

WATER PERMIT NO. 1633-1

Name of Applicant: City of Lemmon

Address: 303 1st Ave W, Lemmon SD 57638

Phone: 605 374-5681

Amount of Water Claimed: 40 gpm (0.09 cfs)

Total Acres: 33

Source of Water Supply: groundwater (one well)

Water to be used for: irrigation of the golf course

County: Perkins

Type of Waste Disposal System: NA

Location: 2 miles southeast of Lemmon

PRIORITY Date Received: 9-11-95

Fee: \$50.00

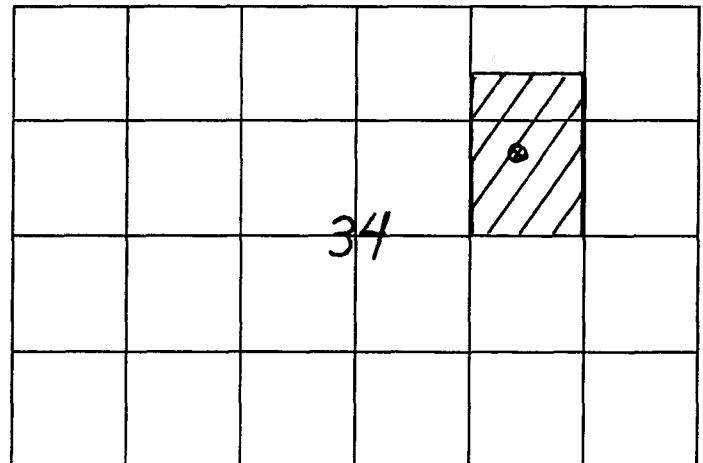
Corrected Application Received: NA

Period of Annual Use: April 1 - October 31

Remarks: Application was originally received in 1991

Diversion Point: SE 1/4 NE 1/4 Sec 34-T23N-R16E

Land to be Irrigated: E 1/2 NE 1/4 Sec 34-T23N-R16E



Depth of Well: 900 feet

Well Driller: Gregory Drilling

Remarks:

Type of Map: areial photo

Prepared by: Rassool Ahadi

Reviewed and the Number Assigned on: 9-15-95

By: Karen Schlaak

Notice of Hearing - date to intervene: _____

SOUTH DAKOTA
WATER PERMIT NO. 1633-1 FOR IRRIGATION

Date of first receipt of application September 11, 1995.

The Water Management Board approved Water Permit Application No. 1633-1 on December 6, 1995 for the City of Lemmon, 303 1st Ave W., Lemmon SD 57638 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 1633-1 appropriates 0.09 cubic feet of water per second (40 gallons per minute) from one existing well (Fox Hills Formation) 825 feet deep located in the SE 1/4 NE 1/4 Section 34-T23N-R16E. Water is diverted from the well into a regulating pond (11 acre-feet storage capacity) located in the SE 1/4 NE 1/4 Section 34 to irrigate portions of 33 acres located in the E 1/2 NE 1/4 Section 34; all in T23N-R16E. Water is for irrigation of the golf course.
2. The amount of the appropriation may not exceed 2 acre feet annually for each acre of land to which water is actually and beneficially applied for irrigation. The water is to be used during the following described annual period: April 1 - October 31.
3. The date from which applicant may claim right is September 11, 1995.
4. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
2. Water Permit No. 1633-1 authorized a dam with storage capacity of 11 acre-feet of water. The dam may be filled one or more times per year.
3. Permit No. 1633-1 limits the diversion rate from the 11 acre-feet storage dam for irrigation of 33 acres to 0.47 cubic feet of water per second (212 gallons per minute).
4. This permit is approved subject to the irrigation water use questionnaire being submitted each year.
5. The City shall maintain the suitability of the soil for irrigation. Within one year of issuance of this permit, the permit holder shall adopt a written irrigation management plan to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. The management plan shall provide for testing of the soil at reasonable intervals.

WATER MANAGEMENT BOARD

By: _____

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

APR 3 1996

date



FORM 2: Application for irrigation in South Dakota

(type or print)

Mail to:
Water Rights Division
Joe Foss Building
523 E Capitol
Pierre SD 57501-3181

No. 11633-1 Hydrologic Unit 10130303
Basin Grand River
Newspaper Lemmon Leader, Lemmon, SD
(office use only)



Application For Permit To Appropriate Water For Irrigation

Type of Application: X New Vested Right Amendment/Correction to Permit No.
(check one) (Use predates Mar 2, 1955)

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

1. Name of Applicant City of Lemmon Phone 605-374-5681
(check one) X Owner Tenant/lessee

Mailing Address 303 1st Ave W, Lemmon SD State 57638
(Street, RR, or Box) (City) (Zip Code)

2. Amount of water claimed 0.09 *CFS or 40 **GPM ***AF Total Acreage
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout if applicable)

3. Source of water supply groundwater

4. Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) SE 1/4 NE 1/4 Section 34
T23NR16E (location of well & regulating pond)
 County Perkins

5. County or counties where water will be used Perkins

6. Annual period during which water is to be used April thru October 31

7. List below each forty acre subdivision, or lot, or fraction thereof and show number of acres to be irrigated in each.
(Attach sheet if more space is needed)

Land Description	Acres	Land Description	Acres
<u>SE 1/4 NE 1/4 Sec 34, T23N, R16E</u>	<u>22.0</u>		
<u>NE 1/4 NE 1/4 Sec 34, T23N, R16E</u>	<u>11.0</u>		

8. Give a description of the project. (Attach sheet if more space is needed)

For use at the Lemmon Municipal Golf Course

Water from the well is pumped into a regulating pond with a capacity of about 11.0 acre feet.

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)

STATE OF SOUTH DAKOTA)

County of Perkins)ss

I, Mike Priest, the applicant, have read this application, examined the attached map, and certify that the matters stated are true, I intend and am able to complete the necessary construction.

Signed Mike Priest

Subscribed and sworn to before me this 11 day of September 1995

Daleen Dilsendager
Notary Public

Supplemental Information

(type or print in ink)

1. Well Information - Proposed Construction

- a) Drill Hole Diameter 10" Depth 900'
- b) Casing Type steel Diameter 6 5/8" O.D. Thickness 0.280"
- c) Screen Type stainless steel Diameter 3" I.D. Thickness 20-slot (6 lb/ft)
- d) Gravel Pack Thickness 3" Length of Gravel Pack 100'
- e) Depth to Top of Water Bearing Material 800'
- f) Depth to Water (ground surface to water level) 470'
- g) Distance to nearest existing domestic well:
On applicants property 100' On property owned by others 1/2 mile

2. Wastewater Disposal System Information

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



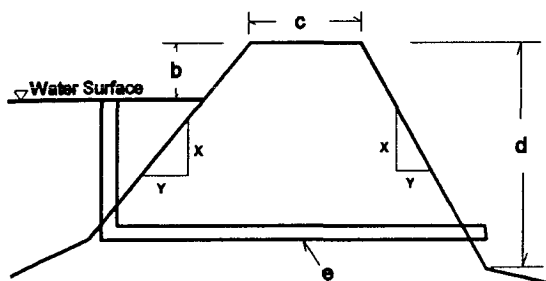
3. Dugout Information

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

4. Water Storage Dams

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

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



- b) Freeboard _____
- c) Crest Width _____
Crest Length _____
- d) Height _____
- e) Primary Outlet Capacity _____
If pipe, diameter _____
- f) Secondary Spillway Capacity _____
Spillway Width _____
- g) X & Y Slope
Upstream _____
Downstream _____
- h) Surface Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres

RECEIPT

Division of Water Rights

South Dakota Department of Water and Natural Resources

412742

Pierre, _____ July 18, 19 91

RECEIVED OF City of Lemmon, 303 1st Ave. West, Lemmon, SD 57638

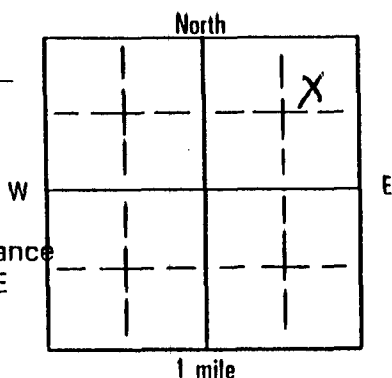
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. <u>1633-1</u> to Appropriate Water, to construct works and to put water to beneficial use _____	50	00
Fee for Application for Permit No. _____ to Appropriate Water for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for Certified Copy of _____		
Fee for Print Copy of Map _____		
Fee for Certifying _____		
Fee for _____		
(Any Other Work Provided by Law)	Total	50 00

By John Hatch 
Chief Engineer

SOUTH DAKOTA WATER WELL COMPLETION REPORT

10-85

Location NE 1/4 NE 1/4 Sec 34 Twp 23 Rg 16County
PerkinsPlease mark well
location with
an "X"S24°27' 44"W a distance
of 1878' from the NE
corner.Well Completion Date 7/27/91

PROPOSED USE:

☐ Domestic ☐ Municipal ☐ Test Holes
☒ Irrigation ☐ Industrial ☐ Stock

Method of Drilling:

Forward Rotary

CASING DATA:

☒ Steel ☐ Plastic ☐ Other

If other describe _____

PIPEWEIGHT	DIAMETER	FROM	TO	HOLE DIAMETER
19.45 LB/FT	6 5/8 IN	0 FT	750 FT	10 IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN
_____ LB/FT	_____ IN	_____ FT	_____ FT	_____ IN

A 53 Grade B

GROUT:

Was the well grouted? ☒ YES ☐ NOTo what depth? 750 FEETWhat is grouting material? Haliburton CementIf cement, number of sacks? 250Describe grouting procedure 6 gal. of water to 94 lbs
of cement, circulated cement to surface, Approx.
8 bls in the pit, return.What was grout weight? 15.50 LB/GALSCREEN: ☐ Perforated pipe ☒ ManufacturedDiameter 3" IN Length 70 FEETMaterial Johnson 304 Stainless SteelSlot Size .020 Set From 750 Feet To 820 FeetSlot Size Blank Set From 820 Feet To 825 Feet

Slot Size _____ Set From _____ Feet To _____ Feet

Other information 715-730 -15' of 3" Sch. 40 black
730-750 - 20' of 3" Stainless Steel PipeWas a packer or seal used? ☐ YES ☒ NOIf so, what material? HTH Chlorine 55 lbs.Describe packer(s) and location? Used Unimum #10 sand pack,
Chlorine was mixed w/sand pack; rechlorinated
during well development & pump test.Was well disinfected upon completion? ☒ YES ☐ NO

Explain (SEE ABOVE)

Bacteriological analysis ☒ YES ☐ NOLaboratory sent to Measurement Services

Well Owner:

Name Lemmon Municipal Golf Course WellAddress Lemmon, SD

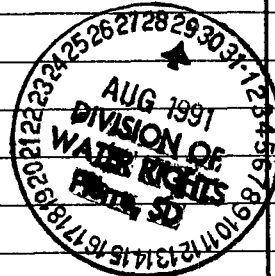
Well Log:

Depth

Formation

From

To

SEE ATTACHED DRILLING
LOG & GEOPHYSICAL LOGSTATIC WATER LEVEL 415 Feet

If flowing: closed in pressure _____ PSI

GPM flow _____ through _____ inch pipe

Controlled by ☐ Valve ☐ Reducers ☐ Other

If other, specify _____

Can well be completely shut in? _____

WELL TEST DATA:

☒ Pumped

See attached Pump Sheet Data,

☐ BailedDescribe: Drawdown & Recovery☐ Other _____

Pumping Level Below Land Surface

470 ft. After 12 Hrs. pumped 52 GPM

_____ ft. After _____ Hrs. pumped _____ GPM

_____ ft. After _____ Hrs. pumped _____ GPM

REMARKS: 10 HP Grundfos Pump, 2" drop pipe with
air line - 15' above pump.
32 joints=672'
4'8" to Intake
To intake 676' 8"This well was drilled under license # 532

And this report is true and accurate.

Drilling firm Gregory Drilling, Inc.

Signature of License Representative:

Lawrence N. Gregory

Signature of Well Owner:

City of Lemmon by Charles B. Johnson, MayorDate July 29, 1991

Gregory Drilling Co.

1059 2nd AVENUE EAST - DICKINSON, NORTH DAKOTA 58601 - (701) 227-0320



Lemmon Municipal Golf Course Well
Lemmon, SD
July 29, 1991

			MINUTES	DEPTH
Sandy clay	0	15	15	20
Rock	15	16	5	40
Clay	16	17	5	60
Rock	17	18	5	80
Sandy & clay layers	18	60	5	100
Clay	60	89	5	120
Rock	89	90	7	140
Sand	90	105	45	160
Clay	105	198	5	180
Rock	198	201	17	200
Clay sandy	201	208	15	220
Rock	208	209	6	240
Clay sandy	209	215	6	260
Clay	215	287	7	280
Clay sandy	287	332	9	300
Clay	332	427	9	320
Clay sandy	427	435	11	340
Clay	435	473	13	360
Rock	473	475	13	380
Clay	475	524	19	400
Rock	524	525	19	420
Sandy clay	525	760	13	440
Sand blue/gray	760	800	17	460
Sand, gray	800	821	120	480
Clay	821	850	14	500
Sandy, blue, clay/sandy	850	898	16	520
Rock	898	901	24	540
Clay sandy	901	905	12	560
Brown clay	905	950	20	580
			22	600
			16	620
			13	640
			11	660
			18	680
			19	700
			13	720
			18	740
			12	760
			10	780
			7	800
			6	820
			17	840
			8	860
			12	880
			14	900
			16	920
			18	940
			8	960

JOHN PAUL GRIES

Consulting Geologist

238 ST. CHARLES STREET
RAPID CITY, SOUTH DAKOTA

Description of cuttings from City of Lemmon Municipal Golf Course Well.

SE NE sec. 34, T. 23 N., R. 16 E.

- 0 - 5 clay, gray to tan, silty
20 clay, same but slightly grayer
35 clay, gray to dark gray, silty
40 clay, very silty, dark gray
55 clay, gray, silty
60 clay, light gray, silty
90 clay, light to medium gray, silty
100 clay, silty to sandy, light gray
70 clay, slightly silty, dark gray
80 clay, same but siltier
90 clay, sandy to silty, medium gray
200 clay, silty to sandy, light gray
25 clay, same with streaks fine white sand
70 clay, silty, light to medium gray
80 clay, slightly silty, medium gray
300 clay, sandy, light gray
35 clay, sandy to silty, light gray
75 clay, slightly silty, dark gray
400 clay, silty, dark gray
25 clay, slightly silty, medium gray
40 clay, silty to sandy, medium gray
70 clay, silty, gummy, dark gray
520 clay, sandy, light gray
60 sand and silt, with interstitial clay, light to medium gray
80 clay, some very sandy, medium gray
600 clay, sandy, medium gray
15 clay, slightly silty, gray
55 clay, silty to sandy, with gummy streaks, medium gray
80 clay, slightly silty, gummy, dark gray
700 clay, gray, with silty streaks
10 clay, light to medium gray, silty to sandy
50 clay, silty, medium to dark gray
825 sand, very fine to fine, angular, clear to white; some interstitial clay
40 clay, sandy, medium gray
70 clay, sandy, with streaks fine angular sand
75 sand, fine, with interstitial clay
900 clay, sandy, dark gray
950 clay, silty, medium to dark gray

Note: This log is in essential agreement with the drillers log and the electric log. The low SP on the electric log is probably due to interstitial clay. Slow and careful development may be necessary to bring the well up to its potential.

J. P. Gries
Rapid City, SD
July 12, 1991



FIELD PUMPING TEST WATER LEVEL MEASUREMENTS

XWELL NO. 638 Meter On - 995 Meter Off

XNAME Pump Set @ 676' 8" to Intake

TESTER(S) Gregory Drilling

Lemmon Municipal Golf
Course Well

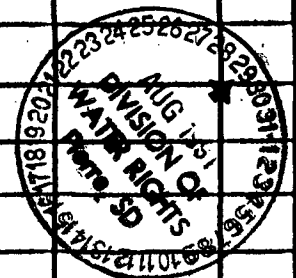
LOCATION:
DATE: 7/26 & 7/27/91

Measurement taken top of casing, 18" above G. Level

TEST PUMPING

RECOVERY

TIME OF MEASURE- MENT	ELAPSED TIME (MIN.)	DEPTH OF WATER (FEET)	PUMPING RATE (GPM)	DRAWDOWN (FEET)		TIME	DEPTH OF WATER (FEET)	ELAPSED TIME (MIN)	COMMENTS
4:00		415	52	0		4:05	470	0	
4:05	5	448	"	33		4:06	452	1	
4:10	10	460	"	45		4:07	438	2	
4:15	15	461½	"	46½		4:08	430	3	
4:20	20	462½		47½		4:09	425	4	
4:25	25	463		48		4:10	423	5	
4:30	30	463'3"		48'3"		4:15	421	10	
4:40	40	463'6"		48'6"		4:20	420	15	
4:50	50	464		49"		4:25	419	20	
5:00	1 hr.	464'6"		49'6"		4:30	418	25	
5:10	1:10	465		50'		4:35	417'6"	30	
5:20	1:20	465'3"		50'3"		4:40	417	35	
5:30	1:30	465'6"		50'6"		4:45	416'6"	40	
5:40	1:40	465'9"		50'9"		4:50	416'3"	45	
5:50	1:50	466'		51		4:55	416'	50	
6:00	2 hrs.	466		51		5:00	415;9"	55	
6:30	2:30	466'6"		51'6"		5:05	415;6"	1 hr.	
7:00	3 hrs.	467		52		5:10	415;3"		
7:30	3:30	467'6"		52'6"		5:15	415		
8:00	4 hrs.	468		53		5:20	415		
9:00	5 hrs	468'6"		53'6"					
10:00	6 hrs	469		54					
11:00	7 hrs	469'3"		54'3"					
12:00	8 hrs	469'6"		54'6"					
1:00	9 hrs	469'9"		54'9"					
2:00	10 hrs	470		55					
3:00	11 hrs	470		55					



4:00 12 hrs 470

55 M-9

Measurement Services

STAR ROUTE 1, BOX 14

BELFIELD, ND 58622

PHONE (701) 575-4649



Name: Gregory Drilling

W. O. No.: 1491

Location: Lemmon Muni. Golf Course

Date Collected:

Collected By: Larry Gregory

Date Received: 7-30-91

Date of Analysis: 7-30-91

CHEMICAL ANALYSIS OF WATER SAFE DRINKING WATER ACT STANDARDS

<u>Parameter</u>	<u>Recommended Parameter Levels</u>	<u>Test Results</u>	<u>Units</u>
pH	6.5-8.5	8.37	pH
Conductivity	-	1821	uhmos/cm
Total Dissolved Solids(C)	500	1150	mg/l
Chloride (Cl)	250	223	mg/l
Sulfate as (SO ₄)	250	1.0	mg/l
Total Alkalinity (CaCO ₃)	-	692	mg/l
Bicarbonate (HCO ₃)	150	681	mg/l
Carbonate (CO ₃)	None	11	mg/l
Calcium (Ca)	200	3	mg/l
Iron (Fe)	0.3	0.09	mg/l
Magnesium (Mg)	125	11	mg/l
Sodium (Na)	270	386	mg/l
Total Hardness (as CaCO ₃)	270	49	mg/l
Total Hardness (as CaCO ₃)	16	3	Grains/gal
Nitrate, NO ₃	10.0	0.48	mg/l

Comments: Very high in sodium, very high in chlorides, soft water.

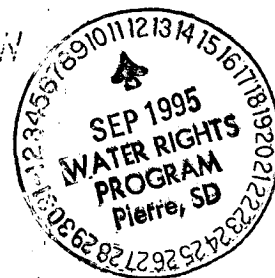
SAR: 23 Irrigation Classification: C3-S4 Non-irrigable due to high sodium and salinity.



