Attachment 8

Draft Rulison Sampling and Analysis Plan

Response to Comments

from

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(Observation Comments)

Draft Rulison Sampling and Analysis Plan

The following provides Noble Energy Production, Inc., Williams Petroleum RMT, and EnCana Oil & Gas (USA), Inc. ("the Companies) responses to the Colorado Oil and Gas Conservation Commission (COGCC) general comments to the Companies Draft Rulison Sampling and Analysis Plan (SAP). These observation comments were prepared and submitted by Luke Danielson and his Expert Group on December 18, 2007. Responses to the comments outlined below will be incorporated into a revised SAP.

Comment 1: 1. It is also clear that there are some technical issues that are fundamental to the plan on which all the data are not yet on the table. The supposed east-west orientation of the fracture zone, the porosity, and other relevant geophysical data need to be understood. The most detailed information available is certainly what has been logged by the companies that have drilled in the Rulison area. This is undoubtedly a case where the public right to know and the need for good science outweigh any claim of "proprietary data." It is after all the companies that are asking for the right to drill closer to a known source of very significant contamination. They need to put these data on the table

Response 1: **The monitoring scheme in the revised SAP is not weighted. The current monitoring scheme is equally weighted equally over twelve sectors. All sectors will be monitored equally regardless of the geologic grain. Existing data are available in the COGCC files. A request should be submitted to the COGCC for this information. Future geologic, geophysical, and monitoring data collected within the 3-mile radius will also be provided to the COGCC and will available to the public on the COGCC website.**

Comment 2: 2. There is no emergency response or emergency preparedness plan worthy of the name. This is the single most glaring weakness in what is presented. A paper plan prepared without involvement of local government or others who will be called on to implement it will be of little or no value ifthere is some kind of emergency. Of course the local public are among the people who need to respond in accordance with the plan, so they need to know what it says, and have input into how it works. They, not URS, are the true "experts" on local issues.

Response 2: **The Radiological Incident Management Plan was appropriately prepared using guidance from the CDPHE Emergency Preparedness and Response Division. The CDPHE Emergency Preparedness and Response Division has stated in a letter dated January 9, 2008 that "… [the Companies] have developed a thorough Incident Management Plan (Appendix A) for the Rulison Project SAP. This revised plan is more complete and consistent with industry and community practices than the previous draft."**

PRELIMINARY OBSERVATIONS ON THE VARIOUS AGENCY COMMENTS.

CDPHE

Comment 3: 3. We should discuss CDPHE specific comments: especially for Cs-137, borehole gamma threshold, and PROCESS questions (pg.2).

Response 3: **Feel free to contact CDPHE to discuss their comments.**

Comment 4: 4. Unlike CDPHE, we would not recommend that 0.45 micrometer samples be collected. **We recommend the use of total (unfiltered) samples.** Many radionuclides are adsorbed on the surfaces of sediment / colloidal particles [even in ground waters], and the private well users do not consume 0.45 micrometer-filtered water.

Response 4: **Both dissolved and total constituents will be determined, as appropriate.**

GARFIELD COUNTY

Comment 5: 5. DOE *[or some other independent party]* should be doing monitoring, not industry reps

Response 5: **This comment is outside the technical scope of the SAP.**

Comment 6: 6. 14 existing monitoring locations are inadequate to define the hydrogeologic regime.

Response 6: **Monitoring is not being performed to define the hydrogeologic regime. Monitoring is being performed to determine whether Rulison-related radionuclides are released to the local water supply.**

Comment 5: 5. Recommend some additional wells upgradient of present water supply wells (*note comment number incorrectly in original document*)

Response 5: **The shallow hydrogeologic groundwater flow system is not directly connected to the Williams Fork Formation. Monitoring of produced water and natural gas in the gas well provides the earliest warning of the potential migration of Rulison-related radionuclides in the Williams Fork Formation. Thus, additional shallow groundwater monitoring wells are not necessary at this time.**

Comment 7: 7. Recommend quarterly monitoring and reporting

Response 7: **Quarterly monitoring and reporting will be done for all Tier I gas wells for 1 year.**

Comment 8: 8, Monitoring of Tier 1 wells should NOT be discontinued after one round

Response 8: **See response to Comment 7.**

Comment 9: 9. Garfield County posed the following question in their comments: *"Perhaps it makes sense to consider a possibility that the fractures extend farther than theorized by DOE. Would monitoring in Tier I for any unexpected secondary porosity of the Williams Fork Formation at locations east and west of the blast cavity during drilling and logging be in order? If the well bore has encountered fractures that could emanate from the blast cavity, then special monitoring, and potentially, emergency containment procedures might be implemented."*

Response 9: Previously addressed in Garfield County response.

Comment 10: 10. We strongly agree with Garfield County that additional investigation work, if feasible, should be completed during drilling to either verify or more closely estimate assumptions used by DOE in its modeling report.

Response 10: The SAP proposes to collect real monitoring data from deep gas wells. Monitoring data developed under this plan will be reported to the COGCC on a periodic basis and will be place on the publically available website. Government agencies, as well as the public, are free to use the data as appropriate. DOE is free to use these data to verify, revise, or calibrate their model if they so choose.

DOE

Comment 11: 11. pg. 2: Note DOE concern for a "broad program." In fact, a broad program is exactly what is needed.

Response 11: The SAP is a broad program, encompassing drilling monitoring, production monitoring, and areal environmental monitoring.

Comment 12: 12. What happened to relying on the DOE model?

Response 12: The SAP was not developed based on the DOE model. Information regarding the DOE model was provided as background in the SAP.

