

Considered: _____

WATER PERMIT NO. 5294-3MAP No. same 224-7744Name of Applicant County of HughesPost Office Address Hughes Co. Courthouse, Pierre SD 57501Amount of Water Claimed 75gpm (0.167 cfs) Total Acres NASource of Water Supply Missouri RiverWater to be used for COM, RWS, DOM County Hughes, SullyAbout 24 miles W of Blunt

PROOF OF PUBLICATION: Received _____ Not Received _____

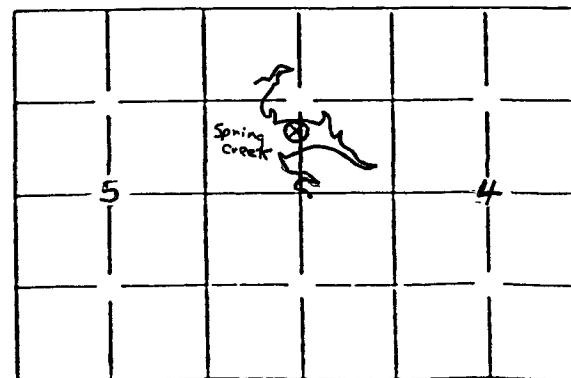
APPLICATION: Approved _____ Subject to _____

F.F. & C.L. Adopted _____ Not Approved _____ Deferred _____

PRIORITY _____ Date Received Mar 14, 1989 Fee _____ Remarks _____Corrected Application Received _____ Period of Annual Use JAN-DECWATER QUALITY APPROVAL RECEIVED NA APPROVED/CONDITIONAL (Circle one)

WI-1 Description same as Application YES _____ NO _____ REMARKS _____

Diversion Point Missouri River : adjacent the
line between the SE 1/4 NE 1/4 sec 5 and the SW 1/4 NW 1/4
sec 4; all in T112N-R80W

Land to be Irrigated NAWell Log: Driller NA Licensed YES _____ NO _____

Depth of Well _____ REMARKS _____

Type of Map Plat PREPARED BY Gregory Wierenga Reviewed and the Number
 assigned on March 20, 1989 By Ron Duval

No. 5294-3 Hydrologic Unit 10130105
 Map No. same Basin Missouri River
 Newspaper Pierre Daily Capitol Journal, Box 878
Onida Watchman, Box 205, Thurs 57564

523 E. Capitol
 Pierre, SD 57501
 (605) 773-3352

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use of water: Industrial ☐ Commercial ☒ Municipal ☐ Other Common Distribution System ☐
 Rural Water System ☒ Suburban Housing ☐ Geothermal Heat ☐ Institutional ☐ Recreational ☐
 Domestic ☒ (above 18gpm) Other ☐

Type of Application: Check one or more of the following

New ☒ Vested Right ☐ Future Use ☐ Change Use ☐

☐ Amend Permit No. _____ with old priority date retained

Change diversion point(s) ☐ Add diversion point(s) ☐ Other ☐

☐ Application to: Change diversion point(s) ☐ Add diversion point(s) ☐ on Permit No. _____

☐ Construction to use water reserved by Future Use Permit No. _____



1. Name of Applicant County of Hughes Phone No. 605-224-7744

Post Office Address Hughes County Courthouse Pierre State SD 57501
(Street, RR or Box) (City) Zip Code

2. Amount of water claimed (c.f.s.) 75 gpm 0.167 cfs

3. Source of water supply Uahe Reservoir Missouri River

4. Location of point of diversion In Bay Located Approximately 1800' South of The Hughes County/
Sully County Line on Section Line Between Sections 4 and 5; T112N, R80W of the 5th P.M.,
See Page 26 in Engineering Report County Hughes

5. Counties where water will be used Hughes

6. Annual period during which water is to be used January 1 - December 31

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

See Report

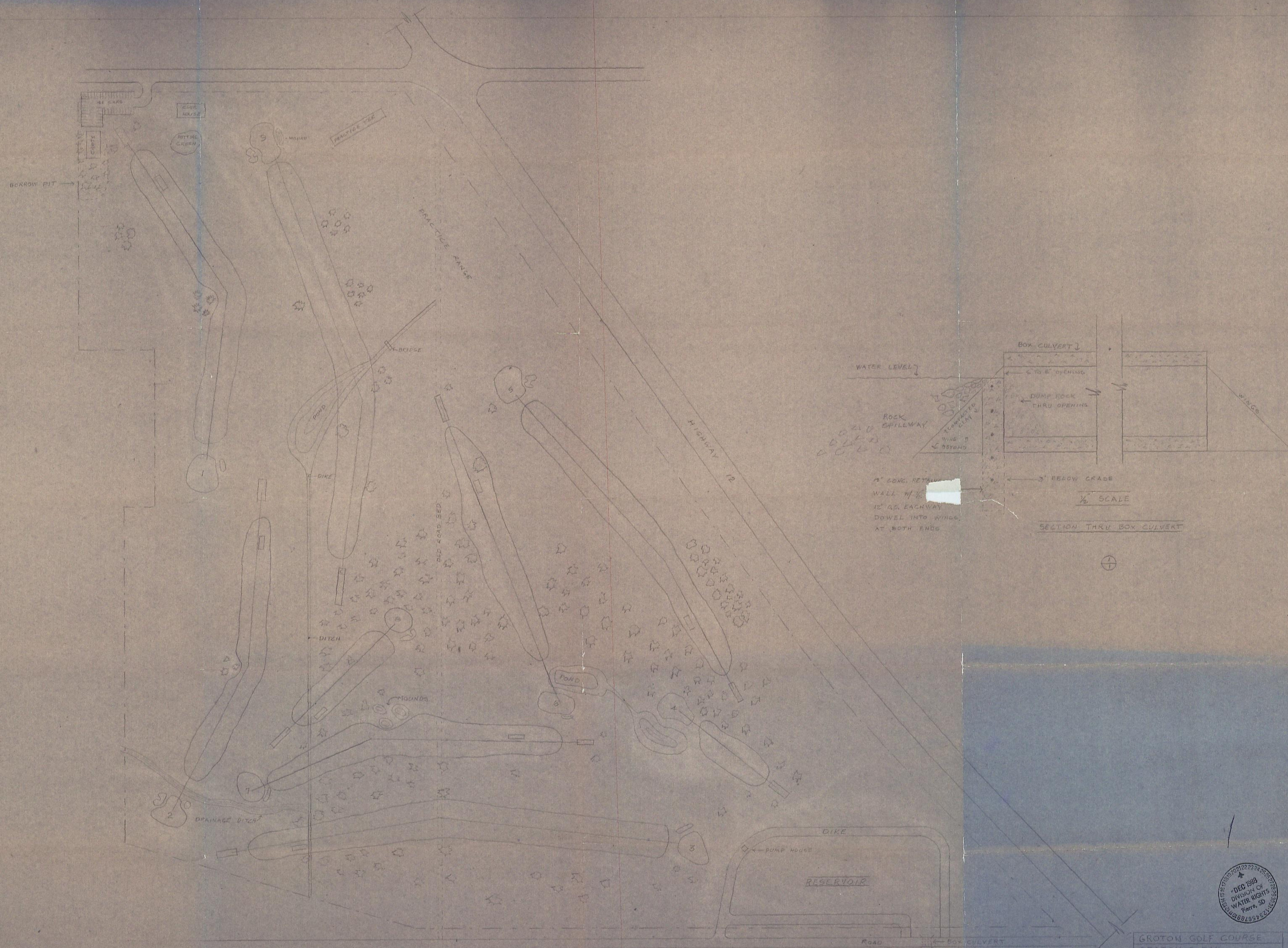
Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map (see instruction)

STATE OF SOUTH DAKOTA)
 County of Hughes)^{ss}

I, Hughes County Commission, Jerry Hawkins, Chairman the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.

Signed Jerry Hawkins

Subscribed and sworn to before me this 14 day of March 19 89
MARY LOU BETHKE, Notary Public
My Commission Expires February 29, 1996
Mary Lou Bethke
 Notary Public



GROTON GOLF COURSE
GROTON, S. DAK.
SCALE: 24" = 100'
8-7-88

Appl. 16 5249-3

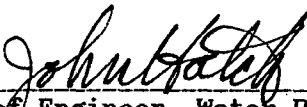
**SOUTH DAKOTA
WATER PERMIT No. 5294-3**

Date of first receipt of application March 14, 1989.

The Water Management Board approved Water Permit Application No. 5294-3 on May 10, 1989 for the County of Hughes, c/o Jerry Hawkins, Commissioner, Hughes Co. Courthouse, Pierre, SD 57501 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 5294-3 appropriates 0.167 cubic feet of water per second from the Missouri River. The point of diversion is to be located in a bay on Spring Creek in the SE1/4 NE1/4 Section 5-T112N-R80W. The area of the proposed use of water is located between Spring Creek and Cow Creek in Hughes and Sully Counties.
2. The water appropriated shall be used for the purpose of supplying commercial operations and rural housing developments and may not exceed the amount of water needed for beneficial use for commercial, domestic, recreation and rural water system purposes.
3. The water is to be used during the following described annual period: January 1 to December 31.
4. The date from which applicant may claim right is March 14, 1989.
5. One-fifth of the construction is to be completed on or before November 10, 1991.
6. All construction is to be completed on or before May 10, 1994.
7. Water is to be put to beneficial use on or before May 10, 1998.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

WATER MANAGEMENT BOARD

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

AUG 1 1989
(date)

RECEIPT

Division of Water Rights

South Dakota Department of Water and Natural Resources

411703

Pierre, March 23, 1989

RECEIVED OF County of Hughes, Pierre, SD 57501 (Attn: County Auditor)

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

Fee for Application for Permit No. <u>5294-3</u> to Appropriate Water, to construct works and to put water to beneficial use _____	150	00
Fee for Application for Permit No. _____ to Appropriate Water for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for Certified Copy of _____		
Fee for Print Copy of Map _____		
Fee for Certifying _____		
Fee for _____		
(Any Other Work Provided by Law)	Total	150 00

By

Chief Engineer

John Hatch

PRELIMINARY ENGINEERING STUDY
WATER SUPPLY
AND
DISTRIBUTION SYSTEM
SPRING CREEK AND COW CREEK
RECREATION AREAS

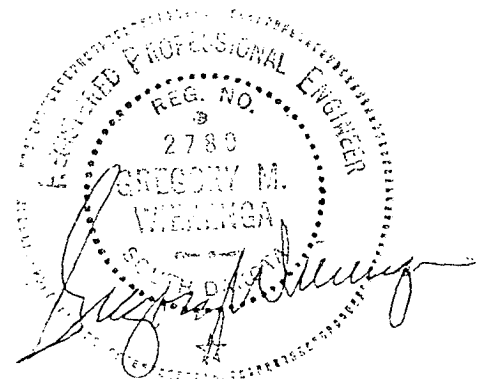
PREPARED FOR:

HUGHES COUNTY
104 EAST CAPITOL
PIERRE, SD 57501

PREPARED BY:

CLARK ENGINEERING COMPANY
2100 SOUTH 7TH STREET, SUITE 105
P. O. BOX 860
RAPID CITY, SD 57709

DECEMBER, 1988



A. 1 No. 5294-3

TABLE OF CONTENTS

Abstract.....	ii
Figures.....	iv
Tables.....	v
1. Introduction.....	1
2. Criteria.....	5
3. Source Development.....	14
4. Treatment.....	18
5. Distribution System and Storage.....	23
6. Project Phasing and Expansion.....	28
7. Cost Estimates.....	31
8. Summary.....	37

ABSTRACT

OBJECTIVE:

This preliminary engineering study was completed to evaluate the technical and fiscal requirements for developing a public water supply for the Spring Creek recreation area in Hughes County. Principal components of the study included the following:

1. Estimate current and future water supply requirements.
2. Evaluate sources of supply, treatment and storage requirements.
3. Delineate and size distribution facilities.
4. Develop construction cost estimates for necessary facilities.
5. Provide operating cost estimates for fiscal planning and preliminary rate structuring.

SCOPE:

This study contains delineation of the potential Spring Creek service area; inventory of existing and potential water use requirements; analysis of water source, treatment, storage and distribution requirements; and development of construction and operating cost estimates.

FINDINGS AND CONCLUSIONS:

Existing and proposed commercial and recreational development within the Spring Creek area of Hughes County will require approximately 24,000 gal./day of potable water by 1990. A design flow of 36,000 gal./day for initial system components is recommended to meet the 1990 demands with a 50% allowance for future growth.

Necessary system components will consist of the following:

1. Raw water intake system using Lake Oahe water as the source of supply.
2. Treatment facility consisting of surface water filtration and disinfection system capable of treating at least 36,000 gal./day.
3. Ground level finish water storage tank with a capacity of 36,000 gal.
4. Constant pressure booster pumping system with a capacity of 120 gpm.
5. Finish water distribution system consisting of 8" and 6" mains and appurtenances.

The estimated total project cost for the proposed system is \$364,000. It is estimated that at projected 1990 development levels, operating costs for the system will be \$8,500/Yr. (or about \$1.71/1000 gal.).

The estimated time requirements for design and construction of the system are as follows:

Design/Review:	3 months
Bidding/Contracting:	2 months
Construction:	<u>5- 7 months</u>

Project Duration	10-12 months
------------------	--------------

FIGURES

<u>Number</u>		<u>Page</u>
1.	Vicinity Map.....	2
2.	Potential Service Area.....	6
3.	Intake Facility Schematic.....	17
4.	Treatment System Schematic - Type A.....	19
5.	Treatment System Schematic - Type B.....	21
6.	Treatment and Storage Facility Layout....	25
7.	Distribution System Layout.....	26

TABLES

<u>Number</u>		<u>Page</u>
1.	Inventory of Existing and Proposed Water Using Development.....	7
2.	Water Supply System Design Criteria.....	9
3.	Water Use Projections for Spring Creek...	11
4.	Ultimate Water Use Projections for Spring Creek/Cow Creek.....	12
5.	Water Quality Summary for Spring Creek/ Cow Creek Source Alternatives.....	15
6.	Construction Cost Estimate for Raw Water Intake and Delivery System.....	32
7.	Construction Cost Estimate for Treatment/ Booster/Storage Facility.....	33
8.	Construction Cost Estimate for Distribution System.....	34
9.	Project Cost Summary for Spring Creek Water System.....	35
10.	Estimated Operation and Maintenance Costs for Spring Creek Water System.....	36

INTRODUCTION

BACKGROUND:

The Spring Creek and Cow Creek Recreation Areas in northern Hughes and southern Sully Counties have become popular access points for recreational activities on Lake Oahe north of Pierre, SD. The Spring Creek and Cow Creek peninsula consists of publicly owned shoreline areas managed by the U. S. Army Corps of Engineers and adjacent privately owned property. The general vicinity of the Spring Creek and Cow Creek areas is illustrated in Figure 1 on page 2.