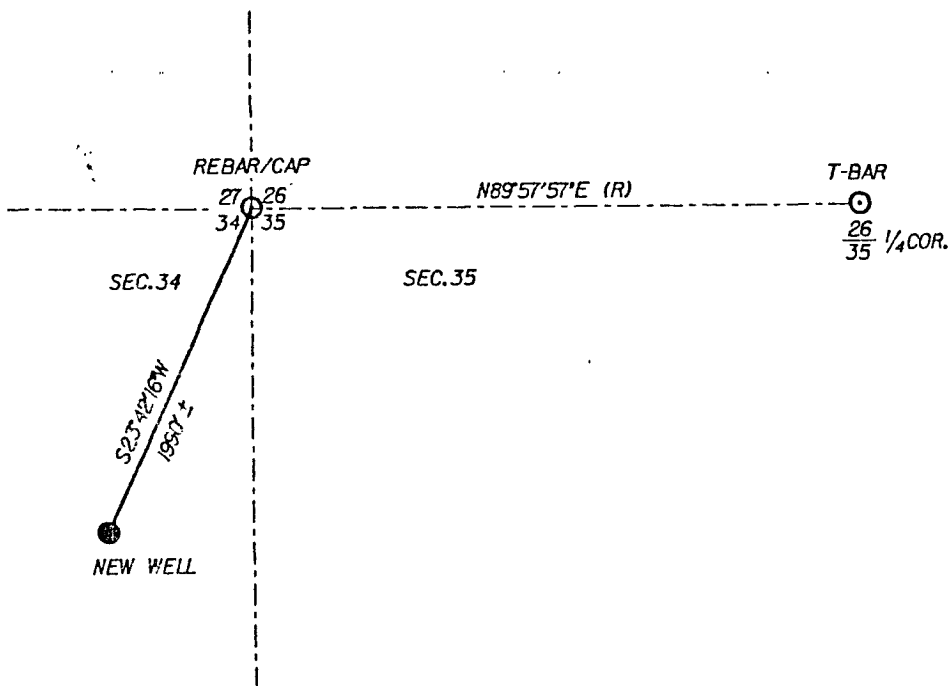
DRILLER GREGORY DRILLING DICKINSON ND. ENGINEER ANALYSIS BY BILL SCHAFER DATE July 15, 1991		JOB NAME MUNICIPAL GOLF COURSE LOCATION LEMMON, SD JOHNSON I.D. NUMBER 91196 SAMPLE SENT IN BY GREGORY DRILLING		SAND ANALYSIS REPORT Johnson Filtration Systems Inc. P.O. Box 64118 • St. Paul, Minnesota 55164-0118 • Telephone: 612-636-3900 Telex: 29-7451 • FAX 1-612-636-0889 • Call Toll Free 1-800-VEE-WIRE																																																																																																																																																						
U.S. STANDARD SIEVE NUMBERS CUMULATIVE PER CENT RETAINED 100 90 80 70 60 50 40 30 20 10 0 SIEVE # 4 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 INCHES 1/4 1/2 3/4 1 1 1/4 1 1/2 1 3/4 2 2 1/4 2 3/4 3 3 1/4 3 1/2 4 4 1/2 5 5 1/2 6 6 3/4 8 MILLIMETERS 6.3 12.5 25 30 42.5 50 60 75 85 100 118 135 150 168 188 200 225 250 280 SLOT OPENING AND GRAIN SIZE, IN THOUSANDTHS OF AN INCH AND MILLIMETERS 1 2 3 4 mm 2.5 5 7.5 10 U.S. Sieve # 60 30 20 10 very fine sand fine sand med sand coarse sand very coarse sand very fine gravel fine gravel		TEST HOLE DATA DIAMETER DEPTH DRILLING METHOD DRILLING FLUID GEOPHYSICAL LOGS STATIC WATER LEVEL		WELL DATA CASING DIAMETER DESIRED YIELD WELL APPLICATION DESIGN RECOMMENDATIONS RECOMMEND : JOHNSON SS SCREEN 20 SLOT (0.020IN) WITH UNIMIN # 10 OR EQUIVALENT.																																																																																																																																																						
		COMMENTS		SCREEN RECOMMENDATIONS DIAMETER <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SLOT</th> <th>LENGTH</th> <th>SETTING</th> </tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>		SLOT	LENGTH	SETTING																																																																																																																																																		
		SLOT	LENGTH			SETTING																																																																																																																																																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>COMBINED SAMPLE DEPTHS</th> <th>PHYSICAL SAMPLE DESCRIPTION</th> <th>mm Inches U.S. Sieve #</th> <th>4.76 .187 4</th> <th>3.36 .123 6</th> <th>2.38 .094 8</th> <th>1.68 .066 12</th> <th>1.19 .047 16</th> <th>.840 .033 20</th> <th>.590 .023 30</th> <th>.420 .016 40</th> <th>.297 .012 50</th> <th>.210 .008 70</th> <th>.149 .006 100</th> <th>.074 .003 200</th> <th>.053 .002 270</th> <th>TOTAL WT.</th> </tr> <tr> <td>#1</td> <td>TO SILENT TO VERY FINE GRAVEL</td> <td>CUMULATIVE % RETAINED</td> <td>100</td> <td>100</td> <td>99.4</td> <td>99.3</td> <td>99.9</td> <td>99.9</td> <td>99.9</td> <td>99.9</td> <td>99.9</td> <td>99.9</td> <td>99.9</td> <td>99.9</td> <td>99.9</td> <td>225.3</td> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>		COMBINED SAMPLE DEPTHS	PHYSICAL SAMPLE DESCRIPTION	mm Inches U.S. Sieve #	4.76 .187 4	3.36 .123 6	2.38 .094 8	1.68 .066 12	1.19 .047 16	.840 .033 20	.590 .023 30	.420 .016 40	.297 .012 50	.210 .008 70	.149 .006 100	.074 .003 200	.053 .002 270	TOTAL WT.	#1	TO SILENT TO VERY FINE GRAVEL	CUMULATIVE % RETAINED	100	100	99.4	99.3	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	225.3																																																																																																																							
COMBINED SAMPLE DEPTHS	PHYSICAL SAMPLE DESCRIPTION	mm Inches U.S. Sieve #	4.76 .187 4	3.36 .123 6	2.38 .094 8	1.68 .066 12	1.19 .047 16	.840 .033 20	.590 .023 30	.420 .016 40	.297 .012 50	.210 .008 70	.149 .006 100	.074 .003 200	.053 .002 270	TOTAL WT.																																																																																																																																										
#1	TO SILENT TO VERY FINE GRAVEL	CUMULATIVE % RETAINED	100	100	99.4	99.3	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	225.3																																																																																																																																										

SO MANY CONSIDERATIONS ENTER INTO THE MAKING OF A GOOD WELL THAT, WHILE WE BELIEVE SLOT SIZES FURNISHED OR RECOMMENDED FROM SAND SAMPLES ARE CORRECT WE ASSUME NO RESPONSIBILITY FOR THE SUCCESSFUL OPERATION OF JOHNSON WELL SCREENS.

MAP TO ACCOMPANY WATER RIGHT APPLICATION



NO SCALE



LEGEND

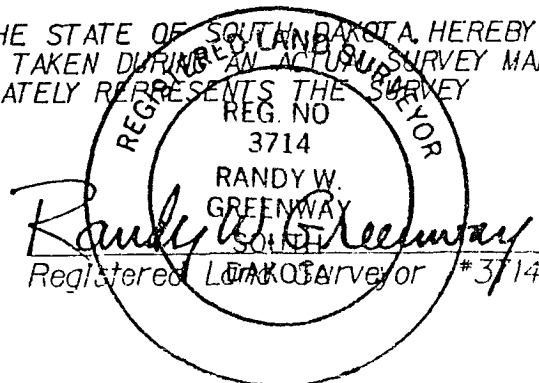
- DENOTES FOUND CORNER OF RECORD
- DENOTES POINT OF DIVERSION

NOTES:

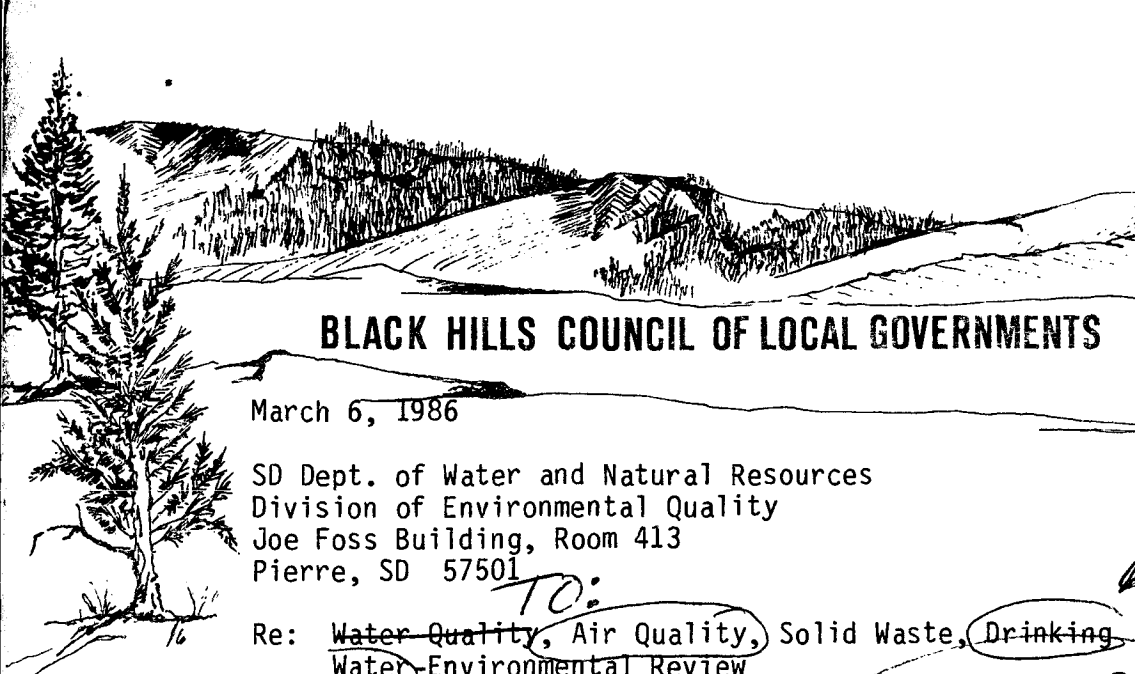
THE BASIS OF BEARING FOR THIS SURVEY IS THE RECORD BEARING BETWEEN THE N 1/4 CORNER AND THE NW SECTION CORNER OF SECTION 35, T23N, R16E, B. H. M.

SURVEYOR'S CERTIFICATE

I, RANDY W. GREENWAY, REGISTERED LAND SURVEYOR IN THE STATE OF SOUTH DAKOTA, HEREBY CERTIFY THAT THIS MAP WAS MADE FROM FIELD NOTES TAKEN DURING AN ACTUAL SURVEY MADE BY ME IN JUNE, 1991, AND THAT IT CORRECTLY AND ACCURATELY REPRESENTS THE SURVEY AS SHOWN HEREON.



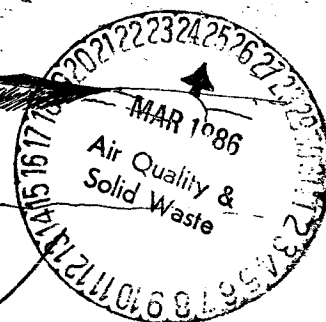
~~S. Pinner~~
~~Busch~~
A. Busch
J. Hatch



BLACK HILLS COUNCIL OF LOCAL GOVERNMENTS

March 6, 1986

SD Dept. of Water and Natural Resources
Division of Environmental Quality
Joe Foss Building, Room 413
Pierre, SD 57501



TO:
Re: Water Quality, Air Quality, Solid Waste, Drinking
Water Environmental Review

Water Rights

Dear Sir:

Lemmon, South Dakota has been awarded CDBG funds by the South Dakota Department of Water and Natural Resources for a water supply project.

The proposed project includes drilling a well which will produce 200 gpm approximately 1000 feet into the Fox Hills formation, a pump house, chlorination system and other necessary appurtenances will be included. The project includes replacement of 1500 L.F. of distribution lines with 8 inch PVC lines and connection to the new well.

The location of the proposed well and distribution system improvements is clearly marked on the enclosed map. We are requesting you to review the project pertaining to water quality, air quality, solid waste, and drinking water. Your prompt response would be appreciated.

Thank you for your cooperation.

Sincerely,

William F. Meredith

William F. Meredith

Enclosure

RECEIVED

p.o. box 1586 306 e. st. joe
rapid city, s.d. 57709
phone (605) 394-2681
serving local government in black hills area



LEGEND

—————	8"	WATER	LINE
—————	6"	WATER	LINE
—————	4"	WATER	LINE
—————	2"	WATER	LINE

LEMMON WATER MAP



Department of Water & Natural Resources

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

Water Rights Division
605 773-3352

April 3, 1986

William F. Meredith
Black Hills Council of Local Government
PO Box 1586
Rapid City SD 57709

Dear Mr. Meredith:

This is in response to your letter of March 6, 1986 relative to CDBG funds for a water supply project for the City of Lemmon SD.

In your letter you stated that the proposed project includes drilling a well. The City of Lemmon does not have a water permit for the new well. Before the City of Lemmon can drill a new well, they must have a water permit.

If the City of Lemmon has any questions or needs water permit application forms, please have them contact us.

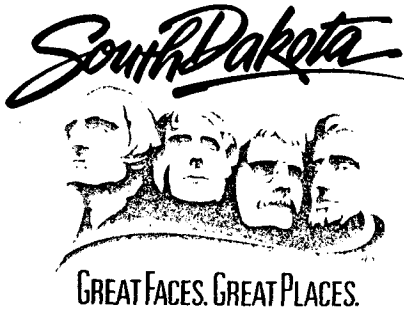
Very truly yours,

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

JOHN HATCH, Chief Engineer
Water Rights Division

JH:DB:ks

cc: Bob Hartford



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

July 19, 1991

Clark B. Johnson, Mayor
City of Lemmon
303 First Ave W
Lemmon SD 57638

Dear Mayor Johnson:

Enclosed is the Application for a Water Permit submitted on behalf of the City of Lemmon. Since this application is for irrigation of the municipal golf course, it will be necessary to complete the enclosed application forms which are specifically for irrigation.

The information from your original application has been transposed to this new form. It is necessary for you to complete Item No. 2, the total acres irrigated, and to describe the acreage in Item No. 7. The application must signed and notarized. To complete the application it will be necessary to submit a well log, a soils map of the irrigated acres and a signed map outlining the acres to be irrigated. An instruction sheet is enclosed which outlines the additional information necessary to process the application.

Since the application is requesting less than the 0.10 cfs, the \$50.00 filing fee is correct and has been receipted.

If you have any questions, please contact this office.

Sincerely,

Karen Schlaak
Natural Resources Analyst
605 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

GREAT FACES. GREAT PLACES.

September 17, 1991

Clark B. Johnson, Mayor
City of Lemmon
303 First Ave W
Lemmon SD 57638

Dear Mr. Johnson:

On July 17, 1991, an application was submitted (copy enclosed) for a permit to appropriate water for irrigation of the municipal golf course at Lemmon. You were notified on July 19, 1991 (copy enclosed) that the application was incomplete and were instructed what additional information was necessary in order to complete the application. To date, we have not received a response.

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

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

If you have any questions, please contact this office.

Sincerely,

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

Karen Schlaak
Natural Resources Analyst
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

October 24, 1994

Eldon S. Jensen, Mayor
City of Lemmon
303 1st Ave West
Lemmon SD 57638

Dear Mayor Jensen:

We received the Application for Permit to Appropriate Water for the City of Lemmon. All of the necessary information has been submitted. A report, recommendation and public notice will now be prepared on the application...

A review of our files indicates that in July, 1991 an application was submitted by the City of Lemmon for a well which was going to be used to irrigate greens and fairways at the Lemmon Municipal Golf Course. The forms were returned to the City to be completed, signed and notarized. Applications for irrigation also require a map which shows the location of the well and outlines the area to be irrigated. The application has not been completed.

If this well located in Section 34-T23N-R16E is used by the City to water the Municipal Golf Course it will be necessary to complete enclosed application forms. Enclosed is a copy of the original application and map submitted.

Processing these applications at that same time would reduce the public notice cost for the City of Lemmon.

If you have any questions, please contact this office.

Sincerely,

Karen Schlaak
Environmental Scientist
605 773-3352

enclosures



July 5, 1995

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

Art Pederson
City of Lemmon
303 1st Ave W
Lemmon SD 57638

Dear Mr. Pederson:

In reference to your phone conversation with Rassool Ahadi, of our office, enclosed are partially completed application forms for a water permit for the Lemmon Municipal Golf Course.

Please complete Items No. 2, 4, 6 & 7 of the application. The forms must be signed and notarized. It will also be necessary to submit a map with the location of the well marked and the areas irrigated outlined (instruction sheet enclosed).

We have the required well log on file. A filing fee of \$50.00 was submitted in July, 1991 and will be applied toward this application. If the amount of water claimed is less than 45 gallons per minute, the filing fee remains \$50.00. If the water use is more than 45 gallons per minute, then the filing fee is based on the number of acres irrigated. These amounts are listed on the instruction sheet.

If you have any questions, regarding completion of the application, please contact Rassool Ahadi or myself.

Sincerely,

Karen Schlaak

Karen Schlaak
Environmental Scientist
605 773-3352

enclosures

REPORT ON WATER PERMIT APPLICATION NO. 1633-1
for the City of Lemmon
September 29, 1995

Application No. 1633-1 proposes to appropriate 0.09 cfs (40 gpm) from one well approximately 825 feet deep located in the SE 1/4 NE 1/4 of section 34, T23N R16E. Groundwater is diverted from the well into a regulating pond (11 acre feet of storage capacity) located in the SE 1/4 NE 1/4 of section 34 to irrigate portions of 33 acres located in the E 1/2 NE 1/4 of section 34; all in T23N R16E in Perkins County. Incidental surface water will also be captured in the pond and used. The water is used for irrigation of a golf course.

AQUIFER - FOX HILLS (FXHL)

The Fox Hills is a buried sandstone, siltstone and shale which is under confined or artesian conditions in this area and which was deposited in a deltaic environment (Croft, 1979). According to the driller's log submitted with the application, sand was encountered from 760 to 821 feet below land surface. Screen was set from 750 to 820 feet and the well was capable of producing 52 gpm with 55 feet of drawdown. The well had a static water level of 415 feet below land surface and a calculated specific capacity of 0.95 gpm/ft of drawdown. The Fox Hills underlies 1.83 million acres and contains an estimated 13.73 million acre feet of recoverable water in storage in Perkins County alone (Allen, 1984). The aquifer is areally extensive into North Dakota to the north and into Harding County to the west and Corson County to the east.

The Water Rights Program does not monitor any observation wells completed into the Fox Hills in Perkins County. There are some water levels available for a municipal well for the City of Lemmon. For a nine year period during the 1980's there was nine feet of water level decline recorded (Winter, 1994), however, the published record does not appear to be indicative of the water levels for the Fox Hills aquifer. The water levels for the well monitored appear to be about 200 feet higher than the water levels for the well in this application. Other information from other City wells also indicates that the water level would be the lower range.

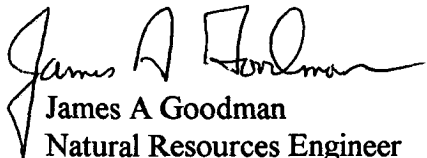
REVIEW OF EXISTING WATER PERMITS/RIGHTS

The only other water permits/rights in this area belong to the City of Lemmon. The Lemmon City wells are located about 3 miles northwest of this application. Interference is not a concern. Significant drawdown should not extend from this application to the existing City Wells.

CONCLUSIONS

1. Water is available from the Fox Hills Formation.
2. The aquifer is confined and under artesian conditions at this site. Interference is not expected to be a concern.

3. The well for this application is constructed. The well is constructed in accordance with SD Well Construction Standards.
4. Water will be diverted from the well to a pond at a rate of 40 gpm. Based upon an inspection it appears the diversion rate from the pond is about 240 gpm. This should be reflected in the permit application. The maximum rate which the permit application could be approved for irrigation would be about 212 gpm.
5. The water is high in sodium and salinity. The water may be unsuitable for irrigation uses and city should consult with an irrigation specialist to determine the feasibility of water use for irrigation.


James A Goodman
Natural Resources Engineer

BIBLIOGRAPHY

- Allen, J.C., D.L. Iles, A.K. Petres, 1984, Analysis of Groundwater and Streamflow Data Western Dakotas Region of South Dakota, for US Army Corps of Engineers, SD DENR, SDGS, Vermillion, SD, 57069.
- Croft, M.G., D.C. Thorstenson, D.W. Fisher, 1979, The Geochemistry of the Fox Hills-Basal Hell Creek Aquifer in Southwestern North Dakota and Northwestern South Dakota, Water Resources Research, Vol. 15, No. 6.
- Winter, D.R., 1994, Water Levels Through 1989 in Bedrock Aquifers in South Dakota, USGS, Open File Report 94-320, Rapid City, SD, 57702.

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 1633-1, City of Lemmon**

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. 1633-1, City of Lemmon, c/o Mike Priest, Finance Officer, 303 1st Avenue West, Lemmon, SD 57638.

The Chief Engineer is recommending DEFERRAL of Application No. 1633-1 until the applicant completes a soil/water analysis. An irrigation management plan may be necessary to ensure proper management practices are utilized to avoid damage to the soil structure from the water's high sodium level.

See report on application for additional information.



JOHN HATCH, Chief Engineer
November 1, 1995

NOTE: A chemical analysis of the water from this well indicates the water is very high in sodium and chloride. An important consideration in an irrigation project is assessing the compatibility of the soils and the quality of the water to be used for irrigation. Some soils need careful management and others may not be suitable for irrigation with water having high sodium or salt content. Damage to the soil structure may occur without proper irrigation management. I am recommending deferral of this application until completion of a soil/water analysis. An irrigation management plan may be necessary for the irrigation of the golf course.

Attached is a sheet explaining a soil/water analysis. The City of Lemmon may want to contact John Bischoff or Gregg Carlson at the Water Resources Institute, South Dakota State University, Brookings, SD 57007 (605-688-4910) for assistance in conducting the soil/water analysis. A soil/water analysis may also be completed by contracting with any qualified water quality lab and having a qualified person perform the analysis.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

November 1, 1995

Mike Priest, Finance Officer
City of Lemmon
303 1st Avenue West
Lemmon, SD 57638

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

Dear Mr. Priest:

Water Permit Application No. 1633-1 for irrigation use has been examined and found to comply with the South Dakota Water Laws and applicable rules. Please note that the Chief Engineer is recommending that the Water Management Board defer action on the application pending completion of a soil/water analysis. Your water source has a high sodium content which may harm the soil structure. Based on this, the chief engineer believes a soil/water analysis is necessary determine whether use of the water for irrigation is feasible, and if feasible, what management practices are needed to ensure a successful project. Please refer to the enclosed recommendation for additional comments and directions on how to proceed.

