

WATER PERMIT NO. 2612-2

Name of Applicant: **Two Right Wings & A Left**

Address: **c/o Brian Hoffman, PO Box 548, Marshall MN 56258**

Phone: **605 532-5735**

Amount of Water Claimed: **48.5 AF** Total Acres: **NA**

Source of Water Supply: **unnamed tributary to the White River**

Water to be used for: **fwp.** County: **Tripp**

Type of Waste Disposal System:

Location: **20 miles northwest of Winner**

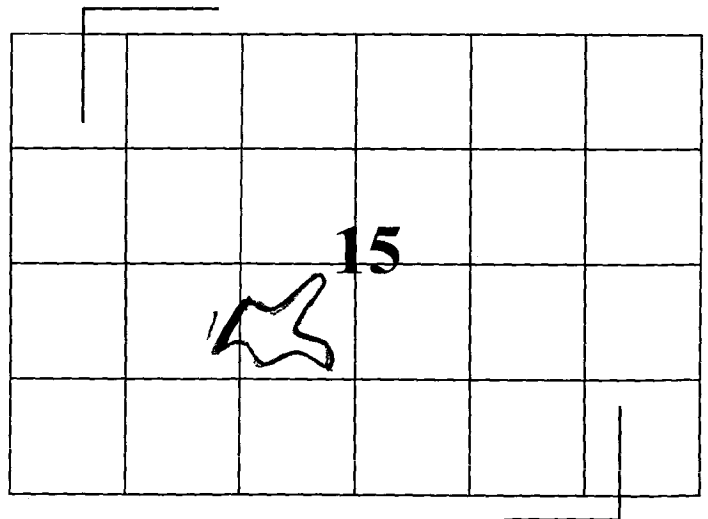
PRIORITY Date Received: **3-12-07** Application/License Fee: **\$200**

Corrected Application Received: Period of Annual Use: **Jan 1- Dec 31**

Remarks:

Diversion Point: **N ½ SW ¼ Sec 15-T102N-R75W**

Water Impounded: **N ½ SW ¼ Sec 15-T102N-R75W**



Depth of Well: **NA**

Well Driller:

Remarks:

Type of Map: **topo**

Prepared by: **Tim Olson, GF&P**

Reviewed and the Number Assigned on: **3-13-07**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

FORM 2: Application for uses other than irrigation
(type or print)

RECEIVED
MAR 12 2007
WATER RIGHTS
PROGRAM

Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	(office use only)	
	No. <u>2612-2</u>	Hydrologic Unit <u>10140204</u>
	Basin <u>White River</u>	
	Newspaper <u>Winner Advocate</u> <u>Winner</u> <u>605-842-1481</u> <u>SD57580</u>	

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

Check use(s) of water:

☐ Municipal	☐ Suburban Housing	☒ Recreational	☐ Institutional
☐ Rural Water System	☐ Commercial	☒ Fish & Wildlife	☐ Geothermal Heat
☐ Domestic (over 18 gpm)	☐ Industrial	☒ Other <u>stockwater</u>	

Type of Application: ☒ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
(check one) ☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____
☐ Amendment/Correction to Permit No. _____

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.) _____

- Name of Applicant Two Right Wings & A Left c/o Brian Hoffman Phone (507) 532-5735
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address PO BOX 548, MARSHALL State MN, 56258
(Street, RR. or Box and City) (Zip Code)
- Amount of water claimed _____ *CFS or _____ **GPM 48.5 ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)
- Source of water supply Un-named tributary to the White River
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
NW 1/4 & NE 1/4 of SW 1/4 section 15, T102N, R75W Water impounded N 1/2 SW 1/4
N 1/2 County Tripp
- County or counties where water will be used Tripp
- Annual period during which water is to be used Year around Jan 1 - Dec 31
- Give a description of the 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)

Construction of a new dam to provide water for fish & wildlife habitat and stockwater.

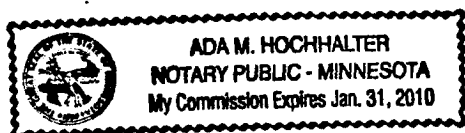
STATE OF SOUTH DAKOTA)

County of DeWitt SS

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Attach map and any other technical information. (see instructions)

I, BRIAN HOFFMAN-PTL, 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 Brian Hoffman - Ptl
Subscribed and sworn to before me this 8th day of March 2007



Ada M. Hochhalter
Notary Public

**SOUTH DAKOTA
WATER PERMIT NO. 2612-2**

Date of first receipt of application March 12, 2007.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 2612-2 to Two Right Wings & A Left, c/o Brian Hoffman, PO Box 548, Marshall MN 56258 authorizing the construction of the dam and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 2612-2 authorizes impoundment of 48.5 acre-feet of water from an un-named tributary to the White River by constructing a dam located in the N ½ SW ¼ Section 15 with water impounded in the N ½ SW ¼ Section 15; all in T102N-R75W.
2. The water appropriated shall be used for fish and wildlife propagation, recreation and livestock water purposes and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 2612-2 is April 16, 2007.
5. The date from which applicant may claim right is March 12, 2007.
6. One-fifth of the construction is to be completed on or before October 16, 2009.
7. All construction is to be completed on or before April 16, 2012.
8. Water is to be put to beneficial use on or before April 16, 2016.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Water Permit No. 2612-2 authorizes a dam with a storage capacity of 48.5 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

WATER MANAGEMENT BOARD

By: Garland Erbele

Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

MAY 10 2007

date



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 _____ 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. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) _____
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System

3. Dugout Information

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

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to 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:

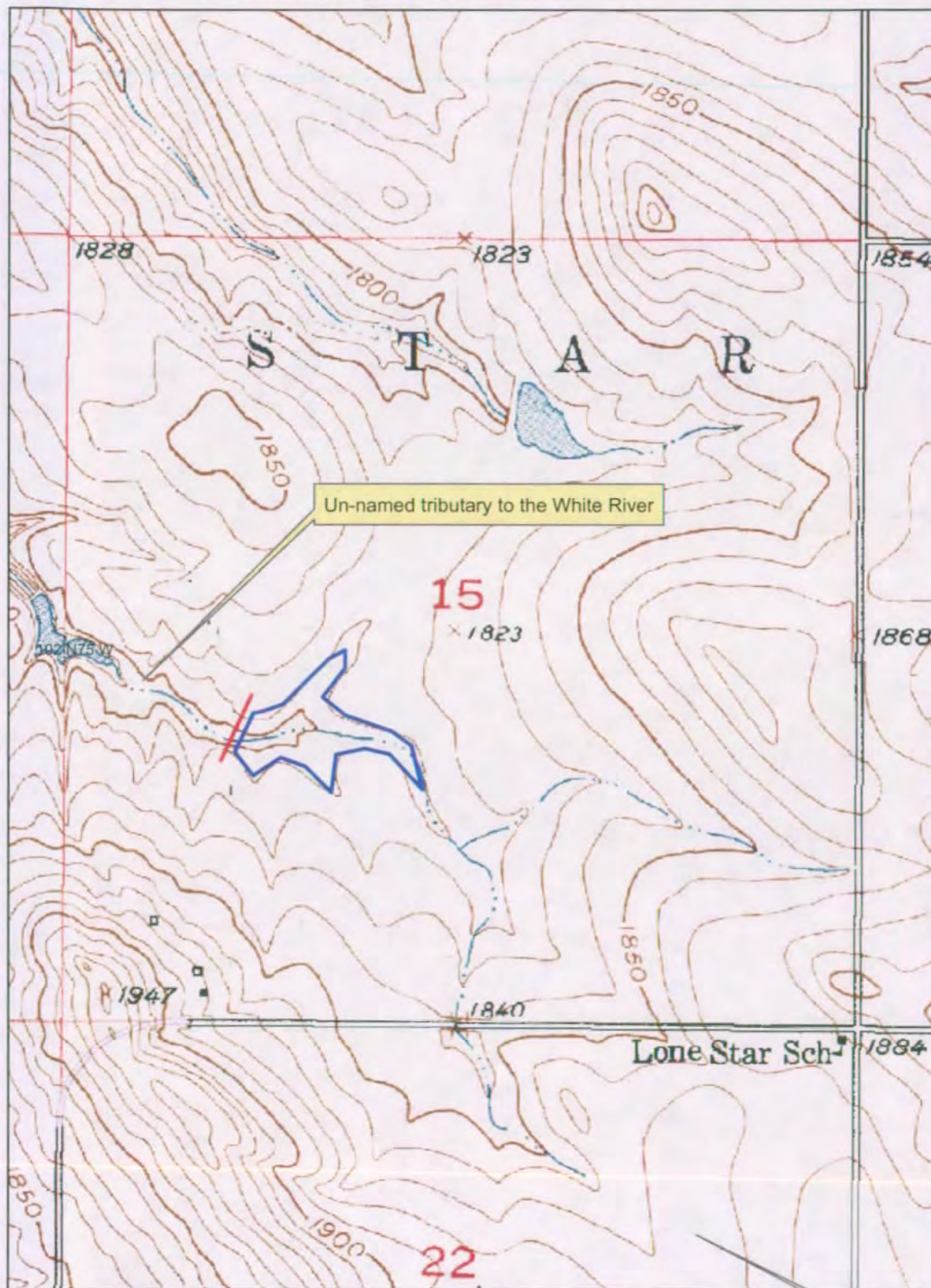
Konechne Engineering
104 Capitol Hill Dr
Pierre, SD 57501

- b) Freeboard 3 ft
- c) Crest Width 12 ft
Crest Length 530 ft
- d) Height 14.0 ft
- e) Primary Outlet Capacity 28.15 cfs
If pipe, diameter 30"riser w/ 18" barrel
- f) Secondary Spillway Capacity 604 cfs
Spillway Width 80 ft
- g) X & Y Slope _____
Upstream 3:1
Downstream 3:1
- h) Surface Area of Impoundment 13.2 acres
- i) Storage 48.5 Acre Feet
- j) Drainage Area Above Dam 462 Acres

Two Right Wings & A Left (Hoffman) Pond Construction
SW1/4 Section 15, T102N, R75W, Tripp County

Point of diversion located approx. 2247 feet northeast of the southwest corner of section 15, T102N, R75W

Storage is 48.5 acre-feet and surface area at fsl is 13.2 acres



RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 3/13, 20 07

RECEIVED OF Two Right Wings and a Left 417 N 3rd Marshall MN 56258
Brian Hoffman

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

Fee for Application for Permit No. <u>2612-2</u> to Appropriate Water, to construct 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. <u>2612-2</u>	50	00
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____		
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law)	TOTAL	200 00

No.

02988

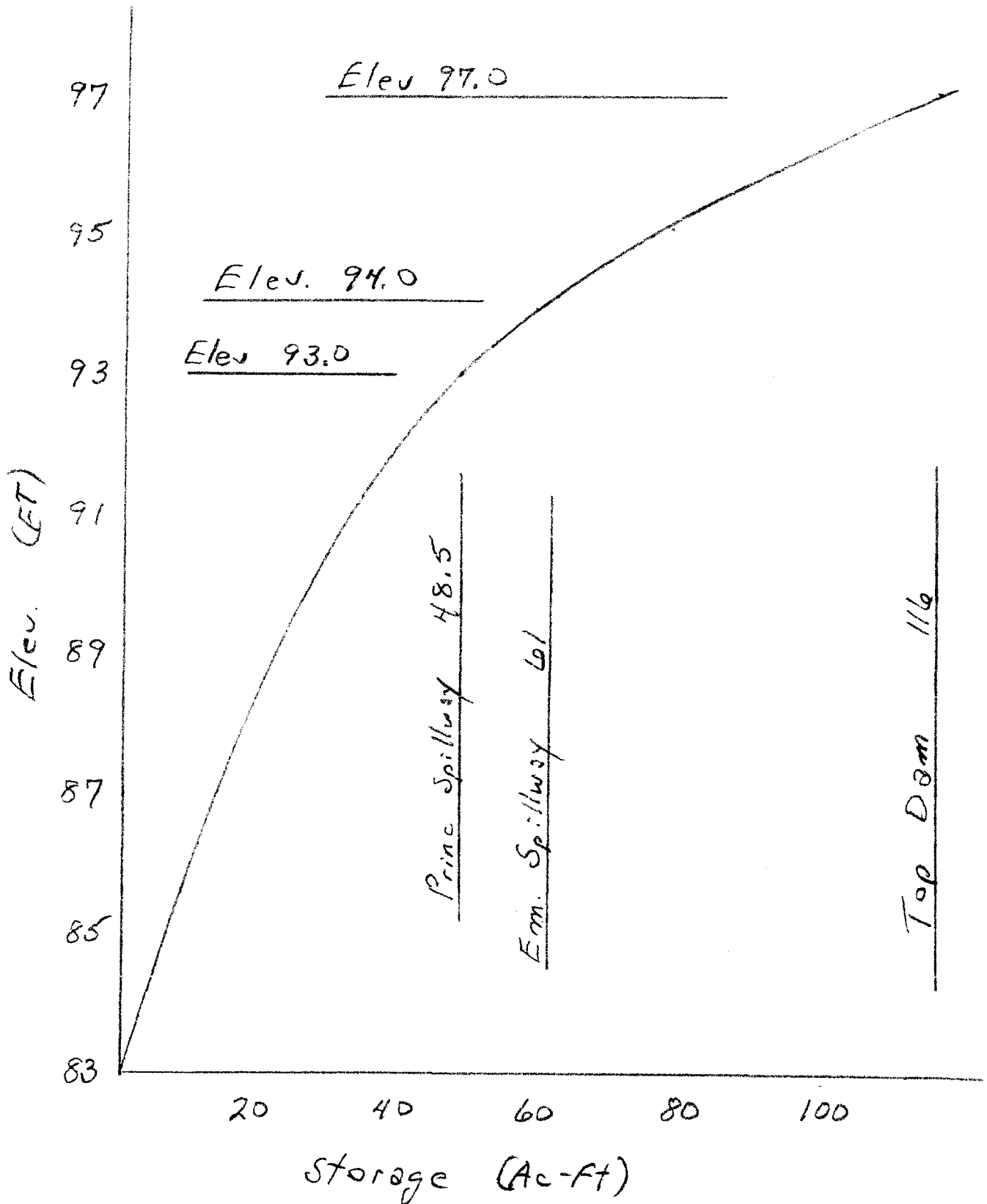
By

Leland Erbelle

Chief Engineer

[Signature]

