply of safe water along with a distribution system.

B. PROPOSED FACILITIES

1. Supply to be furnished from a deep well capable of delivering 250 G.P.M. The water will be treated for iron removal, chlorinated and stored

in an above ground tank.

The proposed distribution system consists of a constant pressure pump unit pumping to a network of 9", 6", and 4" lines.

The sizing of the distribution system is based on the peak instantaneous demand as established for various sized systems.

The system design is based on a usage of 100 G.P.D. per capita based on three persons per housing unit.

The area has experienced a rather rapid growth of year around homes. It is expected that all available lots will be occupied within the next ten years.

Consideration has been given to taking water from the lake as well as using several of the existing deep wells around the lake.

Five (5) wells plus the water from the lake have been tested. Test results are listed in the appendix of this report. Since the treatment cost of the water from well #5 appears to be less then treating the lake water we will examine that system first.

2. Easements for the construction will be obtained from the South Dakota Game, Fish, and Parks Department and state, county and township road departments.

Plans and specifications will be submitted to the State Health ^{Department of} ~~Department~~ ^{Environmental Protection} for their approval prior to the awarding of contracts for construction.

C. PROPOSED SYSTEM

1. The water requirements were based on the following design data: Presently there are 200 homes and two small businesses, plus a state park being developed that will accomodate a large number of campers and picnickers.

Use 300 G.P.D. per housing unit and business.

Present 202 x 300	= 60,600 G.P.D.
10 year growth 202x.06x10x300	= 36,360 G.P.D.
State Park (Estimate)	= 6,000 G.P.D.

Total estimated flow 102,960 G.P.D.

Water is to be approved by the State Department of Health. *Environmental Protection*

a. Sources

Water from 5 wells and from the lake was sent to the water quality laboratory at South Dakota State University for an analysis.

Four of the wells are very high in Sulfate (SO_4). The treatment for this water is rather costly.

The water from the lake was much lower in Sulfate but had a manganese content of 1.83 ppm.

The water from the fifth well tested had an Iron content of 1.83 ppm but was much lower in sulfate than the other wells tested. This well was recently completed and from the information we received relative to its depth we assume the water is being drawn from the Dakota formation.

b. Treatment

Filtration for Iron and/or Manganese removal will be required for water taken from a well supplying water with the same chemical analysis as well #5 or water from the lake.

Chlorination will be provided for the filtered water.

The type of filtration and any other type of treatment will be decided when the tests are made on the actual source of supply.

c. Storage

Prestressed concrete or a steel above ground tank sized for a two day storage for residential use is proposed.

d. Pressure

The system is designed to provide 60 P.S.I. at the pump house. The user at the far end of the completed system will be provided with 15 G.P.M. at 30 P.S.I. under peak instantaneous demand conditions.

e. Distribution System

Control or pump house built of concrete block or steel, sized to protect the pressure system, controls, chemicals, meters, and pressure filters.

The distribution piping for the initial ^{Construction} building consists of approximately 14,000 L.F. 8" pipe; 15,600 L.F. 6" pipe; 4000 L.F. of 4" pipe and 15,800 L.F. of 1" service line with the required corporation stops and curb stops and boxes.

Users are to furnish a frost free pit or area for the installation of the water meters.

f. Hydraulic Calculations

Instantaneous Demand

	ACCUM TOTAL	G.P.M.	AV G.P.M.	PIPE SIZE	LENGTH	HEAD LOSS PER 100'	TOTAL HEAD LOSS	ACCUM. LOSS	PRESSURE LOSS
1	0	15	55	4"	1,600	.26	4.16	66.24	28.3
2	19	96	131	6"	1,500	.16	2.40	62.03	27.0
3	38	166	186	6"	1,400	.29	4.05	59.68	
4	50	205	216	6"	800	.38	3.04	55.62	
5	58	226	236	6"	900	.45	4.05	52.58	
6	66	246	248	6"	450	.51	2.30	48.53	
7	67	249	258	6"	1,400	.54	7.56	46.23	
8	75	267	283	6"	1,400	.63	8.32	38.57	
9	90	299	313	6"	1,300	.76	9.38	29.35	
10	105	326	340	8"	1,400	.23	3.22	19.97	
11	120	355	367	3"	1,000	.26	2.60	16.75	
12	134	378	380	8"	4,100	.27	11.07	14.15	
13	137	382	389	8"	1,100	.28	3.08		
14	145	396							

f. Hydraulic Calculations

Instantaneous Demand

	ACCUM TOTAL	G.P.M.	AV G.M. SIZE	PIPE SIZE	LENGTH	HEAD LOSS PER 100'	TOTAL HEAD LOSS	ACCUM. LOSS	PRESSURE LOSS
A	0	15	54	4"	1,180	.22	2.60	68.33	29.93
B	18	93	107	4"	790	.79	6.24	66.24	
C	25	120	147	6"	1,580	.19	3.00	60.00	
D	40	173	189	6"	1,050	.30	3.15	57.00	
E	50	205	219	5"	920	.39	3.59	53.35	
F	60	232	247	6"	1,970	.50	9.85	50.26	
G	72	262	252	6"	450	.55	2.43	40.41	
H	72	262	281	6"	1,230	.62	7.63	37.93	
I	90	300	318	6"	1,400	.80	11.20	30.31	
J	108	335	349	8"	1,400	.24	3.36	19.11	
K	124	363	376	8"	1,470	.27	3.97	15.75	
L	140	389	404	8"	1,900	.30	5.70	11.73	
M	160	419	419	8"	1,900	.32	6.08		
N	160	419							

f. Hydraulic Calculations

Instantaneous Demand

	ACCUM TOTAL	G.P.M.	AV G.P.M.	PIPE SIZE	LENGTH	HEAD LOSS PER. 100'	TOTAL HEAD LOSS	ACCUMULATED LOSS	PRESSURE LOSS
P	0	15							
			48	4"	1800	.18	3.24	13.38	5.79
O	15	80							
			109	4"	1300	.78	10.14	10.14	
N	30	138							

D. COST ESTIMATE
Constant Pressure System

ITEM	QUANTITY	UNIT PRICE	EXTENDED
1. Class 160 Water pipe Complete & In Place 8" P.V.C. 8" P.V.C. Water Crossing	12,970 LF 1,300 LF	\$ 4.50 7.00	\$58,365.00 9,100.00
6" P.V.C. 6" P.V.C. Water Crossing	14,050 LF 1,600 LF	3.20 6.00	44,960.00 9,600.00
4" P.V.C.	3,890 LF	2.20	8,558.00
2. 1" Service Line	15,800 LF	1.80	28,440.00
3. Corporation Stops	250 Ea	30.00	7,500.00
4. Curb Stops	250 Ea	47.00	11,750.00
5. Valves	12 Ea	200.00	2,400.00
6. Flush Hydrants	5 Ea	350.00	1,750.00
7. Pressure Release Valves	2 Ea	300.00	600.00
8. Storage 200,000 Gallons	LS	LS	48,000.00
9. Filters	LS	LS	35,000.00
10. Well & Submersible Pump	LS	LS	24,000.00
11. Pressure System & Controls	LS	LS	18,000.00
12. Chlorinator	LS	LS	2,500.00
13. Pumphouse	LS	LS	16,000.00
14. Land	3 A.	1,000.00	3,000.00
15. Backwash Pond	LS	LS	2,000.00
16. Water Meters In Place	200 Ea	65.00	13,000.00
Estimated Total Construction			\$344,523.00
Basic Engineering			29,367.00
Inspection			16,240.00
Staking			5,200.00
Easements			3,000.00
Administration			6,300.00
Contingencies			39,643.00
Estimated Total Cost			\$444,273.00

