

Report of
NORTH DAKOTA STATE WATER CONSERVATION COMMISSION
 1301 State Capitol
 BISMARCK, NORTH DAKOTA

SHEEP CREEK DAM AND RECREATION COMPLEX
 GRANT COUNTY

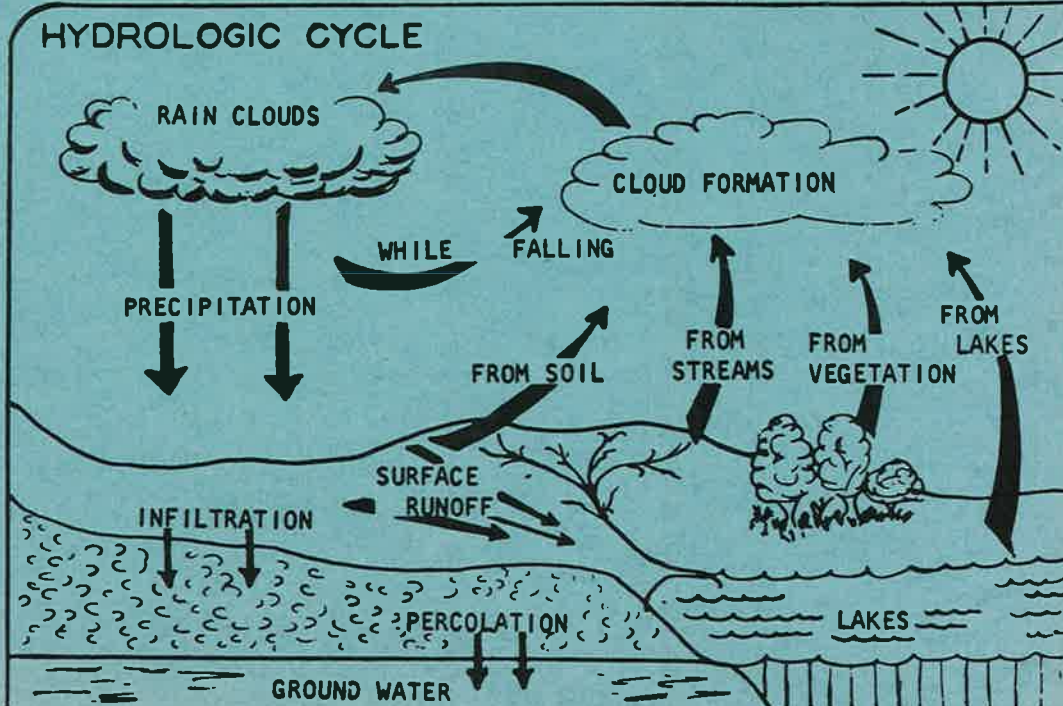
SWC Project #1358 - SORA Project #19-13

Prepared in cooperation with the

Grant County Water Management District
 North Dakota State Game and Fish Department
 North Dakota State Outdoor Recreation Agency
 North Dakota State Water Commission

June 30, 1967

HYDROLOGIC CYCLE



NORTH DAKOTA STATE WATER COMMISSION

PROJECT REPORT

NAME: Sheep Creek Dam and Recreation Complex, Grant County
PROJECT: SWC #1358 - SORA #19-13
DATE: June 30, 1967

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#672-1358-10 "Box Inlet Steel Details"
#672-1358-11 "Box Inlet Steel Details"
#672-1358-12 "Stilling Basin Details"
#672-1358-13 "Stilling Basin Details"

North Dakota State Water Commission

1301 State Capitol

223-8000 Ext. 251

Bismarck, North Dakota 58501

June 30, 1967

John Greenslit
State Liaison Officer
State Outdoor Recreation Agency
Bismarck, North Dakota 58501

RE: Sheep Creek Dam and Recreation Complex,
SWC Project #1358, SORA Project #19-13

Dear John:

Enclosed are seven copies of the acquisition and development project proposal for the Sheep Creek Dam and Recreation Complex in Grant County prepared by our office in cooperation with the Grant County Water Management District, State Game and Fish Department and the State Outdoor Recreation Agency.

Copies of this report are being provided all project participants.

We appreciate the cooperation of all concerned in the preparation of this report.

Sincerely yours,



Milo W. Hoisveen
Engineer-Secretary

MWH:JS:ka
Enclosures
cc: Grant Co. WMD
Game & Fish Dept.
Harold Hanson

Governor William L. Guy
Chairman
Richard P. Gallagher
Vice Chairman - Mandan

Harold Hanson
New England
Russell Dushinske
Devils Lake

Henry J. Steinberger
Donnybrook
Gordon K. Gray
Valley City

Arne Dahl, Ex-Officio Member
Comm. of Agriculture & Labor
Milo W. Hoisveen, Secretary
Chief Engineer & State Engineer

DEPARTMENT OF THE INTERIOR
BUREAU OF OUTDOOR RECREATION
PROJECT PROPOSAL - ACQUISITION

LEAVE BLANK FOR BOR USE ONLY

Date Received	Priority	Project Number
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Project Officer

Use this form for submission of individual projects for acquiring lands and waters or interests in lands and waters for public outdoor recreation purposes. If concurrent Development is being undertaken, check here

SECTION 1

1. State or Territory
North Dakota

2. Name and address of agency responsible for project
Grant County Water Management District, c/o Harry Zacher, Chairman, Elgin, North Dakota

3. Project Title
Sheep Creek Dam and Recreation Complex, Grant County - SORA Project #19-13

4. Brief description of project
Located 4 miles south of Elgin and State Highway #21, the project includes the construction of a dam creating an 85 acre lake with a capacity of 1160 acre-feet with a maximum depth of 40 feet. About 283 acres of agricultural lands are to be acquired and public access will be provided. Facilities are to be provided for such outdoor recreation activities as fishing, swimming, boating, ice skating, camping, picnicking, walking and hiking and playing outdoor games. Designed to meet Area I needs by 1970, the project will also meet local unmet needs. Plans include enhancement of the area's natural beauty.

5. Duration of project
from **3-1-68** to **10-31-70**

6. Federal assistance requested
\$8,320

7. Recommended priority
A

8. Name, Organization, and Title of individual having day-to-day responsibility for direction of project
Harry Zacher, Chairman, Grant County Water Management District, Elgin, North Dakota

9. Name and Address to appear on check
**Milo W. Hoisveen, State Fiscal Officer
1301 State Capitol
Bismarck, North Dakota 58501**

10. TERMS AND CONDITIONS: In submitting this Project Proposal, the State hereby accepts the Terms and Conditions set forth in the BOR Grants-in-Aid Manual, which will be a part of the Project Agreement for any grant awarded under this proposal.

11. CERTIFICATION: As the official designated to represent the State and act for the State for purposes of the Land and Water Conservation Fund Act, I recommend that assistance be made available from the Fund, when monies are available, in accordance with the recommended priority. No financial assistance has been given or promised under any other Federal program or activity with regard to the proposed project. The State or public agency to be responsible for the proposed project has the ability and intention to finance its share of the costs of this project. The Applicant will not discriminate against any person on the basis of race, color, or national origin in the use of any property or facility acquired or developed pursuant to this proposal, and shall comply with the terms and intent of Title VI of the Civil Rights Act of 1964, P. L. 88-354 (1964), and of the regulations promulgated pursuant to such Act by the Secretary of the Interior and contained in 43 CFR 17.