BY	DATE	PROJECT <i>Ho Arman</i>	SHEET ____ OF ____
CHKD BY	DATE	FEATURE	
DETAILS			

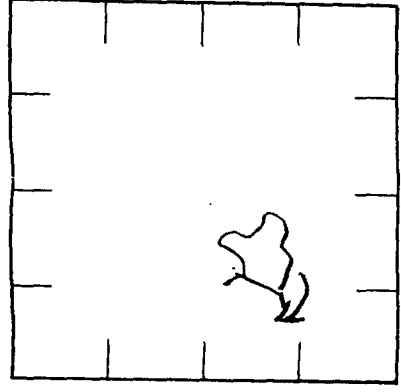


RECEIVED
MAR 19 2007
WATER RIGHTS
PROGRAM

STRUCTURE DATA

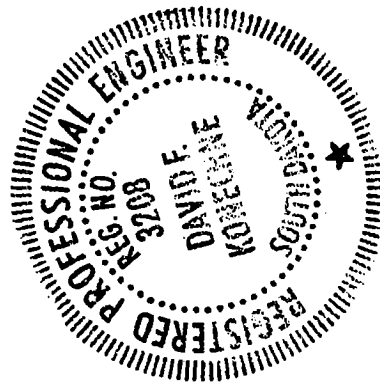
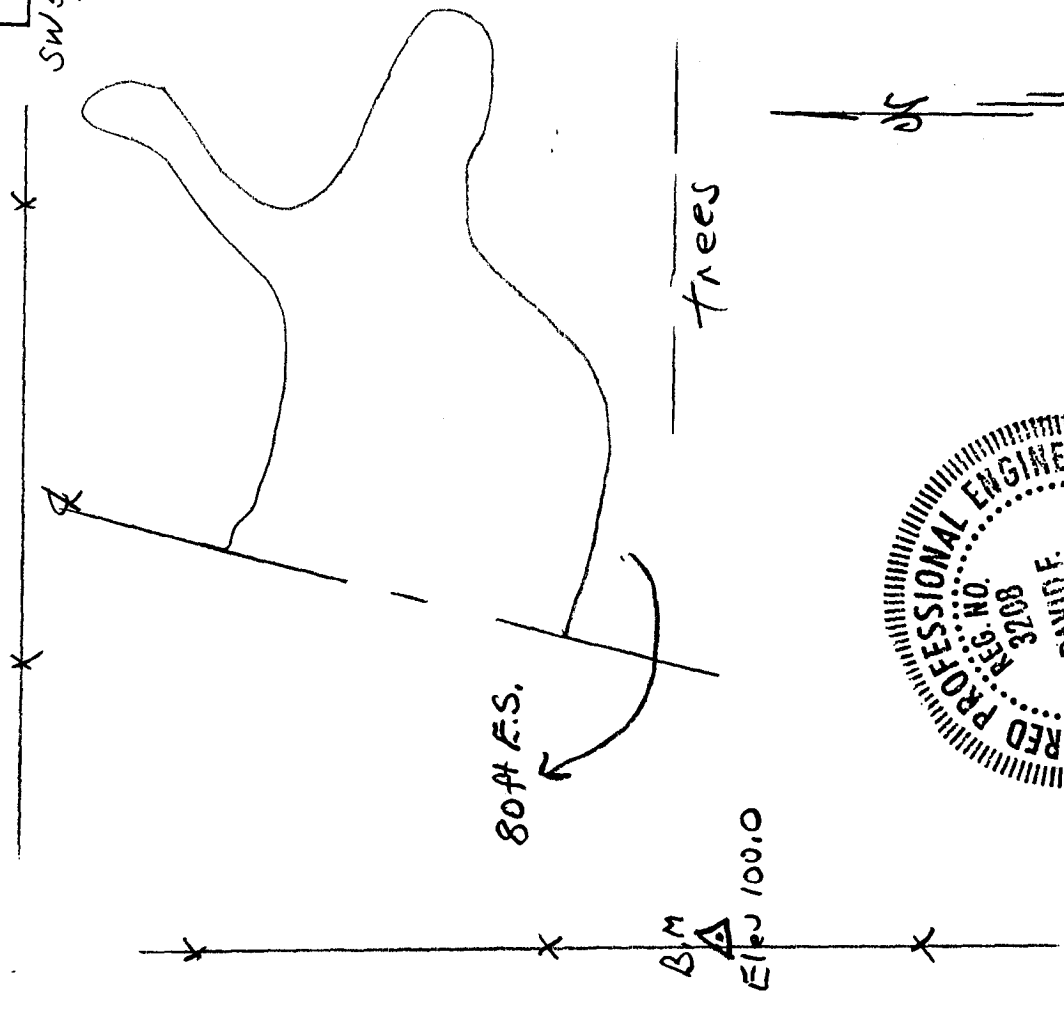
DRAINAGE AREA	ANNUAL YIELD	PEAK RUNOFF	EMERG. SPLWY. CAPACITY	WATER DEPTH	SURFACE AREA	SEDIMENT STORAGE	TOTAL STORAGE
ACRES	AC. FT.	25-YR.	C.F.S.	FEET	ACRES	AC. FT.	AC. FT.
46.2	16.9	451	762	10	13.2	-	48.5

P.S. = 24.4 cfs



SW Sec. 15T. 102N R. 75W
Tripp County

LOCATION



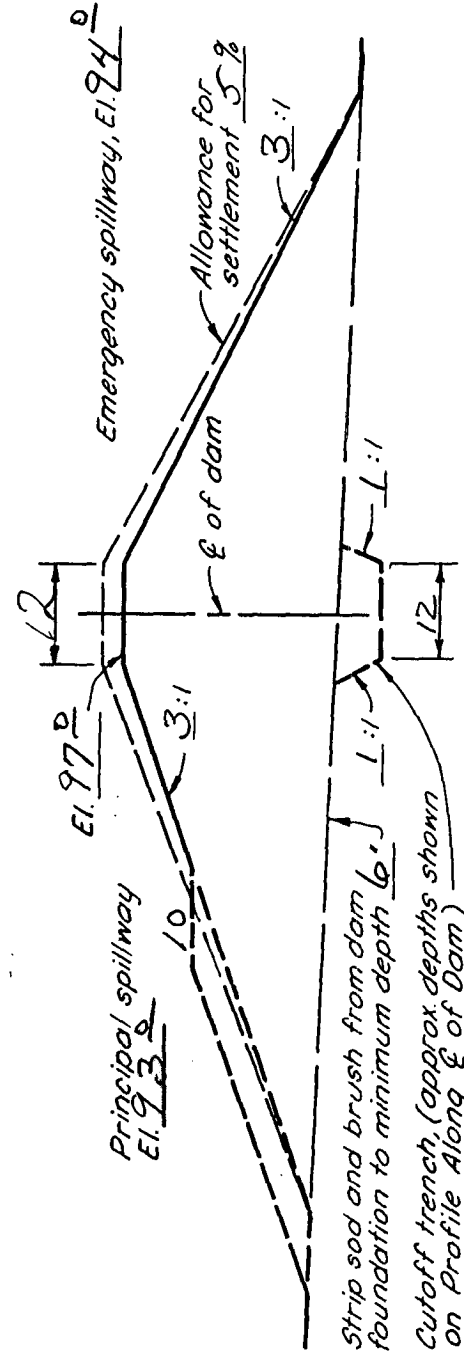
SKETCH PLAN OF DAM AND RESERVOIR AREA

Approximate scale 1" =

REFERENCE: GUIDE PLAN NO. 1.0

TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY
Earth Fill	cuyd	10,031
30" dia vinyl cmp riser - 6 ft long w/ 18" stub	ea	1
18" dia vinyl cmp	lin ft	74
Sand seep collar	cuyd	3.5
4" dia PVC drain pipe sub 40	lin ft	55
Timber pipe support	ea	1
Metal Anti-Vortex	ea	1
Concrete	cuy	0.8



TYPICAL CROSS SECTION OF DAM

S.D. CONSTRUCTION AND MATERIAL SPECIFICATIONS:

- SD-2 Clearing & Grubbing
- SD-7s Earth Fill
- SD-9 Drain Fill
- SD-16 Timber Fabrication
- SD-17 Metal Fabrication
- SD-55 PVC pipe
- SD-12B Concrete
- SD-15 CMP

EARTH DAM

OPERATOR: Brian Holman
CONSERVATION DISTRICT: Tripp
Class "A" Hazard
Designed: Konecne
Drawn: _____
Traced: _____
Checked: _____
Date: _____
Title: _____
Sheet: _____
Drawing No: _____
of: _____

(Rev 4-73) 5 N-20 072 1a1

Emergency spillway El. 945

Berm, if required 3:1
slope normal to 6 of
dam

Trash rack and baffle plate
not shown. See job plan
no. 6.0

Note: Allowance for settlement 5 %

3:1 slope normal to C of dam

-30" dia. riser, see
job plan no. 5, 3

3 | Sand seep
Antiseep collars collar, plan 3.8

Antiseep collars coller, plén

18.13

5.8 % gr.