L. OPERATING COSTS
Constant Pressure System

Raw Water Pumping Per 1,000 Gallons

$$\frac{.189 \times .045 \times 125}{.65 \times .83 \times 60} = \frac{1.063}{3237} = \$0.033$$

Chemical for Filter

$$\$500.00/\text{year} \div 36,500 = \$0.013$$

Chlorine @ 5 lb/24 hr @ \$30.00/Hwt

$$\frac{1000 \div 125}{60} \times \frac{5}{24} \times \frac{30}{100} = \frac{1,200}{144,000} = \$0.008$$

Pressure Pumping

$$\frac{.189}{.65} \times \frac{.045}{.83} \times \frac{138}{60} = \frac{1.174}{32.37} = 0.036$$

Estimated Cost of Water Production per 1000 Gallons = \$0.090

Depreciation:

Pump and Equipment - 10 years

$$\$9,500.00 \times .10$$

$$= \$ 950.00 \text{ per year}$$

Well @ 20 years

$$\$20,000.00 \times .05$$

$$= 1,000.00 \text{ per year}$$

Distribution System @ 50 years

$$\$230,000.00 \times .02$$

$$= 4,600.00 \text{ per year}$$

Storage & Pump House @ 25 years

$$\$64,000.00 \times .04$$

$$= 2,560.00 \text{ per year}$$

Meters

$$\$8,500.00 \times .05$$

$$= \frac{425.00 \text{ per year}}{\$9,535.00 \text{ per year}}$$

Estimated Total Depreciation

Maintenance & Repair (Labor)

2 hr per day at \$3.00 per hour

$$2 \times \$3.00 \times 300$$

$$= 1,800.00$$

Meter Reading & Billing

$$\$3.00 \text{ per meter} \times 200$$

$$= 600.00$$

Testing

$$240.00$$

Insurance, Legal & Administrative

$$= 900.00$$

(Constant Pressure System)

Loan Repayment Based on 50% Grant.
50% F.H.A. Loan for 40 years @5%

Estimated Project Cost \$444,273.00
Loan 222,136.50
Grant 222,136.50
Annual Payment
 $222,136.50 \times .05828 = \$12,946.12$

RECAPITULATION

Estimate 120 M. gallons production 100 M gallons usage
Annual water production @ 120 M gallons/day
 $120 \times 0.09 \times 365 =$

\$ 3,942.00

9,560.00

DEPRECIATION

Maintenance & Repair (Labor)

1,300.00

Meter Reading & Billing

600.00

Testing

240.00

Insurance, Legal & Administrative

900.00

Annual Loan Repayment

12,946.00

Estimated Total Annual Costs

\$ 29,988.00

Estimated Monthly Costs

2,499.00

$299,988.00 \div 12$

Assume 200 users

Estimated Monthly Average Billing

12.50

$2,499.00 \div 200$

D. COST ESTIMATE
HYDROPNEUMATIC SYSTEM

ITEM	QUANTITY	UNIT COST	EXTENDED
1. Class 160 Water Pipe Complete & In Place			
8" P.V.C.	12,970 LF	\$ 4.50	\$58,365.00
8" P.V.C.(Water Crossing)	1,300 LF	7.00	9,100.00
6" P.V.C.	14,050 LF	3.20	44,960.00
6" P.V.C.(Water Crossing)	1,600 LF	6.00	9,600.00
4" P.V.C.	3,890 LF	2.20	8,558.00
2. 1" Service Line	15,800 LF	1.80	28,440.00
3. Corporation Stops	250 Ea	30.00	7,500.00
4. Curb Stops	250 Ea	47.00	11,750.00
5. Valves	12 Ea	200.00	2,400.00
6. Flush Hydrants	5 Ea	350.00	1,750.00
7. Pressure Relief Valves	2 Ea	300.00	600.00
8. Storage 200,000 Gallons	LS	LS	48,000.00
9. Filter	LS	LS	35,000.00
10. Well and Submersible Pump	LS	LS	24,000.00
11. Pump House	LS	LS	17,000.00
12. Pressure Tank	LS	LS	9,000.00
13. Automatic Controls	LS	LS	6,000.00
14. High Service Pump	LS	LS	4,000.00
15. Piping & Valves	LS	LS	6,200.00
16. Chlorinator	LS	LS	2,500.00
17. Land	3 A	1,000.00	3,000.00
18. Backwash Pond	LS	LS	2,000.00
19. Water Meters in Place	200 Ea	65.00	13,000.00
Estimated Construction Cost			\$352,723.00

Estimated Construction Cost

\$352,723.00

Basic Engineering

29,940.00

Inspection

16,500.00

Staking

5,200.00

Easements

3,000.00

Administration

7,000.00

Contingencies

41,400.00

\$455,763.00

E. OPERATING COSTS

Hydropneumatic System

Raw Water Pumping Per 1,000 Gallons

$$\frac{.189 \times .145 \times 125}{.65 \times .83 \times 60} = \frac{1.063}{32.37} = \$0.033$$

Chemical for filter

$$\$500.00 \text{ per year} \div 36,500 = \$0.013$$

Chlorine @ 5 lb/24 hrs @ \$30.00 /lb

$$\frac{1000 \div 125 \times 5 \times 30}{60 \times 24 \times 100} = \frac{1.200}{144,000} = \$0.008$$

Pressure Pumping

$$\frac{.199 \times .045 \times 138}{.66 \times .85 \times 60} = \frac{1.174}{33.66} = \$0.035$$