Recreational activities in the area consist principally of boating and fishing on Lake Oahe in the summer months, bird and other game hunting in the fall, and ice fishing in the winter. Boating, camping and fishing activities are by far the most popular, and the most intense use of the existing facilities is experienced during the summer. Essentially full occupancy of public and private facilities can be expected on summer weekends at the present time, with a relatively high usage during the week as well. Winter usage is fairly small at the present time, but increases are anticipated as more year-round facilities become available.

Publicly owned and operated facilities presently consist of a boat ramp and parking lot in the Cow Creek area, along with camper pads, picnic tables and fish cleaning stations. Vault toilets and additional small parking areas are available at several lake access points in the Cow Creek and Spring Creek areas. Some expansion and upgrading of existing recreational facilities is planned in the near future. A County park, which would include a boat ramp, fisherman parking, swimming beach and picnic area is currently planned for the Spring Creek bay immediately south of Oahe Lodge.

Privately operated facilities consist of the Spring Creek Resort and Oahe Lodge on the Spring Creek side of the peninsula, and the Cow Creek Lodge on the Cow Creek side. The Spring Creek Resort is on publicly owned land under a concessions lease with the Corps of Engineers. Oahe Lodge and Cow Creek Lodge are on private land immediately adjacent to Corps land. Facilities available include rental lodging (cabins and mobile homes), bar and restaurant facilities, a convenience store, camping and RV sites, boat slip and launch areas, along with boat rentals and hunting and fishing guide services. All three resort facilities have expansion plans for 1989 and 1990.

There is presently no residential development in the area except for rental and employee lodging associated with the resort facilities. Development of year-round and seasonal single family and multi-family dwelling units in the area is

considered possible. Long range plans by private landowners indicate a potential for as many as 200 dwelling units in the area, although no immediate development is proposed.

The existing Corps of Engineers managed facilities do not include drinking water or other water consuming facilities except for the Cow Creek fish cleaning station which is supplied by a shallow well. Corps expansion plans do not currently contemplate new facilities which will require potable water service. It is possible that the Corps would consider adding such facilities (camper services, rest rooms, etc.) if a public water system were available, but there are no current plans to do so.

The three private resort facilities are served with water by private shallow wells at each facility. Water quality is very poor, with a high level of mineralization. Existing water supplies do not meet EPA or State drinking water standards with respect to chemical quality. The Spring Creek Resort hauls water for restaurant uses, and ion-exchange softening is attempted at the other areas to upgrade quality. However, water quality is so poor that sophisticated treatment systems would be required to meet minimum drinking water standards. The lack of a high quality water supply is considered to be a major obstacle to further development of the area.

OBJECTIVE:

This preliminary engineering study was completed to evaluate the technical and fiscal requirements for developing a public water supply for the Spring Creek area in Hughes County, with consideration given to future expansion of the system to serve Cow Creek and other future development in Sully County. Principal components of this study included the following:

1. Estimate current and future water supply requirements.
2. Evaluate sources of supply, treatment and storage requirements.
3. Delineate and size distribution facilities.
4. Develop construction cost estimates for necessary facilities.
5. Provide operating cost estimates for fiscal planning and preliminary rate structuring.

SCOPE:

This study contains delineation of the potential Spring Creek/Cow Creek service area; inventory of existing and potential future water use requirements; design and costing criteria, description and evaluation of source, treatment, storage and distribution alternatives, and construction and operating cost estimates.

The existing facility inventory and short term development plans were obtained from the affected resort facility managers and from the Corps of Engineers. Water use projections are based on water use criteria from published sources for similar development types. No actual water measurement records for existing facilities were available for this study.

Source development and treatment alternatives considered in this study were based on water quality data from the local vicinity and other water systems using Lake Oahe water. Water quality testing was not performed as part of this study, but existing laboratory data for other areas are considered reliable for preliminary evaluation. Pilot treatment studies were not performed, as similar treatment applications for systems included in this study are currently being successfully operated in other areas.

Cost information utilized in this study was developed from budget price information from equipment manufacturers and suppliers, comparison with recent bid tabulations for similar work, and from published estimating and pricing guidelines. Costs presented represent the Consultant's opinion as to probable design construction, administrative and operating costs, but no guarantee can be made as to actual or maximum costs which may be incurred.

CRITERIA

SERVICE AREA:

The area referred to in this study as the Spring Creek/Cow Creek service area comprises approximately 1700 acres, generally bounded by Lake Oahe on the north, west and south, and by State Highway 1804 on the east. The potential service area is illustrated in Figure 2 on page 6.

The potential service area illustrated in Figure 2 includes about 700 acres of Corps of Engineers property above the high water line elevation 1620. The balance of the service area is privately owned. Approximately 5% of the Corps land and 3% of the privately owned property is currently developed or improved in terms of recreational or commercial activities or uses. Virtually 100% of the land area can be considered "developable" with respect to surface topography, but it is probable that most privately owned land will remain in agricultural production. It is anticipated that any future residential or additional commercial development will take place adjacent to Corps land at the perimeter of the service area. Corps improvement plans do not presently include any major land use changes which would significantly affect water supply development, with the exception of the County operated park proposed south of Oahe Lodge. Rest rooms and a bathhouse are proposed for these facilities.

EXISTING FACILITIES:

An inventory of the existing level of development in the study area was completed to evaluate potential water supply requirements. Additionally, proposed additions and improvements to the existing facilities were identified to establish water requirements anticipated in the near future (generally 1989 or 1990).

Table 1 on page 7 sets forth the results of the facility inventory. Some changes in the proposed additions or improvements are probable, but it is anticipated that these projections will be sufficiently accurate for purposes of this study.

GROWTH:

There is no master plan or other basis for projecting long term growth and water supply requirements in the service area. The affected landowners and concession operators have no unified opinion as to potential growth, but there is general agreement that additional development of various types will occur provided that satisfactory water and wastewater facilities are available.

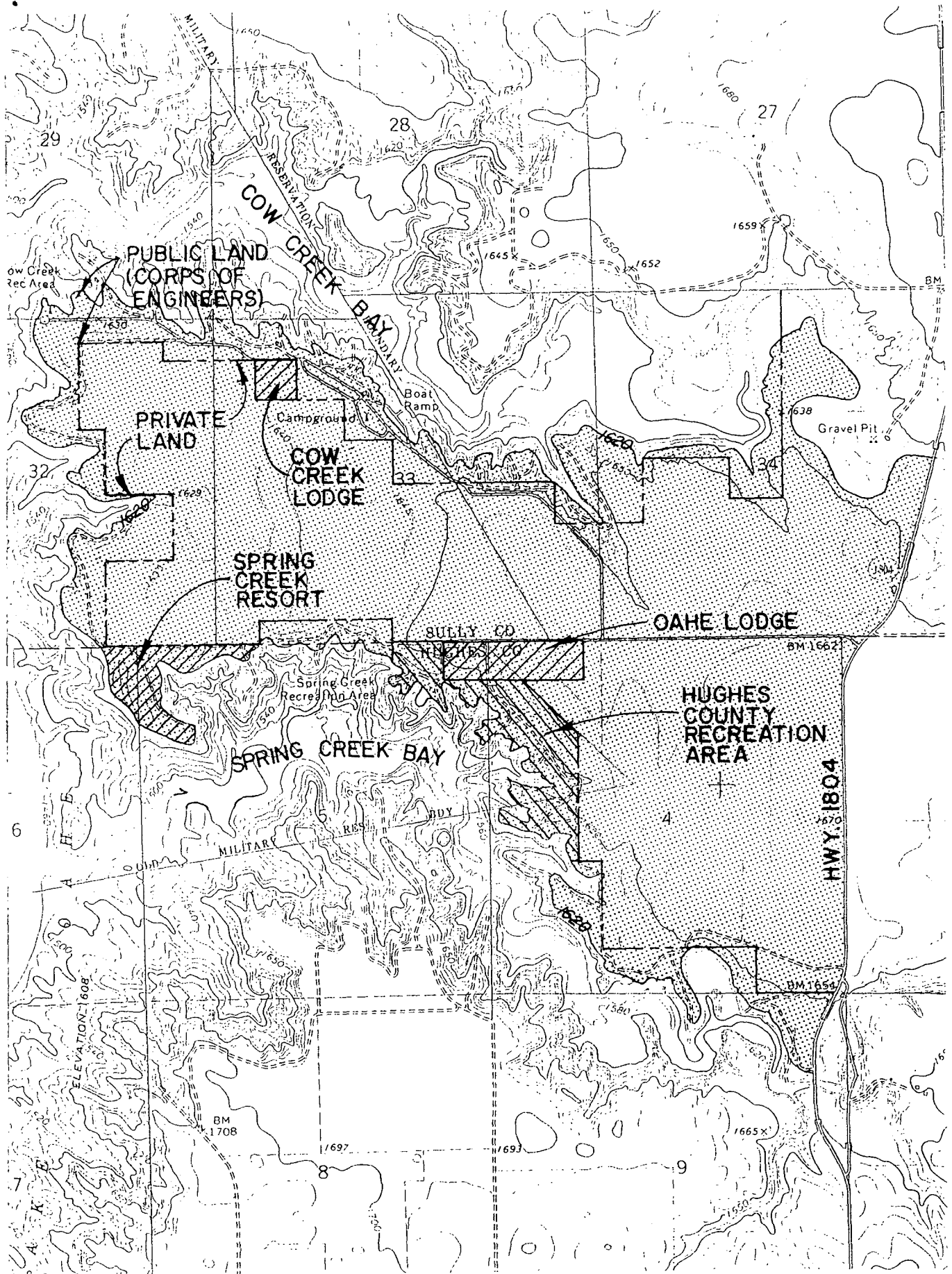


Figure 2. Potential Service Area

TABLE 1. Inventory of Existing and Proposed Water Using Development.

<u>AREA</u>	<u>FACILITY</u>	<u>EXISTING DEVELOPMENT</u>	<u>PROPOSED DEVELOPMENT BY 1990</u>
Spring Creek	Spring Creek Resort	8 2-Bedroom Cabins 2 3 Bedroom Cabins 60 Seat Restaurant 30 Seat Bar/Lounge	4 1-Bedroom Cabins. 16 Unit Motel 23 Camping Units *
	Oahe Lodge	Cabin Units Accommodating a Total of 60 People. 50 Seat Restaurant/Bar 15 Camp Units 12 Mobile Homes	12 Mobile Homes
	Hughes County Park		Swim Beach Bathhouse Restrooms for Park Area and Fisherman Parking Area. Parking Lot Space for 93 Vehicles.
Cow Creek	Cow Creek Lodge	8 2-Bedroom Cabins 50 Seat Restaurant/Bar	20 2-Bedroom Cabins

* Camping units are existing, but no water service or bathhouse facilities provided at this time.

Based on comments by landowners and concession operators, the following growth factors were assumed for a 20 year planning period from 1990 to 2010.

Commercial/Recreation: 50% increase over projected 1990 levels.

Residential: 200 dwelling units.

The commercial growth includes rental lodging, restaurants, camping and similar facilities. The residential growth could include permanent or seasonal privately owned homes or cabins and multi-family units such as townhouses or condominium units.

The growth projections outlined above were used in this study to establish potential ultimate water supply requirements for a 20 year planning period. The ultimate needs are important considerations in providing a reasonable means for expanding initial facilities for growth. The Consultant cautions users of this report that growth could be significantly more or less than estimated and that periodic re-evaluation of the system requirements will be needed throughout the service life of the facilities.

WATER USE:

Design water use requirements were established by applying daily water consumption criteria for each type of water using facility to the existing and projected development levels. Water use criteria were based on published technical sources which have analyzed consumption records from various types of facilities. Table 2 on page 9 summarizes water use and design criteria used in this study.

Projected water needs were estimated for anticipated 1990 development levels for the Spring Creek area in Hughes County. A 50% allowance was added to the projected 1990 development level in Hughes County to establish the initial first phase design flow of 36,000 gpd for intake, treatment, storage and booster pumping facilities. Table 3 on page 11 summarizes projected first phase water supply demands, growth allowance and design flow.

Long term water supply needs for the overall Spring Creek/Cow Creek recreation area are based on 1990 development levels at Spring Creek and Cow Creek, plus commercial growth allowance and projected residential development levels. Table 4 on page 12 summarizes ultimate projected water supply requirements for a 20 year planning period.

Water supply projections for the initial system do not include allowances for significant lawn watering or irrigation. It is anticipated that minor irrigation uses can be considered to be included in the initial use

TABLE 2. Water Supply System Design Criteria.

<u>ITEM</u>	<u>CRITERIA</u>	<u>SOURCE/COMMENT</u>
Planning Period	20 Years (1990-2010)	Used for estimating potential system expansion requirements and evaluating life cycle costs of design alternatives.
Design Water Use Rates - Average Daily Water Consumption Assuming Full Occupancy:		
Cabins (Rental Lodging)	100 gal./bedroom/day	Assumes 2 people per bedroom and 50 gal./capita/day.
Motel Units	100 gal./unit/day	Same as above.
Restaurant	40 gal./seat/day	Assumes 12-16 hour operation.
Bar/Lounge	10 gal./seat/day	Assumes 12 hour operation.
Camping Units	150 gal./unit/day	Assumes water hook-ups plus bathroom & laundry facilities.
Mobile Homes	150 gal./unit/day	Assumes average of 3 people per unit at 50 gpcd.
Recreation Facilities	10 gal./user/day	Assumes 3 people/car and one car per parking stall for areas with restroom and shower facilities.
Single Family Residential	300 gal./unit/day	3 people per home at 100 gpcd.
Peak Water Use Factors:		
Peak Daily Flow	Based on average daily flow rate at 100% occupancy.	Normal practice for small systems.
Average Flow on Peak Day	Peak daily flow averaged over 16-hour use period.	
Peak Hourly Flow	2.5 times average flow on peak day.	
Peak Instantaneous Flow	1.25 times peak hourly flow.	