74' of 18" dia. pipe

64

CROSS SECTION OF DAM ALONG C OF PRINCIPAL SPILLWAY

(Not to scale)

SPECIFICATION NOTES

- ~~I. ELBOW, IF REQUIRED, MAY BE FABRICATED BY CONTINUOUS WELDING SEPERATE PIPE SECTIONS OR BY FABRICATING A CONTINUOUS WELDED JOINT ON THE UPSTREAM END OF LAST SECTION OF PIPE.~~

- ~~2. PIPE WALL THICKNESS SHALL BE
GAGE OR _____ INCHES.~~

All CM Pipe to be

vinyl coated spiral

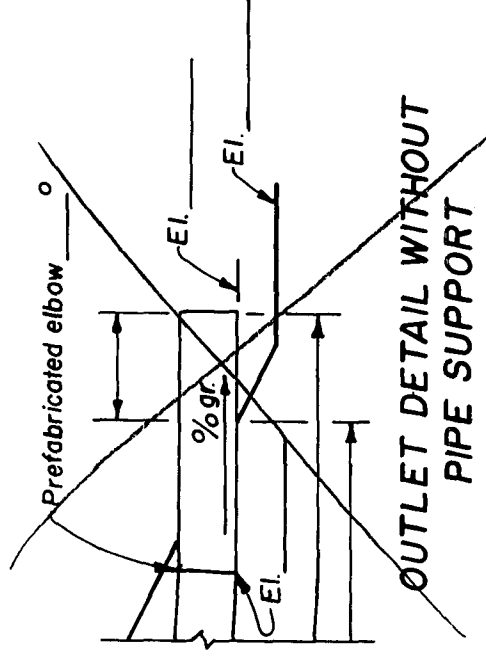
TABLE OF QUANTITIES

[illegible]

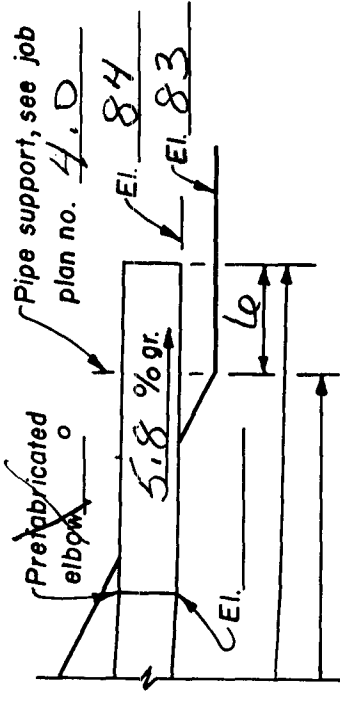
APPLICABLE STANDARD S.C.S. SPECIFICATIONS

REFERENCE: GUIDE PLAN NO. 2.0

Rev. 8/80
JOB PLAN NO. 2.0



~~OUTLET DETAIL WITHOUT~~
~~PIPE SUPPORT~~



OUTLET DETAIL WITH PIPE SUPPORT

Sec. _____, T. _____, R. _____
 _____ County

LOCATION

CORRUGATED METAL PIPE DROP INLET PRINCIPAL SPILLWAY

OPERATOR 51127 HO #1 HO #2 HO #3 HO #4 HO #5 HO #6 HO #7 HO #8 HO #9 HO #10 HO #11 HO #12 HO #13 HO #14 HO #15 HO #16 HO #17 HO #18 HO #19 HO #20 HO #21 HO #22 HO #23 HO #24 HO #25 HO #26 HO #27 HO #28 HO #29 HO #30 HO #31 HO #32 HO #33 HO #34 HO #35 HO #36 HO #37 HO #38 HO #39 HO #40 HO #41 HO #42 HO #43 HO #44 HO #45 HO #46 HO #47 HO #48 HO #49 HO #50 HO #51 HO #52 HO #53 HO #54 HO #55 HO #56 HO #57 HO #58 HO #59 HO #60 HO #61 HO #62 HO #63 HO #64 HO #65 HO #66 HO #67 HO #68 HO #69 HO #70 HO #71 HO #72 HO #73 HO #74 HO #75 HO #76 HO #77 HO #78 HO #79 HO #80 HO #81 HO #82 HO #83 HO #84 HO #85 HO #86 HO #87 HO #88 HO #89 HO #90 HO #91 HO #92 HO #93 HO #94 HO #95 HO #96 HO #97 HO #98 HO #99 HO #100 HO #101 HO #102 HO #103 HO #104 HO #105 HO #106 HO #107 HO #108 HO #109 HO #110 HO #111 HO #112 HO #113 HO #114 HO #115 HO #116 HO #117 HO #118 HO #119 HO #120 HO #121 HO #122 HO #123 HO #124 HO #125 HO #126 HO #127 HO #128 HO #129 HO #130 HO #131 HO #132 HO #133 HO #134 HO #135 HO #136 HO #137 HO #138 HO #139 HO #140 HO #141 HO #142 HO #143 HO #144 HO #145 HO #146 HO #147 HO #148 HO #149 HO #150 HO #151 HO #152 HO #153 HO #154 HO #155 HO #156 HO #157 HO #158 HO #159 HO #160 HO #161 HO #162 HO #163 HO #164 HO #165 HO #166 HO #167 HO #168 HO #169 HO #170 HO #171 HO #172 HO #173 HO #174 HO #175 HO #176 HO #177 HO #178 HO #179 HO #180 HO #181 HO #182 HO #183 HO #184 HO #185 HO #186 HO #187 HO #188 HO #189 HO #190 HO #191 HO #192 HO #193 HO #194 HO #195 HO #196 HO #197 HO #198 HO #199 HO #200 HO #201 HO #202 HO #203 HO #204 HO #205 HO #206 HO #207 HO #208 HO #209 HO #210 HO #211 HO #212 HO #213 HO #214 HO #215 HO #216 HO #217 HO #218 HO #219 HO #220 HO #221 HO #222 HO #223 HO #224 HO #225 HO #226 HO #227 HO #228 HO #229 HO #230 HO #231 HO #232 HO #233 HO #234 HO #235 HO #236 HO #237 HO #238 HO #239 HO #240 HO #241 HO #242 HO #243 HO #244 HO #245 HO #246 HO #247 HO #248 HO #249 HO #250 HO #251 HO #252 HO #253 HO #254 HO #255 HO #256 HO #257 HO #258 HO #259 HO #260 HO #261 HO #262 HO #263 HO #264 HO #265 HO #266 HO #267 HO #268 HO #269 HO #270 HO #271 HO #272 HO #273 HO #274 HO #275 HO #276 HO #277 HO #278 HO #279 HO #280 HO #281 HO #282 HO #283 HO #284 HO #285 HO #286 HO #287 HO #288 HO #289 HO #290 HO #291 HO #292 HO #293 HO #294 HO #295 HO #296 HO #297 HO #298 HO #299 HO #300 HO #301 HO #302 HO #303 HO #304 HO #305 HO #306 HO #307 HO #308 HO #309 HO #310 HO #311 HO #312 HO #313 HO #314 HO #315 HO #316 HO #317 HO #318 HO #319 HO #320 HO #321 HO #322 HO #323 HO #324 HO #325 HO #326 HO #327 HO #328 HO #329 HO #330 HO #331 HO #332 HO #333 HO #334 HO #335 HO #336 HO #337 HO #338 HO #339 HO #340 HO #341 HO #342 HO #343 HO #344 HO #345 HO #346 HO #347 HO #348 HO #349 HO #350 HO #351 HO #352 HO #353 HO #354 HO #355 HO #356 HO #357 HO #358 HO #359 HO #360 HO #361 HO #362 HO #363 HO #364 HO #365 HO #366 HO #367 HO #368 HO #369 HO #370 HO #371 HO #372 HO #373 HO #374 HO #375 HO #376 HO #377 HO #378 HO #379 HO #380 HO #381</

CONSERVATION DISTRICT

**U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE**

Designed.....	Date.....	Approved by.....
Drawn.....		Title.....
Traced.....		Title.....
Checked.....		Sheet.....
		No.....
		and.....
		Drawing No.....

STEEL SCHEDULE

RISER DIA. IN.	BAR SIZE	MARK	TYPE	NO. REQ'D.	LENGTH FT.-IN.	TOTAL LENGTH FT.-IN.	TOTAL WT. LB.	C IN.	L FT.-IN.
30	4	1	STR.	10	4'-0"	40'-0"	27	3	4'-6"

TABLE OF QUANTITIES

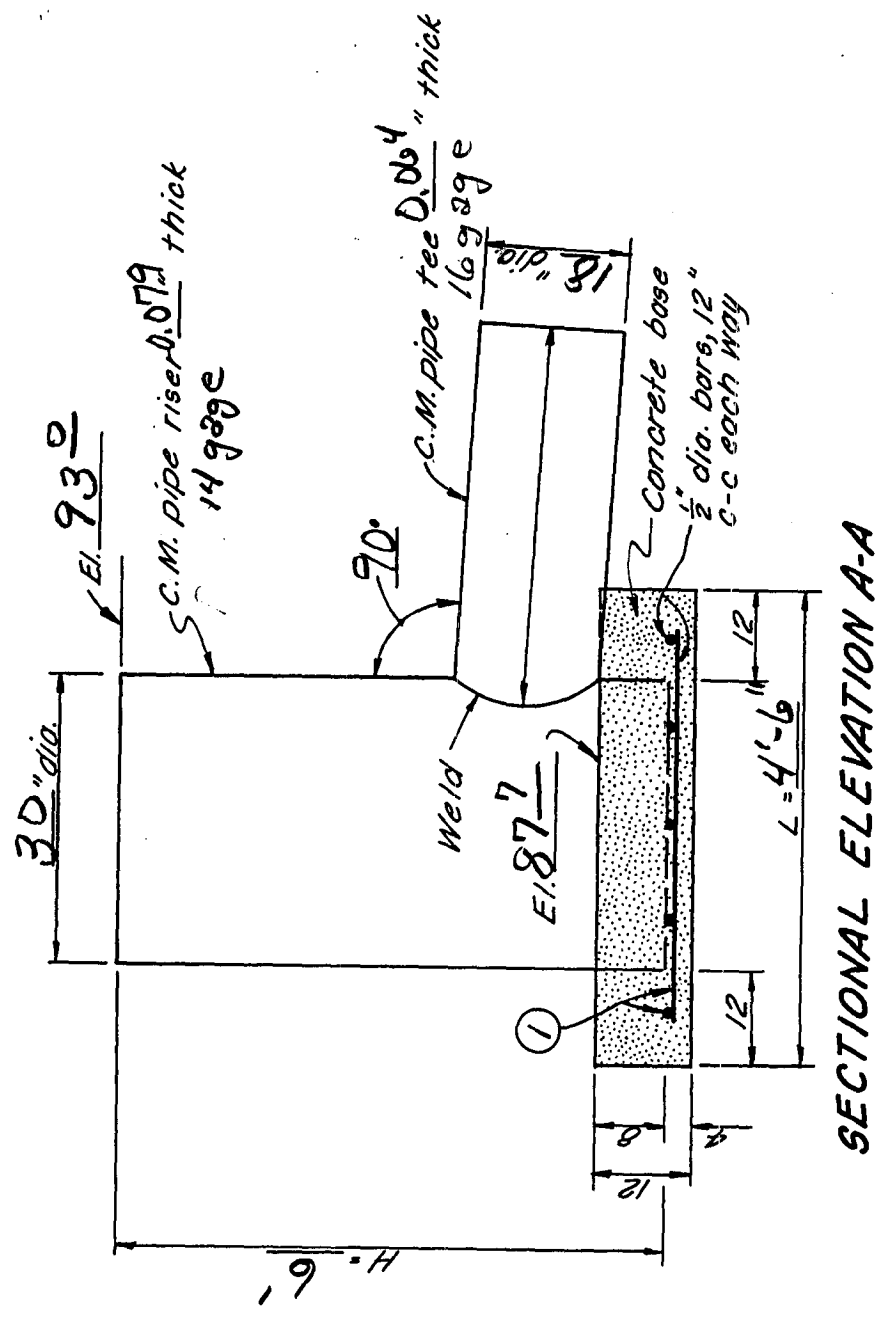
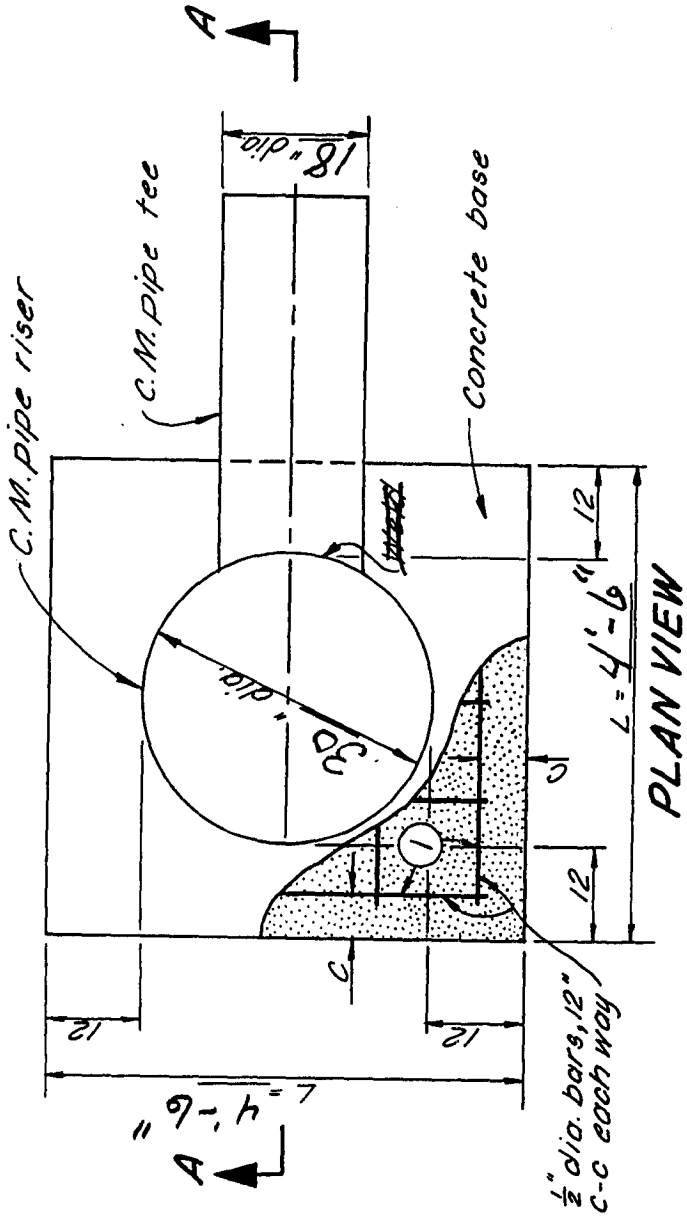
ITEM	UNIT	QUANTITY
CONCRETE	CU. YD.	0.8
REINFORCING STEEL	LB.	27

