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THE STATE OF WYOMING

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GOVERNOR

PDR

Department of Environmental Quality

LAND QUALITY DIVISION

DISTRICT IV OFFICE

30 EAST GRINNELL STREET

TELEPHONE 307-672-6488

SHERIDAN, WYOMING 82801

December 23, 1982

Mr. R.D. Smith, Chief
Uranium Recovery Licensing Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555



RE: Conoco Sand Rock Mill, Moore Ranch Mine, TFN 1 4/209

Dear Mr. Smith:

As part of your agency's concern with the licensing of the Sand Rock Mill tailings disposal site, I am enclosing a copy of the Land Quality Division's staff review of their permit application.

Also enclosed is a copy of Richard Chancellor's memo to Walt Ackerman which recommends that the Administrator deny Conoco's application.

Sincerely,

Glenn Mooney
Glenn Mooney
Geologist

GM:kn

Enclosures



DESIGNATED ORIGINAL

Certified by *B Fisher*

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Department of Environmental Quality

LAND QUALITY DIVISION

DISTRICT IV OFFICE

30 EAST GRINNELL STREET

TELEPHONE 307-672-6488

SHERIDAN, WYOMING 82801

MEMORANDUM

TO: Walter C. Ackerman, Administrator

FROM: Richard A. Chancellor, District IV Engineer *RAC*

DATE: November 24, 1982

SUBJECT: Conoco Moore Ranch/Sand Rock Mill Application, TFN 1 4/209

Enclosed is a list of deficiencies to the above mentioned permit application and possible permit stipulations prepared by the District and Support Group Staff.

The 150-day technical review period has passed and a decision must be made either to approve or deny the application. While the list of deficiencies is lengthy, the permit could be approved with the stipulations, except for the lack of surface owner consent.

Conoco has contended that their "Operating Agreement" takes the place of the required consent. Vicki Bryan disagrees with Conoco's position (see attached letter dated 10 November 1982 from Vicki Bryan to Terry Quigley) and I support her position. I therefore recommend denial of the permit application.

RAC:kn

Enclosure

DESIGNATED ORIGINAL

Certified By _____

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Department of Environmental Quality

LAND QUALITY DIVISION

401 WEST 19TH STREET

TELEPHONE 307-777-7756

CHEYENNE, WYOMING 82002

November 10, 1982

T.W. Quigley
Environmental Project Leader
Conoco, Inc.
555 Seventeenth St.
Denver, CO 80202

RE: Conoco Moore Ranch Mine, TFN 1 4/209

Dear Mr. Quigley:



I have reviewed your "Operating Agreement."

This agreement states that it is not your intention to create a partnership or association which would render Conoco and Kerr-McGee liable as partners. (pg. 13, item 13.1)

It is questionable whether your operating agreement grants Conoco a 50% interest in the Surface Agreement executed between Taylor Ranch and Kerr-McGee. This is a legal matter which I am not qualified to address.

In any case the Surface Agreement does not suffice as surface owner consent because:

- a. it does not address the specific mining and reclamation plan as presented in your application; and
- b. not all of the Taylor Ranch lands described within your permit boundary are listed in the document entitled "Lands On Taylor Ranch Staked By Kerr-McGee Corporation." Lands which are omitted are the portions of Sections 26 and 27, T42N, R75W.

Please be advised that if Taylor Ranch is not covered by the provisions of W.S. 35-11-406(b)(xi), you may request a hearing before the Environmental Quality Council pursuant to paragraph (xii).

If you have any questions, please contact this office.

