

Considered: _____

WATER PERMIT NO. 2221-2

Phone: 224-5517

Name of Applicant: U.S. Forest Service

Post Office Address: PO Box 417, Pierre SD 57501

Amount of Water Claimed: 42 ac-ft Total Acres: NA

Source of Water Supply: runoff

Water to be used for: recreational & wildlife County: Lyman

About 11 miles South of Ft. Pierre

PROOF OF PUBLICATION: Received _____ Not Received _____

APPLICATION: Approved _____ Subject to _____

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

PRIORITY Date Received: 11-15-91 Fee: \$150 Remarks _____

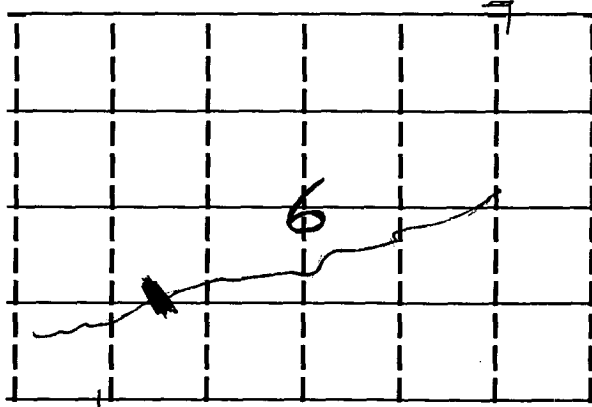
Corrected Application Received 2-26-92 Period of Annual Use January 1 - Dec 31

WATER QUALITY APPROVAL RECEIVED NA APPROVED/CONDITIONAL (Circle one)

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

Diversion Point: W 1/2 SW 1/4 Sec 6-T108N-R79W

Land to be Irrigated: _____



Well Log: Driller: NA Licensed YES _____ NO _____

Depth of Well: _____ REMARKS _____

Type of Map: topo PREPARED BY: David V Coe, P.E. Reviewed and the Number

Assigned on 2-27-92 By Karen Schlaak

No. 2221-2 Hydrologic Unit 10140104
 Map No. _____ Basin Missouri River
 Newspaper Lyman Co Herald, Box 280, Presho

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 ☒ wildlife Production

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 U. S. Forest Service Phone No. 224-5517

Post Office Address P. O. Box 417 Pierre State S.D. 57501
(Street, RR or Box) (City) Zip Code

2. Amount of water claimed (c.f.s.) 42 acre/feet

3. Source of water supply Runoff

4. Location of point of diversion Dam would be located in the west 1/2, southwest 1/4, section 6
T108N R79W

County Lyman

5. Counties where water will be used Lyman and Stanley

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)

The proposed project concerns a dam that will impound water for wildlife habitat, especially migratory waterfowl. Recreation will also be a use of the impoundment. Livestock may be watered at the reservoir site.

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, USDA, U. S. Forest Service 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

Subscribed and sworn to before me this 25th day of Feb 19 92

Supplemental Information

(type or print in ink)

1. Well Information - Proposed construction

- a) Drill Hole Diameter _____ Depth _____
- b) Casing Type _____ Diameter _____ Thickness _____
- c) Screen Type _____ Diameter _____ Thickness _____
- d) Gravel Pack Thickness _____ Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material _____
- f) Depth to Water (ground surface to water level) _____
- g) Distance to nearest existing domestic well:
- On applicants property _____ On property owned by others _____

2. Dugout Information Estimates

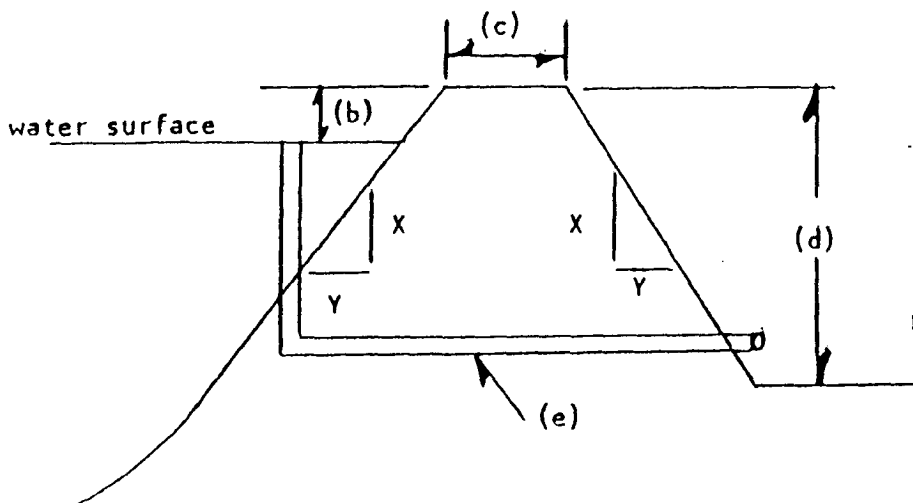
- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

3. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below. The locations of each dam should be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam please give their name and address

Ducks Unlimited
6115 E. Main Ave.
Bismarck, North Dakota 58501
Attention: Roger Smith



- b) Freeboard 4 ft.
- c) Crest Width 12 ft.
 Crest Length 600 ft.
- d) Height 17 ft.
- e) Primary Outlet Capacity 220 cfs.
 If Pipe, diameter 48 in.
- f) Secondary Spillway Capacity 870 cfs
 Spillway width 155 ft.
- g) X & Y Slope
 Upstream 3:1
 Downstream 3:1

Surface Area of Impoundment 10 acres

Storage 41.75 acre feet

Drainage area above dam 3.5 sq. mile

Signature of Applicant _____



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

GREAT FACES. GREAT PLACES.

November 15, 1991

U.S. Forest Service
Anthony W DeToy
PO Box 417
Pierre SD 57501

Dear Mr. DeToy:

In regard to the water permit application received on November 15, 1991, the following information needs to be submitted in order to process the application for the Ducks Unlimited Project in Lyman County.

1. Enclosed is the map submitted with the application. The map must be signed by one of the following: Registered Land Surveyor, Registered Professional Engineer or by any other government employee who normally prepares maps as a part of his assigned duties.
2. The filing fee for this application will be \$150.00.

Upon receipt of the above, further processing of the application will continue. If you have any questions, please contact this office.

Sincerely,

A handwritten signature in cursive script that reads "Karen Schlaak".

Karen Schlaak
Natural Resources Analyst
605 773-3352

enclosure



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

January 29, 1992

U.S. Forest Service
Anthony W. DeToy
PO Box 417
Pierre SD 57501

Dear Mr. DeToy:

On November 15, 1991, you submitted an application (copy enclosed) for a permit to appropriate water for a Ducks Unlimited Project in Lyman County. You were notified on November 15, 1991 (copy enclosed) that the application was incomplete and were instructed what additional information was necessary in order to complete the application. To date, we have not received a response from you.

Obtaining a water permit ultimately benefits you by protecting your right to use water. Except for domestic use, any water user without a water right is not entitled to receive protection in the event of interference by a new or future user who has a water right.

Pursuant to South Dakota Codified Laws 46-1-15, 46-5-9, 46-5-10 and 46-2-18, you must have a water permit prior to using water.

If you have any questions, please contact this office.

Sincerely,

Karen Schlaak
Natural Resources Analyst
(605) 773-3352

enclosure

Conversation or File Documentation

NAME OF PERSON OR FILE: Glenn MoravikADDRESS: U.S Forest Service COUNTY _____DATE: 1-30-92 TELEPHONE _____RE: Pending appl in Lyman Co.

COMMENTS:

Mr. Moravik stated they are doing an
Environmental Analysis and will be
sending in the requested info within
the next couple of months.

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: Karen Schlack



United States
Department of
Agriculture

Forest
Service

Fort Pierre
National
Grassland

Wall Ranger District
P. O Box 417
Pierre, SD 57501

Reply to: 2610

Date: Feb. 26, 1992

Ms. Karen Schlaak
Natural Resource Analyst
Department of Environment and Natural Resources
Joe Foss Building
Pierre, S.D. 57501



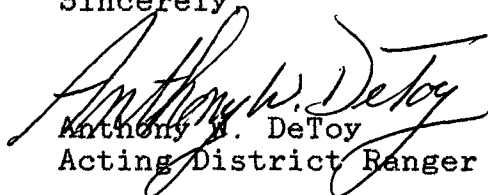
Dear Ms. Schlaak:

We have enclosed an updated application for a water right for the County Line Ducks Unlimited Dam in Lyman County.

D.U. changed their design somewhat, so a new set of plans and a new application form are enclosed. This takes the place of the application we sent to John Hatch of your department on November 12, 1991. Also enclosed are a signed map of the site and a design report.

Please call at 224-5517 if you will need additional information to process this request for a water right.

Sincerely,


Anthony W. DeToy
Acting District Ranger

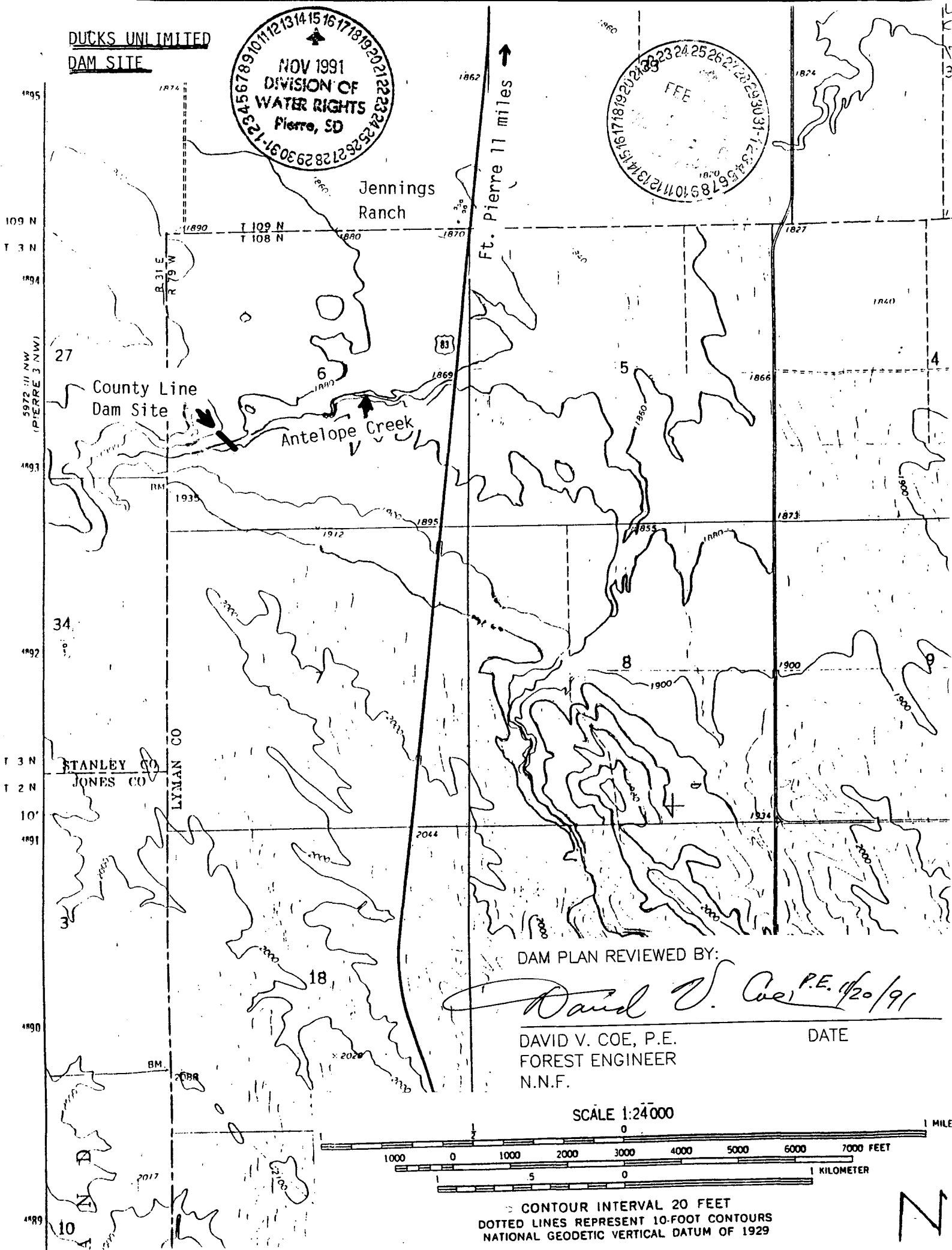
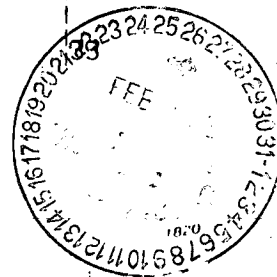
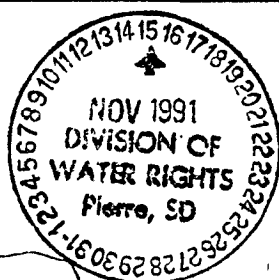
Enclosures



Caring for the Land and Serving People

FS-6200-28(7-82)

**DUCKS UNLIMITED
DAM SITE**



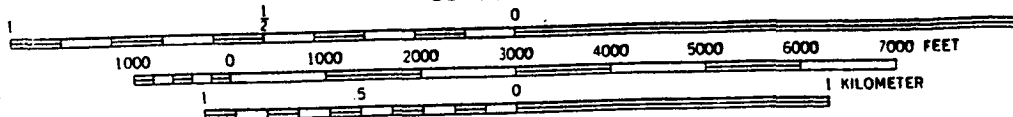
DAM PLAN REVIEWED BY:

David V. Coe P.E. 11/20/91

DAVID V. COE, P.E.
FOREST ENGINEER
N.N.F.

DATE

SCALE 1:24,000



CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

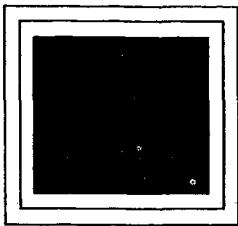


REPORT OF SOIL INVESTIGATION

County Line Impoundment
Lyman County, South Dakota
Project Number B2209



MIDWEST TESTING LABORATORY



MIDWEST TESTING LABORATORY

P.O. Box 2084 • 1900 Commerce St. • Bismarck, North Dakota 58502 • 701-258-2833

March 14, 1989

Ducks Unlimited, Inc
6115 East Main Ave
Bismarck, ND 58501

Attn: Roger Smith

RE: Soil Investigation
County Line Impoundment
Lyman County, South Dakota
Project Number B2209

Dear Roger:

The attached report covers the soil investigation we conducted for the above project. Three copies of our report are being furnished for your use. The work was conducted in accordance with your instructions and authorization.

Approximately 50 percent of the soil samples obtained will be held at our office for two months and will then be discarded unless we are notified to hold them for a longer period of time.

The evaluations contained in this report have considered the normal contingencies; however, should any questions arise pertaining to the soil conditions during preparation of the working drawings, or unexpected conditions develop during construction, please do not hesitate to contact us.

Very truly yours,

MIDWEST TESTING LABORATORY

Dean E. Shaw, E.I.T.

DES/cb

REPORT OF SOIL INVESTIGATION

County Line Impoundment
Lyman County, South Dakota
Project Number B2209

INTRODUCTION

The proposed impoundment development will be accomplished through the use of an earth embankment in conjunction with a 60" riser pipe which will be the primary spillway. Two possible embankment locations were investigated with a total of nine soil test borings being performed on January 18, 1989. Four of these test borings were advanced within the proposed borrow areas with five being advanced along the two proposed dike centerlines. Boring 3A can be used as the north end of both embankments. The purpose of these borings was to determine the soil conditions encountered and with the aid of laboratory analysis, evaluate these conditions in relation to the proposed construction.

SITE AND SOIL CONDITIONS

The proposed site is located 12 miles south of Pierre, South Dakota, in Section 6, Township 109N, Range 79W in Lyman County. The embankment will transverse the shallow valley of Antelope Creek.

Soil conditions encountered were primarily highly plastic fat clays. Within the proposed borrow areas, the initial eight inches were an organic fat clay (topsoil) of dark grayish brown coloration. This is then followed by a fat clay layer of grayish brown coloration. Borings in the borrow areas went to six feet in depth. The soils encountered in the embankment area consisted of the initial eight inches of organic lean clay followed by slightly varying layers of fat clay. At test boring 3A, a lean clay layer of grayish brown coloration was encountered from two to four feet in depth. Colorations of the soils ranged from grayish brown to a dark gray at lower depths. Field consistencies of the clays were generally in the rather stiff to very stiff range.

The preceding discussion is intended as a general review of the soil conditions encountered. For a more complete description, we refer you to the attached boring logs.

GROUNDWATER

Groundwater was not encountered at any of the test borings during their advancement nor when rechecked upon completion. A summary of the times that were checked is included on the attached boring logs.

LABORATORY INVESTIGATION

Several samples of the soils encountered at test borings 2A, 4A, 1, 2, and 3 were selected for laboratory analysis. The testing program consisted of the determination of the soil's index properties (moisture, density, and atterberg limits). One sample was evaluated for its undrained strength characteristics utilizing unconfined compressive test procedures. In addition, two samples of the soils from the borrow site were tested to determine their moisture-density relationships and plasticity characteristics. The moisture-density relationships were determined utilizing the standard proctor, ASTM:D698-78.

All test results have been tabulated and are included on the attached boring logs opposite the samples on which they were performed and on an attached plot.

ANALYSIS AND RECOMMENDATIONS

Design Features

Based on preliminary design features, the proposed earth embankment will have a top width of 12 feet with a side slope on the order of 3:1 (horizontal to vertical) with the maximum height in the range of 20 feet. The maximum impoundment level would be 15 feet. The proposed primary spillway will be a 60" pipe with a riser section and a 90 degree elbow resting on a concrete foundation. The horizontal section of the pipe will be placed at the bottom of the embankment and discharge on the downstream side. An emergency spillway will be built two to three feet higher than the primary spillway. Its location will probably be on the south end of the embankment through the borrow area.

The following recommendations are based upon the above design features as we understand them. Should actual design features vary from those listed, we ask that we be informed so that if required, the appropriate changes in our recommendations can be made.

Embankment Construction

Based on information obtained, it is our opinion that the materials encountered within the proposed borrow sites would be suitable for use in earth dike construction.

Prior to placement of embankment fills, it will be necessary to strip organic surface soils and vegetation. We would anticipate that only a minor amount of site stripping would be necessary with a depth in the range of eight inches. Soil conditions then exposed at the stripped level should be scarified for a minimum depth of six inches with an initial six-inch lift of embankment fills then placed and blended with the scarified material and compactive effort applied. This will provide for a bonding between the base of the embankment and the underlying supporting soils. We recommend that the soil be compacted to obtain a minimum density of 95 percent of the maximum density as determined by the standard proctor, ASTM:D698-78. Moisture contents of the soils should be kept in the range of minus one to plus three percent of optimum moisture as determined by this same method. Loose lift thicknesses prior to compaction should not exceed 12 inches.

A stability analysis was completed based on the previously recommended compaction minimums and procedures. In the worst condition, a factor of safety of 2.0 is found for the rapid drawdown condition. The steady state condition gave a factor of safety of 2.4 while the as built condition indicated a factor of safety of 3.6. In addition, with the proposed pool level of 15 feet, a cursory analysis indicates a seepage loss of approximately .002 cfd per lineal foot of embankment may occur.

There should be little settlement at either of the proposed sites. The fat clays are stiff and overconsolidated. Estimated total settlement

with an embankment height of 20 feet would be in the range of approximately one and one-half inches at the center to one-quarter inch at the toe.

Results of laboratory testing finds that the soils within the anticipated borrow areas are in a somewhat dry and dense condition. In placing these soils as a fill material in accordance with the recommended procedures, no volume loss would be anticipated from borrow to fill. In their relatively dry state as indicated, a considerable amount of water will be necessary to condition the soils to within the recommended moisture range. A weight volume analysis indicates that slightly in excess of 30 gallons of water will be necessary for every cubic yard of earth placed in a fill condition. It should be realized that the analysis provided was based on conditions as they existed at the time of our investigation. Depending upon weather conditions, moisture contents within the upper surface soils may increase or decrease by the time construction is initiated.