<u>ITEM</u>	<u>CRITERIA</u>	<u>SOURCE/COMMENT</u>
Fire Flow: When fire fighting capability provided for system.	500 gpm for 2 hours.	Insurance Services Office.
Finish Water Quality	Primary and Secondary Maximum Containment Levels per EPA Safe Drinking Water Act.	Adopted by State of SD for public water supplies.
Design and Construction Standards.	"Criteria for Design of Water Supply and Treatment Facili- ties," SDDWNR.	Prescribed by State Regulation.

TABLE 3. Water Use Projections for Spring Creek Area of Hughes County (Existing Facilities Plus Anticipated Expansions Through 1990 Based on 100% Occupancy).

<u>AREA</u>	<u>FACILITY</u>	<u>UNITS</u>	<u>CRITERIA GPD/UNIT</u>	<u>AVERAGE DAILY WATER USE (GPD* PER FACILITY</u>	<u>TOTAL (GPD)*</u>
Spring Creek	Spring Creek Resort				
	Cabins (Bedrooms)	26	100	2,600	
	Restaurant (Seats)	60	40	2,400	
	Bar/Lounge (Seats)	30	10	300	
	Camp Units (Each)	23	150	3,450	
	Motel (Units)	16	100	<u>1,600</u>	10,350
	Oahe Lodge				
	Cabins (Bedrooms)	30	100	3,000	
	Camp Units	15	150	2,250	
	Restaurant/Bar	50	40	2,000	
	Mobile Homes	24	150	<u>3,600</u>	10,850
	County Park				
	Users (based on 93 parking spaces and 3 people/car)	280	10		2,800
Total Daily Water Use for Spring Creek Area					24,000
Allowance for Growth: 50% of 24,000 gpd					<u>12,000</u>
Design Flow for Initial Construction					36,000 gpd

* GPD: Gallons Per Day

Table 4. Ultimate Water Use Projections for Spring Creek/Cow Creek Service Area (Based on 20 Year Planning Period 1990 Through 2010).

<u>AREA</u>	<u>FACILITY</u>	<u>UNITS</u>	<u>CRITERIA GPD/UNIT</u>	<u>AVERAGE DAILY WATER USE (GPD* PER FACILITY</u>	<u>TOTAL (GPD)*</u>
Spring Creek	(See Table 3.)				24,000 gpd
Cow Creek	Cow Creek Lodge				
	Cabins (Bedrooms)	56	100	5,600	
	Restaurant (Seats)	50	40	<u>2,000</u>	
Total Water Use for Cow Creek					<u>7,600</u>
Total Combined Water Use for Spring Creek and Cow Creek Areas for 1990 Development Level					31,600
Growth Projections for Period 1990-2010:					
Commercial Development - 50% of 31,600					15,800
Residential Development - 200 units @ 300/gal./unit/day					<u>60,000</u>
Total Ultimate Water Use for Spring Creek and Cow Creek for 2010 Development Level					107,400 gpd

* GPD: Gallons Per Day

projections, but that significant lawn or other irrigation demands associated with future residential development will require special attention. It may be necessary to restrict future lawn and garden areas, or to build in irrigation capability into future system expansions. However, use projections in this study do not include significant irrigation allowances.

SOURCE DEVELOPMENT

SOURCE ALTERNATIVES:

Two water supply source alternatives were identified in this study: 1) shallow wells in the Grey Goose aquifer, and 2) surface water from Lake Oahe. Source alternatives were evaluated on the basis of quantity, reliability and water quality.

The Grey Goose aquifer is a glacial sand and gravel aquifer laying between approximately 25' and 65' below the surface. The water bearing sand is overlain by fine clay and silt till, and underlain by the impervious Pierre shale formation. Static water level is typically about 30 feet below surface. Recharge is from percolation of precipitation through overlying permeable soils. Well yields of 50 to 100 gpm are feasible. Water quality is very poor due to a high degree of mineralization.

Lake Oahe water is readily available and accessible for this system in unlimited quantity. Water quality is chemically superior to that of the well source, and will generally comply with chemical PMCL and SMCL criteria of the Safe Drinking Water Act. Treatment is required, however, to remove suspended particulates and bacterial contaminants.

Table 5 on page 15 presents a summary of water quality parameters for each source alternative and compares the raw water data with the finish water requirements of the Safe Drinking Water Act. Bold faced characters for the source alternatives indicate parameters which do not meet the finish water criteria, and for which treatment would be required.

Treatment of the well water to an acceptable quality would require a sophisticated dual resin type ion-exchange demineralization process, or an equally sophisticated electrodialysis or reverse osmosis demineralization. These treatment systems involve high initial costs, large backwash to waste volumes, either high chemical or high electric power costs, and a relatively high degree of operator training and attention.

Lake Oahe water will also require treatment, but by more conventional and less expensive processes. Conventional chemical coagulation, filtration and disinfection will provide a high quality finish water at less than half the cost of treating well water.

RECOMMENDED RAW WATER SOURCE:

Both raw water source alternatives would provide an acceptable quantity and reliability for this project. Lake

Table 5. Water Quality Summary for Spring Creek/Cow Creek Source Alternatives.

Parameter	Raw Water Quality		Maximum Con-
	Grey Goose Aquifer (1)	Lake Oahe (2)	centration Per EPA Safe Drinking Water Act
Nitrate (NO ₃) mg/l	51.5	< 0.1	10.0
Fluoride (F) mg/l	0.07	0.53	2.4(3)
Chloride (Cl) mg/l	30.4	15.0	250
Iron (Fe) mg/l	0.01	0.12	0.3
Manganese (Mn) mg/l	0.19	0.04	0.05
Sulfate (SO ₄) mg/l	2778	213	250
Tot. Dissolved Solids (TDS) mg/l	4858	489	500
pH	7.12	8.03	6.5-8.5
Alkalinity-M (CaCO ₃) mg/l	339	158	---
Alkalinity-P (CaCO ₃) mg/l	0	0	---
Bicarbonate (HCO ₃) mg/l	414	193	---
Carbonate (CO ₃) mg/l	0	0	---
Spec. Cond. @ 25°C umhos/cm	4275	658	---
Calcium (Ca) mg/l	706	57.7	---
Magnesium (Mg) mg/l	319	23.4	---
Hardness (CaCO ₃)	3076	240	---
Langelier Index	0.58	0.17	---
Sodium (Na) mg/l	136	70.7	---
Potassium (K) mg/l	16.8	5.4	---
Turbidity (NTU)	---	1-200(4)	0.5(5)

- 1) Water quality from Oahe Lodge well, Spring Creek Resort and Cow Creek Lodge well quality is similar.
- 2) Raw water quality from Oahe Plains system located about 5 miles south.
- 3) A minimum fluoride level of 0.9 mg/l is required for systems serving 500 people or more.
- 4) Turbidity varies seasonally and based on weather and wind conditions. A normal turbidity of 1 to 5 NTU is typical.
- 5) 0.5 NTU limitation is pending, currently is 1.0 NTU. Turbidity limitations apply only to surface waters.

Oahe water will provide a high quality finish water at significantly less cost than treating a well supply. Utilization of Lake Oahe as the raw water source for this project is recommended.

INTAKE FACILITIES:

Lake Oahe water levels can fluctuate between elevation 1620 (MSL) and about 1585 (MSL) or lower under extreme drought conditions. To provide a relatively safe and reliable supply, intake facilities should be capable of drawing water from elevations as low as 1580 or less.

Several factors influence proper intake location and design, including water level fluctuations, ice cover, bottom sediment stirring, wave action and erosion, and access for maintenance. Underwater construction costs can be high, and project economy can be a major factor in intake selection and design.

Figure 3 on page 17 illustrates a conceptual level design of a raw water intake facility. This type of intake uses a conventional submersible well pump, allows year around operation and freeze protection, and is considered to be a very low cost arrangement in comparison with other alternatives. A negative factor for this system is the relative inaccessibility of the intake screens for cleaning. However, proper screen sizing and selection can minimize clogging potential, and backflushing capability can be provided to minimize cleaning requirements.

It is proposed that the intake system be designed for the ultimate (2010) design flow, except for the raw water pump which will be designed to meet the initial requirements of the treatment system. As system demands increase in the future, it will be necessary to change the raw water pump, but not the intake screen, pump reservoir, or raw water transmission line to the treatment facility.

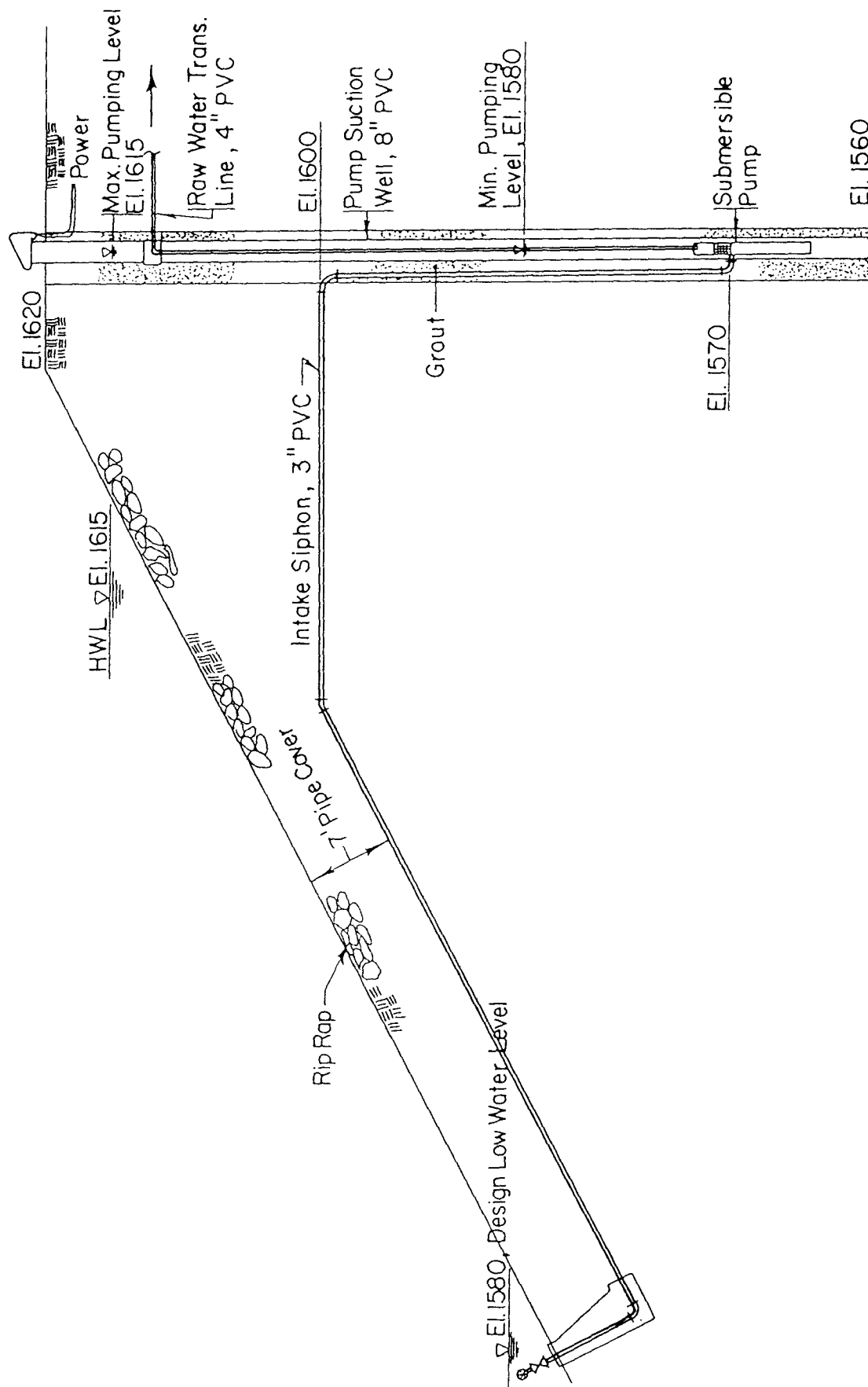


Figure 3. Raw Water Intake Schematic

TREATMENT

TREATMENT ALTERNATIVES:

Treatment of Lake Oahe water to drinking water quality can be accomplished by a relatively straight forward process of chemical coagulation of suspended impurities followed by filtration and disinfection. The relatively good raw water quality will allow a direct filtration process whereby the need for sedimentation, settling or other pretreatment is eliminated.

There are several manufacturers producing filtration equipment in the size range required for this project. Most equipment makers employ at least some proprietary equipment or process features which prevent a simple direct evaluation of the most effective and economical system. For purposes of this study, two proprietary filtration systems were considered which have proven, successful operating histories on similar applications. Both systems employ a chemical coagulation process using alum and polymer feed followed by a multi-media filtration process, but differ in that one system operates in an enclosed pressure system while the other employs gravity flow at atmospheric pressure.

Following is a description of the two alternate filtration processes, hereinafter referred to as Type A and Type B.

Type A Process (Microfloc Products "Water Boy"):

Consists of a small package treatment plant employing open tankage at atmospheric operating pressure. Raw water is pumped to the plant inlet where disinfectant (hypochlorite) and coagulant chemical (alum) are added before entering a flash mix compartment where a coagulant aid (polyelectrolyte) is also applied. After mixing, the water enters a mechanical flocculation tank where easily settleable floc particles are formed. Flocculated water proceeds to tube settlers where flocculated turbidity is removed by gravity settling, thence flows through a gravity mixed-media filter for final polishing. Finish water either flows by gravity to below grade clearwell storage or is pumped to ground level or elevated storage. Figure 4 on page 19 illustrates the Type A filtration process.