Estimated Cost of Water Production/1,000 Gallons = \$0.09

Depreciation

Pumps, Equipment & Controls - 10 years

$$\$10,200.00 \times .10$$

\$ 1,020.00

Well - 20 years

$$\$20,000.00 \times .05$$

1,000.00

Distribution System 50 years

$$\$230,000 \times .02$$

4,600.00

Storage & Pump House - 25 year

$$\$74,000 \times .04$$

2,960.00

Meters

$$\$8,500 \times .05$$

425.00

Estimated Total Annual Depreciation

\$10,005.00

Maintenance and Repair (Labor)

$$2 \text{ hr/day} @ \$3.00/\text{hr}$$

$$2 \times 3.00 \times 300$$

\$1,800.00

Meter Reading & Billing

$$\$3.00 \text{ per meter} \times 200 \text{ meters}$$

600.00

Testing

240.00

Insurance, Legal & Administration

900.00

Loan Repayment Based on 50% Grant

50% F.H.A. Loan For 40 years @ 5%

Estimated Project Costs \$455,763.00

Grant \$227,381.50

Loan \$227,381.50

$$\text{Annual Repayment } 227,381.50 \times .05828 = \$13,280.93$$

Recapitulation	
Estimate 120 M Gallons Production for 100 M Gallons Usage	
Annual Water Production @ 120,000 Gallons/day	
120 x .09 x 365	= \$ 3,942.00
Depreciation	10,005.00
Maintenance & Repair (Labor)	1,800.00
Meter Reading & Billing	600.00
Testing	240.00
Insurance, Legal & Administrative	900.00
Annual Loan Repayment	<u>13,281.00</u>
Estimated Total Annual Cost	\$30,768.00
Estimated Monthly Cost	
30,768.00 ÷ 12	2,564.00
Assume 200 users	
Estimated Monthly Average Billing	
2,564.00 ÷ 200 =	\$ 12.82

D. COST ESTIMATE
Elevated Tank System

ITEM	QUANTITY	UNIT COST	EXTENDED
1. Class 160 Water Pipe Complete & In Place			
8" P.V.C.	12,970 LF	\$ 4.50	\$58,365.00
8" P.V.C. (Water Crossing)	1,300 LF	7.00	9,100.00
6" P.V.C.	14,050 LF	3.20	44,960.00
6" P.V.C.	1,600 LF	6.00	9,600.00
4" P.V.C.	3,890 LF	2.20	8,558.00
2. 1" Service Line	15,800 LF	1.80	28,440.00
3. Corporation Stops	250 Ea	30.00	7,500.00
4. Curb Stops	250 Ea	47.00	11,750.00
5. Valves	12 Ea	200.00	2,400.00
6. Flush Hydrants	5 Ea	350.00	1,750.00
7. Air Release Valves	2 Ea	300.00	600.00
8. Elevated Tank	120,000 Gal	LS	104,000.00
9. Filters	LS	LS	35,000.00
10. Well & Pump	LS	LS	25,000.00
11. Pump House	LS	LS	15,000.00
12. Controls	LS	LS	1,500.00
13. Chlorinator	LS	LS	2,500.00
14. Land	3 A	1,000.00	3,000.00
15. Backwash Pond	LS	LS	2,000.00
16. Water Meters	200 Ea	65.00	<u>13,000.00</u>
Estimated Total			\$384,023.00

Elevated Tank System (cont)

Estimated Construction Cost	\$384,023.00
Basic Engineering	32,136.00
Inspection	16,240.00
Staking	5,200.00
Easements	3,000.00
Administration	6,300.00
Contingencies	43,540.00
Estimated Total Cost	\$490,439.00

E. OPERATING COSTS

Water Pumping per 1000 Gallons

$$\frac{.189 \times .045 \times 260}{.62 \times .86 \times 60} = \frac{2.211}{31.99} = \$0.008$$

Chemical for Filters
\$500.00/year ÷ 36,500 = \$0.013

Chlorine @ 5 11/24 hr @ 30.00/Hwt

$$\frac{1000 \div 125}{60} \times \frac{5}{24} \times \frac{30}{100} = \frac{1,200}{144,000} = \$0.008$$

Estimated Cost of Water/1000 Gal \$0.037

Depreciation

Pump & Equipment 10 years	
\$5,500.00 x .10	= \$ 550.00
Well @ 20 years	
\$20,000.00 x .05	= 1,000.00
Distribution System @ 50 years	
\$230,000.00 x .02	= 4,600.00
Storage & Pump House 25 years	
\$119,000.00 x .04	= 4,760.00
Meters	
\$8,500.00 x .05	= 425.00
Estimated Total Depreciation	\$11,335.00

Maintenance and Repair (Labor

4 hours per week @ \$3.00/hr

$$4 \times 52 \times \$3.00 = \$ 624.00$$

Testing = 240.00

Insurance, Legal & Administrative = 900.00

Meter Reading & Billing

$$\$3.00 \text{ per meter} \times 200 = 600.00$$

Loan Repayment Based on 50% Grant

50% F.H.A. Loan for 40 years @ 5%

Estimated Project Costs \$490,439.00

Grant \$245,219.50

Loan \$245,219.50

Annual Repayment
 $\$245,219.50 \times .05828$

= \$14,291.39

Recapitulation

Estimate 120 M Gallons Production
For 100 M Gallons Usage

Annual Water Production Cost

$120 \times .087 \times 365$

= 3,810.00

Depreciation

= 11,335.00

Maintenance & Repair (Labor)

= 624.00

Testing

240.00

Insurance, Legal & Administrative

900.00

Meter Reading & Billing

600.00

Annual Loan Repayment

14,291.39

Estimated Total Annual Costs

\$31,800.39

Average Monthly Cost $\$31,800.39 \div 12$ \$ 2,650.03

Assume 200 Original Hookups

Average Monthly Billing $\$2,650.03 \div 200$ \$ 13.25

COST OF PRODUCTION IN RELATION TO QUANTITIES PRODUCED

Thousands Gallons Pumped	Pumping & Treating Per 1,000 G	Estimated Monthly Fixed Cost	Total Monthly Cost	Thousand Gallons Sold	Cost Per 1,000 Gallons
1,000	\$0.09	\$2,170.50	\$2,260.50	833	\$2.71
1,500	0.09	2,170.50	2,305.50	1,250	1.74
1,800	0.09	2,170.50	2,332.50	1,500	1.56
2,000	0.09	2,170.50	2,350.50	1,666	1.41
2,250	0.09	2,170.50	2,373.00	1,874	1.27
2,500	0.09	2,170.50	2,395.50	2,083	1.15
2,750	0.09	2,170.50	2,418.00	2,290	1.06
3,000	0.09	2,170.50	2,440.50	2,499	0.98
3,250	0.09	2,170.50	2,463.00	2,707	0.91
3,500	0.09	2,170.50	2,485.50	2,915	0.85
3,750	0.09	2,170.50	2,508.00	3,124	0.80
4,000	0.09	2,170.50	2,530.50	3,332	0.76

F. INCOME

1. Proposed Rates

5/8" or 3/4" meter and first 3,000 Gallons	\$ 8.00 Min.
1" meter and first 3,000 Gallons	10.00 Min.
1 1/4" meter and first 3,000 Gallons	12.00 Min.
1 1/2" meter and first 3,000 Gallons	15.00 Min.
2" Meter and first 3,000 Gallons	25.00 Min.

Minimums listed above are for the first user per meter. An additional assessment of \$5.00 will be charged for each additional user.

Water used above the first 3,000 Gallons will be billed at the following rates.

