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PM
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Subject
Scoping Comments for Buffalo RMP
revision

Please find our comments attached. If you have any difficulties opening or reviewing the document, please let me know.

Thanks,

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(See attached file: PRBRC_scoping_comments_for_Buffalo_RMP.pdf) (See
attached file: FortCreekScoping.pdf)

ENCOURAGING RESPONSIBLE DEVELOPMENT TODAY ~ FOR TOMORROW

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January 5, 2009

Bureau of Land Management
Attn: RMP Project Manager
Linda Slone
2987 Prospector Drive
Casper, WY 82604

Electronic copy to: BRMP_Rev_WYMail@blm.gov.

RE: Scoping Comments for Buffalo RMP Revision

Dear Ms. Slone:

Thank you for the opportunity to submit scoping comments on the revision to the Bureau of Land Management's Buffalo Field Office Resource Management Plan (hereafter "RMP") and related environmental impact statement. We appreciate the opportunity to participate in this process. These comments are submitted on behalf of our organization and behalf of our members who live, work, and/or recreate on or near areas managed by the Buffalo Field Office.

The Powder River Basin Resource Council is a Wyoming grassroots organization that promotes responsible extraction and beneficial use of our state's abundant mineral resources. Most of our approximately 1,000 members are rural landowners in Wyoming and many of them will be impacted by this RMP revision. We have been closely involved in BLM permitting of CBM development, coal mining, and related impacts. We have attached recent scoping comments regarding the Fortification RMP Plan amendment and ask that these scoping comments be incorporated and considered in this larger RMP revision.

The Powder River Basin of Wyoming is fast becoming one of the largest mineral development industrial areas in the country. Development of Bureau of Land Management (BLM) mineral estate over the past years has continued to escalate and has caused significant impacts to air, water, wildlife, and land quality in the region as well as quality of life. BLM must take a hard look at both these past impacts and potential future impacts through the Environmental Impact Statement accompanying this RMP revision. We strongly urge BLM to strengthen its overall mitigation and reclamation measures, create and enhance mechanisms to better manage public lands for multiple use in the Powder River Basin and proactively assess past impacts and anticipate the impacts of development before they occur so those impacts can be prevented or mitigated.

The Buffalo RMP must address development of mineral resources in the Powder River Basin, while effectively protecting the land, water and air quality in addition to citizens' health,

Page 1 of 33

livelihoods and private property rights. **Measures to prevent, reduce and mitigate degradation to air quality, ground and surface water quality, soil and vegetation must be incorporated into the plan.**

Importantly:

- An accurate assessment of past impacts and baseline conditions on air, water and soil quality data must be collected and monitoring plans must be established to preserve the integrity of our resources, assess changes and, when necessary, take action to restore them in a timely fashion.
- Preventing impacts to and waste of all waters of the state must be given the highest priority in this RMP.
- Documentation of the content of drilling and hydraulic fracturing constituents must be required in order to maintain worker and resident safety. A Health Impact Assessment (HIA) must be conducted as an integral part of the Buffalo EIS.
- The integrity of agricultural and grazing opportunities as well as wildlife must also be safeguarded to protect the long-term economic success of our state.

The recently completed *Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans* may prove to be a valuable guideline to craft best management practices for energy development under the Buffalo RMP as well as elsewhere in Wyoming. Likewise, the newly released Colorado assessment, *Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper*, is an excellent primary reference to better manage public health in the Powder River Basin. Please also review the references cited throughout this document.

We request that the BLM consider the following comments and refer to the recommended resources to assist you in establishing the very best development practices under the Buffalo RMP and to maximize the effectiveness of the area's management for years to come.

1. Baseline data collection, an accurate assessment of CBM development impacts to date and effective monitoring programs must be established

The importance of baseline data collection for areas that are not currently under development cannot be over-emphasized. The Buffalo BLM office permitted CBM development to proceed without requiring the collection of adequate baseline data. Additionally, a detailed assessment of all past and projected future impacts is necessary. The Buffalo BLM has permitted thousands of CBM wells under the existing RMP but has no current data on numbers of acres impacted, miles of new roads constructed, disturbed acreage from well construction, miles of new powerlines, miles of new pipelines, numbers of compressor stations or other relevant and required tracking data to ensure the previous EIS has not exceeded predicted impacts. BLM must provide that data in the new EIS and additionally provide the numbers of CBM reservoirs, numbers of lost domestic, livestock and artesian water wells, how many of those wells have been replaced and the quality of water well replacement. The RMP EIS must also disclose and reveal the impacts to soil from CBM discharged water, the impacts to ephemeral drainages and the impacts to perennial drainages. Impacts to fisheries and wildlife and recreation must also be revealed and disclosed.

Without a baseline for comparison, impacts from changes to the management of land, air and water in the Powder River Basin will be impossible to quantitatively assess. Negative impacts are less likely to be evaluated and addressed in an adequate and timely fashion.

Baseline data, well-conceived monitoring programs, action thresholds and responsive action plans must be established for air, surface water, riparian areas, ephemeral channels, fisheries, groundwater, soils, cultural resources, vegetation, and wildlife.

2. Air Quality Monitoring

Monitoring and mitigation of air quality in the Powder River Basin is tremendously important. Governor Freudenthal has recently made it a state priority to address air quality impacts state-wide. In his most recent 2009 budget proposal, the Governor has requested nearly 4 million dollars to be spent to establish a statewide air quality monitoring program to address cumulative effects of energy development on air quality. (See Priority #5 in the DEQ Air Quality Division Budget Request: Assess the Air Quality Impacts of Energy Development). The Governor highlighted the Powder River Basin as the first area where comprehensive monitoring is needed. We urge BLM to work with the state DEQ and develop a comprehensive monitoring plan for both site-specific and cumulative air quality conditions in the Powder River Basin. This monitoring plan should be an integral part of the new RMP and is necessary to plan for new development in the area.

The placement of monitoring stations, operation and oversight of these stations, averaging times and air quality constituents measured must all be considered with great care. The BLM and Wyoming Department of Environmental Quality must work together to ensure the best possible outcome and benefit for this monitoring program to protect Wyoming's air and the health of Wyoming state residents both human and non-human.

Reference:

Governors Supplemental Budget Request

<http://ai.state.wy.us/budget/pdf/0910SupplementalRequest/2009-10%20Spl%20V1%20FINAL.pdf>

3. Mitigating Impacts to Air quality

Air quality is a foremost concern in both urban and rural communities. As we have seen, Wyoming is no exception. Increasing levels of NO_x, ozone and particulate matter have been documented in areas around the state, including within the Buffalo RMP area. Recently, levels of ozone exceeding federal EPA National Ambient Air Quality Standards have drawn considerable attention to public health impacts in Sublette County. While air pollutants have associated adverse effects individually, the cumulative effects of poor quality air are harder to measure and may be even more serious.

Potential effects can include mortality associated with respiratory symptoms, cardiovascular disease and chronic obstructive pulmonary disease (COPD). Excess instances of hospitalization,

emergency room visits, aggravation of respiratory symptoms and illness, altered lung function, infant mortality and low birth weight. Sensitive subpopulations include the elderly, children, outdoor exercisers and those with preexisting respiratory or cardiovascular disease.

Both the individual effects and collective impacts of declines in air quality must be considered in the Buffalo RMP. Children, geriatric residents, outdoor recreationist, tourists, oil and gas field workers, agricultural and other outdoor workers are all at increased risk from degraded air quality in the Powder River Basin. Pollutant sources, effects, potential for concentration increases with respect to climatic events (e.g. temperature inversions) and mitigation must be understood as a precaution to protect public health. Activities from multiple mineral extraction industries including natural gas compressor stations and dehydration units, coal mining operations, and uranium mining in addition to coal-fired power plants and increases in unpaved road traffic create potential for concerning cumulative air quality impacts. Several air pollutants, their sources, potential impacts and relevance to the RMP have been described below.

According to the recent publication of *Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper*:

“Air surrounding oil and gas production areas is particularly susceptible to toxic emissions. Fugitive natural gas emissions may contain many contaminants, such as methane and other hydrocarbons (ethane, propane, butane), hydrogen sulfide (H₂S), and water vapor. These emissions can come from production sites, disposal pits or pipelines. In Garfield County, for example, many of these sites tend to be near population centers and adjacent to streams and other bodies of water (see Garfield County map on page 12 below). Some natural gas wells produce a condensate that can contain complex hydrocarbons and aromatic hydrocarbons such as benzene, toluene, ethyl benzene and xylene (BTEX). Natural gas flaring can produce many hazardous chemicals including polycyclic aromatic hydrocarbons (PAHs, including naphthalene), benzene, toluene, xylenes, ethyl benzene, formaldehyde, acrolein, propylene, acetaldehyde and hexane. Glycol dehydrators, used to remove water from natural gas, can produce BTEX leaks into the air” (Witter et al. 2008)

Nitrogen Oxides (NO_x)

NO_x Sources:

Major NO_x, mainly NO₂, emission sources include vehicular traffic (as a result of the combustion of diesel and gasoline), coal mine blasting activities, power generation, natural gas combustion, and other industrial activities.

NO_x Impacts:

Among other concerns, NO_x impacts include contributing to ground level ozone generation. High and low levels of NO_x have also been associated with respiratory problems and aggravation of Chronic Obstructive Pulmonary Disease (COPD). Indoor NO₂ exposure (which can result from outdoor to indoor air flow) can result in increased asthma symptoms in children (Belanger et al. 2006).

Relevance to the Buffalo RMP:

Among other sources, increased vehicular travel, coal mines, drilling operations, great numbers of diesel and gas compressor stations, and natural gas power substations have

1056

likely increased NO₂ emissions in areas of development in the Powder River Basin – yet we have seen no data from BLM on the past impacts or data on cumulative projected impacts. The existing RMP had an adaptive management component for monitoring air quality but that seems to have fallen short of any actual increased monitoring to real data. The new Buffalo RMP must disclose the current levels of air quality regarding NO_x and ozone and particulate matter.