Principal Spillway Construction

For dimensioning of the principal spillway foundation, based on laboratory test results and standard penetration resistance values, an allowable stress increase of 4000 psf (pounds per square foot) would be available for design. Loading of this magnitude would provide a theoretical factor of safety of approximately three against an actual shear failure. The discharge barrel and riser pipe connection should be designed to accommodate anticipated differential settlement as mentioned in the preceding section. Of primary concern in installation of the discharge barrel is compaction of the backfill soils in the pipe zone particularly below the pipe haunches. Failure to achieve adequate consolidation of the backfill in this area can possibly lead to excessive contact seepage and piping failures on the downstream face. Therefore, compaction recommendations as given previously must be adhered to in backfilling of the discharge barrel.

FIELD INVESTIGATION PROCEDURES

Nine soil test borings were performed at the site on January 18, 1989. The borings were advanced at locations as discussed with you and shown on the attached sketch. Surface elevations are to be provided by your office.

Soil Sampling

The borings were advanced with three and one-quarter inch hollow stem auger, with split barrel samples obtained in accordance with ASTM:D1586-67. Using this procedure, a two-inch O.D. split barrel sampler is driven by a 140 pound weight falling thirty inches.

The number of blows required to drive the sampler twelve inches after a six-inch initial set is the standard penetration resistance and will be referred to as N value, an index related to the consistency of cohesive soils and the relative density of cohesionless soils.

Soil Classifications

As the borings were advanced in the field and samples obtained, they were visually and manually classified in accordance with ASTM:D2488-84. Representative portions of all samples were returned to the laboratory for verification of the field classifications. Selected samples were submitted to a program of laboratory tests to aid in determining the characteristics of the soil. Logs of the borings, laboratory test results, and charts illustrating the soil classification procedures and descriptive terminology are attached.

LIMITATIONS OF INVESTIGATION

The area of the borings in relation to the entire site is relatively small and therefore, should not be assumed to be necessarily typical of the entire area of the site. Also, this investigation cannot represent soil

-----MIDWEST TESTING LABORATORY-----

conditions below the depths of our borings. Because of these and other reasons, we recommend close observation during construction for soil conditions not typical of the strata logged.

MIDWEST TESTING LABORATORY

Dean E. Shaw
Dean E. Shaw, E.I.T.

I hereby certify that this report
was prepared by me or under my
direct supervision and that I am a
duly Registered Professional Engineer.

Theodore J. Schepper
Theodore J. Schepper

Date 3-14-89 Reg. No. 4573-SD



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 1 VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
8"	ORGANIC FAT CLAY-dark grayish brown * (OH)	1	FA					
	FAT CLAY-grayish brown, very stiff to medium (CH)	2	SB	46			65/28	
	*Frost to 6"	3	SB	19				
		4	SB	14				
		5	SB	7				
11	END OF BORING							

WATER LEVEL DATA				BORING DATA	
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED
1-18-89	10:25	HSA 9½'	None	1-18-89	1-18-89 @
1-18-89	10:30	---	None	10:25	
1-18-89	15:30	---	None	METHOD USED:	
				3 1/4" HSA 0-9½'	
				CREW CHIEF D. Roberson	



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 2 VERTICAL SCALE 1"=3'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (OH)	1	SB	10				
	FAT CLAY-dark grayish brown to grayish brown, very stiff (CH)	2	SB	42	13.3	109.2		
3½	FAT CLAY-grayish brown, stiff to very stiff, white mineral inclusions 5' to 12' (CH)	3	SB	26	18.3	100.1	66/22	
		4	SB	32				
		5	SB	36				
12	FAT CLAY-dark gray, very stiff, sand laminations (CH)	6	SB	35				
		7	SB	38				
16	END OF BORING							

WATER LEVEL DATA

DATE	TIME	CAVE IN DEPTH	WATER LEVEL
1-18-89	11:00	HSA 14½'	None
1-18-89	11:10	---	None
1-18-89	15:25	---	None

BORING DATA

STARTED 1-18-89 COMPLETED 1-18-89 @ 11:00
METHOD USED:
3 1/4" HSA 0-14½'
CREW CHIEF D. Roberson



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 3 VERTICAL SCALE 1"=2'
PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff *. (OH)	1	SB	12	14.5	107.1		
	FAT CLAY-grayish brown, rather stiff to stiff (CH)							
	*Frost to 4"	2	SB	26	13.8	99.8		
6'		3	SB	28				
	END OF BORING							

WATER LEVEL DATA				BORING DATA	
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED
1-18-89	11:30	HSA 4½'	None	1-18-89	11:30 @
1-18-89	11:35	----	None	METHOD USED: 3 1/4" HSA 0-4½'	
1-18-89	15:20	----	None		
				CREW CHIEF D. Roberson	



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 4 VERTICAL SCALE 1"=2'
PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (OH)	1	SB	15				
	FAT CLAY-grayish brown, rather stiff to very stiff (CH)	2	SB	39				
		3	SB	44				
6	END OF BORING							

WATER LEVEL DATA				BORING DATA	
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED
1-18-89	11:50	HSA 4½'	None	1-18-89	11:50 @
1-18-89	11:55	----	None	METHOD USED: 3 1/4" HSA 0-4½'	
1-18-89	15:20	----	None		
				CREW CHIEF D. Roberson	



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 1A VERTICAL SCALE 1"=2'
PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (OH)*							
	FAT CLAY-grayish brown, rather stiff to stiff, white mineral inclusions (CH)	1	SB	15				
	*Frost to 4"	2	SB	27				
7		3	SB	30				
	FAT CLAY-dark grayish brown, stiff to very stiff, white mineral inclusions (CH)	4	SB	29				
		5	SB	31				
11	END OF BORING							

WATER LEVEL DATA				BORING DATA	
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED
1-18-89	12:55	HSA 9½'	None	1-18-89	1-18-89 @ 12:55
1-18-89	13:00	9'	None	METHOD USED: 3 1/4" HSA 0-9½'	
1-18-89	15:15	9'	None		
				CREW CHIEF D. Roberson	



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 2A VERTICAL SCALE 1"=3'
PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
6"	ORGANIC FAT CLAY-dark grayish*							
	FAT CLAY-grayish brown, rather stiff to stiff (CH)	1	SB	12				
	*Frost to 4"	2	SB	18	16.2	92.6		
5	FAT CLAY-dark grayish brown, stiff, sand laminations 7' to 9' (CH)	3	SB	27	21.4	100.6	76/25	
		4	SB	21				
9	FAT CLAY-dark gray, stiff (CH)	5	3"TW		34.2	85.6		2560 psf.
		6	SB	28				
14 1/2	FAT CLAY-very dark gray, very stiff (CH)	7	SB	45				
16	END OF BORING							

WATER LEVEL DATA				BORING DATA	
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED
1-18-89	13:40	HSA 14 1/2'	None	1-18-89	1-18-89 @ 13:40
1-18-89	13:45	---	12'	METHOD USED: 3 1/4" HSA 0-14 1/2'	
1-18-89	15:05	---	11 1/2'		
				CREW CHIEF D. Roberson	



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 3A VERTICAL SCALE 1"=2'
PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
6"	ORGANIC FAT CLAY-dark grayish brown * (OH)	1	FA	13				
	FAT CLAY-grayish brown, rather stiff (CH)							
2	*Frost to 3"	2	SB	17				
	LEAN CLAY-grayish brown, stiff, white mineral laminations (CL)							
4	FAT CLAY-grayish brown, stiff to very stiff, white mineral laminations (CH)	3	SB	23				
		4	SB	40				
		5	SB	39				
11	END OF BORING							

WATER LEVEL DATA				BORING DATA	
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED
1-18-89	14:10	HSA 9½'	None	1-18-89	1-18-89 @ 14:10
1-18-89	14:15	---	None	METHOD USED: 3 1/4" HSA 0-9½'	
1-18-89	15:05	---	None		
				CREW CHIEF D. Roberson	



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 4A VERTICAL SCALE 1"=2'
PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
6"	ORGANIC FAT CLAY-dark grayish brown (OH)							
	FAT CLAY-brown, rather stiff to very stiff to stiff (CH)	1	SB	13	13.5	98.8		
	*Frost to 4"	2	SB	34	16.8	104.7		
		3	SB	18				
6	END OF BORING							

WATER LEVEL DATA				BORING DATA	
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED
1-18-89	14:35	HSA 4½'	None	1-18-89	@ 14:40
1-18-89	14:40	---	None	METHOD USED: 3 1/4" HSA 0-4½'	
1-18-89	15:00	---	None		
				CREW CHIEF D. Roberson	



MIDWEST TESTING LABORATORY



JOB NO. B2209 LOG OR TEST BORING NO. 5A VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION SURFACE ELEV. _____	SAMPLE		N VALUE	LABORATORY TESTS			
		NO.	TYPE		MOISTURE	DENSITY	LL/PL	Qu
6"	ORGANIC FAT CLAY-dark grayish brown * (OH)							
	FAT CLAY-grayish brown, very stiff to stiff (CH)	1	SB	18				
	*Frost to 3"	2	SB	40				
6		3	SB	26				
	END OF BORING							

WATER LEVEL DATA

DATE	TIME	CAVE IN DEPTH	WATER LEVEL
1-18-89	14:55	HSA 4½'	None
1-18-89	15:00	---	None

BORING DATA

STARTED 1-18-89 COMPLETED 1-18-89 @ 14:55
METHOD USED:
3 1/4" HSA 0-4½'
CREW CHIEF D. Roberson



MIDWEST TESTING LABORATORY



1900 Commerce St. / P. O. Box 2084 / Bismarck, North Dakota 58502 / 701-258-2833

REPORT OF: MOISTURE-DENSITY RELATIONS OF SOIL

PROJECT: County Line Impoundment
Lyman County, South Dakota

DATE: March 14, 1989

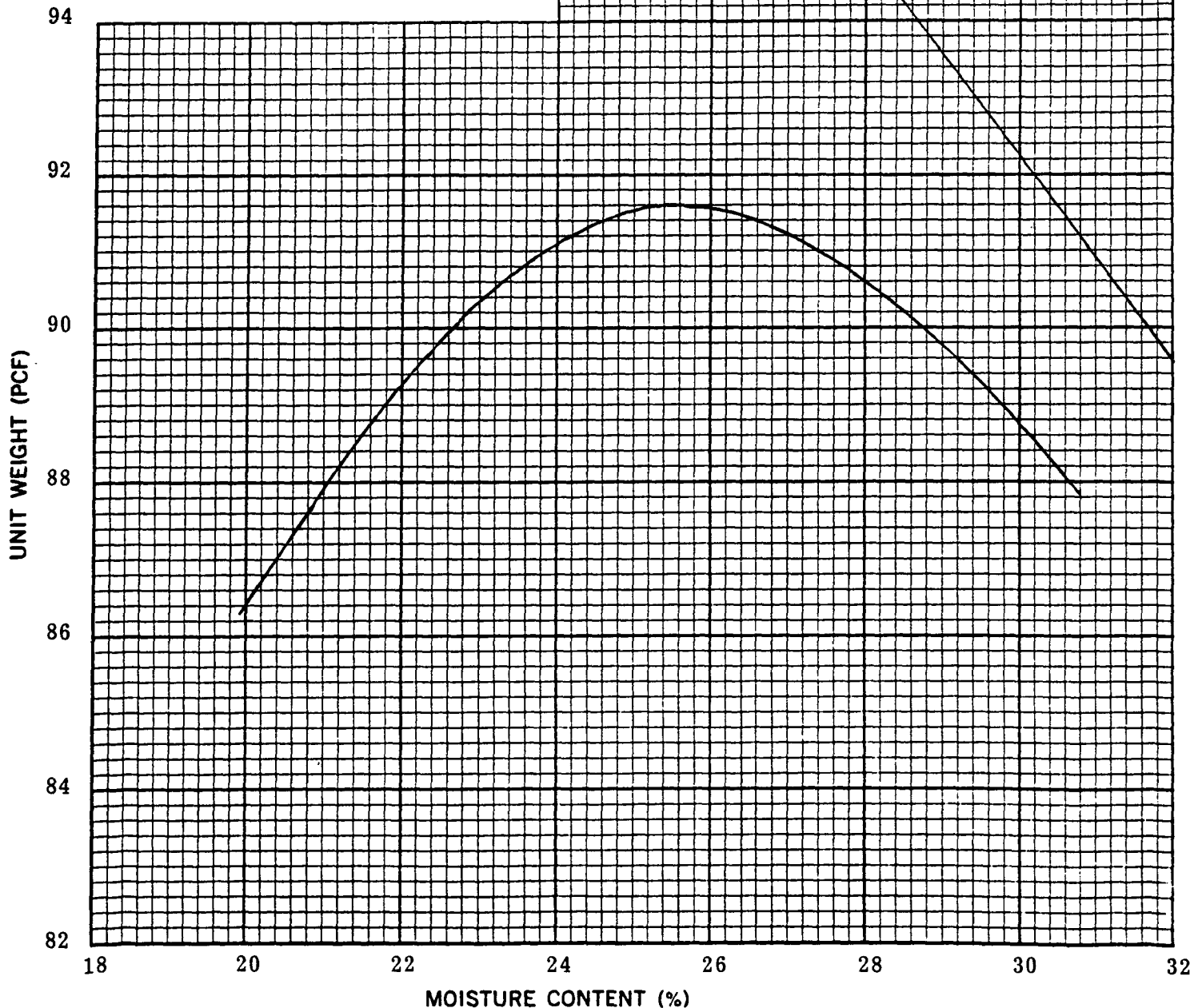
REPORTED TO: Ducks Unlimited, Inc
Attn: Roger Smith
6115 East Main Ave
Bismarck, ND 58501

COPIES:

PROJECT NO: B2209

SAMPLE NUMBER: #1 (test boring 3, depth 0-5')
METHOD: ASTM:D698-78, Method "A",
(-#4 Basis)
SOIL TYPE: FAT CLAY-grayish brown

MAXIMUM DENSITY: 91.6#/cu.ft. **OPTIMUM MOISTURE:** 25.4%





MIDWEST TESTING LABORATORY



1900 Commerce St. / P. O. Box 2084 / Bismarck, North Dakota 58502 / 701-258-2833

REPORT OF: MOISTURE-DENSITY RELATIONS OF SOIL

PROJECT: County Line Impoundment
Lyman County, South Dakota

DATE: March 14, 1989

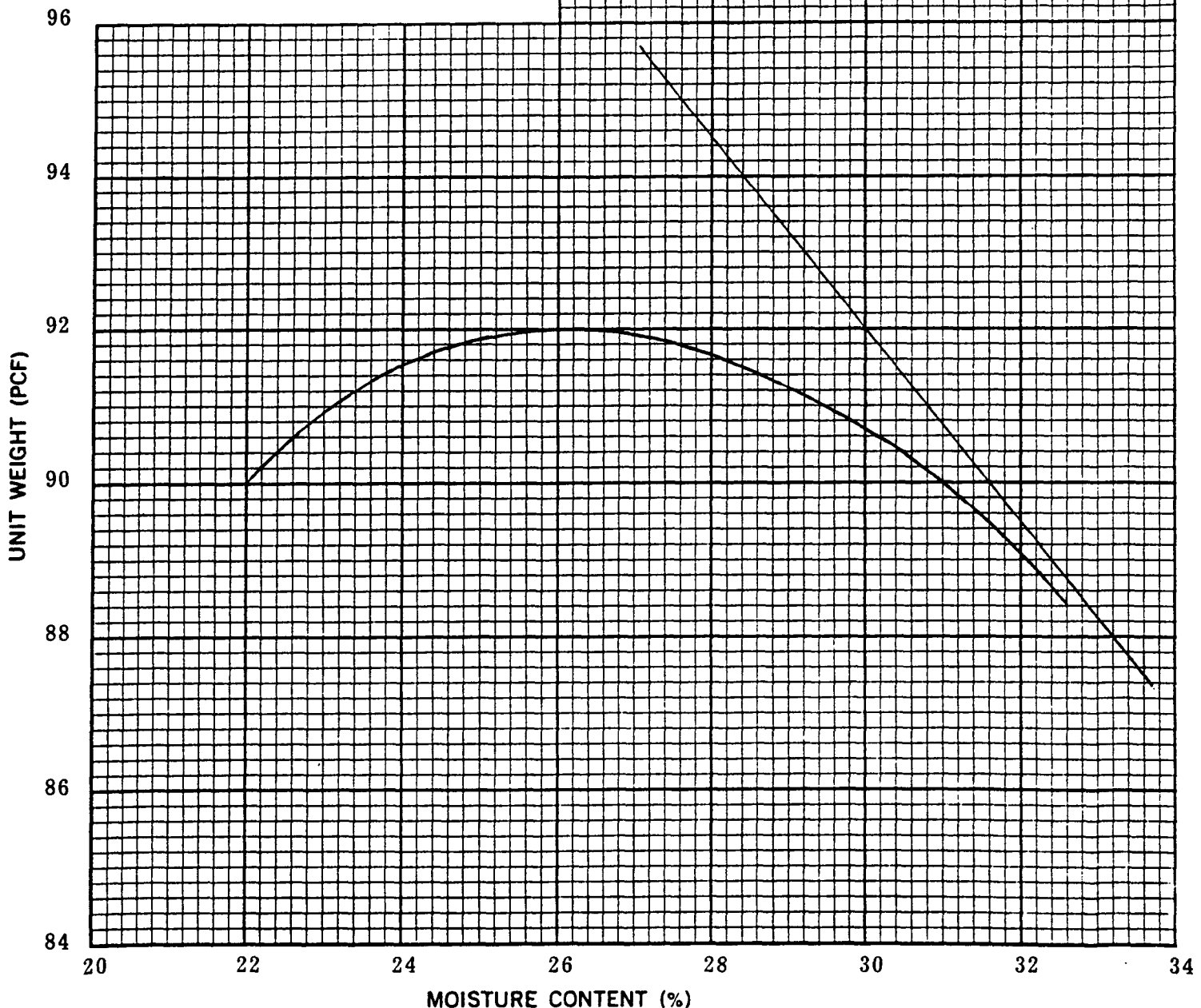
REPORTED TO: Ducks Unlimited, Inc
Attn: Roger Smith
6115 East Main Ave
Bismarck, ND 58501

COPIES:

PROJECT NO: B2209

SAMPLE NUMBER: #2 (test boring 4A, depth 0-5')
METHOD: ASTM:D698-78, Method "A",
(-#4 Basis)
SOIL TYPE: FAT CLAY-brown

MAXIMUM DENSITY: 92.0#/cu.ft. **OPTIMUM MOISTURE:** 26.0%



Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^d				Soil Classification	
				Group Symbol	Group Name ^a
Coarse-Grained Soils More than 50 % retained on No. 200 sieve	Gravels More than 50 % of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5 % fines ^c	$Cu \geq 4$ and $1 \leq Cc \leq 3^e$	GW	Well-graded gravel ^f
			$Cu < 4$ and/or $1 > Cc > 3^e$	GP	Poorly graded gravel ^f
		Gravels with Fines More than 12 % fines ^c	Fines classify as ML or MH	GM	Silty gravel ^{g,h,i}
			Fines classify as CL or CH	GC	Clayey gravel ^{g,h,i}
	Sands 50 % or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5 % fines ^d	$Cu \geq 6$ and $1 \leq Cc \leq 3^e$	SW	Well-graded sand ^f
			$Cu < 6$ and/or $1 > Cc > 3^e$	SP	Poorly graded sand ^f
		Sands with Fines More than 12 % fines ^d	Fines classify as ML or MH	SM	Silty sand ^{g,h,i}
			Fines classify as CL or CH	SC	Clayey sand ^{g,h,i}
Fine-Grained Soils 50 % or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	$PI > 7$ and plots on or above "A" line ^j	CL	Lean clay ^{k,l,m}
			$PI < 4$ or plots below "A" line ^j	ML	Silt ^{k,l,m}
		organic	$\frac{\text{Liquid limit} - \text{oven dried}}{\text{Liquid limit} - \text{not dried}} < 0.75$	OL	Organic clay ^{k,l,m,n} Organic silt ^{k,l,m,o}
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay ^{k,l,m}
			PI plots below "A" line	MH	Elastic silt ^{k,l,m}
		organic	$\frac{\text{Liquid limit} - \text{oven dried}}{\text{Liquid limit} - \text{not dried}} < 0.75$	OH	Organic clay ^{k,l,m,p} Organic silt ^{k,l,m,q}
Highly organic soils	Primarily organic matter, dark in color, and organic odor			PT	Peat

^a Based on the material passing the 3-in. (75-mm) sieve.
^b If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^c Gravels with 5 to 12 % fines require dual symbols:
 GW-GM well-graded gravel with silt
 GP-GM poorly graded gravel with silt
 GP-GC poorly graded gravel with clay

^d Sands with 5 to 12 % fines require dual symbols:
 SW-SM well-graded sand with silt
 SW-SC well-graded sand with clay
 SP-SM poorly graded sand with silt
 SP-SC poorly graded sand with clay

$$Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

^e If soil contains ≥ 15 % sand, add "with sand" to group name.