(Signature)

(Date)

John Greenslit
(Name)

State Liaison Officer
(Title)

12. For State use
Dist: **7 - SORA**
1 - Grant Co. WMD
1 - Comm. Hanson
1 - Game & Fish
10 - SWC

June 30, 1967

SECTION 11

1. Nature and Extent of Use - A. For entire area in which acquisitions are to be made:

B. For area to be acquired:

2. BOR Classification of area <p style="text-align: center;">11</p>	3. Check one <input checked="" type="checkbox"/> New Site <input type="checkbox"/> Addition to existing site	4. Location County <u>Grant</u> Town <u>Elgin</u> Town population <u>944</u> Miles from Town <u>4</u>
5. Total acres to be acquired <p style="text-align: center;">282.45</p>	6. Cover, acres in A. Forest _____ B. Rock _____ C. Cutover _____ D. Swamp _____ E. Grass <u>282.45</u> F. Desert _____ G. Water _____	
7. Topography, acres in A. Flat _____ B. Hilly <u>282.45</u> C. Rolling _____ D. Mountainous _____	8. Waterfront, feet on A. Ocean _____ B. Lake _____ C. Stream _____	9. Roadfront, feet on A. Dirt _____ B. Gravel _____ C. Paved _____

10. PARCELS TO BE ACQUIRED

PARCEL NUMBER	ACRES	ESTIMATED VALUE	NUMBER OF BUILDINGS	ESTIMATED VALUE	METHOD OF ACQUISITION	APPROX. DATE OF ACQUISITION	TOTAL VALUE
1	79.13	NE $\frac{1}{4}$ - 15 -	139-89	H.&A. Rickets	Fee	3-1-68	3,960
2	56.98	SE $\frac{1}{4}$ - 15 -	139-89	Vernon Glaseman	"	3-1-68	2,850
3	19.32	N $\frac{1}{2}$ - 22 -	139-89	"	"	3-1-68	970
4	119.84	W $\frac{1}{2}$ - 15 -	139-89	Mrs. G.B. Roth & Mrs. Wm. H. Fisher	"	3-1-68	6,000
5	7.18	S $\frac{1}{2}$ - 10 -	139-89	Charles Rohusek	"	3-1-68	360
FOR CONCURRENT ACQUISITION AND DEVELOPMENT PROJECT SUBMISSIONS						TOTAL ESTIMATED VALUE \$	1,860 Contingencie
Total estimated acquisition value			16,640	Amount of Federal acquisition assistance requested		\$8,320	640 Adm. Chg.
Total estimated development costs			144,690				16,640 TOTAL
TOTAL			161,330	Source of remainder of funds			
Total amount of Federal assistance requested			80,665	Grant County WMD			
Source of remainder of funds				SORA			
Grant County WMD				SWC			
SORA				'No other Federal funds have been requested for this project'			
SWC							

SECTION 111 - ATTACHMENTS

Attach, by reference number, the following supplemental documents necessary to process this Acquisition Project Proposal:

- A-660-1 *Project Justification.* A. Description of how the proposed project is in accord with the State outdoor recreation plan and would help meet priority needs identified in the plan. Indicate how the natural beauty of the area will be preserved. B. Indicate other organizations consulted during formulation of this proposal. C. Plans for Operations and Maintenance.
- A-660-2 *Maps and Charts.* A. Simple plot plan or map showing the total area to be acquired and its relationship to the surrounding area. Annotate any plans for streets, highways, waterlines, sewers, etc. to be located on or near the involved area. (Key to show location within State, County, or city.) B. Description of any improvements on lands to be acquired. C. Description of all legal rights to be held by applicant and any other person or organization.
- A-660-3 *Agreements.* A. Agreements or arrangements made with other organizations for participating in the project, or in later operation and maintenance of the completed project.

The items shown below need *not* be submitted with the project proposal. However, during the course of execution of an approved project, the applicant should be prepared to submit them to the Bureau for review, as follows:

- A-660-4 Appraisal reports and other documentation of cost.
- A-660-5 Satisfactory evidence of title (such as an opinion by the State Attorney General) for each parcel.
- A-660-6 Five-year history of conveyances for each parcel listed in project proposal (name of parties involved, dates, interest conveyed and consideration).

DEPARTMENT OF THE INTERIOR
BUREAU OF OUTDOOR RECREATION
PROJECT PROPOSAL - DEVELOPMENT

LEAVE BLANK FOR BOR USE ONLY

Date Received	Priority	Project Number
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Project Officer

Use this form for submission of individual projects which will develop lands and waters to facilitate their use by the public for outdoor recreation. If concurrent Acquisition is being undertaken, check here

SECTION 1

1. State or Territory North Dakota	2. Name and address of agency responsible for project Grant County Water Management District, c/o Harry Zacher, Chairman, Elgin, North Dakota
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3. Project Title
Sheep Creek Dam & Recreation Complex, Grant County, SORA Project #19-13

4. Brief description of project
Located 4 miles south of Elgin and State Highway #21, the project includes the construction of a dam creating an 85 acre lake with a capacity of 1160 acre-feet with a maximum depth of 40 feet. About 283 acres of agricultural lands are to be acquired and public access will be provided. Facilities are to be provided for such outdoor recreation activities as fishing, swimming, boating, ice skating, camping, picnicking, walking and hiking and playing outdoor games. Designed to meet Area I needs by 1970, the project will also meet local unmet needs. Plans include enhancement of the area's natural beauty.

SWC #1358

5. Duration of project from 3-1-68 to 10-31-70	6. Federal assistance requested \$72,345	7. Recommended priority A
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8. Name, Organization, and Title of individual having day-to-day responsibility for direction of project Harry Zacher, Chairman, Grant County Water Management District, Elgin, North Dakota	9. Name and Address to appear on check Milo W. Hoisveen, State Fiscal Officer, 1301 State Capitol Bismarck, North Dakota 58501
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10. TERMS AND CONDITIONS: In submitting this Project Proposal, the State hereby accepts the Terms and Conditions set forth in the BOR Grants-in-Aid Manual, which will be a part of the Project Agreement for any grant awarded under this proposal.

11. CERTIFICATION: As the official designated to represent the State and act for the State for purposes of the Land and Water Conservation Fund Act, I recommend that assistance be made available from the Fund, when monies are available, in accordance with the recommended priority. No financial assistance has been given or promised under any other Federal program or activity with regard to the proposed project. The State or public agency to be responsible for the proposed project has the ability and intention to finance its share of the costs of this project. The Applicant will not discriminate against any person on the basis of race, color, or national origin in the use of any property or facility acquired or developed pursuant to this proposal, and shall comply with the terms and intent of Title VI of the Civil Rights Act of 1964, P. L. 88-354 (1964), and of the regulations promulgated pursuant to such Act by the Secretary of the Interior and contained in 43 CFR 17.

(Signature)

John Greenslit

(Name)

(Date)

State Liaison Officer

(Title)

12. For State use

Dist: SORA - 7
Grant Co. WMD - 1
Game & Fish Dept. - 1
Commissioner Hanson - 1
State Water Commission - 10

June 30, 1967

SECTION 11 - TABULAR SUMMARY OF PROJECT ELEMENTS AND COSTS

Identify the phase or element of the Development Project suggested by the line items. Indicate additional breakdown of work elements necessary and desirable to allocate work assignments and costs.

	DATE OF		ESTIMATED COST	TOTAL ESTIMATED COST	
	BEGINNING	COMPLETION			\$
DEVELOP SITE PLANS & SPECIFICATIONS				Amount of Federal development assistance requested	\$ 144,690
A.				Source of remainder of funds	
B.				Grant County WMD	72,345
				SORA	
				SWC	
DEVELOP CONSTRUCTION PLANS AND SPECIFICATIONS				FOR CONCURRENT ACQUISITION AND DEVELOPMENT PROJECT SUBMISSIONS	
A. In preparation by SWC				Total estimated acquisition value	\$ 16,640
B.				Total estimated development costs	\$ 144,690
PREPARE SITE				TOTAL	\$ 161,330
A.				Total amount of Federal assistance requested	\$ 80,665
B.				Source of remainder of funds	
UNDERTAKE CONSTRUCTION				Grant. County. WMD, SORA, SWC	
A. Dam	3-1-68	10-31-70	106,000	No other Federal funds have been requested for this project	
B. Recreation	3-1-68	10-31-70	33,130		
OTHER Facilities				SIZE IN ACRES OF ENTIRE AREA OR PARK	SIZE IN ACRES OF AREA TO BE DEVELOPED UNDER THIS PROPOSAL
A. SORA Adm.	3-1-68	10-31-70	5,560	Land	Water
B.				282.45	

SECTION 111 - ATTACHMENTS

Attach, by reference number, the following supplemental documents necessary to process this Development Project Proposal:

- D-660-1 *Project Plan and Justification.* A. Description of how the proposed project is in accord with the State outdoor recreation plan and would help meet priority needs identified in the plan. B. Summary of area, its nature and relation of development to the area. Indicate how the natural beauty of area will be enhanced. C. Descriptive outline of proposed accomplishments with funds requested. Indicate contemplated other uses of the area. D. List of names of organizations which will undertake the development and how this will be performed. E. Economic feasibility data, or other types of data to indicate extent and kind of use to be made of the completed area or facility. F. Plans for operations and maintenance.
- D-660-2 *Maps and Charts.* A. Simple site plans or maps showing total area, in addition to area to be developed. Annotate to show plans for, or existing streets, highways, waterlines, sewers, etc. to be located on or near the area. (Key to allow location within State, County, or city.) Indicate uses now made of the area by applicant or other agencies or individuals. B. Description of all legal rights to the area to be held by applicant and any other person or organization.
- D-660-3 *Agreements.* A. Agreements or arrangements made with other organizations for participating in project, including operation and maintenance of completed facility.