NO₂ Resource/reference:

Belanger et al. 2006. Association of indoor nitrogen dioxide exposure with respiratory symptoms in children with asthma. *American Journal of Respiratory and Critical Care Medicine*. 173(3): 297-303.

Organic Solvents/Volatile Organic Compounds (VOC's)

VOC Sources:

VOC's are a category of pollutants which include compounds such as chloroform, BTEX, and formaldehyde. VOC's can be both primary and secondary pollutants. Major sources of VOC's include biomass and fossil fuel combustion, traffic, construction materials, household chemicals, solvents, industrial activities and biogenic sources (vegetation).

VOC Impacts:

Acute and chronic impacts include headache, dizziness, upper respiratory tract infection, nausea and cancer. Many VOC's are associated with adverse reproductive effects. VOC's also contribute to ground level ozone formation.

Relevance to the Buffalo RMP:

Increased diesel and gasoline combustion associated with industry traffic, compressor stations, power generation, venting and flaring of natural gas, drilling and stimulation fluids, mud pits, oil, gas and condensate production, purification (refining, water and carbon dioxide removal) will contribute to elevated levels of VOC's in the Powder River Basin.

VOC Resource/references:

Schettler et. al. *Generations at Risk: Reproductive Health and the Environment*. Cambridge: MIT Press, 1999.

Ozone (O₃)

Ozone Sources:

Ground level ozone is a secondary pollutant formed from highly non-linear, complex chemical reactions between VOC's and NO_x in the presence of heat and sunlight in the lower layers of the atmosphere. Ozone follows both diurnal cycles related to sunlight, temperature and traffic patterns as well as seasonal cycles with peaks in months of high heat and sunlight. Temperature inversions can worsen instances of ozone formation. 'Climate change may increase the frequency and intensity of ozone episodes' (Knowlton et al 2004).

Ozone Impacts:

Ozone is a phytochemical oxidant that was first associated with damages to vegetation. Ozone is also reactive with materials and other biological material including the lining of the lungs. Ozone is associated with hospital admissions, respiratory or asthmatic symptoms, abnormal lung development and mortality. Due to the nature of the co-pollutants associated with ozone, it is often hard to separate the effects of the co-pollutants (motor vehicles and industry) from ozone. “Although new National Ambient Air Quality Standards (NAAQS) for ozone is 75 ppb, the EPA acknowledges that for O₃ (and PM_{2.5}) levels substantially below NAAQS are still associated with increased mortality, cardiovascular events, and respiratory problems” (Witter et al. 2008)

Relevance to the Buffalo RMP:

As precursors for ozone increase due to industrial activities in the Powder River Basin, ozone levels have likely risen and are likely to continue to rise. Sublette County ambient air monitors have detected ozone levels exceeding National Ambient Air Quality Standards on several occasions. Under such conditions recommendations to modify human behavior are made as health precaution. Outdoor exercisers must be asked to remain indoors and children must not be permitted to go outside for recess. A system of real monitoring throughout the basin and conveying ozone alerts to rural landowners must be required.

Ozone Resource/references:

Jaffe, Mark. ‘From Calif. to Denver: Ozone woes become regional.’ *The Denver Post*. November 1, 2008.

Knowlton et al. 2004. Assessing ozone-related health impacts under a changing climate. *EHS*. 112(15): 1557-1563.

Merril, Chris. ‘Pinedale people fume on Ozone.’ *Casper Star Tribune*. November 4, 2008.

Witter, Roxana, Kaylan Stinson, Holly Sackett, Stefanie Putter, Gregory Kinney, Daniel Teitelbaum, Lee Newman. Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper. September 15, 2008.

Particulate matter both PM_{2.5} and PM₁₀

PM_{2.5} and PM₁₀ Sources:

Particulate matter can arise from fine matter of any variety, notably dusts, fossil fuel combustion (especially diesel), and other industrial activities. The size, shape, density and aerodynamics of particles (as well as the geometry of the respiratory tract and respiration rate) determine the depth of lung penetration, ability for the lung to remove the particle and the severity of short and long-term impacts of particles in the lung. PM_{2.5} includes all particles of 2.5 microns or less. PM₁₀ includes all particles of 10 microns or less. Thus, a measure of PM₁₀ would include the PM_{2.5}, and PM_{2.5} includes all ultrafine

particles. In the attempt to lower black smoke PM₁₀ particles from diesel exhaust, more PM_{2.5} is now generated.

PM_{2.5} and PM₁₀ Impacts:

PM_{2.5} is now considered more severe than PM₁₀ based on sheer particle size alone. PM_{2.5} can penetrate more deeply into the lung creating irritation and also making it harder to remove. If particles carry other harmful chemicals, these too will be transported deeper into the lung. Heavy metals, organic compounds, sulfates and the properties such as acidity can compound the negative effects of the particle carriers. Particulate matter is associated with hospitalization, mortality and respiratory symptoms. In a study of schoolchildren who ride diesel school buses, increased exposure to diesel exhaust was associated with greater incidence of respiratory symptoms and asthma (Wargo 2002). The trucking industry has seen numerous studies that associate adverse outcomes including lung cancer with diesel exhaust exposure of truck drivers (Steenland et al. 1990, 1998). Even more striking, instances of increases in mortality associated with poor air quality and particulate matter have been noted (Dockery et al 1993 and Samet et al. 2000).

Relevance to the Buffalo RMP:

Particulate matter of many kinds is generated by mineral development and powder generation activities. Road dust from granite and scoria will likely increase as it has already in areas the Powder River Basin. Scoria, or silicate dust, is of particular concern for outdoor industry and agricultural workers due to the structure which can result in adverse lung conditions, silicosis or mortality. Precautions to limit diesel emissions and mitigate road dust and other sources of fugitive dust must be taken to protect local resident and especially worker health.

PM_{2.5} and PM₁₀ Resource/references:

- Dockery et al. 1993. An association between air pollution and mortality in sin U.S. cities. *New England Journal of Medicine*. 329: 1753-1759.
- Ezzati and Kanmen. 2001. Indoor air pollution from biomass consumption and acute infections in Kenya: an exposure-response survey. *Lancet*. 358: 619-624.
- Samet JM et al. 2000. Fine particulate air pollution and mortality in 20 US cities, 1987-1994. *New England Journal of Medicine*. 343: 1742-1749
- Steenland, Kyle et al. 1990. Case-control study of Lung Cancer and Truck Driving in the Teamsters Union. *American Journal of Public Health*. 80(6): 670-674)
- Steenland, Kyle et al. 1998. Diesel Exhaust and Lung Cancer in the Trucking Industry: Exposure-Response Analyses and Risk Assessment. *American Journal of Industrial Medicine*. 34:220-228.
- Wargo, John. 2002. Children's Exposure to Diesel Exhaust on School Buses. Environment and Human Health Inc. North Haven, CT.

Air Quality Baseline data

At minimum, baseline data must include the seven criteria air pollutants:

- Nitrogen Oxides (NO_x)
- Sulfur Dioxide (SO₂)
- Particulate matter both PM_{2.5} and PM₁₀
- Ozone (O₃)
- Lead (Pb)
- Carbon Monoxide (CO)

Additionally other compounds of concern may include:

- Hydrogen Sulfide (H₂S)
- Methane (CH₄) (powerful greenhouse gas)
- Triethyleneglycol (used in gas dehydration plants)
- Polycyclic Aromatic Hydrocarbons (PAH's)
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- Volatile Organic Compounds (VOC's)
- BTEX's/ diesel range organics (Benzene, Toluene, Ethylbenzene, Xylene)
- Semivolatile Organic Compounds (SVOC's)
- Hazardous Air Pollutants (HAP's)
- Heavy metals

Other compounds or elements of potential concern as determined through relevant literature, industry usage or substantiated public concern.

4. The RMP/EIS must fully disclose past impacts and analyze future impacts to water resources and must develop mitigation measures to protect surface and groundwater resources in the Powder River Basin

Water has intrinsic value, especially in an arid state like Wyoming. Most of Wyoming is technically classified as a desert because of limited rainfall and dry, windy conditions. Thus, most of our members rely on groundwater for their homes and livelihoods and they are especially concerned about impacts to groundwater resources.

The Powder River Basin has experienced prolonged periods of drought, which will most likely only increase because of climate change impacts. New water sources may be needed and unfortunately may not be available if water has been depleted or contaminated from industrial operations. The EIS must fully discuss past and projected future aquifer drawdown and recharge in order to detail the significance of these impacts.

Aquifer drawdown is already a concern with hundreds of feet in subsurface aquifer depth already noted. With both large-scale coal strip mining and coal bed methane dewatering occurring simultaneously, irreparable aquifer depletion is a significant impact in the Powder River Basin. BLM committed in previous EIS documents, including the Wyodak and Powder River Basin Oil & Gas EIS to monitor and track groundwater drawdown but the annual and adaptive

1056

management components of those requirements have not been fulfilled by BLM. The new RMP must disclose the extent of drawdown and assess future water supplies related to extensive groundwater depletion from CBM development. The EIS should disclose whether groundwater wells used for other beneficial purposes, artesian or otherwise, have been lost due to CBM development and coal mining. The EIS should project whether wells will be lost as a result of future development and if so, what water sources are available in the near or long-term for replacement.

According to the Draft EIS, South Gillette Area Coal Lease Applications

“Site-specific water-level data collected from coal monitoring wells by mining companies and the BLM in the general South Gillette analysis area...indicate that the groundwater flow directions in the Wyodak coal have been greatly influenced by surface mine dewatering and groundwater discharge associated with CBNG development. Groundwater levels observed near active mining areas prior to 1997 were likely due to mine dewatering alone and the groundwater flow direction within the coal aquifer was typically toward the mine pits. By year 2000, groundwater level decline rates had dramatically increased because drawdown caused by widespread CBNG development west of the mines was overlapping with the drawdown caused by mining operations....Roughly 30 years of surface mining and the more recent CBNG development has resulted in complete dewatering of the coal aquifer in localized areas, particularly near the mines’ pit where the coal seams are structurally highest” (Draft EIS, South Gillette Area Coal Lease Applications p. 3-82).