A notice of hearing has been sent to the Publisher of the Lemmon Leader printed at Lemmon, SD (Ph # 605-374-3751). For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspaper to authorize publication of your Notice of Hearing and to arrange for payment. Early contact with the paper can eliminate delays. The publisher has been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. The newspaper has been instructed to send us the Proof of Publication. We must receive Proof of Publication before the Water Management Board can consider the application.

Sincerely,

for Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

November 1, 1995

Lemmon Leader
PO Box 180
Lemmon, SD 57638-0180

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 1633-1 to be published twice. Please publish the first notice on November 7, 1995, 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 City of Lemmon, c/o Mike Priest, 303 1st Avenue West, Lemmon, SD 57638 (Ph # 605-374-5681).

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 application until proof of publication has been received.

Sincerely,

for 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. _____

Date _____

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

Name

Newspaper

Instruction to Newspaper - Publish first Notice on November 7, 1995, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF HEARING on Application No. 1633-1 to Appropriate Water

Notice is given that the City of Lemmon, 303 1st Avenue West, Lemmon, SD 57638 has filed an application for a water permit to appropriate 0.09 cubic feet of water per second (40 gallons per minute) from one existing well (Fox Hills Formation) 825 feet deep located in the SE 1/4 NE 1/4 Section 34-T23N-R16E. Water is diverted from the well into a regulating pond (11 acre-feet storage capacity) located in the SE 1/4 NE 1/4 Section 34 to irrigate portions of 33 acres located in the E 1/2 NE 1/4 Section 34; all in T23N-R16E. The water is used for irrigation of the golf course.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends DEFERRAL of Application No. 1633-1 until the applicant completes a soil/water analysis. An irrigation management plan may be necessary to ensure proper management practices are utilized to avoid damage to the soil structure from the water's high sodium level.

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 November 27, 1995. 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 a.m., Wednesday, December 6, 1995, Floyd Matthew Training Center, 523 East Capitol, 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 December 6, 1995, 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 November 27, 1995.

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 November 27, 1995, 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; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15. Nettie H. Myers, Secretary, Department of Environment and Natural Resources.

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
 County of Perkins) SS

I, Alice Farstad

certify that the attached printed Notice was
 taken from the Lemmon Leader

printed and published in Lemmon

County of Perkins and State of

South Dakota. The notice was published in
 the newspaper on the following two dates:

Nov. 7, 14, 1995

Cost of Printing: 67.19

Alice A. Farstad
 (Signature)

Publisher
 (Title)

11-27-95
 (Date Signed)



**NOTICE OF HEARING on
 Application No. 1633-1 to
 Appropriate Water**

Notice is given that the City of Lemmon, 303 1st Avenue West, Lemmon, SD 57638 has filed an application for a water permit to appropriate 0.09 cubic feet of water per second (40 gallons per minute) from one existing well (Fox Hills Formation) 825 feet deep located in the SE 1/4 NE 1/4 Section 34-T23N-R16E. Water is diverted from the well into a regulating pond (11 acre-feet storage capacity) located in the SE 1/4 NE 1/4 Section 34 to irrigate portions of 33 acres located in the E 1/2 NE 1/4 Section 34; all in T23N-R16E. The water is used for irrigation of the golf course.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends DEFERRAL of Application No. 1633-1 until the applicant completes a soil/water analysis. An irrigation management plan may be necessary to ensure proper management practices are utilized to avoid damage to the soil structure from the water's high sodium level.

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 November 27, 1995. 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., Wednesday, December 6, 1995, Floyd Matthew Training Center, 523 East Capitol, 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 December 6, 1995, 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 November 27, 1995.

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 November 27, 1995, 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; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15. Nettie H. Myers, Secretary, Department of Environment and Natural Resources.
 (Pub. Nov. 7, 14, 1995)

Permit No. 1633-1
Grand River- Water District

Report Of Examination Of Works And/Or Application of Water To Beneficial Use

TO: Chief Engineer, Water Rights Program, DENR, Foss Bldg., Pierre, SD 57501

I have this day, 9/11/1995, made a thorough examination of the water use system owned by the City of Lemmon of 303 1st Avenue W., Lemmon SD 57638 holder of Permit No. 1633-1, bearing the priority of September 11, 1995, authorizing the diversion of 0.09 cu. ft. per second and the storage of 11.0 acre-feet of the waters of groundwater for irrigation purposes, in Perkins County.

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

- A. Works used to divert the water:
A grundfos pump, 40 gallons per minute capacity.
A grundfos motor, 10 horse power.
- B. Works used to transport water to place of use:
40 feet of 2 inch Polyvinyl Chloride (PVC) pipe.
- C. Works used to apply water to beneficial use:
6 sprinkler heads, 1 inch in diameter with capacity of 34.6 gpm at 60 psi and 38.8 gpm at 80 psi.

The system is in the following condition Good. The point of diversion is located about 830 feet west, 1800 feet south from the northeast corner of Section 34, T23N-R16E (SE1/4 NE1/4). The works are capable of diverting and conveying to the place of use 0.09 cu. ft. per second of water and storing 11.0 acre-feet of water which is used for irrigation of a golf course. Water has been put to beneficial use to the maximum extent as follows:

All in Section 34, T23N-R16E

<u>SE1/4 NE1/4</u>	<u>22.0 ac.</u>
<u>NE1/4 NE1/4</u>	<u>11.0 ac.</u>

comprising a total of 33 acres of land and the license should be issued for 0.09 cfs and 11.0 acre-feet of storage.

Applicable permit qualifications have been complied with: Yes ☒ No

Exceptions to compliance are: None Date Report Completed: 10/5/1995


M. Rassool Ahadi
Natural Resources Engineer
DENR, Water Rights Program

REPORT ON INSPECTION OF PERMIT NO.1633-1

DATE OF INSPECTION: 9/11/1995

NAME & ADDRESS OF INSPECTION CONTACT/ MIKE Priest, 303 1st Avenue W, Lemmon, SD 57638

RELATIONSHIP TO PERMIT HOLDER, IF APPLICABLE: City Finance Officer

NAME & ADDRESS OF PERMIT HOLDER:City of Lemmon

DIVERSION POINT LEGAL LOCATION: SE1/4 NE1/4 Section 34, T23N-R16E

WELL INFORMATION:

- 1) Well Drilling Firm: **Gregory Drilling, Inc.**
- 2) No. of Wells **1**
- 3) Depth(s) **825** feet
- 4) Well log is available **Y**

Casing:

- 1) Diameter **8** inches
- 2) Length **750** feet
- 3) Type **Steel**

Screen:

- 1) Type **PVC** and **Steel**
- 2) Length **35** feet
- 3) Static water level **470** feet

Pump:**

- 1) Make **Grundfos**
- 2) Model **406100-30**
- 3) Size **4** inch
- 4) Capacity **40** GPM

Two identical Chequzzi electric pumps with two identical motors, 10 hp each divert water from the pond at a rate of about 220 gpm. The pumps run 6 sprinklers with capacity of 38.9 gpm at 80 psi and 34.6 gpm at 60 psi.

Motor:**

- 1) Make **Grundfos**
- 2) Model No. **2366126020**
- 3) Horsepower rating **10** hp

**** The pump and motor are used to divert water from the well.**

DISTRIBUTION LINES OR CANALS:

- 1) Type **PVC** 2) Size **2** inches 3) Length **40** feet

PERMIT QUALIFICATIONS AND REGULATIONS:

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

Measurement Services

STAR ROUTE 1, BOX 14
BELFIELD, ND 58622
PHONE (701) 575-4649



Name: Gregory Drilling

W. O. No.: 1491

Location: Lemmon Muni. Golf Course

Date Collected:

Collected By: Larry Gregory

Date Received: 7-30-91

Date of Analysis: 7-30-91

CHEMICAL ANALYSIS OF WATER SAFE DRINKING WATER ACT STANDARDS

<u>Parameter</u>	<u>Recommended Parameter Levels</u>	<u>Test Results</u>	<u>Units</u>
pH	6.5-8.5	8.37	pH
Conductivity	-	1821	uhmos/cm
Total Dissolved Solids(C)	500	1150	mg/l
Chloride (Cl)	250	223	mg/l
Sulfate as (SO4)	250	1.0	mg/l
Total Alkalinity (CaCO ₃)	-	692	mg/l
Bicarbonate (HCO ₃)	150	681	mg/l
Carbonate (CO ₃)	None	11	mg/l
Calcium (Ca)	200	3	mg/l
Iron (Fe)	0.3	0.09	mg/l
Magnesium (Mg)	125	11	mg/l
Sodium (Na)	270	386	mg/l
Total Hardness (as CaCO ₃)	270	49	mg/l
Total Hardness (as CaCO ₃)	16	3	Grains/gal
Nitrate, NO ₃	10.0	0.48	mg/l

Comments: Very high in sodium, very high in chlorides, soft water.

SAR: 23 Irrigation Classification: C3-S4 Non-irrigable due to high sodium and salinity.

R16E

27 26
34 35

1800'

830'

T23N

28 27
35 34

33 34
4 3

34 35
3 2

M. Rassoo / Nhad Sept 15, 1995
Nat. Res Engineer

1033-1



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

APR 3 1996

City of Lemmon
Mike Priest, Finance Officer
303 1st Ave W
Lemmon SD 57638

Dear Mr. Priest:

Enclosed is Water Permit No. 1633-1 authorizing the water diversion system for Lemmon's golf course. One of the permit qualifications, adopted by the Water Management Board, states the city shall maintain the suitability of the soil for irrigation. Within one year of issuance of this permit, the city shall adopt a written irrigation management plan to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. Please submit a copy of this plan to us when complete. The city may want to contact the Water Resources Institute at South Dakota State University or a qualified soil scientist, for assistance in conducting the soil/water analysis.

A review of Water Permit No. 1633-1 will be scheduled for December 1996, to ensure a management plan has been adopted.

If you have questions, please contact Eric Gronlund at (605) 773-3352.

Very truly yours,

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

ks

enclosure



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

December 13, 1996

Mike Priest, Finance Officer
City of Lemmon
303 1st Ave. West
Lemmon, SD 57638

Dear Mr. Priest:

The Water Management Board approved Water Permit No. 1633-1 on December 6, 1995, authorizing the water diversion system for Lemmon's golf course. One of the permit qualifications, adopted by the Board, states that within one year of issuance of this permit, the city shall adopt a written irrigation management plan to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. The management plan shall provide for testing of the soil at reasonable intervals.

At the time the permit was issued I suggested that the city may want to contact the Water Resources Institute at South Dakota State University or a qualified soil scientist, for assistance in conducting the soil/water analysis.

To date, an irrigation management plan for the golf course has not been submitted. Please provide an update on the city's effort to develop an irrigation management plan. If you have any questions, please contact Eric Gronlund of my staff at (605) 773-3352.

Very truly yours,

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



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

July 23, 1997

Mike Priest, Finance Officer
City of Lemmon
303 1st Ave. West
Lemmon, SD 57638

Dear Mr. Priest:

Water Permit No. 1633-1 for irrigation of Lemmon's golf course was approved in 1995 with a qualification requiring an irrigation management plan be adopted. The purpose of this plan is to implement management practices to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. This plan was to be submitted within one year of issuance of the permit.

Last year, I sent you a letter requesting an update of the city's effort to develop an irrigation management plan. I can not find a record that the city responded to this request.

A written irrigation management plan for Lemmon's golf course remains a requirement of Water Permit No. 1633-1. This plan also needs to provide for testing of the soils at reasonable intervals. I again suggest the city contact the Water Resources Institute at SDSU or a qualified soil scientist, for assistance in formulating an irrigation management plan.

The Water Management Board in approving the permit set a one year time frame to implement and submit a written management plan. I will schedule this matter before the Board at their December 3 and 4, 1997, meeting so the city may explain progress in developing an irrigation management plan. You will receive notice in October of the exact time, date and location of the meeting.

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

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

October 16, 1997

Art Pederson
City of Lemmon
303 1st Avenue West
Lemmon, SD 57638-1496

Dear Mr. Pederson:

I am writing to remind you of the need to submit a written irrigation management plan for Lemmon's golf course. Submittal of this plan is a qualification to Water Permit No. 1633-1. The plan is intended to set forth irrigation practices to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. I know the last time we talked you were working on the plan.

I still want to schedule the Water Management Board's consideration of the irrigation management plan at their December 3, 1997, meeting. To do so, we will need a copy of the proposed management plan by November 1, 1997. Please let me know if this time frame presents of problem.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

December 5, 1997

Art Pederson
City of Lemmon
303 1st Avenue West
Lemmon, SD 57638-1496

Dear Mr. Pederson:

I am writing to request submittal of a written irrigation management plan for Lemmon's golf course by **January 10, 1998**. Submittal of this plan is a qualification to Water Permit No. 1633-1.

Water Permit No. 1633-1 was approved in December of 1995. The Water Management Board placed a qualification on the permit for the city to submit a written irrigation management plan within one year. The plan is to set forth irrigation practices to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure.

Over the past year we have had a number of conversations on this irrigation management plan. In October you indicated you were working on the plan and would be submitting it soon. To date, I have not received the irrigation management plan.

I again suggest that the city contact the Water Resources Institute at SDSU or a qualified soil scientist if you need assistance in formulation of a plan.

The Water Rights Program will schedule this issue for the Water Management Board's consideration at their February 25, 1998, meeting. It is my hope that an acceptable plan can be presented to the Board at that time. If a plan is not submitted, the water permit will be brought before the Board for failure to comply with this requirement of the permit.

Please contact me if you have any questions.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

c: Mike Priest, Finance Officer



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

January 22, 1998

NOTICE

TO: Mike Priest, Finance Officer
City of Lemmon
303 1st Ave. West
Lemmon, SD 57638

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

SUBJECT: City of Lemmon's Failure to Submit an Irrigation Management Plan in accordance with Qualification to Water Permit No. 1633-1

The Water Management Board approved Water Permit No. 1633-1 on December 6, 1995, authorizing the water diversion system for Lemmon's golf course. One of the permit qualifications, adopted by the Board, states the city shall maintain the suitability of the soil for irrigation. The qualification stated that ~~within one year of issuance of this permit, the city shall adopt a written irrigation management plan to~~ maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. After several inquiries on the status of the plan, the city has not submitted a written irrigation management plan to the Water Rights Program.

A water permit may be suspended or canceled by order of the Board if the Board finds during a hearing that a permittee has violated a qualification of the permit. **A hearing will be held by the Board at 10:00 AM (CST), February 25, 1998, in the Floyd Matthew Training Center, Joe Foss Building, 523 E. Capitol Ave., Pierre, SD.** The agenda time is an estimate and may be delayed due to prior agenda items. This hearing will be conducted pursuant to SDCL 46-1-12, 46-1-14, 46-2-9, 46-2-11 and 46-2-17. Following the hearing, the Water Management Board can:

1. Approve a written irrigation management plan if an acceptable plan is submitted by February 16, 1998;
2. Suspend Permit No. 1633-1 for a period of up to one year;
3. Amend the qualification which requires a written irrigation management plan;
4. Postpone any action; or
5. Take no action.

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

If you have any questions on the upcoming hearing, please contact Eric Gronlund at (605) 773-3352.

c: Diane Best, Assistant Attorney General
Art Pederson, City of Lemmon

Note: Please contact the Water Rights Program, Joe Foss Building, 523 East Capitol Ave., Pierre, SD (605 773-3352) to assure access to the meeting room for the handicapped or to obtain an interpreter for the hearing impaired.

CERTIFICATION

I hereby certify that on January 22, 1998, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated January 22, 1998, regarding City of Lemmon's Failure to Submit an Irrigation Management Plan in accordance with Qualification to Water Permit No. 1633-1, addressed as stated below:

Mike Priest, Finance Officer, City of Lemmon, 303 1st Ave. West, Lemmon, SD 57638.

Art Pederson, City of Lemmon, 303 1st Ave. West, Lemmon, SD 57638.

A copy of the above described Notice was sent Inter-office to:

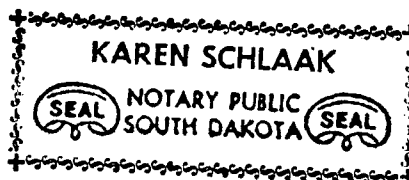
Diane Best, Assistant Attorney General, Capitol Building.


Cheryl F. Frost
Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 23rd day of January, 1998


Notary Public



KAREN SCHLAACK, Notary Public
My Commission Expires
April 1, 2001



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

February 18, 1998

NOTICE

TO: Mike Priest, Finance Officer
City of Lemmon
303 1st Ave. West
Lemmon, SD 57638

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

SUBJECT: Continuance of Hearing City of Lemmon's Compliance with Qualification on Water Permit No. 1633-1

I am continuing the February 25, 1998, hearing before the Water Management Board on the City of Lemmon's Water Permit No. 1633-1. The hearing was to consider the city's failure to submit an irrigation management plan in accordance with a qualification to Water Permit No. 1633-1. The hearing is being continued to allow the city to consult with a soil and water specialist. The specialist will assist in formulating an irrigation management plan for the golf course. A written irrigation management plan is to now be submitted for review by April 15, 1998.

The hearing will now be scheduled for the next Board meeting tentatively scheduled for May 6 and 7, 1998. Future notice of the exact time, date and location of the hearing will be provided to the city.

If you have any questions, please contact Eric Gronlund at (605) 773-3352.

c: Diane Best, Assistant Attorney General

CERTIFICATION

I hereby certify that on February 18, 1998, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated February 18, 1998, regarding Continuance of Hearing City of Lemmon's Compliance with Qualification on Water Permit No. 1633-1, addressed as stated below:

Mike Priest, Finance Officer, City of Lemmon, 303 1st Ave. West, Lemmon, SD 57638.

A copy of the above described Notice was sent Inter-office to:

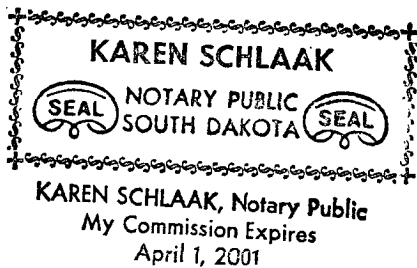
Diane Best, Assistant Attorney General, Capitol Building.


Cheryl F. Frost
Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 19th day of February, 1998


Notary Public





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

April 22, 1998

Mike Priest, Finance Officer
City of Lemmon
303 1st Ave. West
Lemmon, SD 57638

Dear Mr. Priest:

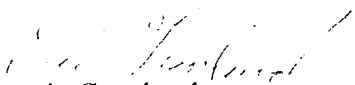
I have not received a copy of the irrigation management plan for the city of Lemmon's golf course. As you will recall submittal of the irrigation management plan is a requirement of Water Permit No. 1633-1. A notice sent to you on February 18, 1998, set a April 15 1998, date for the city to submit the management plan for review. I intended to bring the management plan before the Board at their May 6th meeting.

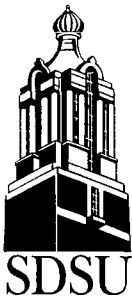
I took the liberty of e-mailing John Bischoff with the Water Resources Institute at SDSU on the status of the management plan. Mr. Bischoff responded indicating he has gotten behind on interpretations and recommendations. He also indicated he will fax to me when complete.

It appears that scheduling for the May 6th Board meeting may now not be possible, however, we need to bring some finality to this issue. I will wait for Mr. Bischoff to complete the management plan.

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

Sincerely,


Eric Gronlund
Water Rights Program
(605) 773-3352



South Dakota State University

April 21, 1998

Mr. Mike Priest
303 1st Ave. W.
City Hall
Lemmon, SD 57638



Water Resources Research Institute
Water Quality Laboratory
Water Pesticide Laboratory

Box 2120, Ag. Engineering 211
SDSU
Brookings, SD 57007
Phone: 605-688-4910
FAX: 605-688-4917
E mail: WRISDSU@MG.SDSTATE.EDU

Dear Mike,

I received your latest water quality analysis for the city of Lemmon's municipal golf course and have finally been able to give you an irrigation management plan to use this on your golf course fairways.

This water is classified as a high salinity, high sodium hazard for irrigation usage. The main ions in this water are sodium bicarbonate. I have plotted your approximate water quality in red on the outside back cover of the enclosed pamphlet (AES13). As you can see, the levels of sodium are nearly off the chart. The different levels of sodium hazard are given according to the level of leaching through the soil profile that will occur. Higher levels of leaching will give lower SAR levels ($SAR = 23.12$) with resulting exchangeable sodium levels in the soil being lower. Little or no leaching will give the highest level of sodium in the soil (Adj. SAR of 42.75). Therefore, leaching of water through the soil profile is necessary for some sodium control.

This water should not be used for irrigation purposes for most normal soils due to the likelihood of soil salinization or loss of soil permeability from the sodium ion, or both. This water is excessively high in both sodium and concentrations of other salts that make it hazardous for economic and managerial success under irrigation without intensive management practices (subsurface tile lines, gypsum amendments, deep tillage, etc). The probability of soil salinization and/or loss of soil permeability from the application of this water is high.