\$1.60 per 1,000 Gallons for the next 3,000 Gallons
1.20 per 1,000 Gallons for the next 5,000 Gallons
0.85 per 1,000 Gallons for the next 10,000 Gallons
0.75 per 1,000 Gallons for all over 21,000 Gallons

A \$20.00 disconnect and/or reconnect fee will be charged for all temporary or permanent service changes.

2. Average Monthly Income

Assume 200 initial users each having an average monthly consumption of 6,000 Gallons per month. The state park using 4,000 Gallons per day over a 3 1/2 month season.

Average Domestic Users Bill

Minimum and first 3,000 Gallons	\$ 8.00
Next 3,000 Gallons 3 x \$1.60	4.80
Average monthly bill	\$12.80

State Park 4,000 G.P.D. x 30 = 120,000 G.P.M.

Minimum and first 3,000 Gallons	\$ 10.00
Next 3,000 Gallons 3 x \$1.60	4.80
Next 5,000 Gallons 5 x \$1.20	6.00
Next 10,000 Gallons 10 x \$0.85	8.50
Next 99,000 Gallons 99 x \$0.75	74.25
Estimated monthly billing	\$103.55

Estimated average monthly billing for park

$$(\$103.55 \times 3.5) \div 12 = \$ 30.20$$

Estimated monthly income

Domestic use \$12.80 x 200 =	\$2,560.00
Park use	30.20
Estimated total income	\$2,590.20

The above calculations are based on estimates and will therefore require a review when actual construction costs and the number of users are known.

The rates must be reviewed annually as actual operating costs are determined.

The cost of bituminous replacement and road repair has not been included in the cost estimates since we do not know the type or amount of bituminous surface that would require replacement. It could possibly increase the monthly charge to each user by \$0.30 to \$0.50 per month.

There would also be an increase in costs if plans are made to enable the west side of the west branch of the lake to be served in the future.

REPORT OF ANALYSIS
Water Quality Laboratory
Water Resources Research Institute
South Dakota State University
Brookings, South Dakota 57006

Submitted by: G. E. Gebhart
Address: Scott Engineering
P.O. Box 1414
Fatartown, SD 57201

Date Rec'd November 8, 1976
Sample No. 76-1877
Identification Well-1275
SW1, Sec. 25, T 123N, R 66W

WATER ANALYSIS

Calcium (Ca)	29	ppm*	1.45	me/l**
Magnesium (Mg)	3	ppm	0.25	me/l
Sodium (Na)	870	ppm	37.84	me/l
Potassium (K)	25	ppm	0.65	me/l
Sulfate (SO ₄)	440	ppm	9.15	me/l
Nitrate (as N)	0.00	ppm	0.00	me/l
Chloride (Cl)	1050	ppm	29.40	me/l
Bicarbonate (HCO ₃)	459	ppm	7.52	me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)	1.83	ppm		me/l
Fluoride (F)		ppm		me/l
Hardness (EDTA as CaCO ₃)		ppm		g.p.g.***
Alkalinity (Methyl Orange)	376	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	0	ppm (as CaCO ₃)		
Electrical Conductivity	3922	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	41.05			
Sodium	94.15	% of cations		
Residual sodium carbonate	5.82	me/l		
pH	7.55			
Others: Manganese (Mn)	0.00	ppm		

*ppm=parts per million
**me/l=millequivalents per liter

***g.p.g.=grains per gallon

COMMENTS:

By: Shirley Kitten

Service Performed

Amount Due

Determinations shown above.

\$12.00

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. 76-1877

Appendix 3

REPORT OF ANALYSIS
Water Quality Laboratory
Water Resources Research Institute
South Dakota State University
Brookings, South Dakota 57006

Submitted by: George E. Gebhart, P.E.

Date Rec'd July 16, 1976

Address Scott Engineering
Watertown, SD 57201

Sample No. 76-811

Identification Mina Lake

WATER ANALYSIS

Calcium (Ca)	87	ppm*	4.35	me/l**
Magnesium (Mg)	26	ppm	2.13	me/l
Sodium (Na)	115	ppm	5.00	me/l
Potassium (K)	23	ppm	0.60	me/l
Sulfate (SO ₄)	225	ppm	4.68	me/l
Nitrate (as N)	0.08	ppm	0.01	me/l
Chloride (Cl)	61	ppm	1.71	me/l
Bicarbonate (HCO ₃)	210	ppm	3.44	me/l
Carbonate (CO ₃)	38	ppm	1.28	me/l
Iron (Fe)	0.04	ppm		me/l
Fluoride (F)		ppm		me/l
Hardness (EDTA as CaCO ₃)	324	ppm	19	g.p.g.***
Alkalinity (Methyl Orange)	172	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	64	ppm (as CaCO ₃)		
Electrical Conductivity	1082	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	2.78			
Sodium	41.39	% of cations		
Residual sodium carbonate	0.00	me/l		
pH	8.18			
Others: Manganese (Mn)	1.60	ppm		

*ppm=parts per million
me/l=millequivalents per liter
***g.p.g.=grains per gallon

COMMENTS: Total cations 12.08 me/l
Total anions 11.12 me/l

By: Shirley Mitten

Service Performed

Amount Due

Determinations shown above.

\$12.00

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. 76-811

Appendix 4

Water Quality Laboratory
Water Resources Research Institute
South Dakota State University
Brookings, South Dakota 57006

Submitted by: **Scott Engineering Co.**
Address **P.O. Box 1414**
Watertown, SD 57201

Date Rec'd **August 3, 1976**
Sample No. **76-911**
Identification **#2 Well - Passengl**

WATER ANALYSIS

Calcium (Ca)	473 ppm*	23.65 me/l**
Magnesium (Mg)	173 ppm	14.19 me/l
Sodium (Na)	1750 ppm	76.12 me/l
Potassium (K)	30 ppm	0.78 me/l
Sulfate (SO ₄)	4630 ppm	96.30 me/l
Nitrate (as N)	6.00 ppm	0.43 me/l
Chloride (Cl)	538 ppm	15.05 me/l
Bicarbonate (HCO ₃)	874 ppm	14.00 me/l
Carbonate (CO ₃)	ppm	me/l
Iron (Fe)	0.09 ppm	me/l
Fluoride (F)	ppm	me/l
Hardness (EDTA as CaCO ₃)	1892 ppm	111 g.p.g.***
Alkalinity (Methyl Orange)	700 ppm (as CaCO ₃)	
Alkalinity (Phenolphthalein)	0 ppm (as CaCO ₃)	
Electrical Conductivity	7667 micromhos per cm at 25° C.	
Sodium Adsorption Ratio	17.50	
Sodium	66.34% of cations	
Residual sodium carbonate	0.00 me/l	
pH	7.03	
Others: Manganese (Mn)	0.00	

*ppm=parts per million
**me/l=millequivalents per liter
***g.p.g.=grains per gallon

COMMENTS: Total cations 114.74 me/l
Total anions 125.78 me/l

Please fill in the enclosed questionnaire and return with your payment.

By: **Shirley Mittan**

Service Performed

Amount Due

Determinations shown above.