The USGS and BLM also have deep groundwater monitoring systems that must be expanded. Using this monitoring information, and other scientifically defensible information, BLM must develop measures to mitigate impacts from severe drawdown and develop criteria where dewatering should be halted. BLM must also comply with all other legal requirements, including requirements for maintaining hydraulic balance and reclaiming to pre-mining conditions found in SMCRA.

5. Ground Water Quality: The Paramount Concern

Given the nature of coalbed methane, deep gas and oil extraction, in-situ uranium development and other potential mineral extraction processes, ground water *quality* protection is of paramount concern. The extreme cost, difficulty and limited result/effectiveness of ground water clean-up efforts should be sharply noted and every opportunity taken to prevent contamination. The superfund sites associated with the Massachusetts Military Reservation on Cape Cod or that of Rocky Mountain Arsenal near Denver are examples of very expensive, time consuming groundwater clean-up programs with relatively limited groundwater remediation given the effort.

Many groundwater contamination plumes must simply self-attenuate as chemicals move through the system or are degraded. This process is dependent on subsurface geology, the compounds of contamination, pH and temperature of the water and groundwater recharge and flow rates. Realistically, much groundwater contamination is irreversible on a human timescale. Therefore, all possible care to prevent aquifer contamination must be taken in this RMP for the protection of the state’s water resources now and in the foreseeable future. Documentation of concerns

associated with groundwater contamination and the oil and gas industry are mounting in the U.S., Canada and around the globe. The constituents in drilling and hydraulic fracturing fluids must be revealed and regulated to allow for energy development without imperiling our precious water supplies. Hundreds of millions of gallons of these fluids are pumped into the earth each year and BLM has an obligation to require energy producers to reveal the content of these fluids, require an intimate understanding of the subsurface geology and aquifer flow rates before drilling and stimulation activities take place.

Ground Water baseline data collection

The following ground water parameters must be assessed before changes in resources management/development ensue:

- pH
- Temperature
- Total Dissolved Solids (TDS)
- Total Suspended Sediments (TSS)
- Ions and Polyatomic ions (Iron, Sodium, Calcium, Magnesium, Potassium, Carbonates, Bicarbonates, Sulfates, Nitrates)
- Iron bacteria
- Heavy metals including Lead, Mercury (Methyl mercury, elemental mercury and mercury ions)
- Arsenic
- Selenium
- Polycyclic Aromatic Hydrocarbons (PAH's)
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- BTEX's/ diesel range organics (Benzene, Toluene, Ethylbenzene, Xylene)
- Methane
- Volatile Organic Compounds (VOC's)
- Semivolatile Organic Compounds (SVOC's)
- Radionuclides
- Chlorinated compounds/pesticides

Other compounds or elements of potential concern as determined through relevant literature, industry usage or substantiated public concern

Baseline conditions for private water and stock wells must be established and monitoring wells established.

Resources:

Constituents found in groundwater in association with oil and gas development from drilling and stimulation (hydraulic fracturing products):

http://www.endocrinedisruption.com/products/chemicals_used_in_natural_gas_development.html

Articles illuminating concern with groundwater from oil and gas development show that incidence are not isolated.

1056

The original ProPublica investigatory article by former Wall Street Journal reporter, Abraham Lustgarten describes the potential for ground and surface water pollution associated with deep gas drilling and hydraulic fracturing fluids and pits. This article illuminates that such occurrences are not isolated events and discusses how EPA exempted oil and gas operations from federal legislation in place to protect human health and the environment, leaving the states responsible for taking such protective measures. This article was picked up by Business Week and the Denver Post. A slideshow of photos from the Pinedale Anticline has also been published online.

Original ProPublica Article:

<http://www.propublica.org/feature/buried-secrets-is-natural-gas-drilling-endangering-us-water-supplies-1113/>

Slideshow of the pinedale anticline:

<http://www.propublica.org/>

Business week’s coverage of the issue:

http://www.businessweek.com/magazine/content/08_47/b4109000334640.htm?chan=magazine+channel_in+depth

Denver Post’s Coverage of the issue:

http://www.denverpost.com/breakingnews/ci_11001835

6. Surface Water Quality

Surface water bodies are a vital resource in the arid climate of the Powder River Basin as are the fisheries that are supported by many of these tributaries and ephemeral streams. Extreme care to preserve the waters and fisheries of the Powder Basin – especially the Powder River – must be taken. Both treated and untreated discharges to waters, reservoirs and soils must be carefully monitored to prevent stream degradation from erosional runoff, sediment loading and ‘non point’ seeping from discharge locations and holding areas of produced water. Salts, carbonates and sulfates are of particular concern with waters of this area.

The following water quality data must be collected from all surface water sources before adjacent development or discharge is allowed to occur:

- pH
- Temperature
- Total Dissolved Solids (TDS)
- Total Suspended Sediments (TSS)
- ions (Iron, Sodium, Calcium, Magnesium, Potassium, Carbonates, Bicarbonates, Sulfates, Nitrates)
- Coliform Bacteria
- Iron bacteria
- *E. coli*
- Arsenic
- Selenium

- Lead
- Mercury (Methyl mercury, elemental mercury and mercury ions)
- Polycyclic Aromatic Hydrocarbons (PAH's)
- methane
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- BTEX's/ diesel range organics (Benzene, Toluene, Ethylbenzene, Xylene)
- Methane
- Volatile Organic Compounds (VOC's)
- Semivolatile Organic Compounds (SVOC's)
- Radionuclides
- Chlorinated compounds/pesticides

Other compounds or elements of potential concern as determined through relevant literature, industry usage or substantiated public concern.

Discharges and protection of Streams, Ephemeral Drainages, Water Bodies and Fisheries

Streams and fisheries are tied to the livelihood of much of the state. Without clean water sources, irrigators struggle to grow crops successfully. Ephemeral drainages can provide water and forage and are a vital asset to a ranch or farm. Riparian areas are important for wildlife and domestic livestock as well. Preserving stream, pond and lake health is important for sustaining our fisheries. Angling and other water related recreation activities are important to residents, visitors and bring in considerable economic income for the state. According to a recent U.S Fish and Wildlife survey, over 200,000 anglers cast their lines in our state each year.

Therefore, baseline data to preserve our waters, riparian areas, fisheries and ephemeral drainages is imperative. All streams of class 3B or better must undergo an overall baseline assessment prior to adjacent development or direct discharge including but not limited to:

- Macro and micro invertebrate analysis
- Fish and amphibian population sample
- Stream flow and velocity measurements
- Channel assessment
- Water parameter analysis with particular attention to salts and hydrocarbons

All other water bodies or channels with classifications between 3C and 4C including wetlands, ponds and ephemeral stream channels that may be affected by development or receive produced water discharge must also be assessed for channel characterization, baseline soil and water quality and invertebrate communities if water is present.

The Wyoming Game and Fish and U.S. Fish and Wildlife Service should take a role in establishing or sharing existing baseline data with the BLM and monitoring of the streams and fisheries over the course of the project.

Protection of the Powder River is of paramount importance. Please see the attached comments on the unique nature of this river and her fisheries.

References:

U.S. Fish and Wildlife Service. 2008. Wildlife Watching in the U.S.: The Economic Impacts on National and State Economies in 2006 Addendum to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

Andrew, Anita S. et al. 2005. Origin of salinity in produced waters from the palm valley gas field, Northern Territory, Australia. *Applied Geochemistry*. 20:727-747.

Rice, C.A., M. S. Ellis, and J. H. Bullock, Jr. 2000. Water co-produced with coalbed methane in the Powder River Basin, Wyoming: preliminary compositional data. USGS Open-file report 00-372.

Rice, C.A. 2003. [Production waters associated with the Ferron coalbed methane fields, central Utah: chemical and isotopic composition and volumes](#). *International Journal of Coal Ecology*. 56 (1-2):141-169.

The Ruckelshaus Institute of Environment and Natural Resources. 2005. Water Production from Coalbed Methane Development in Wyoming: A Summary of Quantity, Quality and Management Options. University of Wyoming.

7. Management of Discharged Water

Flooding of water onto private landowners from outfalls or reservoirs must be prevented and landowners should have an active role in determining how water is put to beneficial use on their property. Residents should also have the authority to require water be piped to another location for beneficial use and not discharged onto property including their bottomlands or drainages if they or downstream landowners do not desire it. Likewise, residents that would like produced water for use on their property must be afforded access to such water and must prevent it from trespassing and causing harm to their neighbors. Water handling practices including reinjection, water treatment, water piping, true beneficial use to the specification of the landowner and carefully managed storage must all be considered. Hamilton Dome has been re-injecting a portion of its water since the late 1970's successfully and with no unrealistic economic burden. The Ruckelshaus Report included in the reference disc estimates the cost of discharge, reservoir construction and reinjection and the assertion by developers that reinjection is impractical based on economics is not validated. Other states and countries require reinjection for ALL produced waters and viable energy development continues.

Minimizing erosion, impact to vegetation, and other impacts of discharged water is not only important for private landowners, but also for public landowners. The BLM must develop mitigation measures to minimize impacts to public lands. This mitigation is necessary for BLM to comply with requirements under FLMPA to prevent undue or unnecessary degradation to public lands.

Resources:

The Ruckelshaus Institute of Environment and Natural Resources. 2005. Water Production from Coalbed Methane Development in Wyoming: A Summary of Quantity, Quality and Management Options. University of Wyoming.

Schneider, Thomas J. 2001. Coalbed methane produced water reinjection.