This water is not suitable for perpetual use on turf unless certain criteria are maintained. These criteria are as follows:

- 1) Dilute the well water with runoff water AS MUCH AS POSSIBLE. You have a dam which holds 10.8 ac-ft. of water and collects runoff water from a small watershed. I understand that you run well water into this dam, and you use it as a holding pond for irrigating. If possible, I would empty the pond in the fall to allow as much surface water runoff as possible into the dam for initial irrigation in the spring. This will help some for total loading of sodium to the soil. If the acreage that you would be irrigating would be around 20 acres (an estimate for a 9 hole golf course), then, if the pond were full of runoff water in the spring, this should handle 6" of applied water for the entire course. If you would apply 30" of water to the course for the entire year, this would reduce the salt load applied on an annual basis to 1/5th of straight well water. This assumes that the runoff water is pure water with no ions in it (usually there will be some). There will also be some evaporation of water from the dam over the course of the summer. This will concentrate the remaining salts.

- 2) Soil test, at least, every 5 years to monitor the soil salinity and soluble sodium levels of the top 6" of soil.

- 3) Plant salt tolerant grasses, or blends of salt tolerant grasses with less salt tolerant grasses. If the less salt tolerant grasses cannot compete with the more salt tolerance grasses, then

they will die out and the more salt tolerant grasses will fill in. I am including copies of sheets that show the salt tolerance of certain turf and grasses in South Dakota for you to keep.

4) If soluble sodium levels (estimated ESP levels of over 12) are over 12 me/l and the combined calcium and magnesium levels are less than 3 me/l (from soil tests), I would then begin a gypsum application program which includes spreading of gypsum (or some other soluble divalent cation, or sulfur) on the fairways. For each 1 me/l of sodium to remove from the top foot of soil would require 1.7 tons/Acre of gypsum, 0.31 tons of sulfur per acre, or 0.55 tons of sulfuric acid per acre. This should be spread such that distribution is even and allows contact time of the material to move with the water into the soil, but not through the soil, until the exchange of sodium with other cations can take place. Ideally, it would be good to roto-till it into the soil, but for turf conditions this is usually not feasible. A good time to apply this material would be in the fall. This would allow movement into the soil, and the winter would give it time to react with the soil.

I have included some projected soil salinity and soil SAR levels in the drainage water on the enclosed graphs. These empirical solutions are based on steady-state assumptions with no dissolution or precipitation of soil salts, but are based on several factors including: 1) the water quality analysis of well water of July 30, 1991, 2) there is 12 inches of annual frost-free precipitation, 3) 6" of runoff water applied over the course annually, and 4) 30" of irrigation water is applied.

If you have further questions regarding this interpretation and recommendation, please do not hesitate to call or write.

Sincerely,



John H. Bischoff, Assistant Professor
Water Resources Institute
Enclosures

1 ✓ Cc: Eric Gronlund, SD DENR

Measurement Services

STAR ROUTE 1, BOX 14
BELFIELD, ND 58622
PHONE (701) 575-4849



Name: Gregory Drilling

W. O. No.: 1491

Location: Lemmon Muni. Golf Course

Date Collected:

Collected By: Larry Gregory

Date Received: 7-30-91

Date of Analysis: 7-30-91

CHEMICAL ANALYSIS OF WATER SAFE DRINKING WATER ACT STANDARDS

<u>Parameter</u>	<u>Recommended Parameter Levels</u>	<u>Test Results</u>	<u>Units</u>
pH	6.5-8.5	8.37	pH
Conductivity	-	1821	uhmos/cm
Total Dissolved Solids(C)	500	1150	mg/l
Chloride (Cl)	250	223	mg/l
Sulfate as (SO4)	250	1.0	mg/l
Total Alkalinity (CaCO ₃)	-	692	mg/l
Bicarbonate (HCO ₃)	150	681	mg/l
Carbonate (CO ₃)	None	11	mg/l
Calcium (Ca)	200	3	mg/l
Iron (Fe)	0.3	0.09	mg/l
Magnesium (Mg)	125	11	mg/l
Sodium (Na)	270	386	mg/l
Total Hardness (as CaCO ₃)	270	49	mg/l
Total Hardness (as CaCO ₃)	16	3	Grains/gal
Nitrate, NO ₃	10.0	0.48	mg/l

Comments: Very high in sodium, very high in chlorides, soft water.

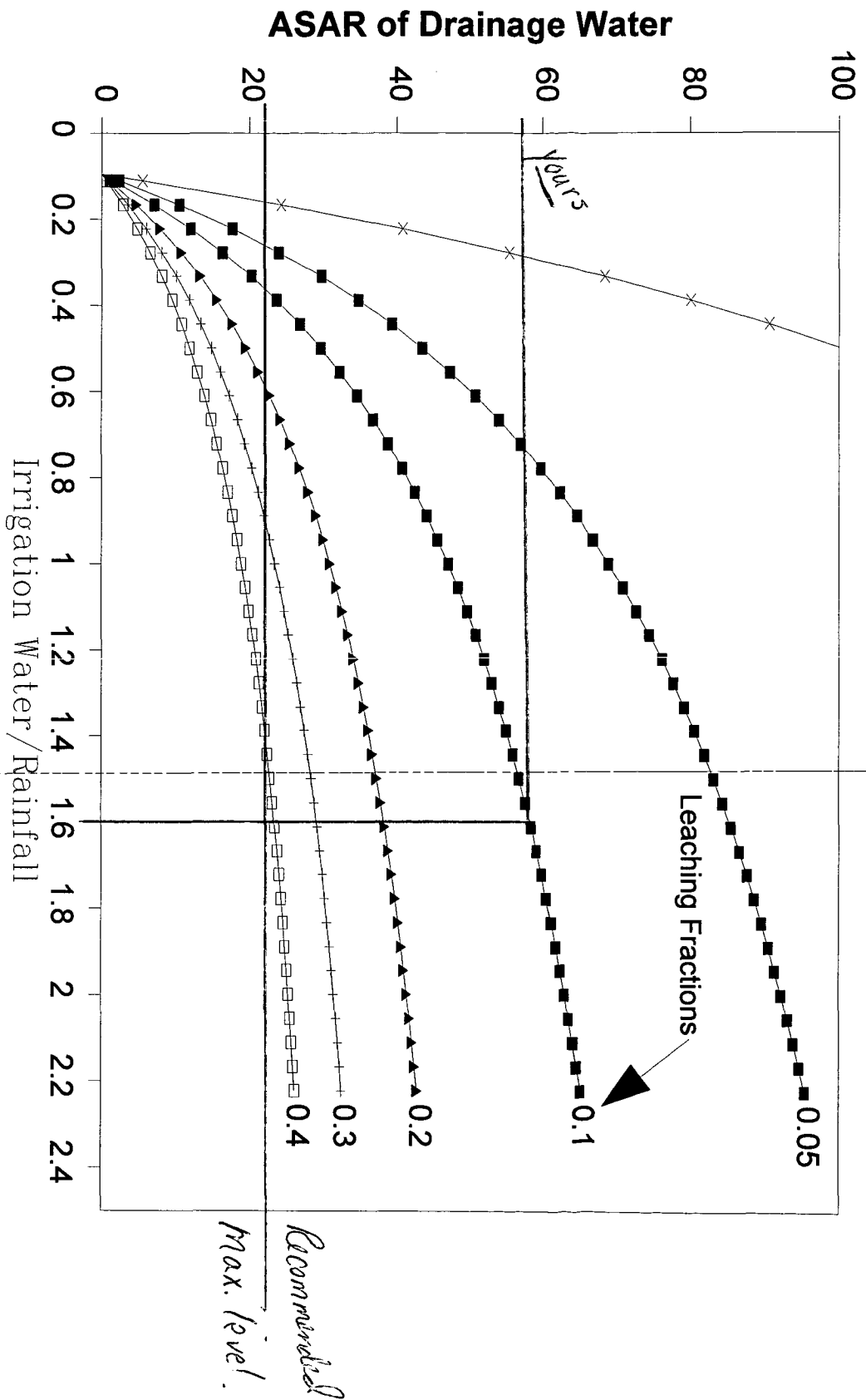
SAR: 23 Irrigation Classification: C3-S4 Non-irrigable due to high
sodium and salinity.

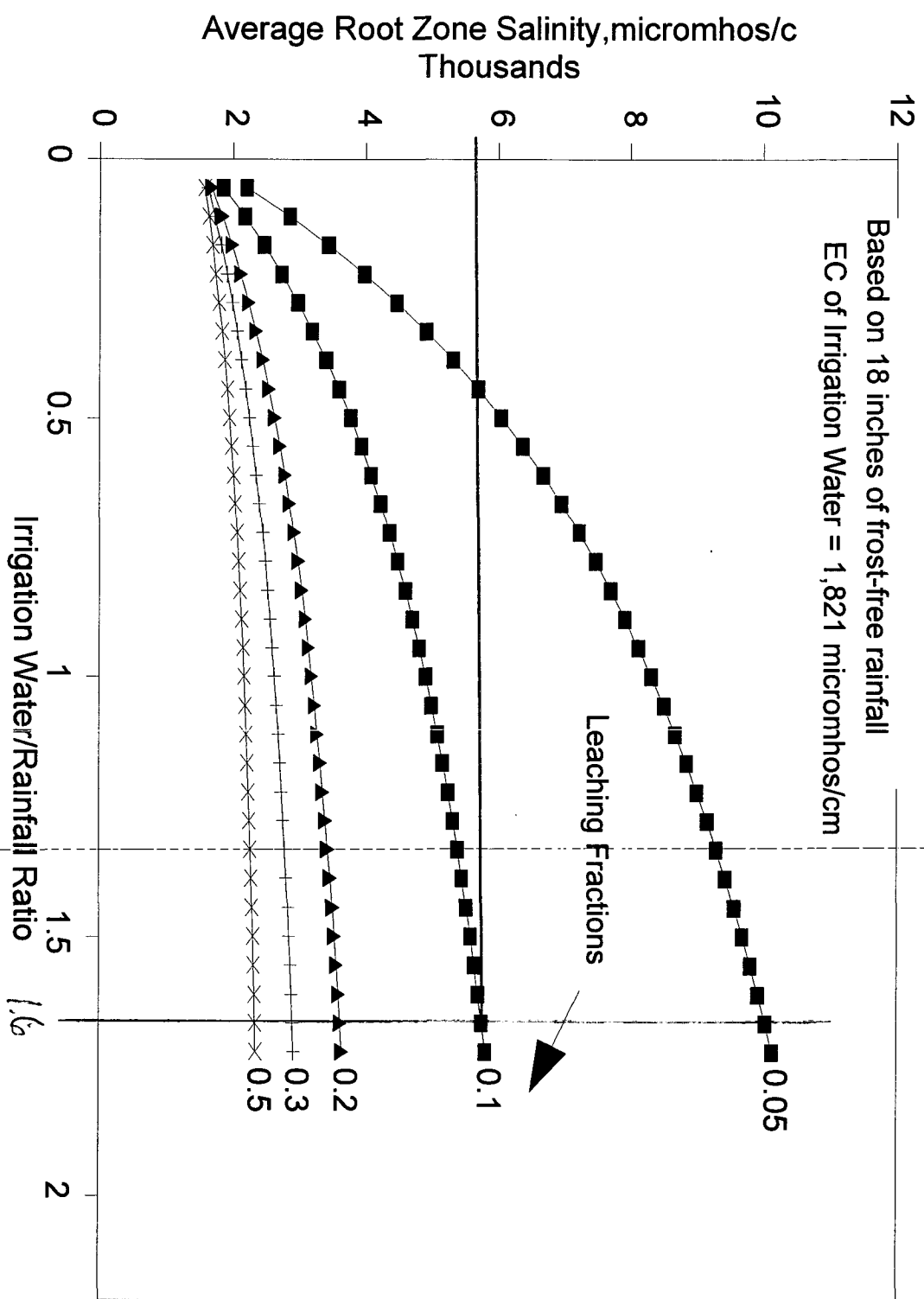
Post-It™ brand fax transmittal memo 7671 # of pages > /

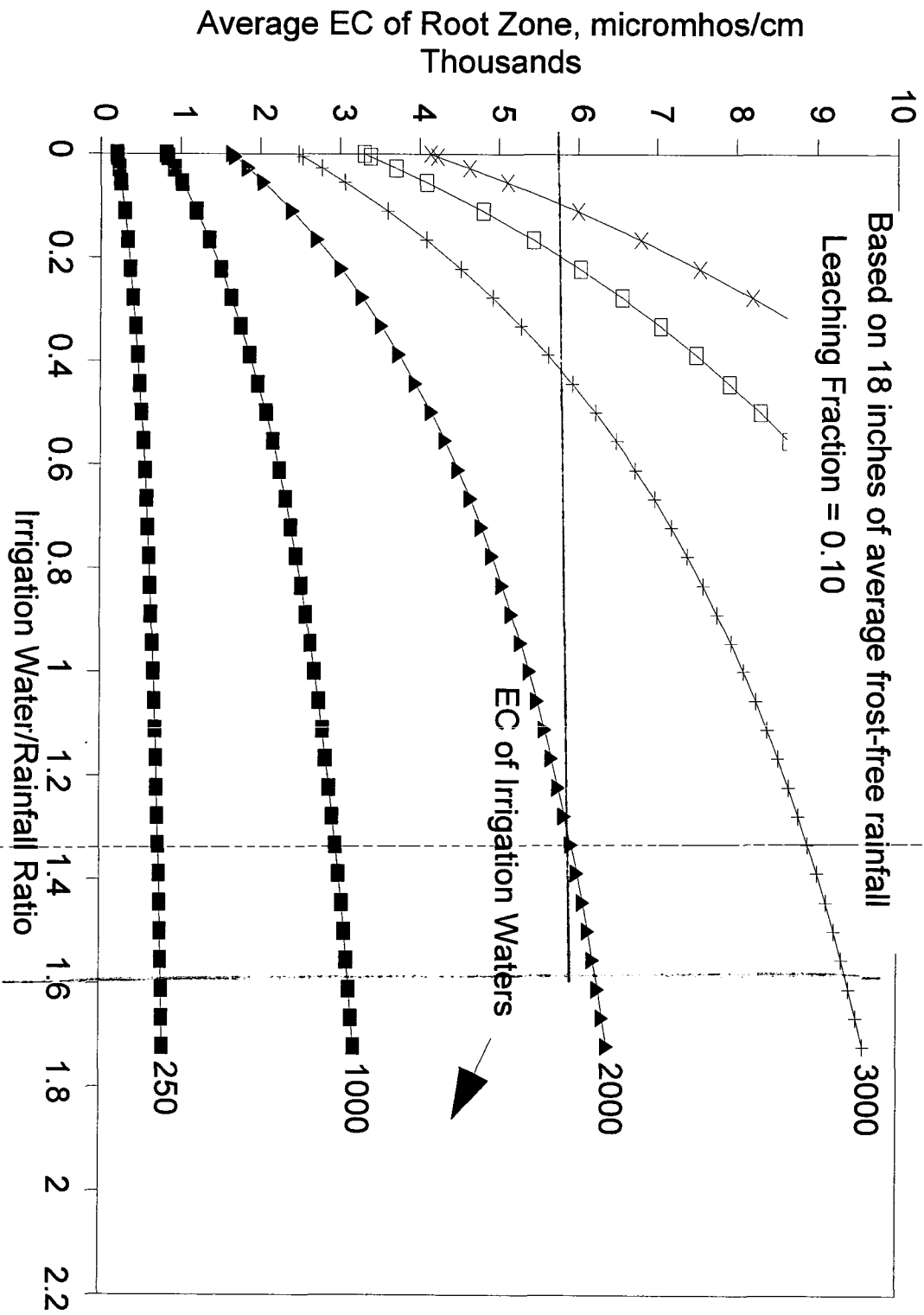
To	John Dischhoff	From	Mike Pries
Co.	SDSU	Co.	City of Lemmon
Dept.		Phone #	
Fax #	688-4917	Fax #	

SAR = 23.12

ASAR = 42.75

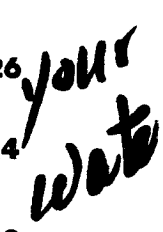






on chart!

(Note : Examples from Table 1 on page 4 are shown in blue)



SALINITY HAZARD

Electrical Conductivity
Adjusted Sodium Adsorption Ratio

a = 529	b = 2200	c = 4252
a = 2.6	b = 29.3	c = 14.4

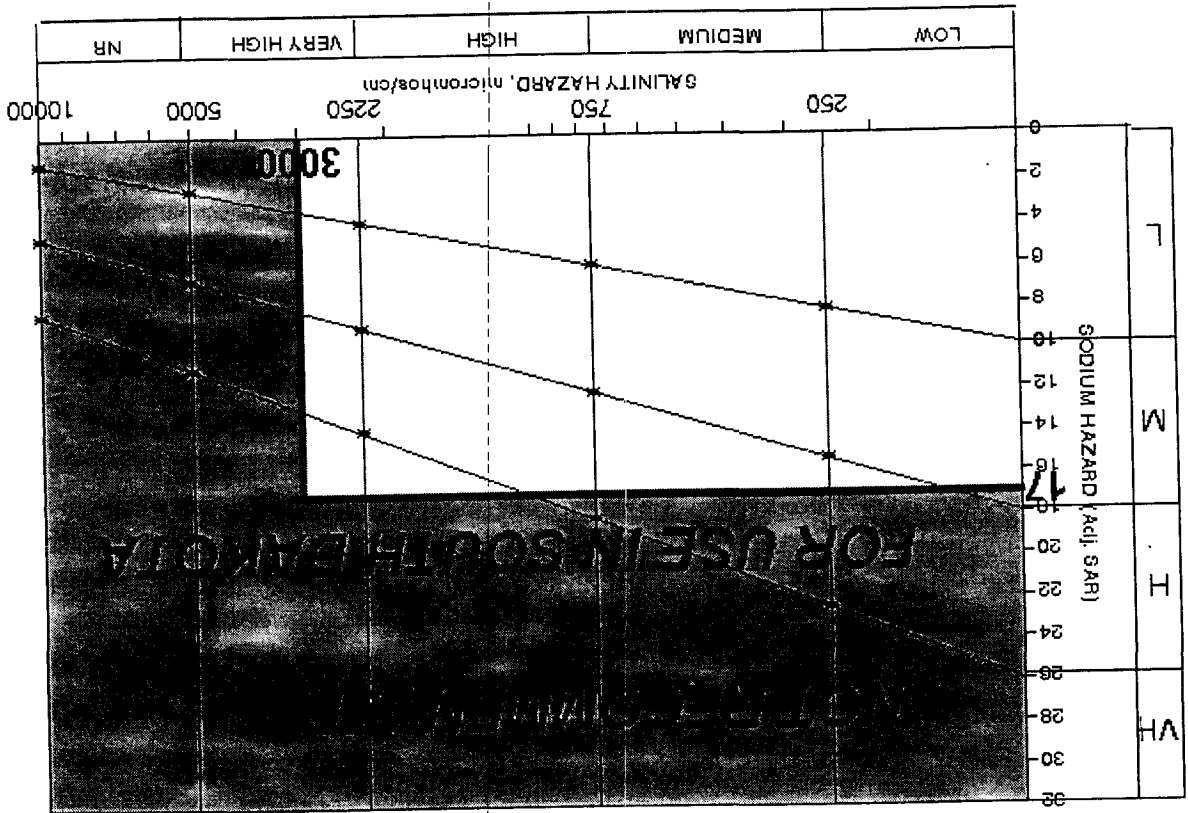
***Adapted From Agricultural Handbook 60, USDA**

Salt Tolerance of Turfgrass

Low tolerance EC_e = less than 4 ^a	Moderate tolerance EC_e = 4-10 ₂	High tolerance EC_e = 8-15 ₂
Kentucky bluegrass	Alta fescue	<i>Purcinellia distans</i>
Highland bentgrass	Perennial ryegrass	Common bermuda
		Hybrid bermuda
		Tiffway
		Tiffgreen
		Sunturf
		Seaside bentgrass
		Zoysia
		St. Augustine

- a. EC_e = Electrical conductivity of the soil saturation extract expressed as deciSiemens/m or millimhos/cm representative of the more active part of the root zone.

(Taken from Agron. Journal 53:247-249. O.R. Lunt, V.B. Younger, and J.J. Oertli. 1961. "Salinity tolerance of five turfgrass varieties.")



Typical pedon of Parchin fine sandy loam, in an area of Twilight-Marmarthe-Parchin association, gently rolling, 900 feet east and 155 feet north of the southwest corner of sec. 16, T. 14 N., R. 12 E.