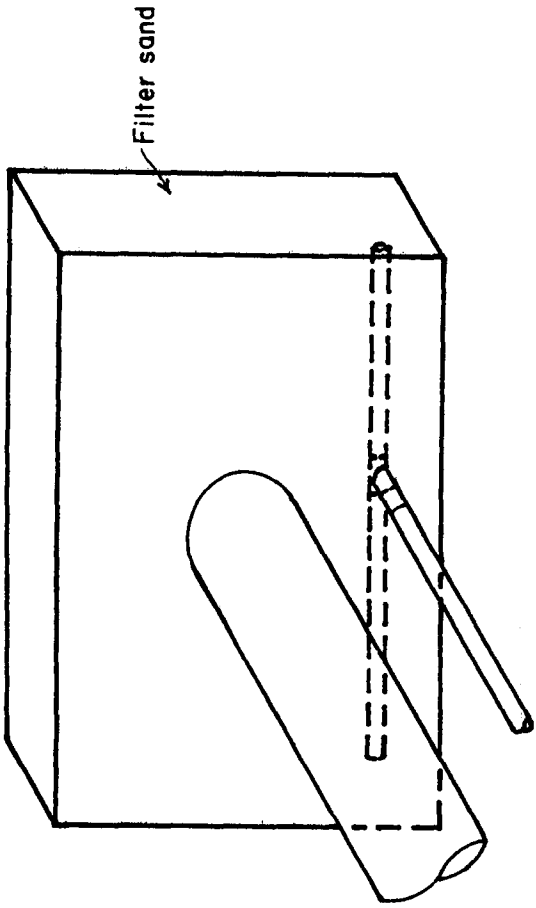
NOTE: All CM Pipe to be vinyl clad spiral

~~CM~~ PIPE RISER WITH FABRICATED TEE

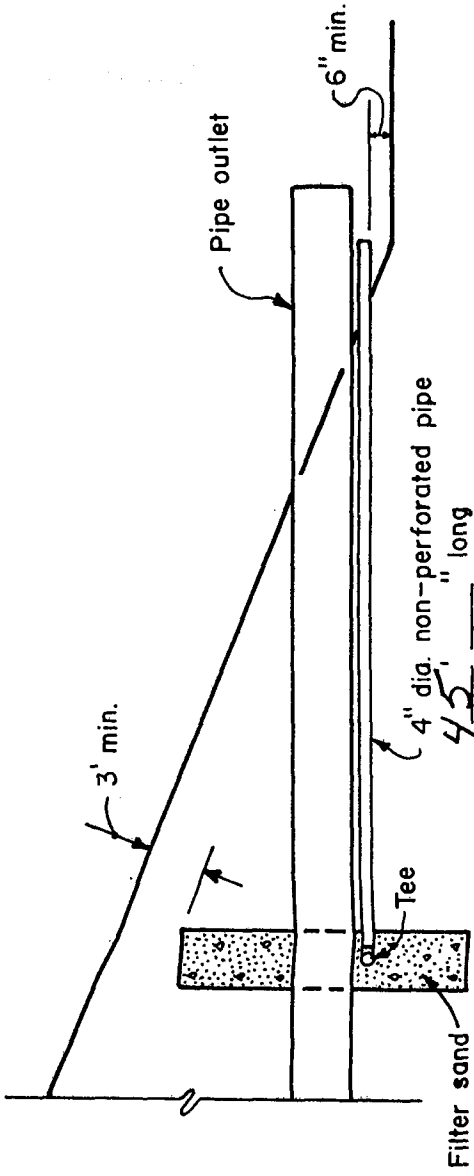
OPERATOR: Brian Hoffman
CONSERVATION DISTRICT:

Designed	Date	Approved by
Drawn		Title
Traced		Title
Checked		Sheet No.
		Drawing No.
		of

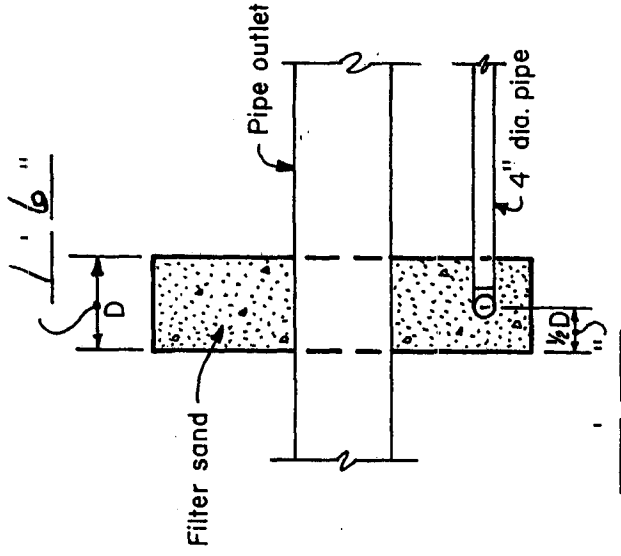




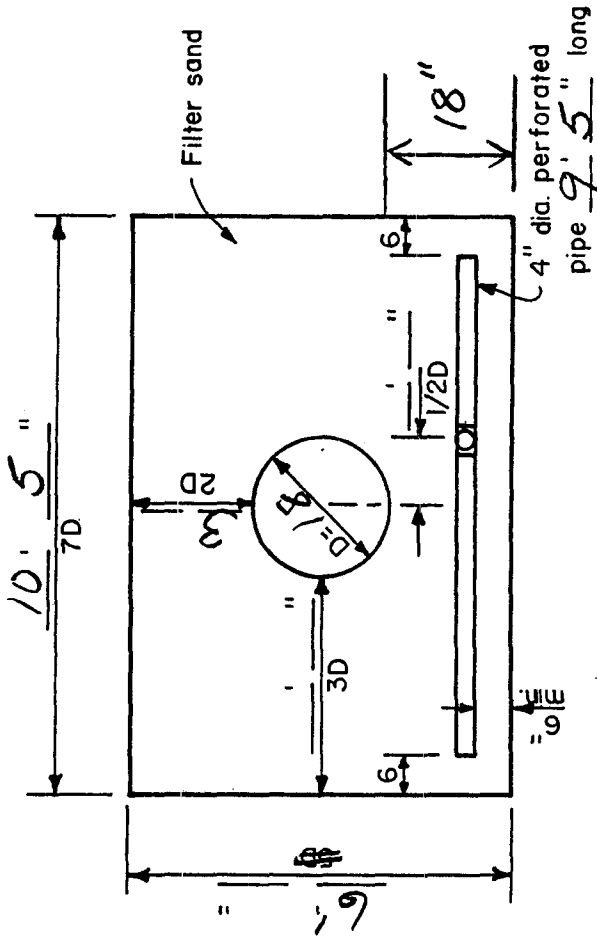
ISOMETRIC VIEW



OUTLET DETAIL



SIDE VIEW



UPSTREAM VIEW

see spec SD-9

3.5 cu yd

FILTER GRADATION

SIEVE SIZE	PERCENT PASSING
3/8"	100
4	95-100
8	80-100
16	50-85
30	25-60
50	10-30
100	2-10

Sec. _____, T. _____, R. _____

County _____

LOCATION _____

SAND ANTISEEP COLLAR

OPERATOR Brian Hansen

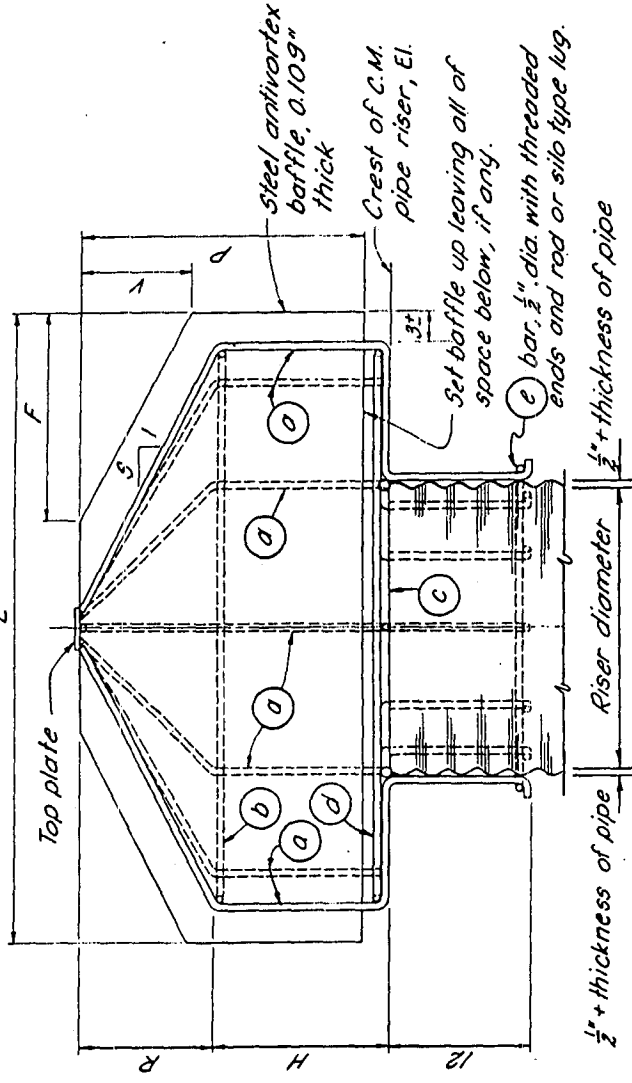
CONSERVATION DISTRICT _____

Designed _____	Date _____	Approved by _____
Drawn _____	Title _____	Title _____
Traced _____	Sheet No. _____	Sheet No. _____
Checked _____	of _____	of _____

NOTE:

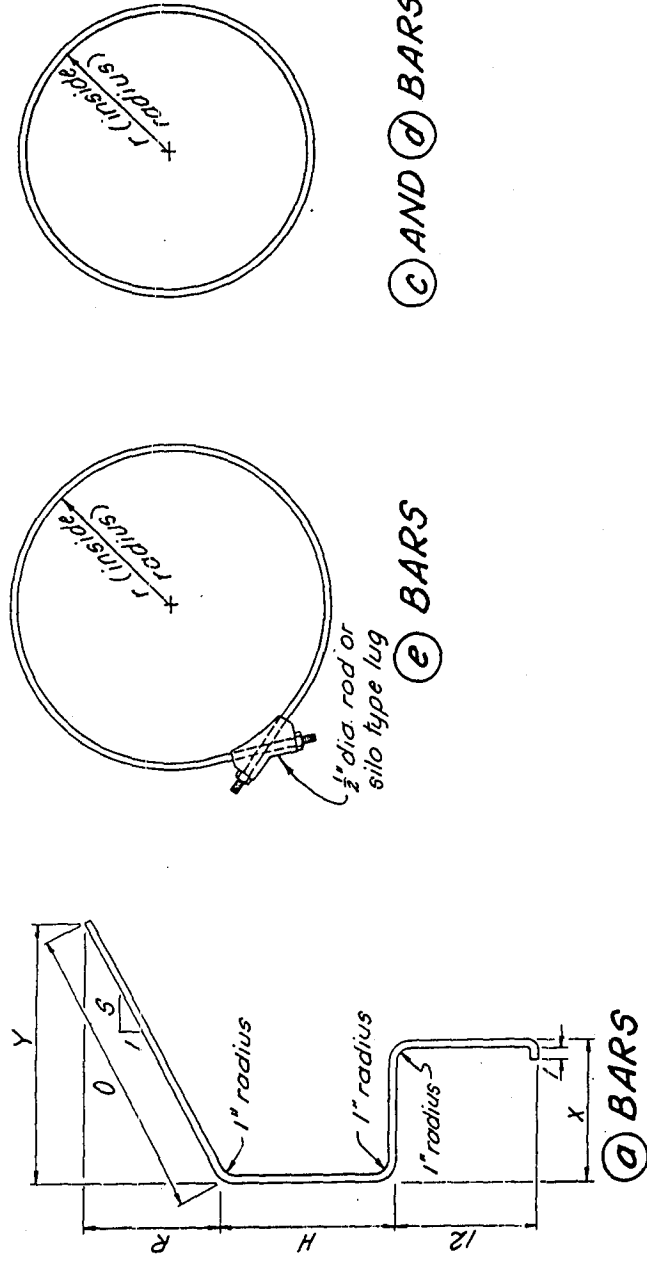
1. THE 4" DIA. PIPE SHALL BE ASTM D1785, SCHEDULE 40, PVC.
2. PROVIDE AN ANIMAL GUARD ON DRAIN OUTLET PIPE. DRILL 2, 1/2" DIA. HOLES, ON 6" FROM END OF PIPE AND PLACE A 3/8" DIA., 5 1/2" LONG GALVANIZED STEEL BOLT THRU THEM AND SECURE WITH A NUT (PLACE BOLT HORIZONTAL).