8. Soil Quality

BLM must ensure the scientific integrity of its environmental analyses. In particular, appropriate soil quality testing is necessary to determine background conditions and to assess future impacts. Soil quality must be assessed and appropriately based on the intended or current use of the land and/or potential impacts to the area. Soils must be sampled by soil horizon or between logically established depth zones. Soil samples should be kept distinct by depth or soil layer and the data applied in a manner relevant to the sample situation. For example, agricultural soils must be sampled and data applied with a different understanding than samples taken to determine the range of a leaking underground storage tank, rogue hydraulic fracturing fluids or a toxic spill. Major concerns should be reduction of impact to soils from salts, hydrocarbons, drilling and hydraulic fracturing fluid constituents and inundation from direct discharge, flooding or rogue waters from produced water use or storage. Drilling and other various pits must be reported, locations documented with GPS, lined and soils tested before development and after reclamation is complete. Closed loop systems must be required.

At minimum, soil data should include the following:

- Establishing a general soil horizon profile through a pit or through core sampling
- Texture of each horizon (composition of clay, silts and sands)
- Structure of each horizon

The following chemical analyses should be conducted for *each* soil horizon or established depth.

- pH
- Ions and Polyatomic ions (Iron, Sodium, Calcium, Magnesium, Potassium, Carbonates, Bicarbonates, Sulfates, Nitrates)
- Iron bacteria
- Heavy metals including Lead, Mercury (Methyl mercury, elemental mercury and mercury ions)
- Arsenic
- Selenium
- Polycyclic Aromatic Hydrocarbons (PAH's)
- Gasoline Range Organics (GRO)
- Diesel Range Organics (DRO)
- Volatile Organic Compounds (VOC's)
- BTEX's/ diesel range organics (Benzene, Toluene, Ethylbenzene, Xylene)
- Methane
- Semivolatile Organic Compounds (SVOC's)
- Radio nuclides

Other compounds or elements of potential concern as determined through relevant literature, industry usage or substantiated public concern

Soil salinization

An abundance of literature abounds on soils, salinity and various methods of reclamation. Many investigations have noted vegetation impacts from altered soil conditions and toxicity related to saline-sodic irrigation water application” (Vance et al 2008). Also “multiple year applications of saline-sodic water produced consistent trends of increased soil EC and SAR values to depths of 30 cm, [and] reduced surface infiltration rates...” (Vance et al 2008). Constant water flow and flooding have caused soil to become anaerobic and resulting in vegetation changes. (Vance et al 2008). “Significant differences ($p \leq 0.05$) were determined between irrigated and non-irrigated areas for EC, SAR, infiltration rates... at most sites.” (Vance et al 2008). Soil salinization from oil-and gas-production activities may influence native flora and fauna (Aschenbach 2006) and may impede natural vegetation or agriculture in the area afterwards. “CBM saline produced water discharges constitute extreme risks and impacts to the entire ecosystem” (Schneider 2001).

The very serious and often irreversible impacts of soil salinization may not be fully understood by the BLM or operators in the Powder River Basin. Therefore, as extensive explanation is provided to illustrate impacts of CBM water discharge on soils and vegetation. Please see Appendix 1.

References:

- Brady, Nyle C. and Ray R. Weil. *The Nature and Properties of Soils*. 13th ed. New Jersey: Prentice Hall, 2002. (Several chapters are provided on the attached disc in pdf form)
- Chhabra, R. 2005. Classification of Salt-Affected Soils. *Arid Land Research and Management*. 19: 61-79.
- [Ganjugunte GK, Vance GF, King LA](#). 2005. Soil chemical changes resulting from irrigation with water co-produced with coalbed natural gas. *Journal of Environmental Quality*. 24(6): 2217-27.
- [Ganjugunte GK, King LA, Vance GF](#). 2008. Cumulative Soil Chemistry Changes from Land Application of Saline–Sodic Waters. *Journal of Environmental Quality*. 37:S-128-S-138.
- Patz, M.J. , K.J. Reddy and Q.D. Skinner. 2006. Trace elements in coalbed methane produced water interacting with semi-arid ephemeral stream channels. *Water, Air, and Soil Pollution* 170: 55-67.
- [Vance GF, King LA, Ganjugunte GK](#). 2008. Soil and Plant Responses from Land Application of Saline–Sodic Waters: Implications of Management. *Journal of Environmental Quality*. 37:139-148.

9. Vegetation

Baseline vegetation studies documenting species composition, percent cover by species, forage species present, threatened or endangered species and vegetation health must be conducted prior to development to aid in reclamation and restoration of soils and vegetation. Vegetation

assessments must also be conducted in areas that will see produced water discharge and below reservoirs. In particular, BLM must assess the spread of noxious weeds from existing industrial development and must develop management practices to avoid introduction and propagation of invasive, non-native, non-forage or salt tolerant species to address the spread of noxious or unfavorable vegetation in the future.

Reference:

Ladenburger, C.G., A.L. Hild, D.J. Kazmer and L.C. Munn. 2006. Soil salinity patterns in Tamarix invasion in the Bighorn Basin, Wyoming, USA. *Journal of Arid Environments*. 65:111-128.

Aschenbach, T.A. 2006. Variation in growth rates under saline conditions of *Pascopyrum smithii* (Western wheatgrass) and *Distichlis spicata* (Inland saltgrass) from different source populations in Kansas and Nebraska: Implications for the restoration of salt-affected plant communities. *Restoration Ecology*. 14: 21-27.

Chourdhuri, G.N. 1968. Effect of Soil Salinity on Germination and Survival of Some Steppe Plants in Washington. *Ecology*. 49: 465-471.

Chrispeels, Maarten J. and David E. Sadava. *Plants, Genes, and Crop Biotechnology*. Sandbury MA: Jones and Bartlet Publishers, 2003. p. 140-170, 518-536.

Jacobsen, Thorkild. Salinity and Irrigation Agriculture in Antiquity. *Bibliotheca Mesopotamica*, Vol. 14. 1982. pp 6,-15, 53-55. (Research conducted in 1957-58).

10. Cultural Resources

Current management of the cultural, historic, archeological and paleontological resources must be updated. Degradation of artifacts, rock art, fossil rich areas and other historical resources must be prevented in compliance with legal requirements. Each resource should be documented photographically and location marked with GPS before development begins. However, publishing of such documentation or increasing road access could actually result in more damage to site locations. Great care to protect the integrity of these irreplaceable and historically invaluable resources must be taken. Buffer zones around each site must be established and staff dedicated to resource protection must be designated. Management of these resources should be proactive and tribal involvement should be sought. Also, the expertise among your staff must be heeded and staff given the resources and freedom to create a truly protective management program for cultural resources in the area.

The section on cultural resources in the 2007 Casper Resource Management Plan is an excellent baseline for cultural resource protection upon which the Powder River RMP can build. The sound elements of this plan should be emulated and improved upon in this RMP.

The Casper ROD can be accessed at:

http://www.blm.gov/rmp/casper/documents/cfo_rod_arnp/cfo_rod_arnp.pdf

11. Native American Concerns

The appropriate tribes must be contacted and invited to be involved as cooperators in the development of this RMP especially with respect to the historical value of the cultural resources in the area. In particular, tribal consultation is necessary for development in and around the Pumpkin Buttes area, which is recognized by the tribes as traditional cultural property.

12. Wildlife

Wildlife resources are an extremely vital asset for our state and national economies. According to a recent U.S. Fish and Wildlife survey publication, 87.5 million people spent \$122.3 billion dollars hunting, fishing and watching wildlife nationwide. In Wyoming, 762,000 people hunted, fished and/or watched wildlife. Of these 643,000 engaged in wildlife watching. Preserving our open spaces and maintaining our wildlife populations is necessary not only to responsibly steward an ever shrinking global treasure, but also to sustain our economy beyond the boom and bust fluctuations of energy development.

An assessment of current wildlife populations in areas that have been impacted by mineral development and a baseline study of populations in areas that have not been impacted by mineral development should be gathered. Wildlife population information must be documented in the EIS, including large and small mammals, migratory and resident fowl, reptiles and amphibians must be collected or obtained from the Wyoming Game and Fish and/or the U.S. Fish and Wildlife Service. BLM must consult with these agencies during the development of the RMP and related EIS. There is little to no data collected on impacts of current and recent CBM development on mule deer populations, antelope populations and elk populations. BLM has an obligation to meet commitments for adaptive management made in previous management documents for monitoring the impacts to these populations. As mentioned previously an assessment of the impacts to wildlife from the extensive mineral development that has taken place must be conducted. Please see our attached scoping comments on the Fortification RMP Plan Amendment.

Many studies have been done on the impacts of various species from oil and gas development including: Dr. David E. Naugle, Brett L. Walker, and Kevin E. Doherty's work on the greater sage-grouse, Sawyer et al. 2006 on mule deer, Sorenson et al. 2007 on caribou in Alberta, Inglesinger and Anderson 2004 on various birds, Zou et al. on produced waters and West Nile virus. Please contact David Naugle at the University of Wyoming for more references on wildlife impacts and the complete citations for those mentioned here.

BLM needs to take the lessons from these various studies and develop effective and scientifically-defensible measures that will mitigate or prevent impacts to wildlife populations.

