

WATER PERMIT NO. 1667-1

Name of Applicant: Wharf Resources

Address: HC 37 Box 811, Lead SD 57754

Phone: 605 584-1441

Amount of Water Claimed: 0.891 cfs (647 AF annually)

Total Acres: NA

Source of Water Supply: Annie Creek

Water to be used for: industrial use

County: Lawrence

Type of Waste Disposal System: NA

Location: 3 miles southwest of Lead

PRIORITY Date Received: 4-2-1998

Fee: \$325

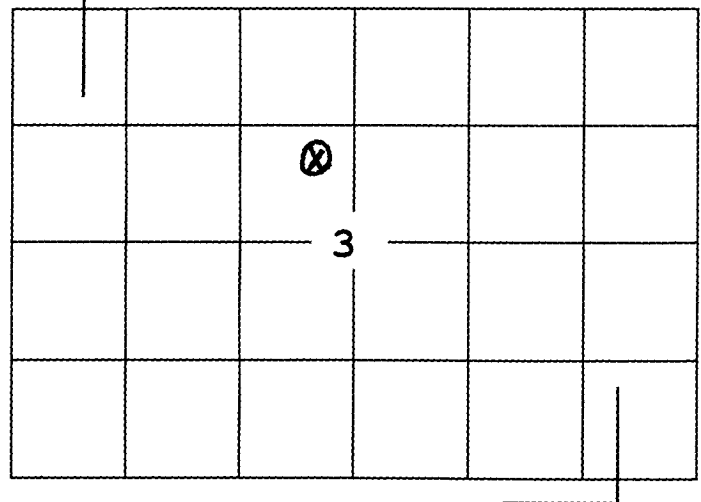
Corrected Application Received:

Period of Annual Use: January 1 – December 31

Remarks:

Diversion Point: SE ¼ NW ¼ Sec 3-T4N-R2E

Land to be Irrigated:



Depth of Well: NA

Well Driller:

Remarks:

Type of Map: topo

Prepared by: Jon Epp, DENR

Reviewed and the Number Assigned on: 4-2-1998

By: Karen Schlaak

Notice of Hearing - date to intervene: _____

SOUTH DAKOTA
WATER PERMIT NO. 1667-1

Date of first receipt of application April 2, 1998.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 1667-1 to Wharf Resources, HC 37, Box 811, Lead SD 57754 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. 1667-1 appropriates up to 0.891 cubic feet of water per second (647 acre-feet of water annually) from Annie Creek for removal of nitrate by the Ross Valley Biological Denitrification Facility. Water will be diverted from a small rock flow through structure (0.3 acre-feet of water storage capacity) located in the SE 1/4 NW 1/4 Section 3-T4N-R2E. The water will be treated by the denitrification plant and treated effluent returned to the Spearfish Creek drainage at several discharge points. These points are to be located in the W1/2 NW1/4 Section 3, T4N, R2E (Ross Valley discharge area); SE1/4 NW1/4 Section 3, T4N, R2E (Annie Creek discharge area); NE1/4 NE1/4 Section 4, T4N, R2E; N1/2 NW1/4 Section 3, T4N, R2E; NW1/4 NE1/4 Section 3, T4N, R2E; SE1/4 SE1/4 Section 33, T5N, R2E; S1/2 SW1/4 Section 34, T5N, R2E (Ross Valley Facility discharge area); and the E1/2 NW1/4 and W1/2 NE1/4 Section 3, T4N, R2E (Reliance Facility discharge area). Except for losses during the denitrification process, this appropriation will be non-consumptive use of water.
2. The water appropriated shall be used for the purpose of operating a biological denitrification facility and may not exceed the amount of water needed for beneficial use for remediation purposes.
3. The water is to be used during the following described annual period: January 1- December 31.
4. The date of approval of Permit No. 1667-1 is June 8, 1998.
5. The date from which applicant may claim right is April 2, 1998.
6. One-fifth of the construction is to be completed on or before November 8, 2000.
7. All construction is to be completed on or before June 8, 2003.
8. Water is to be put to beneficial use on or before June 8, 2007.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

WATER MANAGEMENT BOARD

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

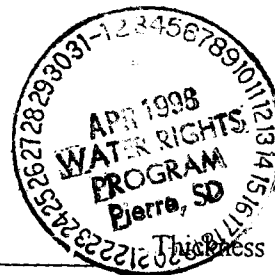
JUN 12 1998

date



Supplemental Information

(type or print in ink)



1. Well Information - Proposed Construction N/A

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

2. Wastewater Disposal System Information N/A

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

3. Dugout Information N/A

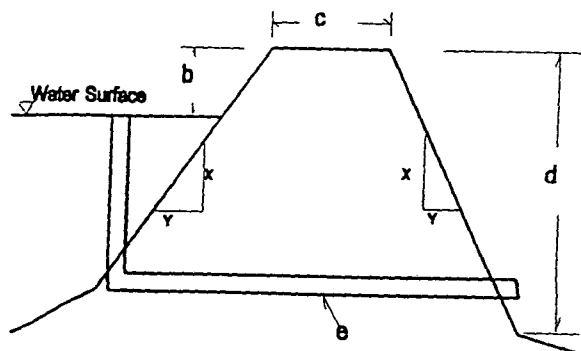
- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

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: The structure is a rock flow-through structure.

It was designed to hold 300,000 gallons of water. As the water flows through, it holds approximately 0.3 acre-ft.



- b) Freeboard 5 feet 6 inches
- c) Crest Width 13 feet
Crest Length 18 feet
- d) Height 12 feet
- e) Primary Outlet Capacity N/A
If pipe, diameter N/A
- f) Secondary Spillway Capacity N/A
Spillway Width N/A
- g) X & Y Slope _____
Upstream 45 degrees (approximately)
Downstream 50 degrees (approximately)
- h) Surface Area of Impoundment 1625 sq. ft.
- i) Storage Approx. 1 Acre Feet
- j) Drainage Area Above Dam N/A Acres

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

Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	No. <u>1667-1</u>	(office use only) Hydrologic Unit <u>10/20203</u>
	Basin <u>Belle Fourche River</u>	
	Newspaper <u>Lawrence Co. Centennial, Deadwood, SD</u>	



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

Check use(s) of water:

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

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

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

- Name of Applicant Wharf Resources Phone (605) 584-1441
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address HC 37 Box 811 Lead State SD 57754
(Street, RR, or Box and City) (Zip Code)
- Amount of water claimed 0.891 *CFS or 400 **GPM 647 ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)
- Source of water supply Annie Creek - Toe of the Reliance Facility
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) Toe of the Reliance Rock
Facility located in the SE1/4, NW1/4, Section 3, T.4N., R.2E., B.H.M.
County Lawrence
- County or counties where water will be used Lawrence
- Annual period during which water is to be used January 1 through December 31
- Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

Please see attached Technical Revision Application.

STATE OF SOUTH DAKOTA)
County of LAWRENCE) SS

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

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

Applicant's signature John A Begeman

Subscribed and sworn to before me this 31st day of March 19 98

Julian G. Emerson
Notary Public signature



1667-1



Figure 2

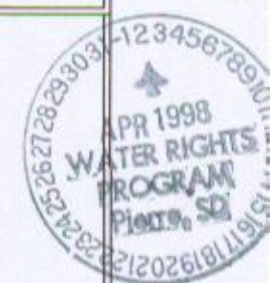


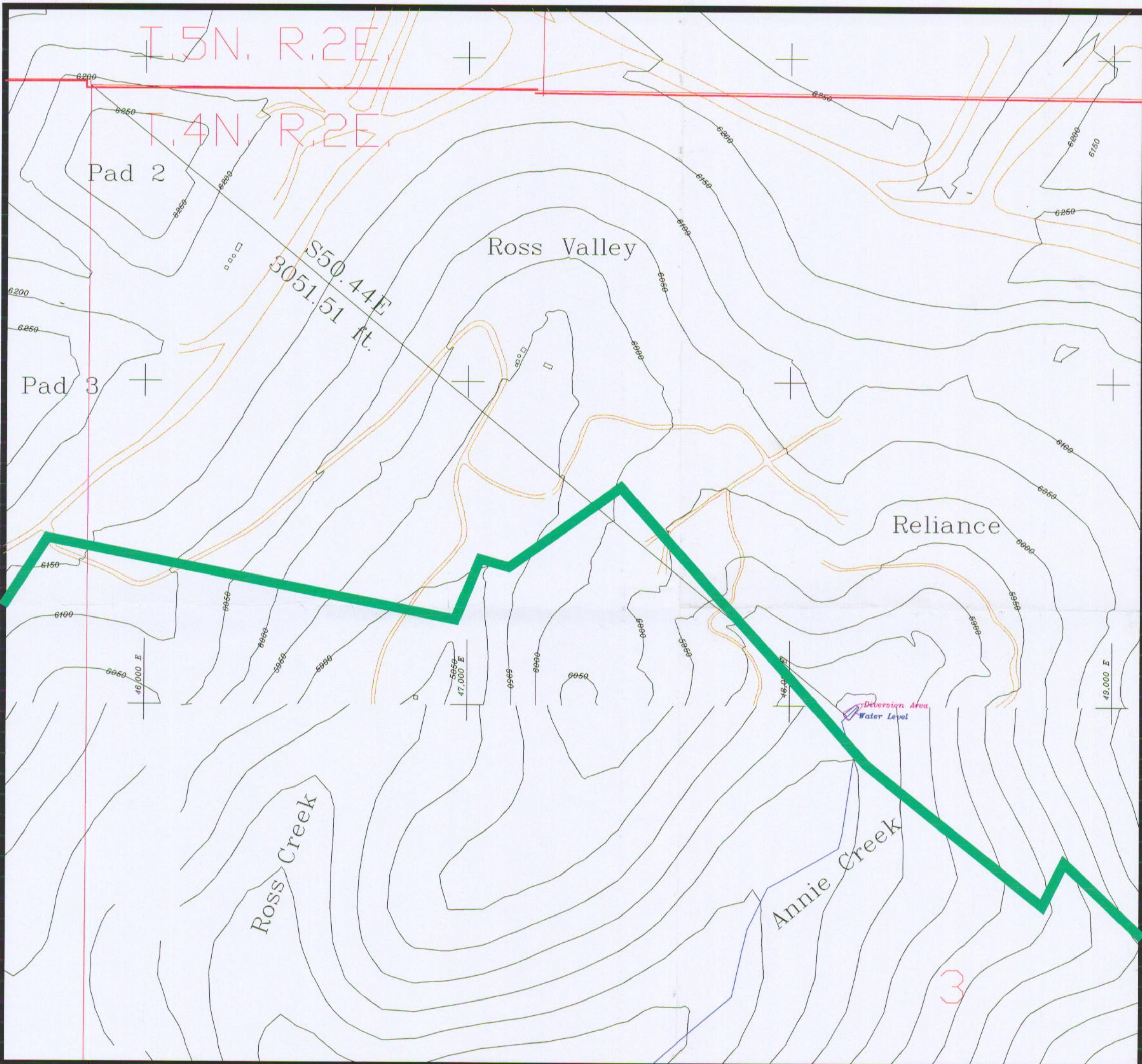
WHARF RESOURCES
 HC 37 BOX 811
 LEAD, SD 57754

PROJECT: The Wharf Mine
 Ross Valley
 Denitrification
 Plant

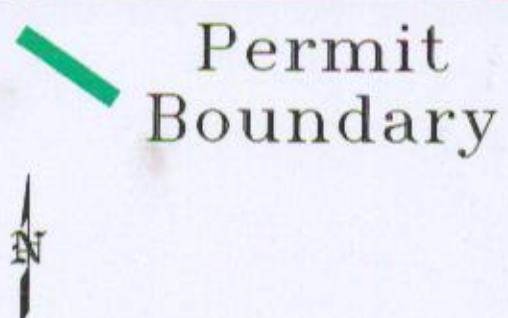
DATE: 03/05/98
SCALE: 1"=300'
DRAWN BY: JAC
CHECKED BY: JF

DENITE.DWG



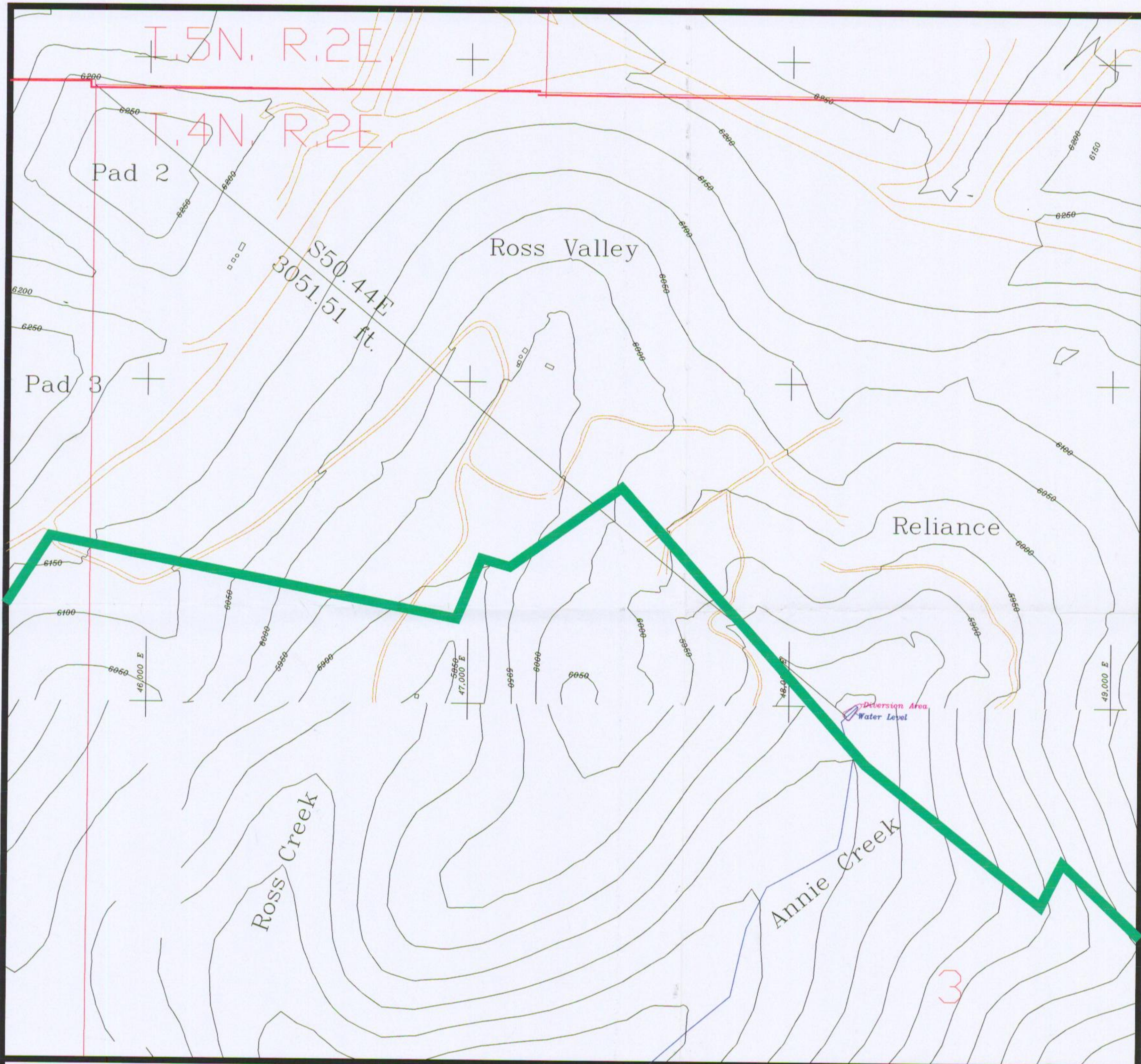


WHARF RESOURCES
 HC 37 BOX 811
 LEAD, SD 57754
 LAWRENCE COUNTY



PROJECT: The Wharf Mine
 Annie Creek
 Water Right
 Diversion Point

DATE: 03/31/98
 SCALE: 1"=200'
 DRAWN BY: Env. Dept.
 CHECKED BY: *John Lynn*
 Net. Res. Eng. SDDENR 4-1-98



WHARF RESOURCES
HC 37 BOX 811
LEAD, SD 57754
LAWRENCE COUNTY

Permit
Boundary

PROJECT:

The Wharf Mine
Annie Creek
Water Right
Diversion Point

DATE: 03/31/98
SCALE: 1"=200'
DRAWN BY: Env. Dept.
CHECKED BY: *Jim Lynn*
Nat. Res. Eng. SDPENR 4-1-98

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

NO 415718

Pierre, April 2 19 98

RECEIVED OF Wharf Resources, HC 37, Box 811, Lead, SD 57754
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. 1667-1 to Appropriate Water, to construct
and to put water to beneficial use _____

325 00

Fee for Application for Permit No. _____ to Appropriate Water, for Future
Use _____

Fee to retain Future Use Permit No. _____ after period of seven years.

Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water
License No. _____

Fee for Filing Transfer Form _____

Fee for Filing Extension Request _____

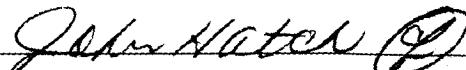
Fee for _____

(Any Other Work Provided by Law)

Total

325 00

By _____
Chief Engineer

John Hatcher 

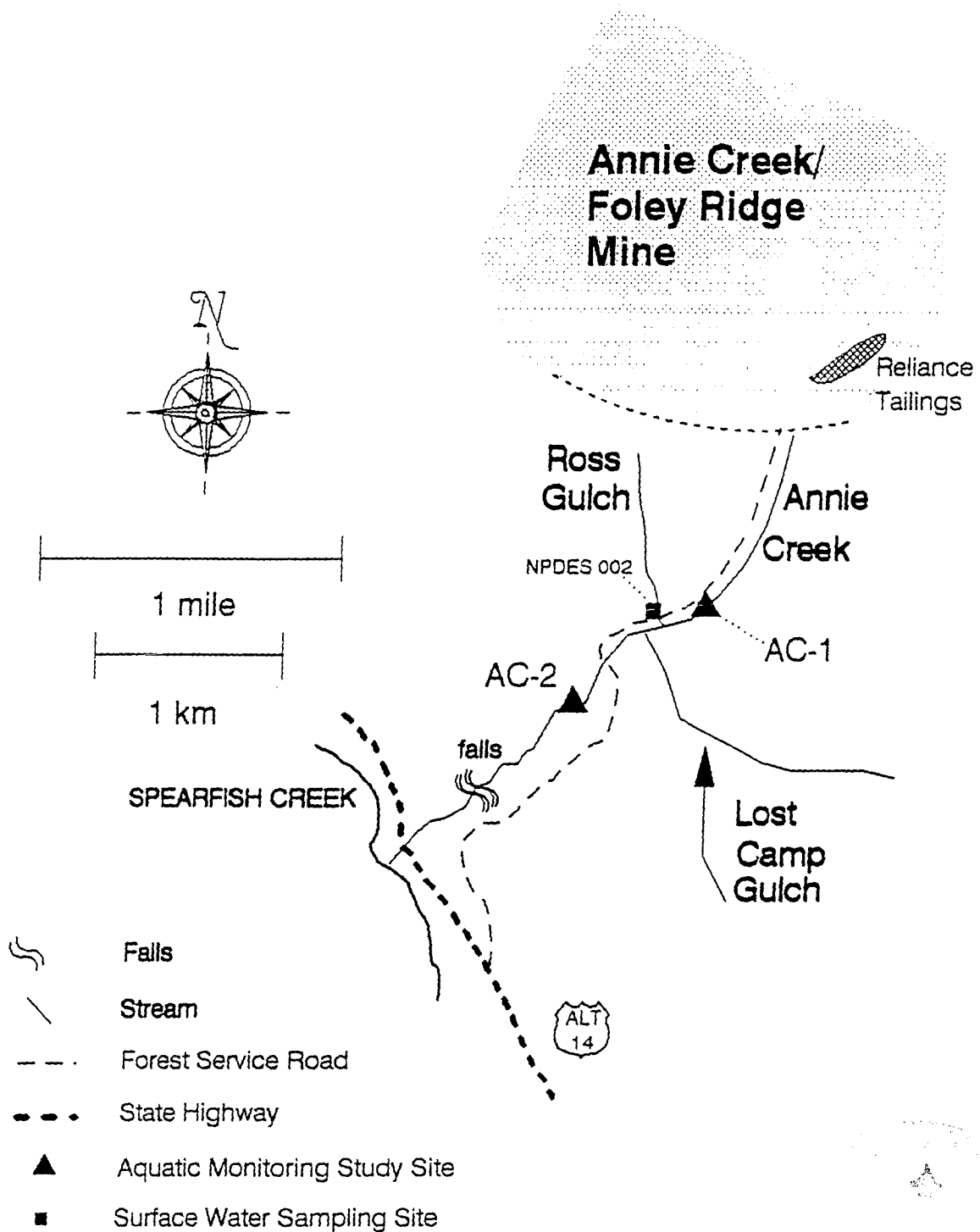
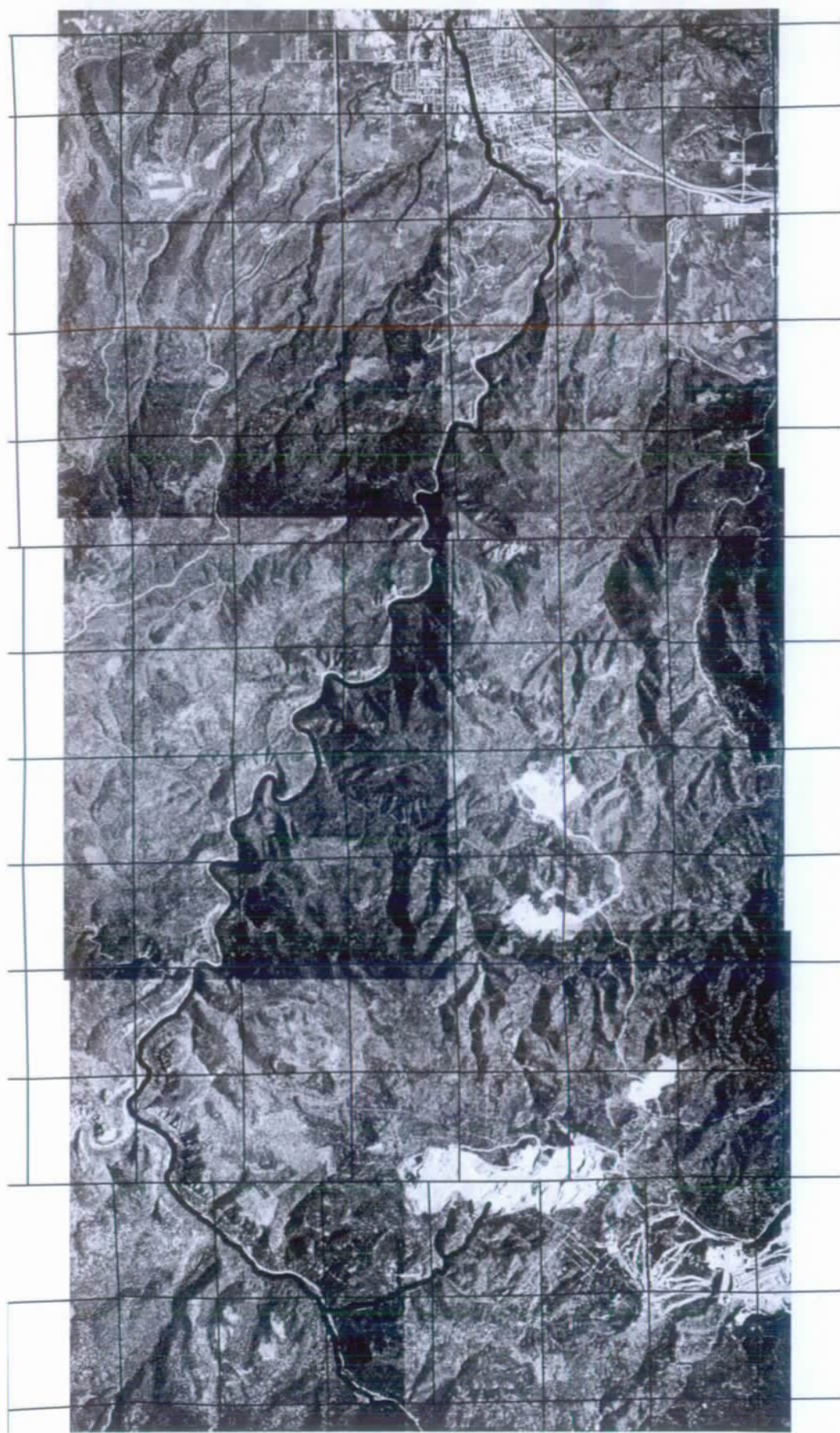


FIGURE 1: Aquatic biological sampling sites on Annie Creek, South Dakota.

[illegible]



CHADWICK & ASSOCIATES, INC.

5575 South Sycamore Street, Suite 100

Littleton, Colorado 80120

Phone (303) 794-8976

Fax (303) 794-5041

December 17, 1997

Terese Hruska
Wharf Resources, Inc.
HC 37, Box 811
Lead, SD 57754-9710

Dear Ms. Hruska:

Enclosed are the results of the acute *Ceriodaphnia dubia* and *Pimephales promelas* tests performed December 10 to 14, 1997 on outfall 001. Acute toxicity test procedures followed methods described in EPA documentation (Weber *et al.* 1993) and the Region VIII NPDES Whole Effluent Toxics Control Program (EPA Region VIII 1993).

No significant toxicity was recorded in either the *Ceriodaphnia dubia* or the *Pimephales promelas* test. Control performance in both tests was met.

If there are any questions regarding these test results, please feel free to call.

Sincerely,

CHADWICK & ASSOCIATES, INC.



Steven P. Canton
President

Enclosure

SPC/mkt



REFERENCES

- EPA Region VIII. 1993. Region VIII NPDES whole effluent toxics control program. July, 1993. Denver, Colorado.
- Hamilton, M.A., R.C. Russo, and R.V. Thurston. 1977. Trimmed Spearman-Kärber method for estimating median lethal concentrations in toxicity bioassays. *Environmental Science & Technology*. 11:714-719; correction 12:417 (1978).
- Weber, C.I., M. Heber, J. Lazorchak, T. Norberg-King, G. Morrison, W. Peltier, F. Fulk, C. Poore, P. Lewis, J. Lazorchak, S. Ward, D. Bengtson, D. Klemm, Q. Pickering, M. Smith, D. Middaugh, D. Klemm. 1993. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. 4th Edition. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio. EPA/600/4-90/027F.

TEST CONDITIONS: *Ceriodaphnia dubia* 48 hr. acute toxicity test

Method: EPA/600/4-90/027F -- Methods for measuring the acute toxicity of effluents . . .

Test Duration: 48 hours

Sample Collection Procedure: grab

Sample Collection Date: 12/9/97

Dilution water: 101 mg/L hardness reconstituted water

Acclimation: cultured in dilution water

Age of organisms at start: <24 hr. old

Feeding: none

End Point: mortality

Start date and time: 12/10/97 14:50

End date and time: 12/12/97 15:00

Type of exposure chamber: 30 mL disposable plastic cup

Volume of exposure chamber: 25 mL

Number of Animals exposed/chamber: 5

Number of replicates/treatment: 4

Test temperature: 20°C ± 1

Standard toxicant used: NaCl

TEST CONDITIONS: Fathead minnow 96 hr. acute toxicity test

Method: EPA/600/4-90/027F -- Methods for measuring the acute toxicity of effluents . . .

Test Duration: 96 hours

Sample Collection Procedure: grab

Sample Collection Date: 12/9/97

Dilution water: 101 mg/L hardness reconstituted water

Age of organisms at start: 6 day old

Feeding: before 48 hr. solution renewal

End Point: mortality

Start date and time: 12/10/97 15:30

End date and time: 12/14/97 14:45

Type of exposure chamber: 9 oz. disposable plastic cup

Volume of exposure chamber: 250 mL

Number of Animals exposed/chamber: 10

Number of replicates/treatment: 4

Test temperature: 20°C ± 1

Standard toxicant used: NaCl

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*:

Acute test

Test date: November 24 to 26, 1997

g NaCl/L	control	1.0	1.5	2.0	2.5	3.0
# alive/# exp.	20/20	20/20	20/20	20/20	6/20	0/20
% survival	100	100	100	100	30	0

 LC_{50} (Spearman-Kärber) = 2.38g NaCl/L (95% CI, 2.28 to 2.48)

Note: This is within our accepted performance range (2.13 to 2.80) determined by 10 previous reference tests performed.

SUMMARY RESULTS OF NaCl REFERENCE TEST ON FATHEAD MINNOW LARVAE:

Acute Test

Test date: November 19 to 21, 1997

g NaCl/L	control	7.0	8.0	8.5	9.0	9.5
# alive/# exp.	18/20	19/20	12/20	12/20	8/20	0/20
% survival	90	95	60	60	40	0

 LC_{50} (Spearman-Kärber) = 8.48 g NaCl/L (95% CI, 8.25 to 8.72)

Note: This is within our accepted performance range (7.12 to 8.56) determined by 10 previous reference tests performed.

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME WHARF RESOURCES NPDES NO. SD-0025852
 50% MORTALITY TEST X PASS FAIL LC₅₀ >100% OUTFALL NO. 001
 TEST ANIMAL & AGE Ceriodaphnia dubia <24hr. old SAMPLE DATE/TIME 12-9-97/8:30
 ANALYSIS DATE/TIME: BEGIN 12-10-97/14:50 END 12-12-97/15:00

DILUTIONS (PERCENT EFFLUENT)

NUMBER ALIVE	0%	12.5%	25%	50%	75%	100%
START OF TEST	20	20	20	20	20	20
AFTER 24 HR.	20	20	20	20	20	20
AFTER 48 HR.	19	20	20	20	20	20
AFTER 72 HR.						
AFTER 96 HR.						