Sincerely,

Vicki J. Bryan
Vicki J. Bryan
Adjudicator

VJB:kv

cc: Rick Chancellor
Glen Mooney ✓
Gary Beach

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Department of Environmental Quality

LAND QUALITY DIVISION

DISTRICT IV OFFICE

30 EAST GRINNELL STREET

TELEPHONE 307-672-6488

SHERIDAN, WYOMING 82801

MEMORANDUM

TO: File, Conoco Moore Ranch/Sand Rock Mill Application,
TFN 1 4/209

FROM: Land Quality Staff

DATE: November 24, 1982

SUBJECT: Second Technical Review Comments

I. Adjudication

A. Appendix A

The surface and mineral owners for the SE $\frac{1}{4}$ Section 1, T.41N., R.75W. were omitted from page A-8. TA

B. Surface Agreement and Surface Owner's Consent

1. It is questionable whether Conoco's operating agreement grants Conoco a 50% interest in the Surface Agreement executed between Taylor Ranch and Kerr-McGee. This agreement states that it is not Conoco's intention to create a partnership or association which would render Conoco and Kerr-McGee liable as partners (pg. 13, item 13.1).

In any case the Surface Agreement does not suffice as surface owner consent because:

- a. it does not address the specific mining and reclamation plan as presented in Conoco's application; and UB
- b. not all of the Taylor Ranch lands described within the permit boundary are listed in the document entitled "Lands On Taylor Ranch Staked By Kerr-McGee Corporation." Lands which are omitted are the portion of Section 26 and 27, T.42N., R.75W. UB
2. A document entitled "Ratification of Surface Agreement" was submitted in lieu of Taylor Ranch's written consent. This agreement was originally executed between Taylor Ranch and Kerr-McGee Corporation.

Pursuant to W.S. 35-11-406(6)(xi) consent must include written approval of the applicant's mining plan and reclamation plan.

DESIGNATED ORIGINAL

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Problems with using the "Ratification" document as surface owner consent are as follows:

- a. Conoco states that it is involved in a 50/50 joint venture with Kerr-McGee to mine these lands; however, there is nothing on form 1 or 3 which indicates that this project is being performed by a joint venture. UB
 - b. The "Ratification of Surface Agreement" does not state that Taylor Ranch agrees to the specific mining and reclamation plan as submitted in this application. The agreement makes references to general mining methods and general reclamation methods as perceived by a ranching interest with emphasis on protecting livestock and water. It does not address the specific plans. UB
 - c. Portions of Sections 26 and 27, Township 42 North, Range 75 West of the permit boundary which are owned by Taylor Ranch are not listed on the "Lands on Taylor Ranch staked by Kerr McGee." This list of lands is attached to the Surface Agreement. UB
 - d. Currently there is nothing in the permit document to substantiate the relationship between Kerr-McGee and Conoco. A copy of the joint venture agreement with specific lands stated is needed. UB
3. Please be advised that if Taylor Ranch is not covered by the provisions of W.S. 35-11-406(b)(xi), you may request a hearing before the Environmental Quality Council pursuant to W.S. 35-11-406(b)(xii). UB
4. Submission of a DEQ Form 8 signed by Taylor Ranch must be submitted unless all of the above concerns can be addressed.

C. Construction Schedule

If initial construction activities do not commence by December 1, 1983, a revised construction and mining schedule shall be submitted prior to conducting any operations (See Stipulation No. 1 below).

II. Environmental Assessment

A. Geology, Appendix D-5

- 1. The well hole data presented on Figure 6-1 do not necessarily agree with the structure contour lines for the elevation of the top of the E coal. In the vicinity of the evaporation pond, possible folding or faulting may be present, as epitomized by wells P-4, P-8, P-7 and P-6. CL
- 2. Additional data is required to substantiate the statement that "There is no significant structural folding or faulting in the area." (See Stipulation No. 2 below).

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3. Section 1.6, Protection of Other Resources, page 6

According to the text, "The U.S.G.S. has determined that the lignites are not a resource and may be wasted." A letter or other verification from the U.S.G.S. or Minerals Management Service should be provided regarding the disposal of the lignite lenses.