The terms shown below need *not* be submitted with the project proposal. However, during the course of execution of an approved project, the applicant should be prepared to submit them to the Bureau for review, as follows:

- D-660-4 *Plans.* A. Site plans, specifications and cost estimates. B. Construction plans, specifications and cost estimates. These *must* be submitted for review and approval before construction may proceed on a structure to cost in excess of \$100,000.
- D-660-5 *Contracts.* A. Copies of pertinent contracts, as specifically required by the Bureau of Outdoor Recreation.

NORTH DAKOTA STATE WATER COMMISSION

ACQUISITION AND DEVELOPMENT PROJECT - JUSTIFICATION REPORT
SHEEP CREEK DAM AND RECREATION COMPLEX, GRANT COUNTY
SWC PROJECT #1358
SORA PROJECT #19-13

June 30, 1967

A&D-660-1. Project Plan and Justification

A. State Plan Accord

Opportunities will be provided at the Sheep Creek Dam and Recreation Complex, Grant County, for the following outdoor recreation activities: boating, fishing, swimming, ice skating, picnicking, hiking and playing outdoor games.

The North Dakota State Comprehensive Outdoor Recreation Plan, as revised and updated, 1966, "Long Range Plan to 1980" indicates outdoor recreation needs on pages 60-62 for the seven planning areas. Area one (1), in which the project is situated, 1970 needs and local unmet needs will be partially met with the proposed installation.

Bureau of Outdoor Recreation priority designation "A" is accorded this project.

B. Summary of Area

Sheep Creek Reservoir is to be located four miles south of Elgin (1960 population - 944) on a tributary of the Cannonball River south of State Highway #21 in Grant County.

The area is presently used for general farming purposes, primarily grazing. Topographically, the area is ideally suited for installation of a retarding structure to create a water-based outdoor recreation complex. Natural forestation is lacking at

the project site, however, tree plantings and general landscaping are planned to enhance the area's appearance and add to its natural beauty.

C. Outline of Project Features

Approximately 283 acres of agricultural land are to be acquired in fee simple for the 85 surface acre reservoir envisioned which would contain 1160 acre-feet of water with a maximum depth of 40 feet. The dam is estimated to cost \$106,000, the land \$16,000, and recreation facilities \$33,130. (See detailed cost estimates.)

Recreation facilities are to be provided for general public use for activities such as picnicking, boating, swimming, camping, playing games, and hiking.

The various project phases, their costs, and cost allocations are as follows:

<u>AGENCY</u>	<u>SORA ADM.</u>	<u>LAND</u>	<u>DAM</u>	<u>FACIL.</u>	<u>TOTAL</u>
Grant County WMD	\$ -	\$ 5,500	\$ 12,600	\$10,265	\$ 28,365
SORA	3,100	2,500 (G&F)	17,600 (G&F)	6,300 (WC)	29,500
Game & Fish Dept.*	-	-	-	-	-
SWC	-	-	22,800	-	22,800
BOR	<u>3,100</u>	<u>8,000</u>	<u>53,000</u>	<u>16,565</u>	<u>80,665</u>
TOTALS	\$6,200	\$16,000	\$106,000	\$33,130	\$161,330

* All funds for cost participation by the State Game and Fish Department will be derived from an allocation made by the State Outdoor Recreation Agency from its appropriation (\$20,100).

D. Organizations and Coordination

All State agencies represented on the State Outdoor Recreation Agency Board reviewed the proposal for the Sheep Creek project. Contact was made with the Bureau of Reclamation which had conducted a study of the Cannonball River Basin. Maps which they had prepared in their study were utilized in the project planning effort. The Grant County Board of Commissioners has approved the project.

The primary agencies and their responsibilities include:

1. Administration - State Outdoor Recreation Agency
(Standard 4% of project costs.)
2. Engineering - State Water Commission
3. Land Acquisition - Grand County Water Management District with assistance of State Game and Fish Department
4. Dam Construction - State Water Commission with contract forces
5. Recreation Facilities - Grant County Water Management District
6. Financing - Bureau of Outdoor Recreation, State Outdoor Recreation Agency, State Water Commission, Grant County Water Management District

All funds required for matching are presently available.

E. Economic Feasibility

Serving a 50 mile radius area with a population of 10,000, the project's anticipated annual visitation is 30,000 with an assumed valuation per visit of \$1.

Annual operation and maintenance costs are estimated at \$1,500 and depreciation at \$5,378 or total annual costs of \$6,878, with estimated annual benefits of \$30,000 less \$6,878 annual costs, the average annual net benefits are \$23,122.

Assuming the \$161,330 total costs were invested and compounded at 4% for 30 years, we would have a product of \$523,257. With net annual benefits of \$23,122 over the projects anticipated 30-year life, we would receive total benefits of \$693,660 indicating a benefit cost ratio of 1.33 to 1. A project economic feasibility report is included with this project proposal.

F. Operation and Maintenance

The Grant County Water Management District will operate and maintain the project with technical assistance from the State Water Commission for the structural maintenance which may be required. The area will be open to the general public at all times. Funds for operation and maintenance will be obtained from taxes levied by the Grant County Water Management District which may levy up to three mills ad valorem. The taxable valuation in Grant County is \$6,814,334.

A&D-660-2. MAPS AND CHARTS

A. Included with this project proposal are the following maps and supporting data:

1. State map showing location of Sheep Creek Project #19-13
2. Aerial photo of project area
3. Design and Hydrology report (Office Engineer memo dated March 6, 1967)

4. Soil Investigation Report (Investigation Engineer memo dated March 7, 1967)
5. Water Permit #1424 and SWC Form 110 "Application for Dam Construction"
6. Land Acquisition Map
7. SWC Map #6037-1358-1 "Reservoir Topography"
8. SWC Map #6299-1358-2 & 2A "Dam Site Topography"
9. SWC Map #6482-1358-5 "Log of Test Borings"
10. SWC Map #6644-1358-6 "Recreation Area and Facilities"

A&D-660-3. AGREEMENTS

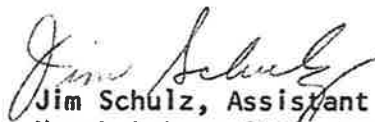
- A. The following agreements are included with this proposal:
 1. Grant County Board of Commissioners resolution approving the project
 2. Grant County Water Management District - Project Assurances
 3. Construction Agreement between Grant County Water Management District, State Outdoor Recreation Agency, Game and Fish Department and State Water Commission

A&D-660-4. PLANS

- A. Construction plans for the project are shown on the following maps included as part of the proposal:
 1. SWC Map #672-1358-8 "Spillway Conduit, Pipe Outlet and Anti-Seep Collar"
 2. SWC Map #672-1358-9 "Pipe Inlet and Outlet Details"
 3. SWC Map #672-1358-10 "Box Inlet Steel Details"

4. SWC Map #672-1358-11 "Box Inlet Steel Details"
5. SWC Map #672-1358-12 "Stilling Basin Details"
6. SWC Map #672-1358-13 "Stilling Basin Details"

Prepared by:



Jim Schulz, Assistant Secretary
North Dakota State Water Commission

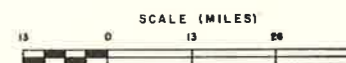
JS:ka

Dist.