30" PVC riser



NOTES:

1. WELD 4 (a) BARS TO BAFFLE PLATE AND TO TOP PLATE. WELD (c) AND (d) BARS TO 4 (a) BARS. WELD (b) BAR TO (a) BARS AND BAFFLE PLATE. WELD REMAINING (a) BARS TO (b), (c), AND (d) BARS AND TOP PLATE.
2. THE TRASH RACK AND ANTI VORTEX BAFFLE MAY BE FABRICATED AS A UNIT, OR TRASH RACK MAY BE FABRICATED IN IDENTICAL HALVES AND ATTACHED TO BAFFLE PLATE WITH 1/2" DIA. U BOLTS SPACED APPROXIMATELY 12" C-C ALONG THE VERTICAL AND INCLINED SECTIONS OF THE (a) BARS NEXT TO THE PLATE.
3. ALL BARS ARE SMOOTH ROUND BARS.
4. SPECIFY FINISH.



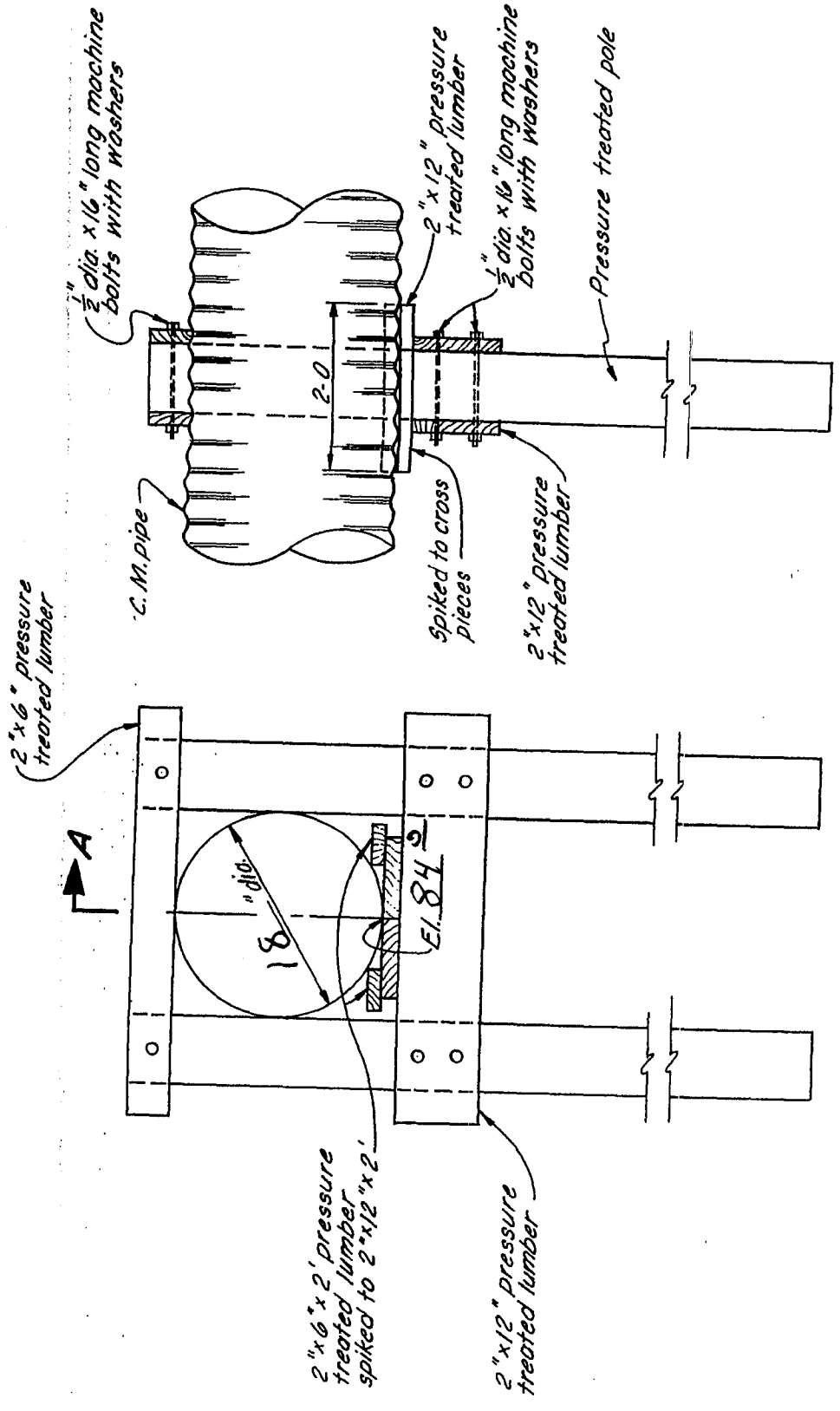
**(b) BARS
BENDING DIAGRAM**

12" TO 36" DIA. CONICAL TRASH
RACK AND BAFFLE PLATE

SOUTH DAKOTA
GUIDE PLAIN NO. 60
Brian Hoffman

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	<i>P.H. D.T.</i>	Date	<i>7-70</i>	Approved by	
Drawn		Title			
Traced		Title			
Checked		Sheet		No.	Drawing No.
				/	
				of	



NOTES:

1. HAND OR MACHINE TAMP BACKFILL THOROUGHLY AROUND FOOTINGS AND COLUMNS.

ELEVATION SECTIONAL ELEVATION A-A

TABLE OF QUANTITIES

ITEM	LENGTH FOR 8" DIA. PIPE	UNIT	QUANTITY
PRESSURE TREATED POLE 8" DIA.	8-0	EACH	2
2" X 12" PRESSURE TREATED LUMBER	4-0	EACH	2
2" X 6" PRESSURE TREATED LUMBER	4-0	EACH	2
2" X 12" PRESSURE TREATED LUMBER	4-0	EACH	2
2" X 6" PRESSURE TREATED LUMBER	2-0	EACH	2
1/2" DIA. MACHINE BOLTS WITH NUTS	1-4	EACH	10
1/2" DIA. WASHERS		EACH	20

TIMBER PIPE SUPPORT

OPERATOR: Brian Hoffman

CONSERVATION DISTRICT:

Designed	Date	Approved by
Drawn		Title
Traced		Title
Checked	No	Sheet
	of	Drawing No.

REFERENCE: GUIDE PLAN NO. 4.0

JOB PLAN NO. 4.0

5, N-29,073.4a

1*****
SITES XEQ 03/16/2007 WATER RESOURCE SITE ANALYSIS COMPUTER PROGRAM
VER 2000 (USER MANUAL - DATED MAY 2001)
TIME 08:38:18

***** 80-80 LIST OF INPUT DATA *****

SITES 05/01/2000 Brian Hoffman 0.721875 H5
SAVMOV 0 101
SAVMOV 101 1 1
STRUCTURE Hoffman

83 0
86 .6
88 4.6
90 7.5
92 10.8
94 15.5
97 20.3

ENDTABLE
WSDATA 5A1 AC 85 462 4000 1.5
PDIRECT 1.8 .00 4.20
POOLDATA ELEV 93 93 83 83 SC
PSINLET 1 7.85
PSDATA 1 74 18 .009 84
ASDATA 41 200 50 2 .05 2
ASINSURF 41 .03
ASINLET 41 0.0 0.0 100 0.0 3
180 10

ENDTABLE
ASEXSURF 41 .03
.65 0
3
2 0
.02

ENDTABLE
ASEXIT 41 N 180
BTMWIDTH FEET 80
GRAPHICS I
GO,DESIGN HL TYPE2 24 TYPE2378 24
SAVMOV 2 101 1
ENDJOB

***** MESSAGE - ALTERNATE STRUCTURE ID (S 1) BEING USED
SINCE USER DID NOT INPUT AN ID.

***** MESSAGE - ALTERNATE SUBWATERSHED ID (A) BEING USED SINCE
USER DID NOT INPUT AN ID.

***** MESSAGE - DRAINAGE AREA FROM WSDATA CONTROL BEING CONVERTED FROM
ACRES TO SQUARE MILES FOR COMPUTATION PURPOSES.

1SITES _____

RECEIVED
MAR 19 2007
WATER RIGHTS
PROGRAM

XEQ 03/16/2007 Brian Hoffman WSID=
 VER 2000 Hoffman SUBW= A
 TIME 08:38:18 SITE = S 1 PASS= 1 PART= 1

***** BASIC DATA *****
 CLIMATE AREA - NOT DEFINED DESIGN CLASS A1 = LT 3000.

STORM DISTRIBUTION-PSH 24 HOUR TYPE II RAINFALL DISTRIBUTION

STORM DISTRIBUTION AUX. -24 HOUR TYPE II RAINFALL DISTRIBUTION

PRECIP. - P-PS,1-DAY P-PS,10-DAY P-SD P-FB
 1.80 0.00 0.00 4.20

WSDATA - CN DA-SM TC/L -/H QRF
 85.00 0.72 4000.00 1.50 0.00

SITEDATA- PERM POOL CREST PS FP SED VALLEY FL 378?
 93.00 93.00 0.00 83.00 YES

BASEFLOW INITIAL EL EXTRA VOL SITE TYPE
 0.00 0.00 0.00 DESIGN

PSDATA - NO. COND COND L DIA/W -/H
 1.00 74.00 18.00 0.00

PS N KE WEIR L TW EL
 0.009 1.00 7.85 84.00

2ND STG ORF H ORF L START AUX.
 0.00 0.00 0.00 0.00

ASCRESTS - AUX.1 AUX.2 AUX.3 AUX.4 AUX.5
 0.00 0.00 0.00 0.00 0.00

AUX.DATA - REF.NO. RETARD. Ci TIE STATION INLET LENGTH
 41 0.00 200.00 50

AUX.DATA - INLET N SIDE SLOPE EXIT N EXIT SLOPE ACTUAL AUX?
 0.030 2.00 0.030 0.050 NO

BTM WIDTH - BW1 BW2 BW3 BW4 BW5
 ft 80.00 0.00 0.00 0.00

AUXILIARY SPILLWAY RATING DEVELOPED USING WSPVRT.

1SITES _____

XEQ 03/16/2007 Brian Hoffman WSID=
 VER 2000 Hoffman SUBW= A
 TIME 08:38:18 SITE = S 1 PASS= 1 PART= 2

PERM POOL 93.00 FT 48.5 ACFT 13.15 AC 0.0 CFS

CREST PS 93.00 FT 48.5 ACFT 13.15 AC 0.0 CFS
 SED ACCUM 93.00 FT 48.5 ACFT 13.15 AC 0.0 CFS
 START ELEV 93.00 FT 48.5 ACFT 13.15 AC 0.0 CFS

>>>> MINIMUM DEPTH (1.00 FT) USED FOR NHCP378 RUN - CREST PS TO CREST AUX.

NRCS-PSH D= 24.00 HR P= 1.80 IN Q= 0.65 IN DA= 0.72 SM
 TC= 1.11 HR CN= 85.00 VOL= 25.1 ACFT

PEAK = 141.4 CFS, AT 12.6 HRS.