DEGOLYER AND MACNAUGHTON REPORT

Comment 13: 13. Where is the actual TECHNICAL REPORT that provides the technical details from the drilling of the reentry well, R-EX?

Comment 14: 14. OM report mostly based on **modeling** [with help from Computer Technical Services]; actually data collected by others. Where are raw data?

Comment 15: 15. Based on information from Austral Oil, not the AEC: " .... information furnished was accepted as represented.

Comment 16: 16. 2,059 observations [wellhead pressures, temperatures, gas, water production, etc.] were made from Oct. 4. 1970 to Sept. 27, 1971

Comment 17: 17. pg. 4 From the sample taken February 27, 1971, "hydrogen *[tritium?]* concentration in produced gas declined linearly with cumulative production, however, the carbon dioxide concentration declined to a minimum" then increased. It was noted that "the carbon dioxide concentration did not decline commensurately with the hydrogen concentration so it must be concluded that additional carbon dioxide was evolving either from solution in water or from the carbonates in the reservoir rock."

Comment 18: 18. pg. 4: Lots of water was produced from this test. It was estimated that between 17,000 and 34,000 barrels of water were present in the cavity before testing commenced. "A total of 20,244 barrels were produced."DOE and industry have claimed that these formations do not yield significant volumes of water. [Note that most of the water was produced only during limited dates, not the whole testing period. Interpretation ?]

Comment 19: 19. pg. 4: "It was not possible to measure the temperature of the cavity. Temperatures were observed in the flow string of the well as high as 438 degrees Fahrenheit." Was this temperature due mostly to remnant heat from fission reactions that occurred at least one year earlier? It seems unlikely that AEC was not actually able to measure the cavity temperature. The technical capability obviously existed at that time. *Note that a roughly* 10 *degree* C *rise in temperature causes chemical reaction rates* to *double (or more). Thus, reaction rates between local waters, rock, gas would greatly increase---and dissolved concentrations of nuclides and other inorganic constituents in ground waters would likely increase.*

Comment 20: 20. Table 2, [by Core Laboratories] Composition of Reservoir Gas (prior to nuclear detonation): Shows only the basic gas constituents and neglects to report any radionuclide or trace / minor constituent concentrations.

Comment 21: 21. Also, Table 2 is based on only one analysis from one sample, Report states [pg. 4] that 12 post-test gas samples were collected, analyzed by Teledyne Labs and reported in Table 3---which is NOT included. These data obviously exist in some other reports.

Comment 22: 22. pg. 10: Case 1, 1st paragraph. It is estimated since August, 1974 this 640 acres has a recovery of 44.2 percent of the gas that was displaced which is a total of 6,374,072 <u>thousand</u> cubic feet by 1971 estimates.

Comment 23: 23. pg. 13: In Summary Conclusions they state the well would produce 6.4 <u>billion</u> cubic feet of gas over a 30-year period, or 44.2 percent under the 640 acres, but more reasonable to conclude 4.1 billion cubic feet at 28.7 percent.

Comment 24: 24. References. Note that none of the AEC / USGS Rulison reports are cited.

Response13-24: These comments are directed at the DeGolyer and Naughton report and do not concern the SAP.

GENERAL

Comment 25: 25. Where on Earth is the EPA? Why does EPA not have some set of comments? EPA has been doing at least some limited monitoring in the past? Why are they not commenting here?

Response 25: This comment does not concern the technical content of the SAP.

Comment 26: 26. Similarly BLM. A considerable amount of this activity is either on BLM land or with BLM minerals. Why are they not commenting? Is the pattern of fragmented responsibility and agencies not talking to each other continuing?

Response 26: This comment does not concern the technical content of the SAP.

Comment 27: 27. The Federal, State and local regulatory agencies need to evaluate the companies' financial assurance requirements (in addition to typical requirements) that may be applicable or relevant and appropriate due to the unique potential risks posed by Project Rulison.

Response 27: There are not any additional financial assurance requirements (beyond those normally required by COGCC) for drilling in the Rulison area.

Comment 28: 28. We have seen no documents from COGCC or CDPHE providing review comments on the DOE modeling report. These agencies should indicate their response to that report because the URS Plan is strongly biased toward those report conclusions, which it seems to accept uncritically and in their entirety. It is interesting that there were no regulatory agency comments on the Plan that were related to URS statements regarding the DOE model. By accepting the plan, the agencies would be endorsing the DOE model.

Response 28: The monitoring rationale and approach presented in the SAP does not rely on the DOE model results. The SAP monitoring approach is independent of the DOE model results, regardless of whether they are right or wrong. The monitoring proposed in the SAP is designed to screen for the presence of Rulison-related radionuclides regardless of how they are transported to a well. COGCC and CDPHE should be directly contacted to discuss their comments on the DOE model.

Comment 29: 29. The regulatory agencies need to prepare guidance documents that include a description of each agency's oversight responsibilities and an oversight Plan. Government is an indispensable partner in a successful monitoring plan, and the plan will not be successful without constructive government oversight.

Response 29: This comment does not concern the technical content of the SAP.

Comment 30: 30. Does government plan on doing everything the way it has been done in the past? If not, what changes does government propose to make in the way it operates?

Response 30: **This comment does not concern the technical content of the SAP.**

Comment 31: 31. Similarly the public, academia, civil society. There is no vision presented of any future role for them. Where is a constructive and useful mechanism for their ongoing involvement through the life of the plan?

Response 31: **This comment does not concern the technical content of the SAP.**