^f If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^g If fines are organic, add "with organic fines" to group name.

^h If soil contains ≥ 15 % gravel, add "with gravel" to group name.

ⁱ If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.

^j If soil contains 15 to 29 % plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^k If soil contains ≥ 30 % plus No. 200, predominantly sand, add "sandy" to group name.

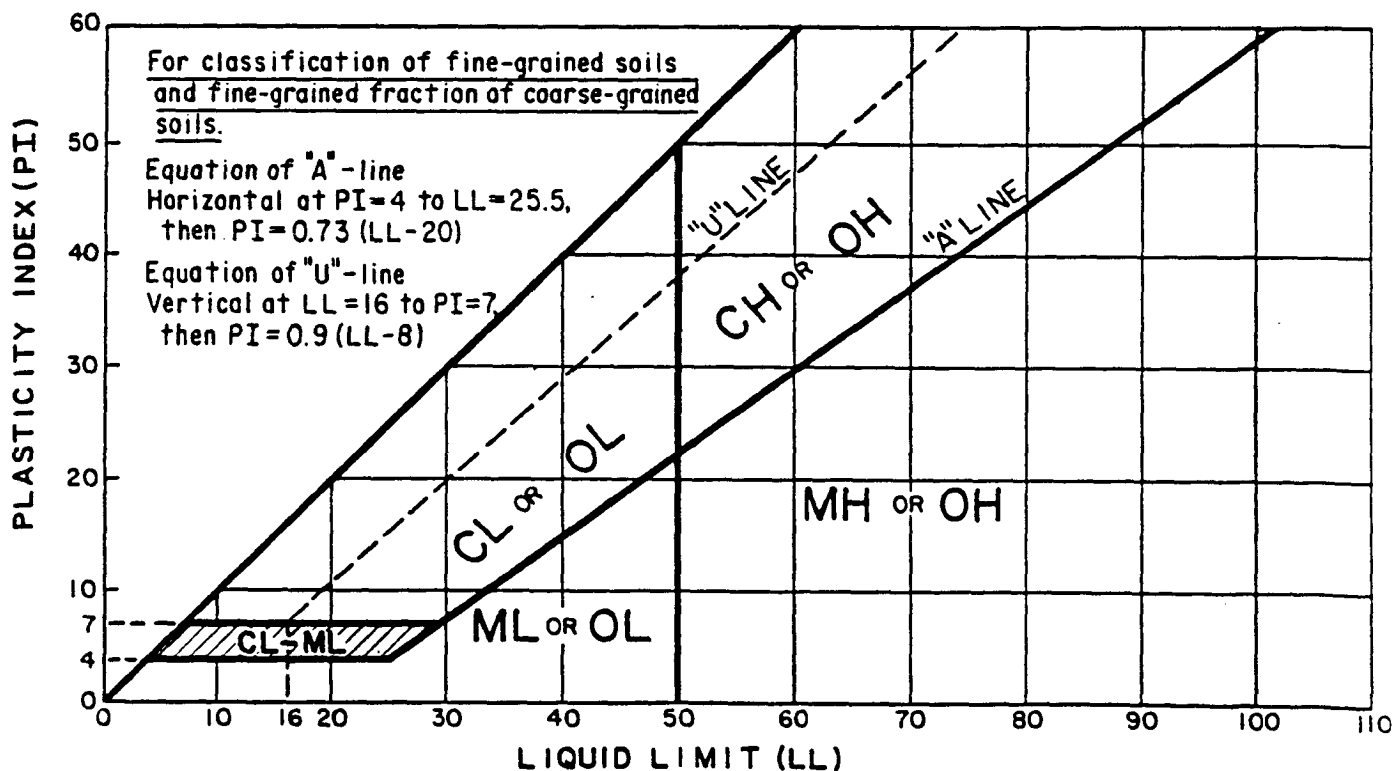
^l If soil contains ≥ 30 % plus No. 200, predominantly gravel, add "gravelly" to group name.

^m $PI \geq 4$ and plots on or above "A" line.

ⁿ $PI < 4$ or plots below "A" line.

^o PI plots on or above "A" line.

^p PI plots below "A" line.



DESCRIPTIVE TERMINOLOGY

RELATIVE DENSITY OF COHESIONLESS SOILS

Term	"N" Value
Very Loose	0-4
Loose	5-8
Medium Dense	9-15
Dense	16-30
Very Dense	Over 30

THICKNESS OF SOIL INTRUSIONS

Term	Range
Lense/Lamination	0-1/8"
Seam	1/8"-1"
Layer	1"-12"

CONSISTENCY OF COHESIVE SOILS

Term	"N" Value
Soft	0-4
Medium	5-8
Rather Stiff	9-15
Stiff	16-30
Very Stiff	Over 30

PARTICLE SIZES

Term	Range
Boulders	Over 8"
Cobbles	3"-8"
Gravel	
Coarse	3/4"-3"
Fine	#4-3/4"
Sand	
Coarse	#4-#10
Medium	#10-#40
Fine	#40-#200
Silt and Clay	Determined by Plasticity Characteristics

NOTE: Sieve sizes shown are U.S. Standard

RELATIVE PROPORTIONS

Term	Range
Trace	0-5%
A Little	5-15%
Some	15-30%
With	30-50%

DRILLING & SAMPLING SYMBOLS

Symbol	Definition
FA	Flight Auger
SS	Split Spoon
TW	Thin-Walled Tube
HSA	Hollow Stem Auger
N	Penetration Resistance: blows required to drive a two-inch OD split spoon sampler one foot by means of a 140-pound hammer falling 30 inches.

LABORATORY TEST SYMBOLS

Symbol	Definition
LL	Liquid Limit, %
PL	Plastic Limit, %
Q _u	Unconfined Compressive Strength, psf
Additional insertions in Q _u column	
G	Specific Gravity
SL	Shrinkage Limit, %
pH	Hydrogen Ion Content - Meter Method
O	Organic Content, % - Combustion Method
M.A.	Grain Size Analysis - Mechanical Method
Hyd.	Grain Size Analysis - Hydrometer Method
C	One-Dimensional Consolidation
Q _c	Triaxial Compression

WATER LEVEL INFORMATION

Water levels shown on the boring logs are levels measured in the borings at the time and under the conditions noted. In sand, the indicated levels can be considered reliable. In clay soil, it is not possible to determine the ground water level within the normal scope of a test boring investigation, except where lenses or layers of more previous

water-bearing soil are present. Even then, a long period of time may be necessary to reach equilibrium. Therefore, the position of the water level noted on the boring logs for cohesive or mixed-texture soils may not indicate the true level of the ground water table.



MIDWEST TESTING LABORATORY

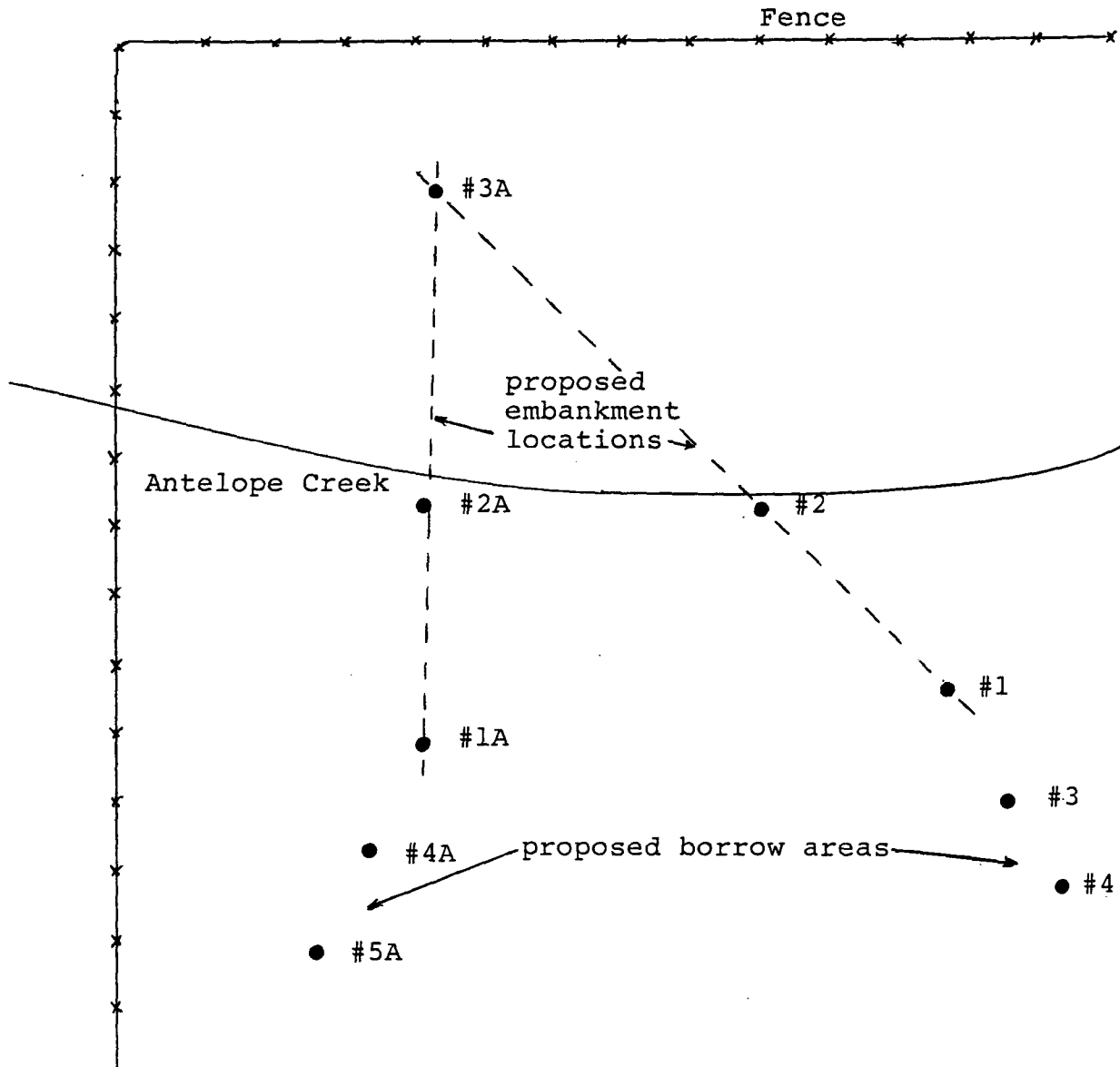


MIDWEST TESTING LABORATORY



TEST BORING LAYOUT

Not To Scale
Approximate locations
Exact locations to be
provided by Ducks
Unlimited, Inc



RECEIPT

Division of Water Rights

South Dakota Department of Water and Natural Resources

413072

Pierre, February 26, 19 92

RECEIVED OF Glenn Moravek, 111 S. Taylor, Pierre, SD 57501-0504

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

Fee for Application for Permit No. _____ to Appropriate Water, to construct works and to put water to beneficial use _____	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 John Hatch (CF)
Chief Engineer

WR Application No. 2221-2
USDA Forest Service

Ducks Unlimited Project - County Line Impoundment
SW 1/4 Sec. 6-T108N-R76W - Lyman Co.

Top of Dam Elev. = 1890
P. Spillway Elev. = 1886
2nd. Spillway Elev. = 1888

Cat. 3 - Small Size Dam

$$\text{Eff. Height} \times \text{Max Storage} = \\ 15 \times 96 = 1440 < 3000$$

Dam Height = 17 ft.
Eff. Height = 15 ft.

∴ Min. Spillway Design Flood =
25 year Frequency

Nov. Storage = 42 Ac.-Ft.
Eff Storage = 65 Ac.-Ft.
Max Storage = 96 Ac.-Ft

From USGS - Techniques for Est Flood Peaks in SD

$$Q_{25} = 83.4 A^{0.6} S^{0.44} S_i^{-0.72} \\ = 83.4 (3.5)^{0.6} (30)^{0.44} (3.70)^{-0.72} \\ = 83.4 (2.12) (4.46) (0.39) \\ = \underline{308 \text{ cfs}}$$

$$DA = 3.5 \text{ mi}^2 \\ S = 30/\text{mile} \\ S_i = 3.70$$

$$Q_{100} = 132 A^{0.65} S^{0.46} S_i^{-0.67} \\ = 132 (3.5)^{0.65} (30)^{0.46} (3.70)^{-0.67} \\ = 132 (2.26) (4.74) (0.42) \\ = \underline{599 \text{ cfs}}$$

Ducks Unlimited - SCS Method $Q_{100} = 566 \text{ cfs} - \text{OK}$
 $Q_{10} = 330 \text{ cfs}$
 $Q_5 = 220 \text{ cfs}$

Primary Spillway - 84" CMP Risers w/ 48" Barrel - $Q_{max} = 220 \text{ cfs}$
2nd Spillway - 155' wide - $Q_{max} = 870 \text{ cfs}$

Section 74:02:08:09 P & S Review

- 1) Topo Map - OK
- 2) Profile along Dam axis - OK
- 3) Dam X-Section - OK
- 4) Area Capacity Curve - OK
- 5) Outlet Drawings - OK
- 6) Spillway Rating - Table - OK
- 7) Spillway Structure Plans - OK
- 8) Specifications - Ducks Unlimited - OK
- 9) EPP - N/A - OK

DESIGN REPORT

PROJECT: COUNTY LINE IMPOUNDMENT
SD-089-01

LOCATIONS: S.W.1/4 SECTION 6 TWP. 108N RGE. 76W
Lyman County, South Dakota

MARSH DATA: Full Service Level (FSL) @ 1886.0
10.0 Surface Acres @ FSL
41.75 Acre-Feet Capacity @ FSL



CLASSIFICATION OF PROPOSED DAM:

Based on the classification criteria outlined in Chapter 74:02:08 "Safety of Dams," it is recommended that the proposed dam be classified as a small, Category 3 dam. No loss of life and minimal economic loss potential is expected should failure occur. The product of the maximum storage capacity times the effective height is less than 3000. ($96 \times 13 = 1248$)

PRELIMINARY RISK ASSESSMENT:

The proposed County Line Impoundment will be constructed approximately 1 mile upstream of U.S. Highway #83. The structure existing in the highway is a bridge with a hydraulic opening of 21 feet high and 36 feet wide. The length of the bridge is 105 feet. The storage capacity of a simulated reservoir above the bridge is greater than the storage capacity of the reservoir created by the proposed dam. A cursory analysis indicates that an estimated breach wave of 1000 cfs will pass through the bridge without overtopping the highway. To remain conservative the effects of flood routing were not considered.

DESIGN:

The embankment will consist of compacted fill, having a top width of 12 feet at elevation 1890.0. A 10 foot berm containing compacted fill to elevation 1886.0 will be constructed on the upstream side of the embankment. All side slopes will be at a ratio of 3 feet horizontal to 1 foot vertical. Material for the embankment will be from the emergency spillway excavation. A representative soil sample from the area of the planned emergency spillway was classified as fat clay in the soil investigation report. All organic material will be removed and scarification will be required below the base of the embankment prior to placing compacted fill. Four inches of topsoil will respread over the entire embankment and emergency spillway.

The primary spillway will function as a fixed level water control structure consisting of a 84 inch corrugated metal riser with draw down capabilities to elevation 1877.0 via a 6 inch gated pipe. The barrel will be a 48 inch corrugated metal pipe which will outlet into a rocked plunge pool. The riser and barrel will be coated as required in the construction specifications.

The emergency spillway will be excavated to elevation 1888.0, having a bottom width of 155 feet and a level crest of 100 feet. The outlet to the emergency spillway will be constructed at a slope of 3.2% to ensure supercritical flow. The expected flow velocity during the 100 year event is 5.5 feet per second.

The outlet channel to the emergency spillway required a horizontal curve to achieve "day light". Flows above elevation 1889.0 will make use of a natural spillway. The capacity of the natural spillway was not considered in the hydraulic design.

HYDROLOGY/HYDRAULICS:

The SCS METHOD was used to determine the inflow hydrograph. Assumptions made in developing inflow hydrographs by SCS METHOD were:

Rain Duration = 1.00
Rain Table # = 1
Antecedent moisture condition = 1
Rainfall from SCS charts

Inflow hydrographs developed from the SCS METHOD were routed through the primary and emergency spillways. This yielded outflow hydrographs revealing peak discharges at maximum reservoir elevations corresponding to various runoff events. The following table is a summary of that printout:

PARAMETERS:

WATERSHED - 3.5 SQ MI

TIME OF CONCENTRATION - 3.62 HOURS

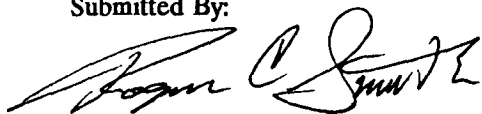
SCS CURVE # - 84

EVENT	RAIN (IN)	RUNOFF (AC-FT)	RESER. ELEV. (MSL)	PEAK INFLOW (CFS)	PEAK OUTFLOW (CFS)	FREE- BOARD (FT)	FLOW IN E.S. (CFS)
2 YR	3.0	122	1887.44	141.3	119.9	2.89	0
5 YR	3.5	174	1888.00	220.1	185.0	2.33	0
10 YR	4.1	244	1888.39	330.5	300.5	1.94	80
100 YR	5.2	387	1889.17	566.2	536.6	1.16	280

The primary spillway capacity was calculated by comparing discharges developed by the weir flow formula and formulas for calculating head loss through corrugated metal pipe. The emergency spillway capacity was calculated using Technical Release No. 39 Hydraulics of Broad-Crested Spillways developed by the SCS.

Dated: January 27, 1992

Submitted By:



Roger Smith, P.E (PE-4325)



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 13, 1992

Roger Smith, P.E.
Ducks Unlimited, Inc.
6115 E. Main Ave.
Bismarck, ND 58501

Dear Mr. Smith:

We have reviewed the plans and specifications for the U.S. Forest Service County Line Impoundment Project in Lyman County. The plans and specifications as submitted are approved.

Our review was to determine compliance with the Water Management Board Safety of Dams Rules, Chapter 74:02:08. Approval of these plans and specifications does not release the U.S. Forest Service as owner of the project, from the responsibility for operating and maintaining the dam in good repair to assure the safety of the dam.

If you have further question, please feel free to contact me.

Sincerely,

Gale N. Selken, P.E.
Natural Resources Engineer IV
for John Hatch, Chief Engineer
Water Rights Division
(605) 773-3352

cc: Anthony W. Detoy
USDA Forest Service
P.O. Box 417
Pierre, SD 57501

REPORT ON
WATER PERMIT APPLICATION NO. 2221-2
U.S. FOREST SERVICE
MARCH 13, 1992

Water Permit Application No. 2221-2 was filed by the U.S. Forest Service to impound 42 acre-feet of water in a dam constructed on Antelope Creek in the W 1/2 SW 1/4 of Section 6-T108N-R79W in Lyman County. The dam will be a Ducks Unlimited project and the water will be used for recreational purposes, wildlife production and livestock watering.

Discussion:

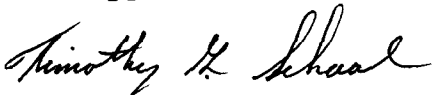
The dam will be 17 feet high with a normal storage capacity of 42 acre-feet and a maximum storage capacity of 96 acre-feet. It will be classified as a Category 3, Small size dam. A dam of this size and category is required to have a minimum spillway capacity capable of passing a 25 year frequency event.

The plans and specifications for this project have been reviewed and approved. The proposed dam will have a drainage area of 3.5 square miles and a 25 year frequency event will produce a peak runoff of 308 cfs. The dam is designed with a CMP primary spillway consisting of an 84 inch riser with a 48 inch barrel with a maximum capacity of 220 cfs and a 155 foot wide secondary spillway with a maximum capacity of 870 cfs. The dam is also designed with a 6 inch low level draw down outlet.