TA

B. Vegetation, Appendix D-8

1. The applicant shall formally establish a Reference Area for each proposed post-mining community type. The applicant:
 - a. Shall retain the use of the currently established land unit of 2.3 acres in the Upland Grassland community as a Reference Area under the above definition.
 - b. Shall formally establish in conjunction with LQD a Reference Area for the Drainage Meadow community type. This land unit shall be at least 2 acres in size; as large a unit as possible is preferred.
 - c. Shall eliminate all consideration and proposed use of the currently established "Reference Area" for the Playa Grassland community (See Stipulation Nos. 3 and 4 below).
2. The applicant shall manage the established Reference Area in the same fashion as all other non-affected portions of the permit area.

BG

BG

III. Mine Plan

A. Mine Hydrology

1. Pond Designs

It is stated on page 36 (revised Feb. 1982) that the resulting water pools from Dams 1A and 1B will be used for dust abatement or discharged when it meets the discharging concentrations. An NPDES permit which designates the discharge concentration levels must be obtained prior to any discharges.

TA

2. Section 3.5.2, Water Treatment, page 39

It is stated on page 39 that some of the pit water will be consumed in the pit while the remainder will be pumped to the evaporation pond for use in the mill. If the pit water is to be transported via a pipeline to the pond, then the location of the pipeline should be shown on Figure MP-1.

TA

3. Mine Plan, Figure MP-1

- a. It is indicated in Figure MP-1 that the northern topsoil stockpile lies on top of the northern overburden dump. An interceptor ditch or berm should be constructed around the toe of the topsoil stockpile to retain topsoil and prevent the movement of topsoil onto the overburden.

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- b. An in interceptor ditch or berm should be constructed along the toe of the overburden dump located east of the temporary tailings/evaporation pond and shown on Figure MP-1.

B. Uranium Mill and Tailings Disposal System

1. Section 4.1.1, Mill Site, page 50

The Air Quality Division of the Department of Environmental Quality should be contacted regarding the necessary air quality permits required for the mill. Verification of air quality permits should be included in the mine permit application. JA

2. Collection Sump, page 51A

The collection sump that will be placed near the mill building should be shown on figure MP-1. JA

C. Tailings Pond Integrity

1. Clay Lining Failure

It should be noted that there are numerous case histories cited in the literature where impermeable clay liners have failed due to chemical and physical changes in the clay. A reliance upon the typical very low permeability of compacted montmorillonitic clay is justified only when pure water is likely to reach and affect it. CL

2. Contamination of Aquifers

- a. With respect to the calculation of seepage rates and the ion migration study, the movement of contaminants through a "failed" three (3) foot clayliner into the underlying saturated 70 sand is a matter of concern. Site specific laboratory studies evaluating the long-term effectiveness of the clayliner are necessary to fully alleviate this concern. CL

b. Lining Aging Tests

With respect to the proposed pit 35N tailings disposal plan, the three (3) foot clayliner can be approved only after site specific accelerated aging tests have been conducted. Should the integrity of the clayliner not be supported by test results, an alternative method of lining the evaporation pond shall be proposed. (See Stipulation No. 5 below). CL

c. Design Certification

"As constructed" drawings, certified by a professional engineer registered in the State of Wyoming, shall be submitted to the Land Quality Division upon the completion of all embankments, tailings disposal ponds and evaporation structures. A registered professional engineer shall supervise construction of all impoundments tailings ponds, and evaporation ponds. (See Stipulation No. 6 below.)

D. Topsoil Handling

1. Table MP-3, Topsoil Stripping Schedule, page 92

- a. The grand total topsoil volume is shown as 2,976,600 bcy. The volumes depicted on the four topsoil stockpiles shown on figure MP-1 equal 2,986,200 bcy. A correction or clarification regarding the total topsoil volumes should be provided. +A
- b. What is the purpose of the figures entitled, "Grand Total - Other Topsoil Disturbed?" Why isn't the topsoil volume from the 46.6 acres included in the total topsoil to be replaced shown in Table MP-4? +A

2. Mine Plan comment III.C.1(a) of the August 13, 1982 letter was responded to in an unacceptable manner. Approval is withheld until the commitment is made to strip the Ascalon soil to 60", the Olney (SL) to 60" and the Olney (SCL) to 40". The applicant has sufficient topsoil to adequately reclaim the land without taking all poor quality topsoil. But since the law requires the salvage of all suitable topsoil it is not acceptable to leave good or fair quality (or poor marginal to fair) topsoil. (See Stipulation No. 7 below.) RL