DILUTIONS (PERCENT EFFLUENT)

MAX/MIN VALUES	0%	12.5%	25%	50%	75%	100%
D.O.	7.2/6.9	7.2/7.1	7.2/7.1	7.1/6.8	7.2/6.9	7.2/7.1
TEMP °C	19.0/19.0	19.0/19.0	19.0/19.0	19.0/19.0	19.0/19.0	19.0/19.0

RECEIVING WATER USED FOR DILUTIONS (Y OR N)? N
 HARDNESS: RECEIVING WATER NA EFFLUENT 346 RECON. WATER (IF USED) 101
 INITIAL TOTAL RESIDUAL CHLORINE IN 100% EFFLUENT: .03
 INITIAL NH₃ (AS N) IN 100% EFFLUENT: <0.1
 pH IN 100% EFFLUENT: INITIAL 7.71 AFTER 24 HR. 8.22
 pH IN 0% CONTROL: INITIAL 7.88 AFTER 24 HR. 7.72
 ANALYST'S NAME Michelle K Thyer
 LABORATORY CHADWICK AND ASSOCIATES, INC.
 SIGNATURE Michelle K. Thyer DATE 12-17-97
 COMMENTS

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME WHARF RESOURCES NPDES NO. SD-0025852
 50% MORTALITY TEST PASS X FAIL LC₅₀ >100% OUTFALL NO. 001
 TEST ANIMAL & AGE Pimephales promelas 6 day old SAMPLE DATE/TIME 12-9-97/8:30
 ANALYSIS DATE/TIME: BEGIN 12-10-97/15:30 END 12-14-97/14:45

DILUTIONS (PERCENT EFFLUENT)

NUMBER ALIVE	0%	12.5%	25%	50%	75%	100%
START OF TEST	40	40	40	40	40	40
AFTER 24 HR.	40	40	39	40	40	40
AFTER 48 HR.	40	40	39	40	39	40
AFTER 72 HR.	40	40	39	40	39	40
AFTER 96 HR.	40	40	39	40	38	39

DILUTIONS (PERCENT EFFLUENT)

MAX/MIN VALUES	0%	12.5%	25%	50%	75%	100%
D.O.	7.5/7.1	7.4/7.1	7.3/7.0	7.2/6.9	7.2/6.9	7.1/6.8
TEMP °C	19.5/19.0	19.5/19.0	19.5/19.0	19.5/19.0	19.5/19.0	19.5/19.0

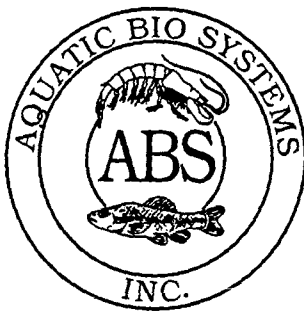
RECEIVING WATER USED FOR DILUTIONS (Y OR N)? N
 HARDNESS: RECEIVING WATER NA EFFLUENT 346 RECON. WATER (IF USED) 101
 INITIAL TOTAL RESIDUAL CHLORINE IN 100% EFFLUENT: .03
 INITIAL NH₃ (AS N) IN 100% EFFLUENT: <0.1
 pH IN 100% EFFLUENT: INITIAL 7.71 AFTER 24 HR. 8.05
 pH IN 0% CONTROL: INITIAL 7.88 AFTER 24 HR. 7.73
 ANALYST'S NAME Michelle K Thyer
 LABORATORY CHADWICK AND ASSOCIATES, INC.
 SIGNATURE Michelle K. Thyer DATE 12-17-97
 COMMENTS

CHADWICK AND ASSOCIATES, INC.
 5575 S. SYCAMORE ST. SUITE 100
 LITTLETON, CO. 80120
 (303) 794-2724

BIOASSAY LABORATORY CHAIN-OF-CUSTODY

CLIENT/PROJECT <u>Wharf Resources</u>				TESTS REQUIRED							
ADDRESS <u>HC 37 Box 811</u>				ACUTE			CHRONIC				
CITY <u>Lead</u> STATE <u>SD</u>				C E R I O	F A T H E A D	D A P H N I A	C E R I O	F A T H E A D			
ZIP <u>57754</u> PHONE # <u>(605) 584-4112</u>											
PROJ. MANAGER <u>Lynn Blackman</u> SAMPLER <u>John Buckhorn</u>											
SAMPLE TYPE	DATE COLL.	TIME COLL.	LOG #							COMMENTS	RECEIPT TEMP.
NPDES 001	12/9/97	8:30 AM		X	X					Methane & OOI water	0.5°C
NPDES 001	12/9/97	8:30 AM		X	X					Methane & OOI water	
NPDES 001	12/9/97	8:30 AM		X	X					Methane & OOI water	
PROJECT INFORMATION			RECEIVING INFORMATION			(CLIENT) RELINQUISHED BY: <u>[Signature]</u>			(CARRIER) RECEIVED BY: <u>[Signature]</u> <u>Sioux Falls Cartage</u>		
COURIER: <u>Sioux Falls Cartage</u>			CONDITION: <u>sealed</u>			DATE/TIME: <u>12/9/97 10:30 AM</u>			DATE/TIME: <u>12/9/97 10:30 AM</u>		
TOTAL NUMBER OF CONTAINERS: <u>3 bottles in 2 coolers</u>			TOTAL NUMBER OF CONTAINERS: <u>3 cubes in 2 coolers</u>			(CARRIER) RELINQUISHED BY: _____			(CHADWICK) RECEIVED BY: <u>Michelle K. Thyer</u>		
COMMENTS						DATE/TIME: _____			DATE/TIME: <u>12-10-97/13:15</u>		

1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524



Toll Free: 800/331-5916
Tel: 970/484-5091 Fax: 970/484-2514

ORGANISM HISTORY

DATE: 12/8/97

SPECIES: Pimephales promelas

AGE: 4 day

LIFE STAGE: Larvae

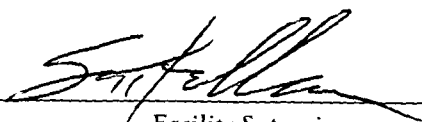
HATCH DATE: 12/4/97

BEGAN FEEDING: 12/5/97

FOOD: Artemia

Water Chemistry Record:	Mean	Range
TEMPERATURE:	<u>24 °C</u>	<u>--</u>
SALINITY / CONDUCTIVITY:	<u>--</u>	<u>--</u>
TOTAL HARDNESS (as CaCO ₃):	<u>124 mg/l</u>	<u>--</u>
TOTAL ALKALINITY (as CaCO ₃):	<u>90 mg/l</u>	<u>--</u>
pH:	<u>7.97</u>	<u>--</u>

Comments:



Facility Supervisor

INITIAL CHEMISTRY BENCH SHEET

Samples Received: Date/Time 12-10-97 / 13:15

Analysis Begun: Date/Time 12-10-97

Dilution Water: lab water or receiving water

Test Substance: effluent

What test/s will samples be used in? Acute Toxic + fathead

Analyst: JB, MT

Client/Project: Wharf

SAMPLE TYPE, LOG NUMBER, CLIENT NAME, DATE COLLECTED/MADE	ANALYSES TEMP. °C	TOTAL HARDNESS mg/L	pH	TOTAL ALKALINITY mg/L	D.O. mg/L	COND. µS	TRC mg/L	AMMONIA mg/L
<u>effluent</u> <u>W1297</u> <u>Wharf</u> <u>12-9-97</u>	<u>20.0</u>	<u>17.3</u> <u>346</u>	<u>7.71</u>	<u>8.5</u> <u>170</u>	<u>6.9</u>	<u>758</u>	<u>0.03</u>	<u><0.1</u>
<u>MH Recon</u> <u>144MH</u> <u>12-9-97</u>	<u>20.0</u>	<u>101</u>	<u>7.88</u>	<u>71</u>	<u>6.8</u>	<u>375</u>	<u>—</u>	<u>—</u>

COMMENTS:

ACUTE TOXICITY CHEMISTRY BENCH SHEET

START Date 12-10-97

FINISH Date 12-12-97

Dilution Water: M4 Recon

Test Substance: effluent

Client/Project: Wharf

Organism: C. dubia

Test	Chemical	Day of Test				COMMENTS
		1	2	3	4	
0	DO	7.2	6.9			
	Cond.	353	355			
	pH	7.72	7.76			
	Temp.	19	19			
12.5	DO	7.2	7.1			
	Cond.	409	410			
	pH	7.78	7.84			
	Temp.	19	19			
25	DO	7.2	7.1			
	Cond.	460	457			
	pH	7.85	7.89			
	Temp.	19	19			
50	DO	7.1	6.8			
	Cond.	560	571			
	pH	8.00	8.04			
	Temp.	19	19			
75	DO	7.2	6.9			
	Cond.	665	678			
	pH	8.10	8.09			
	Temp.	19	19			
100	DO	7.2	7.1			
	Cond.	776	775			
	pH	8.22	8.21			
	Temp.	19	19			
	DO					
	Cond.					
	pH					
	Temp.	19				
ANALYST		JB	JB			

ACUTE TOXICITY CHEMISTRY BENCH SHEET

START Date 12-10-97FINISH Date 12-14-97Dilution Water: MH ReconTest Substance: effluentClient/Project: WharfOrganism: P. promelas

Test	Chemical	Day of Test				COMMENTS
		1	2	3	4	
0	DO	7.3	7.1	7.4	7.5	
	Cond.	371	378	386	367	
	pH	7.73	7.58	7.68	7.57	
	Temp.	19	19	19.5	19.5	
12.5	DO	7.3	7.1	7.4	7.3	
	Cond.	430	421	418	419	
	pH	7.75	7.58	7.67	7.72	
	Temp.	19	19	19.5	19.5	
25	DO	7.2	7.0	7.3	7.2	
	Cond.	476	471	474	480	
	pH	7.82	7.65	7.75	7.82	
	Temp.	19	19	19.5	19.5	
50	DO	7.2	6.9	7.2	7.2	
	Cond.	582	579	581	573	
	pH	7.88	7.71	7.82	7.91	
	Temp.	19	19	19.5	19.5	
75	DO	7.2	6.9	7.1	7.2	
	Cond.	694	686	692	680	
	pH	7.95	7.78	7.89	8.02	
	Temp.	19	19	19.5	19.5	
100	DO	7.1	6.8	6.9	6.9	
	Cond.	805	803	801	790	
	pH	8.05	7.88	7.95	8.04	
	Temp.	19	5 ^B 7.19	19.5	19.5	
	DO					
	Cond.					
	pH					
	Temp.					
ANALYST		JB	JB	MI	MI	

ACUTE TOXICITY TEST BENCH SHEET

START Date/Time 12-10-97 / 14:50

FINISH Date/Time 12-12-97 / 15:00

Dilution Water: MH Reion

Test Substance: Effluent

Client/Project: Wharf

Species: C. dubia

CONCENTRATION & REPLICATE	Number alive/hour of test					# alive # exposed (percent survival)	COMMENTS
	Start	24	48	72	96		
0	A	5	5	5		19/20 95	template #6 B12-2-97A#112
	B	5	5	5			
	C	5	5	+			
	D	5	5	5			
12.5	A	5	5	5		20/20 100	
	B	5	5	5			
	C	5	5	5			
	D	5	5	5			
25	A	5	5	5		20/20 100	
	B	5	5	5			
	C	5	5	5			
	D	5	5	5			
50	A	5	5	5		20/20 100	
	B	5	5	5			
	C	5	5	5			
	D	5	5	5			
75	A	5	5	5		20/20 100	
	B	5	5	5			
	C	5	5	5			
	D	5	5	5			
100	A	5	5	5		20/20 100	
	B	5	5	5			
	C	5	5	5			
	D	5	5	5			
	A						
	B						
	C						
	D						
ANALYST		ME	SB	SB			
TIME RENEWED			13:20	15:00			

ACUTE TOXICITY TEST BENCH SHEET

START Date/Time 12-10-97/15:30

FINISH Date/Time 12-14-97/14:45

Dilution Water: Mt Recon

Test Substance: repellent

Client/Project: Wharf

Species: P. Promelas

CONCENTRATION & REPLICATE	Number alive/hour of test					# alive # exposed (percent survival)	COMMENTS
	Start	24	48	72	96		
0	A	10	10	10	10	40/40 20/20 MI 100	
	B	10	10	10	10		
	C	10	10	10	10		
	D	10	10	10	10		
12.5	A	10	10	10	10	40/40 20/20 MI 100	
	B	10	10	10	10		
	C	10	10	10	10		
	D	10	10	10	10		
25	A	10	10	10	10	39/40 19/20 MI 97.5	
	B	10	10	10	10		
	C	10	9	9	9		
	D	10	10	10	10		
50	A	10	10	10	10	40/40 20/20 MI 100	
	B	10	10	10	10		
	C	10	10	10	10		
	D	10	10	10	10		
75	A	10	10	9	9	38/40 MI 95	
	B	10	10	10	10		
	C	10	10	10	10		
	D	10	10	10	10		
100	A	10	10	10	10	39/40 97.5	
	B	10	10	10	10		
	C	10	10	10	10		
	D	10	10	10	9		
	A						
	B						
	C						
	D						
ANALYST	JB	JB	JB	MI	MI		
TIME RENEWED		13:55	14:45	13:50			

CHADWICK & ASSOCIATES, INC.

5575 South Sycamore Street, Suite 100

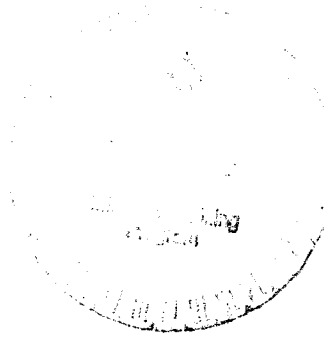
Littleton, Colorado 80120

Phone (303) 794-8976

Fax (303) 794-5041

March 2, 1998

Terese Hruska
Wharf Resources, Inc.
HC 37, Box 811
Lead, SD 57754-9710



Dear Ms. Hruska:

Enclosed are the results of the acute *Ceriodaphnia dubia* and *Pimephales promelas* tests performed February 24 to 28, 1998 on site 001. Acute toxicity test procedures followed methods described in EPA documentation (Weber *et al.* 1993) and the Region VIII NPDES Whole Effluent Toxics Control Program (EPA Region VIII 1997).

No significant toxicity was recorded in either the *Ceriodaphnia dubia* or the *Pimephales promelas* test. Control performance in both tests was met.

If there are any questions regarding these test results, please feel free to call.

Sincerely,

CHADWICK & ASSOCIATES, INC.

Steven P. Canton
President

Enclosure

SPC/mkt

REFERENCES

- EPA Region VIII. 1997. Region VIII NPDES whole effluent toxics control program. August, 1997. Denver, Colorado.
- Hamilton, M.A., R.C. Russo, and R.V. Thurston. 1977. Trimmed Spearman-Kärber method for estimating median lethal concentrations in toxicity bioassays. *Environmental Science & Technology*. 11:714-719; correction 12:417 (1978).
- Weber, C.I., M. Heber, J. Lazorchak, T. Norberg-King, G. Morrison, W. Peltier, F. Fulk, C. Poore, P. Lewis, J. Lazorchak, S. Ward, D. Bengtson, D. Klemm, Q. Pickering, M. Smith, D. Middaugh, D. Klemm. 1993. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*. 4th Edition. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio. EPA/600/4-90/027F.

TEST CONDITIONS: *Ceriodaphnia dubia* 48 hr. acute toxicity test

Method: EPA/600/4-90/027F -- Methods for measuring the acute toxicity of effluents . . .

Test Duration: 48 hours

Sample Collection Procedure: grab

Sample Collection Date: 2/23/98

Dilution water: 100 mg/L hardness reconstituted water

Acclimation: cultured in dilution water

Age of organisms at start: <24 hr. old

Feeding: none

End Point: mortality

Start date and time: 2/24/98 13:15

End date and time: 2/26/98 12:55

Type of exposure chamber: 30 mL disposable plastic cup

Volume of exposure chamber: 25 mL

Number of Animals exposed/chamber: 5

Number of replicates/treatment: 4

Test temperature: 20°C ± 1

Standard toxicant used: NaCl

TEST CONDITIONS: Fathead minnow 96 hr. acute toxicity test

Method: EPA/600/4-90/027F -- Methods for measuring the acute toxicity of effluents . . .