The dam will be located near the head waters of Antelope Creek, approximately 15 miles upstream of the confluence of Antelope Creek and the Missouri River. There are no existing Water Permits or Water Rights on Antelope Creek.

Conclusions:

1. Water Permit Application No. 2221-2 should be approved since unappropriated water is available and approval will not have any adverse effects on existing Water Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 2221-2.



Timothy G. Schaal, P.E.
Natural Resources Engineer III

Approved by:



Gale N. Selken, P.E.
Natural Resources Engineer IV

RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 2221-2, US Forest Service

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Division, Department of Environment and Natural Resources concerning Water Permit Application No. 2221-2, US Forest Service, PO Box 417, Pierre, SD 57501.

The Chief Engineer is recommending APPROVAL of Application No. 2221-2 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 with the following qualifications:

1. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.
2. Approval of Permit No. 2221-2 authorizes storage of up to 42 acre-feet of water annually.

See report on application for additional information.


JOHN HATCH, Chief Engineer
March 23, 1992



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

March 26, 1992

Anthony W Detoy
US Forest Service
PO Box 417
Pierre, SD 57501

Dear Mr. Detoy:

Water Permit Application No. 2221-2 for recreational purposes, wildlife production and livestock watering 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 Publisher of the Lyman County Herald printed at Presho, SD (Ph # 895-2505) and the Capital Journal printed at Pierre, SD (Ph # 224-7301). 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 newspaper to authorize publication of your Notice of Hearing and to arrange for payment. Early contact with the paper can eliminate delays. The publisher has 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. The newspaper has been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 26, 1992

Lyman County Herald
Box 280
Presho, SD 57568

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 2221-2 to be published twice. Please publish the first notice on April 1, 1992, 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 the US Forest Service, PO Box 417, Pierre, SD 57501 (Ph # 224-5517).

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. No action may be taken on the permit application until proof of publication has been received.

Sincerely,

Eric Gronlund

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----
FIRST TRANSMITTAL NOTICE

TO: Eric Gronlund
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 April 1, 1992, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF HEARING on Application No. 2221-2 to Appropriate Water

Notice is given that the US Forest Service, PO Box 417, Pierre, SD 57501 has filed an application for a water permit to impound 42 acre-feet of runoff water by constructing a dam on Antelope Creek. The dam site is to be located in the W 1/2 SW 1/4 Section 6-T108N-R79W. Water is to be stored annually to an approximate elevation of 1886 feet mean sea level and is to be used for recreational purposes, wildlife production and livestock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2221-2 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. Unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation, the Water Management Board will NOT CONDUCT a HEARING to consider this application and the chief engineer will issue the permit as recommended. Petitions filed in support of the application will NOT require the Board to hear the application.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Division, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by April 20, 1992. 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 the petitioner's legal counsel, if legal counsel is obtained.

For purposes of publishing 1) the notice of hearing on Application No. 2221-2 and 2) the chief engineer's recommendation, a meeting at the Division of Water Rights office to hear this application is scheduled for April 28, 1992, at 9:00 am in Room 413, Joe Foss Building, 523 E Capitol, Pierre SD. If this application is opposed or the recommendation is contested, the April 28, 1992, hearing date will be rescheduled for a regularly scheduled Board meeting. Notice of the time and place of the rescheduled hearing before the Board will be given by First Class Mail to the applicant and persons filing petitions. Anyone not filing a petition, but interested in attending the hearing, may contact the Division of Water Rights to confirm a hearing date and location. The April 28, 1992, hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by April 20, 1992.

If a hearing is held, 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 hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. 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. Contact the Water Rights Division to request copies of information pertaining to this application or to assure access to the hearing by the handicapped.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 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.

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
 County Hughes) ss.

I, Peggy Warner

certify that the attached printed Notice 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 1, 1992

April 8, 1992

Peggy Warner

(Signature)

Legal Ad. Representative

(Title)

4-9-92

(Date Signed)

Cost of Printing: _____

138 @ .51 = \$70.38



Public Not

No. 5935 2tdly 4/1, 4/8

NOTICE OF HEARING
on Application No. 2221-2
to Appropriate Water

Notice is given that the US Forest Service, P.O. Box 417, Pierre, S.D. 57501 has filed an application for a water permit to impound 42 acre-feet of runoff water by constructing a dam on Antelope Creek. The dam site is to be located in the W 1/2 SW 1/4 Section 6-T108N-R79W. Water is to be stored annually to an approximate elevation of 1886 feet mean sea level and is to be used for recreational purposes, wildlife production and livestock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2221-2 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. Unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation, the Water Management Board will NOT CONDUCT a HEARING to consider this application and the chief engineer will issue the permit as recommended. Petitions filed in support of the application will NOT require the Board to hear the application.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Division, Foss Building, 523 E. Capitol, Pierre, S.D. 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by April 20, 1992. 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 the petitioner's legal counsel, if legal counsel is obtained.

Lyman County Herald
Presho, South Dakota 57568

April

1992



U.S. Forest Service
PO Box 417
523 E Capitol
Pierre SD 57501

[illegible]



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 26, 1992

Capital Journal
PO Box 878
Pierre, SD 57501

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 2221-2 to be published twice. Please publish the first notice on April 1, 1992, 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 the US Forest Service, PO Box 417, Pierre, SD 57501 (Ph # 224-5517).

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. No action may be taken on the permit application until proof of publication has been received.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----
FIRST TRANSMITTAL NOTICE

TO: Eric Gronlund
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 _____

PARTIES OF RECORD

WATER PERMIT APPLICATION NO. 2221-2

Applicant

Anthony DeToy
U.S. Forest Service
P.O. Box 417
Pierre, SD 57501

Petition of Opposition

Central SD Co-op Grazing District
James Bartels, President
Box 493
Ft. Pierre, SD 57532

Keith Jennings
HCR 32, Box 99
Fort Pierre, SD 57532

April 19, 1992

Chief Engineer
Water Rights Division
Foss Building 523 E. Capitol
Pierre, S. D. 57501



To Whom It May Concern:

As a permittee on the Fort Pierre National Grasslands and as a permittee on and including legal description $W\frac{1}{2}$ of $SW\frac{1}{4}$ section 6 T108N R79W, I oppose the application of the U. S. Forest Service, P. O. Box 417, Pierre S. D. 57501 for a water permit to impound 42 acre-feet of runoff water by construction of a dam on Antelope Creek.

For the Following reasons I oppose the application:

- 1.) The proposed dam to me and others seems to be engineered for anything but success. I have personally visited with the project engineer on the site and feel that he does not understand the watershed and drainage potential.
- 2.) The proposed dam would cause tremendous soil erosion and property damage downstream when the dam is washed out. It is my understanding that no consideration or study has been given to downstream affects on fences, soil and range resources, livestock water impoundments, pipelines and wildlife.
- 3.) The proposed dam would flood range resources affecting livestock and wildlife.
- 4.) The proposed dam would cut across three different pasture allotments leading to livestock ownership problems.
- 5.) The board of directors of the Fort Pierre National Grasslands oppose this project after experiencing other similar but smaller projects and the problems that arise from them.

At a time when soil conservation and water quality is and should be high priority items on a national conservation agenda; a project proposal such as this seems to turn away from these conservation objectives.

I oppose application No. 2221-2 to appropriate water. I contest the chief engineers recommendation to allow for the project. I request an automatic delay concerning application No. 2221-2.

Sincerely,
Keith Jennings
Keith Jennings
HCr 32 Box 99
Fort pierre, S. D. 57532

CC US Forest Service
PO Box 417
Pierre, S.D. 57501

We the Board of Directors of the
Central S.D. Co-operative Grazing Association
are in opposition to the U.S. Forest
Service getting approval for a water
permit to impound 42 acre-feet of
runoff water by constructing a dam
on Antelope Creek. Located in the
W 1/2, SW 1/4. Section 6 - T108N - R79W.



Res

South Dakota Grazing
District Board:
James H. Bartels

4-19-92

US Forest Service
P.O. Box 417
Preire, S. Dak. 57501

To Whom it may concern:

As a permittee on the Fort Preire National Grasslands and as permittee on and including County line allotment of $W\frac{1}{2}$ of $SW\frac{1}{4}$ Section 6 T108 N R79 W I oppose the application of the U.S. Forest Service, P.O. Box 417, Preire, So. Dak. 57501 for a water permit to impound 42 acre-feet of runoff water by the construction of a dam on Antelope creek.

For the following reasons I oppose the application:

- 1) The proposed dam to me and others, seems to lack engineering qualities and characteristics for success. I do not feel that the watershed and drainage potential of the area has been fully understood and engineered for.

- 2) The proposed dam would cause tremendous soil erosion and property damage downstream when the dam is washed out. It is my understanding that no consideration or study has been given to downstream affects on fences, soil and range resources, livestock water impoundments, pipelines and wildlife.
- 3) The proposed dam would flood range resources affecting livestock and wildlife.
- 4) The proposed dam would cut across three different pasture allotments leading to livestock ownership problems.
- 5) The board of directors of the Fort Pierre National Grasslands oppose this project after experiencing other similar but smaller projects and the problems that arise from them.

At a time when soil conservation and water quality is and should be

high priority items on a national conservation agenda; a project proposal such as this seems to turn away from these conservation objectives.

I oppose application no. 2221-2 to appropriate water. I contest the chief engineers recommendation to allow for the project. I request an automatic delay concerning application no. 2221-2.

Sincerely,
Keith E. Jennings
HCR 32, Box 99
Fort Pierre, S. Dak. 57532



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

April 23, 1992

NOTICE

TO: Anthony W. DeToy
U.S. Forest Service
P.O. Box 417
Pierre, SD 57501
and Parties of Record (see attached list)

FROM: John Hatch, Chief Engineer 
Water Rights Division
605 773-3352

SUBJECT: Automatic Delay of Hearing for Water Permit Application No.
2221-2, U.S. Forest Service

Petitions in opposition to Water Permit Application No. 2221-2 have been filed by James Bartels, representing the Central South Dakota Cooperative Grazing District and by Keith Jennings. Copies of the petitions are attached. The petition submitted by Mr. Jennings also requested a postponement of the hearing. Therefore, the hearing on Application No. 2221-2 is automatically delayed pursuant to SDCL 46-2A-4 and 46-2A-5 and will not be held on April 28, 1992.

The Water Management Board will now consider Water Permit Application No. 2221-2 at their September 30 and October 1, 1992, tentatively scheduled meeting to be held in Pierre. The hearing can not be scheduled for the Board's July 22 & 23, 1992 meeting since this meeting is to be held in Martin and an agenda has already been established which does not provide adequate time to hear additional contested water permit applications.

Future notice of the date, time and place of the hearing for Application No. 2221-2 will be provided to all parties of record.

Please contact Eric Gronlund, staff engineer at (605) 773-3352, if you have any questions.

cc: Diane Best, Assistant Attorney General
Roger Smith, Ducks Unlimited

enclosures

CERTIFICATION

I hereby certify that on April 23, 1992, I have personally deposited with the United States Mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated April 23, 1992, regarding Automatic Delay of Hearing for Water Permit Application No. 2221-2, U.S. Forest Service addressed as stated below:

Anthony W. DeToy, U.S. Forest Service, P.O. Box 417, Pierre, SD 57501.

Roger Smith, Ducks Unlimited, 6115 E. Main Ave., Bismarck, ND 58501.

Central SD Co-op Grazing District, James Bartels, President, Box 493,
Ft. Pierre, SD 57532.

Keith Jennings, HCR 32, Box 99, Ft. Pierre, SD 57532.

Copy Sent Inter-office To:

Diane Best, Assistant Attorney General, Capitol Building.

Cheryl F. Frost

Cheryl F. Frost
Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 24th day of April, 1992.



John B. Tate
Notary Public



United States
Department of
Agriculture

Forest
Service

Fort Pierre
National
Grassland

Wall Ranger District
P. O Box 417
Pierre, SD 57501



Reply to: 2610

Date: April 27, 1992

Mr. Eric Gronlund
Natural Resources Engineer
Dept. of Environment and Natural Resources
523 E. Capitol
Pierre, S.D. 57501

Dear Eric:

A copy of the Notice of Hearing from the Lyman County Herald concerning the County Line Cooperative Ducks Unlimited Dam is enclosed.

The original copy, which was notarized, is filed in our office.

Thanks for your work on this project.

Sincerely,

Anthony W. DeToy

Anthony W. DeToy
District Ranger

Enclosure

GM



Caring for the Land and Serving People

FS-6200-28(7-82)



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

August 7, 1992

NOTICE

TO: Anthony DeToy
U.S. Forest Service
P.O. Box 417
Pierre, SD 57501
and Parties of Record (see attached sheet)

FROM: John Hatch, Chief Engineer
Water Rights Division
605 773-3352

SUBJECT: Rescheduling of Hearing for Water Permit Application No.
2221-2, U.S. Forest Service

The Water Management Board will consider Water Permit Application No. 2221-2 on September 30, 1992 at 9:00 am in the Conference Room, Floyd Matthew Training Center, Joe Foss Building, 523 E. Capitol Ave., Pierre, SD 57501. The agenda time is an estimate. The actual time of the hearing may be later than 9:00 am due to prior agenda items. The April 28, 1992 meeting on this application was automatically delayed by petitioners in opposition to the application.

Applicable provisions of the Notice of Hearing published April 1 and 8, 1992 in the Lyman County Herald and the Pierre Capital Journal will still apply at this hearing.

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

Contact Eric Gronlund by September 18, 1992 at 773-3352 to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

cc: Diane Best, Assistant Attorney General
Glenn Moravek, USFS

CERTIFICATION

I hereby certify that on August 7, 1992, I have personally deposited with the United States Mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated August 7, 1992, regarding Rescheduling of Hearing for Water Permit Application No. 2221-2, U.S. Forest Service, along with a copy of the Parties of Record list addressed as stated below and on the attached list:

Glenn Moravek, U.S. Forest Service, P.O. Box 417, Pierre, SD 57501.

Copy Sent Inter-office To:

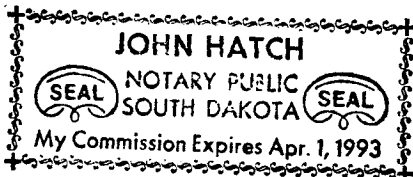
Diane Best, Assistant Attorney General, Capitol Building.

Chas. A. Frost

Cheryl F. Frost
Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 11th day of August, 1992.




Notary Public



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

October 2, 1992

NOTICE

TO: Anthony DeToy
U.S. Forest Service
PO Box 417
Pierre, SD 57501
and Parties of Record (see attached sheet)

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

SUBJ: Preparation of Findings of Fact, Conclusions of Law and
Final Decision

The Water Management Board has directed Harold Deering, the Board's attorney, to prepare proposed Findings of Fact, Conclusions of Law and a Final Decision on approval of Water Permit Application No. 2221-2. The Board will consider the proposed Findings, Conclusions and Final Decision at 1:00 pm, December 2, 1992, Floyd Matthew Training Center, Joe Foss Building, 523 East Capitol, Pierre, SD. The agenda time is an estimate. The actual time of consideration may be delayed due to prior agenda items.

The Board has requested that a copy of the proposed Findings, Conclusions and Final Decision be mailed to each Board member and all Parties of Record by November 12, 1992. Any comments pertaining to the proposed Findings, Conclusions and Decision are to be mailed to each Board member, the Board attorney and all Parties of Record (copy enclosed) by November 23, 1992.

The public hearing was completed September 30, 1992. No additional testimony will be received on December 2, 1992.

cc: Harold Deering, Assistant Attorney General
John Guhin, Deputy Attorney General
Diane Best, Assistant Attorney General

CERTIFICATION

I hereby certify that on October 2, 1992, I have personally deposited with the United States Mail at Pierre, South Dakota, First Class postage, prepaid envelopes containing a Notice dated October 2, 1992, regarding Preparation of Findings of Fact, Conclusions of Law and Final Decision on approval of Water Permit Application No. 2221-2 addressed to:

Anthony DeToy
U.S. Forest Service
PO Box 417
Pierre, SD 57501

and Parties of Record (as shown on the attached list)

A copy of the Notice was sent to:

Harold Deering, Assistant Attorney General
300 N Dakota Ave, Ste 409
Sioux Falls, SD 57102

A copy of the Notice was sent through inter-office mail to:

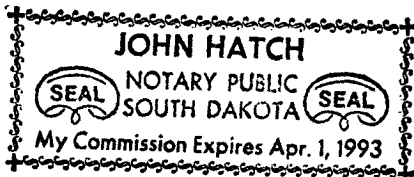
John Guhin, Deputy Attorney General
Diane Best, Assistant Attorney General

Jaci R Konop

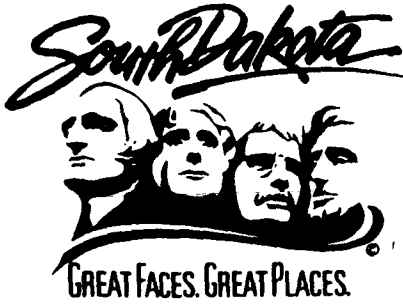
JACI R. KONOP
Senior Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 5th day of October, 1992.



John Hatch
Notary Public



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

October 2, 1992

Keith Jennings
HCR 32, Box 99
Ft. Pierre, SD 57532

Dear Mr. Jennings:

Please find enclosed the video tape that you used in your testimony in the hearing before the Water Management Board on Water Permit Application No. 2221-2. I made a copy of that portion of the video tape that was viewed by the Board and this video will become part of the permanent record.

Thank you for allowing me a few days to get the necessary copy duplicated.

Sincerely,

Eric

Eric Gronlund
Water Rights Division
605 773-3352

Enclosure



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

December 14, 1992

NOTICE

TO: Anthony DeToy
U.S. Forest Service
PO Box 417
Pierre, SD 57501
and Parties of Record (see attached sheet)

FROM: John Hatch, Chief Engineer *John Hatch*
Water Rights Division
605 773-3352

SUBJECT: Adoption of Findings of Fact, Conclusions of Law and
Final Decision

This is to notify you that a Final Decision, including Findings of Fact and Conclusions of Law, was adopted by the Water Management Board for Water Permit Application No. 2221-2 at the December 2, 1992 meeting.

A copy of the signed final Decision, Findings and Conclusions is enclosed for the applicant. Copies will be furnished to anyone else upon request. South Dakota Statutes provide that decisions of the Board may be appealed to the Courts.

cc: Harold Deering, Assistant Attorney General
John Guhin, Deputy Attorney General
Diane Best, Assistant Attorney General

CERTIFICATION

I hereby certify that on December 14, 1992, I have personally deposited with the United States Mail at Pierre, South Dakota, First Class postage, prepaid envelopes containing a Notice dated December 14, 1992, regarding Adoption of Findings of Fact, Conclusions of Law and Final Decision on approval of Water Permit Application No. 2221-2 addressed to:

Anthony DeToy
U.S. Forest Service
PO Box 417
Pierre, SD 57501

and Parties of Record (as shown on the attached list)

A copy of the Notice was sent to:

Harold Deering, Assistant Attorney General
300 N Dakota Ave, Ste 409
Sioux Falls, SD 57102

A copy of the Notice was sent through inter-office mail to:

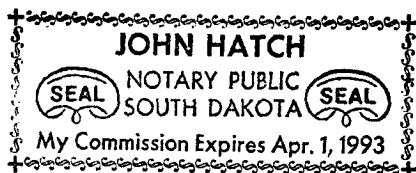
John Guhin, Deputy Attorney General
Diane Best, Assistant Attorney General

Jaci R Konop

JACI R. KONOP
Senior Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 15th day of December, 1992.



John Katch
Notary Public



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

December 28, 1992

Nancy Steever
Central South Dakota Grazing Assn
Box 493
Ft. Pierre, SD 57532

RE: Water Permit Application No. 2221-2, U.S. Forest Service

Dear Ms. Steever:

Enclosed, please find a copy of the Findings of Fact, Conclusions of Law and Final Decision you requested in regard to the above-referenced matter.