7 SORA
1 Grant Co. WMD
1 Game & Fish
1 Comm. Hanson
10 SWC

Map No. 6 - Potential Recreation Resources in North Dakota

#19.13



GENERAL LEGEND

- COMMERCIAL FOREST ■
- NON-COMMERCIAL FOREST ■
- FOREST NURSERIES ▲
- SCENIC ROADS —
- LIGHT WEIGHT AGGREGATE PIT (Mandan) ○
- OIL FIELDS ○
- LIGNITE MINES ○
- CLAY PITS (Hebron) ○
- SALT PLANT (Williston) X

LEGEND

- EXISTING RECREATION AREAS ●
- POTENTIAL RECREATION AREAS ○
- EXISTING & POTENTIAL RECREATION AREAS ◐
- POINTS OF GEOLOGIC INTEREST ■

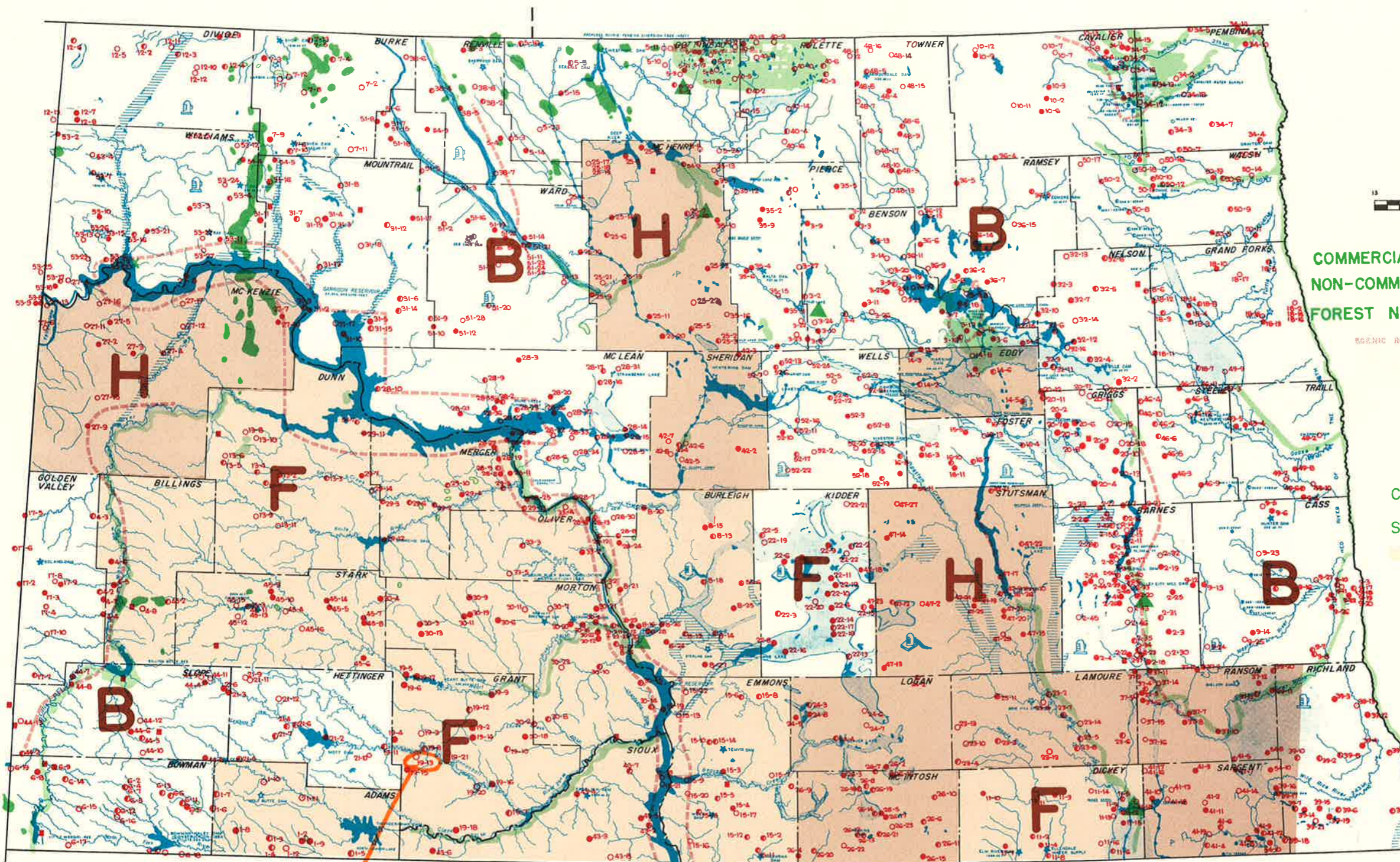
- EXISTING DAM ★
- PROPOSED DAM ☆
- DAM TO BE RECONSTRUCTED ★

CANALS - GARRISON DIVERSION —

COUNTY GROUNDWATER STUDY ■

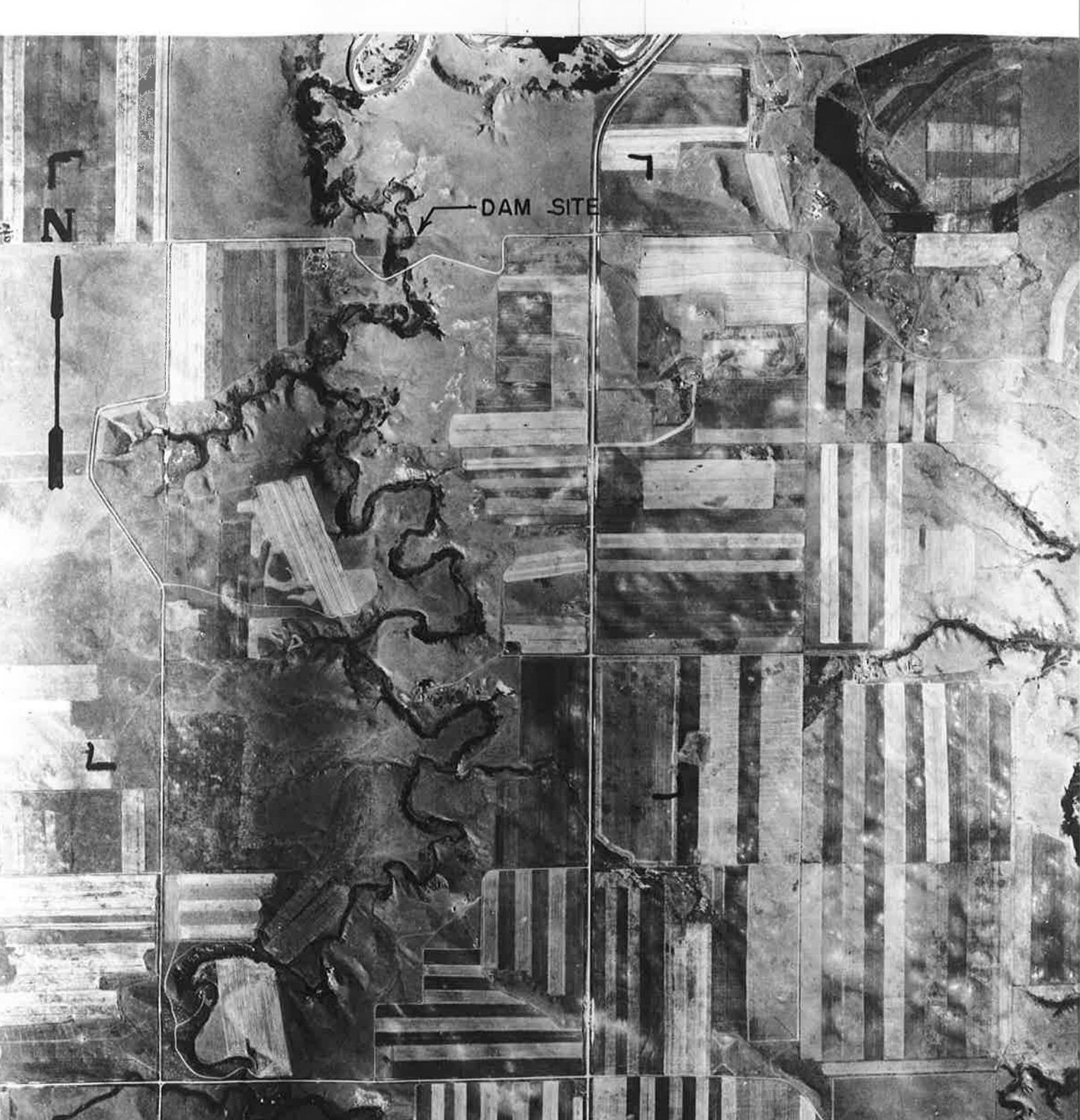
COUNTY GROUNDWATER STUDY COMPLETED ■

SHADED AREAS (BLUE) GROUNDWATER AQUIFER
"BUY NORTH DAKOTA PRODUCTS"