The filter is cleaned by periodic backwashing, either automatically or manually controlled. Tube settler flocculant is discharged from the settling compartment during backwash. From 2% to 5% of finish water produced is wasted in the backwashing process.

A finish water turbidity level of <0.3 NTU is attainable.

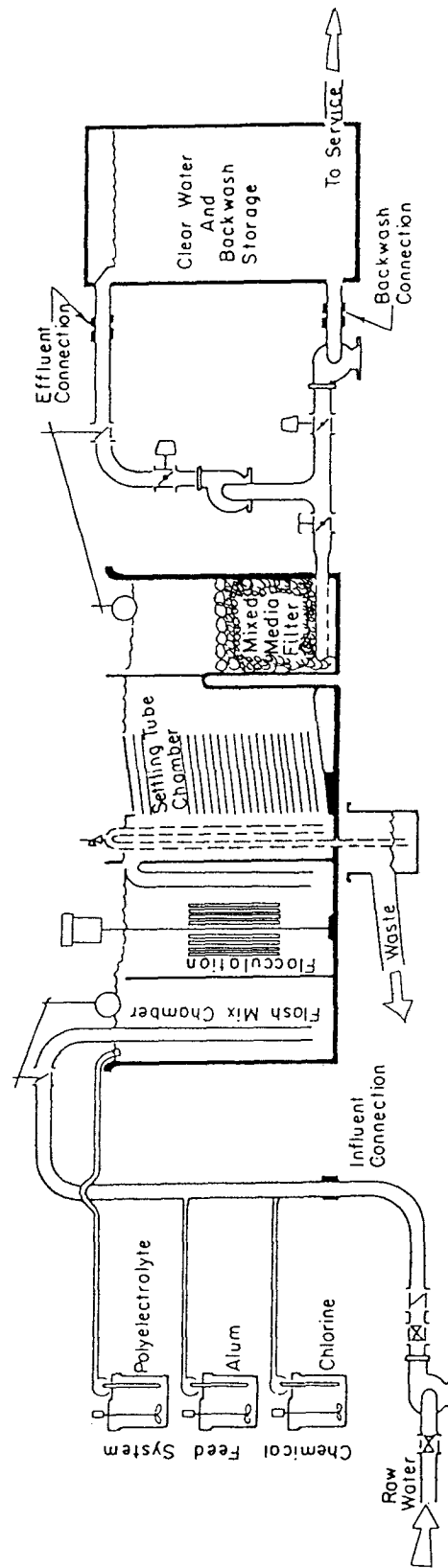


Figure 4. Type A Treatment System (Microfloc Products "Water Boy")

Type B Process (Culligan "Multi-Tech"):

Consists of a two tank all pressure process which employs a depth clarifier for pretreatment followed by a multi-media pressure filter. Raw water is pumped to the plant inlet where coagulant and disinfecting chemicals are added in the same way as the Type A system. Water then passes through the depth clarifier (or roughing filter), then through the pressure mixed media filter to finish water storage. The raw water pump moves the water through the entire treatment process under pressure. Figure 5 on page 21 illustrates the Type B filtration process.

The depth clarifier and filter are cleansed by backwashing with finished water. As for the Type A system, from 2% to 5% of the water produced is wasted in the backwashing process.

Finish water quality with turbidity levels below 0.3 NTU can be achieved for raw waters with up to 200 NTU turbidity levels.

A number of other manufacturers produce filter equipment similar to either the Type A or B equipment described above, and reference to these systems does not necessarily mean that final design and equipment selection should be limited to one or the other.

Backwash wastewater from either system is compatible with conventional municipal wastewater systems, and disposal of backwash water to the proposed public sewer system for the Spring Creek area is recommended for either type treatment system.

TREATMENT CAPACITY:

The required treatment system capacity is a function of the peak daily water production requirements, length of service cycle (hours of operation in a 24 hour day), and volume of finish water storage provided. A typical system will produce the peak day volume in a 20 hour service cycle, and provide finish water storage equal to the peak day usage. Such a system will provide "down time" for backwashing and maintenance, and will provide equalizing storage for peak hourly system demands, backwashing requirements, contact time for disinfection, and reserve capacity for equipment problems.

A treatment system with capacity for 1990 development levels at Spring Creek plus a 50% expansion allowance is proposed for initial construction.

Design Peak Day Flow: 36,000 gpd

Filter Capacity Req'd.: $36,000 \text{ gpd} \div 20 \text{ hrs./day}$
 $\div 60 \text{ min./hr.} =$ 30 gpm

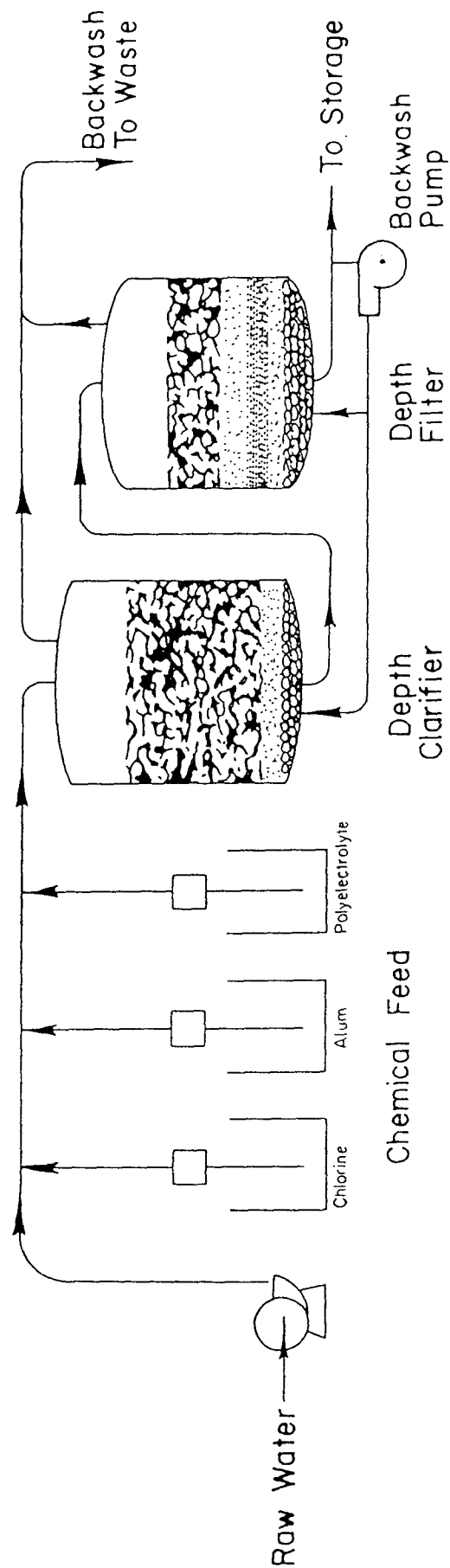


Figure 5. Type B Treatment System (Culligan "Multi-Tech")

Provisions for phased expansions of the initial system can be made to allow increased capacity as the need arises. Two expansions of a capacity equal to the initial system would provide adequate capacity for the projected 2010 peak day demand of 107,400 gal./day.

The Type A (Microfloc "Water Boy") treatment system is manufactured in standard capacities of 10 gpm, 20 gpm, 60 gpm and 100 gpm. A Type A system with a 60 gpm capacity is the smallest standard size system meeting the minimum 30 gpm initial capacity. The larger system could result in a somewhat higher initial cost, but would reduce future expansion costs. A single expansion of an additional 60 gpm system would handle the projected 2010 demands.

The Type B (Culligan "Multi-Tech") treatment system is manufactured in standard capacities of 10 gpm, 15 gpm, 25 gpm, 35 gpm, 48 gpm, 62 gpm, 80 gpm and larger sizes. A Type B system with a 35 gpm capacity would adequately handle the initial design flow of 36,000 gpd. Incremental expansions of two additional 35 gpm systems would handle the projected 2010 demands.

DISTRIBUTION SYSTEM AND STORAGE

STORAGE:

Finish water storage is needed to provide equalizing storage for peak system demands, provide backwash water, provide detention time for adequate disinfection before delivery to users, provide a fire fighting reserve and to provide an emergency reserve for repairs or maintenance on raw water supply or treatment equipment. Finish water storage can be clearwell storage at the treatment plant, or ground level or elevated storage elsewhere in the distribution system, and is generally a combination of both.

A volume of finish water storage equal to the peak day demand, exclusive of any firefighting requirements, is required for small systems (<50,000 gpd) in accordance with DWNCR criteria. A minimum finish water storage reservoir capacity of 36,000 gallons is needed for the projected 1990 demands and expansion allowance, exclusive of fire flows. Additional storage will be needed as system demands and treatment capacity increase. Storage requirements for firefighting are discussed later in this report.

To minimize initial costs, a single storage facility located at the treatment plant site is proposed in this study. It is anticipated that a single, expandable ground level tank can be utilized to provide the necessary clearwell and distribution storage in a single facility. A bolted steel type tank can be designed to provide initial storage needs, and will allow expansion vertically by adding additional tank segments. Such a tank could ultimately reach a height such that the high water elevation would be located at the system hydraulic grade line, thus eliminating most booster pumping requirements. The appropriate size tank could provide fire flow storage in addition to equalization storage and other storage needs.

Because initial winter system usage will be small in comparison with system capacity, freeze protection of the reservoir is a consideration. A partially buried reservoir will allow the tank level to be lowered for freeze protection during low usage winter months. As system demands increase in future years, water levels can be maintained at normal operating levels as normal turn over of stored water will prevent freezing.

BOOSTER PUMPING SYSTEM:

The Spring Creek/Cow Creek service area is generally quite flat, with ground surface elevations ranging from 1630 to 1670. A distribution system hydraulic gradeline of about

elevation 1770 is proposed to provide static pressures in the range of 45 psi to 60 psi for the entire distribution system.

Booster pumping will be required to pressurize the system, as the ground level reservoir will initially operate at an elevation some 80 feet lower than the hydraulic grade line. A constant pressure booster system drawing water from the ground reservoir is proposed. The booster system will be required to meet minimum, average and peak hourly demands in an economical fashion. A manufactured package type duplex or tri-plex constant pressure booster system with a pneumatic tank will provide the necessary flexibility and range of flows for this system. Maximum booster capacity should meet peak hourly demands plus about 25% for peak instantaneous demands. Booster system sizing requirements for 1990 development and expansion allowance are as follows:

Average Rate of Use	36,000 gal. ÷ 16 Hrs. ÷	
on Peak Day:	60 Min./Hr. =	38 gpm
Peak Hourly Flow:	2.5 x 38 gpm =	95 gpm
Peak Hourly Flow Plus 25%:	1.25 x 95 gpm =	120 gpm

A booster system with a small jockey pump of about 30 gpm capacity and two boosters with about 50 gpm capacity each will handle the range of flows for the initial system. The system maintains essentially a constant system pressure through the use of pressure regulating valves and pump cycle sequencing. A small hydropneumatic tank will allow complete pump shutdown during extreme low flows such as would occur during winter months.

Figure 6 on page 25 illustrates the proposed treatment, storage and booster system layout.

PIPE LAYOUT AND SIZING:

Figure 7 on page 26 illustrates primary distribution system layout needed to serve the Spring Creek developments in Hughes County. Because of the large distances between the storage facilities and points of use, a dendritic type distribution system is proposed; that is, mains are not looped to one another for increased reliability and hydraulic performance. As system expansion takes place in future years to serve additional development, looping opportunities may exist for some portions of the system.

Pipe sizes shown in Figure 7 were selected based on preliminary hydraulic analysis of potential future peak demands with fire flows of 500 gpm. Although production, storage and booster facilities will not provide for fire flows initially, it is considered good practice to plan for the possibility of fire fighting capability in the future.

Thus, the primary distribution system should have fire flow capability built in initially to avoid costly reconstruction in the future.

PROJECT PHASING AND EXPANSION

GENERAL:

Initial water supply facilities for the Spring Creek/Cow Creek Recreation area are planned to serve the Spring Creek area in Hughes County only. The proposed design flow of 36,000 gpd is based on the projected 1990 development level at Spring Creek plus a 50% expansion allowance. It is unknown when and where future water use demands may develop, but it appears certain that new development will utilize the additional capacity built into the initial construction.

Service to the Cow Creek area in Sully County is feasible if service is requested. The expansion allowance built into the water supply system would handle the projected 1990 development level at Cow Creek. However, a significant distribution system expansion would be required to furnish water to Cow Creek.

Following is a description of expansion considerations for each component of the water delivery system.

INTAKE AND TRANSMISSION LINE:

The raw water intake and transmission line facilities would be designed to accommodate the initial design flow, but with certain components sized to handle ultimate projected flows. The intake screen, pump housing and raw water transmission line would be capable of ultimate flows.

Expansion of the system beyond the initial design flow would require replacement of the raw water pump to deliver raw water at a rate equal to the expanded treatment capacity.

TREATMENT AND BOOSTER PUMPING FACILITY:

For planning purposes, it is assumed that the building housing the water treatment equipment and booster pumping system would be constructed with sufficient space to accommodate at least one additional treatment unit, and larger booster pumps. Permanent piping components would be sized based on ultimate flows.

The treatment system design capacity will probably vary somewhat from the 36,000 gpd design flow, depending upon the incremental sizing of standard treatment systems for the various equipment manufacturers. It is possible that a treatment system capacity significantly greater than 36,000 gpd will be economical for the initial system.

Treatment system expansion can be accommodated relatively easily by adding treatment unit(s) in parallel with the original equipment. Additional treatment units should be of

the same design, but would not necessarily have to be of the same design capacity as the first unit.

The booster pumping system will be designed for peak flows based on the initial design flow rate. Booster system capacity can be added by changing booster pump size. However, if the proposed ground level reservoir is expanded to provide elevated standpipe storage as discussed hereinafter, then most booster pumping requirements would be eliminated. The booster system could remain in service as a standby system to pressurize the system if for any reason the standpipe water level were below the normal operating range.

STORAGE:

The initial ground level storage volume of 36,000 gallons will provide adequate equalizing storage for peak demands, contact time for disinfection, backwash water storage, and reserve for emergencies for the initial design flow.