Sincerely,

Jaci R. Konop
Senior Secretary

/jrk

Enclosure

STATE OF SOUTH DAKOTA

BEFORE THE WATER MANAGEMENT BOARD

IN THE MATTER OF THE	)	
APPLICATION OF THE	)	FINDINGS OF FACT,
U.S. FOREST SERVICE FOR	)	CONCLUSIONS OF LAW AND
WATER PERMIT NO. 2221-2	)	FINAL DECISION

FINDINGS OF FACT

I

This is an application by the U.S. Forest Service for a permit to impound up to 42 acre feet of water on a dam to be constructed on Antelope Creek, located in the W1/2 SW1/4 of Section 6, Township 108 North, Range 79 West, Lyman County, South Dakota. The dam is located in the Fort Pierre National Grasslands. The water is proposed to be used for livestock watering, wildlife production and recreational purposes.

II

The dam will be classified as a Category 3, Small size dam, which is required to have a minimum spillway capacity capable of passing a 25 year frequency event. The plans and specifications for the dam have been reviewed and approved by the Division of Water Rights pursuant to ARSD 74:02:08. A Category 3 dam is defined as one whose failure may cause "limited damage to agricultural lands or county and township roads or minimum economic loss."

III

The dam is a Ducks Unlimited project, and was designed by them. The dam will be 17 feet high, with a normal storage capacity of 42 acre feet, a maximum storage capacity of 96 acre-feet, and has a surface acreage of approximately 10 acres at normal capacity.

The dam has a drainage area of 3.5 square miles, and a 25 year frequency event will produce a peak runoff flow of 308 cfs.

IV

The primary spillway is designed with a maximum capacity of 220 cfs and the secondary spillway is designed with a maximum capacity of 870 cfs. The dam is also designed with a 6 inch, low level draw down outlet.

V

The dam will be located in the headwaters of Antelope Creek approximately 15 miles upstream from the confluence of the Creek and the Missouri River. There are no existing Water Permits or Water Rights on Antelope Creek. Downstream use is for domestic use, primarily livestock watering.

VI

The permittee who rents the allotment from the U.S. Forest Service through the Grazing Association appeared and is concerned that the dam will wash out causing downstream erosion and damage to fences, a downstream dugout, and a tank; will cause problems to his other pasture because of public access to the dam; may cause weed problems; may eventually result in grazing restriction to accommodate wildlife production; and is concerned about who has liability if the dam fails.

VII

The dam is over-designed under state dam safety rules because as designed it will by-pass approximately 1100 cfs, while the 100 year flood is only about 600 cfs of flow. The dam would have easily controlled downstream erosion with a flow event similar

to that shown on the video tape without even using the secondary spillway. The runoff event depicted in the video tape came at a time when rainfall at the stations at Kennebec, Pierre, and Presho received about twice the normal amount of rainfall for May and June. On June 3, 1991, the day the video was taken, Pierre had 2.6 inches of rain and Presho 3.4 inches.

VIII

The Forest Service will own the dam and has agreements with the Grazing Association and with Ducks Unlimited as to repair and maintenance of the dam. Ducks Unlimited accepts responsibility for fixing problems resulting from the engineering of the dam. The Forest service has an agreement with the Grazing Association on weed control, but there are no plans to fence out the dam or to impose grazing restrictions or wildlife requirements because of the dam.

IX

The dugout and the tank located downstream are both located outside the floodplain of the dam, and would not be affected by failure of the structure.

X

There will not be a reduction in the Animal Unit Months for this allotment because of the dam, although there may be changes in the allotment management plan to reflect the location of the dam and the increased grazing in the area of the dam.

CONCLUSIONS OF LAW

I

The Board has jurisdiction over this matter.

II

There is a reasonable probability that there is unappropriated water available for this use in Antelope Creek.

III

The proposed diversion can be developed without unlawful impairment of existing rights.

IV

The proposed uses of livestock watering, wildlife production and recreational use are beneficial uses.

V

The proposed uses are in the public interest as qualified in the Final Decision.

FINAL DECISION

Application for Water Permit No. 2221-2 by the U.S. Forest Service to impound 42 acre-feet of water in a dam constructed on Antelope Creek in the W1/2 SW1/4 of Section 6, Township 108 North, Range 79 West, Lyman County, SD for recreational purposes, wildlife production, and livestock watering is approved, subject to the following qualifications:

1. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

2. Approval of Permit No. 2221-2 authorizes storage of up to 42 acre-feet of water annually.

Dated this 11th day of December, 1992.

BY THE BOARD



Chairman



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

MAR 17 1993

Anthony DeToy
U.S. Forest Service
PO Box 417
Pierre, SD 57501

Dear Mr. DeToy:

Enclosed is Water Permit No. 2221-2 authorizing construction of your water diversion system and beneficial use of the water, 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,

A handwritten signature in black ink, appearing to read "John Hatch".

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.

**SOUTH DAKOTA
WATER PERMIT NO. 2221-2**

Date of first receipt of application February 26, 1992.

The Water Management Board approved Water Permit Application No. 2221-2 on December 2, 1992 for the U. S. Forest Service, PO Box 417, 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. 2221-2 impounds 42 acre-feet of runoff water by constructing a dam on Antelope Creek. The dam site is to be located in the W 1/2 SW 1/4 Section 6-T108N-R79W. Water is to be stored annually to an approximate elevation of 1,886 feet mean sea level.
2. The water appropriated shall be used for the purpose of impounding water in a dam and may not exceed the amount of water needed for beneficial use for recreational, wildlife production and livestock watering purposes.
3. The water is to be used during the following described annual period: January 1 - December 31.
4. The date from which applicant may claim right is February 26, 1992.
5. One-fifth of the construction is to be completed on or before June 2, 1995.
6. All construction is to be completed on or before December 2, 1997.
7. Water is to be put to beneficial use on or before December 2, 2001.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.
2. Approval of Permit No. 2221-2 authorizes storage of up to 42 acre-feet of water annually.

WATER MANAGEMENT BOARD

By: _____

John Hatch
John Hatch, Chief Engineer, Water Rights Division
Department of Environment Water and Natural Resources

MAR 17 1993

date

United States
Department of
Agriculture

Forest
Service

Nebraska
National
Forest

Ft. Pierre Nat'l Grassland
124 S. Euclid Avenue
Pierre, SD 57501
(605) 224-5517



Reply To: 2610

Date: June 11, 1993

Mr. John Hatch
Chief Engineer, Water Rights Division
Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

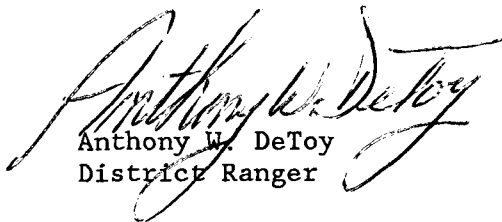
Dear Mr. Hatch:

County Line Dam Ducks Unlimited Project has been completed. We have enclosed a Notice of Completion of Works and Application of Water to Beneficial Use.

If there are questions on the completed form, please call us at 224-5517.

Thanks you for your help on this. We feel this has been a very worthwhile project.

Sincerely,



Anthony W. DeToy
District Ranger

GM/gm

NOTICE OF COMPLETION OF WORKS AND APPLICATION OF WATER TO BENEFICIAL USE



Date JUNE 10, 1993

TO: Water Rights Division, DENR
523 E. Capitol
Pierre, SD 57501-3181

FROM: FT. PIERRE NATIONAL GRASSLAND
USDA FOREST SERVICE PO BOX 417
(name) (address)
PIERRE SD 57501 224-5517
(city) (state) (zip) (phone)

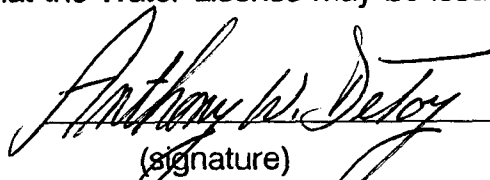
I have completed the construction of the water diversion system and I have put the water to beneficial use to the maximum extent it is going to be used. I have not exceeded the amounts specified in Water Permit No. 2221-2.

Water Permit No. 2221-2 states that the diversion system is to be constructed by 12/2/1997, and that the water is put to beneficial use by 12/2/2001.
(date) (date)

The diversion system was completed on MAY 26, 1993.
(date)

Applying the water to beneficial use was completed on MAY 26, 1993.
(date)

You may schedule an inspection so that the Water License may be issued.


(signature)
ANTHONY W. DETOY
for USDA FOREST SERVICE



Fort Pierre National Grasslands	
SEP 20 '96	
	ROUTE
DIST. RANGER	
WILDLIFE BIO	
RANGE CON.	
SUPPORT SVCS.	

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

September 19, 1996

2221-2

Anthony DeToy
US Forest Service
P.O. Box 417
Pierre, SD 57501

Dear Mr. DeToy:

The inspection of your water use system and the inspection of the extent of application of water to beneficial use, as developed under Water Permit No. 2221-2, has been completed. Your final water right document, the Water License, can now be issued.

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

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

Sincerely,

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

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

RECEIPT

415154

Division of Water Rights

South Dakota Department of Environment and Natural Resources

Pierre, _____, October 15, 19 96

RECEIVED OF US Forest Service, P.O. Box 417, 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>2221-2</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

United States
Department of
Agriculture

Forest
Service

Nebraska
National
Forest

Ft. Pierre Nat'l Grassland
124 S. Euclid Avenue
Pierre, SD 57501
(605) 224-5517

File Code: 6310-3

Date: October 11, 1996

Dept. of Environment & Natural Resources
Water Rights Program
523 E. Capitol
Pierre SD 57501-3181



C-E-R-T-I-F-I-E-D

To Whom It May Concern:

Enclosed please find check #0208287783 in the amount of \$50.00, payment for the Inspection & Issuance of the Water License, Water Permit No. 2221-2, for the USDA, Forest Service, Fort Pierre National Grassland.

For our records, I need a receipt with an "Original" signature & date, stating this was paid. I have enclosed a self-addressed stamped envelope, for your convenience, to return the "Original" receipt to us. Your time and assistance is greatly appreciated! Thank you!

Sincerely,

Jack L Isaac

For ANTHONY W. DETOY
District Ranger

KMD/kmd

Enclosures: (2)
Check #0208287783
Self-Addressed Stamped Envelope

Permit No. 2221-2
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

I have this day, September 12, 1996, made a thorough examination of the water use system constructed by US Forest Service of PO Box 417, Pierre, SD 57501 holder of Permit No. 2221-2, bearing the priority of February 26, 1992 authorizing the storage of 42 acre-feet of the waters of runoff for livestock watering, recreation & wildlife production, purposes, in Lyman County.

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

A. Works used to divert the water:

County Line Dam--17 feet high, 42 ac-ft normal capacity, 96 ac-ft maximum capacity

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

N/A

C. Works used to apply water to beneficial use:

Earth dam

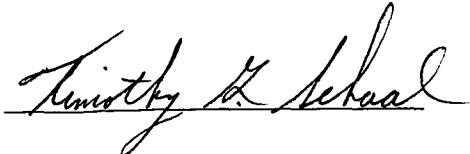
The system is in the following condition Good. The point of diversion is located 600 feet east & 1420 feet north of the SW corner of Section 6-T108N-R79W (W 1/2 SW 1/4). The works are capable of storing 42 acre-feet of water which is to be used for livestock watering, recreation & wildlife production. Water has been put to beneficial use to the maximum extent as follows:

County Line Dam--17 feet high, 42 ac-ft normal capacity, 96 ac-ft maximum capacity

and the license should be issued for 42 acre-feet of storage.

Applicable permit qualifications have been complied with: Yes **X**

Exceptions to compliance are: **none** Date Report Completed: September 17, 1996



Timothy G. Schaal, P.E.
Natural Resources Engineer
DENR, Water Rights Program



SEP 10 1966

9/12/96

W/R #2221-2

Country Line Dam



REPORT ON INSPECTION OF PERMIT NO. 2221-2

Other permit(s) associated with the project: XXXX

DATE OF INSPECTION: September 12, 1996

NAME & ADDRESS OF INSPECTION CONTACT/ Anthony W. Detoy

RELATIONSHIP TO PERMIT HOLDER, IF APPLICABLE: manager

NAME & ADDRESS OF PERMIT HOLDER: US Forest Service, PO Box 417, Pierre, SD 57501

DIVERSION POINT LEGAL LOCATION: 600 feet east & 1420 feet north of the SW corner of Section 6-T108N-R79W (W 1/2 SW 1/4)

DAM INFORMATION:

- 1) Height to crest 17 feet
- 2) Height to primary spillway 13 feet
- 3) Height to secondary spillway 15 feet
- 4) Crest width 12 feet
- 5) Crest length 600 feet
- 6) Spillway length XXX feet
- 7) Spillway width primary--7 ft. CMP, secondary-- 155 feet
- 8) Approx. storage (Normal) 42 acre-feet
- 9) Approx. storage (Maximum) 96 acre-feet
- 10) Date constructed: May 26, 1993

PERMIT QUALIFICATIONS AND REGULATIONS:

- 1) Soil and water permit lands agree with lands being irrigated and lands listed on permit N/A
- 2) Special qualifications to permit being abided by yes
- 3) All structures, wells and lands on map yes
- 4) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period N/A

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 2221-2

(1) The US Forest Service, PO Box 417, Pierre, SD 57501-0417 made Application No. 2221-2, February 26, 1992 for a water permit to impound 42 acre feet of water by constructing a dam on Antelope Creek, Lyman County, South Dakota for recreation, wildlife production and livestock watering purposes. Water will be stored annually to an elevation of 1,886 feet mean sea level (fmsl). Permit No. 2221-2, with a priority date of February 26, 1992 was approved December 2, 1992 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before December 2, 1997 and for the application to beneficial use of said water on or before December 2, 2001.

The permit holder submitted a "*Notice of Completion of Works and Application of Water to Beneficial Use*" on June 14, 1993. The "*Notice*" stated the system was completed and water applied to beneficial use on May 26, 1993.

(2) It is certified that the applicant has complied with the provisions of South Dakota State Law relating to construction of the dam. The dam has a storage capacity of 42 acre feet of water and is located (spillway) 600'E and 1,420'N of the SW corner of Section 6, T108N, R79W (W½ SW¼) - County Line Dam.

(3) The applicant has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use for recreation, wildlife production and livestock watering.

(4) Pursuant to South Dakota Water Law 46-5-30.1 the US Forest Service, PO Box 417, Pierre, SD 57501-0417 the holder and/or owner of Water Permit No. 2221-2 is issued a license to appropriate water, the right to impound sufficient water annually in a dam on Antelope Creek to maintain the water level to an approximate elevation of 1,886 feet mean sea level with a priority date of February 26, 1992 from the location specified in (2) of this license, for recreation, wildlife production and livestock watering purposes. This license is subject to any limitations or qualifications listed in Water Permit No. 2221-2 and subject to South Dakota State Law.



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

JUN 11 1997

date



CHANNEL

A1

6

Carry Lake
Dam

108-79

A1

Water Permit No. 2221-2
U.S. Forest Service

Timothy G. Schaal
Timothy G. Schaal, P.E.
Natural Resources Engineer III
September 17, 1996



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

JUN 11 1997

2221-2

Anthony DeToy
US Forest Service
P.O. Box 417
Pierre, SD 57501-0417

Dear Mr. DeToy:

Enclosed is Water License No. 2221-2. Water License No. 2221-2 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

gm
enclosures

2221-2



DUCKS UNLIMITED

PROJECT AT

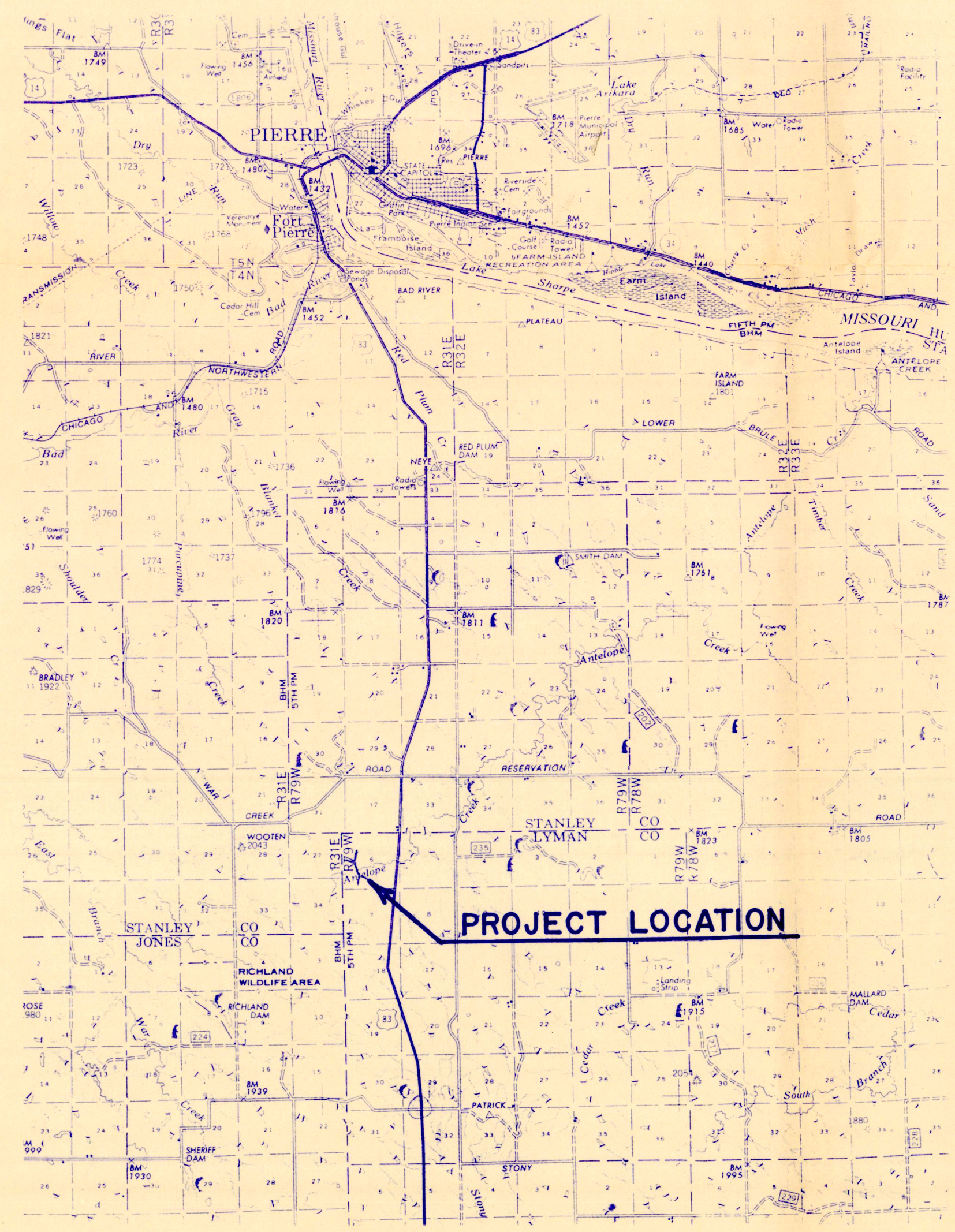
COUNTY LINE IMPOUNDMENT

SEC. 6, TWP. 108 N., RGE. 79 W.