\$11.00

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. **76-911**

REPORT OF ANALYSIS
Water Quality Laboratory
Water Resources Research Institute
South Dakota State University
Brookings, South Dakota 57006

Submitted by: Scott Engineering Co.
Address: P.O. Box 1414
Watertown, SD 57201

Date Rec'd August 3, 1976
Sample No. 76-910
Identification #1 Well - Lakeside Resort

WATER ANALYSIS

Calcium (Ca)	183	ppm*	9.15	me/l**
Magnesium (Mg)	46	ppm	3.77	me/l
Sodium (Na)	1330	ppm	57.86	me/l
Potassium (K)	13	ppm	0.34	me/l
Sulfate (SO ₄)	1160	ppm	24.13	me/l
Nitrate (as N)	0.60	ppm	0.04	me/l
Chloride (Cl)	1400	ppm	39.20	me/l
Bicarbonate (HCO ₃)	937	ppm	15.36	me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)	0.08	ppm		me/l
Fluoride (F)		ppm		me/l
Hardness (EDTA as CaCO ₃)	646	ppm	38	g.p.g.***
Alkalinity (Methyl Orange)	768	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	0	ppm (as CaCO ₃)		
Electrical Conductivity	6865	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	22.77			
Sodium	81.35	% of cations		
Residual sodium carbonate	2.44	me/l		
pH	7.48			
Others: Manganese (Mn)	0.00			

*ppm=parts per million
**me/l=millequivalents per liter
***g.p.g.=grains per gallon

COMMENTS: Total cations 71.12 me/l
Total anions 78.73 me/l

Please fill in the enclosed questionnaire and return with your water sample.

By: Shirley Litten

Service Performed

Amount Due

Determinations shown above.

\$11.00

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. 76-910

Appendix 6

REPORT OF ANALYSIS
 Water Quality Laboratory
 Water Resources Research Institute
 South Dakota State University
 Brookings, South Dakota 57006

Submitted by: **Scott Engineering Co.**
 Address: **P.O. Box 1 414**
Watertown, SD 57201

Date Rec'd **September 13, 1976**
 Sample No. **76-1321**
 Identification **Kopecky Well-**
NE 1/4, Sec. 26, T 123N, R 66W

WATER ANALYSIS

Calcium (Ca)	253	ppm*	12.65	me/l**
Magnesium (Mg)	57	ppm	4.67	me/l
Sodium (Na)	349	ppm	15.18	me/l
Potassium (K)	56	ppm	1.46	me/l
Sulfate (SO ₄)	1320	ppm	27.46	me/l
Nitrate (as N)	0.10	ppm	0.01	me/l
Chloride (Cl)	122	ppm	3.42	me/l
Bicarbonate (HCO ₃)	210	ppm	3.44	me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)	0.01	ppm		me/l
Fluoride (F)		ppm		me/l
Hardness (EDTA as CaCO ₃)		ppm		me/l
Alkalinity (Methyl Orange)	172	ppm (as CaCO ₃)		g.p.g.***
Alkalinity (Phenolphthalein)	0	ppm (as CaCO ₃)		
Electrical Conductivity	2606	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	5.16			
Sodium	44.69	% of cations		
Residual sodium carbonate	0.00	me/l		
pH	6.77			
Others: Manganese (Mn)	0.00	ppm		

*ppm==parts per million
 **me/l==millequivalents per liter
 ***g.p.g.=grains per gallon

COMMENTS: Total cations 33.96 me/l
 Total anions 34.33 me/l

By: **Shirley Litten**

Service Performed	Amount Due
Determinations shown above.	\$12.00

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. 76-1321

REPORT OF ANALYSIS
Water Quality Laboratory
Water Resources Research Institute
South Dakota State University
Brookings, South Dakota 57006

Submitted by: Scott Engineering Co.
 Address: Watertown, SD 57207

Date Rec'd: September 13, 1976
 Sample No. 76-1322
 Identification Harley Taylor Well-
SW 1/4, Sec. 24, T 123N, R 65W

WATER ANALYSIS

Calcium (Ca)	114	ppm*	5.70	me/l**
Magnesium (Mg)	40	ppm	3.28	me/l
Sodium (Na)	936	ppm	40.72	me/l
Potassium (K)	61	ppm	1.59	me/l
Sulfate (SO ₄)	1810	ppm	37.65	me/l
Nitrate (as N)	5.00	ppm	0.32	me/l
Chloride (Cl)	150	ppm	4.20	me/l
Bicarbonate (HCO ₃)	881	ppm	14.44	me/l
Carbonate (CO ₃)		ppm		me/l
Iron (Fe)	0.02	ppm		me/l
Fluoride (F)		ppm		me/l
Hardness (EDTA as CaCO ₃)		ppm		g.p.g.***
Alkalinity (Methyl Orange)	722	ppm (as CaCO ₃)		
Alkalinity (Phenolphthalein)	0	ppm (as CaCO ₃)		
Electrical Conductivity	4808	micromhos per cm at 25° C.		
Sodium Adsorption Ratio	19.22			
Sodium	79.39	% of cations		
Residual sodium carbonate	5.46	me/l		
pH	7.30			
Others: Manganese (Mn)	0.20	ppm		

*ppm=parts per million
 **me/l=millequivalents per liter
 ***g.p.g.=grains per gallon

COMMENTS: Total cations 51.29 me/l
 Total anions 56.61 me/l

By: Shirley Kitten

Service Performed	Amount Due
Determinations shown above.	\$12.00

Make checks payable to: Water Quality Laboratory

Cut along dotted line and return the lower portion with payment

Sample No. 76-1322

Appendix 8

TO ABERDEEN

RANGE 65W

BROWN COUNTY
EDMUNDS COUNTY

MINA LAKE SANITARY
AND WATER DISTRICT BOUNDRIES
PROPOSED LAYOUT

LEGEND
8" Pipe
6" Pipe
4" Pipe

US HWY 12

FUTURE

2

3

4

5

6

7

8

9

10

11

12

A

B

C

D

E

F

G

H

I

J

K

L

M

SEC. 14

SEC. 13

SEC. 24

SEC. 23

SEC. 23

SEC. 24

SEC. 25

SEC. 20

LAKE

LAKE

MINA

P

O

N

13

14

MINA LAKE

165
460 330 0 660 320 380

Aberdeen American News

"SOUTH DAKOTA'S AWARD WINNING NEWSPAPER"

ABERDEEN, SOUTH DAKOTA 57401

TELEPHONE: 605-225-4100

November 25, 1977

SD Water Rights Commission
Pierre, SD 57501

Dear Sirs:

The enclosed Notice of Intent to Appropriiate Water application for the Mina Lake Sanitary & Water System, No. 4176-3, is submitted on one of our regular affidavits. If this is not acceptable, please send one of your affidavits and we will resubmit it.

Thank you.

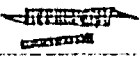
Sincerely,



Sheryl Moran,
Principal Clerk

SH



Mine Lake Waterbury Cape.
Edgar Light 
Aberdeen,

Feels there is other ways
to get water and other
sources of water.

