

NEPA Coordinator
Bureau of Land Management, Northwest Colorado District
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Sent on 2 December 2013 via email to: blm_co_nw_sage_grouse@blm.gov

Re: Greater Sage-Grouse Draft Land Use Plan Amendment/Draft Environmental Impact Statement

Comments in regard to Appendix G: Surface Reclamation Plan

Commenters' Qualifications. Dr. Richard Alward has a Ph.D. from Colorado State University in Ecology with an emphasis on plant ecology. He has over 20 years experience in the field and is currently a member of the Colorado Oil and Gas Conservation Commission with expertise in vegetation and soil reclamation and conservation. Dr. Tamera Minnick also has a Ph.D. from Colorado State University in Ecology with an emphasis on plant ecology. She has over 20 years of teaching and field experience. She is currently an Associate Professor of Environmental Science at Colorado Mesa University where she teaches upper division courses in Restoration Ecology, Soil Science and Sustainability, and Ecology and Management of Grasslands and Shrublands. She gave a presentation in Laramie, WY, at the *2013 Annual Meeting of the American Society of Mining and Reclamation* meeting entitled "Quantitative monitoring in oil and gas reclamation: What can it do for you?" Both commenters are co-authors on scientific papers and manuscripts relevant to the subject of Appendix G:

Minnick, T.J. and R.D. Alward. 2012. Soil moisture enhancement techniques aid shrub transplant success in an arid shrubland restoration. *Rangeland Ecology and Management* 65:232-240.

Minnick, T.J. and R.D. Alward. Plant-soil feedbacks and the partial recovery of soil spatial patterns on abandoned gas well pads. Under revision for publication in *Ecological Applications*.

Minnick, T.J. and R.D. Alward. The benefits of performance based standards in oil and gas reclamation. Submitted to *Environmental Science & Technology*.

Alward, R.D. and T.J. Minnick. Plant communities recover slowly on abandoned gas well pads in the Piceance Basin of western Colorado. In preparation for *Restoration Ecology*.

Summary

Overall, the surface reclamation plan described in Appendix G is excellent and should be adopted with only minor revisions.

Specific Comments

1.1 Background. The use of performance based standards (*Pg. G-1, Line 15* and elsewhere) is commendable and a very important approach for ensuring successful reclamation.

2.2 Plan Components. 1.d. (Pg. G-3, Lines 25-42) The quantitative measurements required for documenting pre-disturbance conditions is commendable. It is important to know the physical and chemical characteristics of the soils at point locations and linear disturbances. Some additional guidelines may be appropriate to ensure an adequate number of samples are analyzed. Should samples be composited prior to or should chemical and physical tests be done on each soil sample or should soil samples be stratified for different soil map units on large disturbances, especially long linear projects? Please offer some guidance for how to determine an "adequate number of samples should be taken to ensure that changes in soil attributes can be detected." It may be sufficient to state that sampling adequacy should be determined in consultation with the BLM ecologist or other appropriate specialist or to explicitly refer to the appropriate chapter(s) in BLM Technical Reference 1730-1.

2.2 Plan Components. 1.e. (Pg. G-4, Lines 3-13) We concur with your recommendation that the Monitoring Manual available from the Jornada ARS be used to guide quantitative measurements of vegetation cover. Please clarify the statement on *Pg. G-4, Line 10*, that the reference to "one-transect" is because the six core indicators can all be measured along the same transect. As it currently reads, this mention of "one-transect" may be misinterpreted to suggest that a single transect would be adequate to sample and describe the recovering plant community.

2.2 Plan Components. 4.b. (Pg. G-5, Lines 9-18) We recommend that monitoring and reporting be conducted more frequently than once every three years. As currently described, 10 years after a site has been reclaimed, the BLM will have only received three reports on the state of re-vegetation (after years 2, 5 & 8). This is an inadequate number of measurements to be able to assess whether re-vegetation is progressing and whether additional actions or interventions might be necessary. It certainly is not a sufficient number of samples for an operator to determine

whether the trajectory of recovery is satisfactory. Indeed, at this monitoring frequency it may take 30 years to obtain enough data points to estimate whether recovery is continuing or has stalled.

3.0 *Timeframes, Success Criteria, and Requirements.* (Pg. G-7, Lines 7-9) It is important to specify the criteria that BLM will use to inform an operator that they need to repeat attempts at seeding, etc. Is there a threshold that must be met after the first monitoring report (at the end of year 2)? What if an operator waits until after the 3rd monitoring report (at the end of year 8) to reseed or control weeds? Will this be satisfactory to the BLM?

3.1.1.3 *Requirements (Phase I).* 12. (Pg. G-9, Lines 19-24) It is important to plan that livestock will need to be excluded until reclamation is successfully completed. Lessees will need to be informed of the likely duration of this exclusion. It may be several decades after the initial disturbance before livestock can return to some areas (assuming 30 years of production from a well-pad and then 30 years of monitoring final reclamation when there will be sufficient data collected to assess re-vegetation success).

3.2.2 *Success Criteria (Final).* 9.a. (Pg. G-14, Lines 32-36) This requirement indicates that vegetation on the reclaimed site must be at least 80% of the desired vegetation cover, according to the DPC. In order to ensure that this is an objective and rigorous standard, it should be explicitly stated whether this 80% must be evaluated statistically using a predetermined value for alpha (e.g., $\alpha = 0.05$) and whether this threshold must be met for a minimum number of years in order to conclude that a site has a "self-sustaining desirable vegetation groundcover" as stated on Pg. G-11, Line 4. [Similar consideration should be given to *Success Criteria #10*, Pg. G-15, Lines 5-8 as well as to 3.1.2.2 *Success Criteria (Phase II)* Pg. G-10 & 11.]

We agree that it is appropriate to evaluate cover for recovering woodland and shrubland sites based on their capability in an herbaceous state since it may take many decades to fully recover woody plant cover. However, completely omitting any requirement to assess the presence of desired woody species precludes drawing conclusions about the re-establishment of "plant community successional processes to progress toward advanced community states." (Pg. G-15, Lines 5-6). Rather than measure cover of desired woody species, we recommend a requirement for density estimates of desired dominant shrubs and/or trees. This can be conducted using quadrats along the already established quadrats or techniques such as those described in Chapter 12 of the Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems, Volume II.

4.0 *Reclamation Status Reports* (Pg. G-18 & 19) Please consider developing a standardized monitoring data reporting format and providing this to operators. This will facilitate assessment of reclamation success(es) associated with different geographic areas, differences and similarities in revegetation techniques, differences in timing of the beginning of reclamation (both seasonal and annual).

General. Please specify whether these requirements in this Surface Reclamation Plan apply only to future disturbances (those that are initiated after this RMP is approved and implemented), or whether it also applies to existing disturbances, especially those disturbances for which final reclamation has not begun as well as recovering disturbances that have not yet successfully met these Phase II requirements. Enforcing this plan retrospectively, in addition to prospectively, would best ensure that GRSG habitat loss is minimized during the life of this RMP.

We greatly appreciate the opportunity to comment on this RMP and EIS. We also want to emphasize that we are very pleased with the thought and care that has gone into development of the Surface Reclamation Plan described in Appendix G. We highly recommend adoption of this plan with just the minor clarifying revisions suggested above.

Sincerely,

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