ROUTED RESULT - HYD TYPE EMAX VOL-MAX AMAX QMAX
 NRCS-PSH 94.00 FT 62.8 ACFT 15.50 AC 24.4 CFS

P.S

PS STORAGE 14.3 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

DRAWDOWN (DDT) TEST 93.00 FT 48.5 ACFT 0.00 CFS
 CONTROL IS 0.000 DETENTION STORAGE

TIME = 3.49 DAYS, TO 0.0 CFS (LIMIT = 10.00 DAYS)

RATING TABLE DEVELOPED, SITE = S 1:
 BY PROGRAM FOR PS AND AUX. SPILLWAYS
 AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 1

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	93.00	0.00	0.00	0.00	48.47	13.15
2	93.27	3.46	3.46	0.00	52.14	13.79
3	93.54	9.78	9.78	0.00	55.98	14.43
4	93.82	17.96	17.96	0.00	60.00	15.07
FULL CONDUIT FLOW, ELEV = 94.09 FT						
5	94.09	27.66	27.66	0.00	64.19	15.64
6	94.45	28.17	28.17	0.00	69.98	16.22
7	94.82	28.66	28.66	0.00	75.99	16.81
8	95.18	29.13	29.13	0.00	82.22	17.39
9	95.54	29.61	29.61	0.00	88.65	17.97
10	95.91	30.07	30.07	0.00	95.29	18.55
11	96.27	30.52	30.52	0.00	102.15	19.14
12	96.64	30.97	30.97	0.00	109.22	19.72
13	97.00	31.42	31.42	0.00	116.50	20.30

1SITES _____
 XEQ 03/16/2007 Brian Hoffman WSID=
 VER 2000 Hoffman SUBW= A

TIME 08:38:18 SITE = S 1 PASS= 1 PART= 3

AUX. CREST 94.00 FT 62.8 ACFT 15.50 AC 24.4 CFS

PS STORAGE 14.3 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

START ELEV 93.00 FT 48.5 ACFT 13.16 AC 0.0 CFS

EFFECTIVE HEIGHT(H)= 11.0 FEET, PRODUCT= 691. (H * STORAGE AT CREST AUX.).

INPUT DESIGN CLASS = A1 = LT 3000. PRODUCT.

NRCS-FBH D= 24.00 HR P= 4.20 IN Q= 2.64 IN DA= 0.72 SM
TC= 1.11 HR CN= 85.00 VOL= 101.5 ACFT

PEAK = 601.0 CFS, AT 12.6 HRS

***** WARNING - UPSTREAM END OF CREST 100. IS UPSTREAM OF THE
FIRST GROUND POINT 150. STATION.

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 2

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	93.00	0.00	0.00	0.00	48.47	13.15
2	93.11	0.90	0.90	0.00	49.95	13.41
3	93.22	2.55	2.55	0.00	51.46	13.67
4	93.33	4.68	4.68	0.00	52.99	13.93
5	93.44	7.21	7.21	0.00	54.55	14.19
6	93.56	10.08	10.08	0.00	56.14	14.46
7	93.67	13.25	13.25	0.00	57.76	14.72
8	93.78	16.69	16.69	0.00	59.41	14.98
9	93.89	20.39	20.39	0.00	61.09	15.24
10	94.00	24.34	24.34	0.00	62.80	15.50
11	94.03	26.86	25.43	1.44	63.26	15.55
12	94.06	29.40	26.53	2.87	63.72	15.59
FULL CONDUIT FLOW, ELEV = 94.09 FT						
13	94.09	31.96	27.66	4.30	64.19	15.64
14	94.23	39.22	27.87	11.35	66.48	15.88
15	94.38	50.60	28.07	22.53	68.81	16.11
16	94.64	89.96	28.42	61.53	73.08	16.53
17	94.96	165.74	28.85	136.89	78.46	17.04
18	95.54	365.10	29.61	335.49	88.65	17.97
19	96.27	691.57	30.52	661.05	102.15	19.14
20	97.00	1102.24	31.42	1070.82	116.50	20.30

SUMMARY OF AUXILIARY SPILLWAY SURFACE CONDITIONS USED IN COMPUTATIONS BY REACH

REACH	FROM STA (ft)	TO STA (ft)	SLOPE CURVE INDEX@ (%)	RETARDANCE COVER FACTOR	VEGETAL CODE (ft)	MAINT. DEPTH *	ROOTING LOCATION
1	100.	200.	0.0	0.030	**	**	CREST
2	200.	380.	5.0	0.030	0.65	3	2.0 EXIT !

@ The program interprets retardance curve index entries of less than 1 as Manning's n values.

* Upper case indicates a reach of constructed spillway channel.

** The program does not use vegetal cover factor, maintenance code, and rooting depth for inlet and crest reaches in computations.

! Reach 2 used in computing exit channel velocities.

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 94.00 FT.

DRAWDOWN (DDT) TEST 93.00 FT 48.5 ACFT 0.00 CFS
CONTROL IS 0.000 DETENTION STORAGE

TIME = 3.82 DAYS, TO 0.0 CFS (LIMIT = 10.00 DAYS)

ROUTED RESULTS	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX ACFT	AUX.-HP FT	VOL-AUX. ACFT
NRCS-FBH	80.0	95.45	87.0	17.8	1.45	24.2

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 29.5 303.6 333.1

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-Sc FT/FT	25% OF Q Sc FT/FT
AUXILIARY	0.76	4.90	0.015	0.020

EFFECTIVE STRESS FOR STABILITY ANALYSIS OF AUX. EXIT CHANNEL
(Refer to Ag. Handbook 667, Chapt. 3, for allowable stresses.)
Aux. Discharge = 304. cfs; Bottom Width = 80. ft

REACH NO.	FROM STA	TO STA	SLOPE %	MANNING'S n	VELOCITY ft/s	STRESS lb/ft^2
2	200.	380.	5.00	0.030	7.13	0.997

AUXILIARY SPILLWAY DURATION FLOW = 12.6 HOURS
ATTACK, OE/B = 0.7 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 7.1 FT/SEC
EXIT SLOPE = 0.050 FT/FT
FLOW DEPTH = 0.5 FT

>>>>> NHCP378 RUN - MINIMUM DEPTH, CREST AUX. TO TOP OF DAM IS 2.00 FT.
NEW TOP OF DAM ELEVATION = 96.00.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	80.0	96.00	97.1	18.7	2.01	34.3

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGES = 30.2 539.3 569.4

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY —	1.11	5.90	0.013	0.017

>>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT REQUIRED
FOR THIS PASS. NEW TOP OF DAM ELEVATION = 96.45.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-AUX.
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	80.0	96.45	105.7	19.4	2.46	42.9

PEAK - CFS Q-PS Q-AUX. Q-TOT. *115.*
DISCHARGES = 30.8 762.8 793.6

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY —	1.40	6.60	0.012	0.016

INFLOW HYD 1 PSH-PEAK = 21.88 CFS AT 14.84 HRS, LOCATION POINT

INFLOW HYD 1 FBH-PEAK = 333.06 CFS AT 13.19 HRS, LOCATION POINT
HYDOUT 1

1SITES....JOB NO. 1 COMPLETE.

Brian Hoffman

0 SUBWATERSHED(S) ANALYZED.

1 STRUCTURE(S) ANALYZED.

2 HYDROGRAPHS ROUTED AT LOWEST SITE.

0 TRIALS TO OBTAIN BOTTOM WIDTH FOR SPECIFIED STRESS OR VELOCITY.

SITES.....COMPUTATIONS COMPLETE

```
>>> SITE SUBWS SUBWS DA CURVE TC TOTAL DA TYPE STRUC <<<
      ID  ID  (SQ MI) NO. (HRS) (SQ MI) DESIGN CLASS
      ---
      S 1  A    0.72  85.  1.11   0.72  378CR  A1
```

```
PASS DIA./ AUX.CREST BTM. MAX. MAX. EMB. INTEGR.* EXIT* TYPE
NO. WIDTH ELEV WIDTH HP ELEV VOL. DIST. VEL. HYD
  (IN/FT) (FT) (FT) (FT) (CY) (FT) (FT/SEC)
      ---
      1 18.0  94.0  80.0  2.5  96.4   0.   0.   7.1 MIN. AUX.
```

* INTEGRITY DIST. AND EXIT VEL. ARE BASED ON THE ROUTED HYDROGRAPH
AND WILL NOT RELATE TO THE MAX. ELEV. (TOP OF DAM),
WHICH IS SET BY MINIMUM DESIGN CRITERIA.

SITES.....SUMMARY TABLE 1 COMPLETED.

NRCS SITES VERSION 2000 ,05/01/2000
FILES

INPUT

C:\data\Engineering\sites\hoffman1\hoffman-18.D2C

OUTPUT - DATED 03/16/2007 08:38:18

C:\data\Engineering\sites\hoffman1\hoffman-18.OUT

GRAPHICS FILES GENERATED

OPTION "L" DATED 03/16/2007 08:38:18

C:\data\Engineering\sites\hoffman1\hoffman-18.DRG

OPTION "P" DATED 03/16/2007 08:38:18

C:\data\Engineering\sites\hoffman1\hoffman-18.DHY

OPTION "E" DATED 03/16/2007 08:38:18

C:\data\Engineering\sites\hoffman1\hoffman-18.DEM

CONSTRUCTION SPECIFICATIONS

BRIAN HOFFMAN DAM

SW 1/4 SECTION 15, T102N, R75W
TRIPP COUNTY, SOUTH DAKOTA

KONECHNE ENGINEERING
PIERRE, SOUTH DAKOTA

CONSTRUCTION SPECIFICATION

SD – 2 CLEARING AND GRUBBING

2.1 SCOPE

The work shall consist of the clearing and grubbing of the area within the stake limits or area designated by the engineer by removal and disposal of trees, snags, logs, stumps, shrubs, and rubbish.

2.2 REMOVAL

Unless otherwise specified all material to be cleared and grubbed shall be removed to a depth of 1 foot below the embankment foundation after stripping and 2 feet below a concrete subgrade.

2.3 DISPOSAL

Where brush piles for wildlife are not specified, cleared and grubbed materials shall be disposed of by burning or burying at locations selected by the contractor and approved by the landowner or engineer. Materials to be buried shall be placed at least 2 feet below the surrounding ground line and have a minimum of 2 feet of cover with the finished surface graded to drain. Any burning operations shall be subject to all public laws governing such operations, and any required permits to be obtained by the contractor.

2.4 PAYMENT

Payment for this item shall be included in the cost of earth fill and is subsidiary to Construction Specification SD-7S, Earth Fill – Class S.

CONSTRUCTION SPECIFICATION

SD – 7S EARTH FILL – CLASS S

7S-1 SCOPE

The work shall consist of the construction of compacted earth fills where the amount of compaction is to be controlled by a method type of specification.

7S-2 MATERIALS

All fill materials shall be obtained from required excavations and designated borrow areas. The selection, blending, routing and disposition of materials shall be subject to approval by the engineer.

Fill materials shall not contain frozen material, sod, brush, roots, or other perishable materials, or rocks larger than 8 inches in diameter. Fill shall not be placed on frozen surface.

7S-3 FOUNDATION PREPARATION

After stripping, the foundation shall be scarified or plowed to a minimum depth of 4 inches. The entire foundation area shall then be compacted by the process used on the fill.

7S-4 PLACEMENT

All foundation excavations and/or preparation shall be completed before placing fill. The fill shall be placed such that the distribution of materials is essentially uniform throughout the entire fill and is free from lenses, pockets, streaks, or layers of materials differing substantially from surrounding material.

Fill, adjacent to structures, shall be placed in a manner that will prevent damage to the structure and allow the structures to assume the backfill loads gradually and uniformly. Equipment weighing more than 400 pounds shall not be operated within 2 feet of any structure.

Fill shall be placed in approximately equal horizontal layers. Fill layer thicknesses shall not exceed 9 inches for machine or 4 inches for hand compaction (including hand directed power tampers adjacent to structures).

7S-5 MOISTURE CONTENT

The fill material shall have a moisture content that when kneaded in the hand will form a ball which does not easily crumble when struck sharply with a pencil or which does not crumble when pressed between the hands.

If the soil is too wet, it will yield free water when kneaded in the hand. The fill may have to be wetted or dried to achieve proper moisture control.

7S.6 COMPACTION (CLASS S)

The fill shall be compacted by one of the following methods.

- a. By routing the hauling and spreading equipment such that all points of the fill is traversed by at least one tread track of the loaded equipment, parallel to the centerline of the fill.

- b. By at least two passes of a tamping (sheepfoot) roller weighing at least 100 pounds per square inch bearing area.

Fill adjacent to structures shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tampers or plate vibrators. Heavy equipment shall not be operated within 2 feet of any structure.

Compaction of fill adjacent to concrete structures shall not be started until the following time limits have elapsed after placement of the concrete.

<u>Structure</u>	<u>Time Interval</u>
Walls and counterforts	14 days
Conduits and Spillway Risers (cast in place)	14 days
Conduits, precast, cradled	2 days
Conduits, precast, bedded	1 day
Anti-seep Collars and Cantilever Pipe props	3 days

7S-7 PAYMENT

Earth Fill is a bid item and payment for earth fill shall be the specified pay limits for excavation and the specified neat lines of the completed earthfill.

CONSTRUCTION SPECIFICATION

SD – 9 DRAIN FILL AND FILTER

9.1 SCOPE

The work shall consist of furnishing and placing drain fill and filter sands or gravels.