- A11—0 to 3 inches; grayish brown (10YR 5/2) light fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure parting to weak fine granular; soft, very friable; many fine roots; medium acid; clear wavy boundary.
- A12—3 to 6 inches; brown (10YR 5/3) loamy fine sand, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak medium and coarse subangular blocky; soft, very friable; common fine roots; medium acid; clear wavy boundary.
- A2—6 to 10 inches; pale brown (10YR 6/3) loamy fine sand, dark brown (10YR 4/3) moist; weak coarse prismatic structure parting to weak medium and fine subangular blocky; soft, very friable; common fine roots; neutral; abrupt wavy boundary.
- B2t—10 to 12 inches; grayish brown (2.5Y 5/2) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium columnar structure parting to moderate medium subangular blocky; very hard, firm, slightly sticky and plastic; thin nearly continuous pale brown (10YR 6/3) coatings on tops of columnar peds; many fine roots along surfaces of peds; mildly alkaline; clear wavy boundary.
- B22t—12 to 15 inches; grayish brown (2.5Y 5/2) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, slightly sticky and plastic; common fine roots; mildly alkaline; clear wavy boundary.
- B23t—15 to 18 inches; grayish brown (2.5Y 5/2) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, slightly sticky and plastic; common fine threads of carbonates; moderately alkaline; clear wavy boundary.
- B3ca—18 to 27 inches; light olive gray (5Y 6/2) fine sandy loam, olive gray (5Y 4/2) moist; weak coarse prismatic structure parting to weak medium and coarse subangular blocky; hard, friable; few fine roots; common threads and spots of carbonates; violent effervescence; strongly alkaline; gradual wavy boundary.
- C1—27 to 37 inches; light gray (5Y 6/1) soft bedded sandstone crushing to loamy fine sand with strata of fine sandy loam and sandy clay loam, dark gray (5Y 4/1) moist; massive; hard, very friable; few threads and spots of carbonates; strong effervescence; strongly alkaline; gradual wavy boundary.
- C2—37 to 60 inches; light olive gray (5Y 6/2) soft bedded sandstone crushing to sandy clay loam with strata of fine sandy loam and loamy fine sand, olive gray (5Y 5/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; slight effervescence; moderately alkaline.

The thickness of the solum typically is 25 to 35 inches but ranges from 17 to 45 inches. The depth to carbonates ranges from 13 to 25 inches. The depth to bedrock typically is 25 to 30 inches but ranges from 20 to 40 inches.

The A1 horizon has hue of 10YR or 2.5Y, value of 5 or 6 (3 or 4 moist), and chroma of 2 or 3. It is strongly acid to slightly acid and is 3 to 7 inches thick. The A2 horizon has hue of 10YR or 2.5Y, value of 5 to 7 (4 to 6 moist), and chroma of 2 or 3. It is loamy fine sand or fine sandy loam and is medium acid to neutral. It is 4 to 12 inches thick. The B2t horizon has hue of 10YR or 2.5Y, value of 5 or 6 (4 or 5 moist), and chroma of 2 to 4. It is sandy clay loam or loam. In some pedons it has threads of gypsum in the lower part. The B3 horizon is fine sandy loam, sandy loam, sandy clay loam, or loam and is mildly alkaline to strongly alkaline. It has few to common threads and nests of gypsum and other salts in some pedons.

Parshall series

The Parshall series consists of deep, well drained, moderately rapidly permeable soils formed in alluvium.

These soils are on terraces and uplands. Slopes range from 0 to 6 percent.

Parshall soils are similar to Arnegard, Tally, and Trembles soils and commonly are adjacent to Farnuf, Manning, Shambo, Stady, Vebar, and Wabek soils on the landscape. Arnegard soils are fine-loamy. Farnuf and Shambo soils have a mollic epipedon that is less than 16 inches thick and are fine-loamy. Manning and Stady soils have sand and gravel within 40 inches of the surface. Tally soils have a mollic epipedon that is less than 16 inches thick. Trembles soils lack a mollic epipedon and have carbonates at or near the surface. They are on bottom land. Vebar soils have a mollic epipedon that is less than 16 inches thick and have bedrock within 40 inches of the surface. They generally are above Parshall soils on the landscape. Wabek soils are sandy-skeletal. They are on gravelly ridges and terrace fronts.

Typical pedon of Parshall fine sandy loam, 0 to 6 percent slopes, 1,980 feet west and 1,710 feet north of the southeast corner of sec. 8, T. 19 N., R. 13 E.

- Ap—0 to 5 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse and very coarse subangular blocky structure parting to moderate medium and fine granular; soft, very friable; neutral; abrupt smooth boundary.
- A12—5 to 13 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak coarse and very coarse prismatic structure parting to moderate medium granular; soft, very friable; neutral; clear smooth boundary.
- B21—13 to 24 inches; grayish brown (10YR 5/2) fine sandy loam, dark brown (10YR 3/3) moist; weak very coarse prismatic structure parting to weak coarse subangular blocky; slightly hard, very friable; neutral; clear smooth boundary.
- B22—24 to 34 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak very coarse prismatic structure parting to weak coarse subangular blocky; slightly hard, very friable; neutral; gradual wavy boundary.
- C1—34 to 58 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable; mildly alkaline; abrupt smooth boundary.
- C2—58 to 60 inches; light brownish gray (2.5Y 6/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, friable; strong effervescence; mildly alkaline.

The thickness of the solum ranges from 20 to 50 inches. The depth to free carbonates ranges from 25 to 60 inches. The mollic epipedon is 16 to 40 inches thick.

The A horizon has color value of 4 or 5 (2 or 3 moist) and is fine sandy loam or sandy loam. It is 8 to 20 inches thick. The B2 horizon has color value of 4 or 5 (3 or 4 moist) and is neutral or mildly alkaline. Some pedons have a B3 horizon. The C horizon is fine sandy loam, sandy loam, loamy fine sand, or loamy sand. Below a depth of 40 inches, it is gravelly sandy loam in some pedons. It is mildly alkaline or moderately alkaline.

Reeder series

The Reeder series consists of moderately deep, well drained, moderately permeable soils formed in material weathered from sandstone. These soils are on uplands. Slopes range from 0 to 9 percent.

Reeder soils are similar to Amor, Farnuf, Felor, Lefor, Marmarth, Morton, Regent, Shambo, and Yegen soils and commonly are adjacent to Arnegard, Belfield, Daglum,

Lantry, Lefor, Morton, Regent, Rhoades, and Vebar soils on the landscape. Amor and Lantry soils lack an argillic horizon. Arnegard soils have a mollic epipedon that is more than 16 inches thick. They are in swales. Belfield, Daglum, and Rhoades soils have a natric horizon. They are in swales and on foot slopes. Farnuf and Shambo soils do not have bedrock within a depth of 40 inches. They generally are on terraces. Felor, Lefor, and Yegen soils contain more sand in the B2t horizon than Reeder soils. Marmarth soils are drier than Reeder soils. Morton soils are fine-silty, Regent soils are fine textured, and Vebar soils are coarse-loamy.

Typical pedon of Reeder loam, in an area of Reeder-Lantry loams, 2 to 9 percent slopes, 725 feet south and 135 feet west of the northeast corner of sec. 17, T. 21 N., R. 12 E.

- A1—0 to 5 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; soft, friable, slightly sticky; neutral; clear wavy boundary.
- B2t—5 to 11 inches; brown (10YR 5/3) light clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; moderately alkaline; clear wavy boundary.
- B22t—11 to 19 inches; light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; moderate medium and coarse prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, sticky and plastic; moderately alkaline; abrupt wavy boundary.
- B3ca—19 to 28 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many fine accumulations of carbonates; violent effervescence; moderately alkaline; clear wavy boundary.
- C—28 to 32 inches; pale yellow (5Y 7/3) loam, olive (5Y 5/3) moist; massive; slightly hard, very friable; common fragments of soft sandstone; few fine accumulations of carbonates; strong effervescence; moderately alkaline; clear wavy boundary.
- Cr—32 to 60 inches; pale olive (5Y 6/3) and light yellowish brown (2.5Y 6/4) soft bedded sandstone, olive (5Y 5/3) and light olive brown (2.5Y 5/4) moist; strong effervescence; moderately alkaline; clear wavy boundary.

The thickness of the solum ranges from 11 to 36 inches. The depth to free carbonates ranges from 11 to 26 inches. The depth to soft sandstone ranges from 20 to 40 inches. The mollic epipedon is 7 to 16 inches thick.

The A horizon has color value of 4 or 5 (2 or 3 moist) and chroma of 2 or 3. It is dominantly loam, but it is silt loam in some pedons. It is slightly acid or neutral and is 5 to 10 inches thick. The B2t horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 to 5 moist), and chroma of 2 to 4. It is loam or clay loam and averages between 18 and 32 percent clay and between 20 and 45 percent fine sand or coarser sand. It is neutral to moderately alkaline. Some pedons lack a B3 horizon. Common or many accumulations of carbonates are in the B3 horizon or the C horizon, or both.

Regent series

The Regent series consists of moderately deep, well drained, slowly permeable soils formed in material weathered from siltstone or shale. These soils are on uplands. Slopes range from 2 to 15 percent.

Regent soils are similar to Belfield, Grail, Morton, and Savage soils and commonly are adjacent to Belfield,

Daglum, Grail, Lawther, Morton, Reeder, Rhoades, Savage, and Wayden soils on the landscape. Belfield, Daglum, and Rhoades soils have a natric horizon. They are in swales and sags and on foot slopes. Grail soils have a mollic epipedon that is more than 16 inches thick. They are in swales. Lawther soils lack an argillic horizon. Morton soils are fine-silty, and Reeder soils are fine-loamy. Savage soils are more than 40 inches deep over bedrock. They generally are on terraces. Wayden soils lack a mollic epipedon and are less than 20 inches deep over bedrock. They generally are steeper than Regent soils and are higher or lower on the landscape.

Typical pedon of Regent silty clay loam, in an area of Regent-Savage silty clay loams, 2 to 6 percent slopes, 2,160 feet east and 1,640 feet south of the northwest corner of sec. 12, T. 20 E., R. 12 E.

- Ap—0 to 5 inches; dark grayish brown (2.5Y 4/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate fine and medium granular structure; slightly hard, friable, sticky and plastic; neutral; abrupt smooth boundary.
- B2t—5 to 13 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium blocky; hard, firm, sticky and plastic; shiny films on faces of peds; neutral; abrupt wavy boundary.
- B3ca—13 to 28 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; few medium accumulations of carbonates; strong effervescence; mildly alkaline; gradual wavy boundary.
- Cca—28 to 35 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct mottles of yellowish brown (10YR 5/6); weak medium and coarse subangular blocky structure; hard, firm, sticky and plastic; many medium accumulations of carbonates; violent effervescence; moderately alkaline; abrupt smooth boundary.
- Cr—35 to 60 inches; light brownish gray (2.5Y 6/2) soft bedded siltstone, olive brown (2.5Y 4/3) moist; common fine stains of yellowish brown (10YR 5/6); slight effervescence; moderately alkaline.

The thickness of the solum ranges from 12 to 36 inches. The depth to free carbonates is 12 to 24 inches. The depth to soft siltstone or shale ranges from 20 to 40 inches. The mollic epipedon is 7 to 16 inches thick.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5 (2 or 3 moist), and chroma of 2 or 3. It is slightly acid or neutral and is 5 to 10 inches thick. The B2t horizon has hue of 10YR or 2.5Y, value of 4 to 6 (3 or 4 moist), and chroma of 2 or 3. It is silty clay loam or silty clay and averages between 35 and 45 percent clay. It is neutral or mildly alkaline. Some pedons lack a B3 horizon. Some pedons lack a C horizon between the B3 and Cr horizons.

Rhoades series

The Rhoades series consists of deep, moderately well drained, very slowly permeable soils formed in material weathered from soft siltstone or shale. These soils are on uplands and terraces. Slopes range from 0 to 15 percent.

Rhoades soils are similar to Absher soils and commonly are adjacent to Amor, Belfield, Cabba, Daglum, Farnuf, Lantry, Morton, Reeder, and Regent soils on the landscape. Absher soils lack a mollic epipedon. Amor, Farnuf, Morton, Reeder, and Regent soils lack a natric horizon. They generally are above Rhoades soils on the landscape. Belfield and Daglum soils have a thicker A horizon than



SALINITY TOLERANCE TABLE

GRASSES & FORAGE CROPS^a

YIELD DECREMENT TO BE EXPECTED FOR CERTAIN CROPS DUE TO SALINITY OF IRRIGATION WATER WHEN COMMON SURFACE IRRIGATION METHODS ARE USED.

<u>CROP</u>	<u>RATING^b</u>	<u>0%</u> <u>EC_E¹</u>	<u>10%</u> <u>EC_E</u>	<u>25%</u> <u>EC_E</u>	<u>50%</u> <u>EC_E</u>	<u>MAXIMUM</u> <u>EC_E</u>
Alfalfa	MS	2000	3400	5400	8850	15700
Alkaligrass, Nuttall	T*	----	----	----	----	----
Alkali sacaton	T*	----	----	----	----	----
Barley (forage)	MT	6000	7400	9500	13000	20000
Bentgrass	MS	----	----	----	----	----
Bermudagrass ^c	T	6900	8500	10800	14700	22500
Bluestem, Angleton	MS*	----	----	----	----	----
Brome, Mountain	MT*	----	----	----	----	----
Brome, smooth	MS	----	----	----	----	----
Buffelgrass	MS*	----	----	----	----	----
burnet	MS*	----	----	----	----	----
Canarygrass, Reed	MT	----	----	----	----	----
Clover, alsike, ladino, red, & strawberry	MS	1500	2350	3600	5700	9800
Clover, Berseem	MS	1500	3250	5900	10300	19000
Clover, Hubam & sweet	MT*	----	----	----	----	----
Clover, White Dutch	MS*	----	----	----	----	----
Cowpea (forage)	MS	2500	3400	4800	7000	11600
Dallisgrass	MS*	----	----	----	----	----
Fescue, tall & meadow	MT	3900	5800	8600	13300	22800
Foxtail, meadow	MS	1500	2500	4100	6700	12000

[OVER]

<u>CROP</u>	<u>RATING</u>	<u>0%</u> <u>EC_E¹</u>	<u>10%</u> <u>EC_E</u>	<u>25%</u> <u>EC_E</u>	<u>50%</u> <u>EC_E</u>	<u>MAXIMUM</u> <u>EC_E</u>
Grama, blue	MS*	----	----	----	----	----
Hardinggrass	MT	4600	5900	7900	11200	17800
Kallargrass	T*	----	----	----	----	----
Lovegrass ^d	MS	2000	3200	5000	8000	14000
Orchardgrass	MS	1500	3100	5500	9600	17600
Ryegrass, perennial	MT	5600	6900	8900	12200	18800
Saltgrass, desert	T*	----	----	----	----	----
Sudangrass	MT	2800	5100	8600	14400	26000
Timothy	MS*	----	----	----	----	----
Trefoil, big	MS	2300	2800	3600	4900	7600
Trefoil, narrowleaf birdsfoot	MT	5000	6000	7500	10000	15000
Vetch, common	MS	3000	3900	5300	7500	12000
Wheat (forage) ^e	MT	4500	8300	14100	23700	43000
Wheat, Durum (forage)	MT	2100	6100	12100	22100	42100
Wheatgrass, standard crested	MT	3500	6000	9800	16000	28500
Wheatgrass, fairway crested	T	7500	9000	11100	14700	22000
Wheatgrass, intermediate & slender	MT	----	----	----	----	----
Wheatgrass, tall	T	7500	9900	13500	19400	31300
Wheatgrass, western	MT*	----	----	----	----	----
Wildrye, Altai & Russian	T	----	----	----	----	----
Wildrye, beardless	MT	2700	4400	6900	11000	19400

^a These data serve only as a guideline to relative tolerances among crops. Absolute tolerances vary, depending upon climate, soil conditions, and cultural practices.

^b Ratings are S=sensitive; MS=moderately sensitive; MT=moderately tolerant; T=tolerant to salts.

^c Average of several varieties.

^d Average for Boer, Wilman, Sand, and Weeping cultivars. Lehmann seems about 50% more tolerant.

^e Data from one cultivar, "Probred"

* Ratings with an * are estimates.

¹ EC_E = Electrical Conductivity of the saturation extract of the average root zone (micromhos/cm).



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

April 29, 1998

No. 1633-1

Mike Priest, Finance Officer
City of Lemmon
303 1st Ave W
Lemmon SD 57638

Dear Mr. Priest:

I am writing in response to receipt of John Bischoff's assessment of the soil/water compatibility for the Lemmon municipal golf course dated April 21, 1998. Thank you for working with Mr. Bischoff to obtain this assessment.

According to the assessment, water use management will be critical to ensure successful irrigation of the golf course. Please advise us as soon as possible how the city intends to make use of Mr. Bischoff's assessment or other measures to manage irrigation of the golf course. After your irrigation management plan is received as required by Permit No. 1633-1, a hearing will be scheduled before the Water Management Board to consider approval of your plan. You will be advised of the time and place after we receive your management plan.

Please contact Eric Gronlund at 605 773-3352 if you have any questions.

Sincerely,

Ron Duvall
Natural Resources Engineer
Water Rights Program



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

June 1, 1998

Mike Priest, Finance Officer
City of Lemmon
303 1st Ave. West
Lemmon, SD 57638

Dear Mr. Priest:

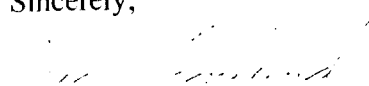
I am writing in regards to the irrigation management plan for Lemmon's municipal golf course. Mr. Bischoff with the Water Resources Institute provided the city an assessment of the soil/water compatibility at the golf course. This assessment provides the city the information necessary to make decisions on how to management irrigation of the turf in a manner that will minimize impacts from the highly saline water.

It is now the responsibility of the city to develop a plan incorporating Mr. Bischoff's assessments and other measures the city may use to manage irrigation of the golf course. Measures listed in the plan must be only those measures the city intends to apply in their operation.

Please submit an irrigation management plan by July 1, 1998. A hearing will then be scheduled before the Water Management Board to consider the plan. You will be notified of the time and place of the hearing after we receive the city's irrigation management plan. Failure to submit an acceptable management plan may cause the city's right to use water for irrigation to be brought before the Water Management Board for suspension.

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

Sincerely,


Eric Gronlund
Water Rights Program
(605) 773-3352

CITY OF LEMMON GOLF COURSE IRRIGATION MANAGEMENT PLAN



The City of Lemmon replaced their sand greens with grass greens in the early 1980's. Two small shallow wells were drilled and used primarily for the watering of only the grass greens and Tee boxes.

The 350 feet shallow wells began giving the City of Lemmon problems during the late 1980's which led to the construction of a our new present well that is approximately 825 feet deep.

The grass greens and Tee boxes have continued to do very well every year with the proper maintenance of plugging the greens, seeding, and fertilization.

In 1995 the City of Lemmon began a program to reseed certain fairways from the existing greens back to the 150 yard markers. Roundup was used prior to reseeding to suppress some of the species of broadleaf grass allowing the seedlings to be more competitive. A mixture of rye grass and Kentucky Blue grass was used and has been filling in a lot of the bare spots the last two years. It should also be noted that the City of Lemmon uses a "plugger" to aerate the fairways as well as the greens and tee boxes.

The City of Lemmon is very much aware of the fact that our water is high in sodium and salinity. With the help of Warne Chemical Company of Rapid City and prior practices of the City of Lemmon Country Club Board members it is our intention to seed three more fairways during early 1998.

I have attached copies of Warne Chemical Company's recommendations that the maintenance personnel at the Golf Course have been utilizing in caring of the greens and fairways.

Although the City of Lemmon understands that there are problems with our irrigated water, We believe that it is possible to irrigate the Golf Course with good management practices that have been used since the early 1980's.

Since sending in our original Golf Course Irrigation Management Plan to Eric Gronlund, it should be noted that the State then recommended I contact John Bishcoff of the Water Resources Institute at SDSU Brookings. Attached are the findings that Mr. Bischoff found concerning the soil, and water tests that the City sent to WRI.

I have since met with the Lemmon Country Club Board of Directors and they have agreed to follow the 4 criteria that hopefully will continue to maintain a successful Municipal Golf Course.

1. Dilute the well water with runoff water as much as possible.
2. Soil test, at least, every 5 years to monitor the soil salinity and soluble sodium levels of the top 6" of soil
3. Plant salt tolerant grasses, or blends of salt tolerant grasses with less salt tolerant grasses such as Seaside bentgrass which is what we have been using on our Greens and Teeboxes for the last 15 years.
4. Implementing a Gypsum application program for our Fairways.

If you should have any further questions concerning this revised Management please contact myself at 374-5681.

CITY OF LEMMON:


MIKE PRIEST, CITY FINANCE OFFICER
cc: attachments

**Irrigation Management Plan
Water Permit No. 1633-1
City of Lemmon
July 23, 1998**

Background

The Water Management Board approved water Permit No. 1633-1 on December 6, 1995. The permit authorizes the irrigation of portions of 33 acres of a golf course with water from a well (Fox Hills Formation). Water is diverted from the well into a regulating pond. The pond also collects surface water runoff and has a storage capacity of 11 acre-feet. The well water is marginal for irrigation purposes depending upon management.

One of the permit qualifications adopted by the Board states that within one year of issuance of the permit, the permit holder shall adopt a written irrigation management plan to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. The management plan shall provide for testing of the soil at reasonable intervals.

Discussion

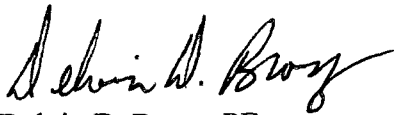
An analysis of a water sample, taken from the well, classified the water as a high salinity, high sodium hazard for irrigation usage. The Water Resources Institute at South Dakota State University did a review of the water analysis results and recommends certain criteria to follow for use of the water.

The city of Lemmon has agreed to adopt the criteria, which is as follows:

1. Dilute the well water with surface runoff water as much as possible.
2. Soil test, at least, every 5 years to monitor the soil salinity and soluble sodium levels of the top 6 inches of soil.
3. Plant salt tolerant grasses or blends of salt tolerant grasses with less salt tolerant grasses.
4. If soluble sodium levels are over 12 me/l and the combined calcium and magnesium levels are less than 3 me/l, begin a gypsum application program.