Storage requirements will increase with increased system demands and treatment system expansions, although not necessarily in direct proportion to increasing design flow. Storage needs will vary depending upon intake and treatment system capacity and reliability, peak use rates, and fire protection requirements.

The proposed 14' diameter bolted steel tank can be readily expanded by adding vertical tank segments to the top of the original construction, provided that the original foundation design allows for the increased loadings. It is feasible to expand the ground level tank to a height of about 112 feet, which would provide elevated storage of about 30,000 gallons in the normal operating pressure range, and about 125,000 gallons of storage overall. This type of expansion, in combination with appropriate booster pump upgrading, would allow for full scale municipal level fire protection within the service area.

It is not known at this time if full scale firefighting capability will be warranted by future development, but the initial construction would allow upgrading to this level in an economical manner.

DISTRIBUTION SYSTEM:

The initial distribution system piping is located to provide service to the existing and proposed development in Hughes County. Proposed sizing is based on peak ultimate flows plus a 500 gpm fire flow. Sizing for fire flow will avoid possible pipe replacement in future years, but will not provide an initial firefighting capability due to limitations of the initial storage and booster system.

The distribution system design will provide fittings at strategic locations to allow future extension of water mains. The exact layout of mains will depend upon the location of future development, but one possible scenario would be a distribution system loop around the west end of the Spring Creek/Cow Creek peninsula which would serve virtually all developable areas at the perimeter of the Corps of Engineers shoreline. Figure 7 on page 26 illustrates locations of possible distribution system expansion points.

COST ESTIMATES

COST CRITERIA:

Cost estimates and analysis presented in this report are based on costing criteria developed from historical bid information, suppliers' quotations and published estimating data.

COST ESTIMATES:

Construction cost estimates for the initial construction phase were developed for all principal system components. Tables 6, 7 and 8 on pages 32, 33 and 34, include detailed cost estimates for the raw water intake and delivery system; treatment booster and storage facility, and distribution system, respectively.

Table 9 on page 35 summarizes overall project costs, including construction, engineering design and construction phase services, and contingencies.

Operation, maintenance and repair costs associated with the initial system were estimated, and are summarized in Table 10 on page 36. Operational costs assume full production of water supply facilities during summer months, with reduced production levels during off season periods as explained in Table 10. Actual operating costs will probably be somewhat lower than projected during the first few years after construction due to lower use rates.

Operational cost estimates presented in Table 10 do not include a sinking fund line item for future system expansion. Costs reflect only actual projected operating costs for a "break-even" operation, with a minimal reserve fund. This analysis does not set forth a recommended water rate schedule for users. Rate setting will require a detailed analysis of actual operating costs, including system management, and establishment of administrative and fiscal policies for the system.

Table 6. Construction Cost Estimate for Raw Water Intake and Delivery System

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Total</u>
1. Drilling & Grouting for Pump Reservoir, 16" dia.	60 VF	\$50/VF	\$3,000
2. 8" PVC Casing	60 VF	15/VF	900
3. 3" PVC Siphon	170 LF	10/LF	1,700
4. 3" Ball Valve	1 EA	200/EA	200
5. Intake Screen, Fittings	LS	2500/LS	2,500
6. Pitless Adapter	LS	1800/LS	1,800
7. Riprap & Shoreline Restoration	LS	3000/LS	3,000
8. Well Pump, Controller	LS	6500/LS	6,500
9. Drop Pipe, 2"	50 LF	6/LF	300
10. Power Cable, Downwell	100 LF	2/LF	200
11. 4" PVC Raw Water Line	1500 LF	5/LF	7,500
12. 4" Gate Valve	1 EA	300/EA	300
13. Flushing Hydrant	1 EA	300/EA	300
14. Air Release Valve & Pit	2 EA	400/EA	800
15. Telemetry Cable	1500 LF	2/LF	<u>3,000</u>
		TOTAL	\$32,000

Table 7. Construction Cost Estimate for Treatment/Booster/
Storage Facility.

<u>Item</u>	<u>Quantity</u>	<u>Unit</u> <u>Cost</u>	<u>Total</u>
1. Treatment Building	600 SF	\$60/VF	\$36,000
2. Filter Equipment Pkg.	LS	58,500/LS	58,500
3. Booster Pump System	LS	15,000/LS	15,000
4. Telemetry & Supervisory Control System	LS	9,000/LS	9,000
5. Ground Reservoir	36,000 GAL	1.50/GAL	54,000
6. Interior Process Piping	LS	7,000/LS	7,000
7. Equipment Painting	LS	1,800/LS	1,800
8. Reservoir Piping, 8"	30 LF	20/LF	600
9. Reservoir Piping, 4"	30 LF	10/LF	300
10. Exterior Hydrant	1 EA	1,200/EA	1,200
11. Exterior Valves, 8"	2 EA	550/EA	1,100
12. Backwash Sewer, 6"	200 LF	10/LF	2,000
13. Site Grading	250 CY	6/CY	1,500
14. Access Drive	300 LF	15/LF	4,500
15. Site Fencing	400 LF	10/LF	4,000
16. Finish Grade, Landscape	LS	1,000/LS	<u>1,000</u>
TOTAL			\$197,500

Table 8. Construction Cost Estimate for Distribution System

<u>Item</u>	<u>Quantity</u>	<u>Unit</u> <u>Cost</u>	<u>Total</u>
1. 8" PVC Pipe & Fittings	2430 LF	\$10/LF	\$24,300
2. 6" PVC Pipe & Fittings	3400 LF	7/LF	23,800
3. 8" Gate Valves	1 EA	550/EA	550
4. 6" Gate Valves	1 EA	350/EA	350
5. Fire Hydrants	2 EA	1,200/EA	2,400
6. Pavement Replacement	60 SF	5/SF	<u>300</u>
		TOTAL	\$ 51,700

Table 9. Project Cost Summary for Spring Creek Water System

<u>Project Component</u>	<u>Estimated Cost</u>	
Construction:		
Intake System	\$ 32,000	
Treatment/Storage/Booster Facility	197,500	
Distribution System	<u>51,700</u>	
Total Construction		\$281,200
Engineering:		
Design @ 10%	\$ 28,120	
Construction Engineering @ 10%	<u>28,120</u>	
Total Engineering		56,240
Miscellaneous and Contingency:		
10% of Construction cost		<u>28,120</u>
TOTAL ESTIMATED PROJECT COST		\$365,560
		=====

Table 10. Estimated Operation and Maintenance Costs For
Spring Creek Water System

OPERATION AND MAINTENANCE:

<u>Fixed Costs</u>	<u>Costs Per Year</u>
Operating Labor (500 hrs/yr @ \$12/hr)	\$6,000
Laboratory Testing	250
Maintenance Materials	500
Electrical (building heat, lights)	600
Annual Fixed O & M	\$7,350/Yr
<u>Variable Costs</u>	<u>Cost Per 1000 Gal</u>
Power for Pumping	\$0.20
Treatment Chemicals	<u>0.04</u>
Variable O & M	\$0.24/1000 Gal

COST OF WATER TO RECOVER O & M:

Total Annual Water Production	5,000,000 Gal/Yr *
Variable O & M: 5,000 M/Gal x \$0.24/M/Gal	\$1,200/Yr
Fixed O & M	<u>7,350</u>
Total O & M	\$8,550/Yr
Cost Per 1000 Gal:	
\$8550 ÷ 5000 M/Gal:	\$1.71/1000/Gal =====

- * 5,000,000 gal annual water use based on 4 months @ full occupancy, 5 months @ 50% occupancy, 3 months @ 10% occupancy and water use of 24,000 gal/day at full occupancy.

SUMMARY

FACILITY DESCRIPTION:

Development of a public water supply system for existing and proposed development in the Spring Creek Area at Hughes County can best be accomplished using Lake Oahe water as the source of supply. Principal system components will include the following:

1. Raw water intake system using Lake Oahe water as the source of supply.
2. Treatment facility consisting of surface water filtration and disinfection system capable of treating at least 36,000 gal./day.
3. Ground level finish water storage tank with a capacity of 36,000 gal.
4. Constant pressure booster pumping system with a capacity of 120 gpm.
5. Finish water distribution system consisting of 8" and 6" mains and appurtenances.

A design flow of 36,000 gpd will handle the projected 1990 level of development at Spring Creek with a 50% expansion allowance. The expansion allowance would meet the projected 1990 demands for the Cow Creek area in Sully County if distribution system expansion to Cow Creek is desired.

The proposed system will meet projected peak domestic use requirements for commercial and recreational facilities, but will not provide fire flows or large irrigation demands. Distribution mains are sized to handle fire flows if future development in the area warrants a fire fighting capability.

The proposed facilities are expandable up to a daily usage of at least 100,000 gal./day with the addition of treatment, storage and booster pumping capacity. No building expansion or repiping of initial construction would be required for expansion to the 100,000 gal./day level of demand.

COSTS:

The total project cost for development of the system is estimated to be \$365,560, including engineering services for design and construction, and a 10% contingency allowance.

Operating costs for the system are estimated to be \$8,550/Yr at full operation at 1990 development levels. The costs of system management, administration and equipment replacement or upgrading are not included in the estimated operational costs.

SCHEDULE:

It is anticipated that from 10 to 12 months will be required for project completion from the beginning of design to completion of construction. The approximate time frame required for major project phases is as follows:

Design:	3 months
Bidding/Contracting:	2 months
Construction:	<u>5 -7 months</u>

Total Project Duration	10-12 months
------------------------	--------------

The principal factor affecting project duration is equipment delivery time requirements for treatment system, controls and booster pumping equipment. A 3 to 4 month delivery time is typical for equipment of this type.

The following bills were approved for payment:

Co Gen: Ackerman Welding-welding Supply-welding supplies cyl rent #100-145.40, Advanced Reporting-deposition-38.20, Anderson Tire-tire change etc-72.00, Anderson Tire-Ft Pierre -tire & repair #21, #4-650.70, Al Arendt-ct ap aty-225.50, AT&T-interest owed 1986-123.72, B&B Salvage-200.00, Best Business Office-toner-lift off tape-202.14, Bierschbach Equip-supplies #100-58.99, Carol E Birgen-travel-supplies-17.92, Black Hills Glass-glass-27.55, City of Plunt-water & sewer-20.00, Richard Bode-ct ap aty-117.80, Bohning & Bohning-supplies & repairs-240.05, Brady Reade & Johnson-ct ap aty-579.80, Oric Bramblee-2 radios-275.00, David Braun-ct ap aty-5374.00, Prisoner Transportation Division-transporting-350.00, Buhls-cleaning-45.20, Bus Depot-bus ticket to Watertown for indigent-32.00, Butler Machinery-repairs-2405.57, Caps Trail Service-repairs & supplies-72.35, Central Radiator-floor jack #100-100.00, Cheyenne River Sioux Tribe-serving subpoena-25.00, Cheryl Christiansen-148.48, Communications Center-radio repair #4 and checked radio-73.14, The Computer Center-2 boxes of Bonus DS/DD Disks-151.80, Culligans-softner-66.55, Dakota Welding-supplies welding #100-34.76, Don's Sinclair-fuel for courthouse-4879.32, Diesel Machinery-repairs #5, #8, #23-1140.14, Division of Motor Vehicles- one set validation tabs-4.00, Dust Tex-service (13)-180.00, Donald E Rickson-mental illness hearing JF-80.00, J D Evans-repairs #23-96.97, Ferley Jewelers-2 watch cells-6.00, Forney Oil-DeLuac 1330-196.53, General Trading-supplies & repairs-1344.05, Graham Tire-repairs \$4-5.00, Hipple Printing-legal adv & classified ad summer assist help-702.31, Homestead Bldg Supplies- supplies #100-21.24, Howard Bros-supplies & Repairs-147.48, Hughes County Treasurer-cash items-42.20, Dave Johnson Insurance-notary bond premium Jack Husted-55.00, Kadoka Clinic-Rx for patient-4.39, KMart-wheel cover-39.88, Karls-stove element & labor-34.40, Craid Kennedy-mental illness hearing RN-80.00, Kleins-supplies-543.30, LJM-trashpickup-59.00, Thomas E Lee-ct ap aty-65.00, Magees-repairs-212.50, McLeod-supplies-3.09, Merriman Office-21.20, Jane Metzinger-Cluster Ext Bd Mtg @ Ft Pierre-16.00, Jeffrey Marvin-investigative services -state/Gabriel-1173.43, Midcon Equip-repairs #2-38.24, Northwestern Public Service-310.69, John Nystrom-Cluster Ext Bd Mtg-11.20, Paper Calmenson-grader blades for motor graders-3840.00, Pieta Htg-furnace supplies #100-179.16, Pierre City-utilities for Cthouse-jail-shelter-hwy shop-Cr of Pr & Land Fill-13,073.68, Plainsco-supplies #103-16.43, Pierre Professional Plaza-rent-500.00, Post Corner Drug-RX for indigents & prisoners-519.61, Reimans-supplies #103-12.67, Ritters Oil-gasoline #100-616.32, Sandvigs Inc-supplies #102, #100-52.62, Schmidt, Schroyer, Colwill & Barnett-sts aty expenses-211.71, Michael Shaw-ct ap aty-150.00, Smith Plumbing-inspect plumbing damages at Terrace Motel-138.00, State Publings-1 notary seal embosser-22.05, Daryl StephensonMD-mental illness hearing-RN-100.00, Sully Buttes Telephone-service #100, #101-57.19, James C Szana DDS-exam & extraction-47.00, Teks Jack Repair-19.44, Texaco-gas-3.18, UBC-supplies-81.06, US Postmaster-stamps CR of Pr-325.00, US Postmaster-stamps treasurer-250.00, Vilas Pharmacy-Rx-B Emery-6.73, Jerry Wattier-386.97-ct ap aty, Wegner Auto-parts service labor -523.36, Mona Weiger-ct reporter-transcript fee Gabriel-1899.90, Paul Weeldreyer-travel & supplies-48.91, Ken Wonenberg-travel-26.20, Western Comm-speaker-34.65, Zander Auto-supplies & repairs-354.42, Sorenson Broadcasting-lease of weather radar service-180.00, Sooper Dooper-food & Supplies prisoners & R Fire-4415.59, Ritters-fuel & gas #102, #101- 2221.25, St Marys Hospital-2 indigents VP & LR-4000.00.

