

April 25, 2007

Mr. Greg Clark, District Ranger
U.S. Forest Service
P.O. Box 218
Big Piney, Wyoming 83113

RE: Eagle Prospect Exploratory Wells DEIS

Dear Mr. Clark:

My name is John Gerstle. I am a resident of Boulder, Colorado concerned about the management of our natural resources, and an employee / shareholder of Hydrosphere Resource Consultants, Inc. As a consultant with approximately 33 years of experience in water resources planning and management, and environmental impact assessment, I have been involved with the evaluation of environmental impacts of energy resources development in the western USA, the Middle East, Africa and Asia since 1975. I have been professionally involved with water resources-related issues in Wyoming since 2005. My resume is provided with this letter.

At the request of The Wilderness Society, I am herewith offering my comments on the water resources-related aspects of the Draft Environmental Impact Statement for the Eagle Prospect Exploratory Wells Project (hereafter called DEIS). In preparing these comments I closely reviewed the DEIS and several agency and individual scoping comment letters focused on water issues, and have also discussed this DEIS with staff from Wyoming Department of Environmental Quality and the Wyoming State Engineer's Office. These remarks are provided with the hope that they will be a positive contribution in the review and revision of the Environmental Impact Statement for the Eagle Prospect Exploratory Wells Project (hereafter called FEIS).

It is clear from the DEIS and its Appendices that considerable effort has been made by the Forest Service to describe the project alternatives, the affected environment and the project impacts. There are a number of water resources-related aspects, however, which require further consideration and my comments are directed to these aspects. The comments are summarized as follows:

- **The estimate of total water needs for the project is unsupported, and may be significantly understated.**
- **The description and discussion of the project area geology and hydrogeology is inadequate, resulting in inadequate consideration of impacts to nearby groundwater users.**
- **Relevant and available sources of information on the project area hydrology and geology have not been considered.**

- **The information, discussion and basis for description and conclusions regarding amounts, treatment, disposal and ultimate fate of produced water and project wastewater is inadequate and/or inappropriate.**
- **Information on the design, construction procedures and operating procedures for the proposed pipeline alternatives is inadequate, and insufficient for the purposes of the DEIS.**
- **The DEIS should require Wyoming Department of Environmental Quality permit approval to ensure that erosion control procedures and Storm Water Management Plan are appropriate for mitigation and management of project-caused erosion from excavation and drilling-related activities.**
- **The DEIS does not adequately describe the alternative drilling and site management procedures which could be used to diminish adverse impacts.**
- **The DEIS should address the need for surface and subsurface hydrologic baseline and monitoring data collection to enable identification of impacts and effectiveness of mitigation measures.**

More detailed remarks are provided below.

1. Total Water Requirements.

The estimate of total water needs during the exploratory drilling process may be significantly understated. Although the actual demand is highly variable and location-specific, for a similar hydrocarbon exploratory drilling application in another location, the applicant estimates that the total water requirement could be as much as 20 AF per 10,000 ft deep hole (in contrast to the 12,000 ft depth planned for the Eagle Prospect). Larger amounts of water are required when circulation is lost during the drilling process – a situation which is difficult or impossible to predict without detailed knowledge of the site geology. The Eagle Prospect DEIS estimate is that 16 AF would be the total demand for all 3 holes, an average of roughly 5.3 AF per hole. Because there is no generally accepted procedure to estimate water requirements for deep drilling activities, a more conservative water requirement estimate should be used unless justification can be provided for the very modest amount identified in the Eagle Prospect DEIS. Increased water supply needs for the drilling activities are a matter of concern because of the limited water resources available, and the existing demands for water in the project area.

The total water requirement and the related consumptive use for the proposed activity are important because of the potential for significant impacts on nearby water uses - both natural and human. For example, declines in groundwater levels which could result from project activities could lead to diminished flows from springs and surface flows in the area, with ramifications for wildlife and related flora and fauna. Similarly, private residences in the project area are dependant upon relatively deep wells with

limited production. Declines in the production of these wells would constitute potentially severe hardship to those depending on them for their water supply.