LYMAN COUNTY, SOUTH DAKOTA

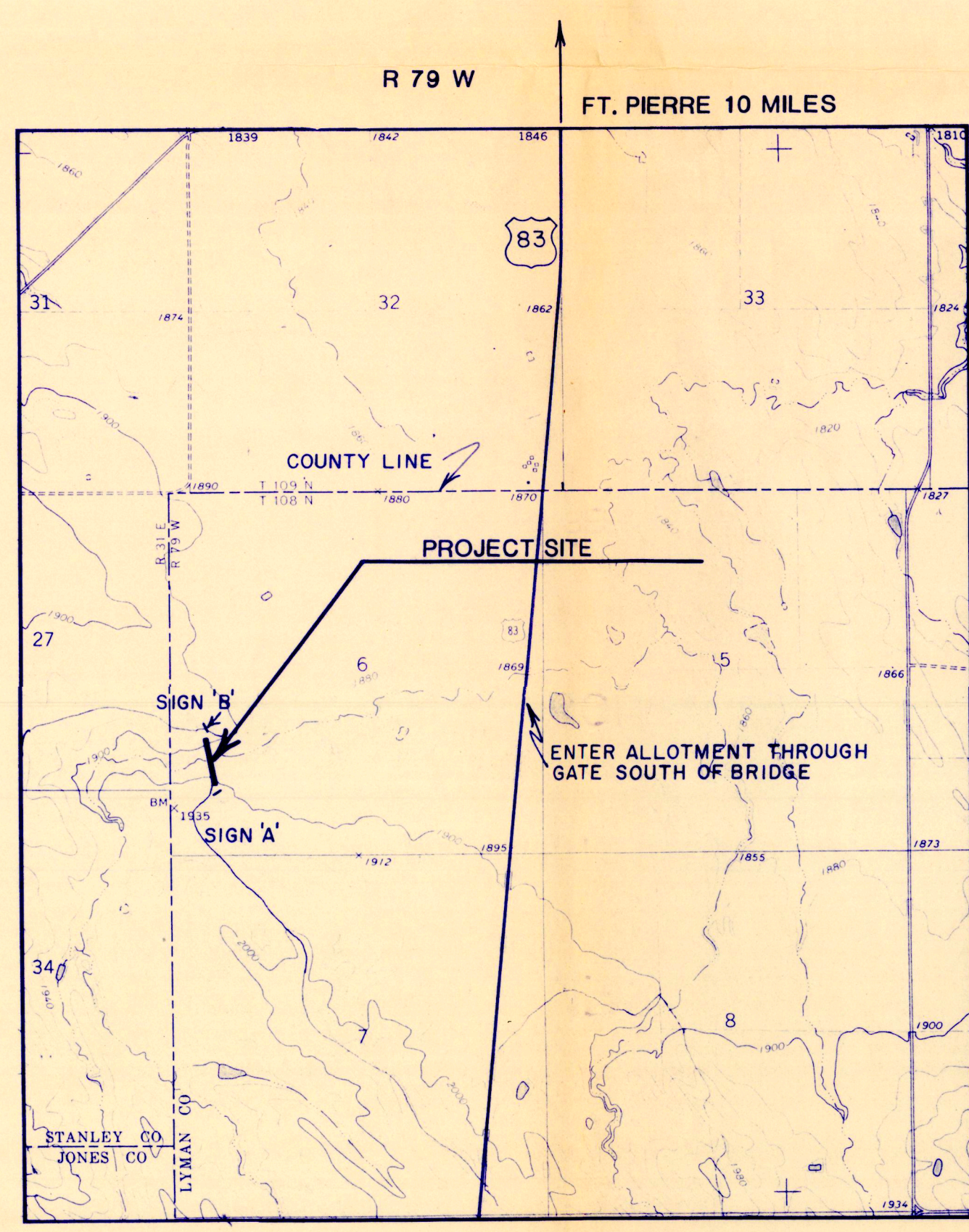
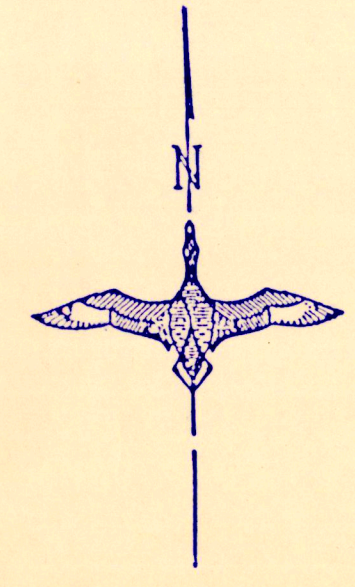
IN COOPERATION WITH

U.S. FOREST SERVICE



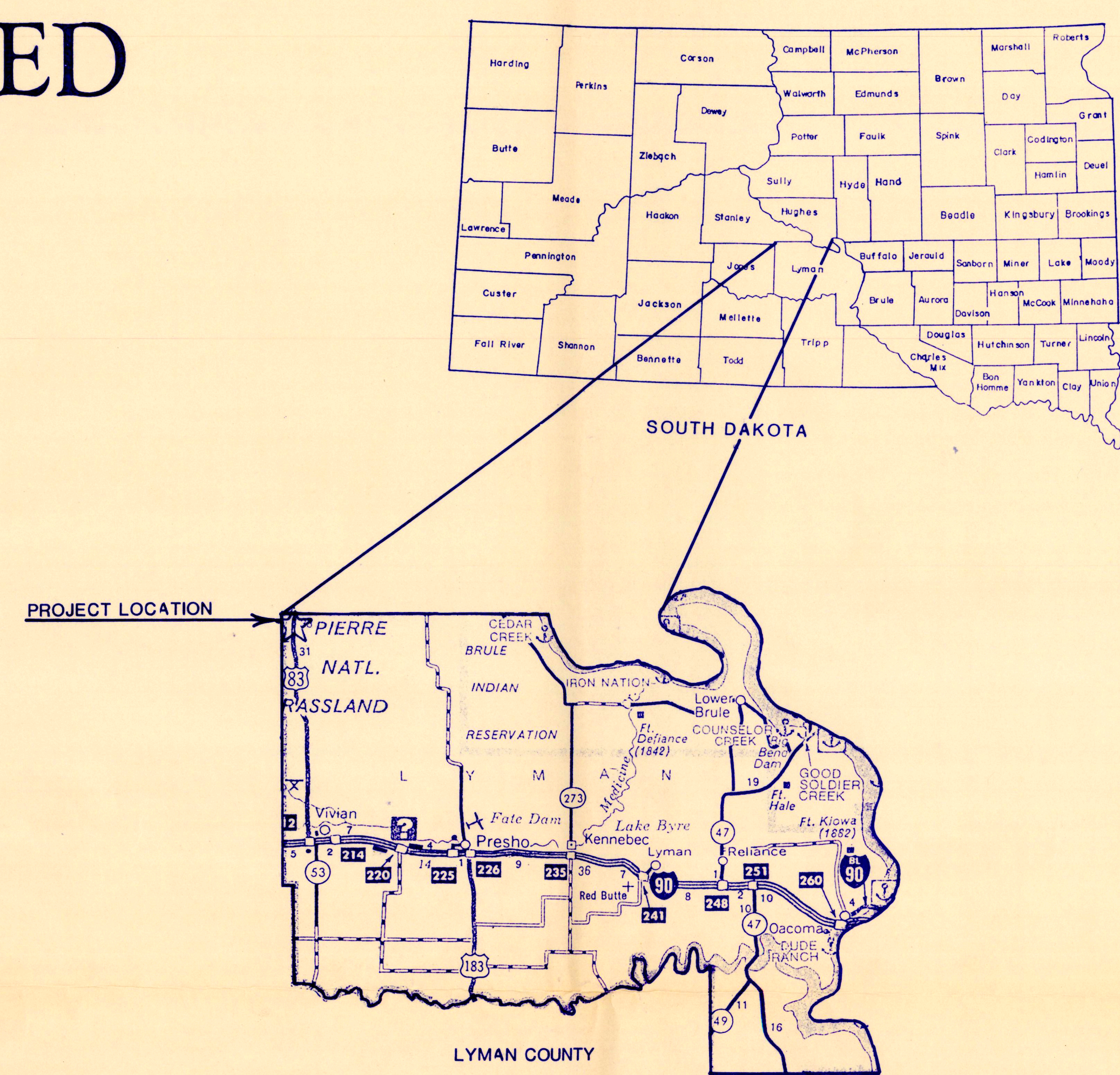
LOCATION MAP

USDA, FOREST SERVICE
Fort Pierre National Grassland
P.O. BOX 417
124 S. EUCLID
PIERRE, SOUTH DAKOTA 57501



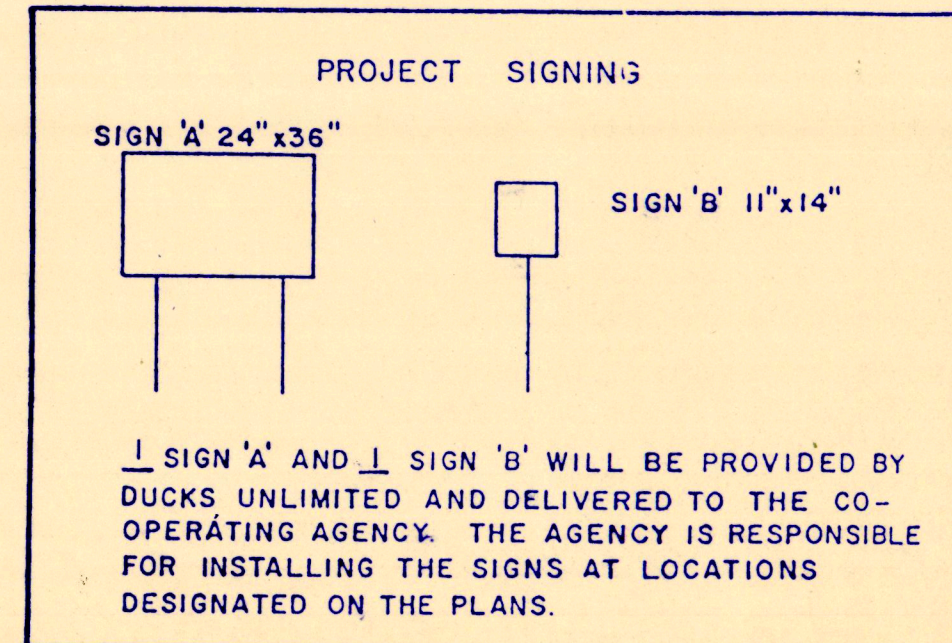
VICINITY MAP

SCALE : 1" = 2,000'



- ### INDEX
1. VICINITY MAP
 2. PROJECT TOPOGRAPHY
 3. SITE PLAN & PROFILES
 4. STRUCTURE PLAN & DETAILS
 5. RISER PLAN & DETAILS
 6. SOILS INFORMATION

SPECIFICATIONS	
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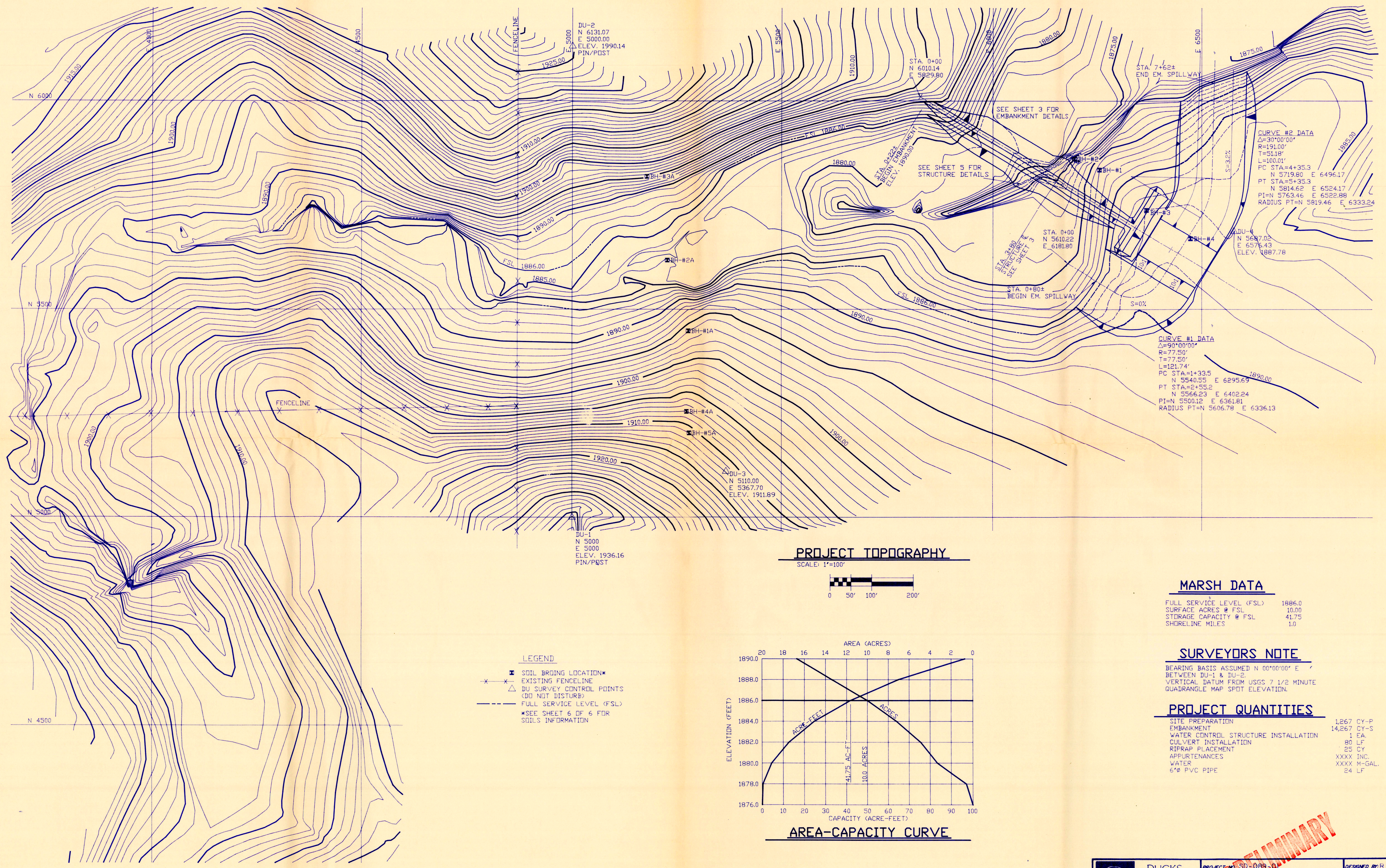


Handwritten signature

	PROJECT NO. DU-1-SD-089-01-001	DESIGNED BY: RCS
	DRAWN BY: TD/KB	
GREAT PLAINS REGIONAL OFFICE		SURVEYED BY:
DATE: 5-24-89		CHECKED BY:
SHEET NO. 1 OF 6		APPROVED BY: <i>Handwritten signature</i>
		APPROVED BY: <i>Handwritten signature</i>

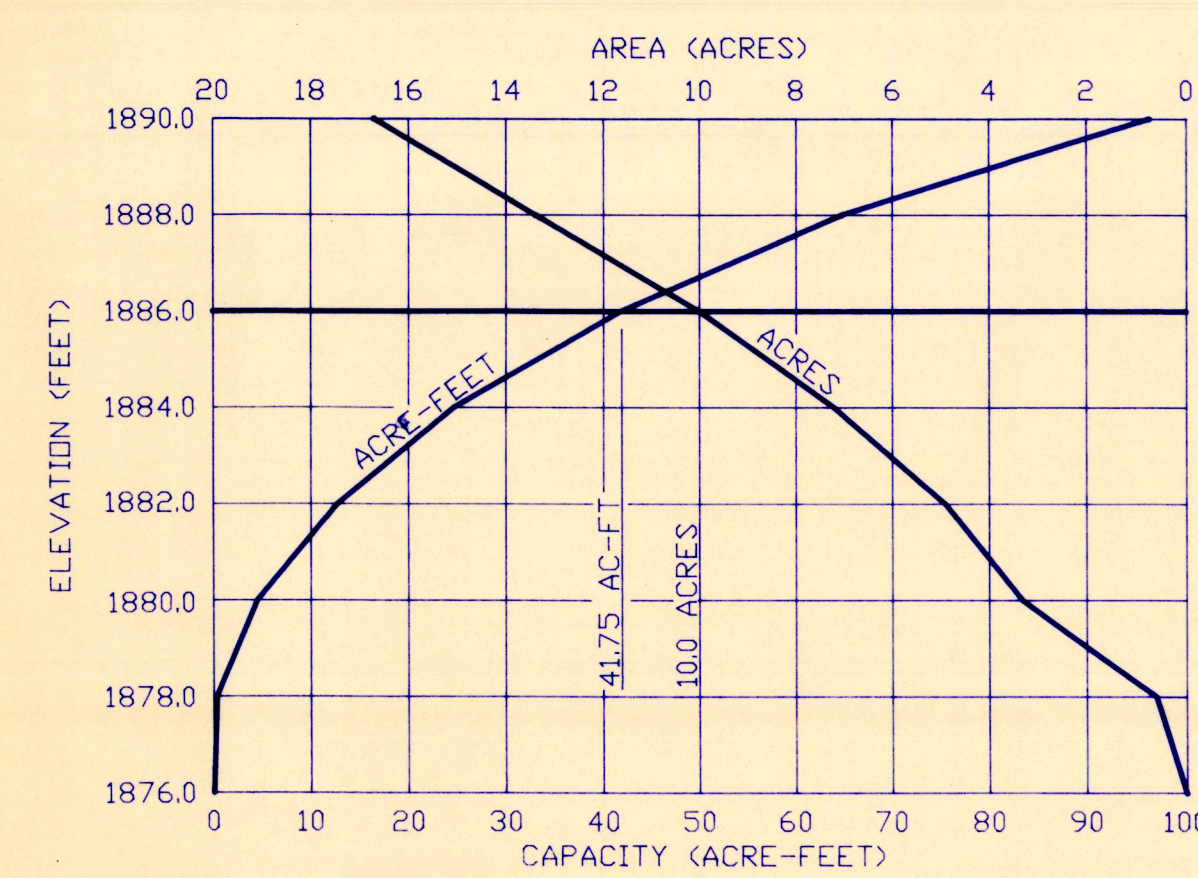
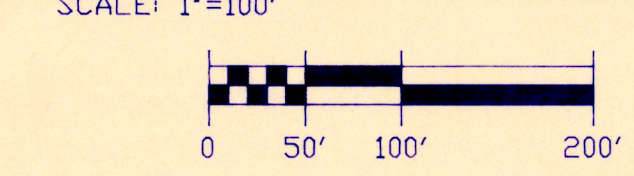
PRELIMINARY

2221-2



- LEGEND**
- SOIL BORING LOCATION
 - EXISTING FENCELINE
 - DU SURVEY CONTROL POINTS (DO NOT DISTURB)
 - FULL SERVICE LEVEL (FSL)
 - *SEE SHEET 6 OF 6 FOR SOILS INFORMATION

PROJECT TOPOGRAPHY



AREA-CAPACITY CURVE

MARSH DATA

FULL SERVICE LEVEL (FSL)	1886.0
SURFACE ACRES @ FSL	10.00
STORAGE CAPACITY @ FSL	41.75
SHORELINE MILES	1.0

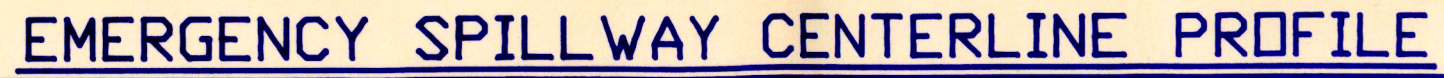
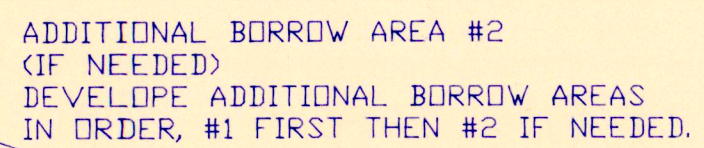
SURVEYORS NOTE

BEARING BASIS ASSUMED N 00°00'00" E
BETWEEN DU-1 & DU-2
VERTICAL DATUM FROM USGS 7 1/2 MINUTE
QUADRANGLE MAP SPOT ELEVATION.