Test Duration: 96 hours

Sample Collection Procedure: grab

Sample Collection Date: 2/23/98

Dilution water: 100 mg/L hardness reconstituted water

Age of organisms at start: 6 day old

Feeding: before 48 hr. solution renewal

End Point: mortality

Start date and time: 2/24/98 14:00

End date and time: 2/28/98 13:20

Type of exposure chamber: 9 oz. disposable plastic cup

Volume of exposure chamber: 250 mL

Number of Animals exposed/chamber: 10

Number of replicates/treatment: 4

Test temperature: 20°C ± 1

Standard toxicant used: NaCl

SUMMARY RESULTS OF NaCl REFERENCE TEST ON *CERIODAPHNIA DUBIA*:

Acute test

Test date: February 10 to 12, 1998

g NaCl/L	control	1.0	1.5	2.0	2.5	3.0
# alive/# exp.	20/20	20/20	20/20	18/20	10/20	4/20
% survival	100	100	100	90	50	20

 LC_{50} (Spearman-Kärber) = 2.51 g NaCl/L (95% CI, 2.31 to 2.73)

Note: This is within our accepted performance range (2.13 to 2.79) determined by 10 previous reference tests performed.

SUMMARY RESULTS OF NaCl REFERENCE TEST ON FATHEAD MINNOW LARVAE:

Acute Test

Test date: February 18 to 20, 1998

g NaCl/L	control	7.0	8.0	8.5	9.0	9.5
# alive/# exp.	20/20	18/20	11/20	8/20	5/20	5/20
% survival	100	90	55	40	25	25

 LC_{50} (Spearman-Kärber) = 8.17 g NaCl/L (95% CI, 7.79 to 8.56)

Note: This is within our accepted performance range (7.32 to 8.92) determined by 10 previous reference tests performed.

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME WHARF RESOURCES NPDES NO. SD-0025852
 50% MORTALITY TEST X PASS FAIL LC₅₀ >100% OUTFALL NO. 001
 TEST ANIMAL & AGE Ceriodaphnia dubia <24hr old SAMPLE DATE/TIME 2-23-98/8:30
 ANALYSIS DATE/TIME: BEGIN 2-24-98/13:15 END 2-26-98/12:55

DILUTIONS (PERCENT EFFLUENT)

NUMBER ALIVE	0%	12.5%	25%	50%	75%	100%
START OF TEST	20	20	20	20	20	20
AFTER 24 HR.	20	20	20	20	20	20
AFTER 48 HR.	20	20	20	20	20	20
AFTER 72 HR.						
AFTER 96 HR.						

DILUTIONS (PERCENT EFFLUENT)

MAX/MIN VALUES	0%	12.5%	25%	50%	75%	100%
D.O.	7.5/7.4	7.4/7.3	7.3/7.2	7.2/7.1	7.2/7.1	7.2/7.1
TEMP °C	20.0/20.0	20.0/20.0	20.0/20.0	20.0/20.0	20.0/20.0	20.0/20.0

RECEIVING WATER USED FOR DILUTIONS (Y OR N)? N

HARDNESS: RECEIVING WATER NA EFFLUENT 242 RECON. WATER (IF USED) 100

INITIAL TOTAL RESIDUAL CHLORINE IN 100% EFFLUENT: .05

INITIAL NH₃ (AS N) IN 100% EFFLUENT: <0.1

pH IN 100% EFFLUENT: INITIAL 7.91 AFTER 24 HR. 8.24

pH IN 0% CONTROL: INITIAL 8.02 AFTER 24 HR. 7.93

ANALYST'S NAME Michelle K Thyer

LABORATORY CHADWICK AND ASSOCIATES, INC.

SIGNATURE Michelle K. Thyer DATE 3-2-98

COMMENTS

REGION VIII GUIDANCE FOR ACUTE WHOLE EFFLUENT REPORTING

PERMITTEE NAME WHARF RESOURCES NPDES NO. CO-0025852
 50% MORTALITY TEST X PASS FAIL LC₅₀ >100% OUTFALL NO. 001
 TEST ANIMAL & AGE Pimephales promelas 6 day old SAMPLE DATE/TIME 2-23-98/8:30
 ANALYSIS DATE/TIME: BEGIN 2-24-98/14:00 END 2-28-98/13:20

DILUTIONS (PERCENT EFFLUENT)

NUMBER ALIVE	0%	12.5%	25%	50%	75%	100%
START OF TEST	40	40	40	40	40	40
AFTER 24 HR.	40	40	40	39	40	40
AFTER 48 HR.	40	40	40	39	40	40
AFTER 72 HR.	40	40	40	39	40	37
AFTER 96 HR.	40	40	40	39	40	37

DILUTIONS (PERCENT EFFLUENT)

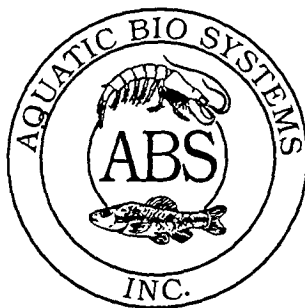
MAX/MIN VALUES	0%	12.5%	25%	50%	75%	100%
D.O.	7.8/7.3	7.6/7.3	7.3/7.0	7.1/6.9	6.9/6.8	7.1/6.8
TEMP °C	20.0/20.0	20.0/20.0	20.0/20.0	20.0/20.0	20.0/20.0	20.0/20.0

RECEIVING WATER USED FOR DILUTIONS (Y OR N)? N
 HARDNESS: RECEIVING WATER NA EFFLUENT 242 RECON. WATER (IF USED) 100
 INITIAL TOTAL RESIDUAL CHLORINE IN 100% EFFLUENT: .05
 INITIAL NH₃ (AS N) IN 100% EFFLUENT: <0.1
 pH IN 100% EFFLUENT: INITIAL 7.91 AFTER 24 HR. 8.10
 pH IN 0% CONTROL: INITIAL 8.02 AFTER 24 HR. 7.79
 ANALYST'S NAME Michelle K Thyer
 LABORATORY CHADWICK AND ASSOCIATES, INC.
 SIGNATURE Michelle K. Thyer DATE 3-2-98
 COMMENTS

BIOASSAY LABORATORY CHAIN-OF-CUSTODY

CLIENT/PROJECT		WHARF RESOURCES		TESTS REQUIRED		RECEIPT TEMP.
ADDRESS	CITY	STATE	ZIP	ACUTE	CHRONIC	
HC 37	Lead	SD	57754	C F A T H E R I D	F A T H E R I D	9-5°C MI
Box 811				D A P H N I A		
PHONE (605) 584-4134		PROJ. MANAGER J. Burchinal				
DATE COLL. 2/23/98 6:15 AM		TIME COLL. 6:15 AM				
SAMPLE TYPE NPRES 001		LOG #				
DATE COLL. 2/23/98 6:50 AM		TIME COLL. 6:50 AM				
SAMPLE TYPE RULCP		LOG #				
DATE COLL. 2/23/98 8:30 AM		TIME COLL. 8:30 AM				0.5°C
PROJECT INFORMATION		RECEIVING INFORMATION				
COURIER: Sioux Falls Car-tug		CONDITION:				
TOTAL NUMBER OF CONTAINERS: 3 bottles in 1 order		TOTAL NUMBER OF CONTAINERS:				
COMMENTS		RECEIVED BY: [Signature]				
DATE/TIME: 2-24-98 10:40		DATE/TIME: 2/23/98 10:00 AM				

1300 Blue Spruce Drive, Suite C
Fort Collins, Colorado 80524



Toll Free: 800/331-5916
Tel: 970/484-5091 Fax: 970/484-2514

ORGANISM HISTORY

DATE: 2/23/98

SPECIES: Pimephales promelas

AGE: 6 day

LIFE STAGE: Larvae

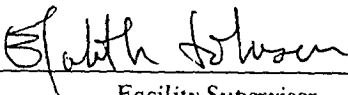
HATCH DATE: 02/17/98

BEGAN FEEDING: 02/18/98

FOOD: Artemia

Water Chemistry Record:	Mean	Range
TEMPERATURE:	<u>24°C</u>	<u>--</u>
SALINITY / CONDUCTIVITY:	<u>--</u>	<u>--</u>
TOTAL HARDNESS (as CaCO ₃):	<u>122 mg/l</u>	<u>--</u>
TOTAL ALKALINITY (as CaCO ₃):	<u>80 mg/l</u>	<u>--</u>
pH:	<u>8.19</u>	<u>--</u>

Comments:


Facility Supervisor

INITIAL CHEMISTRY BENCH SHEET

Samples Received: Date/Time 2-24-98/10:45

Analysis Begun: Date/Time 2-24-98/11:30

Dilution Water: lab water or receiving water

Test Substance: water from site 001

What test/s will samples be used in? Acute Cerio + Fathead

Analyst: MT

Client/Project: Wharf

SAMPLE TYPE, LOG NUMBER, CLIENT NAME, DATE COLLECTED/MADE	ANALYSES TEMP. °C	TOTAL HARDNESS mg/L	pH	TOTAL ALKALINITY mg/L	D.O. mg/L	COND. µS	TRC mg/L	AMMONIA mg/L
Effluent, W298001 Wharf 2-23-98	19.5	<u>12.1</u> 242	7.91	<u>8.8</u> 176	6.4	1146	.05	<0.1
MH Reon 015MH 2-23-98	20°C	<u>5.01</u> 100	8.02	<u>3.45</u> 69	<u>5.9</u> 6.3	357	—	—

COMMENTS:

ACUTE TOXICITY CHEMISTRY BENCH SHEET

START Date 2-24-98FINISH Date 2-26-98Dilution Water: MH ReconTest Substance: water from 001Client/Project: Wharf 001Organism: C dubia

Test	Chemical	Day of Test				COMMENTS
		1	2	3	4	
0	DO	7.4	7.5			
	Cond.	368	376			
	pH	7.93	7.68			
	Temp.	20.0	20.0			
12.5	DO	7.3	7.4			
	Cond.	470	469			
	pH	7.93	7.80			
	Temp.	20.0	20.0			
25	DO	7.2	7.3			
	Cond.	570	571			
	pH	7.98	7.92			
	Temp.	20.0	20.0			
50	DO	7.1	7.2			
	Cond.	800	804			
	pH	8.07	8.03			
	Temp.	20.0	20.0			
75	DO	7.1	7.2			
	Cond.	975	983			
	pH	8.18	8.12			
	Temp.	20.0	20.0			
100	DO	7.1	7.2			
	Cond.	1218	1211			
	pH	8.24	8.18			
	Temp.	20.0	20.0			
	DO					
	Cond.					
	pH					
	Temp.					
ANALYST		<u>ME</u>	<u>ME</u>			

ACUTE TOXICITY CHEMISTRY BENCH SHEET

START Date 2-24-98FINISH Date 2-28-98Dilution Water: Mt ReconTest Substance: water from 001Client/Project: Wharf 001Organism: P. promelas

Test	Chemical	Day of Test				COMMENTS
		1	2	3	4	
0	DO	7.3	7.3	7.4	7.8	
	Cond.	374	376	387	370	
	pH	7.79	7.72	7.44	7.48	
	Temp.	20.0	20.0	20.0	20.0	
12.5	DO	7.3	7.4	7.3	7.6	
	Cond.	479	480	470	457	
	pH	7.81	7.76	7.46	7.51	
	Temp.	20.0	20.0	20.0	20.0	
25	DO	7.1	7.2	7.0	7.3	
	Cond.	593	588	582	563	
	pH	7.89	7.81	7.55	7.54	
	Temp.	20.0	20.0	20.0	20.0	
50	DO	7.0	7.1	6.9	7.1	
	Cond.	810	808	803	771	
	pH	7.96	7.98	7.65	7.65	
	Temp.	20.0	20.0	20.0	20.0	
75	DO	6.9	6.9	6.8	6.9	
	Cond.	1010	1013	1012	976	
	pH	8.02	7.87	7.74	7.71	
	Temp.	20.0	20.0	20.0	20.0	
100	DO	7.0	7.0	6.8	7.1	
	Cond.	1241	1230	1233	1186	
	pH	8.10	7.97	7.82	7.81	
	Temp.	20.0	20.0	20.0	20.0	
	DO					
	Cond.					
	pH					
	Temp.					
ANALYST		MT	MI	MT	MT	

ACUTE TOXICITY TEST BENCH SHEET

START Date/Time 2-24-98 / 13:15

FINISH Date/Time 2-26-98 / 12:55

Dilution Water: MH Reconn

Test Substance: water from 001

Client/Project: Wharf 001

Species: C dubia

CONCENTRATION & REPLICATE		Number alive/hour of test					# alive # exposed (percent survival)	COMMENTS
		Start	24	48	72	96		
0	A	5	5	5			20/20 100	82-10-98A template #4
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
12.5	A	5	5	5			20/20 100	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
25	A	5	5	5			20/20 100	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
50	A	5	5	5			20/20 100	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
75	A	5	5	5			20/20 100	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
100	A	5	5	5			20/20 100	
	B	5	5	5				
	C	5	5	5				
	D	5	5	5				
	A							
	B							
	C							
	D							
ANALYST		ME	ME					
TIME RENEWED			13:00					

ACUTE TOXICITY TEST BENCH SHEET

START Date/Time 2-24-98 / 14:00

FINISH Date/Time 2-28-98 / 13:20

Dilution Water: MH Regen

Test Substance: water from 001

Client/Project: Wharf 001

Species: R. promelas

CONCENTRATION & REPLICATE		Number alive/hour of test					# alive # exposed (percent survival)	COMMENTS
		Start	24	48	72	96		
0	A	10	10	10	10	10	40/40 100	
	B	10	10	10	10	10		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
12.5	A	10	10	10	10	10	40/40 100	
	B	10	10	10	10	10		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
25	A	10	10	10	10	10	40/40 100	
	B	10	10	10	10	10		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
50	A	10	10	9	9	9	39/40 97.5	
	B	10	10	10	10	10		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
75	A	10	10	10	10	10	40/40 100	
	B	10	10	10	10	10		
	C	10	10	10	10	10		
	D	10	10	10	10	10		
100	A	10	10	10	10	10	37/40 92.5	
	B	10	10	10	10	10		
	C	10	10	10	8	8		
	D	10	10	10	9	9		
	A							
	B							
	C							
	D							
ANALYST		ME	ME	ME	ME	ME		
TIME RENEWED			13:25	13:25	13:55			

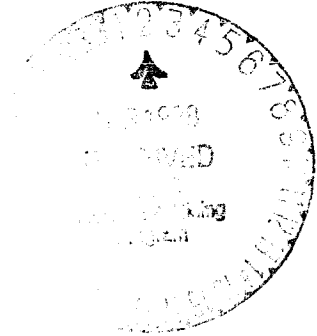


WHARF RESOURCES PARTNERSHIP

(A Montana General Partnership)

March 12, 1998

Mr. Thomas V. Durkin
Minerals and Mining
SD DENR
Joe Foss Building
523 East Capitol Ave.
Pierre, SD 57501-3181



**RE: Technical Revision to Mine Permit No.'s 356, 434, and 435
Construction and Utilization of a Biological Denitrification
"Bug" Plant in Ross Valley**

Dear Tom:

Pursuant to ARSD 74:29:03:16, this technical revision to the State Mining Permits 356, 434, and 435 is hereby submitted.

Wharf Resources has been working aggressively to develop an effective system for reducing and eliminating nitrates within the neutralization solutions. In May 1997, construction on a biological denitrification plant in the process area was initiated. On October 7, 1997, the plant began treatment of neutralization pond water. As of the end of February 1998, over 5 tons of nitrates have been eliminated from the neutralization system. Flow through the plant has been 200 gallons per minute (gpm) with an average nitrate reduction of approximately 45 mg/L. The flow through the plant is scheduled to be up-graded to 400 gpm starting in mid-March.

