

PDR

40-8728

Dan Herlihy
Teton Exploration Drilling Co.
P. O. Drawer A-1
Casper, Wyoming 82601

23 October 1979

Mr. Ron Kaufmann
U.S. NRC
Mail Stop 905 SS
Washington, D. C. 20555



Dear Ron:

Re: Docket 40-8728

Attached please find a copy of the TETON-NEDCO application for a Research & Development Testing License submitted to and approved by the Wyoming Department of Environmental Quality (DEQ). The R&D License number for our approved DEQ License is 2 RD. A copy of the License is also attached. This License authorizes TETON-NEDCO to proceed with all phases of the R&D test subject to the conditions listed in the attached license.

The DEQ application is submitted to the NRC as a reference in the review of the TETON-NEDCO application for Source Material License. Section III.3.5 (Leach Solution Excursion) of the DEQ application supercedes Section III.3.5. of the ER submitted to the NRC, Section IV (Reclamation) of the DEQ application supercedes Section IV of the NRC ER. For your immediate reference, I have attached Table IV-1.02 (Ground Water Restoration Goals for R&D Test) of the DEQ application. This Table supercedes Table IV.1.01 of the presently submitted NRC ER and should answer comment 4(h) of the 10/22/79 NRC comments concerning our Source Material License application.

In reference to comment 4(a) of the 10/22/79 NRC comments requesting a schedule for the Testing operation, the proposed testing schedule is as follows:

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Days After Operation
Commences

Activity

0	Begin mining in N&M production zones
60	Complete mining in M zone
60	Begin restoration in M zone
90	Complete mining in N zone
90	Begin mining in second pattern in N Zone
100	Complete restoration in M zone
100	If needed begin mining in second pattern in M zone
150	Complete mining in second pattern in N zone
150	Begin restoration of both patterns in N zone
160	Complete mining in second pattern of M zone
160	Begin restoration of second pattern of M zone
210	Complete all ground water restoration
210	Implement surface reclamation
365	Complete reclamation

If you have any questions concerning the above, please contact me at your earliest convenience.

Sincerely,

Dan Herlihy

Dan Herlihy
Solution Mining Department

DH:sfs

Attachments

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STATE OF WYOMING

DEPARTMENT OF ENVIRONMENTAL QUALITY LAND QUALITY DIVISION

APPLICATION FOR IN SITU RESEARCH AND DEVELOPMENT TESTING LICENSE

1. (a) Name and Mailing Address of Applicant: Teton Exploration Drilling
Company, Inc., P. O. Drawer A-1, Casper, Wyoming 82602
- (b) If the applicant is a partnership, association or corporation the names and addresses of all managers, partners and executives directly responsible for operations in this state:

Name: <u>D. L. Hankins</u>	Address: <u>P. O. Drawer A-1, Casper, WY</u>
Title: <u>President & Chief Exec. Officer</u>	Phone No: <u>(307) 265-4102</u>
Name: <u>G. A. Jarre</u>	Address: <u>P. O. Drawer A-1, Casper, WY</u>
Title: <u>Vice Pres. Minerals Development</u>	Phone No: <u>(307) 265-4102</u>
Name: <u>H. E. Meier</u>	Address: <u>P. O. Drawer A-1, Casper, WY</u>
Title: <u>Exec. Vice Pres./Secretary</u>	Phone No: <u>(307) 265-4102</u>
Name: <u>T. G. Melrose</u>	Address: <u>P. O. Drawer A-1, Casper, WY</u>
Title: <u>Manager Solution Mining</u>	Phone No: <u>(307) 265-4102</u>
2. Name and mailing address of the agent or person to whom any notice under the provision of Wyoming Environmental Quality Act or Rules and Regulations adopted thereunder may be sent: Mr. Tom Melrose or Mr. Dan Herlihy
3. Attach the following information as part of the specific appendices:
 - (a) APPENDIX "A"
Names and addresses of surface and mineral owners of record within the proposed license area.
 - (b) APPENDIX "B"
 - (i) Names and last known addresses of the owners of record of the surface rights of the lands immediately adjacent to the proposed license area.
 - (ii) Names and last known addresses of any other persons within one-half (1/2) mile having a valid legal estate of record.