- B.... PREDOMINANT CASH GRAIN FARMS
- F.... PREDOMINANT LIVESTOCK FARMS & RANCHES
- H.... GENERAL FARMS, NO PREDOMINANCE

Data Source: U.S. Census of Agriculture 1959, Vol. I, Part 1B, North Dakota



DAM SITE

N

NORTH DAKOTA STATE WATER COMMISSION

COST ESTIMATE

SHEEP CREEK DAM
SWC Project #1358
June 30, 1967

54" RCP - 180 ft. @\$45	\$ 8,100
Concrete - 62 yd. ³ @\$90	5,580
Cable Ties	400
Embankment - 127,000 yd. ³ @35¢	44,500
Core Trench Excavation - 6,000 yd. ³ @60¢	3,600
Riprap - 2,000 yd. ³ @\$4.50	9,000
Gravel - 4,000 yd. ³ @\$2	8,000
Outlet Pipe and Valve	1,500
Toe Drain	1,500
Seeding	<u>300</u>
Subtotal	\$82,480
Engineering	8,000
Contingencies	10,500
Indirect Costs	<u>5,020</u>
TOTAL	\$106,000

NORTH DAKOTA STATE WATER COMMISSION

SWC PROJECT #1358
SORA PROJECT #19-13

Recreation Facilities
Cost Estimate

Sheep Creek Recreation Area
June 30, 1967

<u>Item</u>	<u>Number</u>	<u>Estimated Unit Cost</u>	<u>Estimated Total Cost</u>
I. Area #1			
1. Boating Area			
a. Concrete Launching Ramp	1	\$ 1,075	\$ 1,075
b. Dock	1	300	300
2. Parking Area #1			
a. Grading	10 hrs.	14	140
b. Crushed Gravel	300 c.y.	2	600
c. Barriers	30	4	120
II. Area #2			
1. Picnic Area			
a. Table	4	55	220
b. Fireplace	2	40	80
c. Trash Receptacle	2	15	30
d. Well	1	1,500	1,500
e. Trees	100	1	100
2. Parking Area #2			
a. Grading	10 hrs.	14	140
b. Crushed Gravel	300 c.y.	2	600
c. Barriers	80	4	320
3. Trailer Parking Area			
a. Grading	20 hrs.	14	280
b. Gravel	200 c.y.	2	400
c. Toilets	1	1,825	1,825
d. Trees	50	1	50

<u>Item</u>	<u>Number</u>	<u>Estimated Unit Cost</u>	<u>Estimated Total Cost</u>
III. Area #3			
1. Picnic Area			
a. Tables	10	\$ 55	\$ 550
b. Shelter	4	1,075	4,300
c. Fireplace	5	40	200
d. Trash Receptacle	10	15	150
e. Well	1	1,500	1,500
2. Swimming Area			
a. Sand Blanket	2,000 c.y.	2	4,000
b. Float Line	1	100	100
c. Comfort Station and Change House	1	2,175	2,175
d. Toilets	1	1,825	1,825
3. Play Ground			
a. Swing Set	1	500	500
4. Parking Area #3			
a. Grading	10 hrs.	14	140
b. Crushed Gravel	300 c.y.	2	600
c. Barriers	50	4	200
5. Access Road			
a. Grading	70 hrs.	14	980
b. Crushed Gravel	1,000 c.y.	2	2,000
6. General Area Development			
a. Trees	1,000	1	1,000
b. Signs	Lump Sum		300
		Sub Total	28,300
		Engineering	2,830
		Indirect Costs	2,000
		TOTAL	\$ 33,130

NORTH DAKOTA STATE OUTDOOR RECREATION AGENCY
 Project Economic Feasibility Report
 Benefit-Cost Ratio

Project SHEEP CREEK DAM AND RECREATION COMPLEX, SWC #1358

Location (Co.) GRANT SORA # 19-13

I. BASIC DATA

A. Radius of anticipated use -	50 miles
B. Population within use area -	10,000
C. Anticipated annual visitation -	30,000
D. Investment (include land) -	\$ 161,330
E. Estimated life of facilities -	30 years

II. ANNUAL COSTS

A.. Operation and Maintenance -	\$ 1,500
B. Depreciation (I.D ÷ I.E) -	\$ 5,378
C. Total annual costs -	\$ 6,878

III. ANNUAL BENEFITS

A. Assumed value per visitation -	\$ 1
B. Est. Annual Benefits (III.A x I.C) -	\$ 30,000
C. Average Annual Net Benefits - (III.B - II.C)	\$ 23,122

IV. BENEFIT-COST RATIO

A. Factor for value of I. compounded yrs. @ % = (Standard - 30 yrs. @4% = 3.24339751)	3.24339751
B. Product of Investment (I.D) x factor (IV.A) -	\$ 523,257
C. Total benefits (III.C x I.E) -	\$ 693,660
D. Benefit-cost ratio (IV.C ÷ IV.B) -	1.33:1

Green Form - D-660-1.E.

June 30, 1967

SORA Form #28

NORTH DAKOTA STATE WATER COMMISSION

MEMO TO: Milo W. Hoisveen, Chief Engineer
FROM: Dale H. Glover, Office Engineer
SUBJECT: Sheep Creek Dam, Project #1358
DATE: March 6, 1967

Interest developed in construction of a dam on Sheep Creek in 1964, at a time when the County was planning to build a road and bridge across the Creek. Since then the Grant County Water Management District has been formed, and presumably will contribute to financing the project if it is built. There appears to be much local interest in the project, by local private citizens, a wildlife club, and by Commissioners of the Water Management District.

A map of the reservoir area is available from a survey made by the U. S. Bureau of Reclamation in connection with another project which is now abandoned.

The proposed damsite is at the south line of Section 10, Township 133 North, Range 89 West. It is five (5) miles east and two (2) miles south of New Leipzig, North Dakota (population 390) and four (4) miles south of Elgin, North Dakota (population 944). The nearest water-based recreation area is Lake Tschida, a Bureau of Reclamation reservoir on the Heart River, 18 miles to the north of the proposed damsite.

The Sheep Creek watershed above the damsite is about 51 square miles, however, the uppermost 15 square miles is tributary to the Pretty Rock Natural Wildlife Refuge, leaving 36 square miles directly tributary to the proposed reservoir. The average yearly runoff is estimated at 40 acre-feet per square mile, making a total inflow to the reservoir of 1,440 acre-feet per year. In some years, it is possible that overflow from the Wildlife Refuge would increase the volume.

Normal level of the reservoir pool would be at elevation 2,225 feet, the water area would be 85 acres, and the total volume in storage would be 1,160 acre-feet. The maximum depth of pool would be 40 feet. The service spillway

would consist of a 54 inch reinforced concrete pipe. The emergency spillway would be a grassed chute, 30 feet wide with the bottom at the entrance at elevation 2,235 feet. The volume between the service spillway and emergency spillway would be 1,090 acre-feet, which exceeds the volume (890 acre-feet) estimated for a flood of 100-year frequency in this locality and terrain. A roadway 20 feet wide would be provided across the top of the dam, which would be at elevation 2,240 feet.

