

WATER PERMIT NO. 1661-1

Name of Applicant: Howes Grazing Association

Address: PO Box 150, Howes SD 57748

Phone: 985-5325

Amount of Water Claimed: 1700 acre-feet

Total Acres: NA

Source of Water Supply: tributary of Luis Creek

Water to be used for: domestic County: Meade

Type of Waste Disposal System: NA

Location: Howes Grazing Lake - 2 miles east of Howes Corner on Hwy 34

PRIORITY

Date Received: 1-20-98

Fee: \$550

Corrected Application Received:

Period of Annual Use: January 1 - December 31

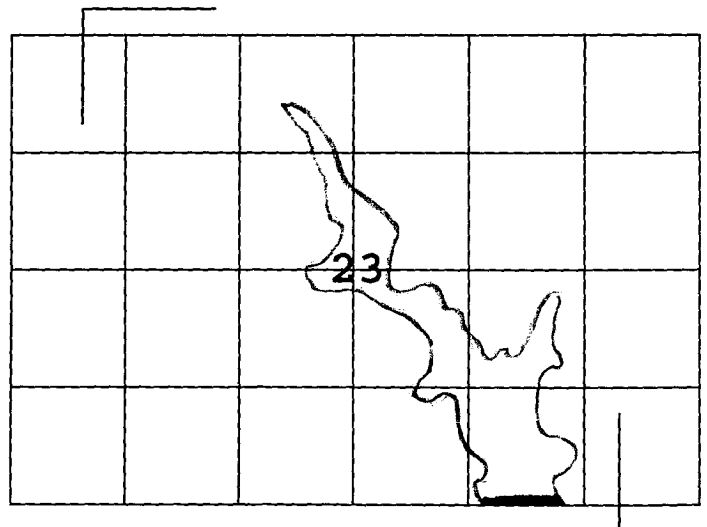
Remarks: Howes Grazing Lake was constructed in 1961 as part of Hwy 34 construction project

Diversion Point: SE 1/4 SE 1/4

Section 25-T8N-R17E

Water Impounded: SE 1/4, SW 1/4 NE 1/4, NE 1/4

SW 1/4, E 1/2 NW 1/4; all in Sec 25-T8N-R17E



Depth of Well: NA

Well Driller:

Remarks:

Type of Map: topo

Prepared by: Tim Schaal

Reviewed and the Number Assigned on: 1-30-1998

By: Karen Schlaak

Notice of Hearing - date to intervene: _____

**SOUTH DAKOTA
WATER PERMIT NO. 1661-1**

Date of first receipt of application January 30, 1998.

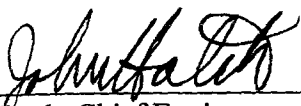
The Water Management Board approved Water Permit Application No. 1661-1 on May 6, 1998 for Howes Grazing Association, c/o Paul L Delbridge, PO Box 150, Howes SD 57748 authorizing the construction of a dam owned by the South Dakota Department of Transportation and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 1661-1 appropriates water for storage in an existing 1,700 acre-foot dam to provide habitat for fish and wildlife production and livestock water. The existing dam is the Highway 34 Road Dam #2 which is owned and maintained by the South Dakota Department of Transportation (DOT). The dam impounds 1,700 acre-feet of water from an unnamed tributary of Luis Creek. The dam was constructed in 1961 as part of the DOT Highway 34 Project. The dam embankment is formed by SD Highway 34 and is located in the SE1/4 SE1/4 Section 25, T8N, R17E. DOT Highway 34 Road Dam #2 impounds water in the SE 1/4, SW 1/4 NE 1/4, NE 1/4 SW 1/4, E 1/2 NW 1/4 Section 25; all in T8N-R17E. This permit authorizes sufficient water to maintain water up to the outlet elevation 2315 feet mean sea level (1,700 acre feet of water) in the dam. The DOT will retain the right to adjust water levels in the reservoir as necessary to assure roadway embankment stability and safety, including draining the water from the dam.
2. The water appropriated shall be used for the purpose of fish and wildlife propagation and livestock water and may not exceed the amount of water needed for beneficial use for fish and wildlife propagation 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 January 30, 1998.
5. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

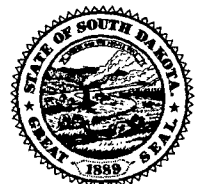
1. Water Permit No. 1661-1 authorizes impoundment of up to 1,700 acre feet of water in Highway 34 Road Dam #2 which is owned and maintained by the South Dakota Department of Transportation (DOT). This permit authorizes sufficient water annually to maintain the water level up to the outlet elevation of 2,315.0 feet mean sea level.
2. Permit No. 1661-1 is subject to the right of the DOT to adjust water levels in the dam as necessary to assure roadway embankment stability and safety, including draining the water from the dam.
3. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

WATER MANAGEMENT BOARD

By: 
John Hatch, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

SEP 3 1998

date



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



Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	(office use only) No. <u>1661-1</u> Hydrologic Unit <u>10/20/13</u>
	Basin <u>Lower Cheyenne</u>
	Newspaper <u>Faith Independent, Faith, SD</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>livestock watering</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.) _____

1. Name of Applicant Howes Grazing Association Phone 985-5325
(check one) ☐ Owner ☐ Tenant/lessee
Mailing Address PO Box 150 Howes, SD 57748 State SD
(Street, RR, or Box) (Zip Code)

2. Amount of water claimed _____ *CFS or _____ **GPM 1700 ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)

3. Source of water supply Trib. Luis Creek (Howes Grazing Lake)

4. Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) 800 feet west of the
SE corner of Section 25-T8N-R17E (SE1/4 SE1/4) water impounded: SE 1/4, SW 1/4 NE 1/4,
NE 1/4 SW 1/4, E 1/2 NW 1/4 all in sec. 25-T8N-R17E County Meade

5. County or counties where water will be used Meade

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

7. 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)

Howes Grazing Lake (Howes Dam #2) was constructed in 1961 as part of a highway project on SD Highway 34.

STATE OF SOUTH DAKOTA)
County of Meade 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, Paul D. Delbridge, 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 Howes Grazing Assn
by Paul D. Delbridge Sec-Treas.
Subscribed and sworn to before me this 28 day of Jan. 19 98

Melinda Selby
Notary Public

4-15-2005

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

10 415625

Pierre, January 30, 1998

RECEIVED OF Howes GRazing Ass., Box 138, Howes, SD 57748
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. 1661-1 to Appropriate Water, to construct
and to put water to beneficial use _____

550 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 _____

(Any Other Work Provided by Law)

Total

550 00

By _____
Chief Engineer

John Hatch (signature)

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

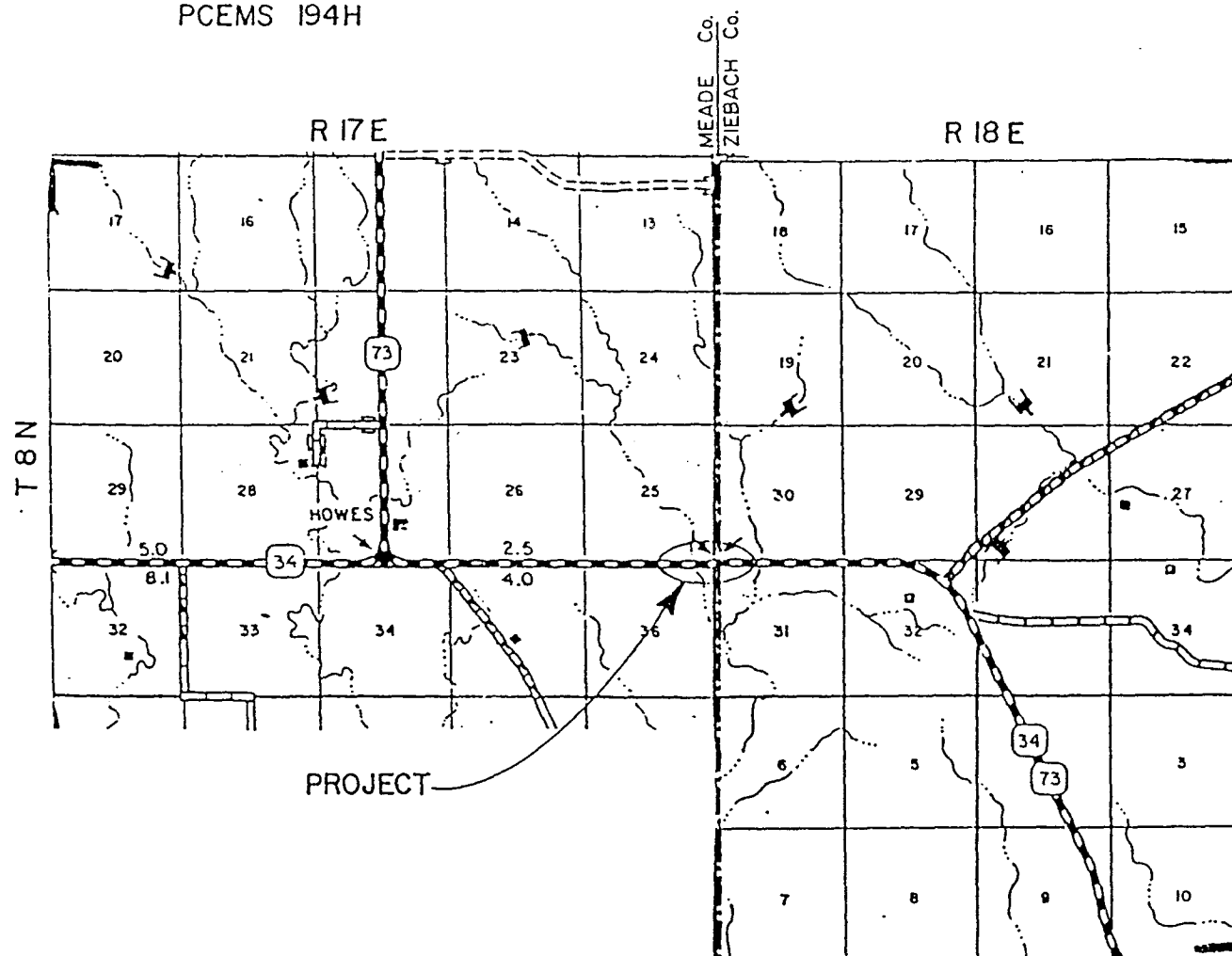
PLANS FOR PROPOSED
PROJECT NO. 0342-474
MEADE AND ZIEBACH COUNTIES
RIP RAP AND DOWNSPOUT
INSTALLATION

CONSTRUCTION AND RIGHT OF WAY PLANS
PCEMS 194H

FED. HWY. ADMIN. NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
8	S.D.	342-474	1	19

INDEX OF SHEETS

Sheet No. 1	Title Sheet
Sheet Nos. 2 and 3	Estimate of Quantities and Plan Notes
Sheet No. 4	Typical Sections
Sheet Nos. 5 and 6	Traffic Control Sheets
Sheet Nos. 7 and 8	Plan Sheets
Sheet Nos. 9 and 10	Thrust Block Details
Sheet No. 11	Rip Rap Details
Sheet Nos. 12 thru 14	Fencing Details
Sheet Nos. 15 thru 17	Pipe Details
Sheet Nos. 18 and 19	Downspout Cross Sections



DESIGN DESIGNATION

ADT (1988)	305
ADT (2008)	415
DHV	58
D	60%
T DHV	8.2%
T ADT	18%
V	70 MPH

LEGEND

STATE AND NATIONAL LINE
COUNTY LINE
SECTION LINE

SCALES

LAYOUT, 1.5 INCHES = 1 MILE

PLAN, 1 INCH = 100 FT.

PROFILE } HORIZONTAL 1 INCH = 100 FT.
VERTICAL 1 INCH = 10 FT.

CROSS SECTIONS } HORIZONTAL 1 INCH = 10 FT.
VERTICAL 1 INCH = 5 FT.

REDUCTION SCALE

1 INCH 1 INCH

APPROVED _____ DATE _____
ADMINISTRATIVE ENGINEER, SOUTH DAKOTA DIVISION OF HIGHWAYS

U.S. DEPT. OF TRANSPORTATION
FEDERAL HIGHWAY ADMIN.
Approved _____ Date _____
DIVISION ADMINISTRATOR

letting September 1944

FED. HWY. ADMIN. NO.	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
1	S. D.	342-474	7	19

STA. 147+94 68' LT.
STA. 147+12 315' RT.
INSTALL 42"-106' RCP
AND 1 FLARED END
AND 1 RCP-CMP TRANSITION
INSTALL 42"-260' CMP
(15° BEND, 108', 20° BEND, 92',
20° BEND, 32', 20° BEND, 20')
AND 1 END SECTION.

HOWES GRAZING ASSOCIATION INC.

STA. 147+12 315' RT
PLACE 50 TONS
CLASS II RIP RAP
AS DIRECTED BY THE ENGINEER

INSTALL THRUST BLOCKS AT
THE FOLLOWING LOCATIONS

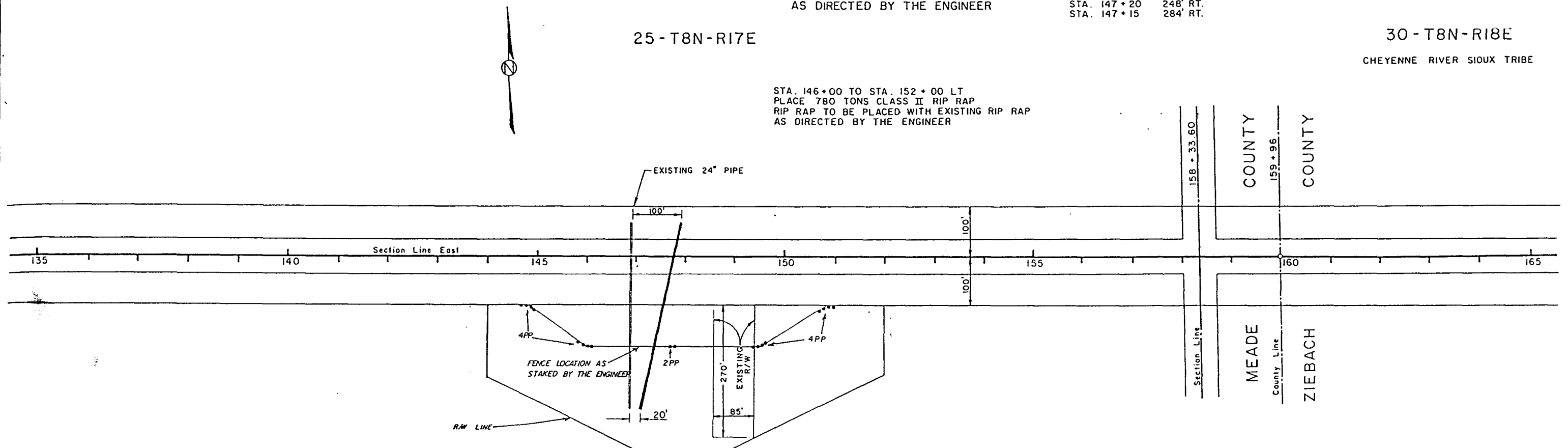
STA. 147+75 154' RT.
STA. 147+20 248' RT.
STA. 147+15 284' RT.

25-T8N-R17E

30-T8N-R18E

CHEYENNE RIVER SIOUX TRIBE

STA. 146+00 TO STA. 152+00 LT
PLACE 780 TONS CLASS II RIP RAP
RIP RAP TO BE PLACED WITH EXISTING RIP RAP
AS DIRECTED BY THE ENGINEER



36-T8N-R17E

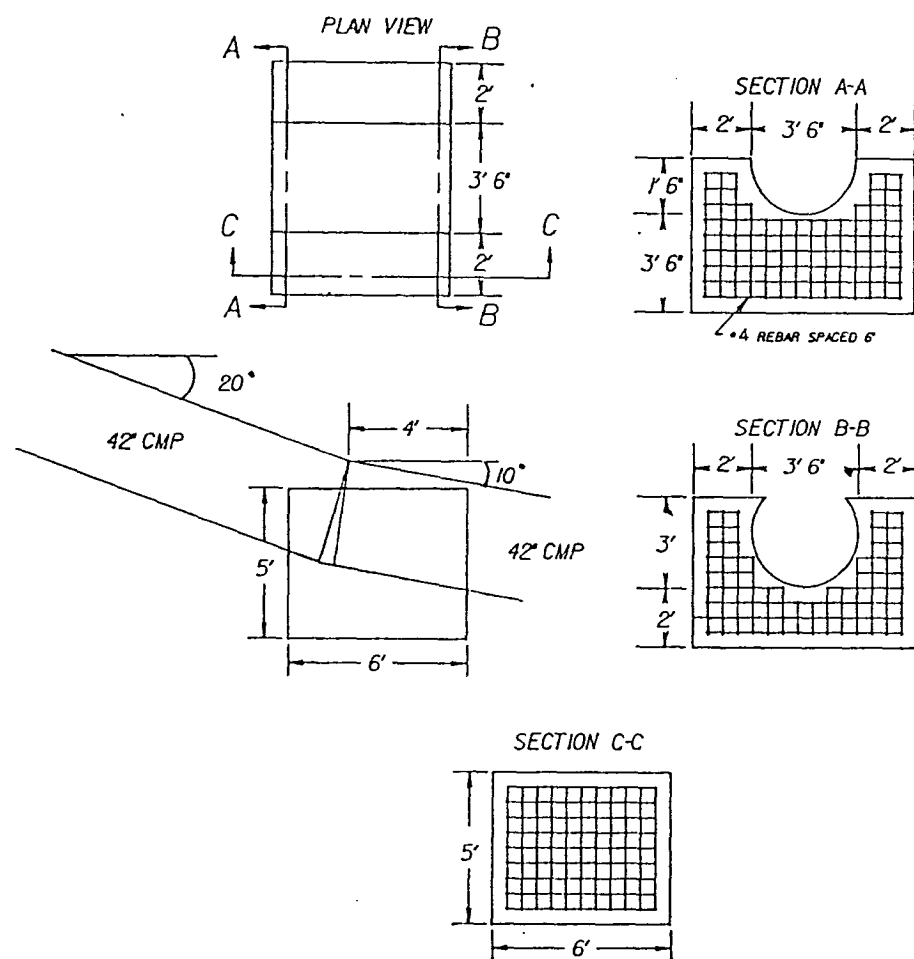
31-T8N-R18E

CHEYENNE RIVER SIOUX TRIBE

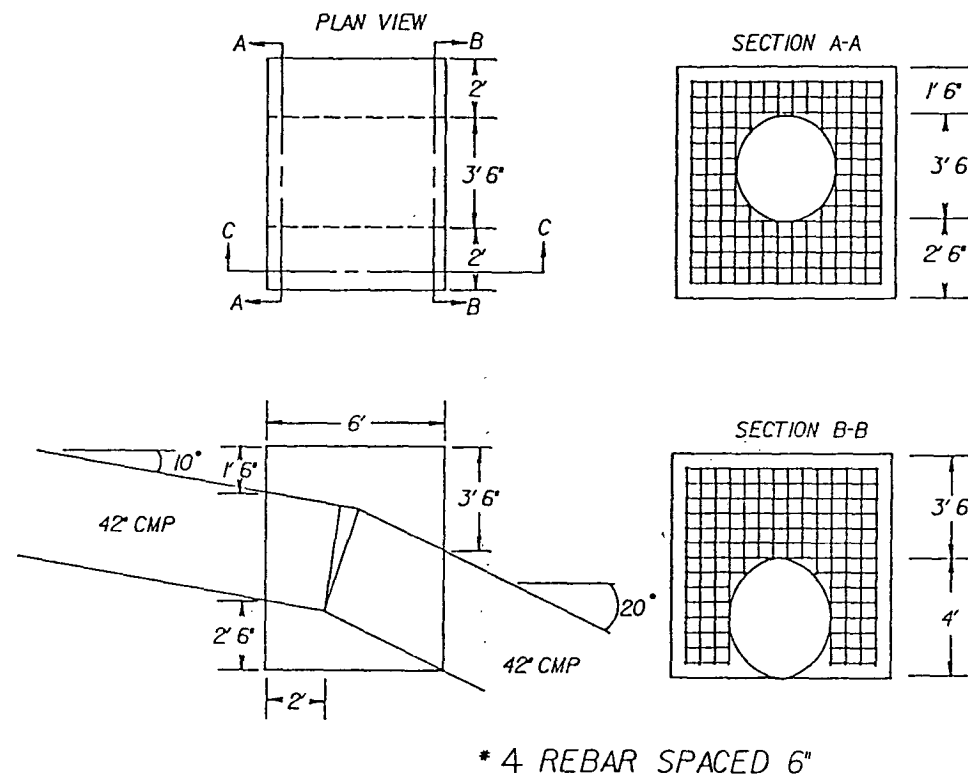
HOWES GRAZING ASSOCIATION, INC.
NE 1/4, 36, T8N, R17E

PARCEL NO. 1
3.94 ACRES TAKING
6.58 ACRES EXISTING R.O.W.

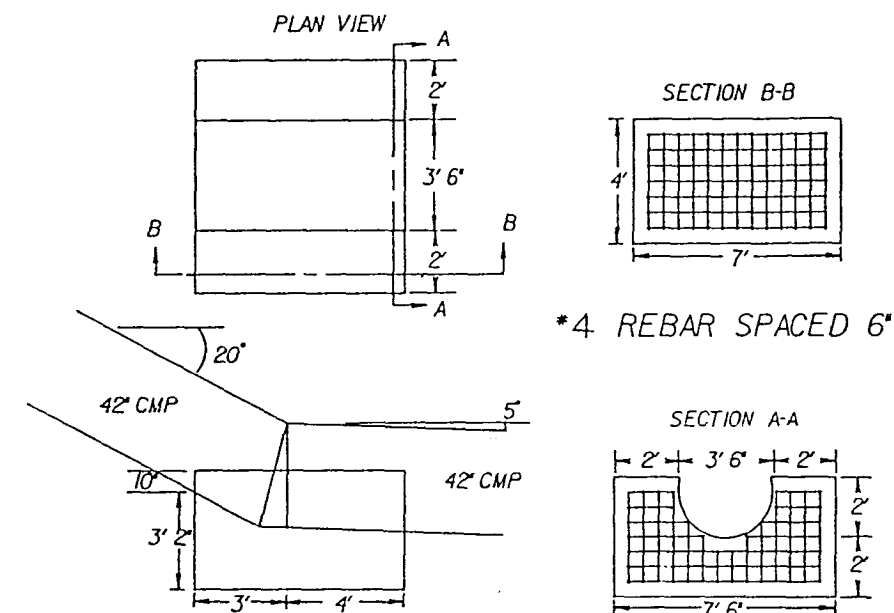
WEST HOWE DAM
THRUST BLOCK #1
STA 147+75 154' RT.



WEST HOWE DAM
THRUST BLOCK #2
STA 147+20 248' RT.



WEST HOWE DAM
THRUST BLOCK #3
STA 147+15 284' RT.



342	474
18	19

2330.00

2310.00 FL 2315.00

2290.00

INSTALL THRUST BLOCKS
 STA 147+75 154' RT
 STA 147+80 248' RT
 STA 147+15 284' RT

2270.00

STA 147+94 168' LT TO
 STA 147+12 315' RT
 INSTALL 42" - 108' RCP
 AND 11" FL END
 AND 11" RCP - CMP TRANSITION
 INSTALL 42" - 260' CMP
 (15° BEND 108' 20° BEND 92'
 20° BEND 32' 201 BEND 20')
 AND 11" END SECTION

2250

FL 2250.00



INVENTORY OF DAMS IN THE UNITED STATES

PAGE

107

06/09/75 10:55:4

STATE	IDENTITY	DIVISION	CONGR	STATE	CONGR	NAME	LATITUDE	LONGITUDE	REPORT DATE
SD	00407	MND	SN	09	02	ROAD DAY NO 2	4437.31	10200.4	24 SEP 73

POPULAR NAME

NAME OF IMPOUNDMENT

Buffalo Lake

SE SE 1/4 Sec 65-TP-R17

REGION BASIN

NEAREST DOWNSTREAM CITY-TOWN-VILLAGE

DIST FROM DAM

POPULATION

1-12 TR CHEYENNE

NONE

0

0

TYPE OF DAM

YEAR COMPLETED

PURPOSES

STRUCTURAL

HYDRAULIC

IMPOUNDING CAPACITIES

1700

REMARKS

1961 R

62

62

2850

1700

MR. BLINN 27 JUN 78

1b NOTE IN FLOOD PLAIN

D/S

SPILLWAY

MAXIMUM DISCHARGE

VOLUME OF DAM

POWER CAPACITY

INSTALLED

PROPOSED

NO. LENGTH

WIDTH

LENGTH

WIDTH

LENGTH

WIDTH

LENGTH

WIDTH

LENGTH

WIDTH

LENGTH

HAS

CRACKS

TYPE

WIDTH

MAXIMUM DISCHARGE

VOLUME OF DAM

POWER CAPACITY

INSTALLED

PROPOSED

NO. LENGTH

WIDTH

LENGTH

WIDTH

LENGTH

WIDTH

LENGTH

WIDTH

LENGTH

OWNER

ENGINEERING BY

CONSTRUCTION BY

ROAD DAY STATE HIGHWAY

REGULATORY AGENCY

OPERATION

MAINTENANCE

INSPECTION DATE

DAY

MO

YR

AUTHORITY FOR INSPECTION

REMARKS

3- ROAD DAY 34 ESTIMATE

New 42" RCP/CMP Primary Spillway 1992

Passes 100 year Flood Q₁₀₀ = 1409 cfs - Max Pool Elev. 2335

Top of Dam 2330

REPORTS CONTROL SYMBOL

DAEN-CWE-17

2/2/98 TGS

Water Permit Application No. 1661-1

Howes Grazing Association

Hwy 34 Road Dam #2 (Howes Grazing Lake) SE 1/4 Sec. 25-T8N-R17E
ID No. - SD 00407

Cat. 2 - Significant Hazard Dam

Top of Dam Elev. - 2330

P. Spillway Elev. - 2315 - 42" RCP w/ Flanged Inlet

Dam Height = 82 ft.

Normal Storage Capacity = 1700 Ac-Ft

Max. Storage Capacity = 2850 Ac-Ft.

Road Dam #2 (Howes Grazing Lake) is an Intermediate size Category 2, Significant Hazard Dam and qualifies for exemption in section 77.02:08:07.02 of the Safety of Dams Rules. The minimum Spillway Design Flood is between 50% PMF and 100 year frequency event.

In 1992, DOT placed a new 42" RCP spillway with an inlet elevation at 2315 msl. They routed a 100 peak = 1409 cfs thru the dam with a max. reservoir level at elevation = 2325 msl and Top of Dam elevation = 2330 msl.

SCS Annual Yield

Use - CN = 80

Isogram #2

DA = 4.7 mi.² = 3008

10% = 2.5

2.5 x 3008/12 = 627 Ac-Ft.

50% = 0.63

0.63 x 3008/12 = 158 Ac-Ft.

80% = 0.25

0.25 x 3008/12 = 63 Ac-Ft.

50 SHEETS
22-141 100 SHEETS
22-142 200 SHEETS

22-141
22-142
22-144





Department of Transportation

Division of Planning

700 Broadway Avenue East

Pierre, South Dakota 57501-2586 605/773-3174

FAX: 605/773-3921

MEMORANDUM

To: Research Review Board

From: Research Technical Panel 89-03

Date: March 28, 1991

Subject: Howes Dams Safety Study Recommendations

The technical panel of research study 89-03 has reviewed Dr. Terje Preber's final report and recommendations concerning the safety of the two dams formed by highway embankments on SD34 near Howes. We feel that Dr. Preber's study is technically sound and that the Department should adopt the recommendations contained in his report.

Specifically, we recommend:

1. That the Division of Engineering perform hydraulic analysis to determine measures necessary to maintain the east and west dams' pool elevations below 2339 and 2315, respectively. If the analysis shows that spillways should be installed or upgraded, construction should be initiated.
2. That Rapid City and Pierre Regions repair eroded areas on the embankments and along the abutments on both dams. Erosion control should be installed to protect the abutments from future erosion.
3. That the Geotechnical Engineering activity investigate and seal the large hole on the east dam.
4. That Rapid City and Pierre Regions adopt a policy of annual dam inspections for these dams. Region personnel should accompany Department of Water and Natural Resources engineers during their inspections, which occur once every three years. In addition, the Regions should perform their own inspections in other years.
5. That with assistance from the Geotechnical Engineering activity, the Rapid City and Pierre Regions should install survey monuments to establish vertical and horizontal control on both dams. The monuments should be used to perform an initial survey and at minimum, an annual survey thereafter.

6. That Rapid City and Pierre Regions establish a plan to handle emergencies at the dams. The dams are classified as Class II dams, meaning that failure would threaten the safety of persons travelling over them. The Dam Safety Act requires that in the event of overtopping, the highway must be closed. The Regions' emergency plan should address responsibility for monitoring the dams and ordering road closure, emergency pumping, detours, and other measures which might be required in the event of heavy rainfall.
7. That Rapid City and Pierre Regions coordinate their maintenance, inspection and emergency activities. One Region assuming responsibility for both dams might be most efficient, but if that is not feasible, the two Regions should establish policies and procedures which are well understood, mutually compatible, and which guarantee that essential actions will be performed.

We feel that the Department should take these actions to minimize the risk that the dams will fail and threaten the safety of the travelling public.

Vernon L. Bump, Geotechnical Engineer
Richard A. Phillips, Bridge Hydraulics Engineer
Daris W. Ormesher, Instrumentation Research Engineer
David L. Huft, Research Engineer

let:howes5



Department of Transportation

Division of Operations

700 Broadway Avenue East

Pierre, South Dakota 57501-2586 (605)773-3571

Fax: (605)773-3921



MEMORANDUM

Date: May 6, 1991
To: Claus Kuehl, Maintenance Engineer
From: Michael Young, Maintenance Operations Engineer
Regarding: Howes Dams Meeting

MY

On May 2, 1991, the following persons met in the SD-DOT Commission Room to discuss implementation of the technical panel's recommendations regarding research study 89-03:

Tim Schaal	DENR
Robert Feller	DOT Rapid City
Daris Ormesher	DOT Research
Richard Phillips	DOT Hydraulics
Vernon Bump	DOT Geotechnical
Terry Jorgensen	DOT Hydraulics
Mike Young	DOT Operations

These recommendations concern the safety of the two dams formed by highway embankments on SD 34 near Howes Corner. The recommendations stem from a SD-DOT sponsored research report "GEOTECHNICAL ANALYSIS OF HOWES DAMS," by Terje Preber and Manojkumar Dhirajlal, March 28, 1991.

Recommendations and actions taken follow:

1. That the Division of Engineering perform hydraulic analysis to determine measures necessary to maintain the east and west dams' pool elevations below 2339 and 2315, respectively. If the analysis shows that spillways should be installed or upgraded, construction should be initiated.

Discussion: Richard Phillips, DOT Hydraulics, indicated that based on a preliminary analysis, the existing thirty inch overflow culvert in the West Dam is adequate to pass a 100 year event when considering the pipe's capacity and the dam's reserve storage capacity. The dam would fill to within four feet of overtopping in a 100 year event and it would take about two weeks for the

dam to drain back down to the inlet elevation (2315) of the pipe. His preliminary analysis of the East Dam indicated a twenty-four inch pipe installed with an inlet elevation of 2339 would be adequate to pass a 100 year event based on reserve storage and pipe capacity. The dam would fill to within 5-6 feet of overtopping and it would take about two weeks for the dam to drain back down to the inlet elevation of the pipe. Based on a cost of \$29,000 to install the thirty inch pipe in the West Dam in 1983, it is estimated the installation of a twenty-four inch pipe in the East Dam may run \$30,000 to \$35,000. Other items which may need consideration: formal right-of-way agreement with Cheyenne River Tribe to install overflow culvert in East Dam, water rights of Tribe relative to installing overflow culvert in East Dam to hold pool elevation to 2339, and right-of-way agreements which allows the existence of either of these dams.

Action: DOT Hydraulics will submit a written recommendation to me regarding these dams. They will check to see if the overflow culverts will be adequate or if larger capacity spillway type structures will be required in order to pass the anticipated flows without excessive increase in pool elevations. Based on these recommendations, I will take action to implement the appropriate recommendation.

2. That Rapid City and Pierre Regions repair eroded areas on the embankments and along the abutments on both dams. Erosion control should be installed to protect the abutments from future erosion.

Discussion: In a telephone conference call between Clyde Pietz, Lloyd Potter, Charles Piper and Claus Kuehl on April 18, 1991, it was agreed that the Rapid City Region would be responsible for the inspections, repair and emergency activities of both dams with Robert Feller named as the primary contact person. If a twenty-four inch overflow culvert is to be installed in the East Dam at an estimated cost of \$30,000 to \$35,000, consideration should be given to the Pierre Region installing the pipe before the Rapid City Region assumes responsibility for the dam.

Action: Robert Feller to review the extent and scope of the erosion work. He will explore the possibility of using maintenance forces to perform the erosion control work. The work consists of filling the eroded areas with compacted fill, seeding and applying erosion matting in areas where needed to control future erosion. Some of the work is not within the highway right-of-way and he will attempt to gain informal permission to gain access to these areas. Robert Feller will meet with representatives of the Howes Grazing Association, West Dam, and the Cheyenne River Tribe, East Dam, on May 9, 1991, at 9:00 a.m., MDT, to discuss the scope of the project and seek their permission to gain access to non-right-of-way areas which will require work.

3. That the Geotechnical Engineering activity investigate and seal the large hole on the East Dam.

Action: Vernon Bump will investigate the reason why the hole developed and take action as required to stabilize the problem. He feels at this time he may have to grout inject the area of the hole to stabilize the area. Once this work is done, maintenance forces may have to do a minor amount of work to fill the hole and seed the area.

4. That Rapid City and Pierre Regions adopt a policy of annual dam inspections for these dams. Region personnel should accompany Department of Environment and Natural Resources (DENR) engineers during their inspections, which occur once every three years. In addition, the Regions should perform their own inspections in the other years.

Discussion: It has been agreed that the Rapid City Region will be responsible for the annual inspections on both dams and Robert Feller has been named as the primary contact person. The Faith Maintenance Foreman will be trained to do the annual inspection and will be responsible to perform the annual inspections on both dams.

Action: Robert Feller and the Faith Maintenance Foreman will meet with the DENR dam inspection team on May 9, 1991, at 9:00 a.m., MDT, at the dam sites to observe and be trained in dam inspections. The Faith Maintenance Foreman will perform future annual dam inspections on both the dams, he will report his findings to his supervisor and take the appropriate action to budget for maintenance and to maintain both dams.

5. That with assistance from the Geotechnical Engineering activity, the Rapid City and Pierre Regions should install survey monuments to establish vertical and horizontal control on both dams. The monuments should be used to perform an initial survey and at minimum, an annual survey thereafter.

Discussion: It has been agreed that the Rapid City Region will be responsible for performing the survey on both dams and Robert Feller has been named as the primary contact person.

Action: Vernon Bump will lay out and install the survey markers. Vernon Bump will work with the Robert Feller relative to the details of the survey marker layout to make sure they are acceptable to all involved. Robert Feller will be responsible to ensure the markers are surveyed after the markers are installed. Survey data shall be forwarded to Vernon Bump for his review and monitoring. Surveys shall be done yearly at approximately the same time each year.

6. That Rapid City and Pierre Regions establish a plan to handle emergencies at the dams. The dams are classified as Class II dams, meaning that failure would threaten the safety to persons travelling over them. The Dam Safety Act requires that in the event of overtopping, the highway must be closed. The Regions' emergency plan should address responsibility for monitoring the dams and ordering road closure, emergency pumping, detours, and other measures which might be required in the event of heavy rainfall.

Discussion: It has been agreed that the Rapid City Region will be responsible for implementing the emergency plan on both dams and Robert Feller has been named as the primary contact person.

Action: Mike Young will draft the emergency plan using the winter road closure plan as an example. The plan will be sent out for review before it is implemented.

6. That Rapid City and Pierre Regions coordinate their maintenance, inspection and emergency activities. One Region assuming responsibility for both dams might be most efficient, but if that is not feasible, the two Regions should establish policies and procedures which are well understood, mutually compatible, and which guarantee that essential actions will be performed.

Discussion: In a telephone conference call between Clyde Pietz, Lloyd Potter, Charles Piper and Claus Kuehl on April 18, 1991, it was agreed that the Rapid City Region would be responsible for the inspections, repair and emergency activities of both dams with Robert Feller named as the primary contact person.

cc: Pietz, Director of Operations
Jenssen, Director of Planning
Larsen, Director of Engineering
Piper, Rapid City Region Engineer
Potter, Pierre Region Engineer
~~Gale Selken, Department of Environment and Natural Resources~~
Robert Feller, Rapid City Region
Vernon Bump, Geotechnical Engineering
Richard Phillips, Hydraulics
Daris Ormesher, Research
Howes Dams File

CHS ✓
RAP ✓
TJ



Department of Transportation

Division of Operations

700 Broadway Avenue East
Pierre, South Dakota 57501-2586 (605)773-3571
Fax: (605)773-3921

June 4, 1991

Chuck Piper
Region Engineer
SD - DOT
Box 1970
Rapid City, SD 57709-1970



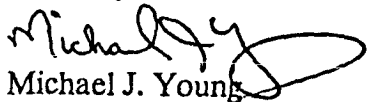
Dear Mr. Piper:

The hydraulic analysis which sized the spillway pipes for the Howes Dams is complete, please find a copy attached. We have received the Department of Environment and Natural Resources latest summary inspection reports on the Howes Dams, please find a copies attached. We are now at the point where plans and specifications should be prepared and a contract let to perform the work necessary to fulfill the recommendations regarding these dams. Work by contract should include the following:

- (1) Installation of a 48 inch pipe spillway in the East Dam with required energy dissipators and erosion control;
- (2) Installation of a 42 inch pipe spillway in West Dam with required energy dissipators and erosion control;
- (3) Installation of additional rip rap on the upstream face of both dams; and
- (4) Fence off upstream and downstream berms outside the highway right-of-way to prohibit vehicle and grazing access to these areas.

Total cost of this work may run as high as \$100,000. Please take the necessary steps to have the plans prepared in the Region. Funding questions should be discussed with Mr. Pietz.

Sincerely,



Michael J. Young
Maintenance Operations Engineer

cc: Clyde Pietz, Director of Operations
Wallace Larsen, Director of Engineering
Cam Kuehl, Maintenance Engineer
Robert Feller, Rapid City Region
Richard Phillips, Hydraulics
Howes Dams File



Department of Transportation

Division of Operations

700 Broadway Avenue East

Pierre, South Dakota 57501-2586 (605)773-3571

Fax: (605)773-3921

August 13, 1991

Gale N. Selken, P.E.
SD - DENR
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3181



Dear Mr. Selken:

Attached please find a set of plans for the correction of deficiencies on the Howes Dams. Please review and comment. Your comments are requested by August 30, 1991.

Please note that no reference is made to correcting the berm erosion problems. This work will either be done by the contractor during the project or by state forces at a later date.

Sincerely,

Michael J. Young
Maintenance Operations Engineer

cc: Howes Dams File



Department of Transportation

Rapid City Design & Materials Office
P.O. Box 1970
Rapid City, South Dakota 57709-1970

August 12, 1991

Mr. Charles A. Piper
Regional Engineer
Department of Transportation
P.O. Box 1970
Rapid City, South Dakota 57709-1970

Re: 0342-474, Meade & Ziebach Counties
Repair of Howes Dam

Dear Mr. Piper:

The plans on the above referenced project are now complete and are being submitted to you, the Operations Support Engineer, the Roadway Design Engineer, and the Area Engineer for review and comments.

It is requested that these comments be submitted in writing to the Regional Design Office with a copy to the Regional Engineer and that the Regional Engineer indicate the number of plans and proposals needed as well as the working days required for construction.

If those reviewing the plans find any bid items which, due to particular circumstances, may cause the item(s) to be bid higher than the normal average bid price, please indicate this in the review letter.

Your comments are requested by Sept. 4, 1991.

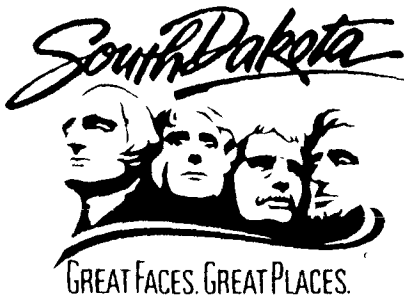
Very truly yours,

DEPARTMENT OF TRANSPORTATION

Dale E. Russell, P.E.
Engineering Supervisor

DER/mg
Enclosures

cc: Weiss - Roadway Design
Durick - Operations
Young - Operations
Harter - Operations
Peterson - Area Engineer
File (2)



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

January 15, 1998

Howes Grazing Association
%Paul Delbridge
PO Box 138
Howes, SD 57748

Dear Mr. Delbridge:

Enclosed is a partially completed application form to obtain a Water Permit for the Howes Grazing Lake associated with Howes Dam #2 (west dam) on SD Highway 34. Please complete the application and return it to us with the \$550.00 filing fee, which is based on the storage of 1700 acre-feet of water. I have an application map here on file so you will not need to include one.

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

Sincerely,

Timothy G. Schaal, P.E.
Natural Resources Engineer
Water Rights Program
(605) 773-3352

enclosure

REPORT ON
WATER PERMIT APPLICATION NO. 1661-1
Howes Grazing Association
February 2, 1998

Water Permit Application No. 1661-1 has been filed by the Howes Grazing Association to impound 1700 acre-feet of water from runoff in Howes Grazing Lake Dam (Hwy 34 Road Dam #2). The dam is located in the SE ¼ SE ¼ of Section 25-T8N-R17E, in Meade County. The water is to be used for fish and wildlife production and livestock watering.

Discussion:

Howes Grazing Lake Dam (Road Dam #2, ID No. 407) and Buffalo Lake Dam (Road Dam #1, ID No. 518) are located on SD Highway 34 just east of the intersection with SD Highway 73 at Howes, South Dakota. They were constructed in 1961, as part of a SD Department of Transportation (DOT) highway project. Howes Grazing Lake Dam is located in the SE ¼ of Section 25-T8N-R17E and just west of the Meade/Ziebach County line. Buffalo Lake Dam is located in the SW ¼ of Section 30-T8N-R18E and just east of the Meade/Ziebach County line.

Howes Grazing Lake Dam is 82 feet high and has a normal storage capacity of 1700 acre-feet with a reservoir level at the spillway elevation (2315 msl) and a maximum storage capacity of 2850 acre-feet with a reservoir level at the top of dam elevation (2330 msl). It is classified as an Intermediate size Category 2, Significant Hazard dam and qualifies for the exemption listed in section 74:02:08:07.02 of the Safety of Dams Rules. The required minimum spillway design must be capable of passing a flood between the 100 year frequency event and 50 percent of the Probable Maximum Flood (PMF).

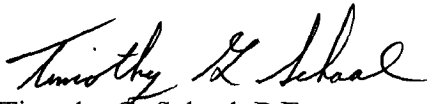
Howes Grazing Lake Dam has a drainage area of 4.7 square miles. A 100 year frequency event produces a peak runoff of 1409 cfs. In 1992, DOT installed a new 42 inch RCP as the primary spillway with a flanged inlet at elevation 2315 msl. The 100 year event is routed through the spillway with a maximum reservoir elevation of 2325 msl, leaving 5 feet of additional freeboard.

The annual yield for this drainage area with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 158 acre-feet. The annual yield with a 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 63 acre-feet. The annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 627 acre-feet.

The Howes Grazing Lake Dam will be located in the SE ¼ SE ¼ of Section 25-T8N-R17E on an upper unnamed tributary to Luis Creek and located about six miles upstream of the confluence of Luis Creek and the Cheyenne River. There are no existing Water Permits/Rights located on the unnamed tributary or Luis Creek between the dam and the Cheyenne River.

Conclusions:

1. Water Permit Application No. 1661-1 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. 1661-1.



Timothy G. Schaal, P.E.

Natural Resources Engineer III

Approved by:



Gale N. Selken, P.E.

Natural Resources Engineer IV

References:

Preber, Terje, M. Dhirajlal, March 28, 1991, Geotechnical Analysis of Howes Dams, Department of Civil Engineering, South Dakota School of Mines and Technology, Rapid City, South Dakota 57701

Water Rights Program, 1998, "Safety of Dams Files", DENR-Water Rights Program, Joe Foss Building, Pierre, South Dakota 57501

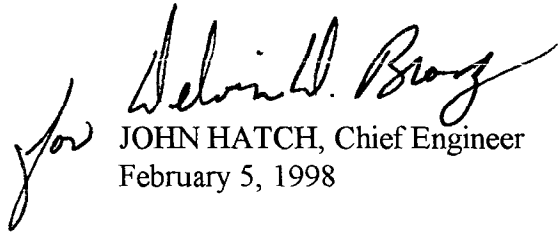
RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 1661-1, Howes Grazing Association

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. 1661-1, Howes Grazing Association, c/o Paul L. Delbridge, P.O. Box 150, Howes, SD 57748.

The Chief Engineer is recommending APPROVAL of Application No. 1661-1 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion has been 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. 1661-1 authorizes a dam with storage capacity of 1,700 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation of 2,315.0 feet mean seal level.
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.


JOHN HATCH, Chief Engineer
February 5, 1998



**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.**

February 10, 1998

Howes Grazing Association
%Paul L. Delbridge
P.O. Box 150
Howes, SD 57748

Dear Mr. Delbridge:

Water Permit Application Nos. 1659-1 and 1661-1 for livestock water and fish & wildlife have 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 Faith Independent printed at Faith, SD (Ph # (605) 967-2161). For your information, a copy of the notice, the recommendations of the Chief Engineer and the 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 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 applications.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendations, 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 applications.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

February 10, 1998

Faith Independent
Box 38
Faith, SD 57626-0038

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application Nos. 1659-1 and 1661-1 to be published twice. Please publish the first notice on February 18, 1998, 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 Howes Grazing Association, %Paul L. Delbridge, P.O. Box 150, Howes, SD 57748 (Ph # (605) 985-5325).

A copy of BOTH publications must be SENT to the WATER RIGHTS PROGRAM. 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 applications 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 Program
Joe Foss Building
Pierre SD 57501-3181

Nos. 1659-1 & 1661-1

Date _____

We are in receipt of your letter of _____ enclosing Notice of Hearing to Appropriate Water by Application Nos. 1659-1 & 1661-1 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 February 18, 1998, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NOS. 1659-1 & 1661-1 to Appropriate Water

Notice is given that Howes Grazing Association, c/o Paul L Delbridge, PO Box 150, Howes SD 57748 has filed the following applications for water permits.

Application No. 1659-1 requests to impound 45.1 acre-feet of water from runoff by constructing a dam located in the NE 1/4 NW 1/4 Section 34 with water impounded in the N 1/2 NW 1/4 Section 34; all in T9N-R17E. This application requests impoundment of water sufficient to maintain water at the outlet elevation and is to be used to provide habitat for fish and wildlife production and livestock water.

Application No. 1661-1 requests impoundment of 1,700 acre-feet of water from a tributary of Luis Creek. The existing dam, known as Howes Grazing Lake, is located in the SE 1/4 SE 1/4 Section 25 with water impounded in the SE 1/4, SW 1/4 NE 1/4, NE 1/4 SW 1/4, E 1/2 NW 1/4 Section 25; all in T8N-R17E. This application requests impoundment of water sufficient to maintain water at the outlet elevation at 2315 feet mean sea level and is to be used to provide habitat for fish and wildlife production and livestock water.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 1659-1 and 1661-1 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 the applications, as recommended, unless a petition is filed opposing the applications or the applicant files a petition contesting the chief engineer's recommendations. If a petition opposing the applications or contesting the recommendations is filed, then a hearing will be scheduled and the Water Management Board will consider the applications. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting these applications 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 recommendations. 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 March 9, 1998.

The petition may be informal, but must include a statement describing the petitioner's interest in the applications, the petitioner's reasons for opposing or supporting the applications, 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 these applications. Nettie H. Myers, Secretary, Department of Environment and Natural Resources.



Form 8

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County of MEADE) SS

I, MELANIE GAULKE

certify that the attached printed Notice was taken

from the FEB 10 LETTER FROM DEPT OF

Env. + Natural Resources

printed and published in THE FAITH INDEPENDENT

County of MEADE and

state of South Dakota. The notice was published

in the newspaper on the following two dates:

FEB. 18, 1998

FEB. 25, 1998

Cost of Printing \$44.51

Melanie Gaulke
(Signature)

Edita
(Title)

March 9, 1998
(Date Signed)

NOTICE OF APPLICATION NOS. 1659-1 & 1661-1 to Appropriate Water

Notice is given that Howes Grazing Association, c/o Paul L. Delbridge, P.O. Box 150, Howes SD 57748 has filed the following applications for water permits.

Application No. 1659-1 requests to impound 45.1 acre-feet of water from runoff by constructing a dam located in the NE 1/4 NW 1/4 Section 34 with water impounded in the N 1/2 NW 1/4 Section 34; all in T9N-R17E. This application requests impoundment of water sufficient to maintain water at the outlet elevation and is to be used to provide habitat for fish and wildlife production and livestock water.

Application No. 1661-1 requests impoundment of 1,700 acre-feet of water from a tributary of Luis Creek. The existing dam, known as Howes Grazing Lake, is located in the SE 1/4 SE 1/4 Section 25 with water impounded in the SE 1/4, SW 1/4 NE 1/4, NE 1/4 SW 1/4, E 1/2 NW 1/4 Section 25; all in T8N-R17E. This application requests impoundment of water sufficient to maintain water at the outlet elevation at 2315 feet mean sea level and is to be used to provide habitat for fish and wildlife production and livestock water.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 1659-1 and 1661-1 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 the applications, as recommended, unless a petition is filed opposing the applications or the applicant files a petition contesting the chief engineer's recommendations. If a petition opposing the applications or contesting the recommendations is filed, then a hearing will be scheduled and the Water Management Board will consider the applications. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting these applications 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 recommendations. 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 March 9, 1998.

The petition may be informal, but must include a statement describing the petitioner's interest in the applications, the petitioner's reasons for opposing or supporting the applications, 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 these applications. Nettie H. Myers, Secretary, Department of Environment and Natural Resources.

[Publish February 18 & 25, 1998]



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 9, 1998

Paul L. Delbridge
Howes Grazing Association
P.O Box 150
Howes, SD 57748

Dear Mr. Delbridge:

Pursuant to SDCL 46-2A-4 and 46-2A-23, I am petitioning to intervene regarding Howes Grazing Association's Water Right Permit Application No. 1661-1. We have also received correspondence from the Department of Transportation (DOT) on this application. The DOT does not object to the application but asserts their right to adjust water levels as necessary to assure roadway embankment stability and safety, including draining the dam in an emergency.

I will be issuing a revised recommendation on Application No. 1661-1 that will address the issued presented by DOT. The DOT as owner of the dam embankment is responsible for operation, maintenance, and water levels in the dam to serve the state highway system.

The published notice of hearing on this application will also need be readvertised. This readvertisement is necessary because the published notice did not describe that Howes Grazing Lake is formed by SD Highway 34 and that the dam is owned and maintained by DOT. **The Water Rights Program will pay the cost of readvertisement.** The revised recommendation and readvertised notice of hearing will be sent to you in the near future.

The Grazing Association's Water Right Permit Application No. 1659-1 to impound 45.1 acre feet of water in Section 34, T9N, R17E is not impacted by this petition. If no petitions are received, Application No. 1659-1 will be approved based on the Chief Engineer's recommendation.

Please contact Tim Schaal or Eric Gronlund if you have any questions.

Very truly yours,

John Hatch, Chief Engineer
Water Rights Program
(605) 773-3352

c: John Cole, Chief Bridge Engineer, Department of Transportation



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 31, 1998

TO: John Cole, Chief Bridge Engineer
Department of Transportation

FROM: Eric Gronlund *Eric Gronlund*
Water Rights Program

SUBJECT: Readvertisement of Notice of Hearing on Water Permit Application No. 1661-1

Please find attached a copy of the revised report, recommendation and readvertisement of Notice of Hearing on Water Permit Application No. 1661-1 for the Highway 34 Road Dam #2. This notice is scheduled to be advertised in the Faith Independent on April 8 and 15, 1998.

Enclosure

REVISED REPORT ON
WATER PERMIT APPLICATION NO. 1661-1
Howes Grazing Association
March 23, 1998

Water Permit Application No. 1661-1 has been filed by the Howes Grazing Association for use of water stored in an existing dam (Highway 34 Road Dam #2) owned by the South Dakota Department of Transportation (DOT) that impounds 1700 acre-feet of water from runoff. The dam is located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 25-T8N-R17E, in Meade County. The water is to be used for fish and wildlife production and livestock watering.

Discussion:

DOT Road Dam #2, ID No. 407 (West Dam) and DOT Road Dam #1, ID No. 518 (East Dam) are located on SD Highway 34 just east of the intersection with SD Highway 73 at Howes, South Dakota. They were constructed in 1961, as part of a SD Department of Transportation highway project. DOT Road Dam #2 is located in the SE $\frac{1}{4}$ of Section 25-T8N-R17E and just west of the Meade/Ziebach County line. DOT Road Dam #1 is located in the SW $\frac{1}{4}$ of Section 30-T8N-R18E and just east of the Meade/Ziebach County line.

DOT Road Dam #2 is 82 feet high and has a normal storage capacity of 1700 acre-feet with a reservoir level at the spillway elevation (2315 msl) and a maximum storage capacity of 2850 acre-feet with a reservoir level at the top of dam elevation (2330 msl). It is classified as an Intermediate size Category 2, Significant Hazard dam and qualifies for the exemption listed in section 74:02:08:07.02 of the Safety of Dams Rules. The required minimum spillway design must be capable of passing a flood between the 100 year frequency event and 50 percent of the Probable Maximum Flood (PMF).

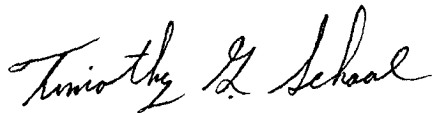
DOT Road Dam #2 has a drainage area of 4.7 square miles. A 100 year frequency event produces a peak runoff of 1409 cfs. In 1992, DOT installed a new 42 inch RCP as the primary spillway with a flanged inlet at elevation 2315 msl. The 100 year event is routed through the spillway with a maximum reservoir elevation of 2325 msl, leaving 5 feet of additional freeboard.

The annual yield for this drainage area with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 158 acre-feet. The annual yield with a 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 63 acre-feet. The annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 627 acre-feet.

DOT Road Dam #2 is located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 25-T8N-R17E on an upper unnamed tributary to Luis Creek and located about six miles upstream of the confluence of Luis Creek and the Cheyenne River. There are no existing Water Permits/Rights located on the unnamed tributary or Luis Creek between the dam and the Cheyenne River.

Conclusions:

1. Water Permit Application No. 1661-1 should be approved since unappropriated water is available and approval should not have any adverse effect on existing Water Permits/Rights.
2. Approval of Application No. 1661-1 should be subject to the right of the DOT to adjust water levels in the dam as necessary to assure roadway embankment stability and safety, including draining the dam.
3. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 1661-1.



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

Approved by:



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

References:

Preber, Terje, M. Dhirajlal, March 28, 1991, Geotechnical Analysis of Howes Dams, Department of Civil Engineering, South Dakota School of Mines and Technology, Rapid City, South Dakota 57701

Water Rights Program, 1998, "Safety of Dams Files", DENR-Water Rights Program, Joe Foss Building, Pierre, South Dakota 57501

**REVISED RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 1661-1, Howes Grazing Association**

Pursuant to SDCL 46-2A-2, the following is the revised recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 1661-1, Howes Grazing Association, c/o Paul L. Delbridge, P.O. Box 150, Howes, SD 57748.

The Chief Engineer is recommending APPROVAL of Application No. 1661-1 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion has been 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. 1661-1 authorizes impoundment of up to 1,700 acre feet of water in Highway 34 Road Dam #2 which is owned and maintained by the South Dakota Department of Transportation (DOT). This Permit authorizes sufficient water annually to maintain the water level up to the outlet elevation of 2,315.0 feet mean seal level.
2. Permit No. 1661-1 is subject to the right of the DOT to adjust water levels in the dam as necessary to assure roadway embankment stability and safety, including draining the water from the dam.
3. 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.

A handwritten signature in black ink, appearing to read "John Hatch", with a stylized, cursive script.

JOHN HATCH, Chief Engineer
March 20, 1998



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 31, 1998

Howes Grazing Association
%Paul L. Delbridge
P.O. Box 150
Howes, SD 57748

Dear Mr. Delbridge

The original notice of hearing for Water Permit No. 1661-1 was published in a manner that did not fully describe the lake. Therefore, the notice of hearing needs to be readvertised to correct any deficiencies. A notice of hearing has been sent to the Publisher of the Faith Independent printed at Faith, SD (Ph # (605) 967-2161). For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the readvertisement are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

The cost of publication of this notice will be paid by the Water Rights Program. Please contact us if you have any questions.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 31, 1998

Faith Independent
Box 38
Faith, SD 57626-0038

Attn: Legal Department

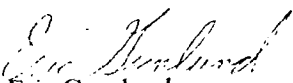
Enclosed is a Readvertisement of Notice of Hearing on Permit No. 1661-1 to be published twice. Please publish the first notice on April 8, 1998, with the second publication 7 days later.

Please bill the Water Rights Program for the cost of the advertisement.

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

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

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

FIRST TRANSMITTAL NOTICE

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

No. 1661-1

Date _____

We are in receipt of your letter of March 31, 1998, enclosing Readvertisement of Notice of Hearing to Appropriate Water by Permit No. 1661-1 which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper

READVERTISEMENT OF NOTICE OF HEARING ON WATER PERMIT APPLICATION NO. 1661-1

Notice is given that Howes Grazing Association, c/o Paul L Delbridge, PO Box 150, Howes SD 57748 has filed an application to appropriate 1,700 acre feet of water in an existing dam to provide habitat for fish and wildlife production and livestock water. The existing dam is the Highway 34 Road Dam #2 which is owned by the South Dakota Department of Transportation (DOT). The dam impounds 1,700 acre-feet of water from an unnamed tributary of Luis Creek. Readvertisement of the notice on this application, published February 18 and 25, 1998, is necessary to clarify ownership of the dam and to provide a complete description of the existing dam. The dam located in the SE1/4 SE1/4 Section 25, T8N, R17E is owned and maintained by the SD Department of Transportation (DOT). The dam was constructed in 1961 as part of the DOT Highway 34 Project. The dam embankment is formed by SD Highway 34 and is located in the SE1/4 SE1/4 Section 25, T8N, R17E. DOT Highway 34 Road Dam #2 impounds water in the SE 1/4, SW 1/4 NE 1/4, NE 1/4 SW 1/4, E 1/2 NW 1/4 Section 25; all in T8N-R17E. This application requests sufficient water to maintain water up to outlet elevation 2315 feet mean sea level (1,700 acre feet of water) in the dam. The DOT will retain the right to adjust water levels in the lake as necessary to assure roadway embankment stability and safety, including draining the water from the dam.

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 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 27, 1998. 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.

The Water Management Board will consider this application at 10:00 AM, May 6, 1998, in the Conference Room, Floyd Matthew Training Center, Joe Foss Building, 523 E. Capitol Ave., Pierre, SD. 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. The May 6, 1998, 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 27, 1998.

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 Eric Gronlund by April 27, 1998, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

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, 46-2A-20, 46-2A-21; 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. Nettie H. Myers, Secretary, Department of Environment and Natural Resources.

PUBLISHER'S AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA

)ss

COUNTY OF MEADE



Melanie Gaulke

of said

County and State, being duly sworn, on oath says: **THE FAITH INDEPENDENT** is a weekly newspaper of general circulation, printed and published in **FAITH**, in said County and State and has been such newspaper during the times herein-after mentioned; that the said **THE FAITH INDEPENDENT** is a legal newspaper and has been in existence for more than one year immediately preceding the first publication herein mentioned; and has more than 200 bona fide subscribers; that I, the undersigned, am _____ Editor _____, of said newspaper, and in charge of the advertising department thereof, and have personal knowledge of all facts stated in this affidavit; and that the advertisement headed _____ Readver. of Not. of Hear. on Water Perm. App. No. 1661-1-Howes Grazing

a printed copy of which is hereto attached, was printed and published in said newspaper for _____ 2 _____ successive issues, the first publication being on the _____ 8th _____ day of _____ April _____, 19 _____ 98 _____, and the last publication on the _____ 15th _____ day of _____ April _____, 19 _____ 98 _____; that \$ \$97.49 ^{61.94}, being the full amount of the fee for publication of the annexed notice insures solely to the benefit of the publishers of the said newspaper; that no arrangement or understanding for a division thereof has been made with any person and that no part thereof has been agreed to be paid to any other person whomsoever.

Melanie Gaulke

Subscribed and sworn to before me this 24th day of April, 19 98.

Ardeella Geist

Notary Public, Meade County

comm exp: 7-11-2001

Readvertisement Of
Notice Of Hearing On
Water Permit Application
No. 1661-1

Notice is given that Howes Grazing Association, c/o Paul L. Delbridge, P.O. Box 150, Howes, SD 57748 has filed an application to appropriate 1,700 acre feet of water in an existing dam to provide habitat for fish and wildlife production and livestock water. The existing dam is the Highway 34 Road Dam #2 which is owned by the South Dakota Department of Transportation (DOT). The dam impounds 1,700 acre-feet of water from an unnamed tributary of Luis Creek. Readvertisement of the notice on this application, published February 18 and 25, 1998, is necessary to clarify ownership of the dam and to provide a complete description of the existing dam. The dam located in the SE1/4 SE1/4 Section 25, T8N, R17E is owned and maintained by the SD Department of Transportation (DOT). The dam was constructed in 1961 as part of the DOT Highway 34 Project. The dam embankment is formed by SD Highway 34 and is located in the SE1/4 SE1/4 Section 25, T8N, R17E. DOT Highway 34 Road Dam #2 impounds water in the SE 1/4, SW 1/4 NE 1/4, NE 1/4 SW 1/4, E 1/2 NW 1/4 Section 25; all in T8N-R17E. This application requests sufficient water to maintain water up to outlet elevation 2315 feet mean sea level (1,700 acre feet of water) in the dam. The DOT will retain the right to adjust water levels in the lake as necessary to assure roadway embankment stability and safety, including draining the water from the dam.

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 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 27, 1998. 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.

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based on the facts presented at the public hearing. The May 6, 1998, 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 27, 1998.

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[Publish April 8 & 15, 1998]

PAYMENT REQUEST FORM

PAYEE: The Faith Independent
P.O. Box 38
Faith, SD 57626

FROM: Water Rights Program
523 E. Capitol
Pierre, SD 57501-3181

DESCRIPTION OF SERVICE, PRODUCE OR TRANSFER

Publication of Readvertisement of Notice of Hearing on Water Permit
Application No. 1661-1, published on April 8 & 15, 1998.

AMOUNT: \$61.94

FUNDING SOURCE:

GENERAL: X

FEDERAL:

COMMENTS:

AUTHORIZATION: _____

John Hubert

5-14-98

I declare and affirm under the penalties of perjury that this claim is
in all things, true and correct. I further agree to comply with the
provisions of the Civil Rights Act of 1964 and regulations issued
thereunder relating to nondiscrimination in federal assisted programs.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

SEP 3 1998

Howes Grazing Association
%Paul L. Delbridge
P.O. Box 150
Howes, SD 57748

Dear Mr. Delbridge:

Enclosed is Water Permit No. 1661-1 authorizing your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

The final inspection has been completed on this Permit, and we are ready to issue the Water License. Statutes require we charge \$50 for the inspection and issuance of the final papers. Upon receipt of this amount the Water License will be sent to you.

Very truly yours,

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

enclosures

c: John Cole, Department of Transportation

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

No 415860

Pierre, September 15, 1998

RECEIVED OF Howes Grazing Assn., Box 138, Howes, SD 57748
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. 1661-1

50 00

Fee for Filing Transfer Form _____

Fee for Filing Extension Request _____

Fee for _____

(Any Other Work Provided by Law)

Total

50 00

By _____
Chief Engineer

John Hatch 

Permit No. 1661-1
Lower Cheyenne - 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, May 16, 1997, made a thorough examination of the water use system constructed by Howes Grazing Association of PO Box 150, Howes, SD 57748 holder of Permit No. 1661-1, bearing the priority of January 30, 1998 authorizing the storage of 1700 acre-feet of the waters of runoff (Howes Grazing Lake) for fish & wildlife and livestock watering purposes, in Meade County.

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

A. Works used to divert the water:

Howes Grazing Lake (DOT Road Dam #2, ID No. 407)

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

C. Works used to apply water to beneficial use:

Howes Grazing Lake (DOT Road Dam #2, ID No. 407)

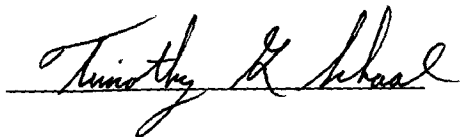
The system is in the following condition Good. The point of diversion is located 800 feet west of the SE corner of Sec. 25-T8N-R17E (SE ¼ SE ¼). The works are capable of storing 1700 acre-feet of water which is to be used for fish & wildlife and livestock watering. Water has been put to beneficial use to the maximum extent as follows:

Howes Grazing Lake (DOT Road Dam #2, ID No. 407)

comprising a total of 1700 acre-feet of storage.

Applicable permit qualifications have been complied with: Yes X

Exceptions to compliance are: none Date Report Completed: June 26, 1998



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

REPORT ON INSPECTION OF PERMIT NO. 1661-1

Other permit(s) associated with the project: XXXX

DATE OF INSPECTION: May 16, 1997

NAME & ADDRESS OF INSPECTION CONTACT/ Paul L. Delbridge, Howes Grazing Association,
PO Box 150, Howes, SD 57748

RELATIONSHIP TO PERMIT HOLDER, IF APPLICABLE: Secretary/Treasure

NAME & ADDRESS OF PERMIT HOLDER: Howes Grazing Association

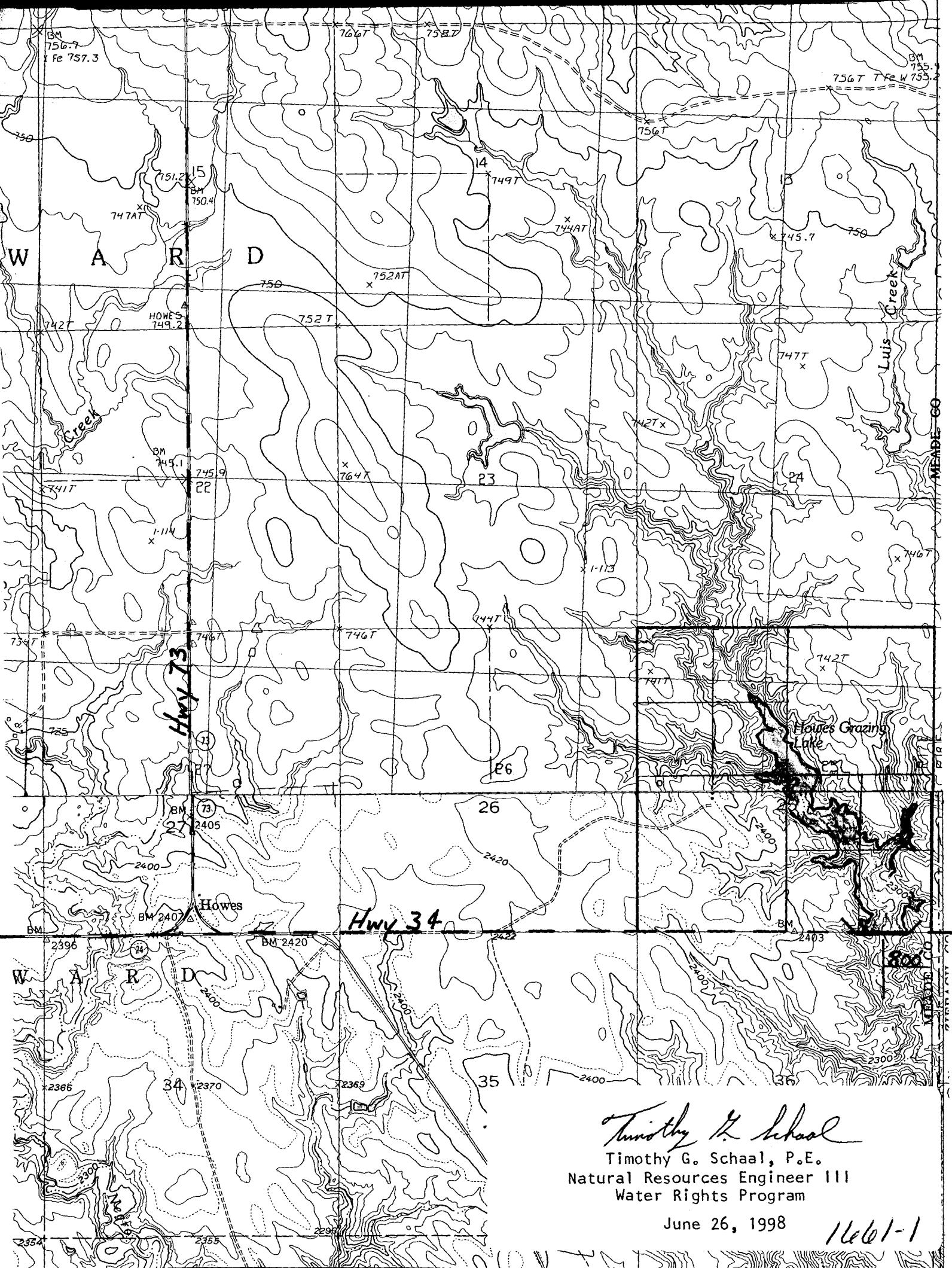
DIVERSION POINT LEGAL LOCATION: 800 feet west of the SE corner of Section 25-T8N-R17E
(SE ¼ SE ¼)

DAM INFORMATION:

- 1) Height to crest 82 feet
- 2) Height to primary spillway 67 feet
- 3) Height to secondary spillway N/A feet
- 4) Crest width 50 feet
- 5) Crest length 900 feet
- 6) Spillway length N/A feet
- 7) Spillway width 42 inch
- 8) Approx. storage (Normal) 1700 acre-feet
- 9) Approx. storage (Maximum) 2850 acre-feet
- 10) Date constructed: 1961

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

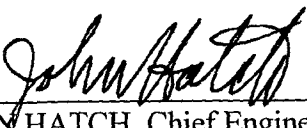
WATER LICENSE NO. 1661-1

(1) Howes Grazing Association, c/o Paul L Delbridge, PO Box 150, Howes SD 57748 made Application No. 1661-1, January 30, 1998 for a water permit to impound 1,700 acre-feet of water from an unnamed tributary of Luis Creek, Meade County, South Dakota for fish and wildlife propagation and livestock water purposes. The dam is owned by the South Dakota Department of Transportation and is known as Howes Grazing Lake (DOT Highway 34 Road Dam #2). Permit No. 1661-1, with a priority date of January 30, 1998 was approved May 6, 1998. Construction of the dam and the application of water to beneficial use was completed in 1961 and complies with applicable provisions of the South Dakota State Law.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the construction of the storage dam and is entitled to impound 1,700 acre-feet of water for beneficial use with sufficient water annually to maintain the water level to the outlet elevation of 2,315.0 feet mean sea level. The location of the storage dam (spillway) is 800 feet west of the southeast corner of Section 25-T8N-R17E (SE ¼ SE ¼).

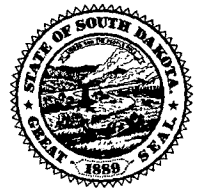
(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use.

(4) Pursuant to South Dakota Water Law 46-5-30.1 Howes Grazing Association, c/o Paul L Delbridge, PO Box 150, Howes SD 57748, holder and the South Dakota Department of Transportation, owner of Water Permit No. 1661-1 are issued a license to appropriate water, the right to impound 1,700 acre-feet of water from an unnamed tributary of Luis Creek with sufficient water annually to maintain the water level to the outlet elevation of 2,315.0 feet mean sea level with a priority date of January 30, 1998 from the location specified in (2) of this license. The water is used to provide habitat for fish and wildlife propagation and livestock water. This license is subject to any limitations or qualifications listed in Water Permit No. 1661-1 and subject to South Dakota State Law.


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

SEP 23 1998

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

SEP 23 1998

1661-1

Howes Grazing Association
%Paul L. Delbridge
P.O. Box 150
Howes, SD 57748

Dear Mr. Delbridge:

Enclosed is Water License No. 1661-1 and Receipt No. 415860 for \$50.00 which was assessed for an investigation and issuance of the license. Water License No. 1661-1 is the final document which completes the process of obtaining a water right.

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

Very truly yours,

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

ks
enclosures

c: John Cole, Department of Transportation

INTER-OFFICE MEMO

TO: Office of Road Design
Attn: Karen Olson

FM: Steve Van Mullem, P.E. & Kevin Marton, P.E.
Office of Bridge Design

RE: M 034-472, Meade County, PCN I3KC & M 034-352, Ziebach County, PCN I3KD
SD34, 2.4 & 3.8 miles E of Jct. SD34 & SD73
Over Howes Lake and Buffalo Lake
Emergency Pipe Repair

DT: July 10, 2014

The purpose of this memo is to provide hydraulic data and recommendations in response to culvert failures that occurred during a recent flood event. Recommendations include the size and type of pipe, thrust blocks, cutoff walls, and scour protection at culvert outlets. See also U:\rd\pri\meadI3KC\I3KC NonSection.pdf for culvert layouts.

The peak flows for each site were calculated based on weighted stream gage adjustment using USGS stream gage #06439080 located on a nearby stream near Avance, SD. Gage values from USGS SIR 2008-5104 was used with equations 4 & 5 of USGS W-RIR 98-4055 to estimate the peak inflows to these sites. Inflow hydrographs were then generated using the USGS synthetic hydrograph procedure found in USGS W-RI 80-80. The inflow hydrographs were then routed based on the available storage above the inlet of the pipe to overtopping of the highway. The estimated inflows were considerably higher than what was used in the previously designed, but is the best available data.

Culvert cutoff walls will be used at the outlet of each downspout to prevent piping failure due to buoyant forces of water acting on the pipe. Downspout cutoff walls shall be designed at a depth of 3'-6" to prevent water from seeping through voids in the riprap layer and potentially undermining the culvert.

Thrust blocks shall be designed at each break of the downspout to resist hydraulic forces at the worst-case of Q_{100-YR} or $Q_{OVERTOPPING}$ flood. The Office of Bridge Design shall use the forces shown on the thrust block tables to help design the thrust block geometry. Each thrust block table shows a force in both the horizontal and vertical direction acting against the force of the water flowing through the pipe.

Riprap aprons are recommended at the outlet of each pipe as described on the following sheets.

Sta. 148+81 (Meade County PCN I3KC):**Hydraulic Data Table: (DA = 4.68 sq. miles)**

Sta. 148+81	Pipe Size	Q25, cfs inflow	Q25, cfs routed	HW25, ft routed	Q100, cfs inflow	Q100, cfs routed	HW100, ft routed	Qovertop flow, cfs
Existing	1-48" & 1-30"	1312	199.7	2325.9	3282	256.7	2331.0	268.6*
Proposed	2-36"	1312	195.9	2326.0	3282	249.1	2330.9	261.1*

*Overtopping of the highway occurs at an elevation of 2332.2 at Sta. 151+00

Thrust Block Table:

SD34 Sta. 148+81 Offset from CL	Thrust Block Resultant Forces due to the water's momentum (velocity flux) [^]	
	Rx (horizontal), lb.	Ry (vertical), lb.
52.38' Rt.	3680.7	279.0
102.62' Rt.	2844.8	1884.8
248.19' Rt.	3403.2	173.4
333.37' Rt.	1234.4	2397.0
[^] The forces shown do not include the friction force from pipe, earth load & block weight, or soil pressure.		

Riprap Apron Recommendations:

Provide a 3'-0" deep layer of Class B Riprap to extend 40-ft downstream from the outlet of each pipe at a width of 12'-0". Underlie the riprap with Type B Drainage Fabric for filtration. The top of the riprap surface shall tie-in with the culvert outlet and the natural ground surface downstream.

Sta. 176+67 (Ziebach County PCN I3KD):**Hydraulic Data Table: (DA = 2.64 sq. miles)**

Sta. 176+67	Pipe Size	Q25, cfs inflow	Q25, cfs routed	HW25, ft routed	Q100, cfs inflow	Q100, cfs routed	HW100, ft routed	Qovertop flow, cfs
Existing	1-48"	947	140.2	2347.4	2370	185.5	2351.1	214.3*
Proposed	2-36"	947	161.9	2347.3	2370	206.6	2350.6	243.6*

*Overtopping occurs at an elevation of 2354.1' at Sta. 170+60 Lt (camp ground entrance)

*Overtopping of the highway occurs at an elevation of 2354.5'

Thrust Block Table:

SD34 Sta. 176+67 Offset from CL	Thrust Block Resultant Forces due to the water's momentum (velocity flux) ^A	
	Rx (horizontal), lb.	Ry (vertical), lb.
58.3' Rt.	4780.3	632.5
130.29' Rt.	4264.8	2000.6
229.28' Rt.	2586.5	146.5
342.78' Rt.	1336.4	2206.0
^A The forces shown do not include the friction force from pipe, earth load & block weight, or soil pressure.		

Riprap Apron Recommendations:

Provide a 3'-0" deep layer of Class B Riprap to extend 20-ft downstream from the outlet of each pipe at a width of 20'-0". Underlie the riprap with Type B Drainage Fabric for filtration. The top of the riprap surface shall tie-in with the culvert outlet and the natural ground surface downstream.

Pipe Recommendations Sta. 170+60 Lt. (Camp Ground Entrance)

No pipe is recommended through this approach since there is more available storage above the 100-year on the east dam then the west and flow will overtop the camp ground approach before the highway based on the survey.

cc: Office of Bridge Design
Foundations
Environmental
Pierre Region
Pierre Area
PIC

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED
**PROJECTS ER 0034(172)115
& ER 0034(173)116**
**SD HIGHWAY 34
MEADE & ZIEBACH COUNTIES**

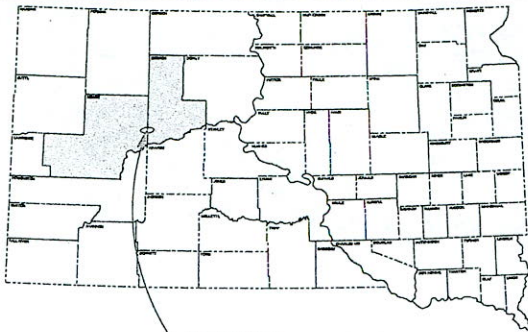
EMERGENCY EROSION REPAIR, PIPE REPLACEMENT
GRADING & ROW PLANS
PCN 052C & 052D

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
ER 0034(172)115	ER 0034(173)116	1	57

Posting Date: 07/18/2014

INDEX OF SHEETS

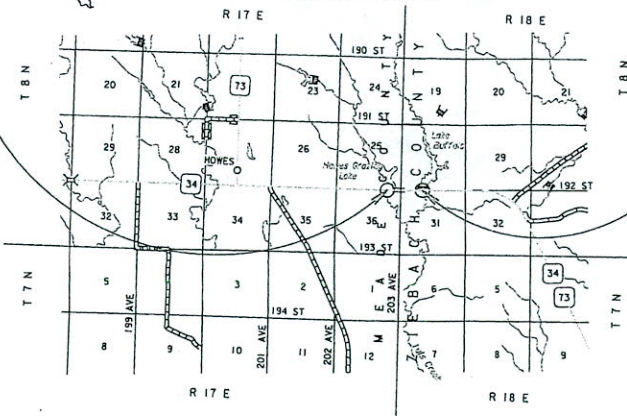
1	General Layout W/Index
2-4	Estimate of Quantities and Environmental Commitments
5-9	General Notes & Tables
10-12	Typical Sections
13-18	Erosion and Sediment Control
19	Horizontal Alignment Data & Control Data Sheet
20	Topography Symbolology & Legend
21-22	Plan Sheets
23-31	Special Detail Sheets
32-43	Standard Plates
44-55	Cross Sections
56-57	Pipe Sections



PROJECTS

ER 0034(172)115
West Dam

ER 0034(173)116
East Dam



DESIGN DESIGNATION

ADT (2013)	500
ADT (2033)	670
DHV	78
D	52%
TDHV	10.2%
T ADT	22.4%
V	70 mph

STORM WATER PERMIT

Major Receiving
Body of Water: Howes Grazing Lake, Lake Buffalo, Lula Creek
Area Disturbed: 32 Acres
Total Project Area: 38 Acres
Approx. Begin Lat: 44.615341872 / Long: -102.0094387831

ER 0034(172)115, PCN 052C

GROSS LENGTH	580.00 FEET	0.110 MILES
LENGTH OF EXCEPTIONS	0.00 FEET	0.000 MILES
NET LENGTH	580.00 FEET	0.110 MILES

ER 0034(173)116, PCN 052D

GROSS LENGTH	460.00 FEET	0.087 MILES
LENGTH OF EXCEPTIONS	0.00 FEET	0.000 MILES
NET LENGTH	460.00 FEET	0.087 MILES

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF	PROJECT	SHEET	TOTAL
KANSAS	ER 0034(173)115	2	57
	ER 0034(173)116		
Posting Date:	07/18/2014		

ER 0034(172)115 PCN 052C - West Dam

ER 0034(173)116 PCN 052D - East Dam

INDEX OF SHEETS

2 Estimate of Quantities
3 to 4 Environmental Commitments

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
009E0400	Eliminated Materials	Lump Sum	LS
100E0100	Clearing	Lump Sum	LS
110E0080	Remove Concrete Anchor Block	3	Each
110E7822	Remove Fence for Reset	1,638	Fl
120E0010	Unclassified Excavation	14,876	CuYd
120E0500	Option Borrow Excavation	41,777	CuYd
120E6100	Water for Embankment	648.0	MGal
230E0010	Placing Topsoil	1,700	CuYd
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1030	Base Course, Salvaged	975.0	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	975.0	Ton
320E1200	Asphalt Concrete Composite	391.0	Ton
360E9010	Temporary Gravel Crossing	1	Each
420E0400	Structure Excavation, Miscellaneous	2	CuYd
421E0100	Pipe Culvert Undercut	283	CuYd
450E0183	36" RCP Class 3, Furnish	128	Fl
450E0184	36" RCP Class 4, Furnish	96	Fl
450E0190	36" RCP, Install	224	Fl
450E2028	36" RCP Flared End, Furnish	2	Each
450E2029	36" RCP Flared End, Install	2	Each
450E4788	36" CMP 14 Gauge, Furnish	600	Fl
450E4790	36" CMP, Install	600	Fl
450E5025	36" CMP Elbow, Furnish	8	Each
450E5026	36" CMP Elbow, Install	8	Each
450E5223	36" CMP Flared End, Furnish	2	Each
450E5224	36" CMP Flared End, Install	2	Each
450E8024	36" RCP to CMP Transition, Furnish	2	Each
450E8025	36" Pipe Transition, Install	2	Each
450E8500	Trash Guard, Furnish	2	Each
450E8501	Trash Guard, Install	2	Each
462E0100	Class M6 Concrete	97.0	CuYd
480E0100	Reinforcing Steel	2,934	Lb
600E0200	Type II Field Laboratory	1	Each
620E0515	Type 1A Temporary Fence	10,000	Fl
630E4100	Reset Fence	1,538	Fl
633E1300	Pavement Marking Paint, White	2.0	Gal
633E1305	Pavement Marking Paint, Yellow	1.0	Gal
634E0010	Flagging	120	Hour
634E0100	Traffic Control	801	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0940	Temporary Pavement Marking	1,272	Fl
700E0210	Class B Riprap	150.0	Ton
730E0210	Type F Permanent Seed Mixture	494	Lb
732E0100	Mulching	48.2	Ton
734E0103	Type 3 Erosion Control Blanket	2,450	SqYd
734E0154	12" Diameter Erosion Control Wattle	6,280	Fl
734E0510	Shaping for Erosion Control Blanket	150	Fl
734E0604	High Flow Silt Fence	2,300	Fl
734E0610	Mucking Silt Fence	160	CuYd
734E0620	Repair Silt Fence	575	Fl
734E5005	Dewatering	Lump Sum	LS
831E0110	Type B Drainage Fabric	446	SqYd

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
009E0400	Eliminated Materials	Lump Sum	LS
100E0100	Clearing	Lump Sum	LS
110E0080	Remove Concrete Anchor Block	3	Each
110E7822	Remove Fence for Reset	1,655	Fl
120E0010	Unclassified Excavation	10,024	CuYd
120E0500	Option Borrow Excavation	32,052	CuYd
120E6100	Water for Embankment	491.0	MGal
230E0010	Placing Topsoil	1,300	CuYd
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1030	Base Course, Salvaged	768.0	Ton
270E0040	Salvage and Stockpile Asphalt Mix and Granular Base Material	768.0	Ton
320E1200	Asphalt Concrete Composite	308.0	Ton
360E9010	Temporary Gravel Crossing	1	Each
420E0400	Structure Excavation, Miscellaneous	2	CuYd
421E0100	Pipe Culvert Undercut	315	CuYd
450E0183	36" RCP Class 3, Furnish	128	Fl
450E0184	36" RCP Class 4, Furnish	128	Fl
450E0190	36" RCP, Install	256	Fl
450E2028	36" RCP Flared End, Furnish	2	Each
450E2029	36" RCP Flared End, Install	2	Each
450E4788	36" CMP 14 Gauge, Furnish	616	Fl
450E4790	36" CMP, Install	616	Fl
450E5025	36" CMP Elbow, Furnish	8	Each
450E5026	36" CMP Elbow, Install	8	Each
450E5223	36" CMP Flared End, Furnish	2	Each
450E5224	36" CMP Flared End, Install	2	Each
450E8024	36" RCP to CMP Transition, Furnish	2	Each
450E8025	36" Pipe Transition, Install	2	Each
450E8500	Trash Guard, Furnish	2	Each
450E8501	Trash Guard, Install	2	Each
462E0100	Class M6 Concrete	139.0	CuYd
480E0100	Reinforcing Steel	3,636	Lb
620E0515	Type 1A Temporary Fence	2,000	Fl
620E4100	Reset Fence	1,655	Fl
633E1300	Pavement Marking Paint, White	2.0	Gal
633E1305	Pavement Marking Paint, Yellow	1.0	Gal
634E0010	Flagging	120	Hour
634E0100	Traffic Control	801	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0940	Temporary Pavement Marking	1,272	Fl
700E0210	Class B Riprap	126.0	Ton
730E0210	Type F Permanent Seed Mixture	338	Lb
732E0100	Mulching	33.5	Ton
734E0103	Type 3 Erosion Control Blanket	2,100	SqYd
734E0154	12" Diameter Erosion Control Wattle	4,280	Fl
734E0510	Shaping for Erosion Control Blanket	80	Fl
734E0604	High Flow Silt Fence	1,900	Fl
734E0610	Mucking Silt Fence	130	CuYd
734E0620	Repair Silt Fence	475	Fl
734E5005	Dewatering	Lump Sum	LS
831E0110	Type B Drainage Fabric	304	SqYd

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0034(172)115 ER 0034(173)115	3	57
Plotting Date: 07/18/2014			

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: WATER QUALITY STANDARDS

Buffalo Lake is classified as a warm water permanent fish life propagation waters with a total suspended solids standard of 20 milligrams/liter.

Howes Dam is classified as fish and wildlife propagation, recreation, irrigation, and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

The Contractor is advised the South Dakota Surface Water Quality Standards, administered by the Department of Environment and Natural Resources (DENR), apply to this project. Special construction measures shall be taken to ensure the above standard(s) of the surface waters are maintained and protected.

COMMITMENT D2: SURFACE WATER DISCHARGE

Buffalo Lake is classified as a warm water fishery with a total suspended solids standard of 90 milligrams/liter.

Howes Dam is classified as fish and wildlife propagation, recreation, irrigation and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that this water body is not impacted.

Action Taken/Required:

If construction dewatering is required, the Contractor shall obtain a Temporary Discharge Permit from the DENR and provide a copy to the Project Engineer. Contact the DENR Surface Water Program at 605-773-3351 to apply for a permit.

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance.

Action Taken/Required:

The DENR and the US Environmental Protection Agency (EPA) have issued separate general permits for the discharge of storm water runoff. The DENR permit applies to discharges on state land and the EPA permit applies to discharges on federal or reservation land. The Contractor is advised this project is regulated under the Phase II Storm Water Regulations and must receive coverage under the General Permit for Construction Activities. A Notice of Intent (NOI) will be submitted to DENR a minimum of 15 days prior to project start by the DOT Environmental Office. A letter must be received from DENR that acknowledges project coverage under this general permit before project start. The Contractor is advised that permit coverage may also be required by off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

The Contractor shall adhere to the "Special Provision Regarding Storm Water Discharges to Waters of the State" for ER 0034(172)115, PCN 052C.

The Contractor shall adhere to the "Special Provision Regarding Storm Water Discharges to Waters of the United States within Indian Reservations" for ER 0034(173)115, PCN 052D.

A major component of the storm water construction permits is development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is a joint effort and responsibility of the SDDOT and the Contractor. Erosion control measures and best management practices will be implemented in accordance with the SWPPP. The SWPPP is a dynamic document and is to be available on-site at all times.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT:
<http://sddot.com/transportation/highways/environmental/stormwater/Default.aspx>

DENR: <http://www.denr.sd.gov/des/sw/stormwater.aspx>

EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Contractor Certification Form (ER 0034(172)115, PCN 052C):

The "Department of Environment and Natural Resources - Contractor Certification Form" (SD EForm - 2110LDV1-ContractorCertification.pdf) shall be completed by the Contractor or their certified Erosion Control Supervisor after the award of the contract. Work may not begin on the project until this form is signed.

The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the Surface Water Discharge General Permit for Storm Water Discharges Associated with Construction Activities for the Project.

The online form can be found at:
<http://denr.sd.gov/des/sw/forms/E2110LDV1-ContractorCertification.pdf>

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT ER 0034(173)115 ER 0034(173)116	SHEET 4	TOTAL SHEETS 57
Plotting Date: 07/23/2014			

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the State ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Highway, Road, and Railway Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating "No Dumping Allowed".

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27-10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

The Contractor shall arrange and pay for a cultural resources survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 205-334-1038 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow 30 Days from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the US Army Corps of Engineers for the permanent actions associated with this project.

Action Taken/Required:

The Contractor shall comply with all requirements contained in the Section 404 permit.

The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

COMMITMENT O: TRIBAL MONITORING

Tribal monitoring is required for ER 0034(173)115 PCN 052C and ER 0034(173)116, PCN 052D.

Action Taken/Required:

The Contractor shall notify Lance Rom, Quality Services, Inc. (605-388-5308) and the Cheyenne River Sioux Tribe THPO (605-964-7554) one week prior to any earth disturbing activities so that tribal monitors are present to monitor the borrow area cut and fill areas. Tribal monitors are not required for the existing road surface, base/sub-base and culvert removal, and for the sub-base, base and pavement installation.

If artifacts of significant concern are identified by the tribal monitor during project construction activities, then the tribal monitor will notify the Project Engineer and such activities shall be immediately halted. The Project Engineer, in consultation with the Cheyenne River Sioux Tribe THPO and/or tribal monitor and the SDDOT Environmental Office will determine the appropriate course of action.

All artifacts, features, or other items of archaeological or paleontological interest uncovered by project construction activities shall not be displaced unless the Cheyenne River Sioux Tribe THPO consents to it.

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 15 gallons of water per cubic yard of Embankment minus Waste.

The side slopes of the cross pipe trench should be as steep as practical to both maintain a safe working environment and minimize the amount of excavation.

The embankment placed to repair the washed out areas and to replace the cross pipe will be compacted in accordance with the Specified Density Method as detailed in Section 120 of the Specifications. The pipe culvert undercut backfill will have different moisture and density requirements. The testing zones for the embankment other than the undercut will be the same as listed in Section 4 of M.S.T.R., but the frequency of testing in Zone 4 will be increased from 1 per 5 ft. to 1 per 3 feet. The testing requirement for fill placed around the pipe will remain the same as shown in M.S.T.R. section 4.1.E.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, ditch blocks, and approaches are included in the earthwork balance notes on the profile sheets.

Special ditch grades and other sections of the roadway different than the typical section(s) shall be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer shall contact the Designer for the proposed change.

Generally, all shallow inlet and outlet ditches as noted on the plan sheets shall be cut with a 10-foot wide bottom with 5:1 backslopes. However, the Engineer may direct the Contractor to adjust the ditch width for proper alignment with the drainage structure.

Temporary fence and/or permanent fence shall be placed ahead of the grading operation unless otherwise directed by the Engineer.

TYPE II FIELD LABORATORY

The field lab shall include an internet connection to the satisfaction of the Engineer. A hard wired phone connection is not required.

CLEARING

Before clearing activities begin, the Contractor shall contact the Engineer to determine the limits of clearing for the project. If the trees or shrubs that are supposed to remain within the limits of work are damaged or destroyed by the Contractor, the Contractor shall replace them with the same size and type at the Contractor's expense.

SHRINKAGE FACTOR: Embankment +30%

TABLE OF EXCAVATION DISCOUNTS BY BALANCE

Location	Excavation (CuYd)	Option Borrow Exc. (CuYd)	Total Excavation (CuYd)
West Dam	4182	38969	43151
East Dam	2262	30480	32742
Total	6444	69449	75893

* The quantities for these items are in the Estimate of Quantities under their respective bid items.

TABLE OF UNCLASSIFIED EXCAVATION

	West Dam	East Dam
Excavation (Unstable and Scour Hole Perimeter Exc.)	4182	2202
Topsoil	1700	1300
Exc. for Deep Pipe Removal	8278	6116
Salvaged Asphalt Mix and Granular Base Material	518	406
Total	14676	10024

PROCEDURES FOR DETERMINING UNCLASSIFIED EXCAVATION QUANTITY

When plan quantities are used for payment, the Unclassified Excavation quantity shall be used for final payment. If final cross sections are taken in the field, add all of the items in the Table of Unclassified Excavation using the following procedures:

The Unstable Material Excavation quantity is included in the Excavation quantity listed in the Table of Unclassified Excavation. When finaling a project, the Unstable Material Excavation quantity shall be added to the Excavation quantity to compute the Unclassified Excavation quantity.

The Topsoil quantity in the Table of Unclassified Excavation is an estimate. When finaling a project, the total quantity of field measured Topsoil shall be used in place of the estimated Topsoil quantity. The quantity of Topsoil from the cuts will be paid for twice as Unclassified Excavation, as it will be in both the Excavation and Topsoil quantities. This will be full compensation for Excavation, which includes necessary undercutting to provide space for placement of topsoil.

The Excavation quantities from individual balances and the Table of Unclassified Excavation have been reduced by the volume of in place surfacing that will be removed.

STATE OF	PROJECT	BIDDER	TOTAL
SOUTH	ER 0034(173)115		
DAKOTA	ER 0034(173)116	5	57

Posting Date: 07/18/2014

TABLE OF OPTION BORROW EXCAVATION

	West Dam (CuYd)	East Dam (CuYd)
Option Borrow Excavation	38969	30480
Topsoil in Option Borrow Pits	2808	1572
Total	41777	32052

UNSTABLE MATERIAL EXCAVATION

Unstable Excavation will be required throughout the project limits to excavate saturated or weak compressible soils and other organic materials. A nominal 2 ft. depth of unstable material is anticipated to be removed from the bottom of scour holes and toe of the berms prior to construction of the embankment. The depth of unstable excavation may be adjusted by the Engineer to ensure a solid foundation free of organic, soft, unstable material is prepared.

The areas of unstable material excavation are drawn on the cross sections with a normal depth of 2 feet. The estimated quantity of 1573 cubic yards of unstable material excavation shall be paid for at the contract unit price per cubic yard for "Unclassified Excavation".

All areas designated as Unstable shall be excavated. The unstable material excavated on this project shall be placed outside the subgrade shoulder in fill sections or stockpiled and used as topsoil.

Field measurement of unstable material excavation shall not be made. However, if there are additional areas of unstable material excavation other than what is shown in the plans, the Engineer shall direct removal of these areas and the additional areas will be measured according to the Engineer.

TABLE OF UNSTABLE MATERIAL EXCAVATION

Station	to Station	Area	L/R	Depth (ft)	Quantity (CuYd)
148+50	148+55	Toe of berm	R	2	262
148+80	148+70	Scour hole bottom	R	2	589
173+80	176+90	Toe of berm	R	2	523
176+50	176+90	Scour hole bottom	R	2	199
Total:					1573

SCOUR HOLE PERIMETER EXCAVATION

Included in the quantity of "Unclassified Excavation" are 4811 cubic yard of scour hole perimeter excavation. The scour hole walls shall be excavated to a slope of 1:1.

SALVAGE AND STOCKPILE ASPHALT MIX AND GRANULAR BASE MATERIAL

An estimated 1743 tons (922 Cubic Yards) of asphalt mix and granular base material shall be salvaged where needed for pipe removal and installation and stockpiled at a site furnished by the Contractor and satisfactory to the Engineer.

The quantity of salvage asphalt mix and granular base material may vary from the plans. No adjustment will be made to the contract unit price for variations of the quantity of "Salvage and Stockpile Asphalt Mix and Granular Base Material."

The salvaged material shall be used on this project as Base Course, Salvaged.

OPTION BORROW PITS

Temporary fence shall be erected prior to commencement of pit operations at option borrow pits 1 and 2. Estimated fence quantities are included in the fence estimate table.

Borrow pit topsoil, to be stockpiled separately from the rest of the overburden, will be considered to consist of the upper 3 inches of natural soil.

At the completion of pit operations, all disturbed areas shall be restored with slopes created by material removal left 3:1 or flatter.

TABLE OF OPTION BORROW PITS

Site	Location	L/R	Option Borrow Exc. (CuYd)
1	West Dam	R	38969
2	East Dam	R	30480
			69449

The quantities listed in the above table for Option Borrow Excavation are also included in the Table of Excavation Quantities by Balances.

EXCAVATION FOR DEEP PIPE REMOVAL AND INSTALLATION

Included in the quantity of "Unclassified Excavation" is excavation for removal of deep pipes. Deep pipes are existing mainline pipes at depths of 10 feet or greater (measured from the flow line to the lowest elevation of either the existing ground line, undercut line, or bottom of removed or salvaged surfacing).

All work necessary to excavate and backfill the deep pipes including labor, equipment, and incidentals shall be incidental to the contract unit price per cubic yard for "Unclassified Excavation". Payment for deep pipe excavation shall be based only on plans quantity and measurement of these excavation quantities during construction shall not be performed.

The excavation quantities for deep pipes are not included with the earthwork balance quantities on the plan sheets. The quantities computed for excavation of the deep pipes are based on the limits shown in the

drawing below. The drawing shows a box culvert for illustration purposes only; the limits are similar for a pipe.

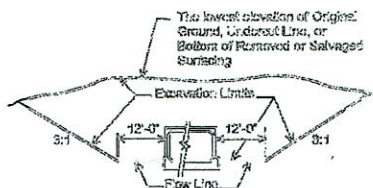


TABLE OF EXCAVATION FOR DEEP PIPE REMOVAL AND INSTALLATION

Station	Location	Type	Quantity (CuYd)
148+81	West Dam	Remove and Install Pipe	3447
149+62	West Dam	Remove Pipe	6321
176+67	East Dam	Remove and Install Pipe	8115
Total:			14883

PIPE CULVERT UNDERCUT

The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. Pipes shown may or may not require undercutting and pipes not shown may require undercutting. The Engineer will determine which pipe shall be undercut in accordance with Section 421 of the Specifications.

The cross pipe will be undercut 2 feet, beginning at the inlet and extending to the first elbow connection to the downstream. The downstream will not be undercut. The undercut will be continuous across the area between the pipes. The width of the undercut will be from 2 feet outside the outermost edge of one pipe to 2 feet outside the opposite pipe.

Compaction of the pipe undercut backfill shall be governed by the Specified Density Method. For all soils having optimum moisture of 25 % or greater, the moisture content at the time of compaction shall not be lower than 2 percentage points below optimum, nor greater than 3 percentage points above optimum. Compaction of these soils shall be 95% +/- 3% of maximum dry density. A minimum of one moisture-density test will be performed in both the bottom 1 foot and top 1 foot of undercut backfill.

Location	Station	Undercut Depth (Ft)	Quantity (CuYd)
West Dam	148+81	2	283
East Dam	176+67	2	315
Total:			598

STATE OF SOUTH CAROLINA	PROJECT	SHEET	TOTAL SHEETS
	ER 0034(172)115 ER 0034(173)116	6	57
Posting Date:		07/18/2014	

REMOVED PIPE, REMOVED

Station	L/R	Remarks
148+78	L/R	Take Out 30"-124" RCP & 30"-254" CMP Downspout & 2 End Sections
149+02	L/R	Take Out 42"-103" RCP (60' in place and 28' exposed) & 42"-252" CMP Downspout (232' exposed) & 2 End Sections
149+76	L	Salvage Safety Guard
149+76	L	Remove Safety Guard Footing
176+07	L	Salvage Safety Guard
176+07	L	Remove Safety Guard Footing
176+79	L/R	Take Out 46"-122" RCP (96' in place and 24' exposed) & 46"-300" CMP Downspout (120' in place and 180' exposed) & 2 End Sections

SAVING ITEMS

All salvaged items noted on the plans shall be salvaged for future highway use. Department of Transportation Forces will pick up salvaged items at the project site. Care shall be taken not to damage the structural properties of the items during dismantling and transporting. All broken concrete and materials not salvaged shall be disposed of in accordance with the Specifications. All costs for salvaging and transporting the items shall be incidental to the contract lump sum price for "Incidental Work, Grading". Before preparing higher bid, the Contractor shall make a visual inspection of the project to verify the extent of the work and material involved.

TRASH GUARDS FOR RCP FLARED END SECTIONS

Trash guards shall be provided on the RCP flared end sections where specified. Trash guards shall meet the requirements of those provided by Crete Concrete Products with standard design bar sizes or equivalent.

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 1/2-inch X 1/2-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5-inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

All CMP shall be 14 gauge. Connection bands shall be 24" wide. All CMP, CMP elbows, transitions, and 24" bands shall be Polymer Coated and shall conform to AASHTO M245 and AASHTO M 36. All costs associated for gauge, coating and connections shall be incidental to the corresponding CMP bid items.

All damage to the Polymer Coating shall be repaired according to the manufacturer's recommendations prior to installation.

CORRUGATED METAL PIPE END SECTIONS, ALUMINIZED TYPE 2 COATING

All CMP end sections shall conform to AASHTO M 36, Aluminum Type 2. All costs associated for gauge, coating and connections shall be incidental to the corresponding CMP End Section bid items.

TABLE OF DRAINAGE BLOCK

Station-Offset	L/R	Class M6 Concrete (CuYd)	Reinforcing Steel (lb)
148+69.50 & 148+62.50-50.53'	R	23.6	809
148+69.50 & 148+62.50-100.82'	R	24.2	882
148+69.50 & 148+62.50-248.13'	R	23.8	882
148+69.50 & 148+62.50-331.37'	R	24.8	774
176+55.50 & 176+78.50-58.30'	R	33.4	831
176+55.50 & 176+78.50-130.28'	R	34.0	831
176+55.50 & 176+78.50-229.28'	R	34.4	831
176+55.50 & 176+78.50-342.78'	R	34.8	923
Total:		232.4	6089

TABLE OF CULVERT OUTLET OUTSIDE WALLS

Station-Offset	L/R	Class M6 Concrete (CuYd)	Reinforcing Steel (lb)	Structure Excavation, Misc (CuYd)
148+69.50-357.04'	R	0.9	120	0.9
148+92.50-357.07'	R	0.9	120	0.9
176+55.50-371.34'	R	0.9	120	0.9
176+78.50-371.34'	R	0.9	120	0.9
Total:		3.6	480	3.6

REINFORCED CONCRETE PIPE

Reinforced concrete pipe shall have rubber gasket joints to provide a watertight seal. The gasketed pipe shall meet the requirements of ASTM C443.

All reinforced concrete pipe sections shall be tied with tie bolts similar to the requirements in standard plate 450.18 with the tie bolts also required to have a watertight seal as approved by the Engineer. Tie bolts shall be installed from inside the pipe.

TABLE OF PIPE QUANTITIES

Station	Reinforced Concrete				Corrugated Metal			
	Circular		Circular Hand and with Trash Guard		Circular		Circular Hand and with Trash Guard	
	36"	36"	36"	36"	36"	36"	36"	36"
	CL	CL	CL	CL	CL	CL	CL	CL
148+81	128	88	2	2	600	2	4	4
176+67	128	128	2	2	818	2	4	4
Total:	256	224	4	4	1218	4	8	8

STATE OF SOUTH CAROLINA	PROJECT	SHEET	TOTAL SHEETS
ER 0034(173)115	ER 0034(173)116	7	57

Posting Date: 07/18/2014

The cost for furnishing and installing the rubber gasket joints and tie bolts shall be incidental to the contract unit price per foot for the corresponding reinforced concrete pipe bid item.

TYPE B RIPRAP AND DRAINAGE FABRIC

Location	Station	L/R	Class B Riprap (Ton)	Type B Drainage Fabric (SqYd)
West Dam	148+81	L	0	160
West Dam	148+81	R	150	178
West Dam	176+78	L	0	110
West Dam	176+67	L	0	160
East Dam	176+67	R	128	144
Totals:			276	750

REMOVE AND RESET RIPRAP

The existing riprap located along the north side of the highway shall be removed and reset where needed for the removal of existing pipe and installation of new pipe. Type B Drainage Fabric shall be placed below the riprap before the riprap is reset. The riprap shall be reset to the same limits and thickness as the existing riprap.

All costs for the work needed to remove and reset the existing riprap shall be incidental to the contract unit price per cubic yard of "Unclassified Excavation".

The quantity of Type B Drainage Fabric is included in the Table of Riprap and Drainage Fabric.

If additional riprap is required for this area as determined by the Engineer, the additional riprap quantity shall be measured and paid for at the contract unit price per ton for "Class B Riprap".

DEWATERING

Each of the two lakes that are located upstream and against the north slope of SD 34 shall be dewatered over the highway to a discharge location that is approved by the Engineer, and until the lake elevations reach ten feet below the existing inlet mainline pipe flowlines.

SD DOT Maintenance forces will provide the traffic control needed to close the project to all traffic during the mobilization and installation required for dewatering each site, and until each site is covered with a temporary gravel crossing as detailed in the plans.

All materials required for the dewatering work shall remain the property of the SD DOT at the conclusion of each project. When these materials are no longer needed at the project sites, the Contractor shall neatly disassemble and stockpile each item in a location as determined by the Engineer. State forces will then load and haul the materials off and away from the project sites. All costs for providing and handling the materials which will become the property of the SD DOT shall be incidental to the lump sum price for Eliminated Materials, Dewatering. These eliminated material costs shall be nonparticipating to the contract for FHWA purposes.

TEMPORARY GRAVEL CROSSING

A temporary gravel crossing shall be constructed at each of the two project sites, to cover the dewatering lines that will be placed over the existing asphalt surface of SD 34. All requirements of Standard Plate 390.30 shall be adhered to in the construction and removal of these crossings. Once these are installed, the road will be reopened to all traffic. Each crossing shall then be maintained by the Contractor for the duration of their use.

All materials required for the Temporary Gravel Crossing work described in this COO shall remain the property of the Contractor at the conclusion of each project.

PIPE BACKFILL

Pipe undercut backfill and pipe culvert backfill shall not consist solely of granular material.

SEQUENCE OF OPERATIONS

SD 34 through both projects shall be open to all traffic on either a granular or asphalt surface from July 26, 2014 to August 17, 2014 (inclusive). The road shall not be closed until the day that the salvage and stockpile asphalt and granular base material operation begins. Work shall progress in a continuous manner in order to minimize the amount of time that the road is closed.

SD DOT Maintenance forces will provide the traffic control needed to close the project to all traffic during the period of road closure. All other traffic control shall be provided by the Contractor per Standard Plans.

The final lift of new asphalt surfacing shall be completed within 7 calendar days after the final lift of new base material is placed. If this requirement is not met, then the Contractor shall open the road and maintain all traffic through both project sites on the granular base for the duration of the work. Any work required to install adequate transition slopes, maintain, reshape, and recompact the granular base prior to asphalt paving shall be at the expense of the Contractor.

GENERAL MAINTENANCE OF TRAFFIC

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall be on fixed location, ground mounted, breakaway supports.

The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP Report 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

TEMPORARY PAVEMENT MARKING

Approximately 64 feet of 4 inch white (24" stop bars reduced to 4" equivalent) and 2,400 feet of 4 inch yellow will be required for each stopped condition. The Contractor will be paid only once for temporary pavement marking placement. The Contractor is responsible for maintaining the temporary pavement markings throughout the duration of the work and for removing all temporary pavement markings when no longer required.

Temporary pavement markings shall be as per the Standard Specifications.

In the absence of a signed lane closure or pilot car operation, Flagger symbol signs (W20-7a) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights shall be positioned on the roadway shoulder in advance of workers for both directions of traffic during the installation of temporary road markers. The traffic control device used shall be moved intermittently to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1), a Workers symbol sign (W21-1a), or a BE PREPARED TO STOP (W3-4) warning sign shall be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work shall be approved by the Engineer.

SIGN TABULATION (both projects included)

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G30-2	36" x 18"	END ROAD WORK	2	17	34
R1-1	30" x 30"	STOP	4	21	84
W1-3	48" x 48"	REVERSE TURN SIGN (LEFT OR RIGHT)	2	34	68
W3-1	48" x 48"	STOP AHEAD (SYMBOL)	4	34	136
W3-4	48" x 48"	BE PREPARED TO STOP	4	34	136
W8-1	48" x 48"	BUMP	4	34	136
W8-7	48" x 48"	LOOSE GRAVEL	4	34	136
W13-1P	30" x 30"	ADVISORY SPEED PLATE	4	21	84
W20-1	48" x 48"	ROAD WORK AHEAD FT. OR AHEAD	2	34	68
W20-4	48" x 48"	ONE LANE ROAD AHEAD	2	34	68
W20-7a	48" x 48"	FLAGGER	2	34	68
W21-1a	48" x 48"	SHOULDER WORK	4	34	136
*****		TYPE III BARRICADE - 8 FT DOUBLE SIDED	8	55	440
TOTAL UNITS					1602

SURFACING THICKNESS DIMENSIONS

Plans quantity will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans quantity may be varied to achieve the required elevation.

SAWING IN EXISTING SURFACING

Where new Portland Cement Concrete Pavement (PCCP) or new asphalt concrete is placed adjacent to existing asphalt concrete or PCCP, the existing pavement shall be sawed full depth to a true line with a vertical face. No separate payment shall be made for sawing.

WATER FOR COMPACTION

The cost of water for compaction of the granular material shall be incidental to the various other contract items. Six percent plus or minus moisture will be required at the time of compaction unless otherwise directed by the Engineer.

BASE COURSE, SALVAGED

The Base Course, Salvaged shall be obtained from the stockpile site(s) provided by the Contractor and may be used without further quality and gradation testing.

All other requirements of the Specifications for Base Course, Salvaged shall apply.

ASPHALT CONCRETE COMPOSITE

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements for Class E, Type 1.

All other requirements of the Specifications for Asphalt Concrete Composite shall apply.

The asphalt binder used in the mixture shall be PG 64-22, PG 64-28 or PG 64-34 Asphalt Binder.

The Contractor will only be allowed to place 1 - 2 inch lift per day.

TABLE OF SURFACING QUANTITIES

Location	Base Course, Salvaged Ton	Asphalt Concrete Composite Ton
ER 0034(172)116 PCN 062C Sta. 147+80 to Sta. 150+66	975	391
ER 0034(173)116 PCN 062D Sta. 175+52 to Sta. 177+93	768	308
Totals	1,743	699

TABLE OF FENCE QUANTITIES

Station to Station	Location	Remove Fence for Reset (Ft)	Reset Fence (Ft)	Temporary Fence Type 1A (Ft)
140+00 to 156+00	West Dam			10000
145+60-100'R to 152+85-100'R	West Dam	725	725	
146+55-100'R to 147+84-186'R	West Dam	153	153	
147+83-186'R to 151+33-186'R	West Dam	350	350	
147+97-45'L to 150+30-45'L	West Dam	233	233	
151+33-186'R to 152+85-100'R	West Dam	177	177	
171+00 to 182+63.50	East Dam			2000
172+90-100'R to 178+35-100'R	East Dam	545	545	
173+62 to 178+25 (100'R to 425'R)	East Dam	1110	1110	
Totals =		3293	3293	12000

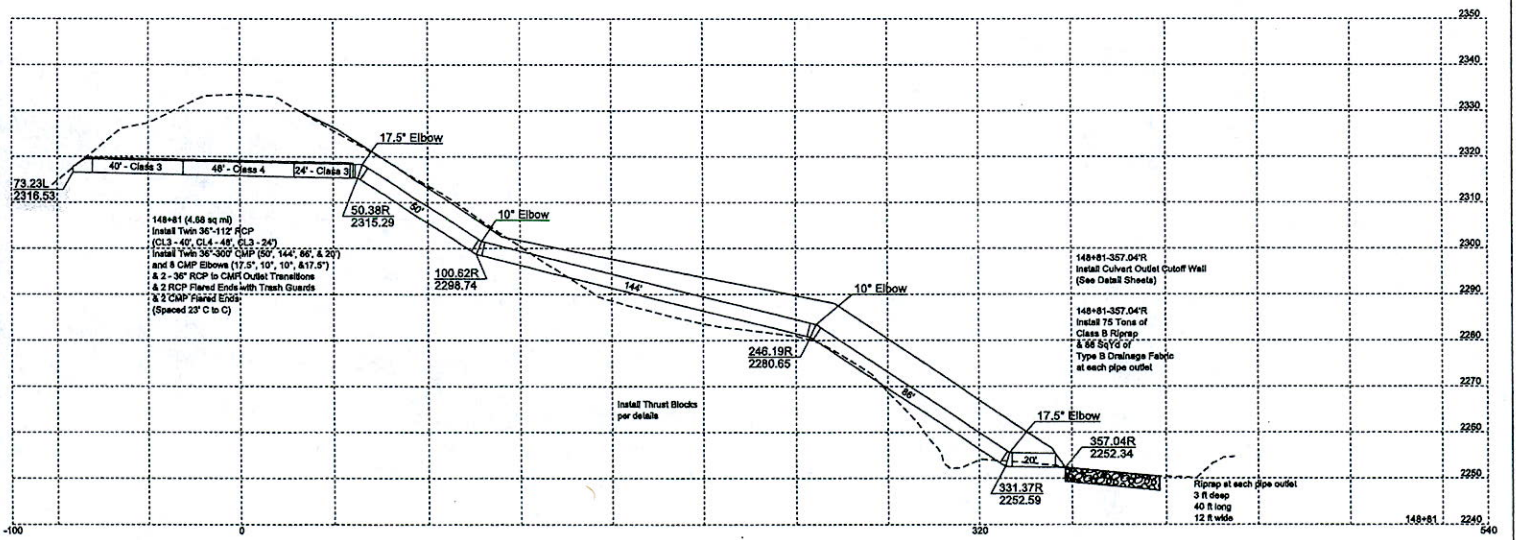
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	ER 0034(172)115 ER 0034(173)116	9	57
Plotting Date:	07/18/2014		

West Dam (Meade Co)

Howes Grazing Lake

Plotting Date: 07/16/2014

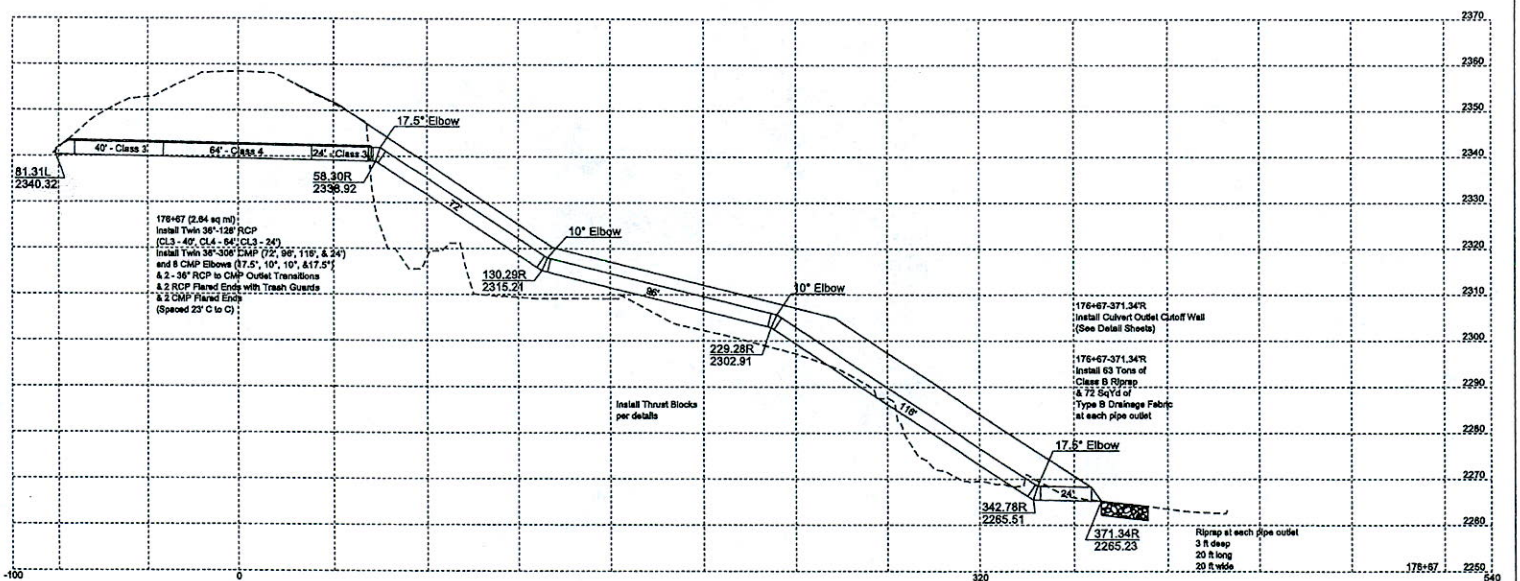
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	ER 0034(172)115	56	57
	ER 0034(173)116		



East Dam (Ziebach Cr.)
Lake Buffalo

Plotting Date: 07/18/2014

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	ER 0034(172)115 ER 0034(173)116	57	57



**SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
REVIEW CERTIFICATION AND AGREEMENT RECORD**

1. SECOND PARTY Ziebach County and Meade County
ADDRESS Box 68, Dupree, SD 57623 & 1425 Sherman St. Sturgis, SD 57785

2. ORGANIZATION RECEIVING BENEFITS SD Department of Transportation

3. PURPOSE OF THE AGREEMENT Closing of Roadways if Dams should break -Howes Dam

4. PERIOD COVERED July 1, 1995 TO _____ AGREEMENT TYPE: LUMP SUM-ACTUAL COST-BOTH

5. TO BE CHARGED TO _____ CONTRACT AMOUNT/EST.COST _____

6. CONTROL NUMBER 910247 DATE ASSIGNED 6-27-95 BUDGET OFFICE (INIT. PMG)

7. IS EXPENDITURE BUDGETED?

_____ YES IF YES WHERE? _____

_____ NO IF NO HAS THE COMMISSION APPROVED? _____ WHEN _____

WE HAVE COMPLETED OUR TECHNICAL REVIEW OF THIS AGREEMENT IN ACCORDANCE WITH THE POLICIES AND PROCEDURES FOR ADMINISTRATION OF CONTRACTS AND AGREEMENTS AND HAVE DOCUMENTED OUR FILES ACCORDINGLY.

DATE: 6/27/95

Originating Organization Signature

WE HAVE COMPLETED OUR LEGAL REVIEW OF THIS AGREEMENT IN ACCORDANCE WITH THE POLICIES AND PROCEDURES FOR ADMINISTRATION OF CONTRACTS AND AGREEMENTS.

DATE: 6-27-70

Office of Legal Counsel Signature

WE HAVE COMPLETED OUR AUDIT REVIEW OF THIS AGREEMENT IN ACCORDANCE WITH THE POLICIES AND PROCEDURES FOR ADMINISTRATION OF CONTRACTS AND AGREEMENTS AND HAVE DOCUMENTED OUR FILES ACCORDINGLY.

DATE:

Internal Audits Signature

VOUCHER PAYMENT RECORD

[illegible]

Personal Use Only

AGREEMENT

This Agreement, entered into this 29th day of June, 1995 by and between the State of South Dakota, Department of Transportation and Ziebach County and Meade County is intended to serve as an instrument of understanding between government entities should either of the dams at MRM 115.5 ± 160.0 along Highway 34 break. These two lakes formed by Highway 34 are Buffalo Lake, Ziebach County, SW 1/4 Section 30 T8N R18E and Howes Grazing Lake, Meade County, SE 1/4 Section 25 T8N R17E.

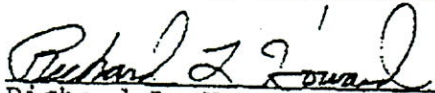
This Agreement will coordinate the closing of roadways should there be a sudden surge of water that might damage these roadways. The principal roadways involved are SD Highway 34 and Meade County Roadway 41S which travels from Highway 34 southeast to the Cheyenne River. Roadway 41S passes through both Meade and Ziebach Counties. Structures involved include Str. No. 69-002-640 and 69-001-649.

This Agreement ensures that should the need arise, the SD DOT Maintenance Forces at Faith, Meade County Highway Forces and Ziebach County Highway Forces will close the roadways as soon as practical with appropriate signing. Further, that the cooperating agencies will provide assistance to each other as requested by the responsible agency for the timely closure of the roadways. A list of appropriate names and telephone numbers will be distributed by the Department of Transportation on an annual basis.

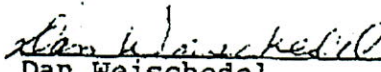
In signing this Agreement the parties involved agree to close the roadways as soon as practical should the above mentioned dams break or it be determined that due to dam condition the closing of the roadways is in the best interest of the public's safety. The involved agencies agree to reimburse actual incurred costs of other agencies for any assistance they may be requested to provide.

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be executed by their respective and duly authorized officers.

SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION


Richard L. Howard, Secretary

MEADE COUNTY


Dan Weischedel
County Highway Supt.

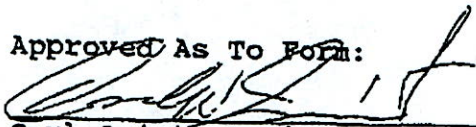
Recommended By:


Clyde Pietz, Director
Division of Operations

ZIEBACH COUNTY


James R. Webb
County Highway Superintendent

Approved As To Form:


Carl Quist, Assistant Attorney General

South Dakota



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

On this 6th day of June, 1995, before me, a Notary Public, personally appeared James R. Webb, known to me to be the Ziebach County Highway Superintendent and acknowledged to me that he did sign the foregoing document as such officer and for the purposes therein stated.

Cindy Lonschick Auditor
Notary Public

My Commission Expires:

2-28-99
(SEAL)



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

On this 29 day of June, 1995, before me, a Notary Public, personally appeared Richard L. Howard, known to me to be the Secretary of Transportation and acknowledged to me that he did sign the foregoing document as such officer and for the purposes therein stated.

Rabara O'Brien
Notary Public

My Commission Expires:

4-18-96
(SEAL)

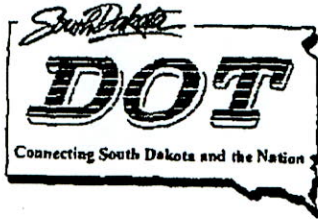
X STATE OF SOUTH DAKOTA)
COUNTY OF MEADE)

On this 8 day of May, 1995, before me, a Notary Public, personally appeared Dan Weischedel, known to me to be the Meade County Highway Superintendent and acknowledged to me that he did sign the foregoing document as such officer and for the purposes therein stated.

[Signature]
Notary Public

My Commission Expires:

My Commission Expires February 12, 2002
(SEAL)



Department of Transportation

Rapid City Region Office

2300 Eglin Street

P.O. Box 1970

Rapid City, SD 57709-1970

Phone: 605/394-2244

FAX: 605/394-1904



Rapid City Design Office

January 5, 1998

Mr. Tim Schaal
Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

Re: **Howes Dam Agreement**

Dear Mr. Schaal:

Attached is the above referenced agreement that you requested.

If I can be of further assistance please feel free to contact me.

Very truly yours,

DEPARTMENT OF TRANSPORTATION

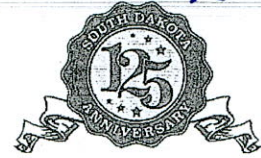
Karen Harris,
Project Engineer

cc: File



DEPARTMENT OF ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov



August 5, 2014

Darin Bergquist, Secretary
Department of Transportation
Becker-Hanson Building
700 E. Broadway Ave.
Pierre, SD 57501

Dear Secretary Bergquist:

We have reviewed the plans and specifications for the Department of Transportation's projects ER 0034(172)115 & ER 0034(173)116 for the emergency erosion repair and spillway pipe replacement at the Howes Grazing Lake Dam in Meade County, and Buffalo Lake Dam in Ziebach County. The plans and specifications for the repair of the dams are 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 the Department of Transportation, as owner of the dams, from the responsibility for operating and maintaining the dams in good repair to ensure the safety of the dam.

The Howes Grazing Lake Dam (SD00407) and the Buffalo Lake Dam (SD00518) are both classified as intermediate size Category 2, Significant Hazard Dams. Section 74:02:08:07 of the Safety of Dams Rules allows for the minimum spillway design flood for an intermediate size Category 2, Significant Hazard Dam to fall in a range between a 0.5 Probable Maximum Flood (PMF) and a 100-year flood, based on a risk assessment. The assessment was completed in the mid 1990's and as a result, an Emergency Plan or Agreement between the Department of Transportation and Meade and Ziebach Counties was developed to close Highway 34 in the event that the highway would be overtopped by an event greater than the 100-year flood. As indicated in the Department of Transportation Inter-Office Memo, dated July 10, 2014, the Howes Grazing Lake Dam and the Buffalo Lake Dam will have the spillway capacity to pass the 100-year event with 1.3 ft. and 3.9 ft. of freeboard respectively.

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

Sincerely,

Timothy G. Schaal, P.E.

Engineer IV

for Jeanne Goodman, Chief Engineer

Water Rights Program

(605) 773-3352

c: Kevin Marton, P.E., SD DOT, Pierre