NOTE: Appendices "A" and "B" shall each be accompanied by maps showing the ownership locations required by the respective appendices. Mapping of (b)(ii) is not required.

 - (c) APPENDIX "C"
 - (i) All lands to be included in the proposed license area shall be tabulated by legal subdivision, section, township, range, county, and municipal corporation, if any, and the number of acres for each subdivision listed.
 - (ii) Lands which are to be part of the proposed license area, for which no right to mine is claimed shall be identified in item (c)(i) above as such and tabulated separately listing the number of acres for each legal subdivision

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(iii) Lands which are located within other permit or license areas shall be identified and a copy of the agreement with the other permittee shall be attached as part of this application.

(iv) An original United States Geological Survey topographic map, clearly outlining and identifying the lands to be within the proposed license area, shall be provided. Photo copies or other similar copies are not acceptable unless prior approval is obtained from the Land Quality Division.

(d) APPENDIX "D" (See Description of the Land in Application Report)

(i) A statement of the present and proposed post-reclamation use of the land.

(ii) The vegetative cover, topsoil characteristics, location and name of present surface waters, and adjudicated water rights for affected areas.

(iii) Locations and present owners of all wells inside and within one-half (1/2) mile of the license area with well completion data and producing interval(s) to the extent such information is available to the applicant and the general public.

(iv) Groundwater quality data and piezometric surface elevations for aquifers that may be affected by recovery fluid injection.

4. (a) Mineral(s) to be extracted: Uraninite (Uranium)

(b) Testing method to be used: In Situ Leaching

5. Estimated dates of commencement and termination of the proposed research and development testing:

Start of testing: 1 September 1979 Termination of restoration: 1 Sept. 1980 (reclamation)

6. The total number of acres in the proposed license area and an estimate of the total number of acres to be affected by the research and development testing.

Total license Acres: 87.2 Estimate of Affected Acres: 6

7. The nearest town, village, or city: Glenrock

8. A filing fee of \$25.00 is enclosed.

9. A testing plan is required including a description of the nature and scope of the testing activity, the general groundwater hydrology, the general geology, maps showing the surface facilities, access roads, communication lines, the sequence of the operation, and descriptions of the expected impacts on natural resources, mitigating measures, operational procedures and operational sequences. The testing plan must show that the test will:

(a) Evaluate minability or workability of a mineral deposit using in situ mining techniques.

(b) Affect the land surface, surface waters and groundwater of the State to the minimum extent necessary and achieve groundwater restoration.

(c) Provide premining, operational and postmining data, information and experience that would be useful for developing reclamation techniques for in situ mining.

10. A reclamation plan is required including descriptions of the methods to be used in groundwater restoration, surface restoration, the type of revegetation and practices to be used to achieve revegetation, and an estimate of the cost of restoration. (reclamation)

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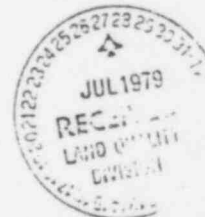
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- Leuenberger Site

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FINAL SWORN STATEMENT

State of Wyoming)
County of Natrona) ss

I Dwain L. Hankins being duly sworn on my oath
Name (typed or printed)

that I am the applicant (or chief executive officer of the applicant if a corporation)
for the foregoing license; that I have read the said application and fully know the
contents thereof; that all statements contained in the license application are true and
correct to my best knowledge and belief, by execution of this statement I certify that
Teton Exploration Drilg. Co. has the right and power by legal estate owner to mine
(Applicant)

from the land for which this license is desired; that Teton Exploration Drilling Co
(Applicant)

has not forfeited, or is not involved in forfeiture proceedings for, a bond posted for
reclamation purposes; and by completion and submission of this application, hereby
give consent to allow the Director, the Administrator and/or his authorized representa-
tives, at reasonable times and without advance notice and upon presentation of appro-
priate credentials, to enter upon and have access to any and all lands covered by this
license thereto and to inspect and copy any records or documents, obtain or monitor any
samples or sampling for, any activities associated with the operation and license.