 604 PM.

4176-3

December 15, 1977

A.G. Westby
1109 S. State
Aberdeen, S.D. 57401

Dear Mr. Westby:

In reply to your request dated December 4, 1977, Application No. 4176-3 for the Hina Lake Water System was approved for 0.15 c.f.s. for rural water system purposes from Hina Lake.

Please advise this office if there are any questions.

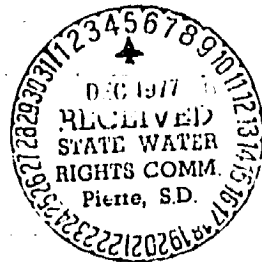
Sincerely,

JAMES WINTERTON
Water Resources Engineer

JW/bw

A. G. Westby
1169 S. State
Aberdeen, S. Dak. 57401

Mr. John Hatch
Chief Eng.
Dept Natural Resources
Pierre, S. Dak.



Dear John:

What is the status
of application no. 9176-3
of Minn Lake water system?
Public hearing was not
held 1/77.

Thanking You in advance.

Sincerely
A. G. Westby

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 4176-3

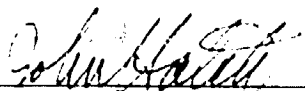
(1) The Mina Lake Sanitary and Water System, RR 2, Box 247, Mina SD 57462 made Application No. 4176-3, November 1, 1977 for a water permit to appropriate 0.15 cubic feet of water per second from Mina Lake, Edmunds County, South Dakota for rural water and sanitary district use purposes. Permit No. 4176-3, with a priority date of November 1, 1977 was approved November 30, 1977 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before November 30, 1982 and for the application to beneficial use of said water on or before November 30, 1986.

The Mina Lake Sanitary and Water System has connected to the WEB Rural Water System for their primary water supply. The System continues to maintain Water Right No. 4176-3 for emergency standby use.

(2) It is certified that the applicant 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 0.13 cubic feet of water per second for beneficial use. The location of the diversion point is 50 feet north and 2880 feet west from the southeast corner of Section 13-T123N-R66W (SE 1/4 SW 1/4).

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

(4) Pursuant to South Dakota Water Law 46-5-30.1 Mina Lake Sanitary and Water System, RR 2 Box 247, Mina SD 57462 the holder and/or owner of Water Permit No. 4176-3 is issued a license to appropriate water, the right to use 0.13 cubic feet of water per second from Mina Lake with a priority date of November 1, 1977 from the location specified in (2) of this license. The water to be used for the purpose of rural water and sanitary district use on an emergency basis. This license is subject to any limitations or qualifications listed in Water Permit No. 4176-3 and subject to South Dakota State Law.


 JOHN HATCH, Chief Engineer
 Water Rights Program
 Department of Environment and Natural Resources

APR 4 1996
 date



Permit No. **4176-3**
JAMES River - Water District

Report Of Examination Of Works And/Or Application of Water To Beneficial Use

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

I have this day, 7/19/1995, made a thorough examination of the water use system constructed by MINA WATER LAKE SANITARY AND WATER SYSTEM of RR2 BOX 247, MINA SD holder of Permit No. 4176-3, bearing the priority of NOVEMBER 1, 1977 authorizing the diversion of 0.15 cu. ft. per second of the waters of SURFACE WATER, MINA LAKE for RURAL WATER AND SANITARY DISTRICT USE purposes, in EDMUNDS County.

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

A. Works used to divert the water:

A SUBMERSIBLE 2 hp PUMP INSTALLED IN A WET WELL

C. Works used to apply water to beneficial use:

THE EXISTING WATER DISTRIBUTION SYSTEM

The system is in the following condition GOOD. The point of diversion is located : FROM THE SE CORNER OF SECTION 13 T123N-R66W, 50 feet N AND 2880 feet W. The works are capable of diverting and conveying to the place of use 0.13 cu. ft. per second of water which is to be used for EMERGENCY STAND BY RURAL WATER USE. Water has been put to beneficial and the license should be issued for 0.13. Applicable permit qualifications have been complied with: YES

Exceptions to compliance are: NONE

COMMENTS: WEB RURAL WATER SYSTEM NOW SUPPLIES THE WATER FOR THE MINA WATER SYSTEM. THE MINA WATER DISTRICT REQUESTS THAT THE WATER PERMIT BE RETAINED ON AN EMERGENCY STANDY BASIS.



Mark D. Rath
Natural Resources Engineer
DENR, Water Rights Program

11/27/95

Date

REPORT ON INSPECTION OF PERMIT NO. 4176-3

DATE OF INSPECTION: 7/19/95

**DIVERSION POINT LEGAL LOCATION: FROM THE SE CORNER OF SECTION 13 T123N-R66W,
50 feet N AND 2880 feet W**

Pump:

- 1) Make MEYERS
- 2) Model QP20
- 3) Size SUBMERSIBLE
- 4) Capacity 60 GPM

Motor:

- 1) Make MEYERS
- 2) Model No. QP20
- 3) Horsepower rating 2 hp

DISTRIBUTION LINES OR CANALS:

- 1) Type PVC 2) Size 6 inches

PERMIT QUALIFICATIONS AND REGULATIONS:

- 1) Special qualifications to permit being abided by Y
- 2) All structures, wells and lands on map Y

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
WATER RIGHTS PROGRAM

November 27, 1995

RE: Change in Diversion Point for Water Permit No. 4176-3, Mina Lake Sanitary and Water System.

An inspection of Permit No. 4176-3 on July 19, 1995 found a diversion point at a location not authorized by Permit No. 4176-3. SDCL 46-5-13.1 provides that a point of diversion may be changed or additional points of diversion may be approved without application or publication of a notice of hearing if the additional point of diversion is from the same source of water, no additional water is appropriated and the chief engineer makes a finding that the change does not increase the potential for interference with existing diversions.

Water Permit No. 4176-3 appropriates 0.13 cubic feet of water per second (cfs) from Mina Lake located in the NE1/4 of Section 24 T123N-R66W. An inspection found the diversion point from Mina Lake located in the SE1/4 SW1/4 of Section 13 T123N-R66W. No additional appropriation of water is required for this diversion.



Mark D. Rath
Natural Resources Engineer III

The Chief Engineer makes a finding that the additional diversion points do not increase the potential for interference with existing diversions. In making the finding, "does not increase the potential for interference" is interpreted to mean potential for adverse interference.



John Hatch, Chief Engineer
Water Rights Program



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

December 12, 1995

4176-3

Doug Eilers
Mina Lake Sanitary
and Water System
PR 2, Box 247
Mina, SD 57462

Dear Mr. Eilers:

The inspection of your water use system and the inspection of the extent of application of water to beneficial use, as developed under Water Permit No. 4176-3, has been completed. Your final water right document, the Water License, can now be issued.

Statutes require a \$50.00 fee for the inspection and issuance of the Water License. Upon receipt of the \$50.00 fee from you, we will begin processing your Water License.