Rural Fire: Becker Fire Equip-parts-91.10, Friman-LP gas-1.50, General Trading-supplies-118.72, Heimans supplies-469.30, Jerrys Ervice-parts, gas-252.45, Smeal Fire Equip-supplies-37.09, Sooper Dooper-food meeting-43.10, Western Comm-parts for Rural Fire-50.17,

Law Lib: West Publishing-lawbooks-169.50

Snow Removal: W E Doyle Equip-mower knives #30, #31-1736.00,

Fed Jail Imp: Bob Barker- 6 doz sheets-208.59, Midcontinent Cable Tv-31.50, Supreme Sales-stack tras 3 doz.-103.44, JC Penny-jail worksuits-99.01,

Special HWy: Central Supply-bridge material & Culverts Twsp Rds-14,617.50

Eight persons were helped by the county in the amount of \$4,408.27.

Auditor's Account with the Treasurer, April, 1989

Cash on Hand.....\$4,486.13

Checks in the Treasurer's possession less than
three days.....759,815.99

Cash items.....42.20

Demand Deposits:

Bank West.....36,429.40

1st Natl.....203,246.92

Am. State.....2,070,794.23

Investments.....3,715,325.87

Total Cash Assets.....\$6,790,140.74

The County Nurse's, Peggy Moreno, Pat Suedkamp, & Lucy Fossen met with commissioners with quarterly report.

Kenroy Janzen of Clark Engineering, James Mollison and Dennis Eisnach met with commissioners and discussion followed on lease agreement on Spring/Cow Creek Resort on water-sewer project.

11:00 AM, CDST, The time set for Public Hearing Notice for HUD Community Block Grant Program. The commissioners agreed to leave hearing open until 11:15 AM. 11:15 AM on motion of Keith Garber, seconded by TKlein, as no one appeared wither against or for hearing, to close hearing. All voting aye. Nay: none. Motion carried.

Moved by TKlein, seconded by J Nystrom to authorize O Nafziger and Dennis Potter to represent commissioners at water hearing. All voting aye. Nay:none. Motion carried.

Blunt City Mayor Sandra Doyle met with commissioners about the capping of an artesian well that has been flowing since dug in early 1900's. It was moved by T Klein, seconded by R Baumgart to go with plan of State Water and Natural Resources for capping well. The state gave the estimate price of \$5,000.00. The state has agreed to pay \$2,500.00 with Blunt City paying \$1,250.00 and Hughes County paying up to \$1,250.00. All voting aye. Nay:none. Motion carried. The county also would help Blunt City clean up aground project.

Connie Little Bear met with commissioners in regard to tax certificate on her house and was told to make arrangements with treasurer to get taxes paid up.

Conversation or File Documentation

NAME OF PERSON OR FILE: County of HughesADDRESS: Pierre SD COUNTY HughesDATE: April 5, 1989 TELEPHONE _____RE: Source of water

COMMENTS:

Contacted Dennis Potter to determine if Hughes
County planned to contract with the Corps of
Engineers for stored water or if natural flow
of the Missouri River is to be specified as the
source. Mr. Potter stated that the source is
natural flows of the Missouri River

File in Permit or other file as necessary. Use to document conversations and what the other party was told; why action or decision was made.

NAME: Ron Swall

Report on Application No. 5294-3
County of Hughes
March 30, 1989

Background

Water Application No. 5294-3 proposes to divert 0.167 cubic feet of water per second (cfs) from the Missouri River. The diversion point is located in the SE1/4 NE1/4 Section 5, T112N-R80W in Hughes County. The water will be used for domestic, commercial, recreational, and rural water system purposes. The water will be used to supply the water needs for Spring Creek and Crow Creek recreation areas.

Discussion

The water distribution system consists of a water intake and treatment facilities, ground level water storage tank, booster pump, and water distribution system. A minimum water storage reservoir capacity of 36,000 gallons is needed for projected 1990 demands and expansion allowance.

Based on comments by land owners and concession operator, a 50% increase in commercial and recreational activities, for a period of 20 years from 1990 to 2010, is assumed.

According to the report submitted by the applicant, water supply projections for the initial system do not include allowances for significant lawn watering or irrigation.

The needed water will be diverted from the Missouri River. An alternative source of water is identified to be Gray Goose Aquifer.

Conclusion and Recommendations

1. The Missouri River is known to have ample supplies of unappropriated water available, therefore, water is available from the Missouri River to meet the needs of Water Permit Application No. 5294-3
2. Approval of Water Permit Application No. 5294-3 is in the public interest and constitutes a beneficial use of the waters of the state.
3. It is recommended that Water Permit Application No. 5294-3 be approved. No qualification should be required.



M. RASSOOL AHADI
Natural Resources Engineer

Approved by



JAMES WINTERTON, P.E.
Natural Resources Engineer IV

RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 5294-3, County of Hughes

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Division, Department of Water and Natural Resources concerning Water Permit Application No. 5294-3, County of Hughes, Hughes County Court House, Pierre SD.

The Chief Engineer is recommending APPROVAL of Application No. 5294-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) in the public interest.

See the attached report for additional information.


JOHN HATCH, Chief Engineer
April 3, 1989



Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

April 5, 1989

**NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPERS RIGHT AWAY.**

Jerry Hawkins, Chairman
Hughes County Commission
Hughes County Courthouse
Pierre, SD 57501

Dear Mr Hawkins:

Water Permit Application No. 5294-3 for commerical, domestic, recreational and rural water system use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the Publishers of the Onida Watchman and Daily Capitol Journal printed at Onida and Pierre SD. For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspapers to authorize publication of your Notice of Intent to Appropriate Water and to arrange for payment. Early contact with the papers can eliminate delays. The publishers have been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. We must receive Proof of Publication before the application can be considered by the Water Management Board.

Sincerely,

Ron Duvall
Natural Resources Engineer
605 773-3352

enclosures

cc: Orman Nafziger





Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

April 5, 1989

Onida Watchman
Box 205
Onida, SD 5764564

Dear Sir:

Enclosed is a Notice of Hearing on Application No. 5294-3 to be published twice. Please publish the first notice on or before April 13, 1989 with the second publication 7 days later.

The APPLICANT MUST VERIFY TO YOU THAT THE NOTICE IS TO BE PUBLISHED, before you make the first publication. Please BILL the APPLICANT for the cost of publication. The APPLICANT is County of Hughes, Hughes County Courthouse, Pierre, SD 57501.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall
Natural Resources Engineer
605 773-3352

enclosures

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

FIRST TRANSMITTAL NOTICE

TO: Ron Duvall
Water Rights Division
Joe Foss Building
Pierre SD 57501-3181

No. _____

Date _____

We are in receipt of your letter of _____ enclosing Notice of Hearing to
Appropriate Water by Application No. _____ which was first published in our issue
of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper





Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

April 5, 1989

Daily Capitol Journal
Box 878
Pierre, SD 57501

Dear Sir:

Enclosed is a Notice of Hearing on Application No. 5294-3 to be published twice. Please publish the first notice on or before April 13, 1989 with the second publication 7 days later.

The APPLICANT MUST VERIFY TO YOU THAT THE NOTICE IS TO BE PUBLISHED, before you make the first publication. Please BILL the APPLICANT for the cost of publication. The APPLICANT is County of Hughes, Hughes County Courthouse, Pierre, SD 57501.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall
Natural Resources Engineer
605 773-3352

enclosures

CUT HERE

FIRST TRANSMITTAL NOTICE

TO: Ron Duvall
Water Rights Division
Joe Foss Building
Pierre SD 57501-3181

No. _____

Date _____

We are in receipt of your letter of _____ enclosing Notice of Hearing to Appropriate Water by Application No. _____ which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name _____

Newspaper _____



Instruction to Newspaper - Publish first Notice on or before April 13, 1989 with 2nd publication 7 days later. The applicant is responsible for payment.

NOTICE OF HEARING on Application No. 5294-3 to Appropriate Water

Notice is given that the County of Hughes, Hughes County Courthouse, Pierre, SD 57501 has filed an application for a water permit to appropriate 0.167 cubic feet of water per second from the Missouri River. The point of diversion is to be located in a bay on Spring Creek in the SE1/4 NE1/4 Section 5-T112N-R80W. Water is to be used by the Spring Creek and Cow Creek recreation areas for domestic, commercial, recreational and rural water system purposes. The area of the proposed use of water is located between Spring Creek and Cow Creek in Hughes and Sully Counties.

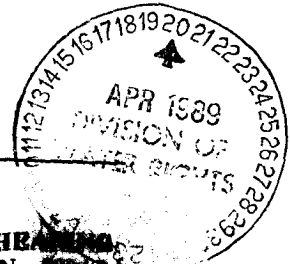
Pursuant to SDCL 46-2A-2, the Chief Engineer of the Water Rights Division recommends APPROVAL of Application No. 5294-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water and 4) it is in the public interest. This application will be considered by the Water Management Board at 523 E. Capitol, Joe Foss Building, Room 216, Pierre, SD on May 10, 1989 at 10:00 am. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer or 4) deny this application based on the facts presented at the public hearing.

Any interested person that intends to participate in the hearing before the Board by presenting evidence or cross-examining witnesses according to SDCL 1-26, must file a written petition with BOTH the applicant and Chief Engineer by April 28, 1989. The Chief Engineer's address is "Water Rights Division, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)". The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application and the signature and mailing address of the petitioner or legal counsel if legal counsel is obtained. The applicant need not file a petition. Contact the Water Rights Division to request information on this application or to assure access to the hearing by the handicapped.

This hearing is an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. The time of the hearing will also be automatically delayed for at least twenty days upon written request to the Chief Engineer from the applicant or a petitioner. The request for a delay must be received by April 28, 1989.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-15; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.

No. _____



PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County Sully) ss.

NOTICE OF HEARING
ON Application No. 5294-3 to
Appropriate Water

I, Parker Knox hereby

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

Water was taken from the Onida Hatchman

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

city of Onida

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

April 13, 1989

April 20, 1989

Parker Knox
(Signature)

owner
(Title)

April 20, 1989
(Date Signed)

Cost of Printing: \$34.99

Notice is given that the County of Hughes, Hughes County Court-house, Pierre, SD 57501 has filed an application for a water permit to appropriate 0.167 cubic feet of water per second from the Missouri River. The point of diversion is to be located in a bay on Spring Creek in the SE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 5-T112N-R80W. Water is to be used by the Spring Creek and Cow Creek recreation areas for domestic, commercial, recreational and rural water system purposes. The area of the proposed use of water is located between Spring Creek and Cow Creek in Hughes and Sully Counties.

Pursuant to SDCL 46-2A-2, the Chief Engineer of the Water Rights Division recommends APPROVAL of Application No. 5294-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water and 4) it is in the public interest. This application will be considered by the Water Management Board at 523 E. Capitol, Joe Foss Building, Room 216, Pierre, SD on May 10, 1989 at 10:00 am. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer or 4) deny this application based on the facts presented at the public hearing.

Any interested person that intends to participate in the hearing before the Board by presenting evidence or cross-examining witnesses according to SDCL 1-26, must file a written petition with BOTH the applicant and Chief Engineer by April 28, 1989. The Chief Engineer's address is "Water Rights Division, Foss Building, 523 E. Capitol, Pierre, SD 57501 (605 773-3352)". The petition may be informal, but must include a statement describing the petitioner's interest in application, the petitioner's reasons for opposing or supporting the application and the signature and mailing address of the petitioner or legal counsel if legal counsel is obtained. The applicant need not file a petition. Contact the Water Rights Division to request information on this application or to assure access to the hearing by the handicapped.

This hearing is an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. The time of the hearing will also be automatically delayed for at least twenty days upon written request to the Chief Engineer from the applicant or a petitioner. The request for a delay must be received by April 28, 1989.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-15; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.

**NOTICE OF HEARING
on Application No. 5294-3
to Appropriate Water**

Notice is given that the County of Hughes, Hughes County Courthouse, Pierre, SD 57501 has filed an application for a water permit to appropriate 0.167 cubic feet of water per second from the Missouri River. The point of diversion is to be located in a bay on Spring Creek in the SE 1/4 NE 1/4 Section 5-T112N-R80W. Water is to be used by the Spring Creek and Cow Creek recreation areas for domestic, commercial, recreational and rural water system purposes. The area of the proposed use of water is located between Spring Creek and Cow Creek in Hughes and Sully Counties.

Pursuant to SDCL 46-2A-2, the Chief Engineer of the Water Rights Division recommends APPROVAL of Application No. 5294-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water and 4) it is in the public interest. This application will be considered by the Water Management Board at 523 E. Capitol, Joe Foss Building, Room 216, Pierre, SD on May 10, 1989 at 10:00 am. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer or 4) deny this application based on the facts presented at the public hearing.

Any interested person that intends to participate in the hearing before the Board by presenting evidence or cross-examining witnesses according to SDCL 1-26, must file a written petition with BOTH the applicant and Chief Engineer by April 28, 1989. The Chief Engineer's address is "Water Rights Division, Foss Building, 523 E Capitol, Pierre, SD 57501 (605 773-3352)". The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application and the signature and mailing address of the petitioner or legal counsel if legal counsel is obtained. The applicant need not file a petition. Contact the Water Rights

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County Hughes) ss.

I, Peggy Warner hereby

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

Water was taken from the Capital Journal

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

City of Pierre

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

April 13, 1989

April 20, 1989

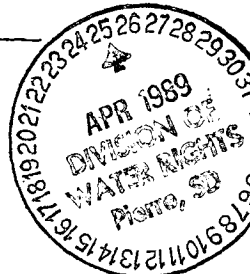
Peggy Warner
(Signature)

Legal Ad Representative
(Title)

April 21, 1989
(Date Signed)

Cost of Printing: _____

101 lines @ .44 \$44.44



CAPITAL JOURNAL, T

Division to request information on this application or to assure access to the hearing by the handicapped.

This hearing is an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. The time of the hearing will also be automatically delayed for at least twenty days upon written request to the Chief Engineer from the applicant or a petitioner. The request for a delay must be received by April 28, 1989.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-15; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.



Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

AUG 1 1989

Jerry Hawkins, Commissioner
County of Hughes
Hughes County Courthouse
Pierre, SD 57501

Dear Mr. Hawkins:

Enclosed is Water Permit No. 5294-3 as approved by the Water Management Board authorizing you to construct your water diversion system and put the water to beneficial use, not exceeding the limits as specified in the Water Permit.

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

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Division
605 773-3352

enclosures

PLEASE NOTE: Certain changes can be made in your permit within the five year construction period, usually without affecting the priority date provided an application to amend your permit is made within the five year period - i.e. changes in location or number of diversion points (wells) or location of land to be irrigated. Well locations for wells into the same aquifer can be moved up to 660 feet without application.

Applications to amend a permit after the five year construction period will be assigned a new priority date. Applications to change water sources, to add lands or increase original diversion rates, if approved will usually receive the date of the new application as a priority date regardless of the five year construction period.



Permit No. 5294-3
Missouri 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

On, July 30, 1996, I made a thorough examination of the water use system constructed by the County of Hughes, c/o Jerry Hawkins, Commissioner, Hughes County Courthouse, Pierre, SD 57501** holder of Permit No. 5294-3, bearing the priority of March 14, 1989 authorizing the diversion of 0.167 cu. ft. per second (75 gpm) of the Missouri River (Lake Oahe) for commercial, domestic, recreation and rural water system purposes, in Hughes County.

** Denny Spencer stated water permit is owned and operated by Spring Creek Sanitary District. A transfer form needs to be sent with licensing information to Spring Creek Sanitary District, PO Box 623, Pierre, SD 57501

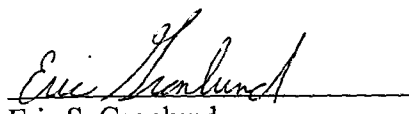
I have to report on the conditions of the same as follows:

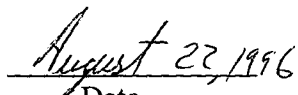
- A. Works used to divert the water:
wet well type of set-up with a siphon intake to Lake Oahe
- B. Works used to transport water to place of use:
submersible pump and booster pump
- C. Works used to apply water to beneficial use:
once treated water goes into a storage tank and is available upon demand

The system is in the following condition excellent. The point of diversion is located On the section line between SE1/4 NE1/4 Section 5 and the SW1/4 NW1/4 Section 4; all in T112N, R80W. The works are capable of diverting and conveying to the place of use 0.159 cu. ft. per second of water (71.5 gpm) which is to be used for commercial, domestic, recreation and rural water system use. Water has been put to beneficial use to the maximum extent as follows and the license should be issued for 0.159 cfs (71.5 gpm).

Applicable permit qualifications have been complied with: No qualifications

Exceptions to compliance are: none


Eric S. Gronlund
Natural Resources Engineer
DENR, Water Rights Program


Date

REPORT ON INSPECTION OF PERMIT NO. 5294-3

DATE OF INSPECTION: July 30, 1996

Other permit(s) associated with the project: Water Permit No. 4920-3 (to be Cancelled)

Contact Person & Address: Renee Ellwin, Spring Creek Sanitary District, PO Box 623, Pierre, SD 57501. My conversation was with the system operator, Denny Spencer, Oahe Lodge, 19602 Lake Pl., Pierre, SD 57501

DIVERSION POINT LEGAL LOCATION: On the section line between SE1/4 NE1/4 Section 5 and the SW1/4 NW1/4 Section 4; all in T112N, R80W

WATER SUPPLY Source: Missouri River (Lake Oahe)

Well Information: This is a wet well type of intake system in which a submersible pump is placed in well and is capable of pumping from the Lake through an intake siphon. See Figure No. 3 in the 1988 Engineering Report

- | | |
|----------------------------|------------------------------------|
| 1) Well Drilling Firm: | 2) No. of Wells <u>1</u> |
| 3) Depth(s) <u>60</u> feet | 4) Well log is available <u>no</u> |

Casing:

- | | |
|-----------------------------|--------------------------|
| 1) Diameter <u>#</u> inches | 2) Length <u>60</u> feet |
| 3) Type <u>#</u> | |

Screen: Not Applicable

- | | |
|-------------------------------------|-------------------------|
| 1) Type <u>#</u> | 2) Length <u>#</u> feet |
| 3) Static water level <u>#</u> feet | |

Pump: Submersible

- | | |
|--|----------------------------|
| 1) Make <u>Sta Rite, Signature 2000, Series H, Stainless</u> | 2) Model <u>L50P4HH</u> |
| 3) Size <u>4 inch</u> | 4) Capacity <u>50*</u> GPM |

* - The pump performance chart, provided by Morris Irrigation who replaced the pump, shows the pump capacity for 60 foot of depth (at 0 psi conditions) as 71.5 gpm. However if the pump pump to the storage/treatment facility (at elev. 1658) the pump can produce a maximum of 64.5 gpm

Motor:

- | | |
|----------------------------------|-----------------------|
| 1) Make <u>#</u> | 2) Model No. <u>#</u> |
| 3) Horsepower rating <u>3</u> hp | |

DISTRIBUTION LINES OR CANALS:

- | | | |
|---|-----------------------------------|-------------------------|
| 1) Type <u>#</u> | 2) Size <u>6 and 8 inch mains</u> | 3) Length <u>#</u> feet |
| 4) Storage Unit <u>Aqua Store (Serial No. 8900296) with a diameter of 19.58', Height of 14.69', capacity 33,000 gallons</u> | | |

SYSTEM TYPE: Not Applicable

DAM INFORMATION: Not Applicable

CHEMIGATION EQUIPMENT: Not Applicable

PERMIT QUALIFICATIONS AND REGULATIONS:

- 1) Special qualifications to permit being abided by **No Qualifications**
- 2) All structures, wells and lands on map **Yes**
- 3) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period **Not Applicable**



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

September 16, 1996

5294-3

Spring Creek Sanitary District
PO Box 623
Pierre SD 57501

Dear Sir:

The inspection of the Spring Creek Sanitary District water use system and the inspection of the extent of application of water to beneficial use, as developed under Water Permit No. 5294-3, has been completed. Eric Gronlund, engineer with this office conducted the investigation. Mr. Gronlund spoke with Dennis Spencer and was informed that Water Permit No. 5294-3 was now owned and operated by the Spring Creek Sanitary District. Enclosed is a partially completed *Notice of Transfer of Ownership* form. This form needs to be completed, signed, notarized and returned with a filing fee of \$2.50.

Statutes require that we charge a \$50.00 fee for the inspection and issuance of the Water License. Upon receipt of the \$52.50 fee (license and transfer fees), we will process the Water License.

Please send fee to: **Department of Environment & Natural Resources**
 Water Rights Program
 523 E. Capitol
 Pierre, SD 57501-3181

Sincerely,

Karen Schlaak
Environmental Scientist
Water Rights Program
(605) 773-3352

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

RECEIPT

415168

Division of Water Rights

South Dakota Department of Environment and Natural Resources

Pierre, _____ October 24, 19 96

RECEIVED OF Spring Creek Sanitary District, P.O. Box 623, Pierre, SD 57501

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>5294-3</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 Hatcher 
Chief Engineer

RECEIPT

415169

Division of Water Rights

South Dakota Department of Environment and Natural Resources

Pierre, _____ October 24, 19 96

RECEIVED OF Spring Creek Sanitary District, P.O. Box 623, Pierre, SD 57501

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. _____		
Fee for Filing Transfer Form <u>Water Permit No. 5294-3</u>	2	50
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	2 50

By John Hatch
Chief Engineer

NOTICE OF TRANSFER OF OWNERSHIP

To: Chief Engineer
Water Rights Program, DENR
523 E. Capitol
Pierre, SD 57501-3181



No. 5294-3

Date: 10-23-96

I/We request that Water Permit No. 5294-3

formerly owned by: Hughes County

be transferred to: (name & address) SPRING CREEK SANITARY DISTRICT -
P.O. BOX 623 - PIERRE, SD Telephone No. 224-9340

Title to the following described land(s)/property has been transferred as described above:

(diversion point location) on section line between SE 1/4 NE 1/4 Sec 5 & SW 1/4 NW 1/4 Sec 4, T112N, R80W

I/We understand that the validity of Water Permit No. 5294-3 has not been determined by this transfer action. If I/We have any questions on validity, I/We understand that only the Water Management Board has the authority to determine if a water permit/right is valid (see note).

You are requested to file this "Notice of Transfer" in the appropriate file with the Water Rights Program, as evidence of the change of ownership.

A fee of Two Dollars and Fifty Cents (\$2.50) is attached to cover the filing fees as required under SDCL 46-2-13.

STATE OF SOUTH DAKOTA)
County of HUGHES)

I/We ROBERT H. HARTFORD being first duly sworn on my oath depose and say that my relation to the above described undertaking is that of Owner, that I have read the above foregoing statement, and that I know of my own personal knowledge that the information herein stated is true.

Robert H. Hartford
(Signed)

Subscribed and sworn to before me this 23rd day of OCTOBER, 19 96.

Carol J. Newak
(Notary Public)

NOTE: Water permits may be cancelled for nonconstruction within the five year construction period. Once a water permit is developed and the water used, the permit becomes a right. A water right may be lost for three reasons:

1. Abandonment - no intent to use water and use is abandoned.
2. Forfeiture - no use of water for three year period without legal excuse.
3. For a third violation of a condition of a water permit/right.

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 5294-3

(1) The County of Hughes, Pierre SD made Application No. 5294-3, March 14, 1989 for a water permit to divert 0.167 cubic feet of water per second from the Missouri River, Hughes County, South Dakota for commercial, domestic, recreational and rural water system purposes. Permit No. 5294-3, with a priority date of March 14, 1989 was approved May 10, 1989 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before May 10, 1994 and for the application to beneficial use of said water on or before May 10, 1998.

On October 24, 1996, Water Permit No. 5294-3 was transferred to the Spring Creek Sanitary District.

(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 0.159 cubic feet of water per second for beneficial use. The location of the diversion point is on the section line between the SE 1/4 NE 1/4 Section 5 and the SW 1/4 NW 1/4 Section 4; all in T112N-R80W.

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

(4) Pursuant to South Dakota Water Law 46-5-30.1 Spring Creek Sanitary District, PO Box 623, Pierre SD 57501 the holder and/or owner of Water Permit No. 5294-3 is issued a license to appropriate water, the right to use 0.159 cubic feet of water per second from the Missouri River with a priority date of March 14, 1989 from the location specified in (2) of this license, for the purpose of commercial, domestic, recreational and rural water system use. This license is subject to any limitations or qualifications listed in Water Permit No. 5294-3 and subject to South Dakota State Law.



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

DEC 26 1996

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

DEC 26 1996

5294-3

Robert H. Hartford
Spring Creek Sanitary District
P.O. Box 623
Pierre, SD 57501

Dear Mr. Hartford:

Enclosed is Water License No. 5294-3 and Receipt No. 415168 for \$2.50 and Receipt No. 415169 for \$50.00 which was assessed for the transfer, investigation and issuance of the license. Water License No. 5294-3 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

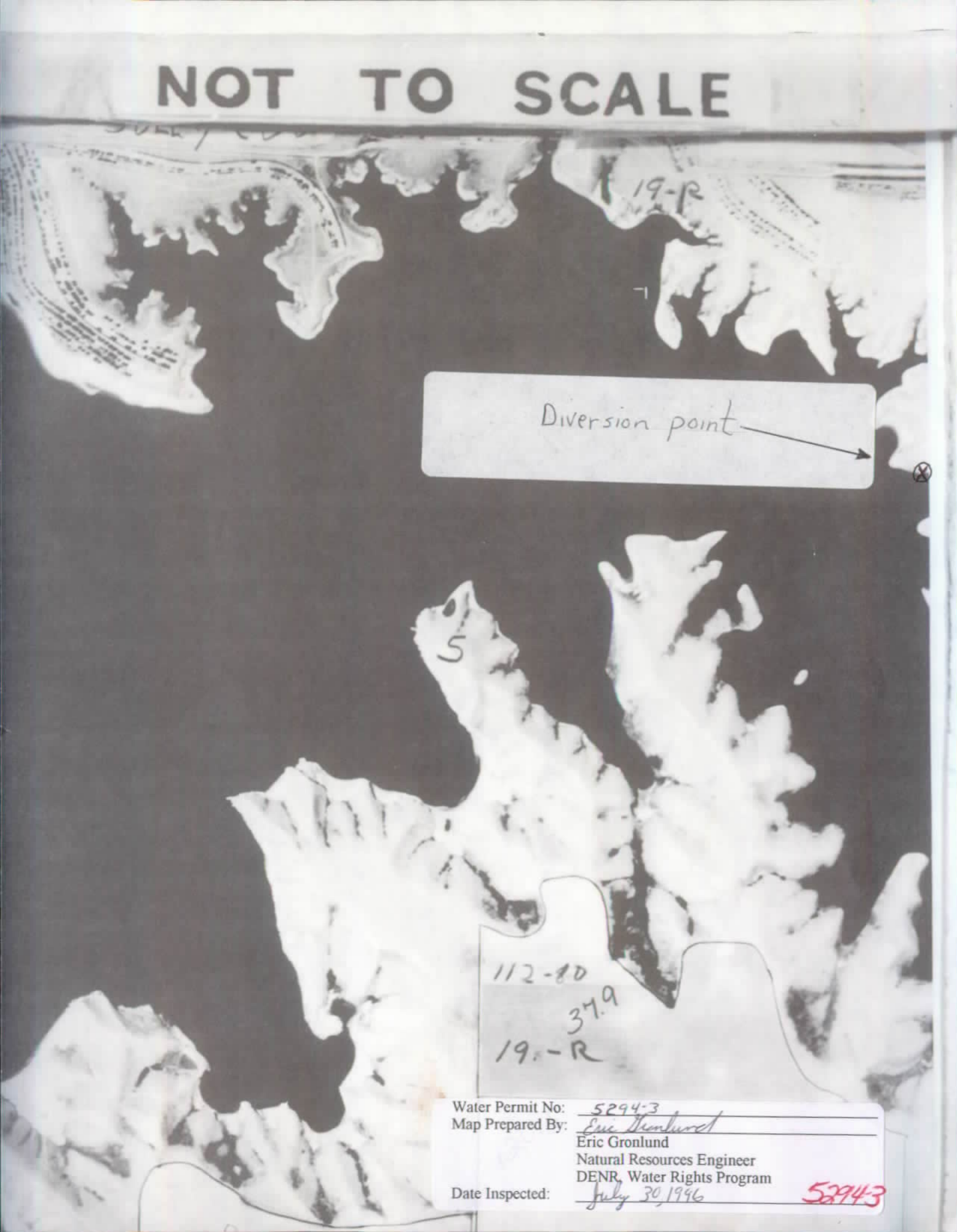
NOT TO SCALE

19-R

5

112-80
37.9
19-R

Diversion point →



Water Permit No: 5294-3

Map Prepared By:

Eric Gronlund

Natural Resources Engineer

DENR, Water Rights Program

Date Inspected:

July 30, 1996

5294-3

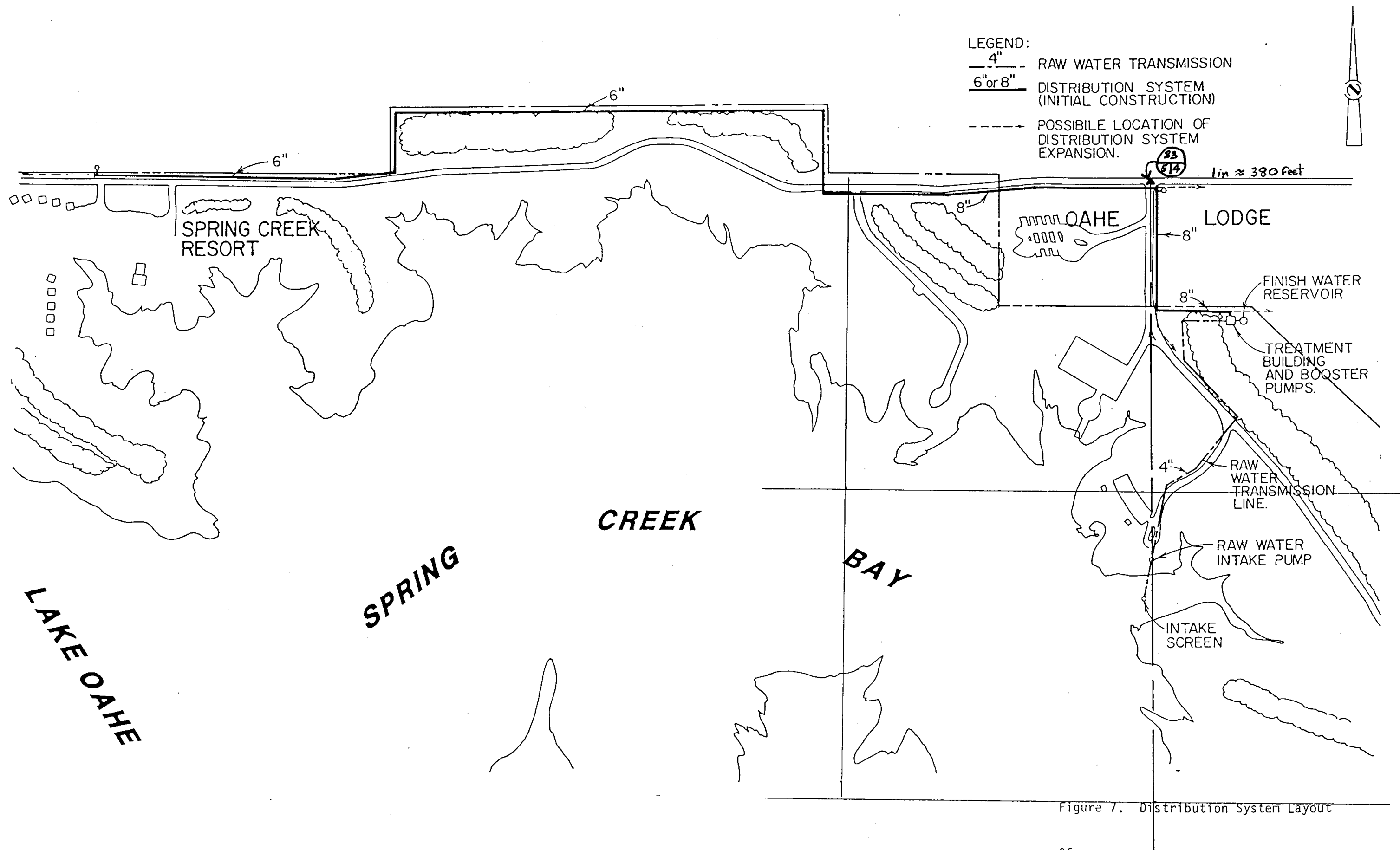


Figure 7. Distribution System Layout

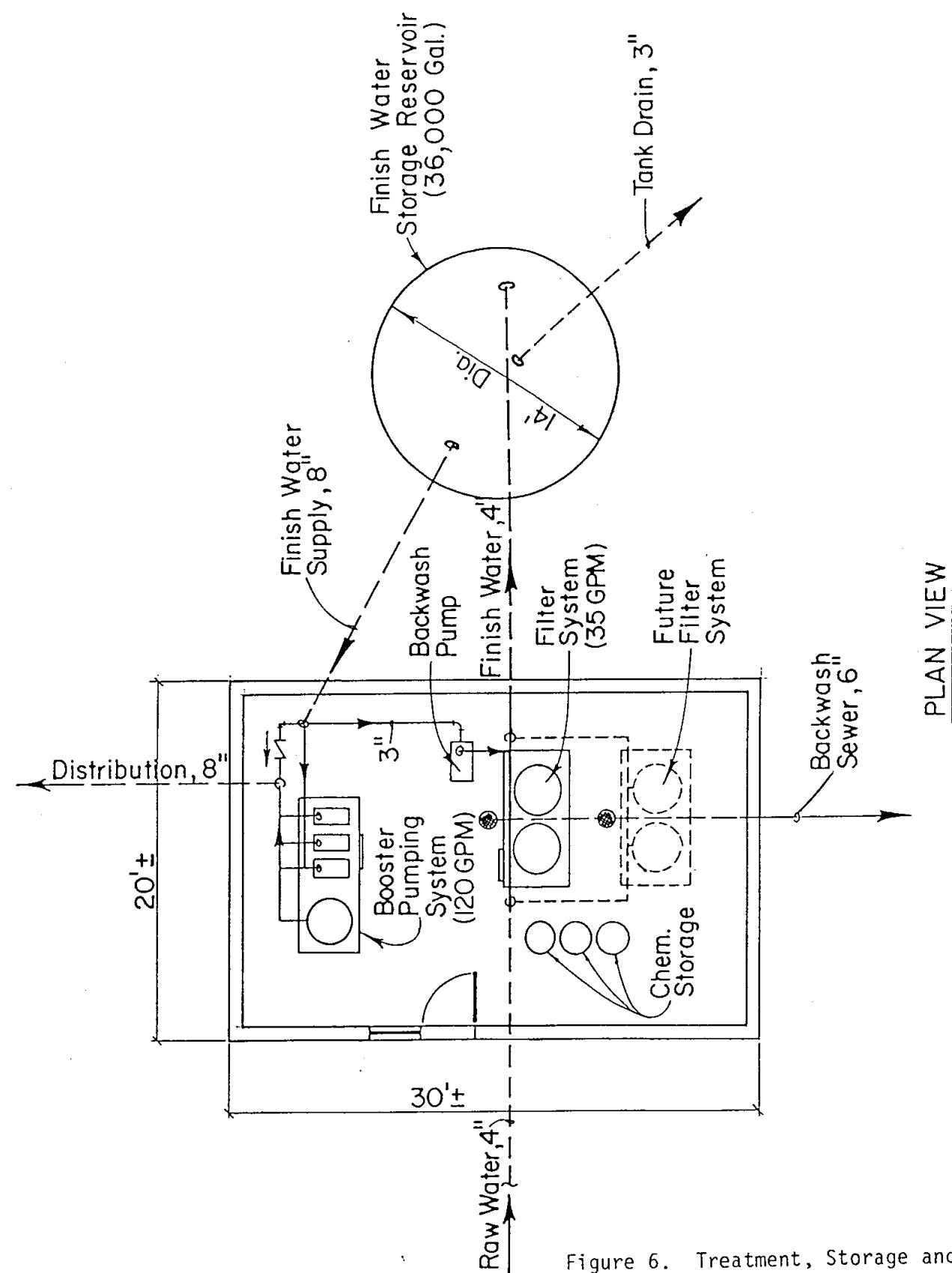
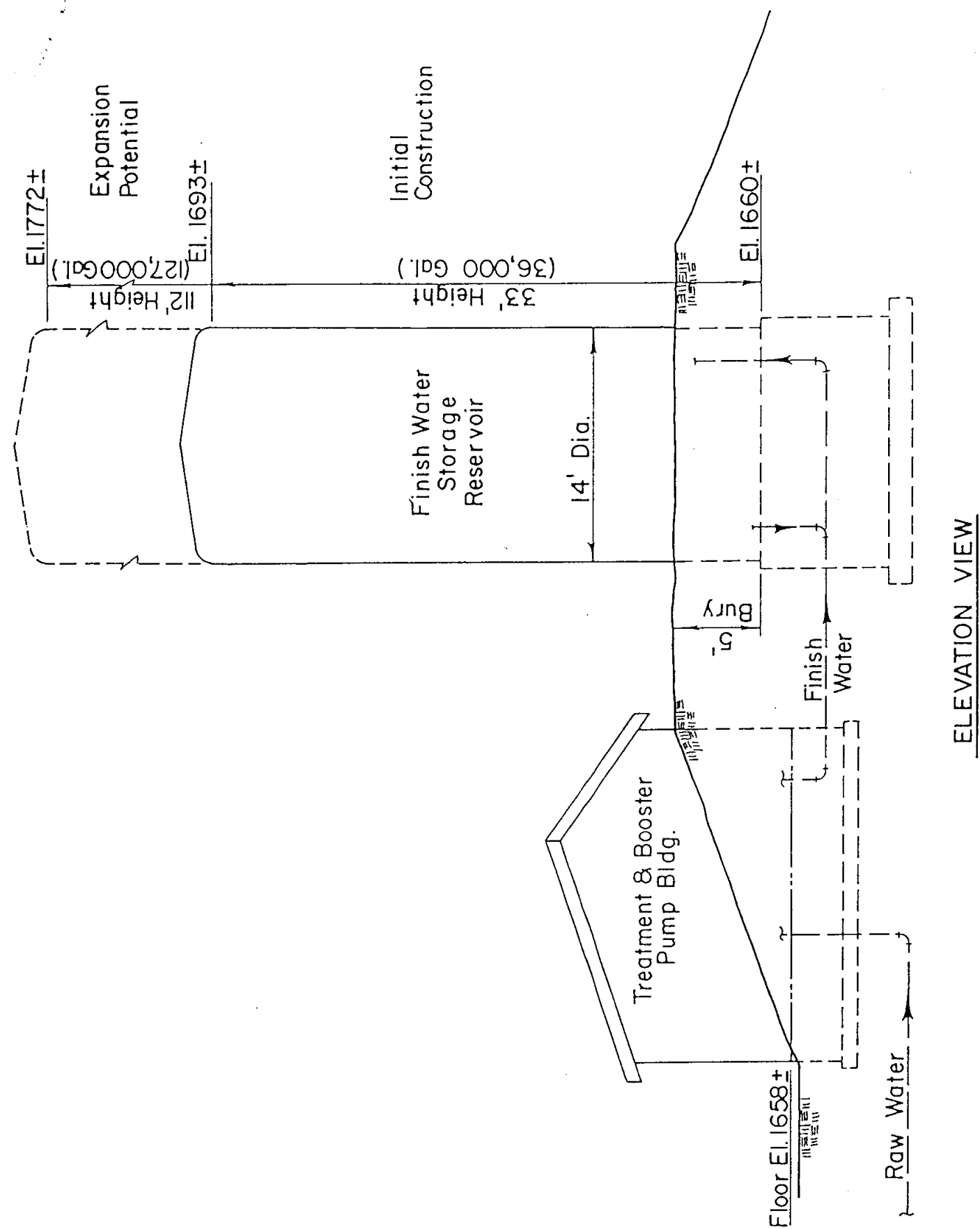


Figure 6. Treatment, Storage and Booster System Schematic

February 2, 2006

5294-3

2005 South Dakota Water Use Questionnaire

To:

SPRING CREEK SANITARY DIS
PO BOX 623
PIERRE SD 57501 0623

RECEIVED
FEB 27 2006
WATER RIGHTS
PROGRAM

Address correction requested:

Hughes County
Spring Creek Sanitary Dist.
204 E. Capitol
Pierre, SD 57501

One questionnaire is being provided for each permitted water source. The following information is based on Water Permit/Right No. 5294-3. If you have other permits/rights in the same water source, also include water use under those permits/rights on this questionnaire.

Water Source: MISSOURI RIVER
Aquifer: NOT APPLICABLE
Management Unit: NOT APPLICABLE

County: HUGHES
Pumping Pt. Legal: SEC 05-T112N-R80W
Type of Water Use: COMMERCIAL

- 1) Please estimate your year 2005 water use from the above water source: 0 gallons
2) If no water use in 2005, please list the reason(s) why in the comments section.

Comments:

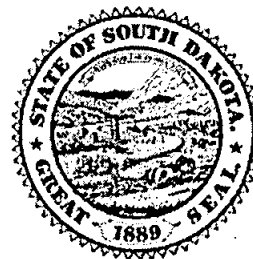
River level far below intake structure
capability for pumping since 2003.
Water supplied by Mid. Dakota
under contract for the Spring Creek San. Dist.
The District wishes to keep water use rights

Contact Person:

Doug Ripley

Telephone No:

605-773-3060



Questions? Please call Mark Rath or Ron Duvall at 605 773-3352 for assistance.

Thank you for completing the 2005 water use questionnaire.

Water Rights on the Web: www.state.sd.us/denr/wr