The dam would be a compacted earth fill structure with slopes of 3:1 upstream and 2:1 downstream. The maximum height above the streambed would be 56 feet. The embankment would include an impervious core section, filter blanket and toe drains.

The outlet of the service spillway would consist of a stilling box with baffle blocks in the floor, and the streambed downstream from the outlet would have rock riprap protection.

Test borings at the site show that with a moderate amount of excavation, suitable foundations soils will be exposed.

There are no utilities, roads, bridges, etc. within the reservoir area which would require removal and relocating.

The present estimated cost of the dam structure is \$106,000, exclusive of costs of lands and associated recreation developments.



Dale Glover
Office Engineer

DG:ka

Dist.
MWH (File #1358)
A I G
DG

NORTH DAKOTA STATE WATER COMMISSION
OFFICE MEMO

MEMO TO: Milo W. Hoisveen, Chief Engineer
FROM: Arland C. Grunseth, Investigation Engineer
SUBJECT: Soil Investigation, Sheep Creek
DATE: March 7, 1967

SOIL INVESTIGATION

Project No. 1358

County: Grant

Project Name: Sheep Creek Dam

INTRODUCTION:

A preliminary investigation was initiated by the State Water Commission to determine the feasibility of an earthfill dam at a proposed site on Sheep Creek, south of Elgin, North Dakota. A total of five test borings were drilled and tested by Twin City Testing and Engineering, Bismarck, North Dakota, during a period from June 21 to 28, 1965. One additional test boring (Boring #6) was drilled by the State Water Commission on October 26 and 27, 1965. The exact locations of the test borings are shown on Drawing No. 6299-1358-2 and the enclosed Test Boring Location Plat.

Laboratory and office work on the foundation studies was performed by the writer and Mr. Ray Christensen, Soils Technician. It included the following: (1) visual examination and analysis of the cores from the test borings, (2) sieve and hydrometer analysis, (3) compilation of test boring and other data, and (4) completion of the written report.

GEOLOGY AND PHYSIOGRAPHY:

The Sheep Creek Dam Site, as described in this report is located along Sections 10 and 15, Township 133 North, Range 89 West, in the west central part of Grant County, in southwestern North Dakota. The largest community in the area, the city of Elgin, has a population of about 950.

Grant County is in the unglaciated portion of the Missouri Plateau, a physiographic province of North Dakota. This province is characterized

by rolling uplands and high flat-topped buttes that are generally capped with a massive and resistant sandstone.

The geologic sequence of rocks which crop out and underlie the entire area is the Tongue River Formation of Paleocene Age. The Tongue River Formation consists essentially of alternating beds of sandstones, clays, and lignite. It is the major lignite-bearing formation in North Dakota.

TESTS:

The borings were cased with a 2½ inch drive pipe which was cleaned and advanced by standard jetting methods or with a cleanout tube. The penetration (N) resistance of the soil was measured by driving a 2 inch O.D. split tube sampler a distance of one foot into previously undisturbed soil with a 140 pound hammer and a 30 inch drop. In the United States this test is commonly referred to as the "Standard Penetration Test." This standard test gives an indication of the consistency of cohesive soils or the relative density of cohesion-less soils. The results are tabulated for each of the borings. This test is not conclusive in itself, but it does afford an indication of the relative strength of the various soils tested.

SOIL CONDITIONS:

The textural quality of the soils encountered in the six test borings appear to be quite uniform and consist primarily of sandy loam in the upper levels with clay predominating in the lower levels. However, in test boring three, a very dense gray loam was encountered at the base of the sandy loam and was drilled to a total depth of 40 feet with no major change in texture.

Test borings three and five drilled on the upper right and left bank respectively, indicate near uniform soil conditions. The textural classification of the soils within the top ten feet \pm is predominantly a non-plastic sandy loam within the SM soil group. Due to their granular texture and very low plasticity, a relatively high permeability coefficient can be expected. The state of consistency of these soils range from very loose to medium dense.

Below the depth of ten feet in test borings three and five, the soils are still predominantly within the textural classification of sandy loam and within the SM and SC soil group. However, the soils within this part of the foundation are compact, very dense and range from non-plastic to slightly cohesive. These are all mainly frictional type soils, and as such, are dependent upon the angle of internal friction (ϕ) for shear strength. The angle of internal friction ranges from approximately 35° to very high. Therefore, the soils within this part of the foundation contain very high shear and load bearing values and will provide for very heavy loads transmitted to their depth. Also, the permeability of these soils is generally much lower than those in the upper ten feet, due to their compactness and very dense state of consistency.

EMBANKMENT MATERIALS:

The material available for the core trench and dam embankment is predominantly a lean-plastic clay and non-plastic to slightly plastic silty and clayey sandy loam within the CL and SC-SM soil groups respectively. Of the fine-grained soils, the CL soil group offers good stability, ideal for impervious cores and blankets, and is best adapted for embankment construction. Of the coarse-grained soils, the SC-SM soil group is fairly stable and may be used for impervious cores.

The SM soil group is not particularly suited to shells, and if used, an upstream blanket or toe drainage should be required for seepage control.


The embankment fill should be placed near optimum moisture and never greater than two or three percentage points above optimum. If the moisture content is properly controlled in the fill, the soils will compact with either a sheepfoot or pneumatic-tired roller. Little consolidation in the fill is expected because of the percentage of sand in the soils.

RECOMMENDATIONS:

In view of the soils data encountered in the preliminary investigation and based on laboratory test results, the site is acceptable for an earth embankment with the following recommendations:

- (1) The foundation proper should be stripped of all loose unconsolidated material to provide a firm base.
- (2) A core trench should be excavated to the proposed depth as shown on Drawing No. 6680-1418-3 and in accordance with design specifications.
- (3) Vertical excavation may vary depending upon subsurface conditions, the exact depth to be determined by the Engineer. However, the core trench should be excavated to a minimum depth of two (2) feet into firm and impervious material.
- (4) The ends of the core trench should be well keyed into the compact and very dense sandy loam on the abutments.
- (5) A proper underground or toe drainage system should be installed to sufficiently relieve the pressure that may be caused by seepage below the core of the dam. The drainage system should consist of a properly located toe drain parallel to the embankment axis along

the downstream toe. This system should sufficiently relieve the build up of pore pressures and the possibility of piping.


Arland C. Gruneth
Arland C. Gruneth
Investigation Engineer

ACG:ch
Dist:
MWH
SWC Project File # 1358
AIG
DG

SWC#1358
April 10, 1967

Commissioner Hauge made the motion to adopt the following resolution, which motion was seconded by Commissioner Ulmer.

RESOLUTION

Be It Hereby Resolved by the Grant County Board of Commissioners that the present plans for the project known as Sheep Creek project in Grant County, North Dakota be approved.

Dated at Carson, North Dakota, this 4th day of April, 1967.

Grant County Board of Commissioners

Wm Besser Jr Chairman

S. H. Hauge Member

Ed Ulmer Member

ATTEST

Oliver
County Auditor

C
O
P
Y

Dist. ✓
SWC Proj. # 1358
SWC Acct.
lea. Proj. Participant

SWC Proj. # 1358

A G R E E M E N T
CONSTRUCTION OF WORKS

THIS AGREEMENT is entered into by and between:

(1) The North Dakota State Water Commission, hereinafter referred to as the Commission, acting by and through, Milo W. Hoisveen, Secretary and Chief Engineer;

(2) The Grant County Water Management District, hereinafter referred to as the District, acting by and through Harry Zacher, Chairman (Elgin);
(name)
(title)

(3) The State Outdoor Recreation Agency, hereinafter referred to as the Agency, acting by and through Milo W. Hoisveen, Executive Officer;
(name)
(title)

(4) The State Game & Fish Department, hereinafter referred to as the Department, acting by and through Russell Stuart, Commissioner.
(name)
(title)

I. Project, Location and Purpose

WHEREAS, the parties to this Agreement propose to construct the following:

Sheep Creek Dam and Recreation Complex, SORA Project #19-13

hereinafter referred to as the Project, located in Sections 10, 15 and 22,

Twp. 139, Rge. 89, Grant County, North Dakota, the purpose of which is

to provide a multi-use outdoor recreation facility for the general public.