Conclusions

The criteria is acceptable if used as a management plan and the City of Lemmon follows the advice of the Water Resources Institute as to when and how to implement the gypsum application program.



Delvin D. Brosz, PE
Natural Resources Engineer

CITY OF LEMMON GOLF COURSE IRRIGATION MANAGEMENT PLAN

The City of Lemmon replaced their sand greens with grass greens in the early 1980's. Two small shallow wells were drilled and used primarily for the watering of only the grass greens and Tee boxes.

The 350 feet shallow wells began giving the City of Lemmon problems during the late 1980's which led to the construction of a our new present well that is approximately 825 feet deep.

The grass greens and Tee boxes have continued to do very well every year with the proper maintenance of plugging the greens, seeding, and fertilization.

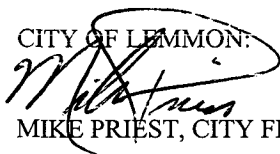
In 1995 the City of Lemmon began a program to reseed certain fairways from the existing greens back to the 150 yard markers. Roundup was used prior to reseeding to suppress some of the species of broadleaf grass allowing the seedlings to be more competitive. A mixture of rye grass and Kentucky Blue grass was used and has been filling in a lot of the bare spots the last two years. It should also be noted that the City of Lemmon uses a "plugger" to aerate the fairways as well as the greens and tee boxes.

The City of Lemmon is very much aware of the fact that our water is high in sodium and salinity. With the help of Warne Chemical Company of Rapid City and prior practices of the City of Lemmon Country Club Board members it is our intention to seed three more fairways during early 1998.

I have attached copies of Warne Chemical Company's recommendations that the maintenance personnel at the Golf Course have been utilizing in caring of the greens and fairways.

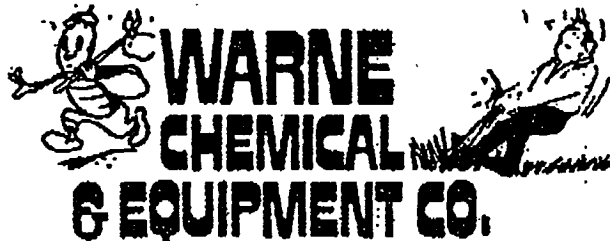
Although the City of Lemmon understands that there are problems with our irrigated water, We believe that it is possible to irrigate the Golf Course with good management practices that have been used since the early 1980's.

CITY OF LEMMON:



MIKE PRIEST, CITY FINANCE OFFICER





Phone (605) 342-7644

2680 Commerce Rd.

Rapid City, South Dakota 57702

January 31, 1996

Mike Priest
City of Lemmon
303 First Avenue West
Lemmon SD 57638

Dear Mike:

Reviewing the soil test from the golf course fairways, I find good soil structure. Soil pH of 7.2 is desirable and should support your reseeding program. Trace elements are adequate. Soluble salts are in the satisfactory range and need to be managed to stay in that range. Recommend retesting for soluble salts in two years to monitor increases. Continue normal applications of fertilizer and an annual aeration program as needed to keep the salts moving through the soil structure.

The following recommendation is based on soil tests and past experiences with similar projects. My primary concern is the type of seeding machine needed to do the job correct. The machine needs to give good seed to soil contact without placing the grass seed too deep into the soil. A seeding depth of a 1/4 inch is the best. Seed in two different diagonal directions to give a diamond shape to the grass pattern. This will enable the grass to fill in faster.

One to two weeks before seeding apply a fertilizer high in phosphorous (18-46-0) at the rate of two pounds of actual phosphorous per thousand square feet. Phosphorous is essential to establish a healthier root system.

Before seeding it is important that you make an evaluation of the existing grasses that are present. If you have some unwanted broadleaf species such as brome grass or quack grass, a preplant application of Roundup would be recommended at approximately 24 ounces per acre. Roundup or Paraquat will suppress some of that species of broadleaf grass allowing the new seedlings to be more competitive. If you don't have any undesirable broadleaf grass, use Paraquat. Use Paraquat to treat the areas that you want to reseed. It will not kill any of the grasses present but will turn them brown. The established grasses will eventually regrow from their root system and turn green. READ THE LABEL OF BOTH PRODUCTS BEFORE USING!

The fertilizer and spray application should be done just before seeding. Seeding should be started when the soil temperatures are at 50 degrees F or higher, usually May 1st to mid May.

Mike Priest
City of Lemmon
January 31, 1996
Page 2

Recommend a seeding rate of one to two pounds per thousand square feet. The more seed that you use the faster the fairways will fill in. Referencing my previous letters (copies enclosed), I recommend mix number one. After seeding make sure that the top 1/2 an inch or so of soil doesn't dry out and crust preventing seedlings from emergence. Recommend daily light waterings until the new grass is in the spike stage, then start watering longer and less often. This will help root growth and prevent a thatch layer from starting.

After the grass germinates and is growing, fertilizer is necessary to keep it growing and healthy. The soil test indicates 2.8 pounds of nitrogen per growing season. Dividing the nitrogen application up is important for good grass management. The new seeded grasses are cool season grasses and do most of their growing in the spring and in the fall. Fertilizer needs to be applied accordingly using a slow release type fertilizer such as a 25-5-15 with 30% or 50% Nutralene. The first application should be made approximately four to six weeks after seeding using about 1-1/4 pounds of nitrogen per thousand square feet. The next application should be made approximately mid August 1996 using one pound of nitrogen per thousand square feet. Again, you should use a slow release nitrogen source. The third application should be made mid October 1996 at a rate of 1-1/4 pounds of nitrogen per thousand square feet.

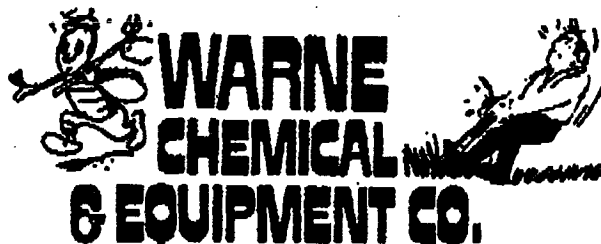
By fall you should have a well established fairway. You should be able to observe any thin spots that will need to be overseeded. With proper fertilization the bluegrass will keep getting a little thicker each year.

Starting in the spring of 1997 I recommend the following annual maintenance program of three fertilizer applications. The first application will be mid May applying 3/4 pounds of nitrogen per thousand square feet. The next application will be mid August applying 3/4 pounds of nitrogen per thousand square feet. The final application would be in the late fall (October to November) at a rate of 1-1/4 pounds of nitrogen per thousand square feet in a slow release form. This late fall application is the most important application as it will carry the grass plant and root development into the dormancy period and encourages an early spring green-up. The slow release fertilizer will feed evenly for a longer period of time maintaining a healthier turf.

If you have any further questions, please call me at 1-800-658-5457.

Sincerely,

Butch Holec
Sales



Phone (605) 342-7644
1-800-658-5457

2880 Commerce Rd.

Rapid City, South Dakota 57702

QUOTE

November 17, 1995

PAGE 1 OF 1

NAME: MEL FRANK
FIRM: LEMMON COUNTRY CLUB
ADDRESS: 509 1ST AVE WEST
CITY, STATE, ZIP: LEMMON SD 57638

GOLF COURSE INTERSEEDING ON A THREE TO FOUR YEAR PROGRAM INTO EXISTING
BUFFALO AND NATIVE GRASS FAIRWAYS.

* MIX #1 \$2.20 PER POUND

50% ALLIANCE RYE GRASS BLEND
25% CITATION II 25% CHARGER
25% SUNRYE 246 25% SATURN
15% LIMOUSINE KY BLUEGRASS
35% NUBLUE KY BLUEGRASS

THIS MIX WILL GIVE:

- * NICE DARK COLOR
- * PROVIDE AN AGGRESSIVE TURF
- * VERY GOOD DISEASE RESISTANCE
- * SOME HEAT TOLERANCE
- * QUICK COVER

* MIX #2 \$1.96 PER POUND

50% ALLIANCE RYE GRASS BLEND AS IN MIX #1
16.6% BARON KY BLUEGRASS
16.6% VIVA KY BLUEGRASS
16.6% PARADE KY BLUEGRASS

THIS MIX WILL GIVE:

- * GOOD COLOR
- * GOOD DISEASE RESISTANCE
- * QUICK COVER
- * BUT WON'T BE AS AGGRESSIVE AS MIX #1



Distributor's Own Turf Supplies

SUBMITTED BY:

SUBMITTED FOR:

Warne Chemical
2690 Commerce Rd.
Rapid City SD
677028069

LENNON COUNTRY CLUB

SUMMARY REPORT OF ANALYTICAL RESULTS

Sample No.	Location	Phosphorus (ppm)	Potassium (ppm)	Magnesium (ppm)	Calcium (ppm)	Sulfur (ppm)	Nitrogen (ppm)	Zinc (ppm)	Manganese (ppm)	Copper (ppm)	Selenium (ppm)
314672	FAIRWAY	12	272	298	2233	5	21.7	0.9	2.5	0.6	
Weighted Average Results for Fairways		1	12	272	298	2233	5	21.7	0.9	2.5	0.6

SUMMARY REPORT OF ANALYTICAL RESULTS

SPECIAL TESTS

CATION EXCHANGE CAPACITY

Sample No.	Location	pH	EC	Soil Texture	Organic Matter (%)	Sodium Adsorption Ratio	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Actual % of Total CEC	Na	Ca	Mg	Total CEC
314672	FAIRWAY	3.2	7.2	VL	0.0	0.0	0.0	0.0	0.0	77.0	0.0	0.0	0.0	0.0
Weighted Average Results for Fairways		3.2	7.2	VL	0.0	0.0	0.0	0.0	0.0	77.0	0.0	0.0	0.0	0.0
Suggested % of Total CEC										5-7	15-20	65-75	0-5	0-5

COMMENTS:

APPROXIMATE RELATION OF CEC TO SOIL TEXTURE

0-8 Sand 20-28 Loam
8-12 Loamy Sand 28-40 Clay Loam

TOTAL P.05

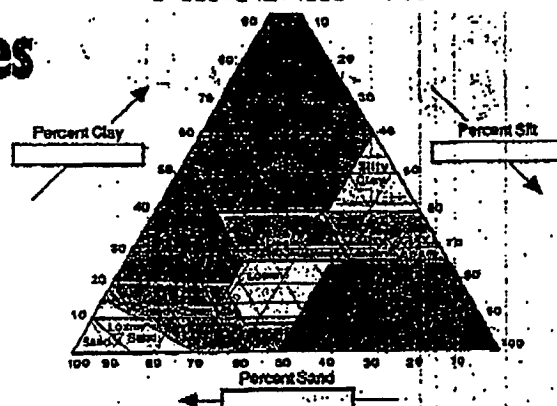
D.O.T.S. Distributor's Own Turf Supplies

SUBMITTED BY:

SUBMITTED FOR:

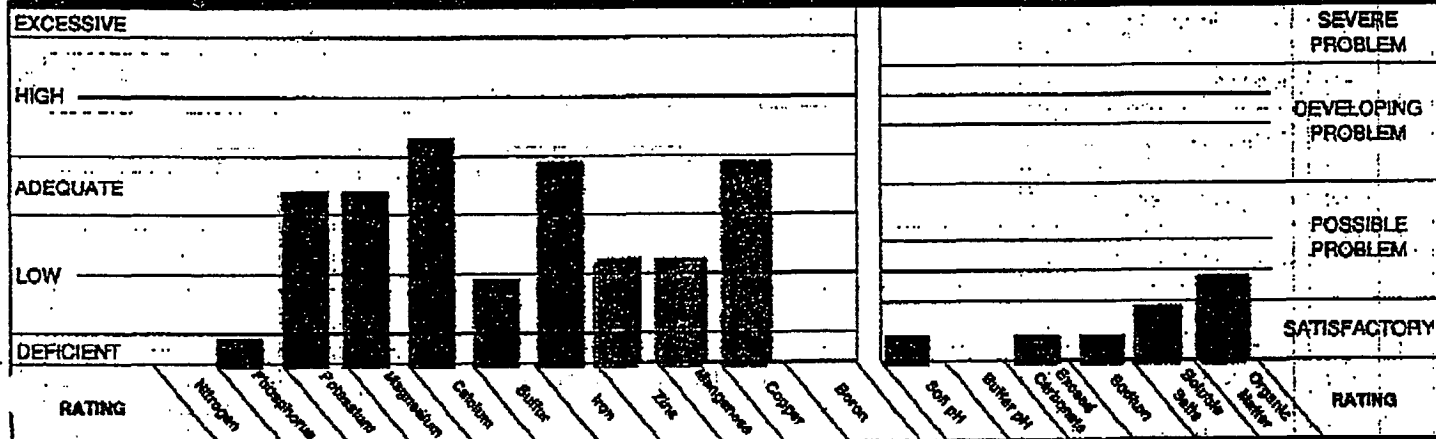
Warne Chemical
2680 Commerce Rd
Rapid City SD
577028069

LEMMON COUNTRY CLUB



Location	Date	Laboratory	Samples Will Be
Fairways	Reported 17-Jan-94	Tomaround	Stored Until 15-Feb-94
		3 Days	

GRAPHIC SUMMARY OF TEST RESULTS



FERTILIZER GUIDELINES

Lab Sample #	Sample Name	Plant Growth	C-Units G-Gypsum	Nutrient Needs 1,000 Sq Ft								Standard 1000 Sq Ft		
				N	P ₂ O ₅	K ₂ O	Mg	S	Fe	Zn	Mn	Cu	B	
314672	FAIRWAY	Medium		2.8	2.2	0.0	0.0	0.30	0.0	0.1	0.01	0.0		
Weighted Average Guidelines for Fairways				2.8	2.2	0.0	0.0	0.30	0.00	0.08	0.01	0.00		

COMMENTS:



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

August 24, 1998

NOTICE

TO: Mike Priest, Finance Officer
City of Lemmon
303 1st Ave. West
Lemmon, SD 57638

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

SUBJECT: Irrigation Management Plan for Water Permit No. 1633-1

The Water Rights Program has reviewed Lemmon's management plan for the irrigation of 33 acres located in the E1/2 NE1/4 Section 34, T23N, R16E. Water Permit No. 1633-1 appropriates water from one well (Fox Hills Formation) and a regulating pond for irrigation of these acres. Enclosed is a copy of the report prepared on the city's irrigation management plan.

The Water Management Board will consider the irrigation management plan at 8:45 AM, on October 1, 1998, in the Conference Room, Floyd Matthew Training Center, 523 E. Capitol Ave. Pierre, SD.

The Chief Engineer recommends that the Board adopt the irrigation management plan as a qualification to Water Permit No. 1633-1 including a requirement to test soil at 5 year intervals. The proposed qualification replaces existing qualification No. 5. The proposed qualification states "The permit holder shall maintain the suitability of the soil for irrigation and adhere to the City of Lemmon's Irrigation Management Plan received July 14, 1998. Testing of the soil shall occur at 5 year intervals and results submitted to the Water Rights Program for review."

If you have any questions, please contact Eric Gronlund at (605) 773-3352.

enclosure

c: Diane Best, Assistant Attorney General

CERTIFICATION

I hereby certify that on August 24, 1998, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated August 24, 1998, along with a copy the Irrigation Management Plan, regarding Irrigation Management Plan for Water Permit No. 1633-1, addressed as stated below:

Mike Priest, Finance Officer, City of Lemmon, 303 1st Ave. West, Lemmon, SD 57638.

A copy of the above described Notice and attachment was sent Inter-office to:

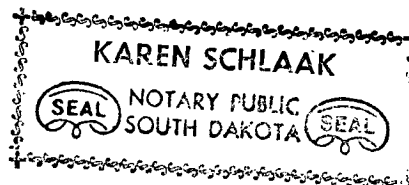
Diane Best, Assistant Attorney General, Capitol Building.


Cheryl F. Frost
Secretary

[illegible]

Sworn to, before me, this 25th day of August, 1998

Karen Schlaak
Notary Public



KAREN SCHLAAK, Notary Public
My Commission Expires
April 1, 2001



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

October 5, 1998

NOTICE

TO: Mike Priest, Finance Officer
City of Lemmon
303 1st Avenue West
Lemmon SD 57638

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

SUBJECT: Irrigation Management Plan for Water Permit No. 1633-1

On October 1, 1998, the Water Management Board approved the City of Lemmon's Irrigation Management Plan as submitted for Water Permit No. 1633-1.

The Board amended qualification No. 5 on the water permit as follows:

5. The permit holder shall maintain the suitability of the soil for irrigation and adhere to the City of Lemmon's Irrigation Management Plan received July 14, 1998. Testing of the soil shall occur at 5 year intervals and results submitted to the Water Rights Program for review."

If you have any questions, please contact Eric Gronlund at (605) 773-3352.

CERTIFICATION

I hereby certify that on October 5, 1998, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated October 5, 1998, regarding Irrigation Management Plan for Water Permit No. 1633-1, addressed as stated below:

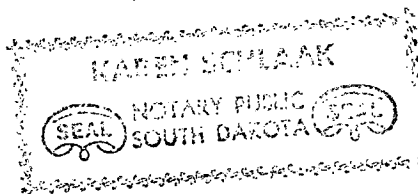
Mike Priest, City of Lemmon, 303 1st Avenue West, Lemmon, SD 57638.


Cheryl F. Frost
Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 6th day of October, 1998


Notary Public



KAREN SCHLAAK, Notary Public
My Commission Expires
April 1, 2001



September 4, 2003

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

Marla Hausauer, Finance Officer
City of Lemmon
303 1st Ave W
Lemmon SD 57638

Dear Ms. Hausauer:

Water Permit No. 1633-1 for the City of Lemmon authorizes 40 gallons per minute from one well located in the SE ¼ NE ¼ Section 34-T23N-R16E. Water is diverted from the well to a regulating pond to irrigate portions of 33 acres of the golf course (copy enclosed).

A condition was placed on the permit requiring the city to adopt a management plan to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. On October 1, 1998, the Water Management Board approved the City of Lemmon's Irrigation Management Plan (copy enclosed) and amended Qualification No. 5 as follows:

The permit holder shall maintain the suitability of the soil for irrigation and adhere to the City of Lemmon's Irrigation Management Plan received July 14, 1998. Testing of the soil shall occur at 5 year intervals and results submitted to the Water Rights Program for review.

This is a reminder that it has been five years since the qualification was placed on the city's permit and testing of the soil is necessary. The results of testing shall be submitted to the Water Rights Program by December 15, 2003.

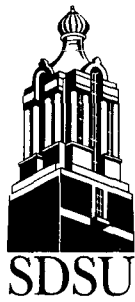
We suggest the city contact the Water Resource Institute at SDSU or a qualified soil scientist to assist analyzing of a soil sample.

Please contact Eric Gronlund, if you have any questions.

Sincerely,

Karen Schlaak
Environmental Scientist
Water Rights Program
605 773-3352

enclosures



South Dakota State University

Water Resources Research Institute
Water Quality Laboratory
Water Pesticide Laboratory

Box 2120, Ag. Engineering 211
SDSU
Brookings, SD 57007
Phone: 605-688-4910
FAX: 605-688-4917
E mail: WRISDSU@MG.SDSTATE.EDU

November 10, 2003

Art Pederson
City of Lemmon
303 First Avenue West
Lemmon, SD 57638

RECEIVED

NOV 10 2003

WATER RIGHTS
PROGRAM

Dear Mr. Pederson:

Enclosed are results of your water analysis (lab number 03-0377) and soil analysis (lab number 50435). It is my understanding that the water sample was taken from the well you use, in part, to irrigate the golf course and the soil sample was taken from a fairway that has been irrigated.

As you are well aware, the water is saline and highly sodic. The electrical conductivity (EC) of 1710 micromhos per cm place it in the high salinity hazard category. The adjusted sodium adsorption ratio (SAR_{Adj}) of 98.5 place this water in the very high sodium hazard category. In fact, you can see that this SAR places it well off the chart we use for assessing such potential hazards (the back page of SDSU circular AES-13, enclosed).

Given that this water is so saline and sonic, it is remarkable that the soil sample analysis does not indicate greater salinity or sodium accumulation in the soil. The soluble salts in the soil sample (EC of 2.1 mmho/cm), the soluble sodium concentration of 4 me/L, and the exchangeable sodium percentage (ESP) of 0.76 indicate little or no impending problem due to salinity or sodium. Whatever you are doing to manage the irrigation with this water, keep doing it because it is working!

In terms of management, I note that John Bischoff recommended (in 1998) the following practices:

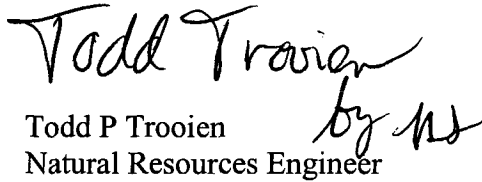
1. dilute the well water as much as possible,
2. soil test periodically (every 5 years) to measure the accumulation of salts and sodium,
3. plant salt tolerant grasses, and
4. apply gypsum or some other calcium source to help exchange sodium off the soil particles and leach the sodium downward, out of the root zone.

These practices are designed to reduce deleterious impacts of the water salinity and sodium and should be continued. You indicate that you have been working with a company in the gypsum application part of this plan; I suggest that you continue to do so.

In summary, this water is of questionable quality for irrigation use. However, the soil sample analysis shows no impending concerns due to salinity or sodium. Whatever you have been doing to manage the irrigation and salinity on the course, keep doing it!