Dated 25th of July, 1979.

Dwain L. Hankins
Individual or chief executive
officer of a corporation

(seal)

My Commission Expires June 16, 1981

[Signature]
Notary Public or Secretary
if a corporation

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THE STATE OF WYOMING)

) ss

DEPARTMENT OF ENVIRONMENTAL QUALITY)

This is to certify that I have examined the foregoing application and do hereby grant the same subject to the following limitations and conditions:
This license grants only the right to affect the lands described in Appendix "C" of the application.

1. Before groundwater restoration by sweeping is begun, the licensee and the Land Quality Division will mutually agree on a method that will prove the amount of sweeping done during the groundwater restoration attempt. Any expenses inherent to this proof method will be paid by the licensee.
2. Before a lixiviant other than $\text{Na}_2\text{CO}_3\text{-HCO}_3$ is injected, approval from the Land Quality Division must be obtained.
3. A proper bond for \$43,700 must be received before October 31, 1979 or before injection begins, whichever occurs first.
4. The remaining mailing receipts for the notification to all persons holding a valid legal estate within 1/4 mile of the permit area must be received before October 31, 1979 or before injection begins, whichever occurs first.

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APPROVED:

W. C. Ackerman
W.C. Ackerman, Administrator
Land Quality Division
Department of Environmental Quality

APPROVED:

Robert E. Sundin
Robert E. Sundin, Director
Department of Environmental
Quality



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Effective Date: October 1, 1979
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TABLE IV.1.02

Ground Water Restoration Goals for R & D Test
(All units in mg/l except as noted)

<u>Chemical Parameter</u>	<u>M Aquifer Restoration Goal</u>	<u>N Aquifer Restoration Goal</u>
pH	5.0-9.0	5.0-9.0
Ammonia (NH ₃)	.5	.5
NO ₂ /NO ₃ Total	1 ¹	1 ¹
Bicarbonate	TDS	TDS
Carbonate	TDS	TDS
Calcium	TDS	TDS
Chloride	250	250
Boron	1	1
Fluoride	1.4 to 2.4	1.4 to 2.4
Magnesium	TDS	TDS
Potassium	TDS	TDS
Sodium	TDS	TDS
Sulfate	250	250
Aluminum	.33 ²	.15 ²
Arsenic	.05	.05
Barium	1.0	1.0
Cadmium	.01	.01
Chromium	.05	.05
Copper	1.0	1.0
Iron	.73	.30
Lead	.05	.05
Manganese	.06 ³	.05 ³
Mercury	.001	.01 ²
Molybdenum	.20 ²	.07 ²
Nickel	1.0 ³	1.0 ³
Radium 226	236.5 ³	208.3 ³
Selenium	.01	.01
Uranium	5	5
Vanadium	.34	.21
Zinc	5	5
TDS	500	554 ³

- 1) The concentration of this parameter shall be at a level such that the restoration concentration for TDS is not exceeded. There is no known recommended Public Water Supply criteria for this parameter.
- 2) No Public Water Supply Criteria exists. Average values shown are determined from wells PN5-L301, PN5-L306, and PN5-L308 in M Aquifer and wells PN5-L302, PN5-L312, PN5-L317, PN5-572, PN5-L573, PN5-L574 in N Aquifer.
- 3) Baseline value (Table II.6.04) exceeds Public Water Supply Criteria. Average values shown are determined from wells PN5-L301, PN5-L306, & PN5-L308 in M Aquifer and wells PN5-6302, PN5-L312, PN5-6317, PN5-572, PN5-L573, PN5-L574 in N Aquifer.