PROJECT QUANTITIES

SITE PREPARATION	1,267 CY-P
EMBANKMENT	14,267 CY-S
WATER CONTROL STRUCTURE INSTALLATION	1 EA
CULVERT INSTALLATION	80 LF
RIPRAP PLACEMENT	25 CY
APPURTENANCES	XXXX INC.
WATER	XXXX M-GAL.
6" PVC PIPE	24 LF

	DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE	PROJECT NO. SD-088-01	DESIGNED BY: R.C.S.
		COUNTY LINE IMPOUNDMENT	DRAWN BY: J.S. CADD
DATE: 2-3-92		SHEET NO: 2 OF 6	PROJECT TOPOGRAPHY
APPROVED BY:		APPROVED BY:	CHECKED BY:

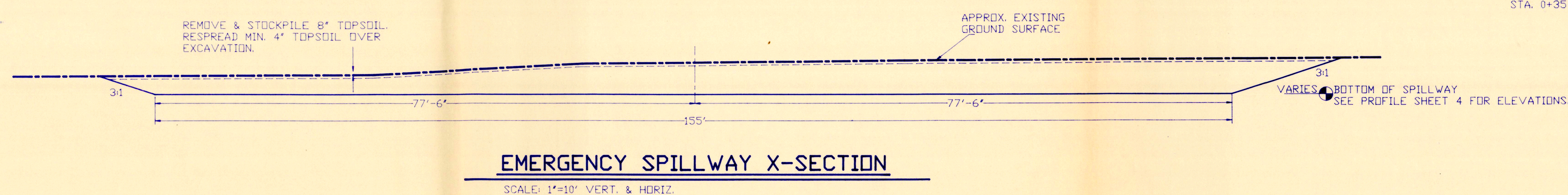
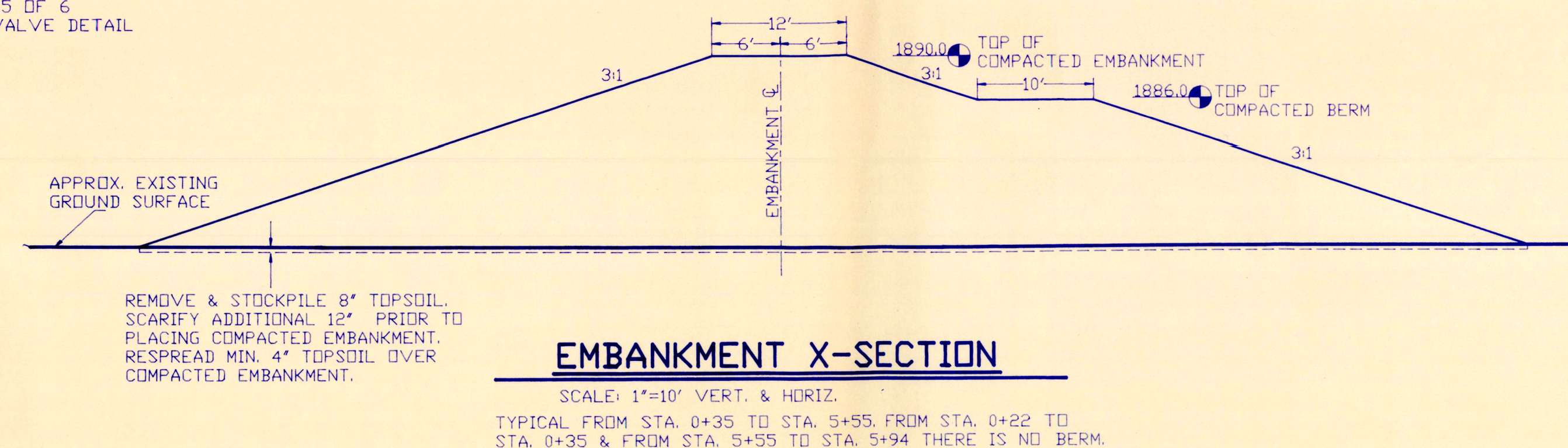
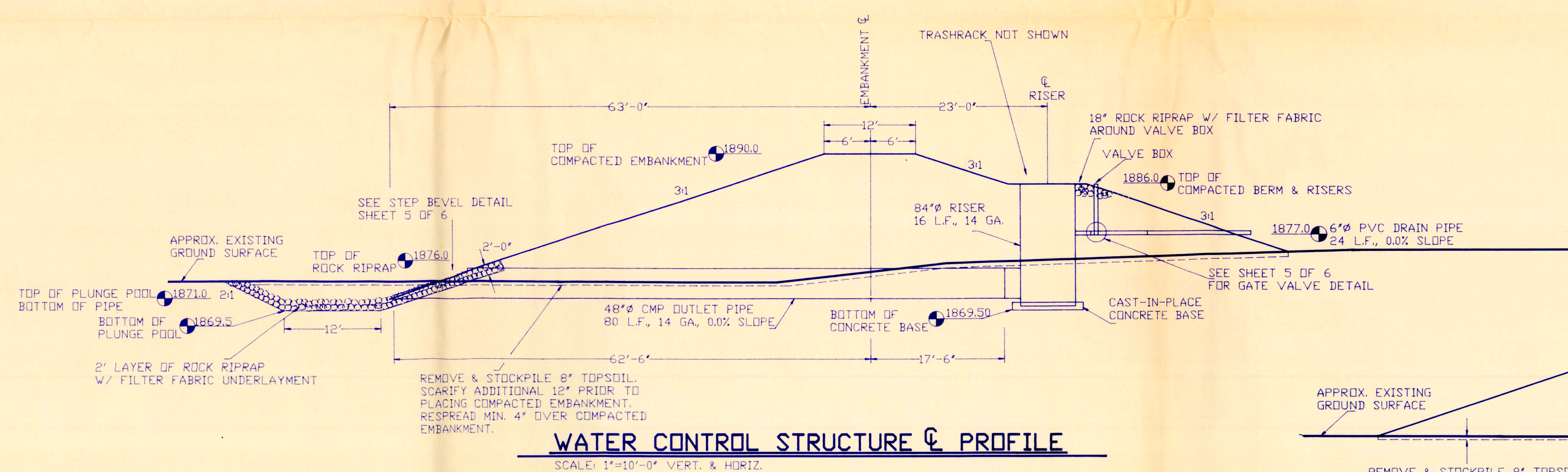
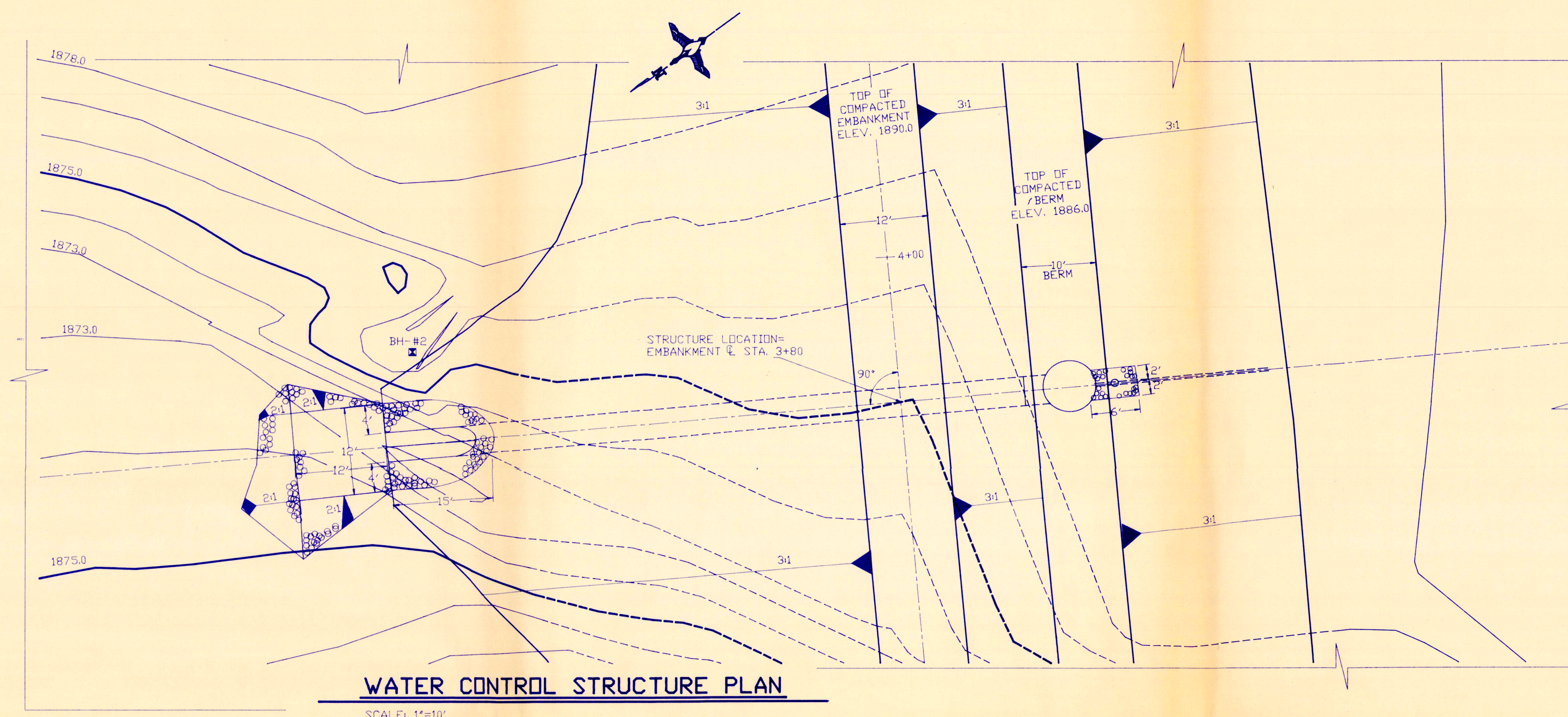


SCALE: 1"=5' VERT.
1"=50' HORIZ.

SCALE: 1"=5' VERT.
1"=50' HORIZ.

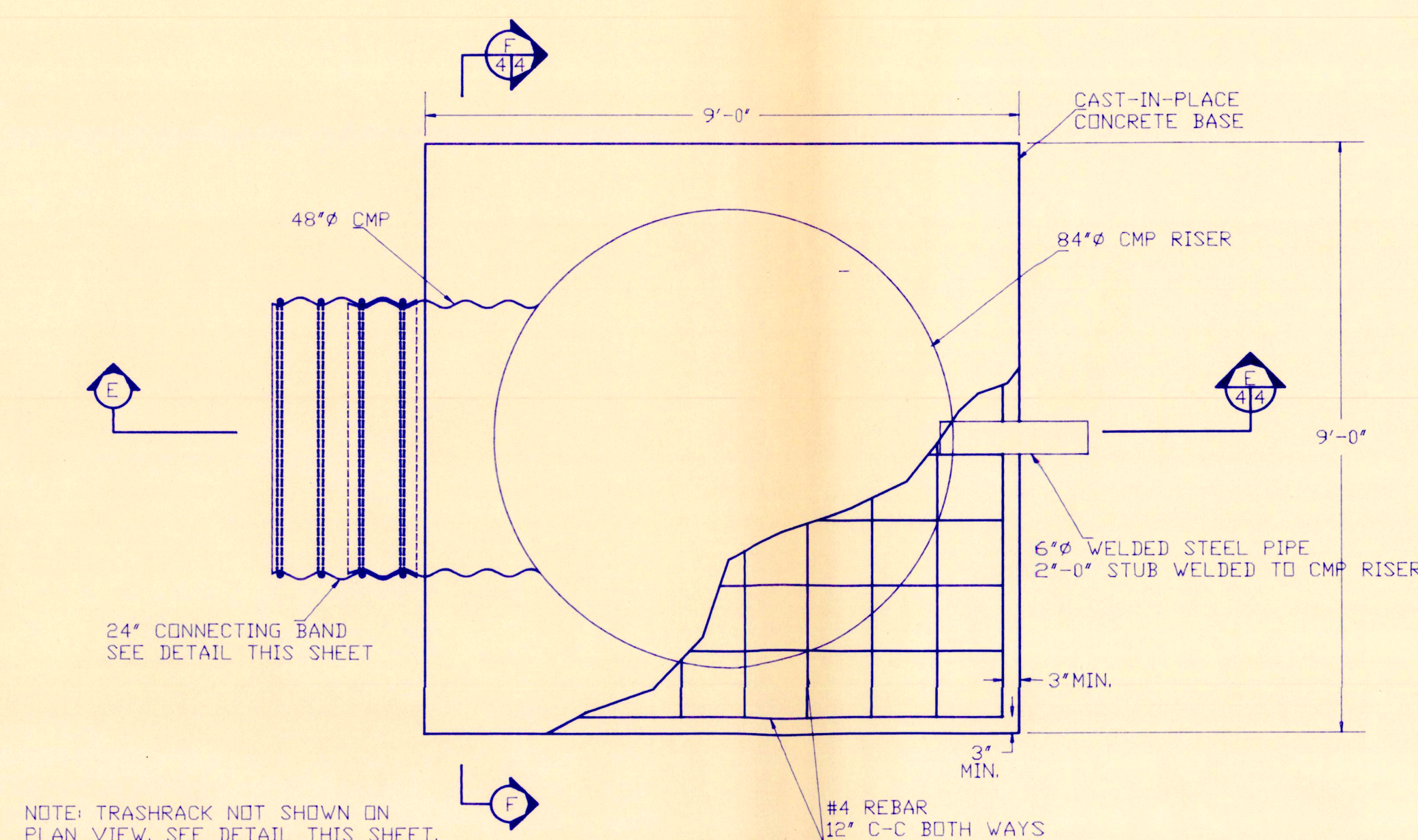
DELMINARY

 DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE	PROJECT NO. 15-01 COUNTY LINE IMPOUNDMENT	DESIGNED BY: R.C.S. DRAWN BY: B. CADD
	SITE PLAN & PROFILES	SURVEYED BY: CHECKED BY:
DATE 2-3-92	SHEET NO: 3 OF 6	APPROVED BY:
APPROVED BY:		

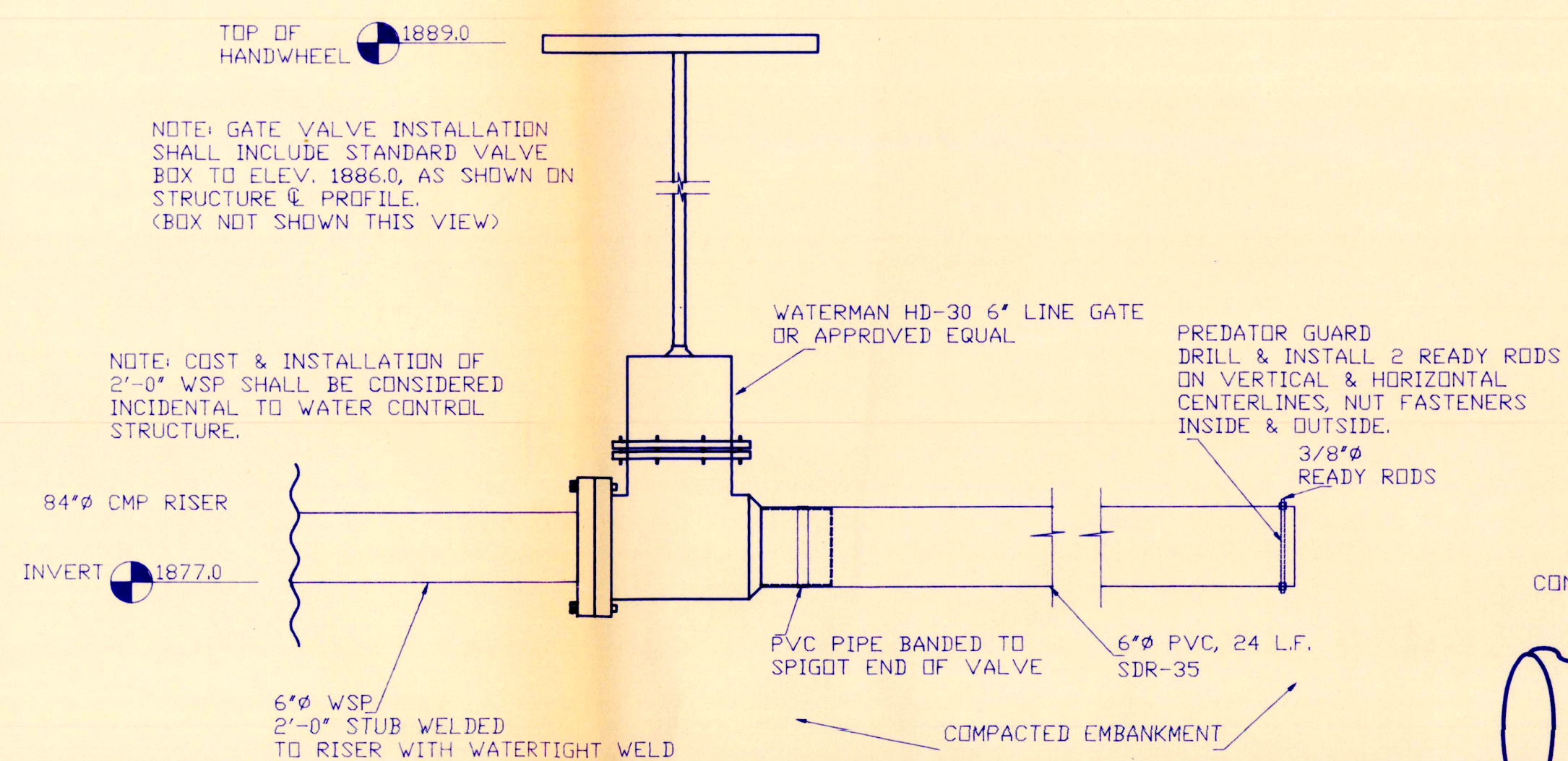


PRELIMINARY

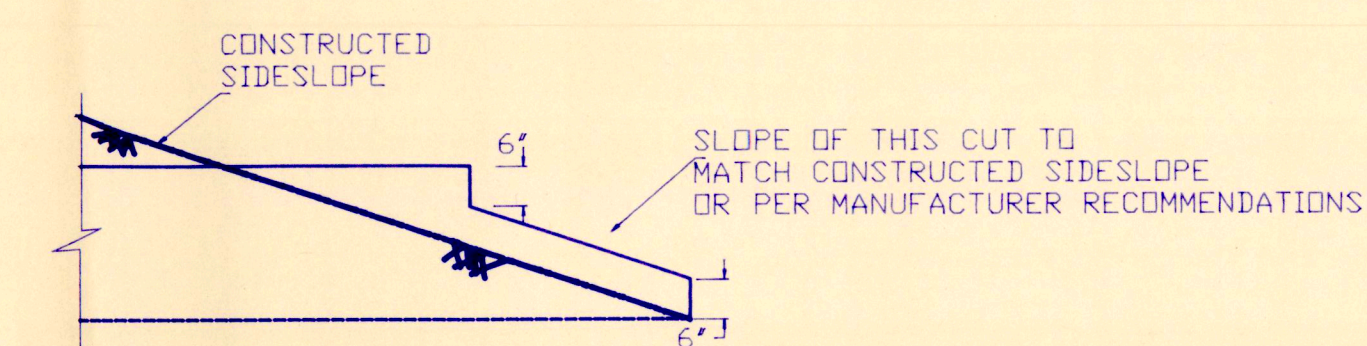
 DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE	PROJECT NO: ED 199-01 COUNTY LINE IMPOUNDMENT		DESIGNED BY: R.C.S.
	STRUCTURE PLAN		DRAWN BY: R. CADD
DATE: 2-3-92	SHEET NO: 4 OF 6	APPROVED BY:	APPROVED BY:

**RISER PLAN**

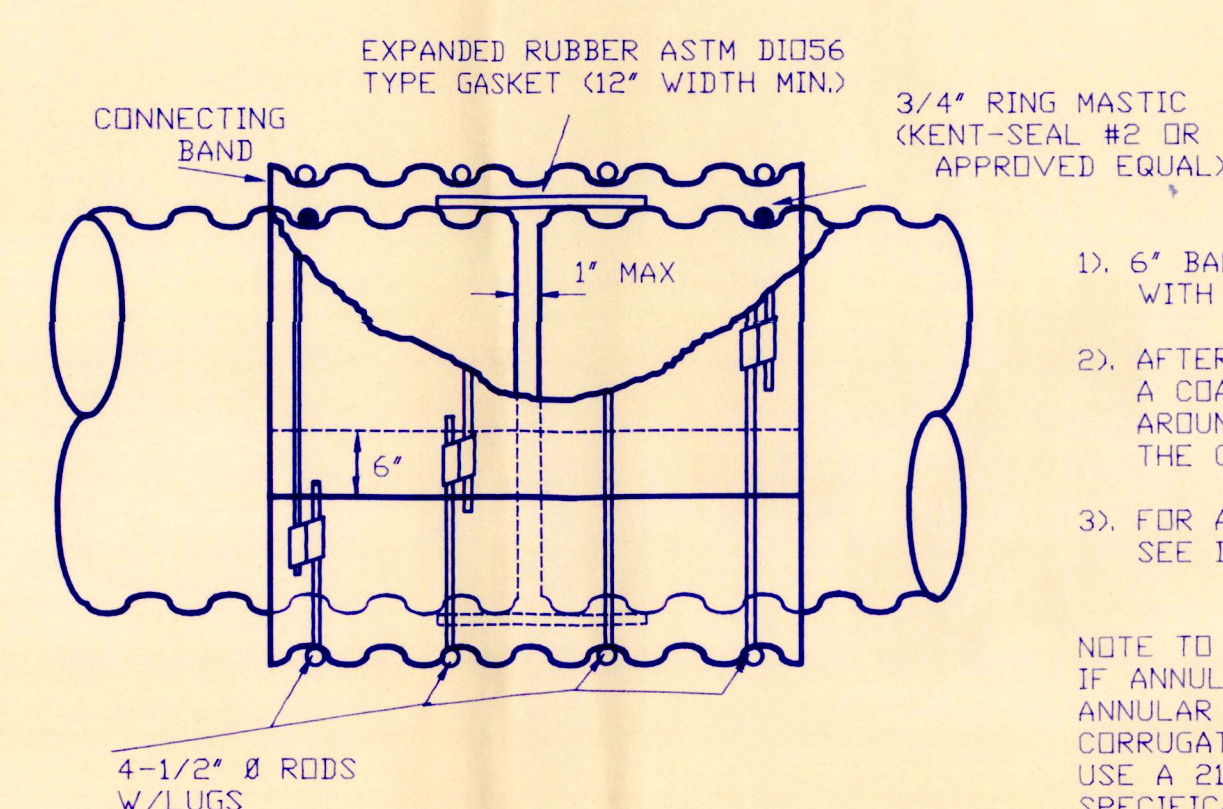
SCALE: 1"=1'