Due to the rapid success of the process area plant in reducing nitrate concentrations, it is proposed to construct a biological denitrification "bug" plant in the Ross Valley area. This plant will treat approximately 400 gpm of water exiting from the toe of the Reliance rock facility (Annie Creek), the Ross Valley spent ore facility, and/or Ross Springs (Figure 2). The treated water will be discharged to one or more of the following sites:

- 1) Ross Creek, anywhere in the drainage above Surface Water Discharge Compliance Site 002,
- 2) Annie Creek, below Beaver Springs and Annie Creek II and above Surface Water Discharge Compliance Site 001,
- 3) At the top of the Ross Valley spent ore facility to be allowed to infiltrate and rinse the facility, most of which will exit at the Ross Valley French Drain into the Ross Valley Lined Containment Pond (RVLCP); the rest will enter the shallow ground water and surface at Ross Springs, and
- 4) At the top of the Reliance rock facility to be allowed to infiltrate and rinse the facility, all of which will exit at Annie Creek II, the toe of the facility.

Denitrifying bacteria are microorganisms commonly found in soil and water. These bacteria require nutrients for growth and energy, including: organic carbon, phosphorus, nitrogen, and trace metals. Because these bacteria also require oxygen for respiration, they will utilize nitrates as their source of oxygen in an anaerobic environment. Methanol is used as the carbon source

at the process area "bug" plant and will be used at the Ross Valley "bug" plant. The following lists the stoichiometric requirement for the utilization of methanol:



The bacteria grow, live, and denitrify best in a stable environment. This environment includes: 1) a neutral pH of between 6.0 to 8.0, 2) an optimal temperature range of 50° to 86° F, 3) a low cyanide level (<1.0 ppm), and 4) a growth media, such as soil, spent ore, or synthetic cubes.

Listed below are the design parameters, the operation parameters, and the construction/start-up time frame.

Design Parameters

- Lower nitrates from a range of 40 to 100 ppm to <10 ppm
- Flow capacity of 400 gpm
- Piping designed for 400 gpm
- Fully automated
 - Flow maintained with automatic valves and magnetic flow meter
 - Chemical flow based on flow rate and nitrate level
 - Temperature and pH monitored for optimum denitrification
- Tank designed as 4 separate reactors of 25 feet by 25 feet by 8 feet
- Expected to operate 365 days per year
- Expected to remove between 26 and 79 tons of nitrate per year

Operation Parameters

- Methanol used as the carbon source
- Phosphoric acid used for the metabolic nutrient
- pH will be in the range of 6.5 to 9.0
- Temperature will be at approximately 63° F
- Dissolved Oxygen will be maintained at <1.0 ppm
- Cyanide will be maintained at <0.5 ppm

Construction/Start-Up Time Frame

(Please see enclosed Denitrification Schedule for the Ross Valley Plant)

- Construction time frame - approximately 3 months
- Construction completion - mid July
- Start flows at 100 gpm
- Ramp up to full operation dependent on bio-mass growth
- Projected full flow date - early September 1998

Please see the Technical Revision to Mine Permit No.'s 356, 434, and 435 - Construction and Utilization of a Denitrification "Bug Plant" submitted to the SD DENR on August 7, 1997 for the specifications for the Ross Valley plant. The specifications for both the Process Area plant and the Ross Valley plant will be the same. Water discharging from the toe of the Reliance facility will be captured and piped to Ross Valley. Once in Ross Valley, it will be mixed with water exiting the toe of the Ross Valley spent ore facility. The water will be pumped to a boiler to be warmed to approximately 63° F. After the water is warmed, methanol and phosphoric acid will be added, to feed the bacteria, and the water will be piped into the plant. The bacteria living on the rock/spent ore media will use nitrate as an oxygen source, producing nitrogen gas. The treated water will then be piped to one or more of the following locations: 1) to the top of the mined rock in the Reliance facility, allowed to infiltrate, and discharged out the toe, 2) to the top of the spent ore in the Ross Valley facility, allowed to infiltrate, and discharged out the toe, 3) to

a direct discharge to the flow in the Reliance (Annie Creek) drainage, and 4) to a direct discharge to the flow in the Ross Valley drainage.

Enclosed please find the results of two Whole Effluent Toxicity Tests. The first test was performed in December 1997. The water used for the test was from outfall 001, located below the toe of the Reliance rock facility. This water was spiked with 54.2 mg/L methanol, the same amount of methanol that would be used as a food source should only water from outfall 001 be running through the plant. An acute 48-hour static toxicity test using *Ceriodaphnia dubia* and an acute 96-hour static toxicity test using *Pimephales promelas* (fathead minnows) were performed and no significant toxicity was recorded in either test.

The second test was performed in February 1998. The water used for the test was a 1:1 mixture of water from outfall 001, located below the toe of the Reliance rock facility, and from the Ross Valley Lined Containment Pond (RVLCP). This water was spiked with 153 mg/L methanol, the same amount of methanol that would be used as a food source if water from outfall 001 and the RVLCP were mixed and run through the plant. An acute 48-hour static toxicity test using *Ceriodaphnia dubia* and an acute 96-hour static toxicity test using *Pimephales promelas* (fathead minnows) were performed and no significant toxicity was recorded in either test. It is felt that a direct discharge of water from the plant to any of the above mentioned locations, would not be detrimental to aquatic life.

It is suspected that capturing all of the flow from the toe of the Reliance facility will stop the flow in upper Annie Creek. It is requested that annual periphyton and macroinvertebrate sampling as well as triennial stream habitat sampling and fish shocking at site AC-1 (see Figure 1) in upper Annie Creek be discontinued. Past sampling at site AC-1 indicates that fish have never been found in at this site. As well, there is a sampling site (AC-2) located in Annie Creek down stream of this site and just above the stream classification. It is expected that flow past site AC-2 will not be affected and sampling at this site will be continued as scheduled.

As-builts will be forwarded on to you when the Ross Valley Biological Denitrification "Bug" Plant is completed. Should you have any questions or require further information, please call Jeff Fuerstenau at (605) 584-4104 or me at (605) 584-4112.

Sincerely,



Terese Hruska
Environmental Coordinator

Enc.

xcopy: Kelli Buscher - SD DENR, Surface Water Quality
Tom Chapman - South Dakota Game, Fish & Parks
John Begeman
Carol Koemer
Jeff Fuerstenau
Jeff Dirksen
Lynne Blackman
File: 203-08-06-69



WHARF RESOURCES PARTNERSHIP

(A Montana General Partnership)

March 12, 1998

Mr. Tom Chapman
Energy & Minerals Coordinator
South Dakota Game, Fish, and Parks
3305 West South Street
Rapid City, SD 57702-8160

**RE: Technical Revision to Mine Permit No.'s 356, 434, and 435
Construction and Utilization of a Biological Denitrification
"Bug" Plant in Ross Valley**

Dear Tom:

Wharf Resources is requesting confirmation from the South Dakota Department of Game, Fish, and Parks that the enclosed technical revision application is in compliance with your department's recommendation for the Wharf Resources mining project.

There will be no new surface disturbance associated with this project and there will be no change in the approved reclamation techniques. However, it is suspected that capturing all of the flow from the toe of the Reliance facility will stop the flow in upper Annie Creek. It is requested that aquatic life sampling and fish shocking at site AC-1 in upper Annie Creek be discontinued. Past sampling at site AC-1 indicates that fish have never been found at the site. As well, there would still be one sampling site located in Annie Creek down stream of this site.

If there are any questions regarding this technical revision, please contact me at (605) 584-4112.

Sincerely,

Terese Hruska
Environmental Coordinator

Enc.

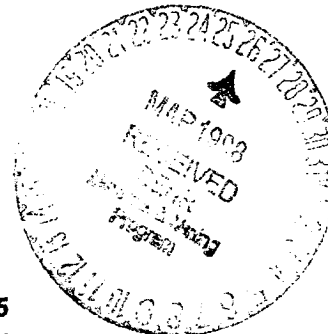


WHARF RESOURCES PARTNERSHIP

(A Montana General Partnership)

March 26, 1998

Mr. Thomas V. Durkin
Minerals and Mining
SD DENR
Joe Foss Building
523 East Capitol Ave.
Pierre, SD 57501-3181



**RE: Technical Revision to Mine Permit No.'s 356, 434, and 435
Construction and Utilization of a Biological Denitrification
"Bug" Plant in Ross Valley (Supplemental Information)**

Dear Tom:

A question regarding the flows in Annie Creek and at Ross Springs has been raised should Wharf Resources pipe the Ross Valley Biological Denitrification Plant treated water to the top of the Ross Valley Spent Ore facility. The following information should answer that question.

The average flows, on a monthly basis, from Annie Creek Outfall 001 (since 1994) and from the Ross Valley French Drain (in 1997) are as follows:

<u>Month</u>	<u>Annie Creek Outfall 001</u>	<u>Ross Valley French Drain</u>	<u>Combined Average Flow</u>
January	110 gpm	205 gpm	315 gpm
February	90 gpm	230 gpm	320 gpm
March	300 gpm	410 gpm	710 gpm
April	590 gpm	630 gpm	1220 gpm
May	580 gpm	1230 gpm	1810 gpm
June	225 gpm	1050 gpm	1275 gpm
July	300 gpm	865 gpm	1165 gpm
August	185 gpm	985 gpm	1170 gpm
September	120 gpm	800 gpm	920 gpm
October	175 gpm	325 gpm	500 gpm
November	125 gpm	215 gpm	340 gpm
December	135 gpm	225 gpm	360 gpm

The plan for the Ross Valley Biological Denitrification Plant is to capture the flow from Annie Creek Outfall 001 and supplement it with flow from Ross Valley to create an inflow of 400 gpm to the plant. Based on the above flows, it appears that the upper portion of Annie Creek will be dry for 10 months out of the year - June through March. In April and May, as the average flow exceeds 400 gpm, the upper portion of Annie Creek will experience flow. The upper portion of Annie Creek extends from the toe of the Reliance Rock Facility to the confluence with the Ross Valley drainage, approximately a ½ mile in length. It also appears that the Ross Valley Plant will operate at less than peak flow for 4 months out of the year, based on the above average flows. From November through February, the combined average flows are less than 400 gpm.

The Ross Valley Spent Ore Facility covers approximately 60% of the Ross Valley drainage. The drainage includes the facility and undisturbed areas in the drainage. Ross Springs is the natural relief point for shallow ground water in the Ross Valley area. By adding 400 gpm of water to the Ross Valley Spent Ore Facility for rinsing purposes, it is suspected that flows at the Ross Valley French Drain will increase; however, flows at Ross Springs will not be affected.

The option of piping the Ross Valley Biological Denitrification Plant treated water to the top of the Ross Valley Spent Ore Facility, would not be a long term situation. As all water that enters the facility is captured and recirculated, it is not feasible to add 400 gpm to the facility indefinitely. The depository would become oversaturated, possibly causing slope stability problems, and flows into the Ross Valley Lined Containment Pond (RVLCP) would be higher than the flows leaving the pond through the recirculation system. One or a combination of the following scenarios would need to occur.

- 1) The 400 gpm effluent from the Ross Valley Biological Denitrification Plant will be piped to the Ross Valley Spent Ore Facility for short periods of time only. This will allow the facility to be rinsed without compromising the integrity of the facility or of the RVLCP recirculation system. The effluent will be diverted from one of the other three discharge options to Ross Valley, and then will be diverted back again. (Please reference the March 12, 1998 Technical Revision for the four discharge options.)
- 2) The 400 gpm effluent from the Ross Valley Biological Denitrification Plant will be piped to the Ross Valley Spent Ore Facility for a moderate period of time to aid in rinsing the facility. Excess water will be evaporated through the use of modified snow guns. The snow guns throw a fine mist into the air, which evaporates quickly. Wharf Resources has used the guns in the past and continues to use them successfully.
- 3) Only part of the flow from the 400 gpm effluent will be used to rinse the Ross Valley Spent Ore Facility. The effluent stream would be split to be piped to both the facility and one or a combination of the other three discharge options. The amount of water added to the facility would not be enough to compromise the integrity of the facility or of the RVLCP recirculation system.

At no time would piping the Ross Valley Biological Denitrification Plant effluent to only the Ross Valley Spent Ore facility be considered a permanent solution. All other options to the discharge of plant water would remain open and active. When effluent water is being piped to the facility, the snow guns will always be available to aid in evaporation. This will ensure that neither the facility nor the RVLCP recirculation system will ever be compromised.

Should you have any further questions or comments, please call me at (605) 584-4112.

Sincerely,



Terese Hruska
Environmental Coordinator

CC: Tom Chapman - South Dakota Game, Fish, & Parks
Carol Koerner
Jeff Fuerstenau
File: 203-08-06-69

RECEIVED

AUG 12 1992

WHARF RESOURCES

Mr. Michael Cepak
Exploration and Mining Program
Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3181

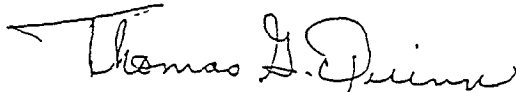
8-7-92

Dear Mr. Cepak,

On 8-5-92, I received a request from Wharf Resources for a new letter to you listing what types of technical revisions I would like to review.

I feel that the Soil Conservation Service would like to review and make comment on seeding mixtures and seeding rates, top soil stripping or storage piles, and implementing new and improved reclamation techniques as they are developed. We would not need to review technical revisions that do not change permit boundaries, or do not involve reclamation, unless the reclamation plan is proposed to be changed. If the recommended seed species are unavailable, we would be happy to recommend alternatives.

Sincerely,



Thomas G. Quinn
District Conservationist

cc: ✓ Wharf Resources
Lawrence Conservation District



WHARF RESOURCES PARTNERSHIP

(A Montana General Partnership)



April 1, 1998

Mr. Eric Gronlund
Water Rights Program
SD DENR
Joe Foss Building
523 East Capitol Avenue
Pierre, SD 57501-3181

RE: Wharf Resources' Water Rights Permit Application for Annie Creek

Dear Eric:

Please find enclosed a request for a temporary permit to use public waters. Also find enclosed Wharf's Application For Permit To Appropriate Water Within The State Of South Dakota: 2 copies of Form 2 - Application for uses other than irrigation, 2 copies of Form 2A - Supplemental Information, and 2 copies of a map showing the diversion location. The map has been reviewed and signed by Jon Epp of the South Dakota Department of Environment and Natural Resources.

The permit is required so that Wharf may capture water from the toe of the Reliance Rock Facility (Annie Creek) and treat it in the Ross Valley Biological Denitrification Facility. Please reference the attached Technical Revision Application. Wharf proposes to appropriate 400 gallons per minute from Annie Creek, treat the water at the plant, and return it to Annie Creek. No water will be consumed.

The diversion to capture Annie Creek water is located 3051.51 feet S50°26'24"E of the northwest corner of Section 3, T.4N., R.2E., B.H.M., Lawrence County. This diversion is a rock flow-through structure constructed of large rock partially overlain with a liner. The diversion was constructed to hold 300,000 gallons of water; however, because the liner does not cover the entire structure and water flows through the large rock, the structure actually only holds approximately 100,000 gallons of water.

Please call me at (605) 584-4112 if you have any questions or if additional information is required.