Please remit the fee within 30 days to:
Department of Environment & Natural Resources
Water Rights Program
523 E. Capitol
Pierre, SD 57501-3181

Sincerely,

Cheryl F. Frost
Secretary
Water Rights Program
(605) 773-3352

NOTE: On check or money order, please specify your permit number. This will insure proper handling of the fee.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

APR 4 1996

4176-3

Doug Eilers
Mina Lake Sanitary and Water System
RR 2, Box 247
Mina, SD 57462

Dear Mr. Eilers:

Enclosed is Water License No. 4176-3 and Receipt No. 414733 for \$50.00 which was assessed for an inspection and issuance of the license. Water License No. 4176-3 is the final document which completes the process of obtaining a water right.

As long as you use the water beneficially, as stated in the Water License, State Water Laws provide that you have a continuing right to use the water.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Program
(605) 773-3352

ks
enclosures

RECEIPT

Division of Water Rights

South Dakota Department of Environment and Natural Resources

414733

4176-3

Pierre, January 2, 1996

RECEIVED OF Mina Lake Sanitary & Water Dist. Rte 2 Box 247, Mina, SD 57462

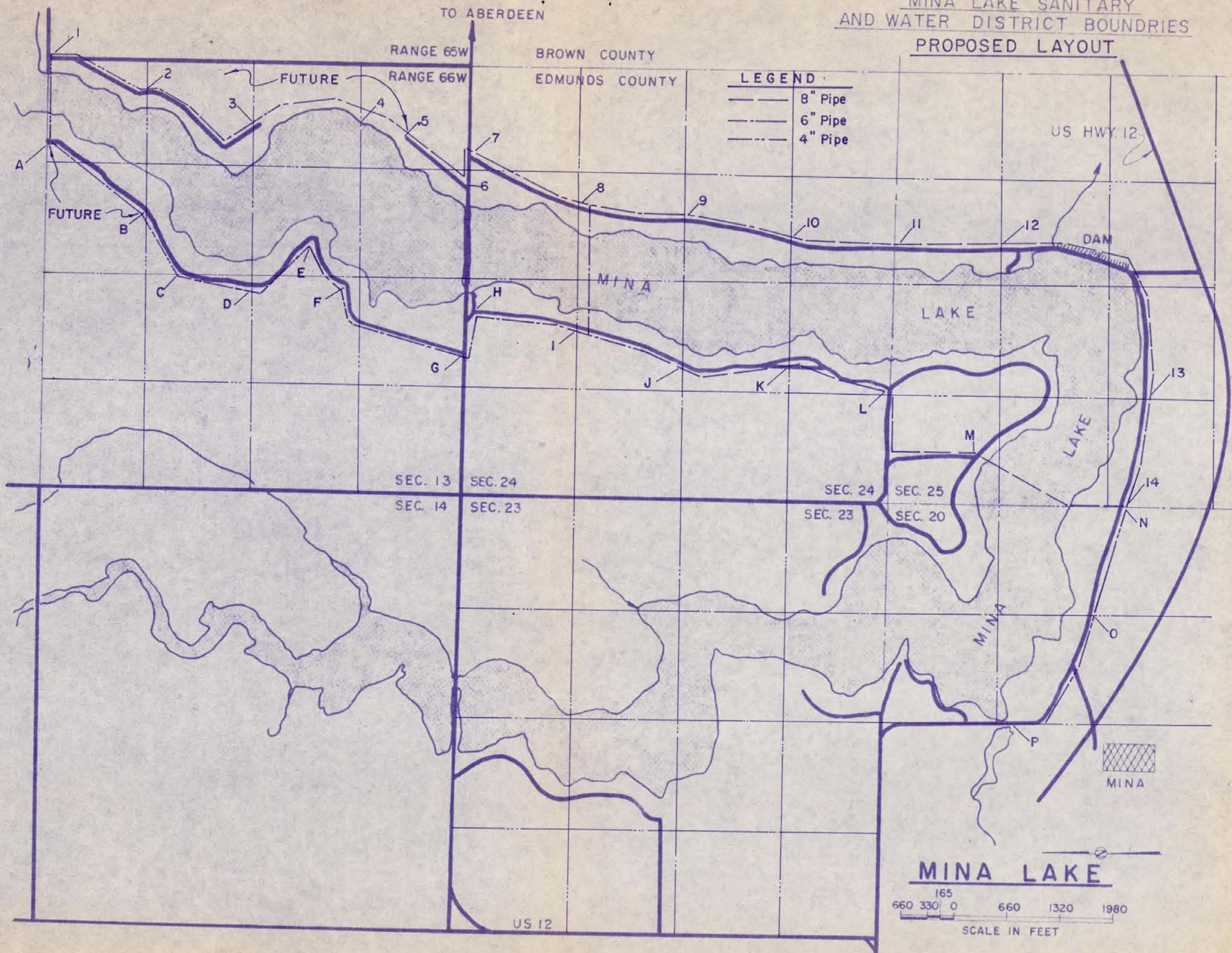
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. _____ to Appropriate Water, to construct 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. <u>4176-3</u>	50	00
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	50 00