3. All topsoil salvage operations will be supervised by person or persons qualified in such operations and familiar with the soils in the area. (See Stipulation No. 8 below.) RL

4. Mine Plan comment III.C.1(b) of the August 13, 1982 letter was given a sufficient response. However, further protection will be necessary. A stipulation will be added to the permit that topsoil need not be stripped from light use roads on areas that are not cut nor filled, as long as travel is restricted to five or fewer round trips per day. This will ensure that the road is a light use road and protect the unstripped topsoil. (See Stipulation No. 9 below.) RL

E. Overburden Handling

1. Section 3.2.1., Technique, page 23

It is stated in the text that "The overburden will probably require light blasting." The warning and safety procedures that will be followed prior to blasting and following blasting should be provided. +A

2. Section 3.2.2., Dump Design, page 24

The text fails to mention the construction of a drainage ditch or berm along the toe of the overburden dump created by the excavation of the tailings/evaporation pond. Such a structure should be constructed to prevent the movement of overburden and/or runoff from the overburden stockpile onto adjacent undisturbed surface where topsoil remains in place. +A

IV. Reclamation Plan

A. Overburden Replacement

1. The Mine Plan comment III.C.2(b) response in the August 13, 1982 letter will be accepted with stipulations. The commitment to keep unsuitable plant growth material from the root zone is not sufficient. A sampling program is necessary to ensure that post-grading surfaces are an acceptable plant growth medium. The following will be stipulated:

RL

a. Four composite samples should be taken at each sample point in redeposited overburden. Composite samples of 0-2', 2-4', 4-6' and 608' should be taken and analyzed for pH, ABP, EC, SAR and wet sieved for sand content. If samples show significantly low pH and/or high potential acid production, the samples should be analyzed for Mo, Se, As, B, and gamma levels. If gamma levels show greater than background plus 2 mR/hr they are unacceptable.

RL

b. The samples should be collected on 2 acre centers.

RL

c. A gamma survey should be run and all areas greater than background plus 2 MR/hr should be mitigated.

RL

d. If unsuitable areas are found they should be delineated and the material replaced.

RL

e. This program includes the overburden stockpile areas that will be permanently reclaimed, the pond areas and pit areas. Areas from which topsoil was stripped for road or facility construction need only be surveyed for gamma radiation. (See Stipulation No. 14 below.)

RL

B. Final Contours, Map RP-1

1. With the respect to map RP-1, the post-mining topography presented by the applicant does not comply with the Wyoming Department of Environmental Quality Rules and Regulations, (IV,2,c(3)(1)): The applicant's response in the October, 1982 resubmittal is not satisfactory. Specifically, additional grading and recontouring will be required on the southern overburden dump, the northern overburden dump, facilities area, and the evaporation pond. (See Stipulation No. 10 below.)

CL

2. With respect to the design of Wash No. 2 over the pit 35N tailings disposal site, the channel and floodplain shall be designed to convey at a minimum the flow of 100 year storm at non-erosive velocities. These velocities shall not exceed 4 fps along any reach. The channel profile shall contain a smooth concave transition from the undisturbed ground to the disturbed ground. This smooth concave profile shall continue until the reclaimed channel once again enters undisturbed ground. Along no reach within the reclaimed channel shall the velocity from the minimum 100 year or less storm exceed 4 fps. Selective handling of channel fill material shall be conducted such that the average grain size

CL

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(graphical mean and median grain sizes) does not exceed sandy clay classification as specified in Appendix RP-A of the Reclamation Plan. (See Stipulation No. 11 below.)

C. Topsoil Replacement

1. The applicant response in the August 13, 1982 letter to comment IV.C.2 in the Reclamation Plan is unacceptable. DEQ/LQD feels that it will not be possible to delineate and locate areas in replaced topsoil found lacking nutrients when sampled in the stockpile. The operator should commit to standard fertility sampling methods in the replaced topsoil. An additional comment concerns the operator's comment that stockpile sampling can find unsuitable material before it is replaced. If unsuitable material is in the topsoil stockpile, then inadequate sampling and/or supervision occurred during stripping. RL

2. Section 5.5, Erosion Control and Water Conservation Practices, page 6 TA

The last complete sentence in the first paragraph on page 6 needs clarification. Does the sentence imply that topsoiled overburden stockpiles will be stabilized or that both topsoil and overburden stockpiles will be stabilized?

3. Table RP-1, Topsoil Removal and Replacement Schedule, page 26 TA

The bcy figures listed under the heading entitled, "Suitable Topsoil Removed" equal 2,846.2 and not 2,866.2 as indicated. A correction in the table is needed.

D. Revegetation

1. The applicant shall formulate and present to DEQ/LQD for discussion and approval a brief, conceptual outline of its proposal for procedures to evaluate suitable post-mining species diversity and species composition. This plan shall be submitted within six (6) months of the date of approval of this permit. BG

2. The applicant shall formulate and present to DEQ/LQD for discussion and approval the following which shall be submitted within six (6) months of the date of approval of this permit: BG

- a. a plan for constructing an appropriate post-mining shrub density standard, and

- b. procedure for evaluating attainment of that post-mining shrub density standard.

(See Stipulation Nos. 3 and 4 below.)

3. Tables RP-3 and RP-4, pages 28 and 29

It is recommended that yarrow (Achillea lanulosa) be removed from both the Upland Grassland and the DRainage Meadow Permanent Revegetation Seed Mixtures. The forb is readily established, TA
CC012

increases under heavy grazing pressure and through time will invade the seeded areas from the surrounding undisturbed areas.

4. Table D-8-3, Acreage of Each Vegetation Type in Permit Area, page 20 TA

The total acreage figure of 3274 should be corrected to read 3276.

5. Section 6.5, Seeding Methods, page 11 TA

Chemical spraying should be approved by the Land Quality Division prior to initiation.

6. Hydrologic Monitoring

The applicant's generic operational monitoring plan is unacceptable. (See Stipulation No. 12 below.) CL

7. Post-Mining Radiologic Survey

The radiological appendix D-10 is acceptable with the following stipulation: RL

A gamma survey should be performed post-mining for 1/2 mile outside the permit area downwind and mitigation commitments for the permit area be extended to these areas. This includes areas in Section 6, T.41N., R.75W.; Sections 11 and 12, T.41N., R.75W.; Section 36, T.42N., R.75W. There is a uniform background in the area with little variation making a pre-mining survey unnecessary unless the operation deems it so. (See Stipulation No. 13 below.)

8. Reclamation Costs

- a. Section 12.0, Reclamation Costs, page 25

Detailed reclamation costs for the first year of operation (Year-3) should be provided to determine the necessary bond level. The costs should include but not be limited to total affected acreage, amount of topsoil to be removed, amount of overburden to be removed, the decommissioning costs for the buildings and structures to be constructed. The reclamation costs should include a 20% contingency factor as required by W.S. 35-11-417(c)(i) to cover the administrator's estimate of the additional cost to the state of bringing in personnel and equipment should the operator fail or the site be abandoned. TP

- b. Table RP-7, Estimated Costs for Overburden Replacement and Decommissioning, page 32

The reclamation cost figure of \$3,100.00 indicated for decommissioning lacks sufficient detail. The total cost figure should be broken down into cost to remove each building and structure which would further include costs incurred to remove concrete, time involved, etc. TA

V. Proposed Permit Stipulations

The following are stipulations which are proposed to be attached to the approved mining permit for the Moore Ranch Mine/Sand Rock Mill Project:

1. If initial construction activities do not commence by December 1, 1983, the permittee shall submit a revised construction and mining schedule prior to conducting any operations. This shall be submitted as a permit revision and may be subjected to the requirements for public notice and opportunity for public hearing if the revised schedule departs substantially from that contained in the Mine Plan.
2. Additional data shall be presented by the applicant which will substantiate the statement: "There is no significant structural folding or faulting in the area." These data shall be presented to DEQ/LQD within two months of permit approval.
3. The applicant shall employ the Reference Area Concept in evaluation of all vegetation parameters established by Chapter IV.2.d.(6) and IV.2.d.(9) as reclamation success standards. A Reference Area is defined as a unit of land at least two acres which is representative of the geology, slope, vegetation and land use history of an affected plant community prior to mining. Vegetation data from the Reference Area shall be compared directly to the same type of data from reclaimed areas at the time bond release is requested; no mathematical climatic adjustment shall be made. BG
4. These procedures shall be used for testing % total cover, % vegetation cover and total herbaceous production. When the operator considers reclamation successful the appropriate Reference Area and revegetated area shall be sampled using identical procedures to generate single mean values for the above vegetation parameters. These mean values shall then be directly compared using a t-test or similar statistical procedure. On grasslands, the mean revegetated community cover and production values must be within 90% of the mean Reference Area parameter with 90% statistical confidence. On shrublands, the mean revegetated community production value must be within 90% of the mean Reference Area parameter with 80% statistical confidence; Cover parameters must be within 90% of the mean with 90% statistical confidence. These standards must be achieved for each parameter in two consecutive years. BG
5. With respect to the disposal methodology proposed by the applicant, this methodology can be approved only after site specific tests of the proposed Moore Ranch clayliner have been conducted. Should the integrity of the clayliner not be supported by test results, an alternative method of lining the evaporation pond shall be proposed. Proposed test procedures shall be presented to DEQ/LQD within two months of permit approval. Final results shall be presented within six months of permit approval. CL
6. "As constructed" drawings, certified by a professional engineer registered in the State of Wyoming, shall be submitted to Land Quality Division upon the completion of all embankments, tailings disposal, and evaporation structures. A registered professional engineer shall supervise construction of all impoundments, tailings ponds, and evaporation ponds. 00012

7. The operator will salvage the Ascalon soils to a depth of 60", the Olney (SL) soils to a depth of 60" and the Olney (SCL) soil to a depth of 40".
8. All topsoil salvage operations will be supervised by person or persons qualified in such operations and familiar with the soils in the area.
9. Topsoil need not be salvaged from light-use roads on areas that are not cut or filled as long as travel is restricted to five (5) or fewer round trips per day.
10. The permittee shall present an alternative post-mining topography plan within six months of permit approval. CL
11. With respect to the design of Wash No. 2 over the pit 35N tailings disposal site, the channel and floodplain shall be designed to convey at a minimum the flow of 100 year storm at non-erosive velocities. These velocities shall not exceed 4 fps along any reach. The channel profile shall contain a smooth concave transition from the undisturbed ground to the disturbed ground. This smooth concave profile shall continue until the reclaimed channel once again enters undisturbed ground. Along no reach within the reclaimed channel shall the velocity from the minimum 100 year or less storm exceed 4 fps. Selective handling of channel fill material shall be conducted such that the average grain size (graphical mean and median grain sizes) does not exceed sandy clay classification as specified in Appendix RP-A of the Reclamation Plan. This design shall be submitted to the Land Quality Division within six (6) months of permit approval. CL
12. Within six months of permit approval, a detailed hydrologic monitoring program (final plan) must be presented and found to be acceptable to Wyoming DEQ/LQD and the NRC. CL
13. A post-mining gamma survey will be performed for one-half(1/2) mile outside the permit boundary and mitigation commitments must be extended to these areas. This includes areas in Section 6, T.41N., R.75W.; Sections 11 and 12, T.41N., R.75W.; and Section 36, T.42N., R.75W.
14. A sampling program for insuring that unsuitable material is kept from the surface and the plant rooting zone is required and must be submitted within six (6) months of the date of permit approval.