NOW, THEREFORE, IT IS AGREED:

II. Drawings and Specifications

That the Project shall be constructed in accordance with drawings

and specifications of the _____ Commission _____, approved by
 _____ Agency _____, _____ Department _____, and _____ District _____,
 which drawings and specifications, State Water Commission maps designated by
(describe)
#1358 and standard recreation facility drawings #1376.

are by this reference made a part of this Agreement to the same force and
 effect as if they were incorporated into the body of this Agreement.

III. Costs and Allocations

That the estimated cost of the various Project elements and their
 allocation to the Project participants shall be as follows:

A. Preliminary Engineering and Investigations - Total Estimate \$ _____

- 1. North Dakota State Water
Commission - \$ _____ or _____ %
- 2. _____ \$ _____ or _____ %
- 3. _____ \$ _____ or _____ %
- 4. _____ \$ _____ or _____ %
- 5. _____ \$ _____ or _____ %

B. Land and/or Easement Acquisition - Total Estimate \$ 16,000

- 1. North Dakota State Water
Commission - \$ - or - %
- 2. District \$ 5,500 or 34.4 %
- 3. Agency (G & F) \$ 2,500 or 15.6 %
- 4. _____ \$ _____ or _____ %
- 5. Bureau of Outdoor
Recreation \$ 8,000 or 50 %

C. Construction of Main Works - Total Estimate \$ 106,000

- 1. North Dakota State Water
Commission - \$ 22,800 or 21.5 %
- 2. District \$ 12,600 or 11.9 %
- 3. Agency (G & F) \$ 17,600 or 16.6 %
- 4. _____ \$ _____ or _____ %
- 5. Bureau of Outdoor Rec. \$ 53,000 or 50 %

D. Construction of Appurtenant Works - Total Estimate	\$	<u>33,130</u>	
(Recreation facilities)			
1. North Dakota State Water Commission -	\$	<u>-</u>	or <u>-</u> %
2. District	\$	<u>10,265</u>	or <u>31</u> %
3. SORA (WC)	\$	<u>6,300</u>	or <u>19</u> %
4. _____	\$	<u>_____</u>	or <u>_____</u> %
5. Bureau of Outdoor Rec.	\$	<u>16,565</u>	or <u>50</u> %
E. Other Items - Total Estimate	\$	<u>6,200</u>	
(SORA Administrative Costs)			
1. North Dakota State Water Commission -	\$	<u>-</u>	or <u>-</u> %
2. _____	\$	<u>-</u>	or <u>-</u> %
3. SORA	\$	<u>3,100</u>	or <u>50</u> %
4. _____	\$	<u>-</u>	or <u>-</u> %
5. Bureau of Outdoor Rec.	\$	<u>3,100</u>	or <u>50</u> %
F. Total Project Costs and Allocations -	\$	<u>161,330</u>	
1. North Dakota State Water Commission -	\$	<u>22,800</u>	or <u>14.1</u> %
2. District	\$	<u>28,365</u>	or <u>17.6</u> %
3. SORA	\$	<u>29,500</u>	or <u>18.3</u> %
4. _____	\$	<u>-</u>	or <u>-</u> %
5. Bureau of Outdoor Rec.	\$	<u>80,665</u>	or <u>50</u> %

That all parties shall provide the others with cost statements within 30 days after the Project's completion and settlements shall be made within 30 days of receipt of said statements.

IV. Title to Lands and/or Easements

That title to all lands and/or easements for the Project shall be purchased in the name of the Grant County Water Management District by the District and recorded in the County Register of Deeds office wherein the Project is situated.

V. Operation and Maintenance

That the _____ District _____ shall operate and maintain the Project in accordance with rules and regulations prescribed by the Commission and Agency _____.

VI. Indemnification

That the _____ District _____ does hereby accept responsibility for, and holds the Commission and the _____ Agency _____ harmless from, all claims and damages to public or private properties, rights, or persons arising out of the construction, operation, and maintenance of the Project. In the event a suit is initiated or judgment entered against the Commission or _____ Agency _____ the _____ District _____ shall indemnify them for any settlement arrived at or judgment satisfied.

VI. Changes in Responsibilities

That changes in any responsibilities of the parties hereto or conditions herein stated will not be effective or binding unless such changes or conditions are made in writing, signed by the parties concerned and attached hereto.

VIII. Other Stipulations

1. State Outdoor Recreation Agency funds totaling \$20,100 have been allocated to the State Game & Fish Department for land acquisition and dam construction.

2. State Outdoor Recreation Agency funds totaling \$6,300 have been allocated to the State Water Commission for recreation facilities.

3. Bureau of Outdoor Recreation cost participation is dependent upon approval
IN WITNESS WHEREOF, the parties hereto have signed this Agreement the _____ by that agency.
day and year indicated below.

WITNESS:

DATE:

NORTH DAKOTA STATE WATER COMMISSION
By:

Jane Duede 6/15/67

Milo W. Housman
Secretary and Chief Engineer

Albert Dickson
~~_____~~ 6-20-67

Grant County Water Management District
By: Harry R. Zech Chairman

_____ 6/15/67

State Outdoor Recreation Agency
By: Milo W. Housman Executive Officer
State Game & Fish Department

Alice Zoller 6/28/67

By: Russell W. Stewart
Commissioner

PART E - PROJECT ASSURANCES

NORTH DAKOTA STATE OUTDOOR RECREATION AGENCY
1301 STATE CAPITOL
BISMARCK, NORTH DAKOTA

(for use of SORA office only)

SORA PROJECT NO. 19-13

DATE RECEIVED _____

PRIORITY _____

1. APPLICANT Grant County Water Management District AGENCY Dist.
% Harry Zacher, Chairman, Elgin, North Dakota ADDRESS WMD
PROJECT IS LOCATED IN Grant COUNTY SWC ✓

2. PROJECT IDENTIFICATION: TITLE Sheep Creek Dam and Recreation Complex SORA NO. 19-13

LEGAL DESCRIPTION: _____ SEC. 10 TWP 139 RGE 89

SCOPE OF PROJECT: Acquire approximately 283 acres land, construct dam creating 85 acre lake and install recreation facilities for general public use.

Total estimated project cost - \$161,330. SWC Proj. #1358

TO BE STARTED March 1 19 68 TO BE COMPLETED October 31 19 70

IN SUBMITTING THIS PROJECT PROPOSAL Grant County Water Management District
(Name of Applying Agency)

HEREBY CERTIFIES THAT:

- A. No financial assistance has been given or promised under any other Federal program or activity with regard to this proposed project.
- B. The Applicant responsible for the proposed project has the ability and the intention to finance its share of the project.
- C. The Applicant accepts the obligation to comply with applicable laws, rules and regulations in effect at the time of the award and to the further terms and conditions of the Bureau of Outdoor Recreation Manual in effect at the time of the award.
- D. Property acquired under this program will be placed in use as an outdoor recreation facility and will be retained for such use in perpetuity or otherwise as provided and agreed to in the project agreement. Prior approval of the North Dakota State Outdoor Recreation Agency will be obtained before any other disposal is made of such property.
- E. The Applicant has the intent and ability to finance the operation and maintenance of the facility being developed for so long as is required.
- F. No foreign uses of such property, other than those described in the proposal will be permitted unless approved in advance by the North Dakota State Outdoor Recreation Agency. In the event foreign use is made of such project the Applicant shall, within one year of such foreign use, reimburse the North Dakota State Outdoor Recreation Agency the cost of the project, less the amount of such cost paid by the Applicant.
- G. If for any reason it shall become necessary for any department or agency of the State of North Dakota to expend State funds in order to fulfill any obligations which the Applicant has agreed to perform in the construction and maintenance of this project, the Applicant shall, within a one year period, reimburse the State department or agency the amount of funds expended for such maintenance or operation.
- H. The Applicant understands that qualification of this project proposal by the North Dakota State Outdoor Recreation Agency does not in itself constitute an obligation or award of requested funds and does not guarantee that funds will necessarily be made available for the project.
- I. The Applicant will supply development specifications and detailed plans to the North Dakota State Outdoor Recreation Agency as requested to do so by the Executive Officer of the Agency.
- J. The Applicant shall, within thirty days after completion of the project, submit to the North Dakota State Outdoor Recreation Agency a certified and itemized statement of its expenditures made in connection with the project, and shall, upon request, make all financial records available to the North Dakota State Outdoor Recreation Agency at any time.