Sincerely,

Terese Hruska
Environmental Coordinator

cc: John Begeman
Carol Koerner
File: 203-10-19

REQUEST FOR TEMPORARY PERMIT
TO USE PUBLIC WATERS



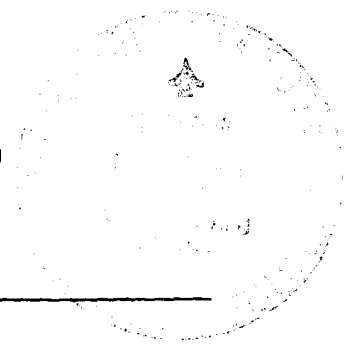
TO: Department of Environment & Natural Resources
Water Rights Program
523 E Capitol
Pierre, SD 57501-3181

Attention: Genny McMath, (605) 773-3352
Fax # (605) 773-4068

1. Name and mailing address of company or person making the application for temporary permit Wharf Resources, HC 37 Box 811, Lead, SD 57754
2. Project or Projects on which water will be used Ross Valley Biological Denitrification Plant
3. Source of water Annie Creek - Toe of the Reliance Rock Facility
4. Location of pumping station or stations. (quarter section, section, township and range)
NW $\frac{1}{4}$, Section 3, T.4N., R.2E., B.H.M., Lawrence County
5. If the pumping station is from surface water, what access area is intended (off county road, public access, private access, other) Private Access from Wharf Mine Site
6. Is this area owned by Game Fish & Parks or in a game production area No
7. Maximum total amount of water (in gallons) that will be used 210,816,000 gallons/yr
8. Total daily withdrawal rate 576,000 gallons
9. Pump rate (gallons per minute) 400 gallons per minute
10. Date when water use will commence Approximately July 13, 1998
11. Date when water use will cease. Unknown - at the end of mine life.

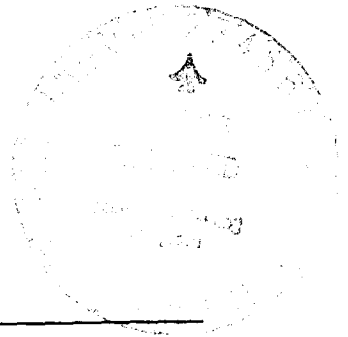
Office Use Only:
REVIEWED BY:
RECOMMENDATION:
DATE REVIEWED:

Technical Revision Checklist:
**Construction and Utilization of a Biological Denitrification
 "Bug" Plant in Ross Valley**



Regulatory Requirement 74:29:03:03	Item	Description
(1)	Name:	Wharf Resources The Wharf Mine Site HC 37 Box 811 Lead, SD 57754-9710
	Contact:	Jeff Fuerstenau Metallurgical Superintendent
(2)	Permit Numbers:	State Mining Permit No.'s: 356, 434, and 435
(3)	Narrative Description:	This technical revision will allow for the construction and operation of a biological denitrification plant to reduce and/or eliminate the nitrates within the Reliance Rock Facility and the Ross Valley Spent Ore Facility. It will also allow Wharf Resources to abandon aquatic sampling and fish shocking site AC-1 due to what will be a lack of year around flow. Please see the attached letter for further details.
(4)	Legal Description:	N½, Section 3, T.4N., R.2E., and the SE¼, SE¼, Section 33, T.5N., R.2E., Black Hills Meridian, Lawrence County, South Dakota.
(5)	Reference Material/Map:	Please reference the enclosed schedule, figures, and Whole Effluent Toxicity Test results.
(6)	Cost of Reclamation:	There is no new surface disturbance associated with this project.
(7)	Description of Reclamation:	This technical revision does not alter the approved reclamation plan submitted in State Mining Permits 356, 434, and 435, and subsequent amendments and technical revisions.
(8)	Surface Owners:	Wharf Resources HC 37 Box 811 Lead, SD 57754-9710
(9)	Mineral Owners:	Wharf Resources HC 37 Box 811 Lead, SD 57754-9710
(10)	Proof of Consultation - Adjacent Landowners:	There is no new surface disturbance or change in the approved reclamation plan.

Technical Revision Checklist:
**Construction and Utilization of a Biological Denitrification
"Bug" Plant in Ross Valley**



Regulatory Requirement
74:29:03:03 Item

Description

- | | | |
|------|---|---|
| (11) | Proof of Consultation -
Consultation Agencies: | A copy of this technical revision application has been submitted to the South Dakota Department of Game, Fish, and Parks. The August 7, 1992 consultation letter from the Lawrence County Soil Conservation Service is on file and is enclosed. |
| (12) | Proof of Compliance with
Local Zoning: | The August 10, 1992 consultation letter from Lawrence County is on file and is enclosed. |
| (13) | Post-Mining Reclamation
Map: | This technical revision does not alter the approved reclamation plan submitted in State Mining Permits 356, 434, and 435 and subsequent amendments and technical revisions. |
| (14) | Effect on Timetable: | There is no effect on the timetable and duration of the mining operation. |
| (15) | Baseline Date and Maps: | Reference State Mining Permits 356, 434, and 435 and subsequent amendments and technical revisions. |



Lawrence County

office of planning and zoning

Lawrence County Courthouse • 78-80 Sherman, Deadwood, SD 57732 • (605) 578-3871

August 10, 1992

RECEIVED

Mr. Michael Cepak
Exploration & Mining Program - DENR
Joe Foss Building
523 East Capital
Pierre, SD 57501-3181

AUG 11 1992

WHARF RESOURCES

RE: County Commission review of Technical Revision to Wharf
Resources' Mining Permit 356, 434 & 435

Dear Mike:

I am writing this letter at the request of Wharf Resources to reaffirm the position of the Lawrence County Commission regarding review of the subject technical revisions.

Please reference the June 8, 1988 letter from Carol Koerner as Planning & Zoning Administrator to your office. That letter stated Commission review would be required of technical revision #8 which allows "the addition of contiguous affected land within the permit area, the sum of which shall not exceed twenty percent (20%) of the state permitted affected land area as of April 1, 1988 (489 acres)." All other technical revisions are considered to be of a minor nature and would not require Commission review. A list of all technical revisions and a brief narrative of each would be submitted to the Commission with Wharfs annual report.

This letter will confirm that that position has not changed; however, should Wharf apply for an amendment outside the present permit boundary or a new permit, the County Commission would like to reserve the right to review the new list of proposed technical revisions to determine at that time which technical revision they would like to review prior to DENR approval.

Sincerely,

Julie Bestgen
Julie Bestgen
Administrator

JB/mjs

xc: File

✓Lili Sjomeling, Wharf Resources
George Opitz, Chairman



WHARF RESOURCES PARTNERSHIP

(A Montana General Partnership)

April 8, 1998

Mr. Thomas V. Durkin
Minerals and Mining
SD DENR
Joe Foss Building
523 East Capitol Ave.
Pierre, SD 57501-3181



**RE: Technical Revision to Mine Permit No.'s 356, 434, and 435
Construction and Utilization of a Biological Denitrification
"Bug" Plant in Ross Valley (Supplemental Information).**

Dear Tom:

Please find enclosed 2 maps depicting the potential areas of discharge. The preferred area to discharge to is the Ross Valley Discharge area. This area is highlighted in light blue on the map. It extends from the toe of the Ross Valley Lined Containment Pond to just below Ross Springs and is located in the W½, NW¼, Section 3, T. 4 N., R. 2 E., B.H.M. Lawrence County.

The next discharge area is the Annie Creek Discharge Area. This area is highlighted in purple on the map. It extends from the toe of the Annie Creek diversion pond to Surface Water Discharge Site 001 and is located in the SE¼, NW¼, Section 3, T. 4 N., R. 2 E., B.H.M., Lawrence County.

The next discharge area is the Ross Valley Facility Discharge Area. This area is highlighted in pink on the map. It covers the area of spent ore deposition in the Ross Valley Perimeter of Operational Pollution and is located in the NE¼, NE¼, Section 4 and the N½, NW¼, Section 3 and the NW¼, NE¼, Section 3, T. 4 N., R. 2 E., and the SE¼, SE¼, Section 33 and the S½, SW¼, Section 34, T. 5 N., R. 2 E., B.H.M., Lawrence County.

The final discharge area is the Reliance Facility Discharge Area. This area is highlighted in brown on the map. It is located in the E½, NW¼ and the W½, NE¼, Section 3, T. 4 N., R. 2 E., B.H.M., Lawrence County.

Should you have any further questions or comments, please call me at (605) 584-4112.

Sincerely,

Terese Hruska
Environmental Coordinator

CC: Carol Koerner
Jeff Fuerstenau
File: 203-08-06-69



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

April 14, 1998

Terese Hruska
Environmental Coordinator
Wharf Resources
HC 37, Box 811
Lead, SD 57754-9710

RE: Technical Revision to Mine Permit No.'s 356, 434, and 435 and Ground Water Discharge Permit GWD 1-94 for Construction and Utilization of Wharf's Denitrification "Bug" Plant in Ross Valley

Dear Terese:

Staff review has been completed on the technical revision submitted on March 13, 1998 and supplemental material submitted on March 26 and April 8, 1998 to construct and use a denitrification "bug plant" to reduce nitrate levels in water flowing from the base of the Ross Valley spent ore and Reliance rock facilities and/or from Ross Springs. Based on this review and agreements reached during our phone conversation on April 9, 1998, the Department of Environment and Natural Resources (DENR) conditionally approves the proposed technical revision. This approval is contingent on Wharf Resources complying with the following conditions:

- 1) Similar to Wharf's first denitrification plant that treats water from the heap/pond system, DENR will track the success of nitrate reduction in the Ross Valley spent ore and Reliance rock facilities and Ross Springs. On a semi-annual basis, Wharf shall submit results of the amount of nitrate removed during the times when the denitrification plant is treating water from any of these locations. This shall include the concentration of nitrate and corresponding flow at the point water is captured and again at the point of discharge after treatment. The sampling schedule may conform with Wharf's in-house schedule for testing nitrate levels at the point of diversion and discharge. It is understood that the samples themselves will be collected in the piping system at the plant, but will be reflective of the nitrate concentration and amount of water collected at its diversion point before treatment and at its discharge point afterwards.
- 2) In order to minimize impacts to riparian and aquatic resources in upper Annie Creek, Wharf shall discharge treated water within the same proximity and at approximately the same flow rate that it was captured, and at a minimum flow rate of 50 gpm during recirculation/flushing scenarios. It is understood that during winter months when severe weather conditions make access to the toe of the repositories difficult, periods may occur when treated water may not be able to be returned to the same location that it was diverted. In that case, it is acceptable to have the point of discharge in the Ross Valley tributary. During periods when water is not returned to the point of original diversion, Wharf shall contact the Department of Game, Fish

and Parks and DENR. The intent is to minimize impacts to the riparian and aquatic habitat during these periods.

- 3) Prior to diverting water from the Ross Valley and Reliance repositories and/or Ross Springs, Wharf shall obtain or maintain the appropriate Water Rights Permits.
- 4) Aquatic monitoring station AC-1 shall be maintained and sampled according to the present requirements. Sampling requirements shall be subject to review and revision should changes be observed at aquatic monitoring station AC-1.

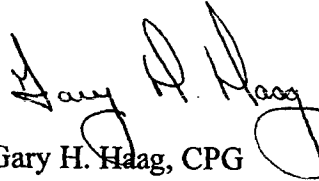
The department is pleased with the results of Wharf's first denitrification plant and its success at removing nitrate from mine waters. We look forward to the removal of nitrate at the Ross Valley and Reliance facilities pursuant to the time estimates calculated by Wharf in the Clinton Project technical review correspondence.

This letter serves only to approve the above mentioned technical revision. This letter in no way is to be construed as agreement to, or approval of, any future plans associated with the project. If you have any questions concerning this technical revision, please feel free to contact us.

Sincerely,



Thomas V. Durkin, CPG
Hydrologist
Office of Minerals and Mining
Phone: (605) 773-4201
FAX: (605) 773-5286
E-mail: tomdd@denr.state.sd.us



Gary H. Haag, CPG
Hydrologist
Ground Water Quality Program
Phone: (605) 773-3296
FAX: (605) 773-6035
E-mail: garyh@denr.state.sd.us

cc: Mark Keenihan, DENR Rapid City Office
Eric Gronlund, Water Rights
Kelli Buscher, Surface Water Quality
Tom Chapman, GF&P

- The daily maximum silver shall not exceed the South Dakota Surface Water Quality Standard.
37. In February 1997, Wharf discharged effluent from its batch treatment pond to Compliance Point 003B. Several layers of ice had built up in that pond, causing inadequate mixing of treated solution. Data collected on February 18, 19, and 20, 1997, showed total cyanide concentrations in the discharge of 0.024, 0.034, and 0.049 mg/L, respectively, and silver concentrations in the discharge of 0.001 mg/L on March 22, 1997. This data shows that the total cyanide and silver limits for Compliance Point 003B were violated at those times.
38. The discharge of effluent that violates the SWD Permit's specified effluent limits constitutes violations of Parts I.C.1., 2., and 3. of the SWD Permit; Appendix C of the SDSWQS; the October 17, 1995, Order; SDCL 34A-2-21 and 34A-2-36; and ARSD 74:52:03:02:(1).

ORDER

WHEREFORE, as a result of these FACTS and VIOLATIONS, and pursuant to SDCL 34A-2-53 and 45-6B-48, the Secretary of the South Dakota Department of Environment and Natural Resources ("Department") hereby ORDERS that the following corrective actions be taken by Wharf:

1. Wharf shall continue to operate the pumpback system at monitoring well HDH-12 until the nitrate concentrations are below the ground water quality standard of 10 ppm.
2. It is recognized by Wharf and the Department that the alluvial aquifer along Annie Creek does exceed the ground water quality standard for nitrate as nitrogen on a seasonal basis and will continue to do so until the discharge from Ross and Beaver Springs is treated. Until this treatment is initiated Wharf shall monitor GWAC-6 on a monthly basis and

report any exceedance of the nitrate as nitrogen standard to the Department. Wharf shall conduct site remediation efforts until nitrate concentrations in the ground water are below 10 mg/L. Within 60 days of the effective date of this Notice and Order, Wharf shall deliver a written schedule to the Department regarding plans for remediation at these sites. Future site remediation, reclamation, closure, and post-closure plans shall be subject to Department and/or Board of Minerals and Environment approval.

3. Wharf shall submit a plan for nitrate reduction to the Department within 60 days of the effective date of this Order. If the completion dates listed in this schedule can not be met, Wharf must immediately notify the Department. The reason for not meeting the completion must be provided along with a new completion date. The Department recognizes that the issue of nitrate reduction, the installation of a superior nitrate management system to the one that is currently in place, and additional bonding if necessary for nitrate treatment, will be addressed during the technical review period of the Clinton Mine permit application process. Any revisions to the plan that are agreed upon by Wharf and the Department as a result of that process are allowable under this Order.
4. Upon the effective date of this Order, Wharf Resources shall meet an interim permit limit of 0.022 mg/L as weak acid dissociable (WAD) cyanide at Compliance Point 001, Compliance Point 002, and Compliance Point 003B. Wharf's Discharge Monitoring Reports shall be modified accordingly to incorporate this interim permit limit. By July 1, 1999, Wharf shall meet the final permit limits for cyanide in the SWD Permit in effect on July 1, 1999. By the 28th day of the month following the end of the quarter, Wharf shall submit quarterly reports of its progress in complying with the cyanide limits. The first

report shall be due January 28, 1998, and shall cover the period of October 1, 1997, through December 31, 1997.

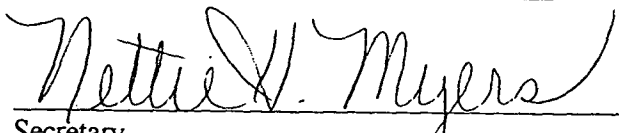
5. Each provision of this Order remains in effect unless superceded by an amendment of such provision of the Order or modification to a permit.