By John Hatch
Chief Engineer

**MINA LAKE SANITARY
AND WATER DISTRICT BOUNDARIES
PROPOSED LAYOUT**



142R
H-25

②

24



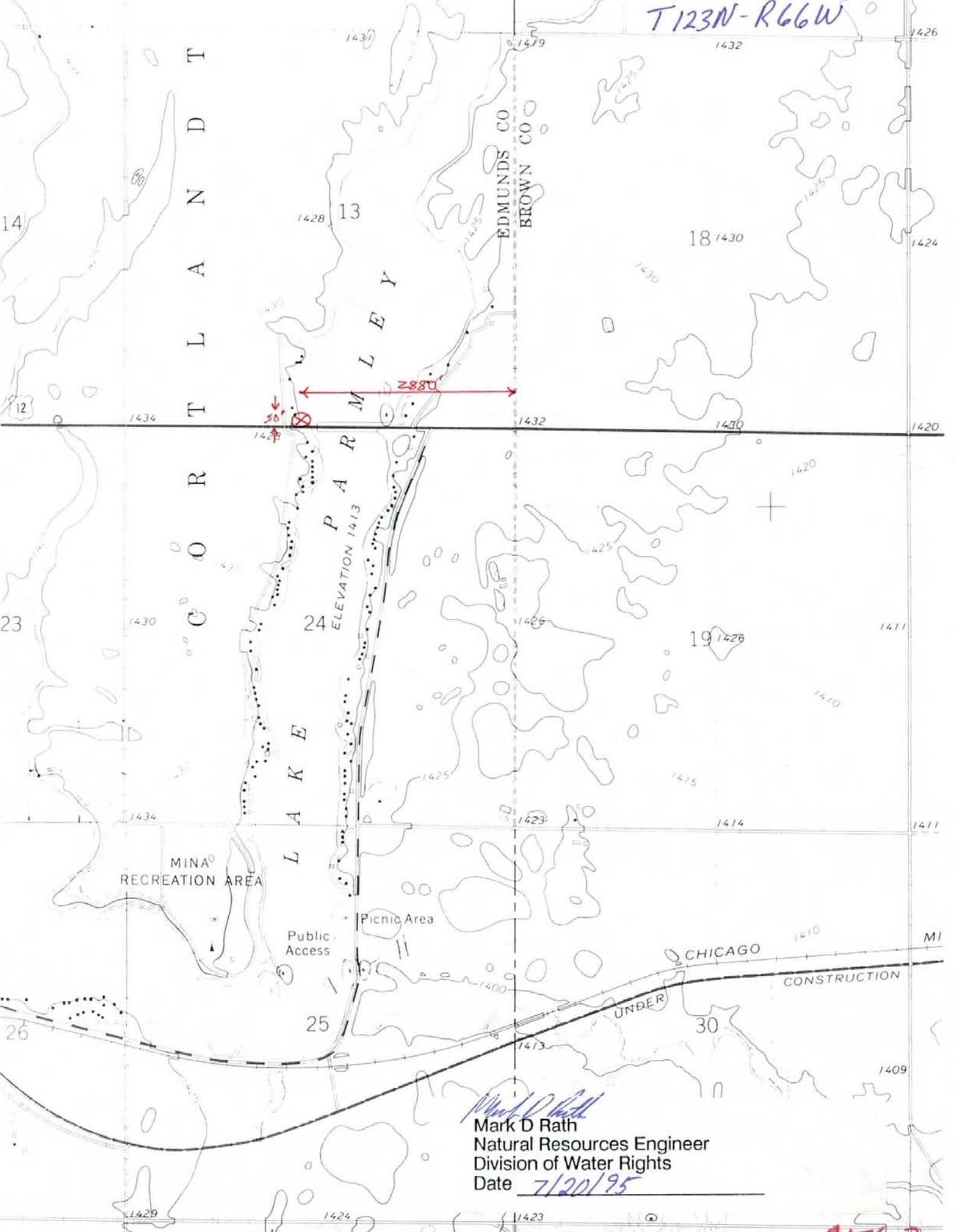
①
8.2
②

③

79.7
T 10030

123-66

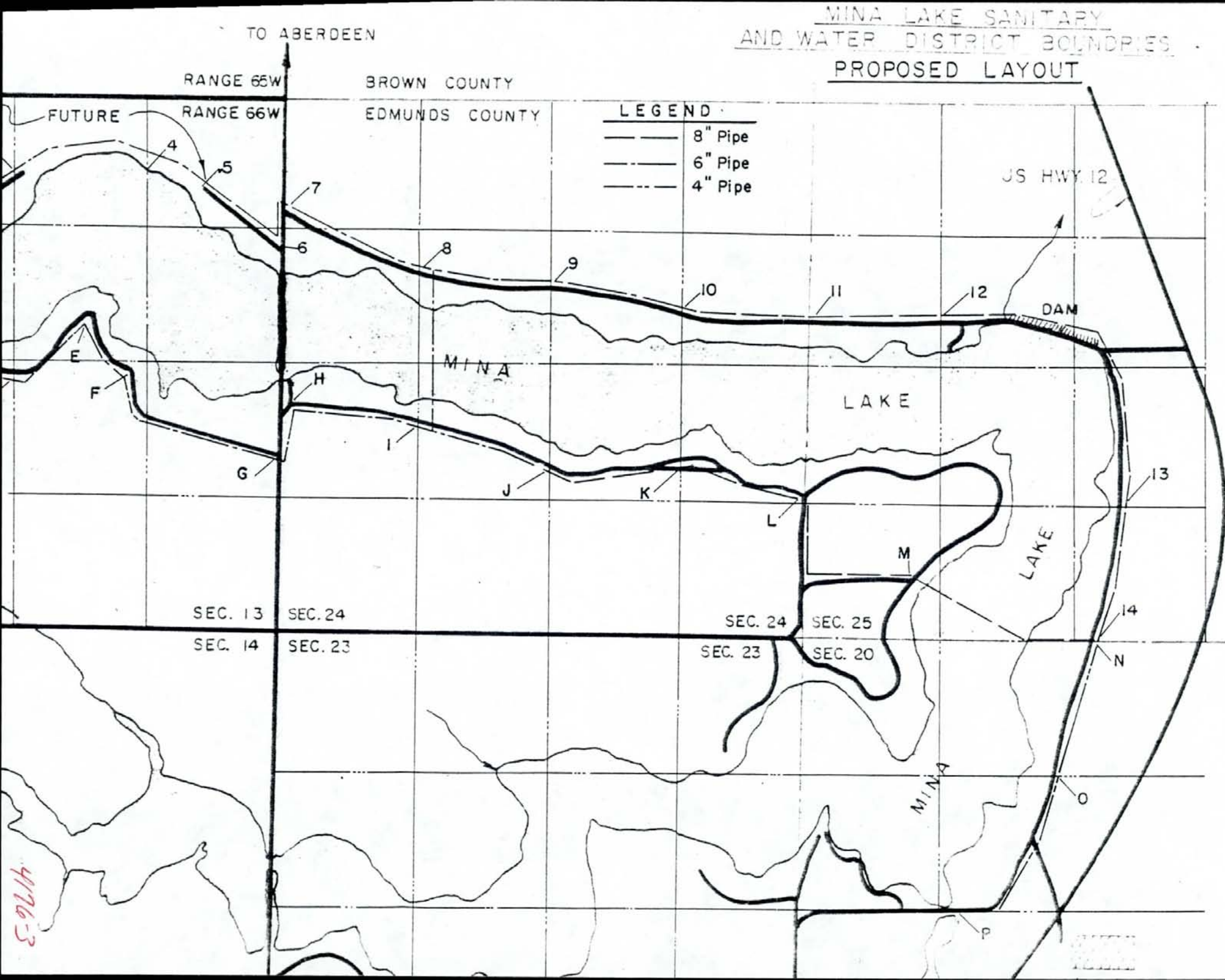
T123N-R66W



Mark D Rath
Mark D Rath
Natural Resources Engineer
Division of Water Rights
Date 7/20/95

4176-3

MINA LAKE SANITARY
AND WATER DISTRICT BOUNDRIES
PROPOSED LAYOUT



MINA LAKE SANITARY
AND WATER DISTRICT BOUNDRIES

TO ABERDEEN

RANGE 66W

BROWN COUNTY

RANGE 66W

EDMONDS COUNTY

US. HWY. 12

PROPOSED
DIVERSION
POINT

DAM

MINA

LAKE

LAKE

SEC. 13

SEC. 21

SEC. 24

SEC. 25

SEC. 14

SEC. 23

SEC. 23

SEC. 20

MINA

MINA

MINA LAKE

195
650 330 0 600 1320 1980
SCALE IN FEET

MAP N^o 3404-3 (APP. N^o 4176-3)