9.2 MATERIALS

a. Quality

Aggregates shall be sand, gravel, or crushed stone, composed of clean, hard, durable mineral particles free from organic matter, clay balls, soft particles or other substances that would interfere with their free draining properties.

b. Gradation

The aggregates shall meet the following gradation requirements unless otherwise specified in the plans.

<u>Size</u>	<u>% Finer</u>
3"	100%
1"	90-100%
#4	50-85%
#50	10-40%
#200	0-5%

9.3 BASE PREPRATION

Surfaces on which drain fill will be placed shall be as undisturbed as possible (do not scarify), and will be free of standing water during placement of the fill. Care shall be taken to prevent trench walls from sliding.

9.4 PLACEMENT

Material shall be placed in uniform, approximately 6-inch thick layers. Extreme care shall be taken to assure uniformity of the drain fill, and to prevent segregation or contamination of the drain fill with foreign matter. When collector pipes are included in drains, the fill materials shall be placed in a manner to avoid displacing the pipe.

9.5 PAYMENT

Drain fill will be a bid item and payment will be made on the cubic yard basis and payment will be to the neat lines as shown on the drawings.

CONSTRUCTION SPECIFICATION

SD-16 TIMBER FABRICATION AND INSTALLATION

16.1 SCOPE

This specification covers the quality and installation of plywood and pressure treated structural timber poles, posts and lumber structure and timber and lumber portions of composite structure.

16.2 MATERIAL

a. Plywood

Plywood shall be new, exterior grades, and shall meet Product Standard PS 1-66
Plywood for use underground shall be pressure treated in accordance with the American Wood Preservers Bureau AWPB-FDN Standard (stamped on plywood).

b. Structural Timber and Lumber

Structural timber and lumber shall be structural grade or better. Structural timber poles, posts, and lumber shall be new, sound, decay free, straight, not warped or cracked. Unless otherwise specified on the drawings, all lumber and timber except re wood and red cedar shall be treated by any of the following preservatives:

Commercial Coal Tar Creosote
Hot and Cold Bath Creosote
Pentachlorophenol – Commercial Treatment
Pentachlorophenol – Cold soaking Method
AWPB-FDN Standard Preserving Salts

c. Hardware

Bolts, rods, nuts, washers, and other hardware shall be an appropriate grade of steel, and if to be placed underground, shall be galvanized or otherwise corrosion protected.

16.3 INSTALLATION

The material shall be of the dimensions, and installed at the location, as shown on the drawings. All lumber to be treated shall be cut to size, insofar as practical, prior to treatment. Raw ends of lumber which has been cut after treatment shall be immersed in the preservative solution, or painted with four (4) heavy coats of the solution. Each application should be allowed to dry. For home treatment, the preservative manufacturer's directions shall be carefully followed.

16.4 PAYMENT

Payment for this item is by the lump sum basis for the Timber Pipe Support and includes all material and labor to install.

CONSTRUCTION SPECIFICATION

SD-17 METAL FABRICATION AND INSTALLATION

17.1 SCOPE

The work shall consist of furnishing, fabricating, and installing metalwork including metal parts of composite structures.

17.2 MATERIALS

A. Steel

Except as noted below, steel shall be carbon steel of a malleable, weldable quality.

High strength, weather resistant steel shall conform to the requirements of ASTM A-242, A-588, or A-514.

Bolts, nuts, washers, rods, rivets, etc. shall be of a material equal to the steel being fastened.

B. Aluminum

Aluminum alloy products shall be Alloy 60610T6.

17.3 PROTECTIVE COATINGS

A. Galvanizing

If specified on the drawings, steel shall be galvanized. Galvanizing shall conform to ASTM A-386, A-153, A-164 Type RS, or A-165 Type TS.

B. Painting

Unless shown otherwise on the plans, non galvanized metal shall be cleaned and painted using the following procedure.

(1) Cleaning – Remove all dirt, oil, and grease by means of a mineral spirit cleaning. Next, thoroughly wet the metal with a dilute (about 5 percent strength) phosphoric acid solution. Allow the acid to dry and then thoroughly rinse the surfaces with clear water and again allow to dry.

(2) Paint – Apply two coats of one of the following paints:

- a. Zinc Dust – Zinc Oxide Primer conforming to Federal Specification TT-P-641, Type III.
- b. Zinc Dust Chlorinated Rubber conforming to Federal Specification TT-P-1046a.
- c. Zinc Dust Paint conforming to Military Specification MIL-P-21035.

- d. Epoxy-Polyamide Paint conforming to Defense Specification DOD-P-15145B.

- (3) Application – Paints shall be thoroughly mixed at the time of application. The first coat of paint shall be applied by brushing. All other coats may be applied by brush or spray. Each coat shall be applied in such a manner as to produce a continuous paint film of uniform thickness.

Paint shall not be applied when the temperature of the item to be painted or of the surrounding air is less than 50 degrees F. Painting shall be done only when the humidity and temperature of the surrounding air and temperature of the metal surfaces are such that evaporation rather than condensation will result during the application and drying time.

The finished surface of each coat shall be free from runs, drops, ridges, laps, or excessive brush marks and shall present no variation in color, texture, and finish. Surfaces shall be thoroughly dry before application of each coat of paint. The surface of each dried coat shall be cleaned as necessary before application of the next coat. After installation of the metalwork, all damage to painted surfaces shall be repaired.

17.4 FABRICATION

Metal items shall be fabricated to close fit, closely conforming to the drawings. Joints to be welded, shall be welded all around, in a manner developing as much strength as possible.

17.5 ERECTION

The metal shall be erected true and plumb, closely conforming to the drawings.

Riveting and welding shall not be done until as much of the structure as will be stiffened thereby has been properly aligned.

MATERIAL SPECIFICATION

SD-55A CORRUGATED POLYETHYLENE (PE) PIPE

1. SCOPE

This specification covers the quality of corrugated polyethylene (PE) tubing and fittings.

2. PIPE AND TUBING

Corrugated polyethylene tubing shall conform to the following requirements for the specified tubing types, sizes, and fittings.

ASTM F667	Standard Specification for Corrugated Polyethylene Tubing
ASTM F667	Standard Specification for Corrugated Polyethylene Pipe
ASTM F894	Standard Specification for Polyethylene large Diameter Profile Wall Sewer and Drain Pipe.

AASHTO M252 Standard Specification for Polyethylene Corrugated Drainage Pipe

AASHTO M294 Standard Specification for Corrugated Polyethylene Pipe, 12 inches to 36 inches diameter.

Water Permit Application No. 2612-2
Two Right Wings & A Left

Top of Dam Elev. - 97
2nd Spillway Elev. - 94
P. Spillway Elev. - 93
DIS Emb. Toe Elev. - 83

Cat. 3 - Low Hazard Dam

Ht = 14 ft.

Normal Storage Capacity - 48.5 A.-Ft
Int. Storage Capacity - 61
Max. Storage Capacity - 116

Int. Capacity x Eff Ht. = $61 \times 11 = 671$ ∴ 25 year
Minimum Spillway Design

From USGS WRI 98-4055 "Tech. For Est. Peak Flows ... in 50"
DA = 462 = 0.72 mi² Region D

$$Q_{res} = 676 CA^{.585}$$

$$= 676 (0.72)^{.585}$$

$$= \underline{558 \text{ cfs}}$$

$$Q_{100} = 1270 CA^{.585}$$

$$= 1270 (0.72)^{.585}$$

$$= \underline{1048 \text{ cfs}}$$

2nd Spillway Capacity

$$Q = C L H^{3/2}$$

$$C = 2.6$$

$$L = 80$$

$$H = 3$$

$$= 2.6 (80) (3)^{1.5}$$

$$= \underline{1080 \text{ cfs}}$$

Section 74:02:08:09

NRCS Annual Yield

DA = 462 CN = 80 ISO = 2 1/2

1. Topo Map - OK
2. Dam Axis Profile - OK
3. Dam Max X-Sec - OK
4. Area-Capacity - OK
5. Outlet Details - OK
6. Spillway Rating - OK
7. Spillway Details - OK
8. Specs - OK
9. EPP - Cat. 3 - N/A - OK

$$80\% \text{ chance} = 0.34$$

$$0.34 \times 462^{1/2} = \underline{13 \text{ A.-Ft}}$$

$$50\% \text{ chance} = 0.80$$

$$0.80 \times 462^{1/2} = \underline{31 \text{ A.-Ft}}$$

$$10\% \text{ chance} = 3.0$$

$$3.0 \times 462^{1/2} = \underline{116 \text{ A.-Ft}}$$



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 2612-2, Two Right Wings & A Left**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 2612-2, Two Right Wings & A Left, c/o Brian Hoffman, PO Box 548, Marshall MN 56258.

The Chief Engineer is recommending APPROVAL of Application No. 2612-2 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) it is in the public interest with the following qualifications:

1. Water Permit No. 2612-2 authorizes a dam with a storage capacity of 48.5 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

See report on application for additional information.

Garland Erbele, Chief Engineer
March 21, 2007

REPORT ON
WATER PERMIT APPLICATION No. 2612-2
Two Right Wings & A Left
March 19, 2007

Water Permit Application No. 2612-2 has been filed by Two Right Wings & A Left, c/o Brian Hoffman, to impound 48.5 acre-feet of water by constructing a dam located in the N $\frac{1}{2}$ SW $\frac{1}{4}$ of Section 15-T102N-R75W, in Tripp County. The application also requests impoundment of sufficient water to maintain water at the outlet elevation. The water will be used for fish and wildlife production, recreation and livestock water.

Discussion:

The dam will be classified as a small size, Category 3, Low Hazard dam. The dam has been designed by Konechne Engineering. The plans and specifications have been reviewed and will be approved; however, construction of the dam can not begin until Water Permit Application No. 2612-2 is approved.

The dam will be 14 feet high with a normal storage capacity of 48.5 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 116 acre-feet with a reservoir level at the top of dam elevation. A dam of this size and hazard classification is required to have a minimum spillway design capable of passing a 25-year frequency event.

The dam has a drainage area of 462 acres or 0.72 square miles. The dam is designed to have a 30 inch diameter CMP riser with an 18 inch diameter CMP barrel and four feet of freeboard as the primary spillway, and an 80 foot wide earthcut spillway with three feet of freeboard as the secondary spillway. A 25 year frequency event produces a peak runoff of approximately 560 cfs and a 100 year frequency event produces a peak runoff of approximately 1050 cfs. The Hoffman Dam will have a combined spillway capacity of approximately 1100 cfs.

The annual yield for this drainage area with an 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 13 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 31 acre-feet and the annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 116 acre-feet.

The Hoffman Dam is located in the N $\frac{1}{2}$ SW $\frac{1}{4}$ of Section 15-T102N-R75W on an unnamed tributary to the White River, about 4 miles upstream of the confluence of the unnamed tributary and the White River. There are no existing Water Rights/Permits located on the unnamed tributary between the proposed dam and the White River.

Conclusions:

1. Water Permit Application No. 2612-2 should be approved since unappropriated water is available and approval should not have any adverse effect on existing Water Permits/Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 2612-2.



Timothy G. Schaal, P.E.
Natural Resources Engineering Specialist

March 22, 2007

Two Right Wings & A Left
c/o Brian Hoffman
PO Box 548
Marshall, MN 56258

Dear Mr. Hoffman:

We have reviewed the plans and specifications for your dam project located in the N ½ SW ¼ of Sec. 15-T102N-R75W, in Tripp County. The plans and specifications for the construction of your dam are approved. Approval of the plans and specifications does not authorize construction of the dam. The construction of the dam may not begin until Water Permit No. 2612-2 is approved.

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

The dam will be classified as a small size Category 3, Low Hazard dam with a dam height of 14 ft. and a normal storage capacity of 48.5 acre-feet and a maximum storage capacity of 116 acre-feet.

If you have any questions, please feel free to contact us.

Sincerely,

A handwritten signature in black ink, reading "Timothy G. Schaal". The signature is fluid and cursive, with the first name being the most prominent.

Timothy G. Schaal, P.E.
Natural Resources Engineering Specialist
for Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

c: Tim Olson, GF&P
Dave Konechne, Konechne Engineering

AFFIDAVIT OF PUBLICATION

State of South Dakota, county of Tripp-ss.

Cheryl Schroeder

of said county being first duly sworn, on oath says that she is the Advertising Manager of

THE WINNER ADVOCATE

a weekly newspaper printed and published at Winner, said county of Tripp, and has full and personal knowledge of all the facts herein stated that said newspaper is a legal newspaper and has a bona fide circulation of a least two hundred copies weekly and has been published within said County for fifty-two successive weeks prior to the publication of the notice herein mentioned, and was printed wholly or in part in a office maintained at said place of publication; that the

36 lines @ 2 column rate x 80%

Notice of Application # 2612-2

Two Right Wings & A Left

a printed copy of which, taken from the paper in which the same was published, is attached to this sheet, and is made a part of this affidavit, was published in said newspaper at least one in each week for 2 successive weeks, on the day of each week on which said newspaper was regularly published to wit:

04/04/07

03/28/07

That the full amount of the fees for the publication of the annexed notice is \$ 43.47

Cheryl Schroeder

Subscribed and sworn to before me this 4th day of April, 2007

Patricia Arvin

Notary Public

County of Tripp, South Dakota

My Commission Expires November 4, 2009

SEAL
Patricia Arvin
Notary Public
SOUTH DAKOTA

RECEIVED

APR 10 2007

WATER RIGHTS
PROGRAM

NOTICE OF APPLICATION NO. 2612-2

to Appropriate Water

Notice is given that Two Right Wings & A Left, c/o Brian Hoffman, PO Box 548, Marshall, MN 56258 has filed an application for a water permit to impound 48.5 acre-feet of water from an un-named tributary to the White River by constructing a dam located in the N 1/2 SW 1/4 Section 15 with water impounded in the N 1/2 SW 1/4 Section 15; all in T102N-R75W. This application requests impoundment of sufficient water to maintain water to the outlet elevation. The water is for fish and wildlife propagation, recreation and livestock water purposes.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2612-2 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on these applications, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendations must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, 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 16, 2007.

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. Contact Eric Cronlund at the above Water Rights Program address to request copies of information pertaining to this application.

Steven M. Pinner, Secretary

Department of Environment and Natural Resources

(13-14 1714)

RECEIVED

APR 10 2007

WATER RIGHTS
PROGRAM



March 22, 2007

WINNER ADVOCATE
125 W 3RD ST
WINNER SD 57580

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 2612-2 to Appropriate Water to be published twice. Please publish the first notice on March 28, 2007 with the second publication 7 days later. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

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 Brian Hoffman PO Box 548 Marshall MN 56258 (Ph # 507-532-5735).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

No. 2612-2

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of March 22, 2007 enclosing Notice to Appropriate Water by Application No. 2612-2 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name Newspaper



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

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

March 22, 2007

TWO RIGHT WINGS AND A LEFT
C/O BRIAN HOFFMAN
PO BOX 548
MARSHALL MN 56258

Dear Mr. Hoffman:

Water Permit Application No. 2612-2 for Fish and Wildlife use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Publisher of the Winner Advocate printed at Winner SD (Ph # 605-842-1481). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendations of the Chief Engineer and reports on the applications 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 Notices and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization, the publisher has been instructed to publish your notice once each week for two consecutive weeks. The newspaper has also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the applications.

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.

Instruction to Newspaper - Publish first Notice on 2612-2 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 2612-2 to Appropriate Water

Notice is given that Two Right Wings & A Left, c/o Brian Hoffman, PO Box 548, Marshall MN 56258 has filed an application for a water permit to impound 48.5 acre-feet of water from an un-named tributary to the White River by constructing a dam located in the N ½ SW ¼ Section 15 with water impounded in the N ½ SW ¼ Section 15; all in T102N-R75W. This application requests impoundment of sufficient water to maintain water to the outlet elevation. The water is for fish and wildlife propagation, recreation and livestock water purposes.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2612-2 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on these applications, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendations must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, 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 16, 2007.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

MAY 10 2007

TWO RIGHT WINGS & A LEFT
C/O BRIAN HOFFMAN
PO BOX 548
MARSHALL MN 56258

Dear Mr. Hoffman:

Enclosed is Water Permit No. 2612-2 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

Permit No. 2612-2
White 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, **October 8, 2008**, made a thorough examination of the water use system constructed by **Two Right Wings & A Left, c/o Brian Hoffman** of **PO Box 548, Marshall, MN** holder of Permit No. **2612-2**, bearing the priority of **March 12, 2007** authorizing the storage of **48.5** acre-feet of the waters of **unnamed tributary to the White River (runoff)** for **fish & wildlife propagation, recreation and livestock water** purposes, in **Tripp** County.

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

A. Works used to divert the water:

A 14 ft. high earthen dam with a normal storage capacity of 48.5 ac-ft of water.

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

N/A

C. Works used to apply water to beneficial use:

A 14 ft. high earthen dam with a normal storage capacity of 48.5 ac-ft of water.

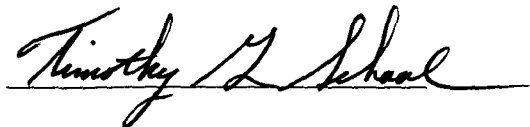
The system is in the following condition **good**. The point of diversion is located **1900 ft. north & 1150 ft. east of the SW corner of Sec. 15-T102N-R75W (N ½ SW ¼) (Lat. 43.635434 & Long. -99.798135)**. The works are capable of storing **48.5** acre-feet of water which is to be used for **fish & wildlife propagation, recreation and livestock water**. Water has been put to beneficial use to the maximum extent as follows:

A 14 ft. high earthen dam with a normal storage capacity of 48.5 ac-ft of water.

and the license should be issued for **48.5** acre-feet of storage.

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

Exceptions to compliance are: **none** Date Report Completed: **March 10, 2009**



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

REPORT ON INSPECTION OF PERMIT NO. 2612-2

DATE OF INSPECTION: **October 18, 2008**

NAME & ADDRESS OF PERMIT HOLDER: **Two Right Wings & A Left, c/o Brian Hoffman,**
PO Box 548, Marshall, MN 56258

DIVERSION POINT LEGAL LOCATION: **1900 ft. north & 1150 ft. east of the SW corner of**
Sec. 15-T102N-R75W (N ½ SW ¼) (Lat. 43.635434 & Long. -99.798135).

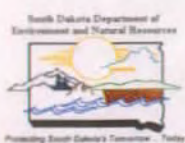
DAM INFORMATION:

- 1) Height to crest **14** feet
- 2) Height to primary spillway **10** feet
- 3) Height to secondary spillway **11** feet
- 4) Crest width **12** feet
- 5) Crest length **530** feet
- 6) Spillway length **XXX** feet
- 7) Spillway width **80** feet
- 8) Approx. storage (Normal) **48.5** acre-feet
- 9) Approx. storage (Maximum) **116** acre-feet
- 10) Date constructed: **2007**

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**

Water Permit No. 2612-2



Timothy G. Schaal

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

3/10/09



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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www.state.sd.us/denr

JUN 15 2009

2612-2

Brian Hoffman
Two Right Wings & A Left
PO Box 548
Marshall MN 56258

Dear Mr. Hoffman:

Enclosed is your Water License No. 2612-2. Included with the license is a map prepared by the staff engineer who conducted the inspection. Water License No. 2612-2 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.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 2612-2

(1) Two Right Wings & A Left, % Brian Hoffman, PO Box 548, Marshall MN 56258 made Application No. 2612-2, March 12, 2007 for a water permit to impound 48.5 acre feet of water from an un-named tributary to the White River, Tripp County, South Dakota for fish & wildlife propagation, recreation and domestic purposes. Permit No. 2612-2 with a priority date of March 12, 2007 was approved April 16, 2007 and issued to the applicant for storage of water with construction of the described water supply system to be completed on or before April 16, 2012 and for the application to beneficial use of water on or before April 16, 2016.

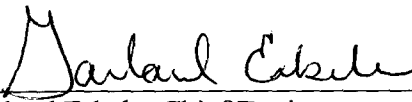
(2) The water supply system has been completed and water impounded for beneficial use in accordance with South Dakota State Law. Pursuant to South Dakota Codified Law 46-5-30.1, Two Right Wings & A Left, % Brian Hoffman, PO Box 548, Marshall MN 56258 the holder and/or owner of Water Right No. 2612-2 is issued a license, bearing a priority date of March 12, 2007 to impound 48.5 acre feet of water from an un-named tributary to the White River. The water is stored for fish & wildlife propagation, recreation and domestic livestock watering purposes.

The storage dam (spillway) is located as follows:

- 1,900 feet north and 1,150 feet east of the SW corner of Section 15, T102N, R75W (NW ¼ SW ¼) with water impounded in the N ½ SW ¼ Section 15, T102N, R75W.

(3) This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Permit No. 2612-2 including the following qualifications:

- Water Right No. 2612-2 authorizes a dam with a storage capacity of 48.5 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
- Low flows as needed for downstream domestic use, including livestock water and prior water rights must be bypassed.



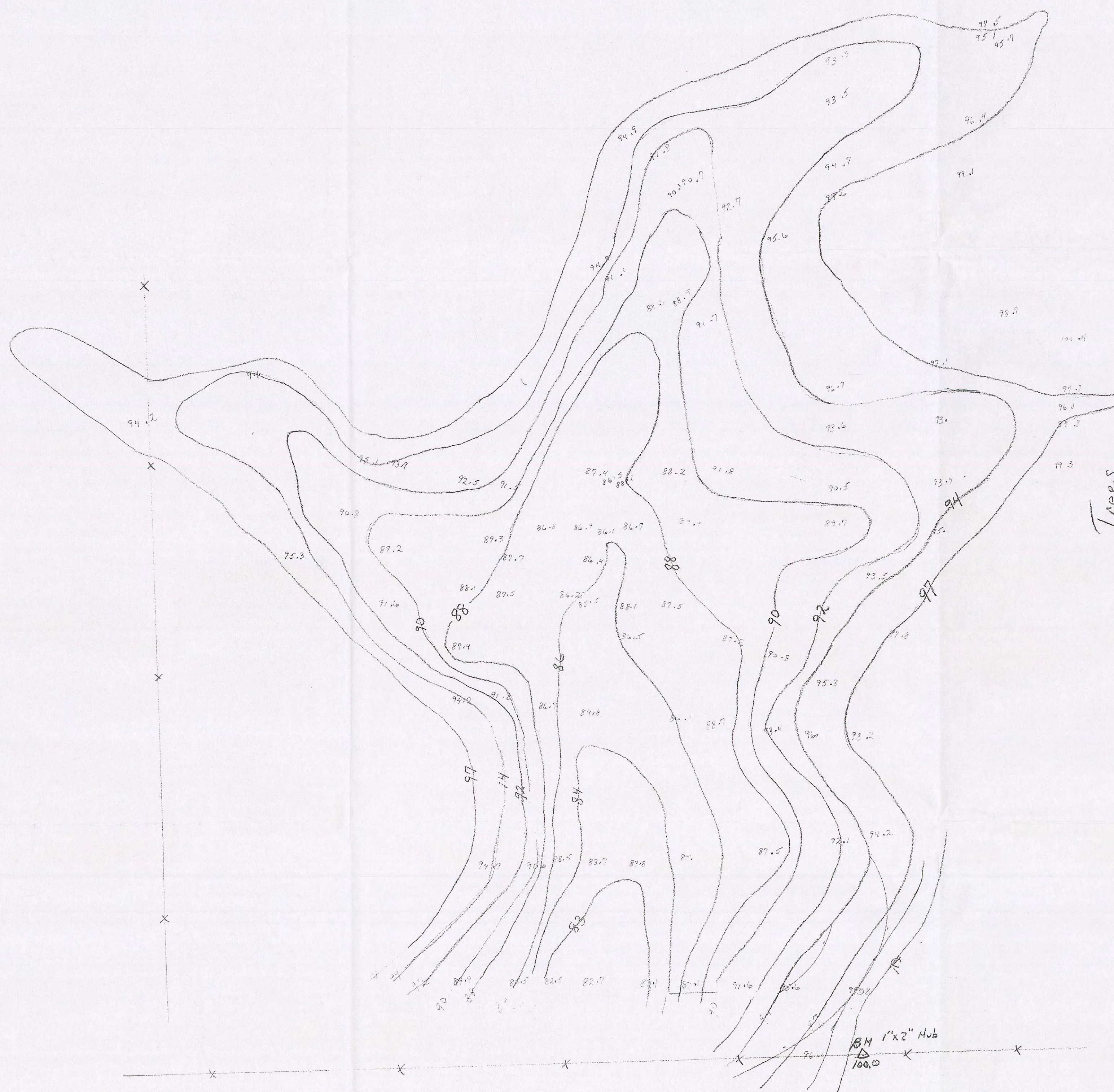
Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

JUN 15 2009

date



Elevation (Ft)	Area (Ac)	Storage (Ac-Ft)
88.0	4.6	18
93.0	12.0	48.5
94.0	15.5	61



Brian Hoffman
Tripp County
SW Sec 15, T102N, R75W