SUBMITTED BY Grant County Water Management District APPLICANT

Harry R. Zacher (Name of Applying Agency)
(Authorized Representative) TITLE Chairman DATE 6/15/67

(Authorized Representative) TITLE _____ DATE _____

(Authorized Representative) TITLE _____ DATE _____

Permit No. 1424

Application for a Permit to Divert and Appropriate the Water of the State of North Dakota



Date received and filed in State Engineer's office... Grant County Water Management District - Sheep Creek Dam

(Name of Applicant) Elgin, North Dakota, whose post office address is... hereby applies for a permit to divert and appropriate water of the State of North Dakota as stated herein, subject to existing rights.

- 1. Source of proposed appropriation... Sheep Creek... Cannonball River
2. A. Amount of water requested... 1160 acre-feet storage plus 255 acre-feet annually use
B. Proposed rate of withdrawal of water... cubic feet per second or gallons per minute.

3. Points of Diversion:

- A. (1) 1/4 1/4 Sec. Twp. Rge.
(2) 1/4 1/4 Sec. Twp. Rge.
(3) 1/4 1/4 Sec. Twp. Rge.

B. If water is to be delivered from storage reservoir complete the following: and file NDSWCC Form 110 or 111: South line of

Location of dam SW 1/4 SE 1/4 Sec. 10 Twp. 133 Rge. 89 and NW 1/4 NE 1/4 Sec. 15, Twp. 133, Rge. 89

Height embankment above stream bed 36 Ft. Capacity of Reservoir 1160 acre-feet. Area of water surface 85 acres.

C. If water is to be obtained from well complete the following:

Proposed depth well... Depth to top of Aquifer... Proposed size well or well casing... Depth to Bottom of Aquifer... Has pump test been performed... if so, by whom... Computed capacity of well...

4. Purpose Recreation

A. If purpose is irrigation:

Type of irrigation system... Dates of use... Estimate of time required for completion of system...

5. Has the quality of water analysis been made? Class water C S

Date Sample taken...

6. Description of land to be irrigated (show lot numbers where applicable):

Table with columns: Sec., Twp., Rge., NE 1/4, NW 1/4, SW 1/4, SE 1/4, Total. Multiple rows for land description.

Total number of acres to be irrigated

Located in Grant County, North Dakota.

Estimated quantity of water that will be returned to the approximate source from which diverted:

Grant County Water Management District

x By [Signature] (Applicant's Signature) Chairman

NOTE: Above application is merely a declaration of intention to create a water right, approval does not create such right. Water right will be created only if and when water is beneficially used.

DO NOT COMPLETE THIS SIDE OF FORM — THIS SIDE FOR USE OF STATE ENGINEER

CONDITIONAL PERMIT

This is to certify that I have examined the foregoing application and hereby approve the same
SUBJECT to prior water rights. The acre-feet is subject to modification by the State
Engineer. ~~Failure to comply with any order of the State Engineer may result in~~
(If denied state reason, if approved state condition, if any, to approval)

forfeiture of water right.

The amount of water to be appropriated shall be limited to the amount that can be used beneficially, not
to exceed 1160 acre feet each year for storage plus 255 acre-feet annual use.

1. Date of priority April 10, 1967
2. Date of hearing on application May 22, 1967
3. Date of approval by State Water Conservation Commission June 30, 1967
4. Construction to be initiated on or before --
5. Construction to be completed on or before --
6. Water shall be beneficially used on or before December 31, 1972

WITNESS my hand and seal this 5th day of July, 19 67.

Mulo W. Hansen
State Engineer
Secretary, State Water Conservation Commission

Permit No. _____

APPLICATION FOR PERMIT TO CONSTRUCT OR ENLARGE A DAM OR RESERVOIR



To: Chief Engineer
North Dakota State Water Commission
Bismarck, North Dakota

Management District

I, Harry Zacher, Chairman, Grant County Water Management District, the undersigned, do hereby apply for a permit to construct or enlarge dam as indicated below and according to specifications shown on this and attached sheets:

1. Location: County Grant South line of
Legal description to nearest forty acre tract: SW 1/4 SE 1/4 Sec. 10 Twp. 133 N., Rge. 89 W.

2. Purpose: Recreation

3. Data
Drainage Area Above Dam 36.6 Square Miles

Type of Dam Earth Embankment

Type and Size of Spillway Reinforced Concrete Pipe 54" Dia.

Type and Size of Emergency Spillway Grassed Chute 30'

Type and Size of Gate Reservoir Control Structure -

Invert Height above Stream Bed of Control Structure 41'

Height of Spillway above Stream Bed 51' feet

Surface Area of Reservoir at Spillway Crest 85 acres

Computed Reservoir Capacity at Spillway Crest Elevation 1160 acre feet

4. Water course on which dam is to be located is a tributary to: Cannonball River

5. Will flows presently available to downstream riparian land owners be depleted? no If so, to what extent?

6. Downstream landowners who might be deprived of use of water by construction of the dam are -

7. Is the dam and impounded water on the owners land? yes
(If the answer is no, proof of easement from other owner must be filed with application.)

8. For an enlargement of an existing dam, answer the following:
Why is enlargement necessary? _____

Year dam was constructed _____ By what agency _____

Total yardage in existing dam _____

9. The dam will be built under the supervision of North Dakota State Water Commission and will conform to data and specifications given above and on the following attached sheets plans on file
North Dakota State Water Commission
(Name or Number of attached data sheet)

10. This dam will be operated in conformance to all state water laws and rules and regulations of the North Dakota State Water Commission.

11. Construction will begin on or before December 31, 1969, 19____
and will be completed on or before December 31, 1970, 19____

Date Submitted: 4-10-69
X Signed By Harry Zacher
(Owner of land on which dam is located) Chairman
Address _____

OF NORTH DAKOTA)
Y OF Grant)ss

I this 10 day of March 1969, before me a Notary Public personally appeared Harry Zacher

known to me to be the same person who executed the foregoing application and acknowledged to me that he executed the same.

[Signature]
Notary Public, _____ County, N. D.
My Commission Expires _____

should be recognized that the filing of this application and its approval in no way relieves the landowner of any responsibility or liability for damages from the construction, operation or failure of this structure.

AFFIDAVIT OF DESIGNING AGENCY

The dam and reservoir described in this application and on attached sheets has been designed and approved by the _____
State of North Dakota _____ and, if the construction thereof is supervised by this agency, it will be built accord-
(Name of Agency) _____ ing to the specifications and data shown in this application and data sheets attached hereto.

Dated this _____ 10th _____ day of _____ April _____, 1967 _____

North Dakota State Water Commission
(Name of Agency)

Bismarck, North Dakota
(Address of Agency)

Designing Agency
Signed _____ North Dakota State Water Commission

By: *M. W. Hansen*

Title _____ State Engineer-Chief Engineer

For use of North Dakota State Water Commission
APPROVAL AND PERMIT

This is to certify that I have examined the foregoing application and hereby approve the same subject to the rules and regulations of the
North Dakota State Water Commission and the laws of the State of North Dakota subject to the following conditions: _____

WITNESS my hand and seal this _____ 5th _____ day of _____ July _____, 19 67 _____

Signed: *M. W. Hansen*
Chief Engineer
North Dakota State Water Commission

DISAPPROVAL

This is to certify that I have examined the foregoing application and hereby reject and disapprove the same for the following reasons: _____

WITNESS my hand and seal this _____ day of _____, 19 _____

Signed: _____
Chief Engineer
North Dakota State Water Commission