References:

U.S. Fish and Wildlife Service. 2008. Wildlife Watching in the U.S.: The Economic Impacts on National and State Economies in 2006 Addendum to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

- Aldridge, C. L., and M. S. Boyce. 2007. Linking occurrence and fitness to persistence: a habitat-based approach for endangered greater sage-grouse. *Ecological Applications* 17:508-526.
- Doherty, K.E., D.E. Naugle, B.L. Walker, J.M. Graham. 2008. Greater sage-grouse winter habitat selection and energy development. *Journal of Wildlife Management* *In Press*.
- Holloran, M. J., R. C. Kaiser, and W. A. Hubert. 2007. Population response of yearling greater sage-grouse to the infrastructure of natural gas fields in southwestern Wyoming. Completion report. Wyoming Cooperative Fish and Wildlife Research Unit, Laramie, WY, USA.
- Moynahan B. J. 2004. Landscape-scale factors affecting population dynamics of greater sage-grouse (*Centrocercus urophasianus*) in northcentral Montana, 2001–2004. Dissertation, The University of Montana. Missoula, USA.
- Moynahan, B.J., M.S. Lindberg, and J.W. Thomas. 2006. Factors contributing to process variance in annual survival of female greater sage-grouse in north-central Montana. *Ecological Applications* 16:1529-1538.
- Naugle, D. E., C. L. Aldridge, B. L. walker, T. E. Cornish, B. J. Moynahan, M. J. Holloran, K. Brown, G. D. Johnson, E. T. Schmidtmann, R.T. Mayer, C. Y. Kato, M. R. Matchett, T. J. Christiansen, W. E. Cook, T. Creekmore, R. D. Falise, E. T. Rinkes, and M. S. Boyce. 2004. West Nile virus: pending crisis for greater sage-grouse. *Ecology Letters* 7:704-713.
- Naugle, D. E., B. L. Walker, and K. E. Doherty. 2006. Sage-grouse population response to coal-bed natural gas development in the Powder River Basin: interim progress report on region-wide lek-count analyses. Unpublished Report, University of Montana, Missoula, USA.
- Walker, Brett et. al. 2004. From the Field: Outbreak of West Nile virus in greater sage-grouse and guidelines for monitoring, handling, and submitting dead birds. *Wildlife Society Bulletin*. 32(3): 1000-1006
- Walker, Brett et. al. 2007. *Greater Sage-Grouse Population Response to Energy Development and Habitat Loss*, *J. Wildlife Management*. 71: 2644.
- Walker, Brett et. al. 2007. West Nile Virus and Greater Sage-Grouse: Estimating Infection Rate in a Wild Bird Population. *Avian Diseases*. 51:000-000.
- Western Association of Fish and Wildlife Agencies. Memo: Multi-state Sage-grouse coordination and research based recommendations. January 28, 2008. *Using the Best Available Science to Coordinate Conservation Action that Benefit Greater Sage-Grouse*

1056

Across States Affected by Oil & Gas Development in Management Zones II-II (Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming).

Zou, Li, Scott N. Miller, and Edward T. Schmidtman. (2006). Mosquito larval habitat mapping using remote sensing and GIS: implications of coalbed methane development and West Nile virus. *Journal of Medical Entomology*. 43(5): 1034-1041.

Cumulative impacts of habitat fragmentation

As more and more areas of the state are industrialized, each contiguous region becomes more and more valuable. This means careful management of areas in the Powder River Basin is vital due to the ecological significance of its position, its unique formations and archeological and paleontological resources and the increasing value of its biological resources. This may also mean more species have likely become dependent on the area for habitat as surrounding areas have seen disturbances from industrialization. However, bioregions are never entirely isolated and the dynamism of nature must be considered in management decisions. Species will move across the landscape coinciding with successional changes in that landscape whether these stages are human or nature induced (Schmitz 2005). You cannot simply set aside a parcel of land in isolation and expect the populations to stay within the geopolitical borders established. To maintain effective habitat, it must be actively maintained or replaced at the same time as other portions of the habitat are exploited (Schmitz 2005).

13. Ongoing Monitoring & Data Collection

As baseline data is collected and an assessment of current impacts is established for all of the above impact areas, monitoring programs must be established to fill in the gaps of information necessary to assess and mitigate impacts to the resource. Monitoring must continue throughout the life of this RMP to allow for adaptive management. Response thresholds and action plans for each resource must be created and the BLM must actively engage in the monitoring and management process.

Water, air, and soil data should be collected regularly in the first five years of development at a site and periodically after this initial period.

If concerning changes are documented in the data, then data collection should become more frequent and remedial actions taken to address the concern.

14. Staff, Inspection and enforcement

Proper inspection and enforcement staff must be hired for the duration of the RMP. A plan of this importance and detail must have knowledgeable staff dedicated to the protection of air, soil and water resources. Without the necessary staff and resources, even a well-designed and well-meaning management plan will fail. The BLM needs the staff and resources to operate beyond the realm of permitting to ensure proper management of our public resources.

To ensure proper adherence to the management plan when it is adopted, specific BLM personnel must be delegated in the Powder River Basin and charged with duties to monitor

compliance, track reclamation, communicate with developers, landowners, grazing permit holders to ensure the best reclamation and land use outcome possible.

With current levels of human and monetary resources, the BLM simply cannot keep up with scheduled environmental inspections in the Powder River Basin in light of the rapid development and incentives to continue permitting. In fact, common agency practices are such that:

“[t]he BLM Field Offices are able to inspect active wells once every 2-10 years on average and inspect active wells for environmental compliance once every 4-59 years” (WORC 12).

According to internal inspection report summaries, BLM recognizes the importance of inspections, but acknowledges the agency lacked the personnel to complete necessary inspections and enforcement even before CBM development really took off. According to internal annual Inspection Strategy Summaries from the BLM Buffalo Field Office (BFO) as early as 2003,

‘[h]igh priority environmental [inspections] on abandoned and OSITA [oil shut-in temporary abandonment] conventional wells will not be accomplished due to the same issues’ (BLM BFO Inspection Summaries).

However, BLM is aware of the importance of such inspections.

‘[b]ased on experience and complexity/controversy, we also need to try to accomplish environmental inspections on 100% of the coal bed methane (CBM) project plans of development (PODs) within a year of approval and development.’

The BLM BFO also stressed that

‘BOP [blowout prevention] inspections on CBM is essential due to the potential for blow outs that have occurred on Fee minerals and for higher pressures expected due to the drilling in drainage areas where water tables have been pumped down to maintenance level’ (BLM BFO Inspection Summaries).

Unfortunately by FY 2004, with little more than 30 individuals in all sectors of permitting and inspections and with thousands of wells being permitted each year, BLM did not have the appropriate staff and resources to conduct necessary inspections of new PODs, or monitor Conditions of Approval for development.

‘Due to the extensive workload in CBNG well permitting (3000 APDs) in FY04, all high priority environmental inspections will not be completed’ (BLM BFO Inspection Summaries).

And in a 2004 Inspection Summary the BLM writes that

“[o]ther issues that may impact ability to complete planned numbers [of inspections] are: staff turnover, filling of vacant positions, experience level of new employees (training)” (BLM BFO Inspection Summaries).

1056

The number of full time surface compliance technicians at the BLM BFO has hovered between one and zero over the past five years with oil and gas inspectors gravitating near a dozen. The Powder River Basin spans eight million acres and with over 51,000 CBNG and 3,200 conventional wells projected for this area by 2012 (Kniola and Gil 2005), no way exists for so few staff to conduct inspections and enforce compliance in the region.

Of the inspections conducted, non-compliance is alarmingly high. This documents the need for inspections. According to a study done on surface compliance in the Powder River Basin in 2005 by Kniola and Gil, 530 of 628 wells and facilities inspected were out of compliance. Action to correct such violations and revenue collected by the state for excess damages are rare giving operators little incentive for high performance. Only one operator out of 20 was found to be compliant with both wells and facilities on the locations inspected (Kniola and Gil 2005).

Additionally, the public plays an active role in overseeing development on public lands. As a result of our past difficulties in obtaining information, we encourage BLM to create a publicly available database that is maintained on a monthly or quarterly basis.

Inspections and Enforcement References:

BLM BFO Inspection Strategy, Comments Summaries FY2003-FY2008

Kniola, Benjamin E. and Julian Serafin Gil. Surface Compliance of Coal Bed Natural Gas (CBNG) Development in North Central Wyoming. 2005.

Law and Order in the Oil and Gas Fields: A Review of Inspection and Enforcement Programs in Five Western States. A report by the Western Organization of Resource Councils. November 24, 2004.

15. Maintain and expand current land designations, establish buffer zones to prevent hard boundaries between heavily developed and undeveloped land and establish wildlife migration corridors.

Current Wilderness Study or Wilderness Areas, Areas of Critical Environmental Concern, Wild and Scenic, Rare and Uncommon or other designations should be maintained. Buffer zones around such designated area must be established to prevent harsh boundaries between these specific land use designations and development. Habitat migration corridors and protected areas for sage-grouse and other species must be established and maintained.

Fencing and habitat fragmentation from other development throughout the area, in addition to the projected loss of security habitat under the recommended alternative, may have compounding effects on a species' ability to freely move within the area and communicate with other population centers, reducing genetic diversity and limiting the success of the species in the area.

These effects may not be seen immediately upon initial disturbances. Lag times in response to a perturbation in the system are much longer with longer-lived species such as ungulates (Schmitz 2005). This means we may not see the effects on the population for a period of time which may

make the system appear highly resistant to the disturbance, when in fact a longer lag time exists between the disturbance and some very serious consequences. Caution must be exercised to prevent such misunderstanding of data or apparent success in the early years of monitoring the reaction to disturbance to an area.

16. Split Estate: BLM must demand protection of private property

According to the BLM, around 800,000 acres of Federal surface will be considered in this plan as well as millions of acres of Federal minerals underlying private surface. This creates millions of acres of split estate whose surface owners –whether they are state or privately held– should receive added protection during the development of the subsurface Federal minerals.

Maintenance and improvement of Wyoming residents’ health, land and livelihood must be the focus of this RMP.

Split estate concerns have been improved by modest legislation in recent years; however, conflicts, concerns and anxieties about split estate negotiations still arise. The BLM must provide surface owners with portions of Federal subsurface minerals with information and resources regarding split estate. At the very least, access to the very best surface treatment, minimized industrial footprint, proper water storage, handling and availability for beneficial use, elimination of water trespass from either Federal or private land onto areas where it is not wanted and excellent reclamation requirements must be available to all surface owners without litigation, excessive negotiation or frustration. Thoughtfully planned meetings to unite mineral developer and landowner visions regarding land and water use, land entry/access and other areas of concern must be conducted. Such meetings should explore the needs and jobs of both developers and landowners so that seemingly arbitrary concerns or practices can be understood and given relevance to all parties. Developers AND their subcontractors should be present at such meetings and developers should be educated in the common courtesies of western lands, e.g. leave a gate how you find it, leave no trace, be respectful of the land, wildlife and livestock.

Action to prevent spillover effects from groundwater contamination, air contamination, land devaluation and water trespass from adjacent surfaces with development onto other private surfaces must be taken and incidence of harm handled swiftly and justly.

The BLM has a great opportunity and arguably an urgent responsibility to mitigate the impacts of split estate in Wyoming. It is within the right of the BLM to demand better surface treatment for public and private lands within the Powder River Basin and the BLM should step up and set an extraordinary example with the Powder River Basin RMP to do so.

References:

PeeGee Ranch v Devon Energy Production Company, L.P Campbell County Civil Action No. 26607. State of Wyoming Sixth Judicial District. March 19, 2007.

Runge, Carlisle Ford. 1984. Energy Exploration on Wilderness; “Privitization” and Public Lands Management. *Lande Economics*. Vol. 60, No. 1, 56-68.

- Sax, Joseph L. 1971. "Takings, Private Property and Public Rights." Yale Law Journal 81: 149-186.
- Southern Ute Indian Tribe vs Amoco Production Company*. United States Supreme Court decision on June 7, 1999 of No. 98-830.
- Williams v. Maycock*. Wyo Const at 8 -1 even CBM water determined in Williams Production RMT Company v. Willam P. Maycock, II, Sith Judicial District, Civil Action No. 26099 – Oct. 11, 2005.

17. Phased Development

NEPA requires agencies to consider, evaluate and disclose to the public "alternatives" to the proposed action. 42 U.S.C. §§ 4332(2)(C)(iii) & (E). CEQ regulations require an agency to "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed action. 40 C.F.R. §1502.14. Additionally, the evaluation of alternatives must constitute a "substantial treatment," presenting the impacts of the alternatives in comparative form "sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and public." *Id.*

The duty to consider a range of alternatives is accompanied by a duty to "study ... significant alternatives suggested by other agencies or the public during the comment period." *DuBois v. U.S. Dept. of Agriculture*, 102 F.3d 1273, 1286 (1st Cir. 1996).

Alternatives are important because:

Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork – even excellent paperwork – but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on [an] understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

40 C.F.R. § 1500.1(c) (emphasis added); see also 40 C.F.R. § 1500.2(e).

One of alternatives considered by BLM in this RMP and related EIS must be phased development.

Phased development is a critical management option to minimize impacts, particularly short-term cumulative impacts, of industrial development. BLM must take a hard look at and develop a phased development alternative that considers a planned and appropriate manner of developing federal minerals in the Powder River Basin.

Phased development cannot be successfully implemented with an oversimplified time table. Such management endeavors require baseline data, planning and diligent monitoring for success. Development between areas must be punctuated by a significant time buffer to be determined by a pre-determined level of reclamation success, forage species recovery and wildlife re-colonization. Adaptation of the populations to the development and potential recovery of

vegetation from development cannot be prescribed with inflexible timelines. Such re-colonization and re-vegetation must be assessed and monitored locally. Once ground cover and forage vegetation are recovering and wildlife populations have returned to the area in sufficient numbers as prescribed by the management plan, the next area may be opened for that phase of development. Reclamation and restoration may involve fencing around reclamation areas & livestock rest in certain areas during the process. Without such provisions, habitat will be consumed more quickly than usability or use is reestablished, which will result in a devastating reduction in biodiversity, creating instability in the entire ecosystem (Schmitz 2005).

An excellent reference for phased development is the recently released *Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans*. Please review this document and incorporate the relevant elements into the RMP for the Powder River Basin. Phased development was also recently considered and approved in the BLM's Pinedale EIS.

Another publication called *Integrating Biodiversity Conservation into Oil and Gas Development* put forth by the Energy and Biodiversity Initiative, a collaboration of energy companies and conservation organizations is an excellent resource with examples of development coinciding with efforts to conserve regional and local biodiversity.

Resources:

Bureau of Land Management. Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement and Proposed Amendment of the Powder River and Billings Resource Management Plans. November 7, 2008.

18. Preservation of biodiversity

Biological diversity is crucial for habitat stability and maintenance of biological populations in an area. The diversity-stability hypothesis – the link between species diversity and ecosystem stability – was formally presented by Robert McArthur in 1955 (Schmitz 2005). Habitat fragmentation results in a loss of species which in turn leads to a simplification of an ecosystem which reduces resilience (the ability of the system to return to the original or an alternate stable state following a disturbance per unit time, or rate of rebound) and resistance (the ability to withstand a disturbance) making the entire system fragile. Given the limited redundancy, (number of species that perform in the same niche creating a more diverse and, therefore, more stable food web) water scarcity and highly erosive soil in an arid ecosystem, this area is innately fragile and, thus, highly impacted by disturbances. Recovery time to such disturbances may be slow or impractical which is not adequately addressed in the tri-phased development considerations in the EA.

Also, techniques such as directional drilling can be used to reduce the footprint of energy development extensively. *Drilling Smarter: Using Directional Drilling to Reduce Oil and Gas Impacts in the Intermountain West* is an excellent resource providing concrete examples and valid recommendations. A recent article in *Field and Stream* also illuminates the feasibility of directional drilling and its positive impacts on wildlife habitat, but notes a lack of governmental will to require its use.

1056

In conjunction with water loss in the area, mismanagement has the potential to diminish ecosystem functioning. There are many ecosystem services of biodiversity which are unmarketable and, therefore, difficult to assign a market value. Such services include climate control, disturbance recovery, water regulation, erosion control, soil formation and stabilization, nutrient cycling, recreation and genetic resources (Schmitz 2005). More significantly, the loss of these benefits could spill over to affect area landowners and the local water ways, especially the Powder River. Please see the references on the accompanying disc for many of these resources.

Resources:

Herring, Hal. 2008. A New Direction. *Field and Stream*. December 2008-January 2009. p 34-35.

Integrating Biodiversity Conservation into Oil and Gas Development. 2003. Energy and Biodiversity Initiative.

Recommendations for Development of Oil and Gas Resources within Crucial and Important Wildlife Habitats, over 100 pages on how to develop with wildlife habitats. 2004. Wyoming Game and Fish Department.

Schmitz, Oswald. 2005. Lecture. Environmental Problem Solving. Yale University Fall 2005.

Management practices to reduce impacts associated with oil and gas development in the Fortification creek special management. Bureau of Land Management.

Molvar, Erik M. 2003. Drilling Smarter: Using Directional Drilling to Reduce Oil and Gas Impacts in the Intermountain West. Biodiversity Conservation Alliance.

19. Combining infrastructure

The use of existing roads and infrastructure to minimize new development, combined water and gas pipelines, power lines etc. can greatly reduce the surface impact to an area. **Combined infrastructure should become standard practice in the Powder River Basin, due to the extensive surface disturbances that have already occurred.**

20. Reclamation and bonding

To ensure the best treatment of the Powder River Basin, meaningful and adequate reclamation bonds for each new development must be determined by a professional engineer and collected in order to ensure successful reclamation. This must also include bond considerations for reclamation of discharge locations, stream channels and outfalls as well as interim and final reclamation for roads, well pads, compressor stations, dehydration plants, power plants, power lines and other infrastructure associated with uranium, coal, CBM, or other mineral operations.

Reclamation is difficult in general, but even more so in an arid environment. Creating appropriate bonding, reclamation requirements and designated inspections and enforcement staff to oversee development from start to finish will improve the resource management plan. Appropriate seed mixes, watering, livestock rest, fencing, and prevention of invasive species must be undertaken and reclamation and vegetation experts must be consulted. The most

important element of reclamation is reducing the industrial footprint from the start to require the least amount of reclamation work after development activities have halted. Bonding for the cost of reclamation will ensure that the state and taxpayers do not foot the reclamation bill if a company faces financial failure.

An important local resource published by the Lake Desmet Conservation District is available in their office and contains articles by a number of respected authors from various areas of expertise. This and other local knowledge should be consulted to create a very prescriptive reclamation plan for the Powder River Basin.

Additionally, BLM must comply with appropriate provisions of federal law, including SMCRA, in determining reclamation plans for mineral development.

References:

- Sharing Solutions for Successful Plantings in the Northern Great Plains: A Resource Guide. Science Summit, sponsored by Lake Desmet Conservation District. May 2003.
- Kotzer, Eli. 2005. Artificial kidneys for the soil — solving the problem of salinization of the soil and underground water. *Desalination*. 185: 71-77.
- Konukcu, F., J.W. Gowing and D.A. 2005. Rose. Dry drainage: A sustainable solution to waterlogging and salinity problems in irrigation areas? *Agricultural Water Management*. In Press, Corrected Proof, Available online 21 November 2005.
- Prathapar, S.A. et al. 2005. Mechanically reclaiming abandoned saline soils in Pakistan. *Irrigation and Drain*. 54: 519-526.
- Zahow, M.F., and C. Amrhein. 1992. "Reclamation of saline sodic soils using synthetic polymers and gypsum," *Soil Science Society American Journal*, 56: 1257-1260.

21. Suitability Criteria

BLM needs to fully develop and utilize unsuitability criteria for mineral resources. Although this is a requirement of SMCRA for federal coal resources, we encourage BLM to conduct a suitability analysis for all federal minerals in this RMP. Minerals should be unsuitable for development when they are uneconomic to recover or when extreme environmental or socio-economic impacts would occur from their development. For instance, BLM should refrain from leasing minerals in ephemeral drainages, within 100 feet of streams, or on high gradient lands that have potential for excessive erosion.

BLM should prevent development in irrigated or naturally sub-irrigated surface lands unless the agency can make findings similar to SMCRA § 510(b)(5):

- 510(b)(5) the proposed surface coal mining operation, if located west of the one hundredth meridian west longitude, would -
(A) not interrupt, discontinue, or preclude farming on alluvial valley floors that are irrigated or

naturally subirrigated, but, excluding undeveloped range lands which are not significant to farming on said alluvial valley floors and those lands as to which the regulatory authority finds that if the farming that will be interrupted, discontinued, or precluded is of such small acreage as to be of negligible impact on the farm's agricultural production, or (B) not materially damage the quantity or quality of water in surface or underground water systems that supply these valley floors in (A) of subsection (b)(5).

22. Interagency collaboration

The effects of development are often segregated by arbitrary geopolitical boundaries mineral ownership or both. However, ecological impacts do not stop at the borders of our state or federal lands, nor does development on private land remain isolated from impacts on neighboring properties or public lands. Devaluation of property from adjacent development, water trespass, air quality degradation and groundwater pollution and habitat fragmentation also do not stop at state lines, county lines or fence lines. The larger geologic, ecologic and other impacts must be considered cumulatively over the RMP area and throughout the state.

While each Plan of Development (POD) attempts to give some necessary local consideration to development, the cumulative impacts of all the POD's combined must be anticipated, considered and monitored. Not all areas of land are equally valuable for forage resources or water access for wildlife and cattle. Not every acre of a ranch is as equally productive as the next. Small percentages of surface disturbance in each POD add up to be far more than the total acreage depending on what area is disturbed and its potential likelihood to be restored to its original condition after development activities cease. Such local and cumulative impacts must be considered and collaboration among agencies, counties, and states must be taken beyond the formalities of the NEPA (Nation Environmental Policy Act) process and delve into meaningful sharing of information experience and expertise. Organizational efforts such as the Interagency Work Group (IWG), must be revitalized, given proper staffing and used to benefit both Wyoming and Montana. The BLM field offices involved with development in the Powder River Basin, the Jonah Field and the Pinedale Anticline have a wealth of experience and collective knowledge. Use it. Do not repeat missteps in management in the Powder River Basin when they can be avoided.

23. Oil and Gas

The past and foreseeable effects of oil, gas and coalbed methane development in the basin must be assessed and anticipated and potential concerns addressed proactively. While oil and gas development bring revenue and jobs to the state, other sectors of the economy are also very important and must be encouraged. Public lands must be managed to support multiple uses.

It is BLM's obligation and responsibility to consider first the people and lands of Wyoming for *both* the short and long-term success of the state and the preservation of Wyoming's land and livelihood. It is not acceptable to develop public or private surface lands for oil and gas without the utmost mindfulness and requirement of the best development and reclamation practices available.

Also, the revenues from wildlife, hunting and fishing, tourism and other benefits of undeveloped land such as natural services such as aquifer recharge, water purification, erosion control etc must be considered.

24. Anticipated Future Development

In addition to the mineral development and current uses for the land, the Buffalo RMP must look to the future for potential land uses such as carbon sequestration, wind power generation, transmission lines, underground coal gasification, increased uranium development, more coal-fired power plants, enhanced oil recovery, methanogenesis to increase CBM production as well as deep gas and oil or gas shale developments. Each of these uses carries significant impacts to the land, air, water, visual resources and quality of life in the Powder River Basin and these must be anticipated and addressed by this RMP.

Carbon sequestration

Carbon sequestration is an evolving approach to mitigating impacts caused by the release of carbon dioxide and other greenhouse gases. Wyoming has taken the lead in developing a legal framework for geologic carbon sequestration, but many gaps in this framework still remain. Additionally, much of the needed geologic and hydro-geologic data necessary for the proper long-term storage of carbon dioxide underground has yet to be obtained. Given that the BLM is a surface estate owner in the Buffalo RMP area, it is imperative that the agency determine whether carbon sequestration will be allowed on federal lands and if so under what conditions. BLM needs to consider the latest scientific information and develop mechanisms to mitigate impacts to land and water resources.

Uranium, bentonite and other mineral development

In-situ and other forms of uranium mining as well as bentonite, hardrock mining or shale formation developments may also develop in the Powder River Basin. Considerations for impacts of these operations must be taken into account and the unique impacts of each development type researched, understood and anticipated. The same baseline considerations, monitoring and inspection and enforcement must be taken as mentioned above for oil and gas with particular attention to groundwater and soils. Additionally, cumulative impacts of this development with existing types of development (CBM, coal, etc.) must be assessed and mitigated.

Our members have a number of concerns about uranium mining in the RMP area. Many of these concerns stem from environmental problems at Wyoming's only currently operating in-situ uranium mine. In July, the Wyoming Department of Environmental Quality and Power Resources (dba Cameco) entered into a \$1.4 million settlement agreement stemming from a notice of violation issued for a "number of major long-standing environmental concerns," including delayed water restoration, insufficient bonding, and spills and underground excursions of fluids used in the mining process.¹ Even after Cameco was issued this substantial fine by the state, the company still experiences frequent environmental problems, including spills and excursions. As evidence of the level of problems at the Smith Ranch-Highland facilities, Cameco

¹ See Wyoming Department of Environmental Quality Land Quality Division Settlement Agreement and related Investigation Report, *available at* <http://deq.state.wy.us/out/LQenforcementactions.htm>.

1056

has a “Spill Committee” which meets monthly to discuss regularly occurring spills and preventative measures that should be taken.

According to a study by the National Research Council, “The primary risk associated with in situ uranium mining is the potential for contamination of adjacent groundwater.” The study identified that

If the system of injection and production wells is not properly designed and constructed, the pregnant lixiviant may escape into the sandstone aquifer, carrying with it dissolved uranium and radium. Small amounts of several trace metals are also present in the lixiviant, including lead, selenium, molybdenum, and arsenic.

To date, all ISL projects have had “excursions” and “spills” and other events that could threaten waters resources during operations. The track record of the Smith Ranch-Highland site may be a good indication of what can happen during an ISL project:

Over the years there have been an inordinate number of spills, leaks and other releases at this operation. Some 80 spills have been reported, in addition to numerous pond leaks, well casing failures and excursions. Unfortunately, it appears that such occurrences have become routine. (DEQ) currently has two large three-ring binders full of spill reports from the Smith Ranch-Highland operations.

Additionally, ISL projects leave water resources threatened after operations. To date, no ISL project has returned groundwater quality to baseline conditions. In fact, it is doubtful that some wellfields may ever be returned to restored conditions. For instance, the Wyoming DEQ noted that one wellfield at the Smith Ranch-Highland site has not made restoration progress even after ten years: “Wellfield C has now been in restoration for ten years. The 2007 Annual Report states that the ground water quality is similar to ‘end of mining’ wellfield conditions.”

Elevated levels of arsenic, molybdenum, selenium, vanadium, and uranium are often present at higher levels than baseline even after groundwater restoration. Additionally because of the mining solution, elevated levels of sodium, carbonate, or sulfate are present. Mining may also increase total dissolved solids and change pH levels.

BLM needs to disclose impacts to water quality from past mines and projected impacts from future mines in the RMP/EIS. How likely is contamination of areas outside the mining zone before it can be cleaned-up? Are geologic strata capable of confining water pollution either in the short or long-term? What is the success of previous projects and anticipated success for new projects in the RMP area?

References:

National Research Council 2007 Report prepared for the NRC: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/contract/cr6870/>

Wyoming Department of Environmental Quality investigative report of the Smith Ranch-Highland ISL operations, November 2007:

<http://deq.state.wy.us/out/downloads/LQ%20ROI%20Power%20Resources.pdf>

Underground Coal Mining and In-situ coal gasification

During the lifetime of the new RMP, efforts may be made to develop deep reserves of coal unsuitable for surface mining. We have heard about potential in-situ coal gasification projects and other potential underground mining activities. BLM should not lease coal reserves for purposes of in-situ coal gasification until it is proven that the process will not contaminate groundwater or cause subsidence impacts. Past in-situ gasification trials resulted in groundwater contamination and other impacts and we are deeply concerned about the future prospects of these processes until the technology can be proven. At this time, we believe it is premature for BLM to identify areas of federal coal reserves for leasing for the purpose of in-situ coal gasification in this RMP.

Additionally, BLM must develop protective measures to mitigate impacts of leasing coal for the purposes of underground mining (room and pillar or longwall mining). If not managed appropriately, underground mining could cause devastating subsidence or other impacts.

25. Coal-fired power plants and other large industrial facilities

BLM must include siting criteria in its RMP for the location of coal-fired power plants or other large industrial facilities, including, but not limited to natural gas compressor stations, carbon sequestration facilities, uranium processing facilities, or waste water treatment plants. These industrial facilities have the potential to dramatically impact existing land uses and therefore they should be appropriately sited in a manner to minimize impacts to existing land uses and public health and safety of neighboring landowners.

26. The RMP/EIS must fully analyze socio-economic impacts of increased industrial activity

Local hiring is becoming increasingly difficult as Wyoming continues to experience a workforce shortage. According to an article in the Casper Star-Tribune, “A strong Wyoming economy combined with a shortage of skilled workers resulted in work force shortages in many industries, particularly the energy industry...”²

Industry recruits workers from neighboring states and nationally as they cannot find the workers here in Wyoming.³ To attract workers, extractive industries typically pay more than other economic sectors, with frequent overtime because of the labor shortage, and this has contributed

² See Jeff Gearino, *Searching for Workers*, CASPER STAR TRIBUNE, January 3, 2007.

³ See, e.g. Bob Moen, *Power Shortage: Uranium and wind industries lack workers*, CASPER STAR TRIBUNE, Sept. 5, 2008:

Chuck Foldenauer of Cameco Resources, which operates the only active uranium mine in Wyoming near Glenrock, said uranium mining companies are in need of workers for jobs ranging from construction to chemists... Cameco... is currently looking to fill 30 additional positions... In trying to fill the jobs, Cameco is recruiting in Wyoming and nationwide, working with colleges and improving wages and benefits.

to a large wage gap in communities like Gillette and Casper. For instance, the median income in Campbell County is now \$71,800 up from \$53,200 ten years ago before the CBM boom really took off. However, the majority of people in the county and across Wyoming still earn much less than that. Current economic information shows that although Wyoming's per capita income has grown as a result of the energy boom, most Wyoming residents are not benefiting. A recent report from the Equality State Policy Center, *The State of Working Wyoming*, explains that "Those who do not work in the energy industries or who do not own shares of production see little of the additional income generated by the boom."⁴ Income inequality in the state continues to grow,⁵ and many families have difficulty covering the basic costs of life. Costs for food, health care, transportation, rent, and other essential costs are all going up. According to state economist Justin Ballard, "While rising energy-related commodities have increased the state's treasury and led to low unemployment rates, they have also hurt citizens at the fuel pumps and cash registers."⁶ While most parts of the country are facing severe economic declines, Wyoming's inflation rate is the highest it has been since 1980.⁷ This leads to an overall decrease in the quality of life of many families. Additionally, small businesses are suffering as hotels and other local businesses are finding it increasingly difficult to find workers as low-level employees seek higher-paying jobs with mines and oil and gas companies.