Thanks you for sending your samples to the SDSU labs. If you have any further questions or concerns, please do not hesitate to contact us.

Sincerely,


Todd P Trooien
Natural Resources Engineer

Enclosures: water analysis results, copy of soil analysis results, soil test report, AES-13

Cc: Karen Schlaak, DENR

REPORT OF WATER ANALYSIS**Water Quality Laboratory****Water Resources Institute****South Dakota State University**

Ag Engineering 211 -- Box 2120 Brookings, SD 57007 -- Phone (605) 688-4910 Fax (605) 688-4917 -- Email nancy_stuefen@sdstate.edu
<http://wri.sdstate.edu>

Bill to: Karen Schlaak

SD DENR, Water Rights

57501

County:

Submitted by: City of Lemmon

303 1st Ave W.

57638

Date sampled:

Time sampled:

Lab Sample #: 03-0377

Site Name: SE 1/4, NE 1/4, S34, T23N, R

Date Rec'd: 09/25/2003

Date out of lab: 10/03/2003

Source: Well

Irrigation Analysis

Calcium (Ca)	0.00 ppm	Analysis result was less than detection limit	0.000 meq/l
Magnesium (Mg)	1.10 ppm		0.090 meq/l
Sodium (Na)	481.00 ppm		20.923 meq/l
Potassium (K)	3.30 ppm		0.086 meq/l
Alkalinity (Methyl Orange)	728.00 ppm	(as CaCO ₃)	
Alkalinity (Phenolphthalein)		ppm (as CaCO ₃)	
Bicarbonate (HCO ₃)	888.31 ppm		14.56 meq/l
Carbonate (CO ₃)	0.00 ppm		0.00 meq/l
Boron (B)	1.83 ppm		
Sulfate (SO ₄)	1.20 ppm		0.025 meq/l
Nitrate as N (NO ₃)	0.09 ppm		0.006 meq/l
Chloride (Cl)	214.00 ppm		5.992 meq/l
Electrical Conductivity	1710	Micromhos per cm at 25 degrees C	
pH	8.58		
Sodium Adsorption Ratio (SAR)	98.52		
Adjusted SAR	78.26		

Service Performed:

Analysis by: Shirley Mittan

CC:

Analysis Cost:

92.00

Sales Tax:

0.00

Total Cost:

92.00

Amount Received:

Amount Due: 92.00

Make checks payable to:
 SDSU Water Quality Lab

Please write lab number on your check!

gpg = grains per gallon ppm = parts per million meq/l = milliequivalents per liter

Comments:

Lab sample # 03-0377

SOIL TEST REPORT

50435

Soil Testing Laboratory - Box 2207A - South Dakota State University - Brookings, SD 57007-1096 - ph. 605/688-4766 - fax 605/688-4667

Submitted by: City of Lemmon
303 First Ave West
Lemmon, SD 57638

Date Sampled:
Date Received: 10/6/03
Date Reported: 10/8/03

INTERPRETATION OF SOIL TEST LEVELS

Alkaline	pH	Satisfactory	Na		K	HIGH
	pH		Na		K	
	pH		Na		K	
	pH		SS Na		K	
Satisfactory	pH	Possible Problem	SS Na	P	K	MEDIUM
	pH		SS Na		K	
	pH		SS Na		K	
	pH		SS Na		K	
Acid	pH	Poor	SS Na	P	K	LOW
	pH		SS Na		K	
	pH		SS Na		K	
	pH		SS Na		K	

ESP: 1.76

SOIL TEST RESULTS

Sample or Field ID	Texture Class	pH	Buffer pH	Soluble Salts mmho/cm	Sodium me/l	O.M. %	Nitrogen NO3-N lbs/A	P		K ppm	Sulfur SO4-S lbs/A	Zn ppm	Fe ppm	Mn ppm	Cu ppm	Ca ppm	Mg ppm	Chloride lbs/A	B ppm
								Olsen ppm	Bray ppm										
1	Medium	8.6		2.1	4		3	9		407									

Depth 1: 0" - 6"

3

RECOMMENDATIONS (lbs/A)

	N	P2O5	K2O	S	Zn	Fe	Mn	Cu	Ca	Mg	Cl	B
1st choice												
2nd choice												

These statements are for the first crop choice only.

For a better evaluation of available nitrogen present, a sample from the top two feet should be taken for the nitrate-nitrogen test. Refer to the handout FS633 "Taking Soil Samples".

If a recommendation is desired, please contact your County Extension Educator or the SDSU Soil Testing Laboratory.

For additional information contact your County Extension Educator: County:

Phone:



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

November 20, 2003

Art Pederson
City of Lemmon
303 First Avenue West
Lemmon SD 57638

Dear Mr. Pederson:

The Water Rights Program received the water and soil analysis from SDSU for the well water and soils at the city golf course. The city contracted with SDSU to conduct this analysis because of the condition to Lemmon's Water Permit No. 1633-1 which requires testing of the soils at 5 year intervals. This condition is intended to monitor the soil condition in order to maintain the suitability of the soil for plant growth and avoid damage to the soil structure.

The city has complied with the permit condition by having this analysis conducted and the fact that the results were favorable. The city must continue to adhere to the irrigation management plan developed in 1998.

Thank you for your prompt attention to this matter. The city will be contacted again in five years when testing of the soils will again need to be conducted.

Sincerely,

Eric Gronlund
Water Rights Program, DENR
(605) 773-3352



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

September 23, 2008

Barb Bartell, Finance Officer
301 1st Ave W
Lemmon SD 57638

Dear Ms. Bartell:

The City of Lemmon holds Water Permit No. 1633-1 which authorizes the City to divert water from a well located in the SE ¼ NE ¼ Section 34-T23N-R16E to a regulating pond to irrigate portions of the golf course. At the time the application was considered there were serious concerns regarding the compatibility of the water with the soil. Therefore, a condition placed on the permit requiring the city to adopt a management plan to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. A copy of the approved management plan is attached. This testing of the soil shall occur at 5 year intervals with results submitted to the Water Rights Program for review.

This is a reminder that it has been five years since the City submitted the results of the soil testing. In the past, the city has contacted the Water Resources Institute at SDSU to assist analyzing of a soil sample.

On July 22, 2008, Mark Rath, a staff engineer with our program, met with Mel Frank to conduct the investigation of this water use system. The final water right document, the water license, can now be issued. State law requires that we charge a \$50.00 fee for the investigation and issuance of the water license. Upon receipt of the \$50.00 fee and the results of the soil testing, the water license can be issued. A licensed water right will be similar to a property right that can not be lost as long as the water use continues and you abide by the permit requirements.

Also, our review of the permit indicates the permit is subject to the irrigation water use questionnaire being submitted each year. It appears this annual questionnaire has never been sent to the City. The city will receive this questionnaire during the month of October.

I realize this letter contains a lot of information. If you need further explanation on any of the above requests, please contact Eric Gronlund or me.

Sincerely,

Karen Schlaak

Karen Schlaak
Water Rights Program
605 773-3352
karen.schlaak@state.sd.us

enclosure

1633-1
RECEIVED

NOV - 6 2008

WATER RIGHTS
PROGRAM

CITY OF LEMMON

303 First Avenue West
Lemmon, SD 57638

Email cityoflemmon@sdplains.com
Phone (605)374-5681 Fax (605) 374-5789

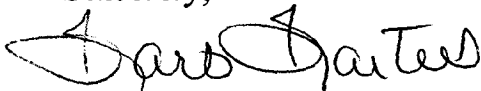
November 5, 2008

Karen Schlaak
Water Rights Program
DENR
523 East Capitol
Pierre, SD 57638

Dear Ms. Schlaak:

Enclosed please find copies of the results of the soil testing along with the \$50.00 fee for the investigation and issuance of the water license. If you need any more information, please feel free to contact me at 605-374-5681.

Sincerely,



Barb Bartell
City Finance Officer

Enclosures

1633-1

Analytical Services Provided Through...



RECEIVED
Analync NOV - 6 2008
WATER RIGHTS
PROGRAM

SOIL ANALYSIS - COMBINED ANALYSIS RESULTS Testing Performed by Harris Laboratories

Distributor: Superior Tech Products/Rick Gabler
Facility: LEMMON GOLF
LEMMON, SD 57638

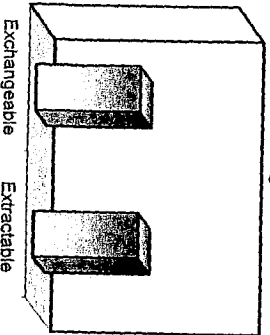
Laboratory No: 7440064 - 7440065
Sample ID: GRN04 GRN05
Info Sheet No: 25833
Report Date: 9/4/2008

Client Notes
Sample Depth: _____
Turf Type: _____
Other Information: _____

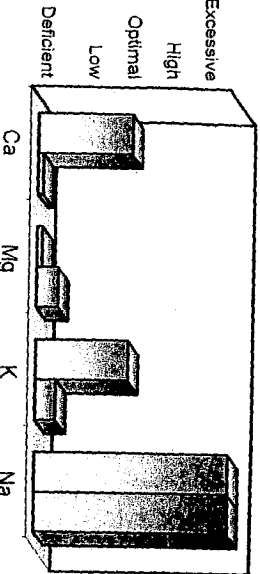
General Information

pH: 9.6
OM: 1.0
CEC: 8.5
SI: 0.8
ENR: 0.3

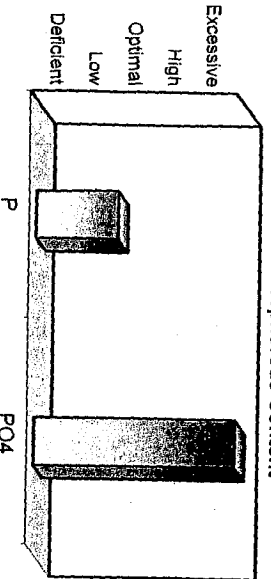
Legend



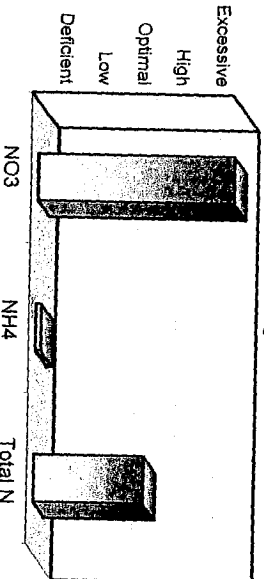
Base Cation Content



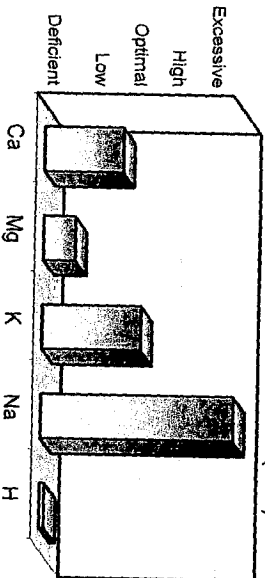
Phosphorous Content



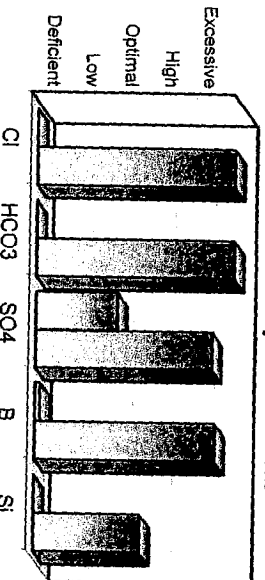
Nitrogen Content



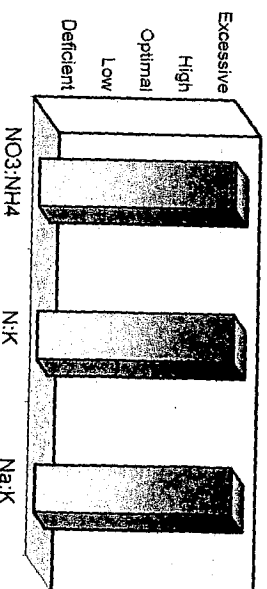
Percent Base Saturations (PBS)



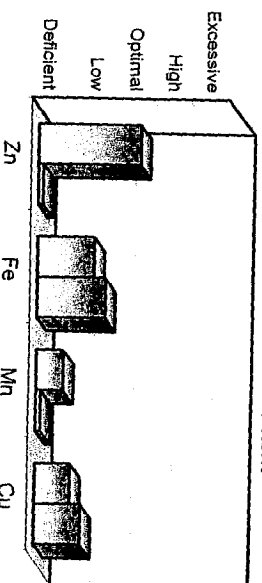
Secondary Anion Content



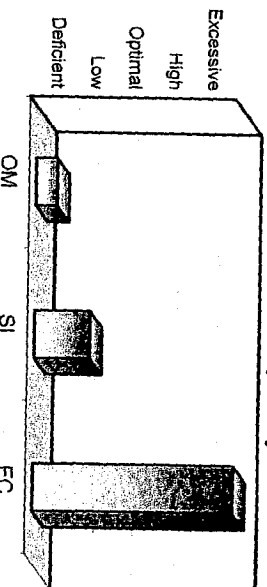
Ratios



Other Cation Content



Soil Physically



AMENDMENT GUIDELINES

Total Requirements in lb/acre
Ca: 427 (479 kg/ha) P2O5: 36 (41 kg/ha)
Mg: 69 (77 kg/ha) N: _____
K: 132 (148 kg/ha) Other: _____

Soil amendment rates and materials should be selected with an awareness of rootzone depth and uptake potential; materials burn and solubilization characteristics; and percolation rate and moisture exposure (precipitation and irrigation). Solubilizing and surfactant agents as well as flushing procedures may be advisable. Nitrogen management is particularly problematic. Guidelines reflect current conditions, adjusted for percolation and volatilization. Managers must accommodate all other conditions on a continuing basis in making nitrogen decisions. Consult your certified Analync representative for further guidance.

Mel's Copy



SOIL ANALYSIS - EXCHANGEABLE TEST RESULTS
Testing Performed by Harris Labs, Lincoln, Nebraska

Report Information

1 Report Type: FL
2 Report Method: 3
3 Dealer Acct. No: 5538411
4 Distributor: Superior Tech
Products/Rick Gabler
5 Turf Type: GRN04 GRN05
6 Report Date: 9/4/2008
7 Info. Sheet No: 25833

Client Information

10 Facility: LEMMON GOLF
11 Address:
12 City: LEMMON
13 State: SD
14 Zip Code: 57638

	A	B	C	D	E	F	G	H	I	J	Adj.
8 Laboratory No.	7440064	7440064									Adj.
9 Client ID	GRN04	GRN05									Avg.
15 % Organic Matter	1	1									1
88 ENR	0.33	0.33									0.33
17 P - ppm	12	14									13
18 K - ppm	124	126									125
19 Mg - ppm	59	46									52.5
20 Ca - ppm	1072	1005									1038.5
21 S - ppm	19	14									16.5
22 Zn - ppm	3.8	5.2									4.5
23 Mn - ppm	8.7	4.5									6.6
24 Cu - ppm	1.1	0.7									0.9
25 Fe - ppm	25.6	17									21.3
26 B - ppm	2.1	2									2.05
27 pH	9.5	9.6									9.55
28 Buffer pH											
29 Ex. Carbonates											
30 Soluble salts	0.66	0.57									0.62
31 Na - ppm	622	524									573
32 % PBS - K	3.6	4									3.8
33 % PBS - Mg	5.5	4.8									5.15
34 % PBS - Ca	60.4	62.7									61.55
35 % PBS - Na	30.5	28.4									29.45
36 % PBS - H	0	0									0
37 CEC	8.9	8									8.45
38 Ca:Mg Ratio	18.2	21.8									20
39 NH ₄ - ppm											
40 Cl - ppm											
41 P - ppm											
42 Al - ppm											
43 Mo - ppm											
44 % Sand											
45 % Silt											
46 % Clay											
47 Texture											



SOIL ANALYSIS - WATER EXTRACTABLE TEST RESULTS
Testing Performed by Harris Labs, Lincoln, Nebraska

Report Information												
1	Report Type: FL											
2	Report Method: 3											
3	Dealer Acct. No: 5538411											
4	Distributor: Superior Tech Products/Rick Gabler											
5	Turf Type: GRN04 GRN05											
6	Report Date: 9/4/2008											
7	Info. Sheet No: 25833											
Client Information												
10	Facility: LEMMON GOLF											
11	Address:											
12	City: LEMMON											
13	State: SD											
14	Zip Code: 57638											
		A	B	C	D	E	F	G	H	I	J	6
8	Laboratory No.	7440064	7440064									Adj.
9	Client ID	GRN04	GRN05									Avg.
48	EC - conductivity	2.61	2.62									2.61
49	Saturation Index	0.82	0.79									0.8
50	Na - meq/ltr	18.56	16.07									17.31
51	Ca - meq/ltr	1.12	1									1.06
52	Mg - meq/ltr	0.49	0.37									0.43
53	K - meq/ltr	0.59	0.57									0.58
54	NH ₄ - N - meq/ltr	0.3	0.3									0.3
55	NO ₃ - N - meq/ltr	4.07	3.86									3.96
56	P - PO ₄ - meq/ltr	1.39	1.69									1.54
57	HCO ₃ - meq/ltr	8.3	10.27									9.28
58	S - SO ₄ - meq/ltr	2.14	1.76									1.95
59	Cl - meq/ltr	9.71	9									9.36
60	B - meq/ltr	0.6	0.55									0.58
61	Mn - ppm	0.54	0.29									0.42
62	Cu - ppm	0.22	0.13									0.18
63	Zn - ppm	0.16	0.14									0.15
64	Fe - ppm	10.15	7									8.58
65	Si - ppm	35.14	25.23									30.18



EVALUATION FROM COMBINED TEST METHODS

Facility: LEMMON GOLF Info. Sheet No.: 25833 Turf Type: GRN04 GRN05

Organic Matter / Saturation Index

Organic Matter (1) DEFICIENT

OM will not support adequate soil CO₂ production and other essential microbial functions.

Ca and Mg solubility and organic N availability are probably low.

Probable poor water retention and high leaching of nutrients (especially N, S, and K) unless thatch is problematic.

Saturation Index (0.8) VERY LOW

Expect excessive percolation rates, low capillary water, and high leaching of nutrients.

Soluble Salts / Electrical Conductivity (EC)

Electrical Conductivity (2.61) EXCESSIVE

Levels this high interfere with normal plant function in all species (except Paspalum). The charge balance is severely skewed leading to excessive absorption of Na (+) and/or Cl (-). Flushing is required.

Base Cations (Ca, Mg, K, Na, H) and pH

Calcium (1038.5) OPTIMAL

Soil Ca content is adequate for efficient mining and plant availability. Maintain proper soil levels by routine application of bulk CaCO₃ and foliar Ca products.

Calcium Percent Base Saturation (61.55)

The traditional Albrecht based soil test says that this level of Ca is inadequate to meet plant needs. However, PBS is not an accurate indicator of plant availability. Refer to the "Soluble Calcium" section.

Soluble Calcium (1.06) DEFICIENT

Immediate attention is required. Root growth has stopped, response to injury is interrupted, resistance to heat stress is poor, and membrane function is failing. Foliar Ca must be applied as soon as possible.

Soluble Calcium Ratio DEFICIENT

Soluble Ca is not the majority of combined basic cations.

Ca availability is lower than necessary to sustain turf health.

Magnesium (52.5) DEFICIENT

Mg concentration and distribution in the soil is probably inadequate to furnish sufficient Mg to meet the turf's needs.

Soluble Magnesium (0.43) DEFICIENT

Mg availability from the soil is inadequate for optimum growth, color, and durability.

Potassium (125) OPTIMAL

Soil reserves are at a good level to provide adequate K for root uptake. Expect good "charge balance" and minimal effects from Na. Continue applying appropriate amounts of bulk K to keep levels sufficient.

Potassium Percent Base Saturation (3.8) OPTIMAL

The traditional soil test may conclude this PBS is optimal but doesn't accurately predict plant availability. Refer to the "Soluble K" section.



EVALUATION FROM COMBINED TEST METHODS

Facility: LEMMON GOLF Info. Sheet No.: 25833 Turf Type: GRN04 GRN05

Soluble Potassium (0.58) DEFICIENT

K levels are deficient and plant functions are in jeopardy of failing. Stomate operation is minimal so expect poor movement of water and nutrient throughout the plant. Nitrate processing and protein production is severely limited. Immediate application of bulk and foliar K sources is recommended.

Soluble Potassium Ratio LOW

Available K in soil solution is in a ratio with other basic cations which precludes adequate uptake.

Soluble Sodium:Potassium Ratio (29.73) EXCESSIVE

Na is predominant to K and the plant is attempting to substitute Na where possible. Water consumption is excessive due to weak stomates, leaf thickness has decreased, growth is suppressed, chlorophyll production is limited, and photosynthesis is suppressed. Immediate attention is required. Na must be flushed from the soil profile and K must be applied both foliarly and in the soil.

Sodium Percent Base Saturation (29.45) HIGH

Na PBS is high. Immediate attention required.

Soluble Sodium (17.31) HIGH

Soluble sodium is unacceptably high for proper turf/plant function. Immediate adjustment to the soil's and plant's nutritional content is indicated.

Hydrogen Percent Base Saturation (0) LOW

The traditional Albrecht based soil test states that H PBS should be between 10% and 15% to make micronutrients more available. Analync disagrees with this philosophy. Any H that is present on the soil colloid greater than 2% is wasting space in the "warehouse." Bulk addition of Ca, Mg or K is recommended to replace H. Analync's data has shown that a plant will adapt to its conditions and alter its array of root exudates to accommodate nutrient need. Focus on the "soluble" nutrient comments for a more accurate representation of plant availability.

Soil pH (9.55)

The traditional Albrecht based soil test recommends that the pH must be between 6.0 and 6.5 to ensure maximum nutrient availability. Analync disagrees with this philosophy. Analync's data and experience has shown that soil pH is the RESULT of existing soil and water conditions and NOT the cause of them. A plant will adapt to its conditions and alter its array of root exudates to accommodate nutrient need. Strong, healthy grass is grown in soil pH extremes of 4.0 and 9.0. Focus on the "soluble" nutrient comments for a more accurate representation of plant availability.

Phosphorous

Phosphorous (13) OPTIMAL

Even though exchangeable P is in an acceptable range, it may be an unreliable predictor of P availability to the plant.

Soluble Phosphorous (1.54) EXCESSIVE

P (PO_4) in solution is excessive and may interfere with the uptake of Mg, Fe, Mn, Cu, and Zn. Problems with maintaining adequate color may result. High levels of PO_4 may encourage the establishment of Poa Annua and excessive seed head production during stress.

Anions

Soluble Chloride (9.36) HIGH

Cl at this level will contribute to sealing of the soil.



EVALUATION FROM COMBINED TEST METHODS

Facility: LEMMON GOLF Info. Sheet No.: 25833 Turf Type: GRN04 GRN05

Bicarbonates (9.28) HIGH

HCO₃ is excessive and can reduce Ca availability.

Sulfur (16.5) OPTIMAL

Content is at sufficiency levels.

Soluble Sulfur (1.95)

S solubility is either inadequate or out of ratio to meet the requirements for complex protein production.

Boron (2.05)

The exchangeable B content may be an unreliable predictor of the boron available to the plant.
Please refer to soluble B content.

Soluble Boron (0.58) EXCESSIVE

Soluble B is excessive and toxicity could result.

Soluble Silicon (30.18) OPTIMAL

Si levels are optimum for strengthening cell walls, modulating lignin synthesis, preventing metal toxicity, pathogen resistance, and controlling transpiration. Maintain current levels with a balanced program of both soil and foliarly applied Si sources.

Micronutrients

Zinc (4.5) OPTIMAL

The exchangeable Zn content may be an unreliable predictor of the availability to the plant.

Soluble Zinc (0.15)

Zn availability is inadequate for enzymatic functions within the plant. The turf will experience excessive stress during periods of high temperatures and may have reduced cold weather tolerance.

Manganese (6.6)

The exchangeable Mn content may be an unreliable predictor of the availability to the plant.
However, the existing level is lower than desirable.

Soluble Manganese (0.42)

This level of Mn is inadequate for proper enzymatic function within the plant.

Copper (0.9)

The exchangeable Cu content may be an unreliable predictor of the availability to the plant.
However, copper reserves appear inadequate to meet plants' chlorophyll and stress tolerance requirements.

Soluble Copper (0.18) LOW

This level of Cu is inadequate for proper plant function and protein synthesis.

Iron (21.3)

The exchangeable Fe content may be an unreliable predictor of the availability to the plant.
However, soil Fe reserves appear insufficient to meet plants' chlorophyll and cell division requirements.

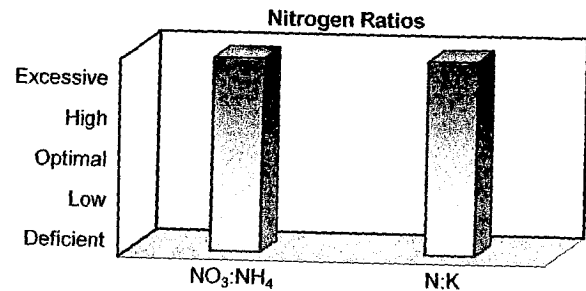
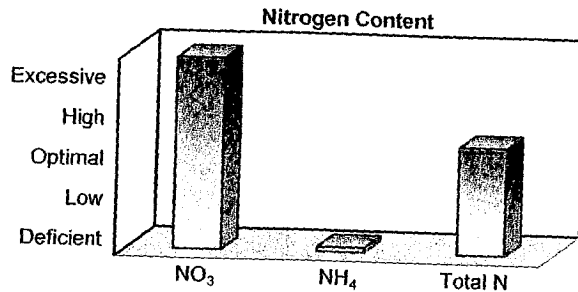
Soluble Iron (8.58) LOW

The availability of Fe is inadequate to support essential plant functions.



Nitrogen

Facility: LEMMON GOLF Info. Sheet No.: 25833 Turf Type: GRN04 GRN05

**Nitrate (NO₃) (3.96) EXCESSIVE**

NO₃ levels are excessive. The plant is forced to store excess NO₃ in vacuoles causing weak cell walls and unhealthy growth. The cause of the excess could be poor soil conditions from layering or over application of granular fertilizers. Stop NO₃ applications until levels subside.

Ammonium (NH₄) (0.3) DEFICIENT

Low levels of NH₄ indicate an overall deficiency of N. The turf is most likely performing below its potential.

Nitrate:Ammonium Ratio (13.21) EXCESSIVE

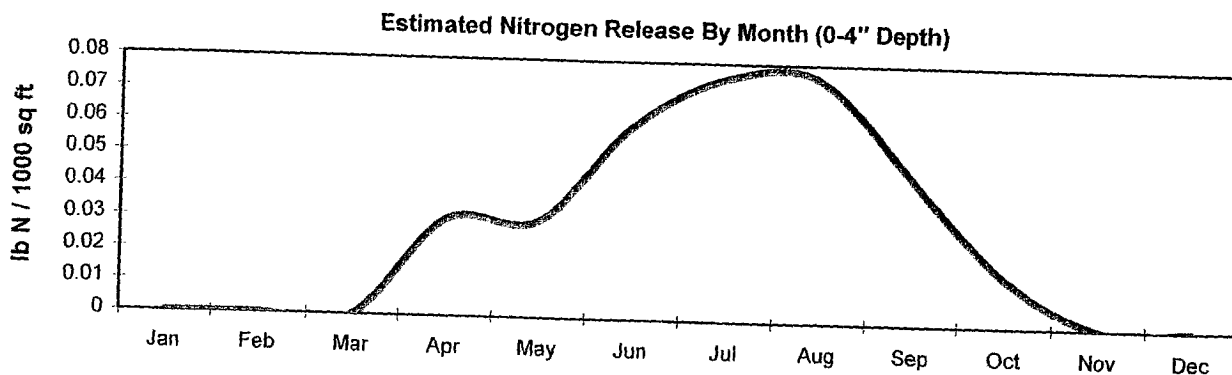
NO₃ levels are excessive and/or NH₄ levels are deficient. Expect less than optimum growth and watch for succulence leading to weak cell walls. Modify inputs to bring inputs back in line.

Soluble Nitrogen:Potassium Ratio (7.32) EXCESSIVE

N is probably excessive and/ or K is low. Expect weak cell walls, compromised color, and succulent growth. Symptoms of heat and drought stress will be severe. Modify inputs to get ratio back in line.

Estimated Nitrogen Release (ENR)

Organic Matter: 1 CEC: 8.5 Region / Zip Code: 57638

Average Annual ENR: **0.33** lb N / 1000 sq ft

Superior Tech Products

Soil Report

Customer: Lemmon G.C.

Samples from: Green # 4

Sample Date: September 4, 2008

		Target (Per your C.E.C.)	Actual	Notes
CEC			8.9	
PH	6.0 To 7.0		9.5	Very High
Buffer Index				
Organic Matter	2.0-4.5		1	Low
Ca:Mg Ratio	9 To 1		18.2	Very High
Sol. Salts(mmhos/cm)	Less Than 0.45		0.66	High
Excess Carbonate				
Base Saturation %				
Calcium	65 To 75%		60.4	Low
Magnesium	10 To 15%		5.5	Very Low
Potassium	2 To 5%		3.6	
Sodium	Less Than 2%		30.5	Extremely High
Hydrogen			0	
Nutrient Content (Parts per Million)			Actual PPM	
Phosphorus	17-20		12	Low
Potassium	178-222		124	Low
Calcium	1050-1350		1072	
Magnesium	116-148		59	Very Low
Zinc	3.4-7.9		3.8	
Manganese	20-50		8.7	
Copper	1.2-3.0		1.1	Little Low
Iron	10-50		25.6	
Sodium	25-42		622	Very High
Sulfur	8-14		19	
Boron	1.2-2.5		2.1	

Notes: High Availability Na, P₂O₅, Cl, HCO₃, SO₄, B
 Low Availability Ca, Mg, K, Zn, Mn

- 1) pH is way too high
- 2) OM is lower than it should be
- 3) N₂ is excessive in the nitrogen blend.
- 4) EC is way to high from all the + chemicals

Superior Tech Products
Soil Report

Customer: Lemmon G.C.

Samples from: Green # 5

Sample Date: September 4, 2008

		Target (Per your C.E.C.)	Actual	Notes
CEC			8	
PH	6.0 To 7.0		9.6	Very High
Buffer Index				
Organic Matter	2.0-4.5		1	Low
Ca:Mg Ratio	9 To 1		21.8	Very High
Sol. Salts(mmhos/cm)	Less Than 0.45		0.57	High
Excess Carbonate				
Base Saturation %				
Calcium	65 To 75%		62.7	Low
Magnesium	10 To 15%		4.8	Very Low
Potassium	2 To 5%		4	
Sodium	Less Than 2%		28.4	Extremely High
Hydrogen			0	
Nutrient Content (Parts per Million)			Actual PPM	
Phosphorus	16-19		14	Low
Potassium	157-196		126	Low
Calcium	960-1200		1005	
Magnesium	104-134		46	Very Low
Zinc	3.4-7.9		5.2	
Manganese	20-50		4.5	
Copper	1.2-3.0		0.7	Low
Iron	10-50		17	Little low
Sodium	20-33		524	Very High
Sulfur	8-14		14	
Boron	1.2-2.5		2	

in water - Soil

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date 11/6, 20 08

RECEIVED OF City of Lemmon 303 1st Ave W Lemmon SD 57638

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

Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use	
Fee for Application for Permit No. _____ to Appropriate Water for Future use	
Fee to retain Future Use Permit No. _____ after period of seven years.	
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>1633-1</u>	50 00
Fee for Filing Transfer Form _____	
Fee for _____	
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____	
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____	
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____	
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____	
(Any Other Work Provided by Law)	
TOTAL	50 00

No.

03788

By

Garland Erbe

Chief Engineer

29

Permit No. 1633-1
Grand River - Water District

Contact Person & Address: **Mel Frank, 303 1st Ave W, Lemmon SD 57638**

Report Of Examination Of Works

On, **July 22, 2008**, I made a thorough examination of the water use system constructed by **the City of Lemmon** of **303 1st Ave W, Lemmon SD** holder of Permit No. **1633-1**, bearing the priority of **Sept 11, 1995** authorizing the diversion of **0.47** cu. ft. per second of the waters of **ground water (Fox Hills)** and the storage of **11** ac-ft for **irrigation** purposes, in **Perkins** County.

The system is in the following condition **good**. The point of diversion is located **SW ¼ NE ¼ Sec 34 T23N-R16E** with a longitude of **-102.11791667** and a latitude of **45.9154667** as determined using **GPS**. The works are capable of diverting and conveying to the regulating pond dam **0.09** cu. ft. per second of water. The storage dam located **SW ¼ NE ¼ Sec 34 T23N-R16E** with a longitude of **-102.11791667** and a latitude of **45.9154667** as determined using **GPS** is capable of impounding. The regulating dam is capable of impounding **5 ac-ft of water**. Water is diverted from the pond at a rate of **0.66** cu. ft. per second (**due to a qualification the authorized diversion rate should be reduced to 0.39 cfs**) which is to be used for **irrigation**. Water has been put to beneficial use to the maximum extent as follows:

All land is located in **Sec 34 T23N-R16E:**

NE ¼ NE ¼ - 8 acres **SE ¼ NE ¼ - 19 acres**

comprising a total of **27** acres of land and the license should be issued for **0.09** cfs.

Review of Permit Qualifications And Regulations:

- 1) Special qualifications to permit being abided by **yes**
- 2) All structures, wells and lands on map **yes**
- 3) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period **yes**.
- 4) Exceptions to compliance are: **The diversion from the pond exceeds the authorized diversion rate**

Report On the Specifics of the System

Diversion Point Information:

Well Information:

- | | |
|---|--|
| 1) Well Drilling Firm: <u>Gregory Drilling</u> | 2) No. of Wells <u>1</u> |
| 3) Depth(s) <u>825</u> feet | 4) Well log is available <u>yes</u> |

Casing:

- | | |
|--------------------------------------|----------------------------------|
| 1) Diameter <u>6.6</u> inches | 2) Length <u>750</u> feet |
| 3) Type <u>steel</u> | |

Screen:

- 1) Type steel
- 2) Length 75 feet
- 3) Static water level 415 feet

Pump:

- 1) Make Grunfos
- 2) Model 406100-30
- 3) Size 4
- 4) Capacity 40 GPM

Motor:

- 1) Make Grundfos
- 2) Model No. 2366126020
- 3) Horsepower rating 10 hp

DISTRIBUTION AND REGULATING SYSTEM:**Regulating Pond**

- 1) Length 200
- 2) Width 70 inches
- 3) Depth 12 feet
- 4) Capacity 5 acre-feet

Lines

- 1) Type PVC
- 2) Size 2 inches

Pump: 2 Pumps

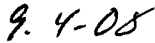
- 1) Make Berkley
- 2) Model N.A.
- 3) Size 4
- 4) Capacity 150 GPM

Motor:

- 1) Make Unknown
- 2) Model No. N.A.
- 3) Horsepower rating 7.5hp

SYSTEM TYPE: Sprinklers**Comments :** none

Mark D. Rath
Natural Resources Engineering Specialist
DENR, Water Rights Program



Date

No. 1633-1



Lat: 45.91546667
Lon: -102.11791667
From the NE corner of Sec 34
1800 ft S and 825 ft W

Sec 34 T23N-R16E

8 ac

19 ac



Mark D Rath 8-5-08
Mark D Rath
Natural Resources Engineering Specialist
SD Dept of Environment and Natural Resources

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 1633-1

(1) The City of Lemmon, 303 1st Ave W, Lemmon SD 57638 made Application No. 1633-1, September 11, 1995 for a water permit to divert 0.09 cubic feet of water per second (cfs) from groundwater (one well), Perkins County, South Dakota for irrigation purposes. Permit No. 1633-1, with a priority date of September 11, 1995 was approved December 6, 1995 and issued to the applicant for diversion of water with construction of the described water supply system and the application to beneficial use of water completed.

(2) The water supply system has been completed and water applied to beneficial use in accordance with South Dakota State Law. Pursuant to South Dakota Codified Law 46-5-30.1, the holder and/or owner of Water Right No. 1633-1 is issued a license, bearing a priority date of September 11, 1995 to appropriate 0.09 cfs from groundwater (one well) to a regulating pond (5 acre-feet storage capacity). Water is diverted from the regulating pond at a rate of 0.39 cfs to irrigate 27 acres.

The diversion point is located: 1,800 feet south and 825 feet west of the northeast corner of Section 34-T23N-R16E (SE ¼ NE ¼). The acres authorized for irrigation are as follows:

Section 34-T23N-R16E	NE ¼ NE ¼	8 acres	SE ¼ NE ¼	19 acres
Total 27 acres				

(3) This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Permit No. 1633-1 including the following now applicable qualifications:

- The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
- No. 1633-1 authorizes a dam with storage capacity of 5 acre-feet of water. The dam may be filled one or more times per year.
- No. 1633-1 limits the diversion rate from the 5 acre-feet storage dam for irrigation of 27 acres to 0.39 cfs (173 gallons per minute).
- This Permit is approved subject to the irrigation water use questionnaire being submitted each year.
- The permit holder shall maintain the suitability of the soil for irrigation and adhere to the City of Lemmon's Irrigation Plan received July 14, 1998. Testing of the soil shall occur at 5 year intervals and results submitted to the Water Rights Program for review.

Garland Erbele

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

DEC 23 2000

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

DEC 23 2000

1633-1

Barb Bartell, Finance Officer
City of Lemmon
301 1st Ave W
Lemmon SD 57638

Dear Ms. Bartell:

Enclosed is Water License No. 1633-1. This is the final water right document completing your process of obtaining a Water Right. Enclosed is your receipt for payment of the water license fee and a map prepared by Mark Rath, staff engineer who conducted the investigation.

The Water Rights Program has received the soil and water analysis for the well water and soils at the golf course. The analysis has been reviewed and the city must continue to adhere to the irrigation management plans developed in 1998. The city will be contacted in another five years when testing of the soils will again need to be conducted.

As long as you use the water beneficially, as stated in the Water License, the State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Sincerely,

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

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

denr.sd.gov

October 22, 2013

Barb Bartell, Finance Officer
City of Lemmon
303 1st Ave W
Lemmon SD 57638

Dear Ms. Bartell:

The City of Lemmon holds Water Right No. 1633-1 which authorizes the city to divert water from a well located in the SE 1/4 NE 1/4 Section 34-T23N-R16E to a regulating pond to irrigate portions of the golf course. At the time the application was considered, there were serious concerns regarding the compatibility of water with the soil. A condition on the permit requires the city to continue a management plan to maintain the suitability of the soil for plant growth and to avoid damage to the soil structure. A copy of the approved management plan dated July 14, 1998 is attached.

This is a reminder that it has been five years since the city submitted the results of the soil testing. In the past, the city has contacted the Water Resources Institute at SDSU to assist analyzing of a soil sample.

If you have any questions, please contact me.

Sincerely,

Karen Schlaak
Water Rights Program
605 773-3352
karen.schlaak@state.sd.us

enclosure

CITY OF LEMMON

**303 First Avenue West
Lemmon, SD 57638**

Email: cityoflemmon@sdplains.com
Phone: 605-374-5681 **Fax:** 605-374-5789

RECEIVED

NOV - 8 2013

**WATER RIGHTS
PROGRAM**

MEMO

TO: Jeanne Goodman, Chief Engineer
FROM: Barb Bartell, City Finance Officer 
SUBJECT: **2013 Irrigation Questionnaire**
DATE: November 5, 2013

Enclosed please find the 2013 questionnaire.

If you should have any questions, please feel free to call me at 605-374-5681.



1633-1
DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

January 16, 2015

NOTICE

TO: CITY OF LEMMON, FINANCE OFFICER, 303 1ST AVE W, LEMMON, SD 57638

FROM: Ron Duvall, Natural Resources Engineer
for Garland Erbele, Chief Engineer
Water Rights Program

SUBJECT: Reporting Requirement for 2014 Irrigation Questionnaire(s)

Our records indicate your 2014 Irrigation Questionnaire(s) has not been submitted for Permit No(s) 1633-1. The request for the Questionnaire was dated October 17, 2014. The Water Management Board has directed that owners of water permits who have not submitted the 2014 Irrigation Questionnaire(s) be given notice of permit violation and a hearing to be held by the Board. The hearing is to determine what action is to be taken for violation of Water Permit No(s) 1633-1 qualification:

"This permit is approved subject to the Irrigation Water Use Questionnaire being submitted each year."

The hearing will be held at **10:00 am, March 4, 2015** in the Floyd Matthew Training Center, Joe Foss Building, 523 E Capitol Avenue, Pierre, SD and will be conducted pursuant to SDCL 46-1-12, 46-1-14, 46-2-9, 46-2-11 and 46-2-17. These are contested case hearings pursuant to Chapter 1-26. According to SDCL 46-1-12, the Board may suspend a permit for a period of up to one year for the first violation of a permit qualification or up to three years for a second violation, or cancel a permit for a third violation. Following the hearing, the Water Management Board can:

1. Suspend or cancel Permit No(s) 1633-1 in accordance with applicable provisions of SDCL 46-1-12;
2. Postpone any action; or
3. Take no action.

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

If the questionnaire(s) is (are) received in this office before the **March 4, 2015** hearing you will no longer be in violation of your permit and your name will be removed from the Board agenda. Enclosed are additional questionnaire(s) for your use. If you have questions or need assistance, please contact Genny McMath at (605) 773-3352 or email at genny.mcmath@state.sd.us. If you prefer, you can complete the questionnaire online at the following link: <http://denr.sd.gov/iq.aspx>

NOTE: Please contact the Water Rights Program, Joe Foss Building, 523 E Capitol, Pierre, SD (605-773-3352) to assure access to the meeting room for the handicapped or to obtain an interpreter for the hearing impaired.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

denr.sd.gov

January 27, 2015

1633-1

Barb Bartell, Finance Officer
City of Lemmon
303 1st Ave W
Lemmon SD 57638

Dear Ms. Bartell:

I am writing to acknowledge receipt of the 2014 irrigation questionnaire for the City of Lemmon.

You may disregard the January 16, 2015, "Notice" concerning reporting requirements for Water Right No. 1633-1. The information was received in our office prior to the Water Management Board meeting and your name has been deleted from the agenda.

If you have any questions, please contact me.

Sincerely,

Genny McMath
Water Rights Program
(605) 773-3352
email: genny.mcmath@state.sd.us