NOTICE IS HEREBY GIVEN that this Notice of Violation is effective thirty days from its issuance, unless Wharf submits a written request for a hearing before the Secretary regarding the allegations. The written request must be filed before the expiration of thirty days, by delivery to: Secretary, Department of Environment and Natural Resources, 523 East Capitol Ave., Pierre, SD 57501-3182. NOTICE IS ALSO GIVEN THAT, should Wharf fail to request a hearing within that time, the allegations stated herein shall be deemed fact and the Notice of Violation shall be immediately effective.

NOTICE IS ALSO HEREBY GIVEN that these violations, as well as a failure to comply with the provisions of the Order and Settlement Agreement, may subject Wharf to injunctive legal action pursuant to SDCL 34A-2-73 and 34A-2-74, and to legal action for civil penalties and for damages to the natural resources pursuant to SDCL 34A-2-75.

This Notice of Violation does not constitute a waiver or election by the State to forego civil or criminal action to seek penalties or other relief as the State may deem appropriate under the provisions of SDCL chapter 34A-2.

Dated and signed this 12th day of Dec, 1997.


Secretary
Department of Environment and Natural Resources

SETTLEMENT AGREEMENT

Based upon the alleged violation listed in the attached Notice of Violation, it has been alleged that Wharf has violated South Dakota's water pollution control statutes and regulations, the mined land reclamation act, and Mine Permit Nos. 356, 434, and 435 and associated Amendments and Technical Revisions, an October 17, 1995, Order for Compliance, and Surface Water Discharge Permit No. SD-0025852. These allegations shall be addressed through the Order and through the settlement of the Department's civil penalty claim discussed below.

Wherefore, as provided for under SDCL 34A-10-17, the parties above named by way of the signature of their representatives as indicated below for and in consideration of the matters set forth above and other good and valuable consideration, hereby stipulate and agree as follows:

1. Wharf shall pay a \$40,000 penalty to the South Dakota Department of Environment and Natural Resources ("Department") in settlement of the Department's civil penalty claim against Wharf. The first payment of \$10,000 shall be paid to the Department within 30 days of the effective date of the Agreement. Subsequent payments of \$10,000 shall be made by December 31, 1998, December 31, 1999, and December 31, 2000. Upon payment to the Department, these payments will be deposited in the Regulated Substance Response Fund.
2. Wharf shall fund supplemental environmental projects totaling \$160,000. These projects shall be directed towards improving the water quality of streams or ground water in the northern Black Hills or enhancing the beneficial uses of those waters. Wharf shall pay an initial sum of \$40,000 to Game, Fish & Parks within 30 days of the effective date of this Agreement. Subsequent payments of \$40,000 shall be made to Game, Fish & Parks by December 31, 1998, December 31, 1999, and December 31, 2000. The funds shall be provided with a stipulation that the South Dakota Game, Fish & Parks involve the Department of Environment and Natural Resources, other interested parties, and the public in the development and implementation of the project(s) that are chosen.
3. Wharf shall comply with the Order as attached, unless amended at a later date.
4. This Agreement shall settle the claims raised by the accompanying Notice of Violation issued to Wharf by the Department, as well as all civil, criminal, or administrative actions available to the parties as a result of the violations alleged therein.
5. This Agreement shall be enforceable by the parties pursuant to the applicable laws of the state of South Dakota.
6. Wharf hereby gives the Department permission to release information obtained by the Department during the investigation of the matters alleged in the Notice of Violation and Order, including but not limited to laboratory analyses, inspection reports, records obtained from Wharf, and the records and documents obtained by the Department or generated by the Department during the course of this investigation. A press release concerning the penalty agreement may be issued by the Department after review by, and input from, Wharf.

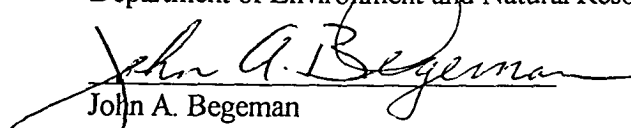
7. Wharf is going to request a modification of the cyanide limit in its Surface Water Discharge Permit to reflect the current water quality standard for cyanide, which is based on the weak acid dissociable method, as approved by EPA. The department agrees to propose a draft permit with a condition regarding cyanide that reflects the current water quality standard. The Department agrees to process this modification, following its normal public notice procedures for a permit modification.

Signed and dated as indicated below.

12-18-97
Date

12/17/97
Date


Nettie H. Myers, Secretary
Department of Environment and Natural Resources


John A. Begeman
Wharf Resources USA, Inc.

REPORT ON WATER PERMIT APPLICATION NO. 1667-1

Wharf Resources

April 22, 1998

Application No. 1667-1 proposes to appropriate for remediation purposes up to 0.891 cubic feet of water per second (647 acre-feet annually) from Annie Creek for removal of nitrate by the Ross Valley Denitrification Facility. The diversion point is to be located in the SE1/4 NW1/4 of Section 3 T4N-R2E. Water will be diverted from a small rock flow through structure (0.3 acre-feet of storage capacity) located in the SE1/4 NW1/4 Section 3 T4N-R2E. The water will be treated by the denitrification facility and the effluent returned to the Spearfish Creek drainage at several points. These points are to be located in the W1/2 NW1/4 Section 3 T4N-R2E (Ross Valley discharge area), SE1/4 NW1/4 Section 3 T4N-R2E (Annie Creek discharge area) NE1/4 NE1/4 Section 4 T4N-R2E; N1/2 NW1/4 Section 3: T4N-R2E; the NW1/4 NE1/4 Section 3 T4N-R2E; the SE1/4 SE1/4 Section 33 T5N-R2E; and the S1/2 SW1/4 Section 34 T5N-R2E (Ross Valley Facility discharge area), and the E1/2 NW1/4 and the W1/2 NE1/4 Section 3 T4N-R2E (Reliance Facility discharge area). The proposed project is located approximately 5 miles west of Lead in Lawrence County. Except for losses during the denitrification process, this application will be non-consumptive use of water.

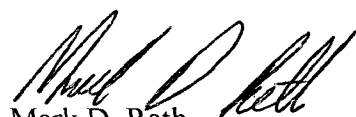
Review of the Proposed Project

The applicant proposes to appropriate for remediation purposes up to 0.891 cfs as part of a water denitrification project. The intent of the project is to reduce and eliminate nitrates, in the water exiting the toe of the Reliance Rock facility, that currently can flow into Annie Creek. The water is to be collected from water exiting the toe of the Reliance rock facility then pumped to a biological denitrification plant located in the Ross Valley. The applicant intends to discharge the treated water within the same proximity and at approximately the same flow rate that it was diverted. This is to minimize the impacts to riparian and aquatic resources. There may be times during winter months when severe weather conditions prohibit the discharge of the effluent at this point. At these times the applicant has agreed to notify the Department of Environment and Natural Resources to allow for the minimization of impacts to the riparian and aquatic habitat.

The applicant is proposing a non-consumptive use of water for the denitrification process. It is recognized that there will be small losses associated with the project and will not be truly a non-consumptive use. There are several downstream senior water rights on Spearfish Creek that would have the potential of being impacted through this use of water. There are currently elevated nitrates in the water in the Annie Creek alluvium. It would be in the public's interest to have the elevated nitrates reduced to maintain ground water standards which would offset the small amount of water lost through the denitrification process.

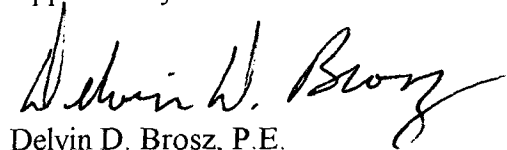
Conclusions

1. This application proposes to appropriate for remediation purposes up to 0.891 cubic feet of water per second (647 acre-feet annually) from Annie Creek for removal of nitrate.
2. The intent of the project is to reduce and eliminate nitrates in the water exiting the toe of the Reliance Rock facility that currently can flow into Annie Creek by treating it at a bio-denitrification plant.
3. Treated water is to be returned to the same proximity and at the same rate as it was diverted except under severe winter weather conditions.
4. There are currently elevated nitrates in the water in the Annie Creek alluvium. It would be in the public's interest to have the elevated nitrates reduced to maintain ground water standards which would offset the small amount of water lost through the denitrification process
5. Except for losses during the denitrification process, this appropriation will be non-consumptive use of water.



Mark D. Rath
Natural Resources Engineer III

Approved by:



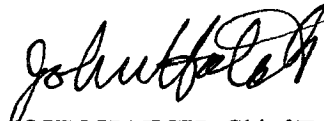
Delvin D. Brosz, P.E.
Natural Resources Engineer IV

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 1667-1, Wharf Resources**

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. 1667-1, Wharf Resources, c/o John A. Begeman, HC 37, Box 811, Lead, SD 57754.

The Chief Engineer is recommending APPROVAL of Application No. 1667-1 because 1) the proposed diversion can be developed without unlawful impairment of existing rights, 2) the proposed use is a beneficial use and 3) it is in the public interest because failure to operate the denitrification plant may result in additional pollution of the Annie Creek alluvium or otherwise impair the use of ground water in the Annie Creek basin for other uses.

See report on application for additional information.

A handwritten signature in black ink, appearing to read "John Hatch", with a stylized flourish at the end.

JOHN HATCH, Chief Engineer
May 4, 1998



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

May 11, 1998

Wharf Resources
%John A. Begeman
HC 37, Box 811
Lead, SD 57754

Dear Mr. Begeman:

Water Permit Application No. 1667-1 for industrial use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the Publisher of the Lawrence Co. Centennial printed at Deadwood, SD (Ph # (605) 578-3305). For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

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



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

May 11, 1998

Lawrence Co. Centennial
Box 512
Deadwood, SD 57732-0152

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 1667-1 to Appropriate Water to be published twice. Please publish the first notice on May 20, 1998, with the second publication 7 days later.

The applicant must verify to you that the notice is to be published, before you make the first publication. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is Wharf Resources, %John A. Begeman, HC 37, Box 811, Lead, SD 57754 (Ph # (605) 584-1441).

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

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

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

No. 1667-1

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

Date _____

We are in receipt of your letter of May 8, 1998, enclosing Notice of Hearing to Appropriate Water by Application No. 1667-1 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper

Instruction to Newspaper - Publish first Notice on May 20, 1998, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO 1667-1 to Appropriate Water

Notice is given that Wharf Resources, HC 37 Box 811, Lead SD 57754 has filed an application for a water permit to appropriate for remediation purposes up to 0.891 cubic feet of water per second (647 acre-feet of water annually) from Annie Creek for removal of nitrate by the Ross Valley Biological Denitrification Facility. Water will be diverted from a small rock flow through structure (0.3 acre-feet of water storage capacity) located in the SE ¼ NW ¼ Section 3-T4N-R2E. The water will be treated by the denitrification plant and treated effluent returned to the Spearfish Creek drainage at several discharge points. These points are to be located in the W1/2 NW1/4 Section 3, T4N, R2E (Ross Valley discharge area); SE1/4 NW1/4 Section 3, T4N, R2E (Annie Creek discharge area); NE1/4 NE1/4 Section 4, T4N, R2E; N1/2 NW1/4 Section 3, T4N, R2E; NW1/4 NE1/4 Section 3, T4N, R2E; SE1/4 SE1/4 Section 33, T5N, R2E; S1/2 SW1/4 Section 34, T5N, R2E (Ross Valley Facility discharge area); and the E1/2 NW1/4 and W1/2 NE1/4 Section 3, T4N, R2E (Reliance Facility discharge area). Except for losses during the denitrification process, this appropriation will be non-consumptive use of water.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1667-1 because 1) existing rights will not be unlawfully impaired, 2) it is a beneficial use of water, and 3) it is in the public interest because failure to operate the denitrification plan may result in additional pollution of the Annie Creek alluvium or otherwise impair the use of ground water in the Annie Creek Basin for other uses. In accordance with SDCL 46-2A-23, the chief engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and chief engineer. The applicant must file a petition if contesting the chief engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by June 8, 1998.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Nettie H. Myers, Secretary, Department of Environment and Natural Resources.



AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA
COUNTY OF LAWRENCE

Joan M. Lewis or Allana L. Houser, being duly sworn, says: That the **Lawrence County Centennial**, is and, during all the times hereinafter mentioned, was a legal newspaper as defined in SDCL 17-2-2, as amended, published at Deadwood, Lawrence County, South Dakota, by Dickson Media, Inc.; that affiant is and, during all of said times, was employed as an accountant by the publisher of such newspaper and has personal knowledge of the facts stated in the affidavit; the the notice, order or advertisement, a printed copy of which is attached, was published in said newspaper for successive issues, bearing the following dates:

<u>May 21</u>	<u>1998</u>	<u>199</u>
<u>May 28</u>	<u>1998</u>	<u>199</u>
<u>199</u>	<u>199</u>	<u>199</u>
<u>199</u>	<u>199</u>	<u>199</u>
<u>199</u>	<u>199</u>	<u>199</u>

that the full amount of the fee charged for publishing the same, to-wit, the sum of \$ 48.24, inures solely to the benefit of the publisher of said newspaper; that no agreement or understanding for the division of the fee has been made with any person, and that no part of the fee has been agreed to be paid to any other person.

Allana L. Houser

Subscribed and sworn to before me this

2nd day of June, 1998
Charita Brunner

Notary Public, South Dakota

**My Commission Expires
February 1, 2001**



**Application to
Appropriate Water**
**NOTICE OF APPLICATION NO. 1667-1
to Appropriate Water**

Notice is given that Wharf Resources, HC 37 Box 811, Lead SD 57754 has filed an application for a water permit to appropriate for remediation purposes up to 0.891 cubic feet of water per second (647 acre-feet of water annually) from Annie Creek for removal of nitrate by the Ross Valley Biological Denitrification Facility. Water will be diverted from a small rock flow through structure (0.3 acre-feet of water storage capacity) located in the SE1/4 NW1/4 Section 3-T4N-R2E. The water will be treated by the denitrification plant and treated effluent returned to the Spearfish Creek drainage at several discharge points. These points are to be located in the W1/2 NW1/4 Section 3, T4N, R2E (Ross Valley discharge area); SE1/4 NW1/4 Section 3, T4N, R2E (Annie Creek discharge area); NE1/4 NE1/4 Section 4, T4N, R2E; N1/2 NW1/4 Section 3, T4N, R2E; NW1/4 NE1/4 Section 3, T4N, R2E; SE1/4 SE1/4 Section 33, T5N, R2E; S1/2 SW1/4 Section 34, T5N, R2E (Ross Valley Facility discharge area); and the E1/2 NW1/4 and W1/2 NE1/4 Section 3, T4N, R2E (Reliance Facility discharge area). Except for losses during the denitrification process, this appropriation will be non-consumptive use of water.

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Nettie H Myers, Secretary
Department of Environment and Natural Resources

Publ: May 21 & 28, 1998
Lawrence County Centennial



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

JUN 12 1998

Wharf Resources
%John A. Begeman
HC 37, Box 811
Lead, SD 57754

Dear Mr. Begeman:

Enclosed is Water Permit No. 1667-1 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Also enclosed is Form 10, Notice of Completion of Works and Application of Water to Beneficial Use, which you are to complete and submit to the Chief Engineer when you have completed the system and/or have put the water to beneficial use. An inspection can then be scheduled so that the Water License may be issued, thus completing your acquisition of a Water Right.

Very truly yours,

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

enclosures

PLEASE NOTE: Certain changes may be made to your water permit usually without affecting the priority date. The location of a point of diversion may be changed or additional points of diversion may be approved if the water source remains unchanged; no additional water is appropriated; and, if irrigating, no additional land is irrigated. The change may be allowed without application or publication, if the Water Rights Program is contacted and the chief engineer makes a finding that the change does not increase the potential for interference with existing diversions.