**GATE VALVE DETAIL**

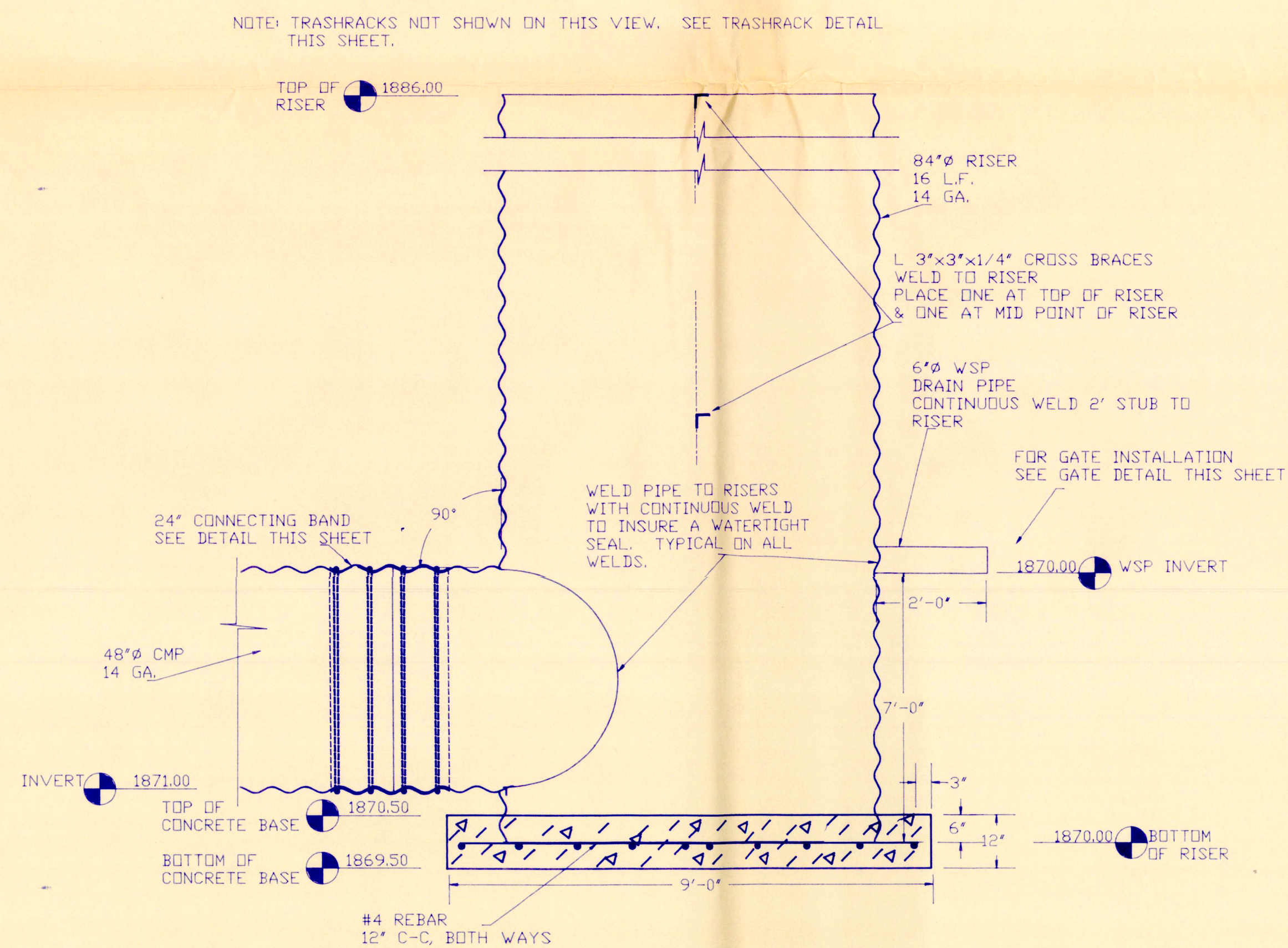
NOT TO SCALE

**STEP BEVEL DETAIL**

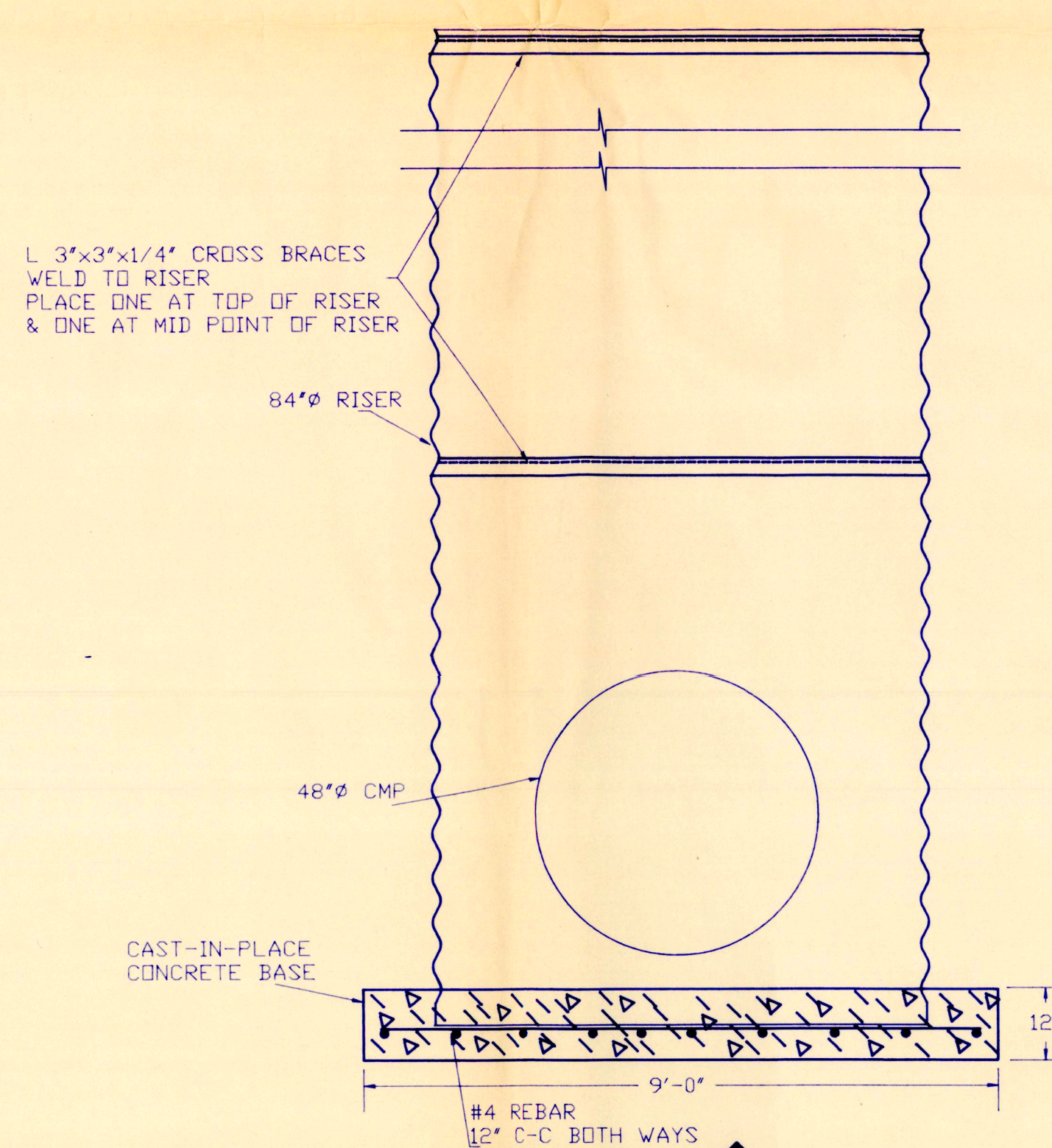
NOT TO SCALE

**CONNECTING BAND DETAIL**

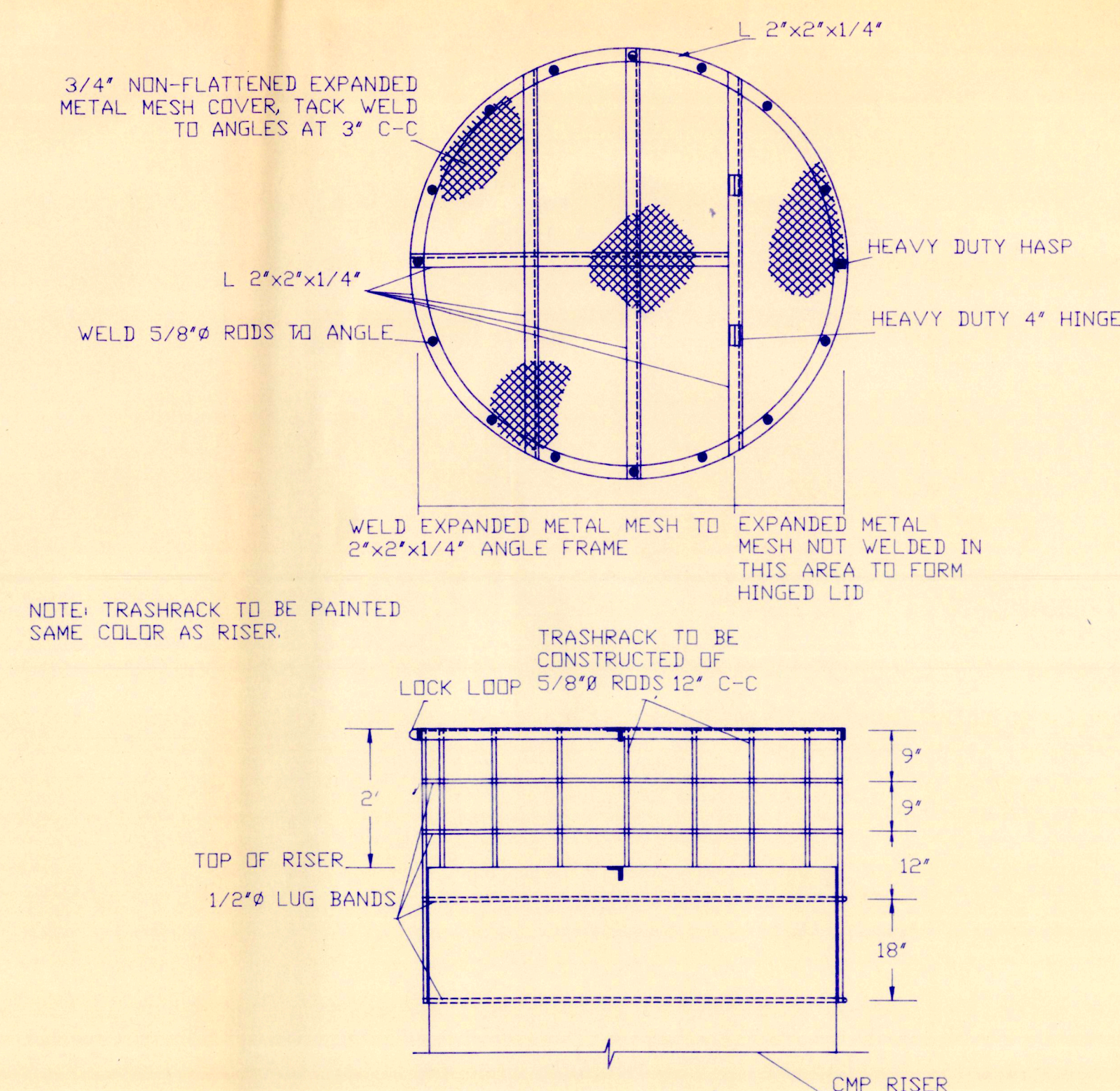
NOT TO SCALE

**SECTION RISER & PROFILE**

SCALE: 1"=1'

**SECTION**

SCALE: 1"=1'

**TRASHRACK DETAIL**

NOT TO SCALE

GREAT PLAINS REGIONAL OFFICE	DUCKS UNLIMITED INC.	PROJECT NO. 90-1089-01 COUNTY LINE IMPOUNDMENT	DESIGNED BY: R.C.S. DRAWN BY: B. CADD
	RISER DETAILS		SURVEYED BY: CHECKED BY:
DATE: 2.3.92	SHEET NO: 5 OF 6	APPROVED BY:	APPROVED BY:

22a1-2

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 1A VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	FA				
	FAT CLAY-grayish brown, very stiff to medium (CH)		2	SB	46		65/28	
	*Frost to 6"							
			3	SB	19			
			4	SB	14			
			5	SB	7			
11	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	10:25	HSA 94'	None			10:25	
1-18-89	11:30	---	None				
1-18-89	15:30	---	None				

METHOD USED 3 1/4" HSA 0-94'

CREW CHIEF D. Robertson

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 2 VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	SB	10			
	FAT CLAY-dark grayish brown to grayish brown, very stiff (CH)		2	SB	42	13.3	109.2	
	FAT CLAY-grayish brown, stiff to very stiff, white mineral inclusions 2" to 12" (CH)		3	SB	26	18.3	100.1	66/22
			4	SB	32			
			5	SB	16			
			6	SB	35			
			7	SB	38			
12	FAT CLAY-dark gray, very stiff, sand laminations (CH)							
16	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	11:00	HSA 141'	None			11:00	
1-18-89	11:30	---	None				
1-18-89	15:25	---	None				

METHOD USED 3 1/4" HSA 0-141'

CREW CHIEF D. Robertson

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 3 VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	SB	12	14.5	107.1	
	FAT CLAY-grayish brown, rather stiff to stiff (CH)		2	SB	26	13.8	99.8	
	*Frost to 4"							
			3	SB	28			
6"	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	11:30	HSA 44'	None			11:30	
1-18-89	11:30	---	None				
1-18-89	15:20	---	None				

METHOD USED 3 1/4" HSA 0-44'

CREW CHIEF D. Robertson

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 4 VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	SB	15			
	FAT CLAY-grayish brown, rather stiff to stiff, white mineral inclusions (CH)		2	SB	39			
	*Frost to 4"							
			3	SB	44			
6"	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	11:30	HSA 49'	None			11:30	
1-18-89	11:55	---	None				
1-18-89	15:20	---	None				

METHOD USED 3 1/4" HSA 0-49'

CREW CHIEF D. Robertson

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 1A VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
8"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	SB	15			
	FAT CLAY-grayish brown, rather stiff to stiff, white mineral inclusions (CH)		2	SB	27			
	*Frost to 4"							
			3	SB	30			
			4	SB	29			
			5	SB	31			
11	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	11:55	HSA 94'	None			11:55	
1-18-89	13:00	---	None				
1-18-89	15:15	---	None				

METHOD USED 3 1/4" HSA 0-94'

CREW CHIEF D. Robertson

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 5A VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
4"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	SB	12			
	FAT CLAY-grayish brown, rather stiff to stiff (CH)		2	SB	18	16.2	92.6	
	*Frost to 4"							
			3	SB	27	21.4	100.6	76/25
	FAT CLAY-dark grayish brown, stiff, sand laminations 2" to 9" (CH)		4	SB	21			
			5	3"TW	34.2	85.6		2560 psf
			6	SB	28			
			7	SB	45			
14	FAT CLAY-very dark gray, very stiff (CH)							
16	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	11:40	HSA 141'	None			11:40	
1-18-89	12:40	---	None				
1-18-89	15:05	---	None				

METHOD USED 3 1/4" HSA 0-141'

CREW CHIEF D. Robertson

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 2A VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
6"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	FA	13			
	FAT CLAY-grayish brown, rather stiff to very stiff (CH)		2	SB	17			
	*Frost to 3"							
	LEAN CLAY-grayish brown, stiff, white mineral inclusions (CL)		3	SB	23			
	FAT CLAY-grayish brown, stiff to very stiff, white mineral inclusions (CH)		4	SB	40			
			5	SB	39			
11	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	14:10	HSA 94'	None			14:10	
1-18-89	14:15	---	None				
1-18-89	15:05	---	None				

METHOD USED 3 1/4" HSA 0-94'

CREW CHIEF D. Robertson

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 4A VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
6"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	SB	13	13.5	98.8	
	FAT CLAY-brown, rather stiff to very stiff to stiff (CH)		2	SB	34	16.8	104.7	
	*Frost to 4"							
			3	SB	18			
6	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	14:35	HSA 44'	None			14:40	
1-18-89	14:40	---	None				
1-18-89	15:00	---	None				

METHOD USED 3 1/4" HSA 0-44'

CREW CHIEF D. Robertson

MIDWEST TESTING LABORATORY

JOB NO. B2289 LOG OR TEST BORING NO. 5A VERTICAL SCALE 1"=2'

PROJECT County Line Impoundment, Lyman County, South Dakota

DEPTH IN FEET	SOIL DESCRIPTION	SURFACE ELEV.	SAMPLE NO.	TYPE	VALUE	LABORATORY TESTS	LL/PL	Q _u
6"	ORGANIC FAT CLAY-dark grayish brown, rather stiff (CH)		1	SB	18			
	FAT CLAY-grayish brown, very stiff to stiff (CH)		2	SB	40			
	*Frost to 3"							
			3	SB	26			
6	END OF BORING							

WATER LEVEL DATA				BORING DATA			
DATE	TIME	CAVE IN DEPTH	WATER LEVEL	STARTED	COMPLETED	1-18-89	9
1-18-89	14:55	HSA 44'	None			14:55	
1-18-89	15:00	---	None				
1-18-89	15:05	---	None				

METHOD USED 3 1/4" HSA 0-44'

CREW CHIEF D. Robertson

THE BORINGS DONE ON THIS PROJECT REPRESENT THE SOILS FOUND AT THE LOCATIONS OF THE BORINGS ONLY. SOILS MAY VARY BETWEEN LOCATIONS AND OTHER AREAS OF THE PROJECT SITE NOT DRILLED. A COMPLETE GEOTECHNICAL ENGINEERING REPORT IS AVAILABLE FOR REVIEW AT DUCKS UNLIMITED GREAT PLAINS REGIONAL OFFICE. THE CONTRACTOR WARRANTS THAT SITE CONDITIONS HAVE BEEN EXAMINED AS REQUIRED BY SECTION 101.203 EXAMINATION OF SITE CONDITIONS OF THE GENERAL CONDITIONS PRIOR TO BIDDING OR CONSTRUCTING THIS PROJECT. NO ADJUSTMENT TO THE CONTRACT WILL BE MADE DUE TO CHANGED SITE CONDITIONS.

NOTE: SEE SHEET 2 OF 6 FOR SOIL BORING LOCATIONS.

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE

PROJECT NO. DU-P-SD-089-01-001

DESIGNED BY: TD
DRAWN BY: TD
SURVEYED BY: TD
CHECKED BY: TD

DATE: 5-31-89
SHEET NO: 6 OF 6
APPROVED BY: