

No. 1474-3Water Division No. 3 BIG SIOUX RIVER District
(Blanks to be filled by the Engineer for the W. R. C.)**VESTED RIGHT**
APPLICATION FOR PERMIT**To appropriate Water within the State of South Dakota**

(NOTE—Draw a line through items not applicable.)

1. Name of applicant South Dakota Department of Game, Fish and Parks
Postoffice address Pierre, County Hughes, State _____

- I. If a corporation _____
(a) Name of same _____
(b) Date and place of incorporation _____
(c) Amount of capital stock _____
(d) Amount paid in _____
(e) Names and addresses of directors _____

(NOTE—A certified copy of articles of incorporation must accompany the application.)

II. Method of accomplishing the work and financial resources of the applicant:

- (a) Method of accomplishing work (Whether by contract, employment of others, or by direct labor) _____
(b) Cash on hand, \$ _____ (c) Treasury stock, \$ _____
(d) Bonds to be issued, \$ _____ (e) Other resources, \$ _____

2. Name of diversion work ROUND LAKE - Deuel County
As required to fill lake to outlet level - approximately 2550
3. Amount of water claimed acre feet per year cubic feet per second _____
4. Source of water supply Dry Draw _____
5. Location of point of diversion One point in the watershed located in the NW 1/4 Sec. 5
T 117, R 50 on _____ bank Deuel County.
6. Annual period or periods during which water is to be used continuously _____
7. To be used for:

- I. Irrigation or domestic use: Gravity, overhead sprinkling or combination system? _____
(a) Number of acres to be irrigated _____ acres.

- (b) Legal subdivisions to be irrigated _____

(NOTE—A list of lands to be irrigated, giving each subdivision and fraction with acreage thereof, should be written here, or may be appended as a part of this application. Same must also be shown on accompanying map.)

- (c) Statement as to domestic use (giving location, etc.) To the ordinary high water mark of the
inundated portion of sec. 3, 4, 9, 10, T 117, R 50

II. Stockwatering, mining, milling, power, fish culture, fire protection and public recreation:

- (a) Nature of use XX Public recreational purposes
Name any of the above uses claimed _____
(b) Amount of power to be generated _____ horse power.
Amount claimed for engine cooling _____
(c) Location of plant _____
(d) Method of developing power _____
(e) Point where water will be returned to stream _____

V/R

8. Estimated cost of work:

(a) Head Gates, \$-----

(c) Fluming, \$-----

(e) Other structures -----

(b) Pumping plant, \$-----

Rock, \$-----

Total, \$-----

9. Description of diversion works:

1. Nature of works: (Reservoir, dam, ditch, flume, pumping plant, etc.)

II. Dimensions of works. Information requested not applicable. Round Lake is a meandered lake. Maximum depth is approximately 8 feet.

(a) Dam: Height ----- feet; length at bottom ----- feet; length at top -----

----- feet; thickness at bottom ----- feet; thickness at top -----

feet; slope at front water face -----; slope at back face -----

material used in construction -----

(b) Reservoir: Capacity when filled ----- 2720.0 ----- acre feet. Surface area at highwater mark ----- 850 ----- acres.

DEPTH AT OUTLET-FEET	SURFACE AREA AT EACH DEPTH AT OUTLET--ACRES	FEET	ACRE-FOOT CAPACITY

(c)* Head gate: Width ----- feet; height ----- feet;

Material -----

(d) Canal: Total length ----- miles.

LOCATION BELOW HEADGATE	DEPTH	BOTTOM WIDTH	WIDTH AT WATER-LINE	GRADE PER MILE
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet
At ----- Mile	----- feet	----- feet	----- feet	----- feet

(Give dimensions where reductions in size are made.)

10. Time required for completion of work ----- years.

11. Time required for complete application of water to the proposed beneficial use ----- years.

12. Choice of newspaper for publication of notice of intention to appropriate -----

STATE OF SOUTH DAKOTA

County of ----- Hughes ----- ss.

I, ~~XXXXXXXXXXXXXXXXXX~~ E. A. Hodgins, being first duly sworn on my oath depose and say: That my relation to the above described undertaking is that of owner, that I have read the above foregoing statement, examined the map accompanying the same, and that I know of my own personal knowledge that the matters therein stated and shown are true.

Signed ----- R. A. Hodgins -----

Subscribed and sworn to before me this ----- 9th ----- day of ----- December ----- 19.67.

Notary Public (or other qualified officer.)

*Each diversion must have a headgate or measuring device.

H. E. Bowers, Notary Public
My Commission Expires -----

Round Lake
Deuel Co
3,4,9,10-117-50

Appl. No
1474-3

4	3
9	10

X

Scale 8" = 1 mile

John Popowski
Feb. 2, 1959

1474-3

Remarks by State Water Resources Commission:

"NESTED RIGHT" CLAIMED

STATE OF SOUTH DAKOTA
County of HUGHES }

Pierre, South Dakota, FEBRUARY 7, 1968

This is to certify that the foregoing application was received by the Commission at 11:15 o'clock
a.m. upon the 11TH day of DECEMBER, 1967

State Water Resources Commission

By: Austin

for Chief Engineer, Executive Officer

Number of permit 1474-3

Date of first receipt of application DECEMBER 11, 1967

Date of return to applicant for correction, amendments or changes required as follows: ---, 19---

Date of receipt of corrected application ---, 19---

Date from which applicant may claim right 1889, 19---

Approved JANUARY 10, 1968 Recorded in Book 10 Page 80

This is to certify that we have examined the foregoing application for a permit to appropriate water of the State of South Dakota, and we hereby grant the same as stated herein, subject, however, to the following limitations and conditions:

1st. The equivalent of at least one-fifth of the work above specified is ~~to be~~ completed ~~on or before~~ ---

2nd. The whole of said work is ~~to be~~ completed ~~on or before~~ ---

3rd. The limit of time for proof of beneficial use of water appropriated in accordance herewith is COMPLETED, ---

4th. The water appropriated shall be used for the purpose of PUBLIC RECREATION

5th. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.

6th. The amount of the appropriation herein granted shall not exceed 2550 ACRES FEET ANNUALLY ~~which shall not exceed~~; neither shall it exceed the capacity of the above described system of diversion works, nor the least amount of water that experience may hereafter indicate as necessary for ~~the exercise of the best husbandry and further, said appropriation shall be limited to one-tenth (1/10) of one cubic foot of water per second of time for each acre of land to which water is actually~~ USED FOR PUBLIC RECREATION was

and beneficially ~~applied for irrigation~~ on or before JUNE 30, 55; said water to be used during the following described annual period:

CONTINUOUSLY
Witness my hand this 7TH day of FEBRUARY, 1968

State Water Resources Commission

By: ---

Chief Engineer, Executive Officer

Certificate of Construction Issued FEBRUARY 7, 1968

Water License issued FEBRUARY 7, 1968

Permit No. 1474-3

Water Division No. 3 Big Sioux River Water District

Certificate of Completion of Works

TO ALL WHOM IT MAY CONCERN:

This is to Certify, That THE Department of Game, Fish and Parks

of Pierre, County of Hughes, and State of South Dakota, the holder of Vested Right of Permit No. 1474-3, issued upon Application

No. 1474-3, bearing date of priority of 1949, authorizing the diversion of 2550 acre feet annually second of the waters of dry draws

County of Deuel, State of South Dakota, at a point in the NW 1/4 Sec. 5, T117N, R50E

for public recreation

purposes, has fully complied with the provisions of the laws of the State of South Dakota relating to proof of completion of the works of diversion set out and described in said Permit; that said works are recognized as satisfactory

condition for diverting and conveying to the place of intended use 2550 acre feet annually six ft.

second of water; and that the land proposed to be irrigated by the use of said water are described as follows,

to-wit: to be used in place for public recreation

Witness my hand this 7th day of February A. D. 1968

State Water Resources Commission

By:

Chief Engineer J. H. GRIMES Officer

STATE OF SOUTH DAKOTA

WATER LICENSE No. . . . 1474-3.

WHEREAS, On the 11th day of December A. D. 1967
 the Department of Game, Fish and Parks

of Pierre County of Hughes and State of
South Dakota duly made application (No. 1474-3) Vested Right
 annually 2550 acre feet to us for ~~a~~ permit to use dry draws
~~of the waters of~~ County of Deuel, State of South Dakota, for public recreation
 purposes; and

WHEREAS, On the 7th day of February A. D. 1968
Vested Right recognizing
 / Permit No. 1474-3 was issued to said applicant for the diversion of said water, ~~and providing for~~
 completion of the works of diversion therein described ~~as follows:~~
SA. D. 12 and for the application to beneficial use of said
 water ~~on or before the~~ and,
~~XXXXXX~~

WHEREAS, On the 11th day of December A. D. 1967
 the holder of said permit duly made proof of the completion of adequate works for the diversion of 2550 ac. ft.
annually of said waters, as evidenced by our Certificate No. 1474-3
~~XXXXXX~~
 dated February 7, 1968 confirming the completion of works of sufficient capacity for
2550 acre feet annually
 diverting and conveying to the place of intended use ~~cubic feet per second~~ of water, with date of
 priority of 1889 and,

WHEREAS, On the 11th day of December A. D. 1967
 proof was duly made of the application to beneficial use of 2550 acre feet annually
~~cubic feet per second~~ of said water;
to be used in place for public recreation purposes

Location No.

Water Division No. Water District

Proof of Application of Water to Beneficial Use**PETITION OF HOLDER**

Ques. 1. State your name, residence, occupation and postoffice address.

Ans. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota

Ques. 2. If acting in behalf of a corporation, state its name, principal place of business (if a foreign corporation, give name and postoffice of statutory agent,) your position with reference to same, and your authority for appearing in its behalf.

Ans.

Ques. 3. State date of posting and date of recording notice of appropriation.

Ans.

Ques. 4. State source of water supply and give exact location of point of diversion.

Ans. Dry Draw - one point in the watershed located in the NW $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 5,
T. 117, R 50

Ques. 5. Describe your works of diversion giving length and height of each dam and state amount of water they are capable of conveying from point of diversion to place of use, and give name of canal or ditch or other works by which water is conducted to such place of use, and date of completion of same.

Ans. A meandered lake - depth 8 feet - 850 acres

Ques. 6. State for what purpose water is used and describe place of use. (If for irrigation, name each subdivision in which used, and number of acres in each subdivision that have ACTUALLY been irrigated with said water.)

Ans. Fish and wildlife propagation, conservation and recreation

Ques. 7. If for other than irrigation purpose, state how applied, amount of horse power generated, etc

Ans. Used in place in lake or reservoir

Ques. 8. What is the minimum amount of water required for the use specified above?

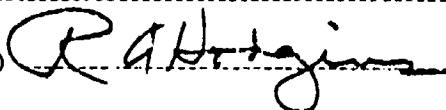
Ans. As required to fill lake to outlet level - approximately 2550 acre feet
per year.

Ques. 9. If you are not the person or representative of the corporation to whom above mentioned permit was originally issued, please state how ownership was acquired by present holder.

Ans.

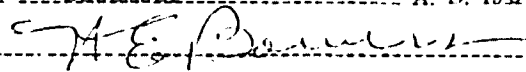
Ques. 10. State when, how, in what amount and to what extent, the water diverted under above mentioned permit has been used.

Ans. A meandered lake, Used by the public for uses specified except for
that amount lost by evaporation and seepage

(Sign) 

I hereby certify that the foregoing testimony was read to the above subscriber before its signing, that I believe him to be the person he represents himself to be, and that said testimony was subscribed and sworn to before me, at my office in Pierre, County of Hughes

State of South Dakota, on this 8th day of December A. D. 1967

Witnesses. 
K. E. Powers, Notary Public
My Commission Expires

I, the undersigned, do hereby certify that I am a duly qualified electer residing in the immediate vicinity of the diversion works designated in the foregoing testimony, that I have no interest in the works, water or land above described, that I have read the foregoing testimony and that I know of my own personal knowledge that the matters therein stated are true.

1474-3



Department of Water & Natural Resources

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

September 21, 1988

Richard Beringson, Secretary
Department of Game, Fish and Parks
Anderson Building
445 E Capitol
Pierre SD 57501

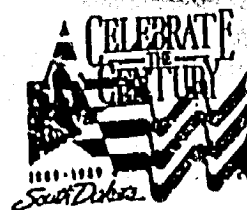
Dear Mr. Beringson:

I am writing to notify you that pursuant to the Notice of Intent to Validate Vested Water Right Claims dated June 20, 1988 that I intend to oppose validation of all Department of Game, Fish and Parks Vested Water Right Claims for lakes for the following reasons:

1. Until the outlet elevation for each lake is surveyed and the outlet elevation is set by the Water Management Board.
2. To allow the Vested Water Right Claim to be amended, if necessary, as follows:
 - a) Include the outlet elevation;
 - b) To correct the amount of water claimed;
 - c) To add the qualification that a vested claim is subject where necessary to installation of a concrete outlet structure to assure retention of the outlet as the established elevation; and
 - d) To add any amendments and qualifications necessary to clarify a Vested Right Claim.

Also, that I intend to oppose validation of all Department of Game, Fish and Parks Vested Water Right Claims for dams to allow the Vested Water Right Claim to be amended, if necessary, as follows:

1. To include the spillway elevation;
2. To correct the amount of water claimed; and
3. To add any amendments and qualifications necessary to clarify a Vested Right Claim.

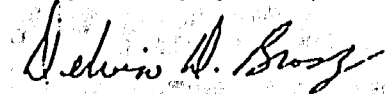


September 21, 1988
Richard Beringson, Secretary
Page 2

We will be working with your staff on these validations. We have already discussed setting outlet elevations before validating claims for lakes. Although the work necessary to complete the validation process will take several years to complete, the results should be of benefit to the public and to your Department. As the work is completed to validate each claim, the claim will be presented to the Water Management Board for validation.

Please advise if you have any questions.

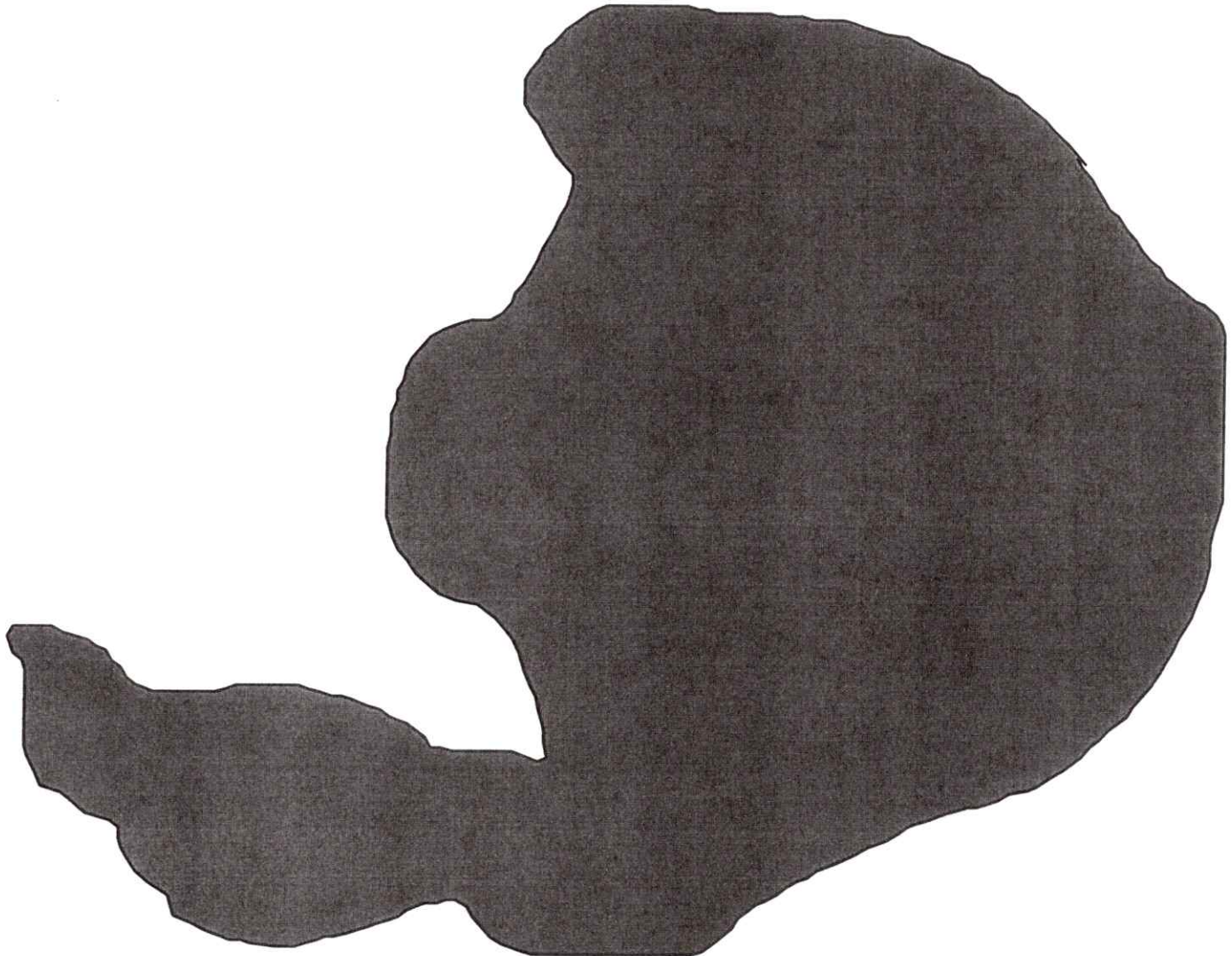
Very truly yours,



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

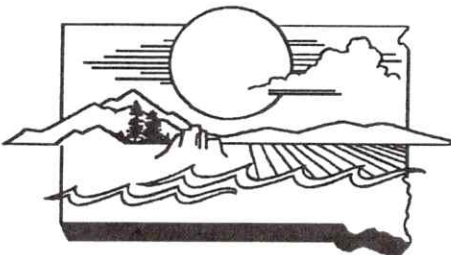
cc: Ron Koth, Department of Game, Fish and Parks

REPORT ON
ROUND LAKE - DEUEL COUNTY
ORDINARY HIGH WATER MARK INVESTIGATION



WATER RIGHTS PROGRAM

March 26, 1997



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

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ABSTRACT

Roger Rust, Box 142, Goodwin, South Dakota 57238 (Appendix No. 9), has requested the Water Management Board to establish the Ordinary High Water Mark (OHWM), Ordinary Low Water Mark (OLWM), and outlet elevation for Round Lake in Deuel County.

In response to the request and pursuant to SDCL 43-17-1, 43-17-21, 43-17-24 and 43-17-28, an investigation was conducted by the South Dakota Department of Environment and Natural Resources, Water Rights Program acting on behalf of the Water Management Board.

This report contains the results of the field investigation conducted May 1993, and October 1996.

During the field investigation of Round Lake, the following easily recognizable characteristics were used in recommending an elevation for the OHWM: erosion, changes in the character of the soil, boulder lines, and terrestrial vegetation.

Based on the finding in this report, the recommended elevation for the Round Lake OHWM is 1860.0 feet above mean sea level.

INTRODUCTION

On September 23, 1992, the Water Rights Program received a written request for the establishment of an Ordinary High Water Mark, Ordinary Low Water Mark, and outlet elevation for Round Lake from Roger Rust, riparian landowner. Based on the request, an investigation was conducted to determine elevations to be recommended for the Ordinary High Water Mark (OHWM), Ordinary Low Water Mark (OLWM), and outlet.

OHWM is defined by SDCL 43-17-20(2), which states:

“Ordinary high water mark,” the term as defined in decisions rendered by the courts of this state.

An OHWM is established by the processes of nature. The Water Management Board’s (Board) setting thereof is merely a formal recognition of the mark established by nature.

An Ordinary Low Water Mark (OLWM) elevation will not be recommended for Round Lake. The high water conditions at Round Lake hid the evidence for an OLWM from view. The outlet elevation for Round Lake is not recommended at this time due to the lack of conclusive evidence.

State law (SDCL 43-17-2) provides that all navigable rivers and lakes are public highways within 50 feet landward from the water’s edge, provided that the outer boundary of such public highway may not expand beyond the OHWM and may not contract within the OLWM. Thus, the public has the right to use a strip of land up to 50 feet wide below the OHWM beginning at the water’s edge or the OLWM for public purposes.

Further, while the public may use the 50 foot strip of land for only “public” purposes, the private adjoining landowner may use the land for any purpose not inconsistent with the rights of the public. Such purposes ordinarily would include, but not limited to, the right to graze and water livestock, to hay, or to build a boat dock.

South Dakota Codified Law (SDCL) 43-17-23 states that in determining the OHWM, natural factors take precedence. Man-made influences, either those that have been constructed to lower the mark or those constructed to raise the mark, shall be disregarded unless the influences have been lawfully constructed or have existed and been accepted for a period of time determined by the Board to be the equivalent of natural conditions.

When requested to do so, the Board is required by SDCL 43-17-21 and 43-17-28 to establish the OHWM for public lakes. SDCL 43-17-1 provides that the ownership of land below the OHWM, and of land below the water of a navigable lake or stream, is regulated by the laws of the United States or by such laws of the state as the Legislature may enact.

A lake is “navigable” if its waters constitute “public waters” (Flisrand v. Madson 35 S.D. 457, 152 N.W. 796, (1915)). A lake is also “navigable” when, if maintained at the high-water mark, it is suitable for rowing, fishing, fowling and bathing (Anderson v. Ray (1916) 37 S.D. 17, 156 N.W. 591).

“Ordinary” according to SDCL 43-17-20(2) is defined in decisions rendered by the courts of this state. In the case of Flisrand v. Madson, 35 S.D. 457, 152 N.W. 796, (1915) the court wrote:

Neither high or low water mark means the highest or lowest point reached by the waters of a lake during periods of extreme and continued freshets, or periods of extreme and continued drought, but does mean the high and low points of variation of such waters under ordinary conditions, unaffected by either extreme.

In the case of Anderson v. Ray, 37 S.D. 17, 156 N.W. 591 (1916) the South Dakota Supreme Court wrote:

In the case of freshwater rivers and lakes - in which there is no ebb and flow of the tide, but which are subject to irregular and occasional changes of height, without fixed quantity of time, except that they are periodical, recurring with the wet or dry seasons of the year - high water mark, as a line between the riparian owner and the public, is to be determined by examining the bed and banks, and ascertaining where the presence and action of the water are so common and usual, and so long-continued in all ordinary years, as to mark upon the soil of the bed a character distinct from that of the banks, in respect to vegetation, as well as respects the nature of the soil itself.

In the Waubay Lake decision, issued on January 17, 1986, the South Dakota Supreme Court stated the determination of these water marks is to be done on a case by case basis. The Court stated that:

“ . . . under ordinary circumstances, the Ordinary High Water Mark will be set at a level where there is a distinct mark which evidences erosion, and changes in the character of the soil, and destruction of terrestrial vegetation, which have occurred under the ordinary and continuous conditions of the lake, disregarding periods of extreme and periodic freshets, and disregarding the highest water mark which does not evidence erosion and soil changes and destruction of vegetation occasioned under ordinary conditions. If a single distinct mark, occasioned under ordinary circumstances and evidencing all of the factors delineated above does not exist, i.e., there is conflicting evidence of the role of the Ordinary High Water Mark, it is the level where significant major, and substantial terrestrial vegetation ends, that the OHWM is to be set.” (cites omitted)

MEANDER LINE

A meander line, as the name implies, is a line that meanders and is not at a constant topographic elevation. An OHWM is at a constant topographic elevation. Hence, a meander line is not and cannot be associated with an OHWM. A meander line survey is established by man for surveying and mapping purposes and is not a property line. OHWM's are established by nature and defined by man.

In the case of *Flisrand v. Madson*, 1915, the South Dakota Supreme Court wrote:

“The fact alone that the lake in question was meandered by the government survey does not directly control this matter, as a meander line is not considered a boundary line, but merely serves to define the sinuosities of the bank of the lake and a means of ascertaining the amount of land in the fractional tract subject to sale, which is to be paid for by the purchaser. *St. Paul Ry. Co., Shurmeier* 7 Wall 272, 19 L. Ed. 74, and note page 972.”

The meander line was surveyed around Round Lake in 1872 (see Attachment No. 2).

GENERAL INFORMATION

Round Lake is located in northwestern Deuel County 6 miles north of the city of Goodwin. Round Lake is located in Sections 3, 4, 5, 8, 9, and 10, T117N, R50W. The present outlet elevation has not been determined, however the flow elevation of a culvert in the outlet channel is 1857.1 feet above mean sea level (fmsl). The outlet channel is located on the southwestern part of the lake in the NW ¼ NE ¼ Section 8, T117N, R50W (see Attachment No.1).

All elevations in this report are referenced to a United States Department of Commerce, Environmental Sciences Services Administration, Coast and Geodetic Survey benchmark with a 1969 sea-level datum described as follows:

The benchmark is located 3 miles south and 2 miles east of Troy and 4 miles south and 3 miles west of Stranburg, both in Grant County, South Dakota; near the corner of Sections 27, 28, 33, and 34 in T118N, R50W; 116 feet north and 52 feet west and 1.6 feet lower than the crossroads; 81 feet north and 1 foot east of the fence corner; a standard tablet set in the top of a concrete post at elevation 1898.688 fmsl, stamped “10 HEH 1969”.

Temporary benchmarks were established by the Water Rights Program along the perimeter of Round Lake. The locations and elevations of the temporary benchmarks are available from the Water Rights Program upon request.

WATER RIGHTS

Vested Water Right Claim No. 1474-3 held by the South Dakota Department of Game, Fish and Parks (SD GF&P) is the only existing claim on file for water stored in Round Lake. Vested Water Right Claim No. 1495-3, also held by SD GF&P, claims Round Lake overflow water for South School Lake. (Water Right files, 1997) There are also domestic uses (i.e. livestock watering, dams, dugouts, etc.) present within the Round Lake drainage basin.

Vested Water Right Claim No. 1474-3, Round Lake, claims an 1889 priority date, and approximately 2550 acre-feet of water per year to fill Round Lake for public recreational purposes. The claim states that the location of the Round Lake outlet is in the NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 5, T117N, R50W. This claim indicates a reservoir capacity (lake storage) when filled of 2720 acre-feet and a surface area of 840 acres at a maximum depth of 8 feet. The lake storage and surface area at full water level were estimated by the SD GF&P on December 8, 1967. The storage and area of the lake are only estimates and may not be the actual lake storage or surface area at the OHWM. There are 953 acres below the 1872 meander line survey.

Vested Water Right Claim No. 1495-3, South School Lake, claims an 1889 priority date and approximately 660 acre-feet of Round Lake overflow water per year to fill South School Lake for public recreational purposes. The claim states that the location of the outlet is in the NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 22, T117N, R50W.

A correction will need to be made to Vested Claim No. 1474-3 for Round Lake. The location of the outlet will need to be corrected from the NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 5 to the NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 8, T117N, R50W.

Corrections also need to be made to Vested Water Right Claim No. 1495.3, South School Lake. The source of water for South School Lake will need to be corrected from overflow water from Round Lake to overflow water from Wigdale Lake. The location of the outlet for water in South School Lake will need to be changed from the NE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 22, T117N, R50W to the W $\frac{1}{2}$ NE $\frac{1}{4}$ Section 16, T117N, R50W.

GEOLOGY

Most of Deuel County lies on the Coteau De Prairies division of the central lowlands province. The surface of the Coteau is primarily glacial moraine topography with a generally hummocky appearance as a result of glacial movement and subsequent melting of ice (Beissel and Gilbertson, 1987). Most of the surficial land forms are a result of the late Wisconsin glaciation.

The Bemis moraine, from the last ice advance into the Coteau Des Prairies, acts as a drainage divide between the Big Sioux River and the Minnesota River. Round Lake lies

on the western flank of the moraine and is therefore a part of the Big Sioux River drainage basin.

The Altamont Moraine is believed to be the outermost moraine of the last Wisconsin Glacial period. Like the Bemis moraine it runs from the northwest to the southeast in Deuel County (Beissel and Gilbertson, 1987).

The limit of the Altamont moraines occur just east of the chain of lakes which end at Round Lake. A meltwater outwash lies under the chain of lakes, see Attachment No. 4. The channel starts at approximately Wigdale Lake and travels north to Round Lake continuing west along Willow Creek and ultimately to the Big Sioux River.

HYDROLOGY

Round Lake water levels appear to fluctuate with the water levels of the water table aquifer that occurs in the area. The Water Rights Program monitors one well in the water table aquifer that encompasses Round Lake; well GT-81A which lies 2.5 miles northwest of Round Lake. The general fluctuations in the water levels in well GT-81A follow measured lake levels for Round Lake over the last 13 years, see Attachment No. 5a. The difference between groundwater levels and Round Lake water levels seem to remain relatively the same throughout the period of record.

There are four lakes in the chain of lakes that end at Round Lake. The chain consists of Wigdale, School, and Round lakes, also included is a connection between Bullhead and Round lake. All four hydrographs for these lakes have the same shape for the period of lake level measurements. This also follows the yearly precipitation graph and the hydrograph for well GT-81A, see Attachment Nos. 5a, 6, and 9.

Besides ground water and yearly precipitation, water levels in Round Lake are maintained by inflow from Willow Creek. When Round Lake water levels are low, flow from Willow Creek can enter the lake via the culverts in the outlet channel. Water levels in the chain of lakes could also be maintained by the meltwater channel that connects the lakes below the surface of the ground, see Attachment No. 4 (Beissel and Gilbertson, 1987). This meltwater channel formed when water from melting glaciers was carried away in established or developing drainages. The action of the meltwater created the near surface outwash aquifer underlying and connecting the four lakes.

The direction of surface water flow between these lakes depends on water levels in the individual lakes. At the time of investigation, water was flowing from Wigdale Lake to School Lake to Round Lake. There was no flow between Bullhead Lake and Round Lake. Water was spilling from Round Lake to Willow Creek and ultimately to the Big Sioux River.

WATER LEVELS

Available measured water level measurements of Round Lake are shown in Attachment No. 5. The water level measurements were taken by the Water Rights Program.

However, historical water levels can be inferred from the existence of boulder lines. Boulder lines at Round Lake have formed as a result of ice and wave action modifying the lake bank. Although it is not possible to put a genesis date on the boulder lines, they are indicative of historic water levels occurring at or near the boulder line elevations. The base of boulder lines are found at Round Lake at the following elevations (fmsl): 1858.0, 1859.2 to 1859.9, and 1860.2 to 1860.5 fmsl. The top of boulder lines are found at the following elevations (fmsl): 1860.3, 1861.2, 1863.0, and 1863.6 to 1863.9 fmsl. See Attachment No. 8.

Other historical water level information was gathered from landowners along Round Lake. During the 1930's Round Lake was dry and the lakebed was farmed. The lake was again very low in 1976. At that time the west arm of the lake was dry. There have been other times when a person could wade across the west arm of the lake.

Round Lake landowners also recall that the sloughs around the lake are wet during normal spring thaws. During a typical spring water levels in Round Lake reach the trees along the shore.

CLIMATOLOGICAL DATA

Climatological data for Round Lake is included in this report as Attachment No. 9a. The climatological data is discussed in detail under the heading of RUNOFF FACTORS in this report.

RUNOFF FACTORS

Beginning soil moisture conditions refer to the degree that a soil is saturated with water. During a "dry" year(s), the soil moisture becomes depleted due to plant use, evaporation, and natural drainage. Runoff Volume from a rainfall event during depleted soil moisture conditions would be reduced due to the rain soaking into the ground.

On the other hand, during a "wet" year(s), the soil becomes saturated with water and isn't capable of absorbing the rainfall event. Hence, the identical rainfall event during "wet" years will produce a much larger runoff volume than during "dry" years. The more saturated the soil becomes, the larger the runoff volumes generated during a particular rainfall event.

A single rainfall event whose duration is spread over a number of days or weeks can generate a relatively small runoff volume. Conversely, a single rainfall event whose duration is only a few minutes or hours could generate a relatively large runoff volume.

Hence, the runoff volume generated by any given rainfall event is dependent upon the amount and how rapidly the rain falls.

The potential for the largest runoff volumes for any drainage basin (Round Lake or any other lake) are generated when saturated soil moisture conditions are present going into the winter. The ground then freezes nearly solid and becomes impermeable due to winter temperatures below 32 degrees Fahrenheit. Snow accumulations coupled with cold winter temperatures set the scene for a major runoff event the following spring.

A rapid temperature rise in the spring quickly melts the previous winters snow accumulation. The still frozen/saturated soil is not able to soak up any of the snow melt-water, hence, nearly all snow melt-water arrives at terminal locations such as depressions, dams and lakes or discharge to streams.

As previously shown, yearly runoff entering Round Lake is dictated by a complicated set of circumstances that include general climatic factors, soil moisture conditions, and snow melt.

MAN MADE INFLUENCES

Natural factors are given precedence in determining the ordinary high water mark. Man-made influences, either those that have been constructed to lower the mark or those constructed to raise the mark, shall be disregarded unless the influences have been lawfully constructed or have existed and been accepted for a period of time determined by the Board to be the equivalent of natural conditions (SDCL 43-17-23).

There appears to be manmade influences at Round Lake and as on many other lakes the influences are in the inlet and outlet areas. There are three five foot culverts in the Round Lake outlet channel at the junction with Willow Creek. The culverts were installed in the late 1960's when the county road was regraded, according to the Deuel County Highway Superintendent. The culverts replaced a concrete structure which had been there since the county road was built.

The flow lines of the culverts are at different elevations with two culverts sloping toward Round Lake and one culvert sloping toward Willow Creek. In the section titled **OUTLET** the affect these culverts have on Round Lake will be discussed in more detail. There are also roads with culverts between School and Round lakes and between Bullhead and Round lakes.

The above man-made influences have apparently had an affect on the OHWM but have been in place for such a time they probably constitute natural conditions.

FIELD INVESTIGATION

BENCH MARK ESTABLISHMENT AND COLLECTION OF FIELD DATA

Temporary bench marks were established around Round Lake. The locations and elevations for the temporary bench marks are available from the Water Rights Program upon request.

Field data for Round Lake was collected on the following dates: May 11, 12 and 13, 1993 and October 15, 16, and 17, 1996. The field information contained in this report is from natural outcrops along the perimeter of Round Lake. The data collected can be found in Attachment Nos. 7 and 8.

ORDINARY HIGH WATER MARK EVIDENCE

Distinct physical evidence used in identifying the OHWM are: erosion (change in slope of the bank), changes in the character of the soil, boulder lines, growth and destruction of terrestrial vegetation (FLISRAND V. MADSON, 1915; ANDERSON v. RAY, 1916; S.D. WILDLIFE FEDERATION v. WATER MGT. BD., 1986; Red Lake, Brule County Ordinary High Water Mark and Ordinary Low Water Mark, and Outlet Elevation Investigation Report).

Erosion

Distinct erosional features around Round Lake are summarized in Attachment No. 8.

Consistent erosional features at Round Lake consist of cutbanks, washed root systems, and changes in slope. These features are found at the following elevations: 1859.1 to 1859.4 fmsl, 1859.6 to 1860.8 fmsl, and 1861 to 1861.7 fmsl for change in slope, bottom of cutbank, and base of washed root systems; 1860.8 to 1862 fmsl, 1862.2 to 1862.6 fmsl, and 1862.9 fmsl for change in slope, top of cutbank, and top of washed root systems. The erosion elevations at or near 1860 fmsl are consistent with water levels measured since November 8, 1983.

Changes in the character of the soil

Soil stratification occurs around a lake when wave action washes the lake shore and leaves the larger parent materials (pebbles, cobbles, boulders) relatively stationary while the fine grained materials (sand, silts, clays, peats) are transported the greatest distance into the lake. An idealized lake shore progression would start with backshore boulder sized materials and terminate with clay and peat materials deposited in the deepest portions of the lake. Historical lake levels can be inferred by locating areas showing remnant soil stratification.

Lake water levels limited the amount of visible soil changes. The few soil characteristics observed were found at elevations of 1859.1 fmsl for top of pebbles, 1860.2 fmsl for top of smaller pebbles, and 1861.9 to 1862.4 fmsl for the top of sandy beach and beginning of

top soil. Distinct surficial changes in the character of the soil at Round Lake can be found in Attachment No. 8.

Boulder Lines

In the spring lake shores can be acted upon by ice sheets/wind action which form ice pushed ridges. The lake ice melts first near the shores because of the relatively rapid heating of the earthy material of the shore and the shallow bottom. An open lane of water is formed which is further widened by a rise in lake level from the water added by the melting snow of the surrounding slopes. If strong winds develop before the ice becomes rotten, the ice is blown about from side to side by the winds and pushed on the shores with almost irresistible force. The direction of shove is related to that of the winds and may vary along any shore even during a jam, if the winds shift considerably. The force of the push depends on the firmness and momentum of the ice, the latter being determined by the velocity and duration of the wind, the weight of the ice and to some extent the distance through which the ice is free to move. (Dionne, 1979)

Ice pushed ridges/boulder lines can be composed of foreshore and backshore materials. There are boulder lines present around Round Lake. The boulder lines present are related to ice action and wave erosion acting upon the lake bank. The boulder lines are found at the base of steeply sloping hillsides as residuum.

Boulder lines are summarized in Attachment No. 8. Base elevations of boulder lines range from 1858, 1859.2 to 1859.9 fmsl, and 1860.2 to 1860.5 fmsl.

Terrestrial Vegetation

The tree population observations in this report are limited to easily recognizable characteristics such as species, diameter and elevation. The tree population around Round Lake is predominately elm and cottonwood with ash being of secondary occurrence. Growth of terrestrial vegetation around Round Lake is summarized in Attachment No. 8.

Certain species of trees are able to survive periods of flooding better than others. Elm and cottonwood trees are the predominant trees on Round Lake's shore. Elm trees are considered intermediately tolerant to flooding. This means an elm tree with good vigor can survive occasional inundation between 20 and 30 percent of the growing season. Cottonwood trees are considered tolerant to flooding. This means a cottonwood tree with good vigor is able to survive when flooded more than 30 percent but less than 40 percent of the growing season. (Hightshoe, 1988)

The ability for certain trees to survive occasional flooding may be due to the formation of lateral roots at or just above the waterline (Gill). Photo Nos. 9 and 10 show lateral roots washed by wave action. The base of these washed root systems occur at 1859.8 in Photo No. 10 and 1860.1 in Photo No. 9. The top of the washed root systems occur at 1861.3 in Photo No. 10 and 1861.5 in Photo No. 9.

Using trees on a Lake without other OHWM evidence would suggest that the OHWM elevation lies between the elevation of predominant destruction of terrestrial vegetation and the top of the washed root systems. Destruction of terrestrial vegetation (i.e. trees) at Round Lake is limited.

Elm and cottonwood trees measured at Round Lake range in diameter from six inches to five feet and have grown between the elevations of 1859.6 and 1862.9. Two live cottonwood trees two feet and three feet in diameter were found at elevation 1859.6 and 1859.8 fmsl. Other large trees include a four foot diameter cottonwood tree at 1860.6 fmsl and a five foot diameter cottonwood tree at 1860.8 fmsl. The lowest terminal elevation for live trees at Round Lake is at 1859.6 fmsl.

Consistent elevations for various tree classes (diameters, heights) at Round Lake are difficult to determine from the field data collected. However, it does appear that there are four zones of tree growth. The four zones occur at elevations of 1859.6 to 1859.8 fmsl, 1860.2 to 1861 fmsl, 1861.6 to 1862.9 fmsl, and 1863.3 to 1863.9 representing tree growth on the upper limits of a steep bank. Cottonwood trees are predominant in the two lower growth zones while Elm trees make up the upper two growth zones.

OUTLET

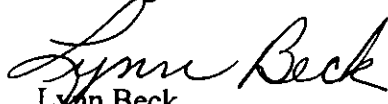
The outlet for Round Lake is located in the NW¼ NE¼ Section 8, T117N, R50W. There are three five foot diameter culverts through a county road at the junction of the outlet channel and Willow Creek. The overflow elevations of the culverts are 1857.11, 1857.45, and 1857.83 fmsl. According to the Deuel County Highway Superintendent the culverts were installed at different elevations to accommodate flow as lake levels rise. Two of the culverts are sloped toward Round Lake and the other is sloped toward Willow Creek. The Highway Superintendent did not know if the different slopes were due to settlement or if the culverts were intended as an inlet/outlet structure depending on water levels in Round Lake and Willow Creek.

Water levels in Round Lake prevented a survey of the outlet channel. There may exist an overflow elevation higher than 1857.11 fmsl. The culverts were flowing at the time of investigation and the lake body, at elevation 1858.83 fmsl, extended to the county road. Therefore, the lake outlet elevation is below 1858.83 fmsl.

In South Dakota most of the lakes with OHWM's have outlets that are six inches to one foot below the OHWM. The recommended OHWM for Round Lake is 2.2 to 2.9 feet above the invert elevations of the culverts in the outlet channel. Because of the difference in the bottom of the culvert elevations and the recommended OHWM elevation and the flow in the channel at the time of investigation the outlet elevation can not be determined, at this time.

CONCLUSIONS

1. The term "Ordinary" for any given lake, as defined by established OHWM's can be synonymous with average, normal and yearly. "Ordinary" can also take into consideration periodic fluctuating water levels based upon prevailing climatic conditions and watershed characteristics.
2. A meander line is not at a constant elevation and is not considered in determining the OHWM for any given lake.
3. Historical water levels indicate that Round Lake has experienced 6.4 feet of fluctuation since November 8, 1983.
4. Man made influences caused by road construction and culvert installation over and in the outlet and inlet channels may have affected the Round Lake OHWM, but have been in existence long enough to constitute natural conditions.
5. Based upon the field data collected, potential OHWM elevations for Round Lake are as follows: Visible changes in the character of the soil occur between 1859.1 to 1860.3 and 1861.9 to 1862.4 fmsl; base of boulder lines occur at elevations 1858.0, 1859.2 to 1859.9, and 1860.2 to 1860.5 fmsl; visible erosional features occur at 1859.1 to 1863 fmsl; the lowest terminal elevation for live trees is at 1859.6 fmsl.
6. Based upon the field data summarized in conclusion number 5, a potential OHWM elevation for Round Lake is 1860.0 fmsl. Data from soil characteristics were limited due to the water level in the lake. However, erosional features, boulder lines and terrestrial vegetation afforded strong evidence with supportive evidence from soil characteristics. OHWM's are not associated with the highest limits of a lake bank but are associated with the upper limits of a lake bank. The majority of the indicators show the OHWM exists at the elevation of 1860.0 fmsl, it is recommended that the OHWM be established at 1860.0 fmsl.
7. The outlet elevation for Round Lake can not be established at this time due to the lack of conclusive evidence.
8. Vested Water Right Claim Nos. 1471-3 and 1495-3 will need to be corrected prior to being validated.


Lynn Beck
Natural Resources Engineer III
Water Rights Program


Gale N. Selken, P.E.
Natural Resources Engineer IV
Water Rights Program

**RECOMMENDATION OF CHIEF ENGINEER ON ESTABLISHMENT OF AN ORDINARY
HIGH WATER MARK FOR ROUND LAKE, DEUEL COUNTY**

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 establishment of an Ordinary High Water Mark on Round Lake in Deuel County.

The Chief Engineer of the Water Rights Program recommends that the Ordinary High Water Mark for Round Lake, Deuel County be established at an elevation of 1860.0 feet mean sea level (fmsl).

See report for additional information.

A handwritten signature in black ink, appearing to read "John Hatch", written in a cursive style.

JOHN HATCH, Chief Engineer
January 28, 1997

Bibliography

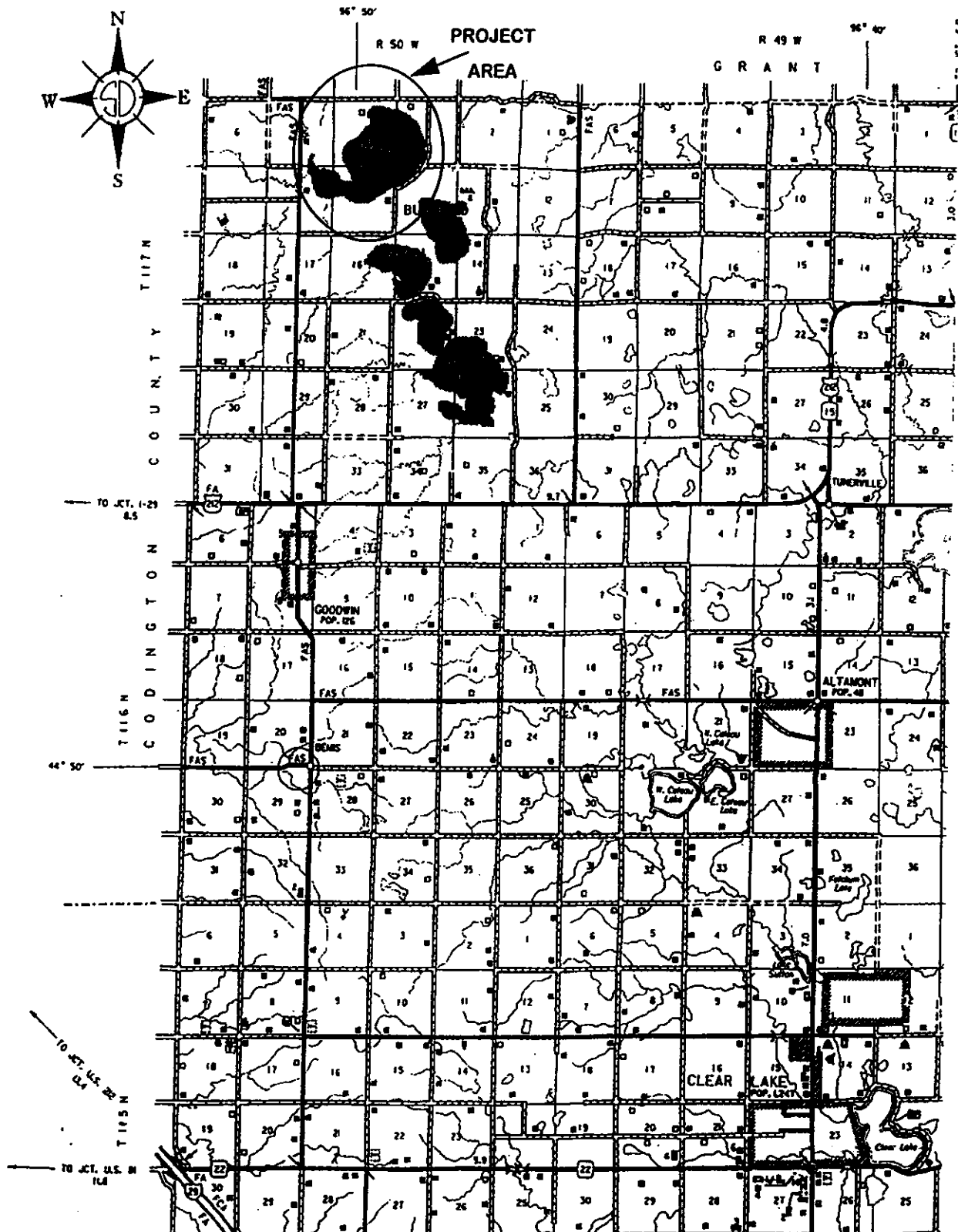
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- Water Rights Program Files, 1996, Department of Environment and Natural Resources, Joe Foss Building, 523 East Capitol, Pierre, SD 57501.

Persons and Agencies Referenced

- Archives, State Library Building, Pierre, SD 57501
- Deuel County Register of Deeds, County Courthouse, Milbank, SD 57252
- State Climatologist, South Dakota State University, Brookings, SD 57007

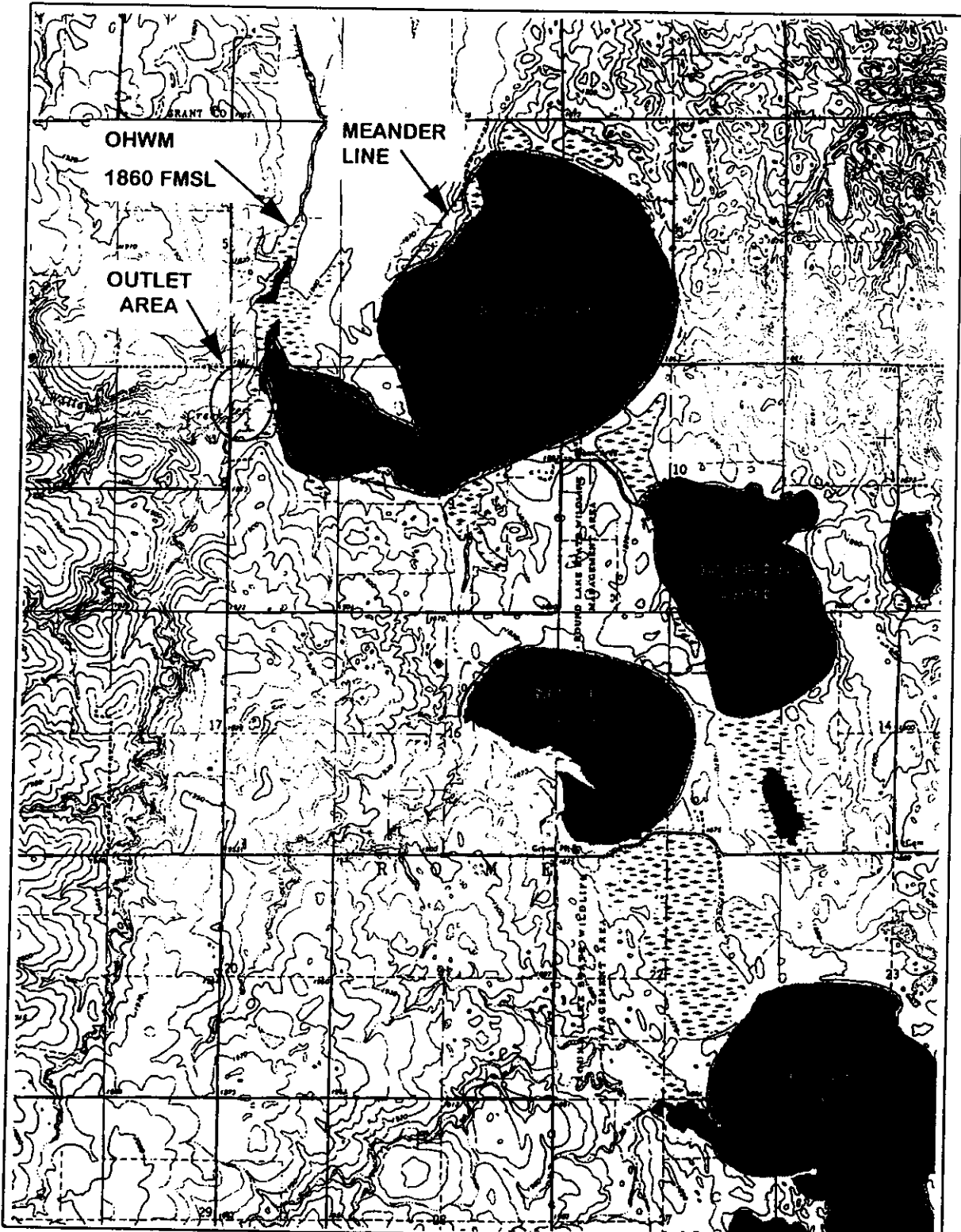
Attachment No. 1
GENERAL HIGHWAY MAP
DEUEL COUNTY
SOUTH DAKOTA

1989



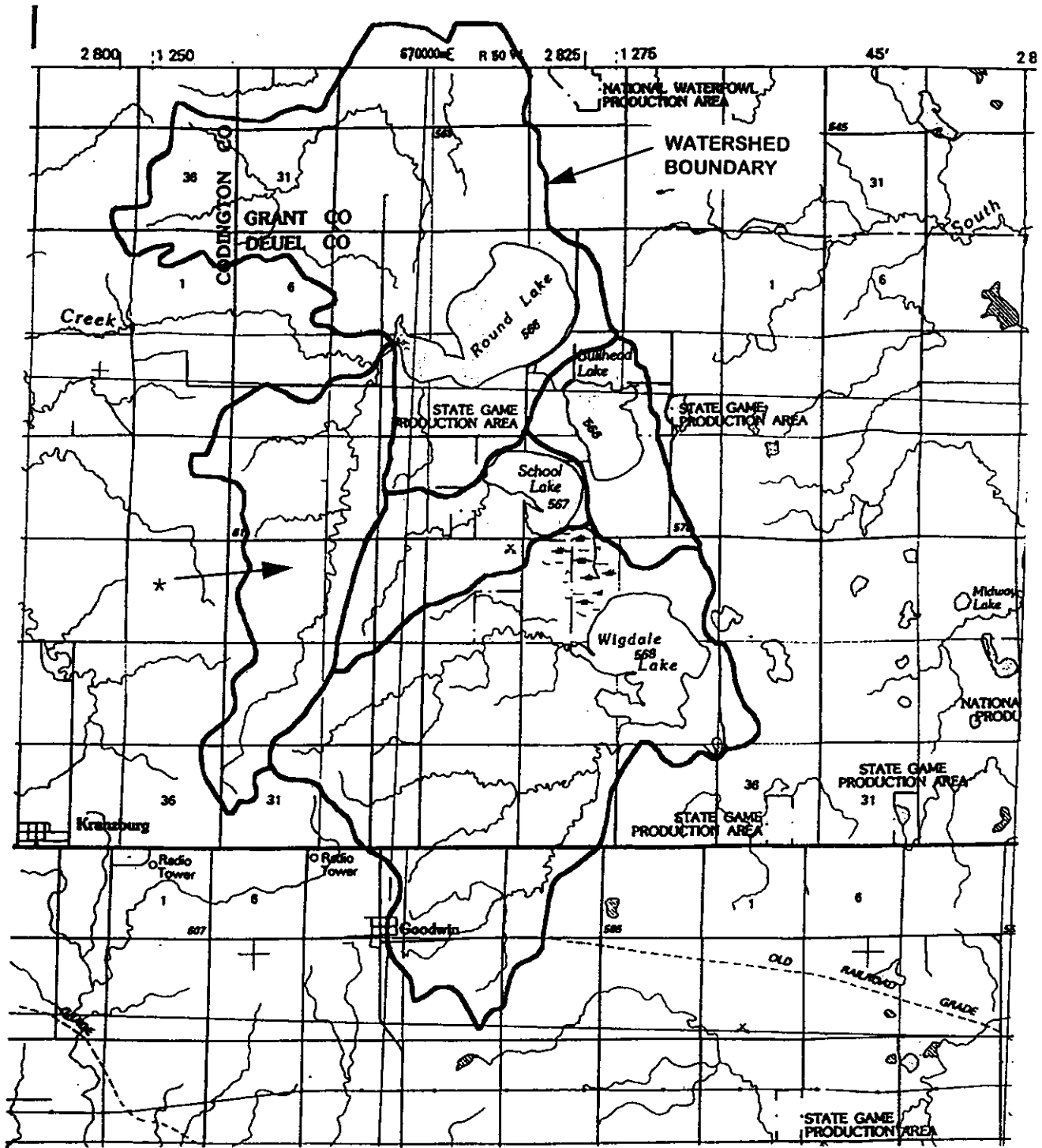
Attachment No. 2

GOODWIN QUADRANGLE
SOUTH DAKOTA - DEUEL COUNTY
7.5 MINUTE SERIES (TOPOGRAPHIC)



Attachment No. 3

WATERSHED MAP



* Additional watershed area when Willow Creek flows into Round Lake.

Attachment No. 4

MELT-WATER CHANNEL

Direction of flow of meltwater
to the Big Sioux River.

Figure 9. Position of active ice during the formation of the Altamont and James Lobe Altamont moraines.

-  Active ice front
-  Proximal limit of the Altamont moraines
-  Direction of ice flow
-  Meltwater channel

0 1 2 3 4 5 6 12 18 24 MILES
SCALE

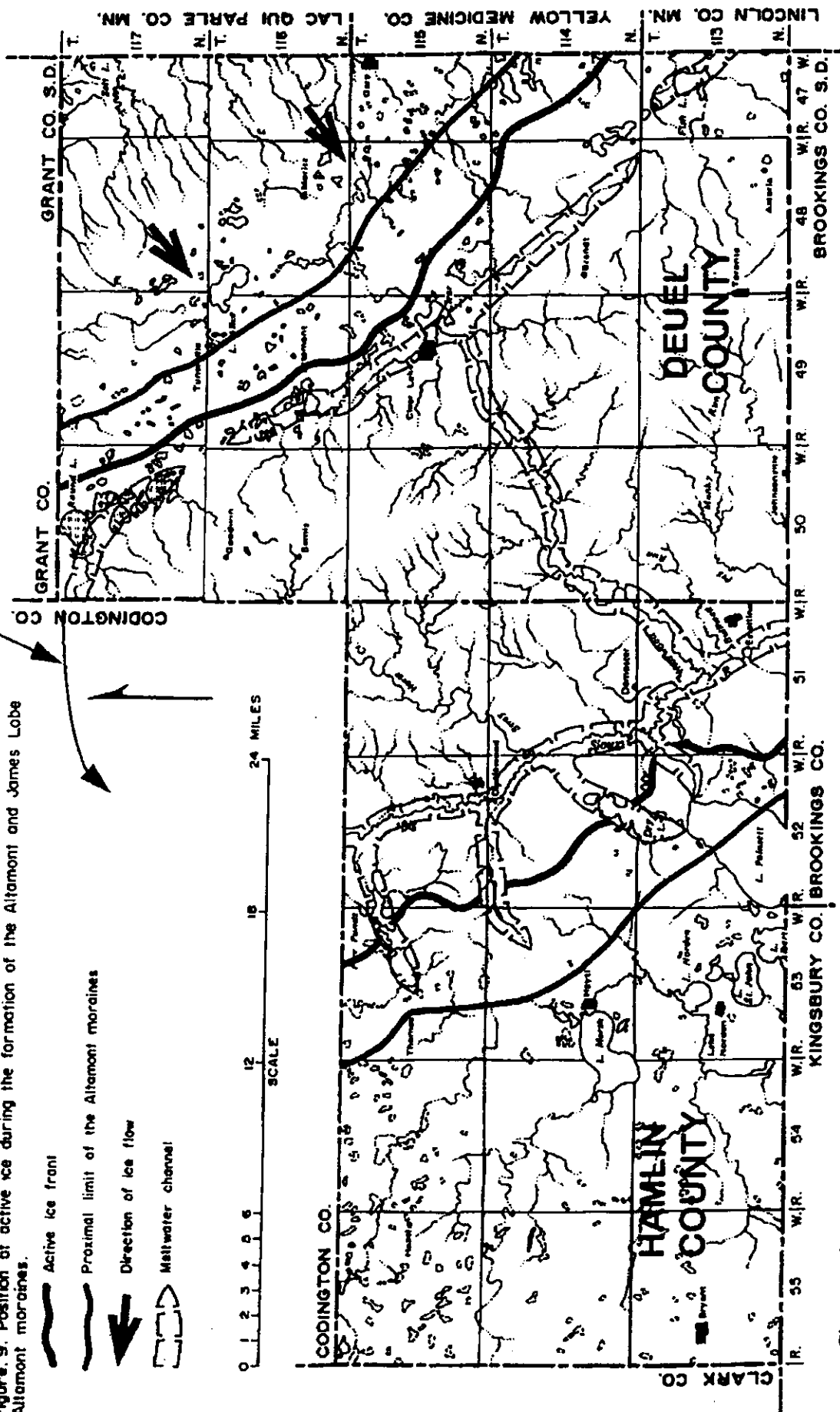


Figure 9 from Geology and Water Resources of Deuel and Hamlin Counties, South Dakota, Part 1: Geology, 1987.

Attachment No. 5

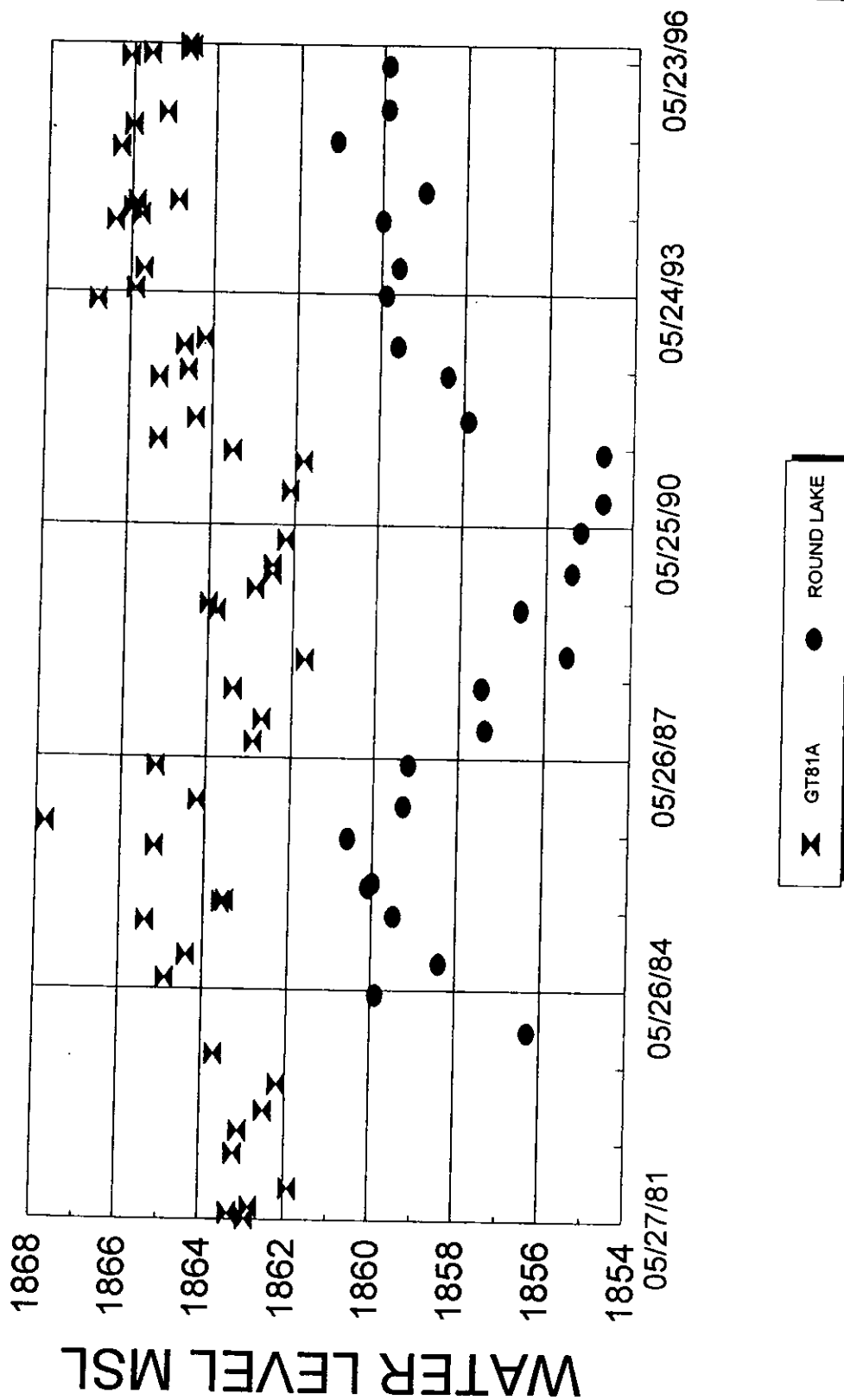
**MEASURED WATER LEVELS
FOR
ROUND LAKE, DEUEL COUNTY**

DATE	WATER LEVELS
11-08-83	1856.3
05-01-84	1859.9
09-27-84	1858.4
05-08-85	1859.5
09-20-85	1860.1
10-10-85	1860.0
05-07-86	1860.6
10-08-86	1859.3
04-23-87	1859.2
10-07-87	1857.4
04-20-88	1857.5
09-21-88	1855.5
04-26-89	1856.6
10-18-89	1855.4
05-02-90	1855.2
09-19-90	1854.7
05-01-91	1854.7
10-02-91	1857.9
04-29-92	1858.4
09-16-92	1859.6
05-12-93	1859.9
09-22-93	1859.6
05-04-94	1860.0
09-14-94	1859.0
05-10-95	1861.1
10-11-95	1859.9
05-01-96	1859.9
10-02-96	1858.6

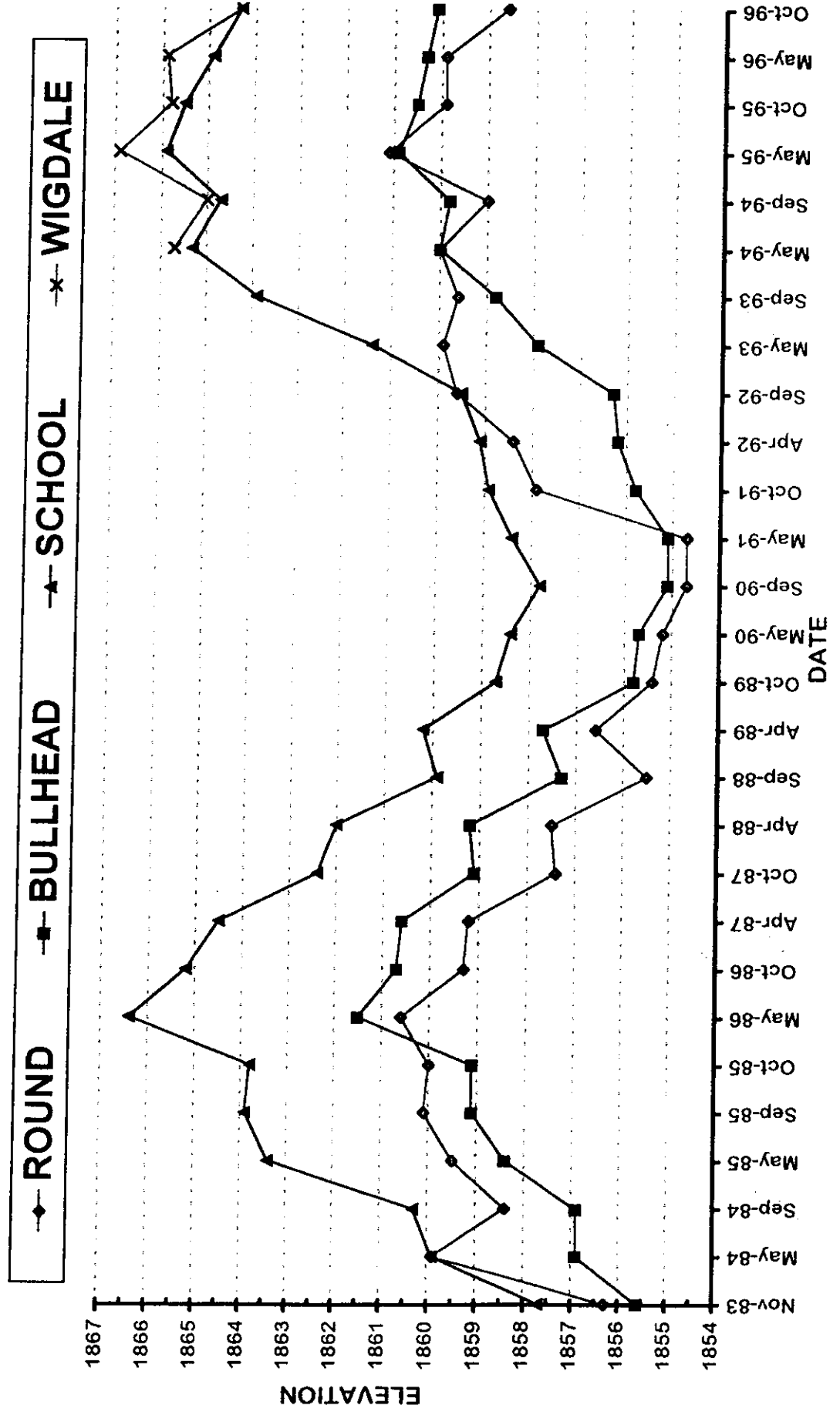
Measurements by Water Rights Program

WATER RIGHTS

GT-81A AND ROUND LAKE



BULLHEAD, ROUND, SCHOOL, AND WIGDALE LAKES DEUEL COUNTY LAKE LEVELS



Attachment No. 7

OHWM EVIDENCE

EROSIONAL CHARACTERISTICS:

Elevation (fmsl)	Legal Description	Comments
1858.44	SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 10, T117N, R50W	Change in slope.
1858.45	"	"
1858.46	"	"
1858.48	"	"
1858.49	"	"
1858.45	"	"
1848.51	"	"
1858.42	"	"
1858.46	"	"
1859.17	"	"
1859.14	"	"
1859.12	"	"
1859.13	"	"
1859.10	"	"
1859.08	"	"
1859.08	"	"
1859.05	"	"
1859.11	"	"
1859.94	"	"
1859.94	"	"
1859.93	"	"
1859.90	"	"
1860.21	"	"
1860.85	"	Base of cutbank.
1861.28	"	"
1861.21	"	"
1861.19	"	"
1861.17	"	"
1861.14	"	"
1861.68	"	"
1861.56	"	"

Erosional characteristics continued:

Elevation (fm sl)	Legal Description	Comments
1860.37	SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 10, T117N, R50W	Base of cutbank.
1860.38	"	"
1860.55	"	"
1861.46	"	"
1862.26	"	Top of cutbank.
1862.49	"	"
1862.31	"	"
1862.24	"	"
1862.60	"	"
1862.50	"	"
1862.45	"	"
1862.56	"	"
1862.92	"	"
1862.32	"	"
1862.59	"	"
1859.96	"	Base of washed root systems.
1860.12	"	"
1860.06	"	"
1860.07	"	"
1860.23	"	"
1860.03	"	"
1860.03	"	"
1860.01	"	"
1859.76	"	"
1860.10	"	"
1860.36	"	"
1860.38	"	"
1860.89	"	Top of washed root systems.
1861.54	"	"
1861.04	"	"
1861.63	"	"
1861.14	"	"
1861.57	"	"
1861.39	"	"
1861.18	"	"
1861.26	"	"
1862.32	"	"
1861.85	"	"
1862.93	"	"

Erosional characteristics continued:

Elevation (fmsl)	Legal Description	Comments
1858.42	NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 10, T117N, R50W	Change in slope.
1859.19	"	"
1859.94	"	"
1860.55	"	Base of cutbank.
1860.80	"	"
1862.05	"	Top of cutbank.
1860.10	"	Base of washed root system.
1861.88	"	Top of washed root system.
1861.78	"	Top of bank.
1862.81	"	"
1859.76	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 3, T117N, R50W	Base of washed root system.
1859.81	SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 3, T117N, R50W	Change in slope.
1859.73	"	"
1860.32	"	"
1860.90	"	"
1862.37	"	"
1862.92	"	"
1871.27	"	"
1859.80	"	"
1860.43	"	"
1860.80	"	"
1861.75	"	"
1862.06	"	"
1862.95	"	Top of sand ridge.
1864.83	"	Change in slope.
1869.77	"	"
1859.63	"	"
1860.03	"	"
1859.57	"	"
1861.67	"	"
1863.41	"	Top of sand ridge
1862.13	"	Change in slope.
1863.37	"	"
1860.68	SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 4, T117N, R50W	Base of cutbank
1860.65	"	"
1861.84	"	Top of cutbank
1861.66	"	"
1859.45	"	Base of washed root system

Erosional characteristics continued:

Elevation (fmsl)	Legal Description	Comments
1859.17	"	Base of washed root system
1861.75	"	Top of washed root system
1860.84	"	"

SOIL CHARACTERISTICS:

Elevation (fmsl)	Legal Description	Comments
1857.95	SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 10, T117N, R50W	Base of pebbles.
1858.06	"	"
1858.04	"	"
1858.01	"	"
1858.00	"	"
1858.10	"	"
1858.09	"	"
1858.04	"	"
1858.06	"	"
1859.15	"	Top of pebbles.
1859.15	"	"
1859.08	"	"
1859.10	"	"
1859.15	"	"
1859.13	"	"
1859.13	"	"
1859.92	"	"
1859.15	"	"
1859.62	"	Base of smaller pebbles.
1859.61	"	"
1859.69	"	"
1859.61	"	"
1860.31	"	Top of smaller pebbles.
1860.24	"	"
1858.04	NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 10, T117N, R50W	Base of pebbles.
1859.24	"	Top of pebbles.
1862.37	SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 3, T117N, R50W	Top of sandy beach.
1862.06	"	"
1861.88	"	"
1861.96	"	"
1861.94	"	"

BOULDER LINES:

Elevation (fmsl)	Legal Description	Comments
1860.24	SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 10, T117N, R50W	Base of boulder lines.
1860.35	"	"
1860.40	"	"
1860.39	"	"
1861.21	"	Top of boulder line.
1861.28	"	"
1857.90	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 3, T117N, R50W	Base of boulder line.
1858.83	"	"
1859.15	"	"
1859.23	"	"
1859.39	"	"
1859.84	"	"
1860.22	"	"
1859.57	SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 3, T117N, R50W	Base of boulder line.
1859.91	"	"
1860.48	"	"
1863.62	"	Top of boulder line.
1863.93	"	"
1863.64	"	"
1857.97	SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 4, T117N, R50W	Base of small boulder line.
1858.00	"	"
1858.01	"	"
1860.33	"	Top of small boulder line.
1860.36	"	"

TERRESTRIAL VEGETATION:

Elevation (fmsl)	Legal Description	Comments
1860.32	SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 10, T117N, R50W	Lakeside 2' dia. live cottonwood
1860.81	"	" 4-6" to 1' live cottonwood
1860.27	"	" clump 6"-18" live cottonwood
1860.27	"	" 2' dia. live cottonwood
1860.41	"	" 14" dia. live cottonwood
1860.24	"	" line of 8"-14" cottonwood
1860.28	"	" 15" dia. live cottonwood
1860.25	"	" 2' dia. live cottonwood
1860.81	"	" 5' dia. live cottonwood
1861.84	"	" 2.5' dia. live elm
1862.05	"	" 18" dia. live elm

Terrestrial vegetation continued:

Elevation (fsm)	Legal Description	Comments
1862.82	"	" 1' dia. live elm
1862.89	"	" 1' dia. live elm
1862.52	"	" 10" dia. live elm
1862.66	"	" 2' dia. live ash
1863.87	"	" 5' dia. live cottonwood
1863.87	"	" 3' dia. live cottonwood
1863.68	"	" 2-18" dia. live elm
1863.50	"	" 3-14" dia. live elm
1860.52	"	Landside 2' dia. live cottonwood
1861.54	"	" 4-6" to 1' live cottonwood
1860.58	"	" clump 6"-18" live cottonwood
1861.21	"	" 2' dia. live cottonwood
1861.10	"	" 14" dia. live cottonwood
1861.00	"	" line of 8"- 14" cottonwood
1861.62	"	" 15" dia. live cottonwood
1860.94	"	" 2' dia. live cottonwood
1863.84	"	" 5' dia. live cottonwood
1863.14	"	" 2.5' dia. live elm
1862.92	"	" 18" dia. live elm
1862.84	"	" 1' dia. live elm
1862.88	NE¼ NE¼ Sec. 10, T117N, R50W	Lakeside 2' dia. live elm
1862.05	"	" 18" dia. live elm
1863.44	"	Landside 2' dia. live elm
1862.09	"	" 18" dia. live elm
1862.91	"	" 3' dia. live elm
1859.61	NW¼ SE¼ Sec. 3, T117N, R50W	Lakeside 2' dia. live cottonwood
1860.44	"	" 2-10" dia. ash
1860.76	"	" 10" dia. tree
1860.73	"	" 1' dia. live ash
1861.63	"	" clump of live trees
1862.36	"	" 2' dia. live elm
1860.94	"	landside 2-10" live ash
1861.17	"	" 1' dia. live ash
1862.81	"	" clump of live trees
1860.57	SE¼ NW¼ Sec. 3, T117N, R50W	lakeside 1.5' dia. old tree stump
1860.90	"	" group of 6" to 1' trees
1860.98	"	" 8" dia. live elm
1861.74	"	" 4' dia. live cottonwood
1861.78	"	" 2' dia. live cottonwood

Terrestrial vegetation continued:

Elevation (fsm)	Legal Description	Comments
1862.23	"	" 1' dia. live elm
1862.35	"	" 8" dia. live elm
1862.91	"	" 1' dia. live elm
1863.29	"	" 2' dia. live elm
1861.18	"	landside 1.5' dia. old tree stump
1861.34	"	" group of 6" to 1' trees
1861.42	"	" 8" dia. live elm
1862.35	"	" 1' dia. live elm
1863.03	"	" 1' dia. live elm
1860.62	SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 4, T117N, R50W	lakeside 4' dia. live cottonwood
1860.90	"	" 4' dia. live cottonwood
1862.97	"	landside 4' dia. live cottonwood
1861.64	"	" 4' dia. live cottonwood

WATER MARKS:

Elevation (fsm)	Legal Description	Comments
1860.87	SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 10, T117N, R50W	Water mark on tree.
1860.78	"	Water mark on rock.
1861.17	"	Water mark on tree.
1861.16	"	"
1861.26	"	"
1861.47	"	"
1861.50	"	Water mark on metal can.
1861.42	"	Water mark on tree.
1861.88	"	"
1861.70	"	"
1861.14	NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 10, T117N, R50W	Water mark on tree.
1859.59	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 3, T117N, R50W	Water mark on rock.
1860.43	"	"
1860.45	"	"
1860.46	"	"
1860.48	"	"
1860.45	"	"
1860.66	"	"
1860.70	"	Water mark on tree.
1860.16	SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 3, T117N, R50W	Water mark on rock.
1860.35	"	"
1860.67	"	"

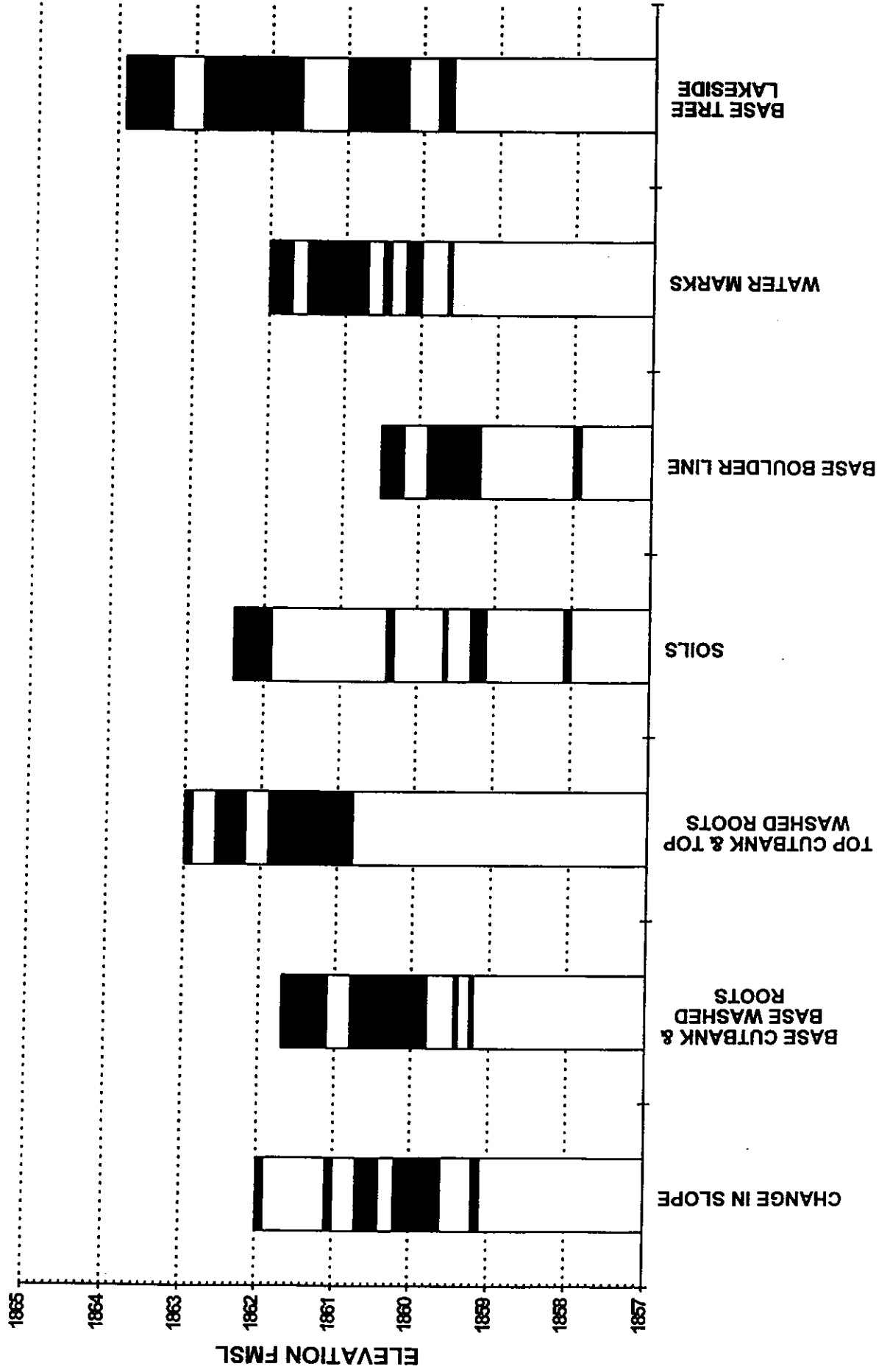
Water marks continued:

Elevation (fsml)	Legal Description	Comments
1860.81	"	"
1860.82	"	Water mark on tree.
1860.99	"	Water mark on rock.
1861.03	"	"
1861.30	"	"
1861.49	"	Water mark on tree.
1862.02	"	"
1860.08	SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 4, T117N, R50W	Water mark on rock.
1860.08	"	"
1860.05	"	"
1860.49	"	"
1860.40	"	"
1860.45	"	"
1860.44	"	Water mark on tree.

Attachment No. 8

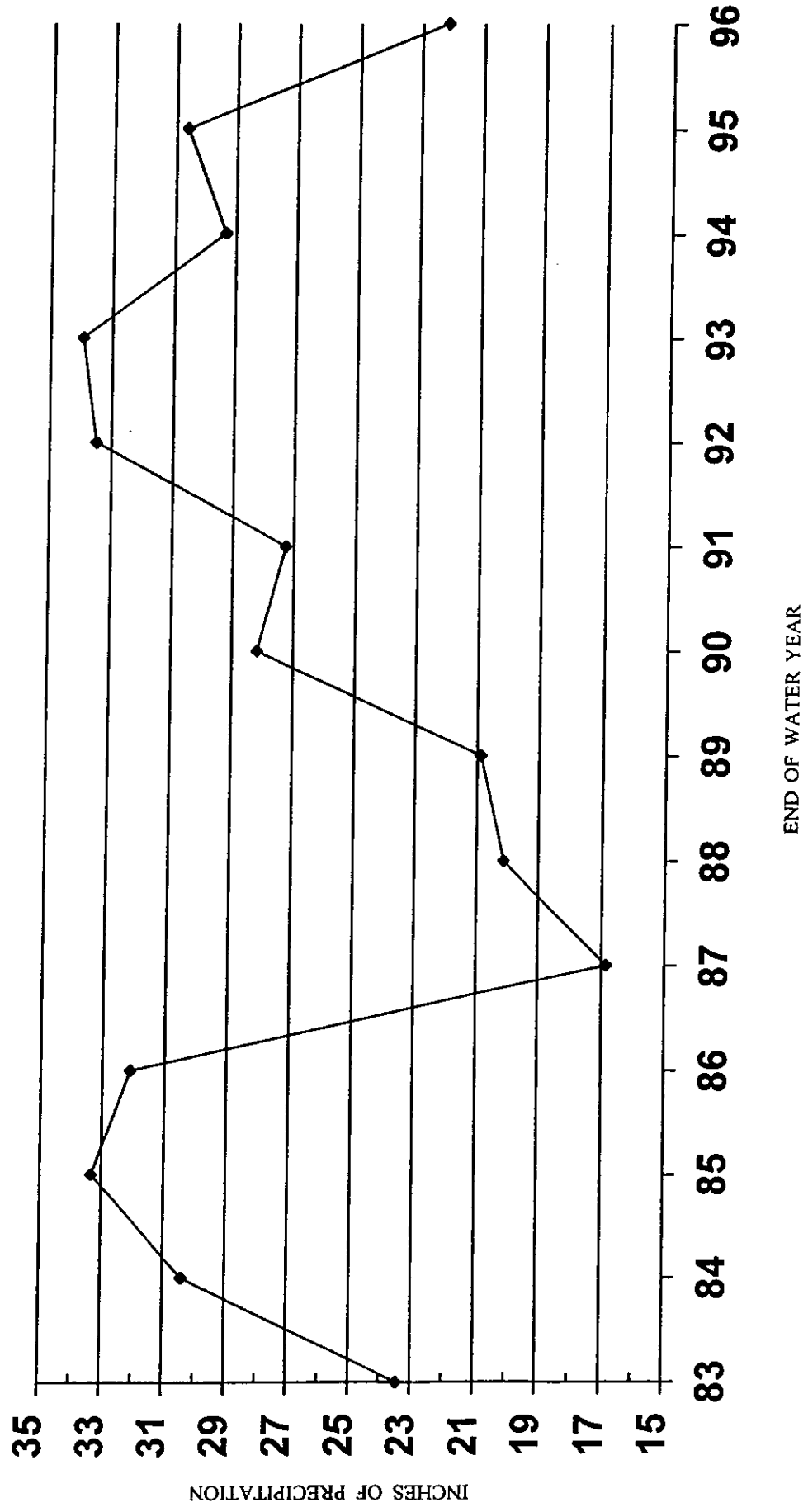
OHWM EVIDENCE GRAPH

The black bar segments represent bands of evidence along Round Lake's shore. Each segment is a group of a particular category of evidence found at or near the same elevation.



Attachment No. 9

WATER YEAR PRECIPITATION TOTALS
FOR
CLEAR LAKE, DEUEL CO. STATION



Attachment No. 9a



Monthly Precipitation for													Annual
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Clear Lake Station number: 39177707													
1938	NA	NA	NA	NA	NA	NA	NA	4.55	2.55	0.28	0.73	0.19	NA
1939	1.59	0.75	0.71	1.31	2.54	5.78	7.18	4.21	1.10	1.03	0.00	0.05	26.25
1940	0.05	0.45	2.80	1.78	1.01	4.94	1.13	7.26	0.31	1.36	1.23	0.47	22.79
1941	0.75	0.21	0.17	4.66	1.64	3.29	1.94	1.58	1.58	2.64	0.25	0.65	19.36
1942	0.00	0.09	2.68	2.15	7.29	3.19	2.14	2.83	4.99	0.70	0.01	0.40	26.47
1943	0.57	0.67	1.43	0.43	3.36	4.37	4.69	4.11	0.98	1.64	1.38	0.00	23.63
1944	1.05	0.49	0.60	2.28	2.71	4.01	1.88	5.10	2.17	0.17	0.95	0.12	21.53
1945	0.29	0.81	0.58	1.55	4.09	5.15	5.82	1.55	1.62	0.47	0.73	1.48	24.14
1946	0.00	1.31	1.91	0.92	4.37	6.05	4.20	1.75	5.86	4.09	1.18	0.48	32.12
1947	0.64	0.25	1.03	4.81	1.33	6.59	0.32	2.11	3.31	1.84	3.07	0.12	25.42
1948	0.07	1.94	0.45	2.99	0.74	5.14	5.94	5.37	2.68	1.08	1.34	0.13	27.87
1949	0.79	0.00	1.74	0.43	2.27	4.24	5.33	0.97	3.70	1.82	1.47	0.95	23.71
1950	0.68	0.00	2.32	1.21	4.70	1.41	2.51	1.56	1.82	1.71	0.43	0.56	18.91
1951	0.44	0.64	2.73	2.70	3.81	4.31	4.36	5.90	0.84	1.95	0.49	2.19	30.26
1952	1.77	1.49	1.59	0.52	1.42	7.46	1.29	1.35	0.84	0.00	0.84	0.32	18.89
1953	1.12	1.82	0.82	4.53	3.26	5.96	5.09	1.38	0.32	0.54	1.16	1.81	27.81
1954	0.27	0.69	2.71	2.45	2.44	3.74	1.79	1.65	3.57	1.69	0.94	0.08	22.02
1955	0.47 MM		0.34	2.30	0.67	4.84	4.78	3.03	0.79	0.35	NA	1.93	NA
1956	0.80	0.15	1.39	1.85	3.47	6.51	4.67	5.74	1.77	0.57	1.24	0.16	28.44
1957	0.43	0.95	0.68	2.38	5.44	2.58	1.91	3.20	4.60	3.02	1.30	0.76	27.25
1958	0.13	0.67	0.73	2.75	1.57	3.48	2.42	1.80	3.06	0.15	1.86	0.29	18.91
1959	0.38	0.68	0.12	1.21	4.68	1.63	3.01	1.59	1.73	2.32	1.10	1.56	20.06
1960	0.72	0.00	1.11	2.42	2.27	5.12	2.06	8.31	1.75	0.85	0.94	1.06	26.61
1961	0.04	0.52	0.57	1.43	5.40	4.27	1.64	3.04	2.64	1.73	0.26	0.54	22.08
1962	NA	NA	NA	NA	4.25	4.95	6.59	0.59	1.89	0.84	0.56	0.06	NA
1963	0.33	0.38	1.82	2.53	1.65	3.22	9.19	0.77	3.20	1.56	0.56	0.52	25.73
1964	0.00	0.09	1.42	2.70	1.52	2.36	4.15	5.77	1.14	0.05	0.41	0.42	20.03
1965	0.75	0.32	2.26	3.13	7.45	2.68	2.38	3.57	4.60	0.77	0.80	0.51	29.22
1966	0.22	0.88	0.67	1.75	1.69	2.12	4.10	4.24	2.28	0.86	0.38	0.34	19.53
1967	0.88	0.96	0.18	2.39	0.64	6.94	1.14	1.72	0.95	1.16	0.17	0.39	17.42
1968	0.24	0.00	0.74	4.36	2.22	3.90	2.12	2.06	2.85	4.04	0.86	2.02	25.41
1969	1.75	2.01	0.44	1.79	2.33	2.65	5.22	2.04	0.80	3.04	0.21	1.07	23.35
1970	0.24	0.03	1.31	3.85	4.44	3.86	4.86	1.43	2.04	4.20	3.26	0.22	29.74
1971	0.10	0.98	0.03	1.77	1.77	6.72	3.78	2.63	1.03	4.57	2.54	0.36	26.28
1972	0.50	0.31	0.89	3.03	8.51	1.02	5.98	2.10	0.65	3.34	1.26	1.37	28.96
1973	0.22	0.44	2.17	1.15	3.78	0.47	1.35	2.74	1.99	1.40	0.84	0.77	17.32
1974	0.00	1.20	1.07	1.75	4.39	2.90	1.56	3.07	0.66	0.83	0.50	0.14	18.07
1975	1.93	0.32	4.21	4.50	1.13	4.70	1.83	3.99	1.81	0.81	0.92	0.19	26.34
1976	0.84	0.56	1.41	1.00	0.38	1.52	1.60	NA	NA	0.39	0.09	0.54	NA
1977	0.50	1.53	5.29	1.94	2.10	4.36	2.34	4.50	5.60	3.60	3.48	1.42	36.66
1978	0.19	0.41	1.12	3.37	4.87	2.83	2.14	4.87	2.51	0.32	0.99	0.54	24.16
1979	2.39	0.55	1.75	3.02	2.46	4.01	2.62	6.04	0.66	3.62	0.22	0.16	27.52
1980	0.32	0.67	0.69	0.13	2.54	7.97	2.72	4.64	0.78	1.16	0.06	0.14	21.82
1981	0.39	1.38	1.41	1.26	1.21	4.16	2.96	1.13	0.75	2.03	1.22	0.90	18.80
1982	1.75	0.27	1.14	1.43	5.33	2.65	6.80	3.73	2.60	3.47	1.34	0.41	30.92
1983	1.00	0.09	4.09	1.46	1.63	3.23	2.48	1.64	2.62	1.57	5.21	0.67	25.69
1984	0.57	0.75	2.06	3.28	2.56	7.92	1.18	1.09	3.55	6.85	0.02	0.78	30.61
1985	NA	0.22	3.09	2.35	2.94	2.43	5.03	4.33	5.30	1.20	1.72	0.66	NA
1986	0.38	0.76	1.35	5.85	4.15	3.42	5.85	2.34	4.43	0.50	0.42	0.00	29.45
1987	0.17	0.43	2.20	0.70	1.42	1.35	4.93	1.95	2.78	1.16	0.87	0.92	18.88
1988	1.35	0.37	1.08	1.21	1.74	0.48	2.27	6.34	2.34	0.17	1.24	0.39	18.98
1989	0.21	0.82	2.95	1.82	1.10	1.89	2.48	4.66	3.15	1.55	0.74	0.05	21.42
1990	0.00	0.38	1.53	1.44	3.88	8.46	5.10	3.02	1.12	1.65	0.07	0.42	27.07

Monthly precipitation for Clear Lake, Station number 39177707 continued:

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1991	0.27	0.68	1.15	4.67	4.38	5.82	3.03	3.59	2.45	0.72	1.14	0.03	27.93
1992	0.99	0.77	1.41	2.00	1.39	16.12	4.10	2.73	2.08	0.58	2.29	0.75	35.21
1993	1.13	0.70	1.92	2.67	4.99	8.41	5.51	2.14	2.85	0.51	2.55	0.97	34.55
1994	1.94	1.00	0.57	3.02	1.89	6.84	2.70	4.27	3.07	2.16	0.85	0.41	28.72
1995	0.53	0.27	3.95	5.05	4.37	1.58	5.45	1.86	4.14	2.71	0.82	0.26	30.99

Attachment No. 10



Photo No. 1: Round Lake outlet channel upstream side of the culverts.



Photo No. 2: Five foot diameter Culverts in Round Lake outlet channel; overflow elevations of 1857.11, 1857.47, and 1857.83 fmsl.

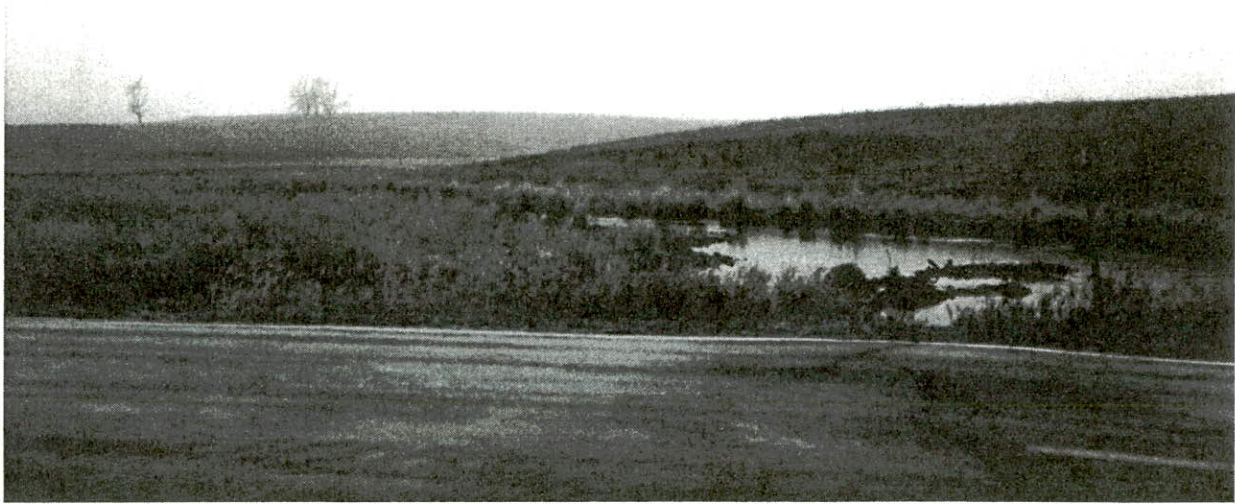


Photo No. 3: Round Lake outlet channel downstream side of the culverts.



Photo No. 4: Upstream side of the culvert from Bullhead Lake to Round Lake. Slough between Bullhead and Round lakes.



Photo No. 5: Line of trees and beach on the southeast side of Round Lake. Lakeside base of tree elevations range from 1860.2 to 1860.4 fmsl.



Photo No. 6: Boulder line on the northeast side of Round Lake. Base of boulder line elevations range from 1859.6 to 1860.5 fmsl, also base of steep bank.



Photo No. 7: Boulder line on the east side of Round Lake, looking to the south. Base of boulder line elevations range from 1859.2 to 1860.2 fmsl.



Photo No. 8: Boulder line on the east side of Round Lake, looking to the north. Base of boulder line elevations range from 1857.9 to 1859.2 fmsl.



Photo No. 9: Cluster of four cottonwood trees six inches to one foot in diameter on the southeast side of Round Lake. Lakeside base of tree elevation is 1860.8 fmsl, base of washed root system is 1860.1 fmsl, and top of washed root system is 1861.5 fmsl.



Photo No. 10: Five foot diameter cottonwood tree and washed root system on the southeast side of Round Lake. Lakeside base of tree elevation is 1860.8 fmsl, base of washed root system is 1859.8 fmsl, and top of washed root system is 1861.3 fmsl.

**AGENDA
WATER MANAGEMENT BOARD**

April 29, 1997

**Floyd Matthew Training Center
Joe Foss Building
523 East Capitol Ave., Pierre, SD**

Scheduled hearing times are estimates and may be delayed due to prior agenda items

April 29, 1997

8:30 am Call to Order

Approve March 5 and 6, 1997 Board Minutes

Reset next meeting to July 1 and 2 Tues/Wed (Pierre suggested)

Status and Review of Water Right Litigation -- John Guhin

Division of Environmental Services Update -- Steve Pirner

Administer Oath to Department of Environment and Natural Resources Staff

9:00 am Consider Proposed Amendments to Rules on Surface Water Quality Standard, Uses Assigned to Lakes and Uses Assigned to Streams -- Bill Baer

10:00 am Consider New Water Permit Applications

-- Water Permit Application No. 5978-3, Mark Sheffield -- Jim Goodman

-- Water Permit Application No. 5983-3, Clearfield Colony -- Jim Goodman

Cancellation Considerations -- Eric Gronlund

Consider Future Use Review -- Eric Gronlund

Consider Request for Rescission of Cancellation of Water Right No. 2389-3 and Vested Water Right No. 5384-3, Albert Haskell -- Ron Duvall

Consider Violations of Irrigation Questionnaire & Rescission of Suspension -- Genny McMath

10:30 am Consider Ordinary High Water Mark for Round Lake in Deuel County -- Lynn Beck

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5. Design, construction and management of the lagoons shall be sufficient to maintain seepage rate of less than 10^{-7} centimeters per second. Compaction of the soils within the wastewater lagoon must be at least ninety percent of the Standard Procter Density (ASTM D6980-70).
6. Permit No. 5978-3 is subject to compliance with the following then existing and applicable Water Management Board Rules:
 - a) Chapter 74:03:15 Ground Water Quality Standards,
 - b) Chapter 74:03:16 Ground Water Discharge Permit,
 - c) Chapter 74:03:02 Surface Water Quality Standards,
 - d) Chapter 74:03:04 Uses Assigned to Streams, and
 - e) Chapter 74:03:17 through 74:03:26 Surface Water Discharge Provisions.

MOTION by Rickenbach, SECONDED by Brink, to approve Water Permit Application No. 5983-3 with the qualifications recommended by the state engineer. Motion carried.

ORDINARY HIGH WATER MARK FOR ROUND LAKE IN DEUEL COUNTY

Lynn Beck provided the board with her report (copy on file). She noted that Geological Survey had prepared the maps using the General Information System with ARC View software. She pointed out the location of Round Lake on the map.

The only correspondence received on establishment of the ordinary high water mark for Round Lake was from GFP who requested they be made a party of record in the proceedings.

The Water Rights Program received a request from Roger Rust, a riparian landowner on Round Lake, for the establishment of the ordinary high water mark. Based on that request, the department conducted an investigation in May 1993 and October 1996.

Round Lake is in the northwestern corner of Deuel County. The outlet area is at the west end of the lake. There are two vested water rights held by GFP, and both claim 1889 priority dates. Vested Water Right Claim No. 1474-3 is for approximately 2550 acre feet of water per year to fill Round Lake for public recreational purposes. Vested Water Right Claim No. 1495-3, School Lake, is Round Lake overflow water for 660 acre feet to fill South School Lake for public recreational purposes.

There are four lakes in the chain of lakes that end at Round Lake. The chain consists of Wigdale, School, Round, and Bullhead Lakes. The Water Rights Program monitors well GT-81A about 2 1/2 miles north of Round Lake. All four of the hydrographs for these lakes have the same shape for the period of lake level measurements. This also follows the yearly precipitation graph and the hydrograph for well GT-81A. The hydrographs are included in Ms. Beck's report.

The direction of surface water flow between the lakes depends on water levels in the individual lakes. However, at the time of the investigation, water was flowing from Wigdale Lake to

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School to Round Lake. There was no flow between Bullhead and Round Lake. Water was flowing from Round Lake to Willow Creek and ultimately to the Big Sioux River.

Historical water level information was obtained from local landowners. In the 1930s the lake was dry and the lakebed was farmed. The lake was again very low in 1976. At that time the west arm of the lake was a dry. There have been other times when a person could wade across the west arm of the lake. Landowners also recall that the sloughs around the lake are wet during normal spring thaws. During a typical spring, water levels in Round Lake reach the trees along the shore.

Ms. Beck stated that in the outlet channel there are three five foot culverts. These culverts were installed in the late 1960s when the county road was regraded. The flow lines of the culverts are at different elevations with two of the culverts sloping toward the lake and one culvert sloping toward Willow Creek. The lowest of these overflow elevations was 1857.1. Ms. Beck stated that these manmade influences have been in place long enough to constitute natural conditions.

The evidence used in identifying the ordinary high water mark was erosion, changes in the character of the soil, boulder lines, growth and destruction of terrestrial vegetation. Consistent erosional features at Round Lake were cutbanks, washed root systems, and changes in slope. Erosion elevations at or near 1860 fmsl are consistent with the lake levels that have been monitored since 1983. There are several bands of evidence within the erosional areas partially due to the fact that erosion can occur over a short period of time as the lake goes up and down.

The soil characteristics observed were washed pebbles and the top of the sandy beach.

The base elevation of the boulder lines were found at 1858 fmsl and within ranges 1859.2 to 1859.9 fmsl, and 1860.2 to 1860.5 fmsl.

Elm and cottonwood trees are predominant around Round Lake. They ranged in diameter from six inches to five feet. Two of the live cottonwood trees, one two feet and the other three feet in diameter, were found at elevations 1859.6 and 1859.8 fmsl. Other large trees included a four foot diameter cottonwood tree at 1860.6 and a five foot diameter cottonwood tree at 1860.8 fmsl. The lowest terminal elevation for live trees at Round Lake is at 1859.6 fmsl.

Ms. Beck noted that in the outlet channel there are three five foot diameter culverts. The overflow elevation of the culverts are 1857.1, 1857.4, and 1857.8 fmsl. Water levels in Round Lake prevented a survey of the outlet channel to determine exactly where the outlet elevation was. At the time of the investigation the water level was 1858.8 fmsl and the lake body extended to the county road. It is believed that the outlet elevation is below 1858.3 fmsl, but due to lack of evidence, the department chose not to set the outlet elevation at this time.

The recommended ordinary high water mark for Round Lake is 1860 fmsl which is 2.2 to 2.9 feet above the invert elevations of the culverts in the outlet channel. Because of the difference in the bottom of the culvert elevations and the recommended ordinary high water mark elevation and the flow in the channel at the time of the investigation, the outlet elevation cannot be determined at this time.

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Ms. Beck read her conclusions into the record (see report).

The chief engineer recommended that the ordinary high water mark for Round Lake, Deuel County, be established at an elevation of 1860.0 fmsl.

MOTION by Freeman, SECONDED by Gunderson, that the ordinary high water mark for Round Lake, Deuel County be established at an elevation of 1860.0 feet mean sea level. Motion carried.

FINDINGS OF FACT, CONCLUSIONS OF LAW AND FINAL DECISION FOR WATER PERMIT APPLICATION NOS. 5957-3 AND 5958-3, EUGENE BARTZ

MOTION by Freeman, SECONDED by Brink, to adopt the Findings of Fact, Conclusions of Law and Final Decision in the matter of Water Permit Application Nos. 5957-3 and 5958-3, Eugene Bartz. Motion carried.

ADJOURN

Chairman Rollag declared meeting adjourned at 4:30 p.m.

WATER RIGHTS PROGRAM OBSERVATION WELL NETWORK UPDATE

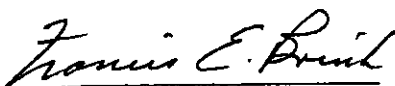
Ken Buhler, DENR Water Rights Program, presented information on DENR's observation well network. He provided background information on the network and overhead slides showing hydrographs for several monitoring wells.

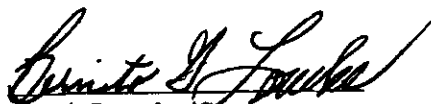
Mr. Buhler answered questions from the board regarding the observation well network.

A court reporter was present for this meeting and a transcript of the proceedings may be obtained by contacting Capital Reporting Services, PO Box 903, Pierre, SD 57501; telephone number (605)224-7611.

The meeting was also tape recorded and duplicate copies of the cassette tapes may be obtained by contacting the Department of Environment and Natural Resources, 523 East Capitol, Pierre, SD 57501; telephone (605)773-3151.

Approved this 9 day of July, 1997


Francis Brink, Chairman


Bernit Loucks, Secretary



DENR
SOUTH DAKOTA

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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Memo to File

Round Lake in Deuel County

VWR No. 1474-3

The OHWM was set by the Water Management Board on April 29, 1997.

OHWM elevation 1860.0 fmsl NGVD29