A new water permit application is required to change water sources, increase the permitted diversion rate, or increase the irrigated acreage. If the application is approved, the water permit will receive a new priority date.

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



Date November 19, 1998

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

FROM: Wharf Resources HC 37 Box 811
(name) (address)

Lead SD 57754 (605) 584-1441
(city) (state) (zip) (phone)

I have completed the construction of the water diversion system and I have put the water to beneficial use to the maximum extent it is going to be used. I have not exceeded the amounts specified in Water Permit No. 1667-1.

Water Permit No. 1667-1 states that the diversion system is to be constructed by June 8, 2003, and that the water is put to beneficial use by
(date)

June 8, 2007.
(date)

The diversion system was completed on November 2, 1998.
(date)

Applying the water to beneficial use was completed on November 2, 1998.
(date)

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

John A. Begeman
(signature)



WHARF RESOURCES (U.S.A.), Inc.

A wholly owned subsidiary of Goldcorp Inc.

1667-1



Wharf Resources (U.S.A.), Inc.
HC 37 Box 811
Lead SD 57754

SD DENR WATER RIGHTS PROGRAM
523 EAST CAPITOL
PIERRE SD 57501-3181

As a matter of corporate simplification, Wharf Resources will now be doing business as Wharf Resources (U.S.A.), Inc. Therefore, all contracts, statements, invoices, or other documents you may have with Wharf Resources, a Montana General Partnership, or simply in the name of Wharf Resources, should be changed to Wharf Resources (U.S.A.), Inc. All purchase orders or other correspondence to you in the future will be from Wharf Resources (U.S.A.), Inc. The management structure of the company remains the same.

If you have any questions, please do not hesitate to contact me.

Sincerely,

John A. Begeman
General Manager

CHRISTENSEN, MOORE, COCKRELL & CUMMINGS, P.C.

Dana L. Christensen
Mikel L. Moore*
Dale R. Cockrell**
Steven E. Cummings***
Tracy Axelberg

Two Medicine Building
160 Heritage Way
P.O. Box 7370
Kalispell, MT 59904-0370

Office: (406) 751-6000
Fax: (406) 756-6522
*Also Admitted in Arizona
**Also Admitted in South Dakota
***Also Admitted in Washington

April 16, 1999

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



Re: Wharf Resources

Dear Mr. Hatch:

This letter is being written on behalf of Wharf Resources, a Montana general partnership, and Wharf Resources (U.S.A.), Inc. Pursuant to a corporate reorganization, Wharf Resources, a Montana general partnership, has transferred the following water right permit and license numbers to Wharf Resources (U.S.A.), Inc.:

1346-1	1514-1
1365-1	1173-1
1406A-1	1437-1
1460-1	1493-1
PW-1	1667-1

If you have any questions, please do not hesitate to contact me.

Sincerely,

CHRISTENSEN, MOORE, COCKRELL
& CUMMINGS, P.C.

Dale R. Cockrell
Direct Line No. (406) 751-6003

DRC/bls
cc: John Begeman
Carol Koerner



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

May 24, 1999

Dale R Cockrell
Christensen, Moore, Cockrell & Cummings, PC
PO Box 7370
Kalispell, MT 59904-0370

RE: Water Permits and Water Rights held by Wharf Resources

Dear Mr. Cockrell:

Thank you for your letter of April 16th regarding the transfer of water rights and permits held by Wharf Resources.

Enclosed are seven partially completed "Notice of Transfer of Ownership" forms for use in filing the transfers with Vested Water Right No. 1173-1, Water Right Nos. 1346-1, 1365-1, 1406A-1 and 1493-1 and Water Permit Nos. 1437-1 and 1667-1

Please review the enclosed forms and complete as needed. The forms should be signed in the presence of a notary public by a representative of Wharf Resources (U.S.A.), Inc. Please return the completed forms to our office with a required filing fee of \$2.50 each (total of \$17.50).

Thank you for your help and if I can answer any questions for you, please give me a call.

Sincerely,

Genny McMath
Environmental Scientist
Water Rights Program
(605) 773-3352

enclosures



1667-1

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

June 16, 1999

Dale R Cockrell
Christensen, Moore, Cockrell & Cummings, PC
PO Box 7370
Kalispell, MT 59904-0370

RE: Wharf Resources (U.S.A.) Inc.

Dear Mr. Cockrell:

I am writing to acknowledge receipt of the transfer of ownership forms for Vested Water Right No. 1173-1, Water Right Nos. 1346-1, 1365-1, 1406A-1 and 1493-1 and Water Permit Nos. 1437-1 and 1667-1. The transfers have been completed and the above water rights and permits are now listed in the name of **Wharf Resources (U.S.A.) Inc.** Enclosed are the receipts for the filing fees.

I noticed when transferring the records that Wharf had an additional water right that I did not send a transfer form to you for. I am including a copy of Vested Right No. 1174-1 to give you an idea of which system the water right pertains to. I apologize for overlooking this in my first correspondence to you.

Enclosed is a partially completed "Notice of Transfer of Ownership" form for Vested Water Right No. 1174-1. The form will need to be signed in the presence of a notary by a representative of Wharf Resources (U.S.A.) Inc. Upon completion, please forward the form and a \$2.50 filing fee to our office.

Thanks again for your help and if I can answer any questions for you please give me a call.

Sincerely,

Genny McMath
Environmental Scientist
Water Rights Program
(605) 773-3352

enclosures

c: John Begeman, General Manager of Wharf Resources (U.S.A.) Inc

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

№ 416145

Pierre, June 14, 1999

RECEIVED OF Wharf Resources, Inc., HC 37, Box 811, Lead, SD 57754
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. _____		
Fee for Filing Transfer Form <u>Water Permit No. 1667-1</u>	2	50
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	2 50

By

Chief Engineer

John Hatch (Signature)

NOTICE OF TRANSFER OF OWNERSHIP

To: Chief Engineer
Water Rights Program, DENR
523 E. Capitol
Pierre, SD 57501-3181



No. 1667-1

Date: 6-7-99

I/We request that Water Permit No. 1667-1

formerly owned by: Wharf Resources, a Montana general partnership

be transferred to: (name & address) Wharf Resources (U.S.A.) Inc., HC 37, Box 811

Lead, SD 57754

Telephone No. (605) 584-1441

Title to the following described land(s)/property has been transferred as described above:

diversion point location: SE 1/4 NW 1/4 Section 3, T4N, R2E

I/We understand that the validity of Water Permit No. 1667-1 has not been determined by this transfer action. If I/We have any questions on validity, I/We understand that only the Water Management Board has the authority to determine if a water permit/right is valid (see note).

You are requested to file this "Notice of Transfer" in the appropriate file with the Water Rights Program, as evidence of the change of ownership.

A fee of Two Dollars and Fifty Cents (\$2.50) is required to cover the filing fees as required under SDCL 46-2-13. This form must be signed by the new owner.

STATE OF SOUTH DAKOTA)

County of Lawrence)

I/~~we~~ John A. Begeman being first duly sworn on my oath depose and say that my relation to the above described undertaking is that of ~~we~~ that I have read the above foregoing statement, and that I know of my own personal knowledge that the information herein stated is true.

****General Manager of Wharf Resources (U.S.A.) Inc.**

John A. Begeman
(Signed)

Subscribed and sworn to before me this 7th day of June, 1999.

Julianne J. Benson
(Notary Public)

NOTE: Water permits may be cancelled for nonconstruction within the five year construction period. Once a water permit is developed and the water used, the permit becomes a right. A water right may be lost for three reasons:

1. Abandonment - no intent to use water and use is abandoned.
2. Forfeiture - no use of water for three year period without legal excuse.
3. For a third violation of a condition of a water permit/right.

Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 1667-1

I have this day, Aug 24, 2017 made a thorough examination of the water use system constructed by Wharf Resources, 10928 Wharf Road, Lead, SD 57754 of Permit No. 1667-1, bearing the priority of 4/2/1998 authorizing up to 0.891 cu. ft. per second water from Annie Creek for industrial purposes, in Lawrence County.

Inspection contact & relationship to permit holder, if applicable:

Lynn Blackman, Environmental Coordinator
605-584-4190

correspondence:

% Matt Zietlow, Environmental Coordinator
605-584-4155

A. Works used to divert the water:

A drainage system at the base of the Reliance waste rock dump at the head of Annie Creek collects water and discharges at the toe of the slope into a small collection pond. The pond is constructed with a rock fill embankment and has an HDPE liner. Approximate pool dimensions are: surface area 0.06 acres, depth 5 ft., storage 0.15 acre-feet.

B. Works used to transport and apply water to beneficial use:

Water is pumped from the collection pond through an HDPE pipe to a larger collection/holding pond in Ross Valley. Pumping rate varies through the year with a maximum pump rate in 2017 of approximately 200 gpm. The pump has a maximum capacity of 400 gpm. At the Ross Valley pond water from the Annie Creek pond is combined with water collected at the toe of the Ross Valley spent ore dump and pumped to the Ross Valley Denitrification facility for treatment. Water from the treatment facility is discharged to holding/treatment ponds in the SW ¼ SW ¼ and SE ¼ SW ¼ Section 34 T5N R2E; to leach pads for denitrification located in SW ¼ Section 33 T5N R2E, E ½ NE ¼ Section 4 and NW ¼ NW ¼ Section 3 T4N R2E; and to a discharge point in Annie Creek located immediately below the Annie Creek pond in the SE ¼ NW ¼ Section 3 T4N R2E. Except for losses in the system, this appropriation is a non-consumptive use of water.

C. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Yes
list any extended period of nonuse: none
- 2) Exceptions to compliance are: none

D. Condition and Location:

1. The system is in good condition with the diversion point located as follows:
2,042' S and 2,303' E of NW corner Section 3 T4N R2E (44.339098, -103.86688).
2. The works are capable of diverting and conveying to the place of use up to 0.89 cu. ft. per second (400 gpm) of water which is used for industrial use and the license should be issued for 0.89 cfs.
3. All structures, wells and lands on map Yes

E. Comments or other permit(s) associated with the project:

Wharf Resources also holds Permit #1437-1 which authorized the collection pond in Ross Valley in the SE ¼ NE ¼ Section 3 T4N R2E.



Steven Quissell
Water Rights Inspector
DENR Water Rights Program

Date Report Completed: Aug 29, 2017



Annie Creek collection pond and pump facility



Ross Valley collection pond



Toe of rock fill embankment in Annie Creek and one of the discharge points for the Ross Valley Denitrification Plant.

**Water Right Nos. 1437-1, 1667-1 and 1761-1
Wharf Resources Inc.
August 24, 2017**

Sec 33
T005N
R02E

Well PW-2, Lat: 44.350626 Lon: -103.874332
Additional diversion point authorized under
Water Right Nos. 1346-1, 1493-1 and 1761-1

Sec 34
T005N
R02E

License # 1365-1
(Joseph well)

Sec 35
T005N
R02E

Sec 36
T005N
R02E

processing ponds

water treatment plant

Pad 4

water treatment plant

holding/treatment ponds

twin 5,000 gal. storage

Pad 1

Pad 2

Well PW-1 Permit # 1761-1
License # 1493-1
Lat: 44.345159 Lon: -103.877454

Well HDH-8A License # 1346-1
Lat: 44.34312 Lon: -103.874241

Pad 3

Topsoil
Stockpile

Ross Valley
Spent Ore

Reliance
waste rock

Permit #1437-1
Sedimentation Pond
Lat: 44.34076 Lon: -103.870419

Permit 1667-1 Collection Pond
Lat: 44.339098 Lon: -103.86688

Sec 4
T004N
R02E

Sec 3
T004N
R02E

Sec 2
T004N
R02E

Sec 1
T004N
R02E

Steven Quissell

**Steven Quissell
Water Rights Inspector
DENR Water Rights Program**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Geomapping, AeroGRID, IGN, IGA, swisstopo, and the GIS User Community

1667-1



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

JOE FOSS BUILDING
PMB 2020
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
<http://denr.sd.gov>

September 19, 2017

1437-1
1667-1

Matt Zietlow, Environmental Coordinator
Wharf Resources
10928 Wharf Rd
Lead SD 57754

Dear Mr. Zietlow:

On August 24, 2017 the investigation of the water use systems, including the extent of application of water to beneficial use, as developed under Water Permit Nos. 1437-1 and 1667-1, was completed by Steve Quissell, a staff engineer with our program. The final water right document, the water license, can now be issued for each one.

State law requires that we charge a \$50.00 fee (**each**) for the investigation and issuance of the water license. Upon receipt of the \$100.00 fee from you, we will complete processing the water licenses. The check or money order for the fee should be made payable to the "Water Rights Program".

If you have any questions, please contact me.

Sincerely,

Genny McMath
Water Rights Program
(605) 773-3352

Note: A field investigation was also conducted for Water Permit No. 1761-1, held by Wharf Resources. The fee has already been paid for No. 1761-1 and the license is being processed.

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date October 10, 2017

RECEIVED OF Wharf Resources 10928 Wharf Road Lead 57754-9710

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	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 <u>1667-1</u>		
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. _____	50	00
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law)	TOTAL	50 00

No. **08352**

By Jeanne Goodman
Chief Engineer

vm



1667-1

**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

denr.sd.gov

OCT 13 2017

1437-1
1667-1

Matt Zietlow
Wharf Resources (USA) Inc
10928 Wharf Rd
Lead SD 57754

Dear Mr. Zietlow:

Enclosed are Water License Nos. 1437-1 and 1667-1. These are the final water right documents completing the process of obtaining Water Rights. Included with the licenses is a map prepared by the staff engineer who conducted the field investigation.

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

Sincerely,

Jeanne Goodman, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures: water licenses, map, receipts

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 1667-1

(1) Wharf Resources (later transferred to Wharf Resources (USA) Inc., 10928 Wharf Rd., Lead SD 57754 made Application No. 1667-1, April 2, 1998 for a water permit to divert 0.891 cubic feet of water per second (647 acre feet of water annually) from Annie Creek, Lawrence County, South Dakota for industrial (remediation) purposes. Permit No. 1667-1, with a priority date of April 2, 1998 was approved June 8, 1998 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before June 8, 2003 and for the application to beneficial use of said water on or before June 8, 2007.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the construction of the water supply system and is entitled to divert 0.89 cubic feet of water per second (647 acre feet of water annually) for beneficial use.

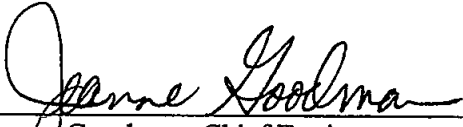
The location of the diversion point is in the SE ¼ NW ¼, approximately 2,042'S and 2,303'E of the NW corner Section 3, T4N, R2E (44.339098, -103.86688).

A drainage system at the base of the Reliance waste rock dump at the head of Annie Creek collects water and discharges at the toe of the slope into a small collection pond.

(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use. Except for losses in the system, this appropriation is a non-consumptive use of water.

(4) Pursuant to South Dakota Water Law 46-5-30.1 Wharf Resources (USA) Inc., 10928 Wharf Rd., Lead SD 57754 the holder and/or owner of Water Right No. 1667-1 is issued a license to appropriate water, the right to use 0.89 cubic feet of water per second from Annie Creek with a priority date of April 2, 1998 from the location specified in (2) of this license for industrial use (operating a biological denitrification facility for remediation purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 1667-1.


Jeanne Goodman, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

OCT 13 2017

date