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TABLE III.3.5.01

EXCURSION PARAMETER UPPER CONTROL LIMITS¹

Excursion Parameter (mg/l except as noted)	IDAHO AQUIFER (Applicable to Well, PN5-L570 and PN5-L304)				Upper Control Limit
	(\bar{X})	(S)	(t)	(UCL)	
	Population Mean	Population Standard Deviation	n_1	90% t- Distribution Factor	
Alkalinity (as CaCO_3) ²	200	12.75	4	1.64	221
Chloride (CL)	7.7	1.5	3	1.89	10.6
Conductivity (mhos/cm)	1,003	81.8	4	1.64	1137
Sodium (Na)	46	6.6	4	1.64	57
Sulfate (SO_4)	355	89.7	4	1.64	502
Uranium (as U)	.06	.03	3	1.89	.112

N AQUIFER

(Applicable to Wells PN5-L309, PN5-L313, PN5-L319, PN5-L320 & "proposed monitor wells" for N Aquifer Monitor Well Ring)

Excursion Parameter (mg/l except as noted)					UCL Upper Control Limit
	(\bar{X})	(S)	(t)	(UCL)	
	Population Mean	Population Standard Deviation	n_1	90% t- Distribution Factor	
Alkalinity (as CaCO_3)	160	21.3	10	1.38	189
Chloride (CL)	7.1	6.15	10	1.38	15.6
Conductivity (mhos/cm)	783	75.8	8	1.42	891
Sodium (Na)	36	3.6	10	1.38	41
Sulfate (SO_4)	258	47.4	10	1.38	323
Uranium (as U)	.19	.28	8	1.42	.585

1) Degrees of freedom = n_1 and $n_2 - 2$

n_1 = # of sample for determining baseline means

n_2 = # of samples collected at monitor well to detect an excursion

$n_2 = 1$.

One tailed student t distribution table is used.

$\text{UCL} = \bar{x} + (t)(s)$

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2) Alkalinity as $\text{CaCO}_3 = .8202 \text{ (mg } \text{HCO}_3\text{)}.$

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TABLE III.3.5.01 (Continued)

M AQUIFER
(Applicable to Wells PN5-L305, PN5-L575, PN5-L576 &
"proposed monitor well" for M Aquifer Monitor Well Ring)

Excursion Parameter (mg/l except as noted)	\bar{x} , Population Mean	s , Population Standard Deviation	n_1	t 90% t- Distribution Factor	<u>UCL</u> Upper Control Limit
Alkalinity (as CaCO_3) ¹	214.5	57.49	6	1.48	300
Chloride (Cl)	8.83	5.67	6	1.48	17.22
Conductivity ($\mu\text{mhos/cm}$)	516.25	7.50	4	1.64	528.55
Sodium (Na)	29.61	4.78	7	1.42	36.4
Sulfate (SO_4)	110.67	28.99	6	1.48	153.6
Uranium (as U)	.032	.02	5	1.53	.06

BASAL AQUIFER
(Applicable to Well PN5-L314)

Excursion Parameter (mg/l except as noted)	\bar{x} Population Mean	s Population Standard Deviation	n_1	t 90% 5- Distribution Factor	<u>UCL</u> Upper Control Limit
Alkalinity (as CaCO_3)	190	4.24	2	3.08	203
Chloride (Cl)	6.5	.71	2	3.08	8.7
Conductivity ($\mu\text{mhos/cm}$)	590	-	1	-	-
Sodium (Na)	47	3.5	2	3.08	58
Sulfate (SO_4)	138	6.4	2	3.08	158
Uranium (as U)	.0015	.00071	2	3.08	.0037

1) Alkalinity as $\text{CaCO}_3 = .8202$ (mg of HCO_3).

This table will be recomputed and submitted to the DEQ - LQD once the proposed monitor wells have been installed and sampled at least 4 times but before injection begins.

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