2. Description of Geology and Geohydrology

Discussion of the surface and subsurface hydrology and geology in the project area is inadequate. Given the fact that the project and DEIS is being undertaken to describe about these issues, and the fact that there has been extensive work done to learn about the geology and resources of nearby locations, the lack of information and related discussion renders the DEIS incomplete. The DEIS contains statements about the probable minimal impact of the exploration drilling (including frac-ing and other well development procedures) and the use of a water supply well at the drilling pad location on existing nearby wells and other water rights. The DEIS states that the geological formation which is to be investigated is isolated from the shallower aquifers used for local water supply, and therefore will not have significant impacts on those wells. No basis for these statements has been provided. Furthermore, the data and information provided on subsurface hydrology is extremely limited and conclusions are drawn from it which may not be directly applicable to the project area. It seems problematic to draw detailed conclusions about the surface and subsurface hydrology dynamics in the Eagle Prospect project area from wells, groundwater analysis, stream monitors, etc that are located tens of miles away.

Examples of similar NEPA documents addressing energy resources development in nearby areas with more detailed descriptions of geology and hydrogeology are:

Draft Environmental Impact Statement for the Seminoe Road Natural Gas Development Project, Carbon County, Wyoming , issued by the Bureau of Land Management, November 2005

Draft Environmental Assessment for the Shell-Chevron Oil Shale Research, Development and Demonstration Projects, Rio Blanco County, Colorado CO-110-2006-118-EA, issued by the Bureau of Land Management, August 2006.

Environmental Assessment for the Oil Shale Research, Development and Demonstration Project, White River Mine, Uintah County, Utah UT-080-06-280, issued by the Bureau of Land Management, September 2006

3. Available information on project area geology

The DEIS reference list indicates that a number of potentially relevant existing reports addressing aspects of the hydrology, geology and hydrogeology of the project area were not consulted. An incomplete list of information sources not referenced in the DEIS list of references includes:

Leeman, W. P., 1982, Development of the Snake River Plain-Yellowstone Plateau Province, Idaho and Wyoming: An Overview and Petrologic Model in Cenozoic Geology of Idaho: Bill Bonnicksen and R. M. Breckenridge, Editors: Idaho Bureau of Mines and Geology Bulletin 26, p. 155-177.

Underground Injection - Geographic Information System Mapping, Department of Environmental Quality, Water Quality Division (V. Hasfurther and S. Needham, WWRC, August 1, 1992 through June 30, 1993).

DEQ/WQD Cooperative Agreement: Assessing Vulnerability of Aquifers in Wyoming to Contamination/Phase One: Vulnerability Mapping of Goshen County, Wyoming Using Geographic Information Systems, Department of Environmental Quality, Water Quality Division (S.P. Gloss, V.R. Hasfurther, W. Gribb, L. Munn, R. Marrs, P. Huntoon, January 13, 1992 through March 15, 1993).

Dorr, J.A., Jr., Spearing, D.R., and Steidtmann, J.R., 1977, Deformation and deposition between a foreland uplift and an impinging thrust belt--Hoback Basin, Wyoming: Geological Society of America Special Paper 177, 82 p.; fig. 2, scale 1:73,500(approx.). 5

Froidevaux, C.M., 1977, Geologic map of the Hoback Peak area, Lincoln and Sublette Counties, Wyoming, in Rocky Mountain thrust belt geology and resources: Wyoming Geological Association Guidebook, 29th Annual Field Conference, unnumbered map, scale 1:24,000. 5

Privrasky, N.C., 1963, Geology of the Big Piney area, Sublette County, Wyoming: U.S. Geological Survey Oil and Gas Investigations Map OM-205, scale 1:31,680.

Welder, G.E., 1958, Ground-water reconnaissance of the Green River Basin, southwestern Wyoming: U.S. Geological Survey Hydrologic Investigations Atlas HA-290, sh. 1, scale 1:250,000.

West, R.M., 1968, Geology and mammalian paleontology of the New Fork-Big Sandy area, Sublette County, Wyoming: Field Museum of Natural History Fieldiana-- Geology, v. 29, 193 p.; fig. 2, scale 1:211,200.

4. Disposal of Produced Water, Drilling Wastes and other Wastewater

There is minimal discussion of the need for treatment and disposal of produced water and drilling wastes to avoid possible pollution of local surface and subsurface waters. Given the potential for production of highly saline and/or mineralized water, and the significant amounts of drilling fluids, fuels, lubricants and other potential pollutants required for exploratory drilling, this topic should be addressed in detail. The DEIS

indicates that produced water may be trucked off site for disposal – but does not describe the waste flows and volumes (and amount of traffic) which may be involved in this effort.

The potential amount and quality of produced water from the drilling activities should be explicitly addressed by the DEIS in detail, because of the potential significance of the impacts, both on nearby groundwater resources and on surface waters.

5. Consideration of Alternative Pipeline Routes, Design, Operations and Impacts

Although two alternative pipeline routes (Alternatives B and C) are briefly described, the pipeline details are not provided – for example, the pipeline diameter and material, operating pressures and conditions, flows, and pumping station requirements and characteristics. No detailed description is provided of the reclamation/rehabilitation actions which will be taken in connection with the potential removal of the pipeline following the conclusion of activities.

The discussions of the pipelines and their alternatives should reflect the significance of their overall impact on the environment. Pipelines have impacts even when they perform as planned – for example, there can be related erosion issues, impacts on wildlife movement patterns, auditory impacts due to pumping facilities and visual impacts in addition to the potential for defects. Furthermore, the DEIS should consider the possibility of accidents which could lead to explosions and pollution due to leaks and breaks in the pipeline.

6. Erosion and Sedimentation

The DEIS indicates that standard USFS procedures will be followed for excavation, construction and rehabilitation of road improvements, maintenance and excavation necessary for the road, drill pads, staging areas, pits and related facilities. The DEIS should clearly identify the “Best Management Practices” which will be followed under project implementation. For example, storm water management and erosion control procedures should be explicitly described, rather than using the general term of “Best Management Practices”. There should be an requirement to obtain explicit approval of the Wyoming Department of Environmental Quality for the Operator’s Storm Water Pollution Prevention Plan (SWPPP), instead of merely submitting the SWPPP to WDEQ prior to construction, as indicated in Appendix D (Design Criteria) of the DEIS..

7. Alternative Drilling Procedures

The DEIS does not go into detail on the issues associated with tank lining, leakage and spill prevention activities to avoid pollution and other adverse impacts, other than a general reference to “Best Management Practices”. Specific “Best Management Practices” should be identified. There are, for example, alternative drilling procedures and practices, such as transporting drill cuttings offsite for suitable disposal, or use of pitless drilling procedures, which could avoid or mitigate some of the adverse impacts of the proposed actions. Some options may lead to meaningful changes in secondary impacts, such as (for example) diminished traffic on the site access roads, or diminished

onsite water supply requirements. These options should be identified and discussed, and an explicit decision.

8. Collection of Baseline Data

The DEIS does not provide suitable requirements or even recommendations for the collection of data on surface and subsurface hydrological conditions which will enable the project impacts to be identified. Without such data, it is difficult or impossible to make an objective determination of project impacts, or the success of eventual mitigation procedures. Such baseline data collection should be initiated before any physical activity disturbs the existing environment and resources of concern, and a monitoring program should thereafter be undertaken to identify impacts and mitigation measure effectiveness.

Conclusion

The DEIS does not adequately describe the existing hydrological characteristics of the affected environment, the water resources-related project impacts, elucidate the alternative formulations of this project or identify the mitigation measures which could serve to avoid or diminish its adverse impacts.

Sincerely,
Hydrosphere Resource Consultants, Inc.

John H. Gerstle

Attachment: CV for John Gerstle

cc: Mr. Peter Aengst, The Wilderness Society - peter_aengst@tw.s.org
Ms. Jodee Pring, Wyoming State Engineer's Office - jpring@seo.wyo.gov
Mr. Waterstreet, Wyoming Dept of Environmental Quality - dwater@state.wy.us
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