The combination of out of state workers and high wages produces a number of related impacts in communities with energy booms. Communities in Wyoming have faced everything from increased housing costs to a paucity of teachers, doctors, and police officers to increased drugs, drunk driving, and prostitution.⁸

BLM also needs to fully analyze impacts to hunting and other recreational activities on public lands. A recent federal government survey found that in 2006 "762 thousand Wyoming residents and nonresidents 16 years old and older fished, hunted, or wildlife watched in Wyoming...state residents and nonresidents spent \$1.1 billion on wildlife recreation in Wyoming."⁹ Clearly, lands in Wyoming have economic value beyond mineral production

27. The RMP/EIS Must Consider Greenhouse Gas emissions and Climate Change Impacts

BLM must address climate change impacts as "reasonably foreseeable" consequences of increased mineral development. 40 C.F.R. §§ 1508.7, 1508.8. Greenhouse gas emissions are clearly within the direct, indirect and cumulative effects that NEPA documents must analyze.¹⁰

⁴ Equality State Policy Center, *The State of Working Wyoming*, February 2008, available at http://www.equalitystate.org/PDFs/State_of_Working_Wyoming.pdf.

⁵ See Equality State Policy Center, *Pulling Apart – Economic Equality Declines*, available at http://www.equalitystate.org/PDFs/Pulling%20apart_Economic%20equality%20declines.pdf; Jared Miller, *Income gap widens in Wyo.*, CASPER STAR TRIBUNE, April 9, 2008, A1, A6.

⁶ *Wyoming Inflation: Report: Rate high as 8.1 percent*, SHERIDAN PRESS, March 31, 2008, citing Wyoming Economic Analysis Division report.

⁷ See attached article from the CASPER STAR TRIBUNE.

⁸ See *In a Red State Rolling in Green: A Relaxed Attitude*, attached to this letter.

⁹ U.S. Department of Interior, Fish and Wildlife Service, and U.S. Department of Commerce, *2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: Wyoming* at 6, available at <http://www.census.gov/prod/2008pubs/fhw06-wy.pdf>.

¹⁰ See *Mid States Coalition for Progress v. Surface Transp. Bd.*, 345 F.3d 520 (8th Cir. 2003) (holding increased coal consumption and global warming emissions was reasonably foreseeable effect of railroad expansion to transport coal).

Completing a thorough analysis of global warming impacts will also help NRC fulfill its legal obligation under NEPA to “recognize the worldwide and long-range character of environmental problems” and support international efforts to prevent “declines in the world environment.” 42 U.S.C. § 4332 (F). Please see attached Fortification Creek scoping comments for details.

Climate change will greatly impact the people of Wyoming and the western United States

Human-induced climate change is of concern to our members because of its ability to impact Wyoming and the west. Numerous studies have documented that climate change will dramatically impact states like Wyoming. For instance, the National Wildlife Federation estimates that “Global warming is likely to alter essential habitat in the Greater Yellowstone Ecosystem” and impact plant and animal species across the state.¹¹ Global warming could also impact industries that depend on snow and water resources, such as skiing, tourism, and agriculture. In a report released in May 2008, even the U.S. Department of Agriculture found “climate change is already affecting U.S. water resources, agriculture, land resources, and biodiversity, and will continue to do so.” Some findings of the report include:

Grain and oilseed crops will mature more rapidly, but increasing temperatures will increase the risk of crop failures, particularly if precipitation decreases or becomes more variable.

Higher temperatures will negatively affect livestock. Warmer winters will reduce mortality but this will be more than offset by greater mortality in hotter summers. Hotter temperatures will also result in reduced productivity of livestock and dairy animals.

Weeds grow more rapidly under elevated atmospheric CO₂. Under projections reported in the assessment, weeds migrate northward and are less sensitive to herbicide applications.

Invasion by exotic grass species into arid lands will result from climate change, causing an increased fire frequency. Rivers and riparian systems in arid lands will be negatively impacted.¹²

State Climatologist, Steve Gray, has warned that global warming could dramatically impact Wyoming, especially water supplies in the state. Communities in Wyoming, including the City of Gillette, are already facing water shortages and climate change impacts caused by increased uranium mining could intensify those impacts.

Conclusion

We respectfully submit these comments and expect that you will use the resources mentioned and provided with this document beneficially as you draft the Resource Management Plan for the Powder River Basin.

¹¹ National Wildlife Federation, *Global Warming and Wyoming*, available at <http://www.nwf.org/GlobalWarming/pdfs/Wyoming.pdf>

¹² USDA, *US Climate Change Science Program Releases Report on the Effects of Climate Change on Agriculture, Land and Water Resources, and Biodiversity*, Press Release, May 27, 2008. The report is available at <http://www.climatechange.gov/Library/sap/sap4-3/default.php>.

1056

Development can be done right and it is your job to ensure that stewardship of the *public* resources including the development of *public* minerals is done with the utmost care and thought for our current and future well-being and with respect for our private property and health.

Wyoming deserves to be more than an example to which other states look to avoid the unpleasant and preventable side effects of energy development. Our residents, out state and our country deserve better.

The legacy of wise stewardship of all of our public resources –land, water, air, wildlife, livelihood and minerals– that you leave in the Powder River Basin will long outlive the pending development and ephemeral state and federal revenues which will be generated from mineral development in the Powder River Basin. Make the Buffalo Resource Management Plan the example to which our state and others can look to emulate.

We look forward to reviewing and commenting on the Draft EIS and RMP revision and in working with your agency to ensure responsible development in the Powder River Basin.

Sincerely,

Jill Morrison
Ashley Robers
Shannon Anderson
Staff, Powder River Basin Resource Council

1057

"Shannon
Anderson"
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01/05/2009 04:07
PM "'Jill Morrison'"
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Subject
Scoping Comments for Buffalo RMP
revision

Please find our comments attached. If you have any difficulties opening or reviewing the document, please let me know.

Thanks,

Shannon Anderson
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(See attached file: PRBRC_scoping_comments_for_Buffalo_RMP.pdf) (See
attached file: FortCreekScoping.pdf)

1057

**Powder River Basin Resource Council
Wyoming Outdoor Council
Wyoming Wildlife Federation
Wyoming Chapter of the Sierra Club
Natural Resources Defense Council
National Wildlife Federation
The Wilderness Society**

November 29, 2007

BLM Buffalo Field Office
Attn: Thomas Bills
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1425 Fort Street
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e-mailed to: Fort_Creek_WYMail@blm.gov
Hand Delivered

RE: Fortification RMP Plan Amendment Scoping Comments

Dear Mr. Bills,

Thank you for the opportunity to submit scoping comments on the proposed Buffalo Resource Management Plan Amendment regarding the Fortification Area. These scoping comments are submitted by the Powder River Basin Resource Council, the Wyoming Outdoor Council, the Wyoming Wildlife Federation, the Wyoming Chapter of the Sierra Club, the Natural Resources Defense Council, the National Wildlife Federation and The Wilderness Society. Our respective organizations represent a diverse and numerous membership and we all have a long history of working for the protection of our air, water, land and wildlife resources and for maintaining our quality of life.

As you know, several of these organizations have also been leading an effort to challenge BLM's current permitting of CBM development on the periphery of the Fortification area which we believe is having a significant cumulative impact on the Fortification elk herd and is compromising other resources in the area. We are submitting copies of the expert testimony we filed with those pending appeals to ensure that the expertise we acquired on the Fortification elk herd, reclamation challenges and needs and groundwater resources will be considered in this Plan Amendment.

Notably, our scoping comments are crafted on the premise that the public will have an opportunity to review and comment on a Draft Resource Management Plan Amendment and Draft National Environmental Policy Act analysis. We assume that this opportunity will be provided and emphasize that affording the public this opportunity is

1

critical to the viability and acceptability of any ultimate Resource Management Plan Amendment and any consequent management activities in the Fortification Area.

We ask that BLM address the following issues regarding the proposed RMP Plan Amendment on Fortification:

The History for Protection and the Unique Resources Offered by the Greater Fortification Area

The Fortification is a treasured area that encompasses over 100,000 acres in the middle of the Powder River Basin. It is bounded on the west by the Powder River, one the last remaining wild prairie rivers in North America, and on the east by Wild horse Creek. The area rises like an island in the middle of the Basin. The heart of the Fortification contains the only Wilderness Study Area in the Powder River Basin. The public lands surrounding the WSA have been nominated for designation as an Area of Critical Environmental Concern. The public and the BLM identified the important resources in this area and documented them in seven different planning documents starting in the 1970s and going on through 2003.

The special resource values identified in these planning processes include an isolated Rocky Mountain plains elk herd and its habitat, high visual quality lands, the 12,000-acre WSA, and cultural, historical or paleontological values as well as the proposed ACEC. The area is prized for an unbelievable diversity of wildlife that includes elk, mule deer, pronghorn antelope, whitetail deer, wild turkeys, peregrine falcons, sharp tail and sage grouse, bobcats, mountain lions, swift fox, bald and golden eagles, a variety of songbirds, horny toads, prairie dogs as well as other wildlife. In sum, it is an island of naturalness in the middle of an increasingly industrialized and fragmented landscape. A landscape that is becoming host to one predominant use – CBM development.

The fact that the BLM has, through seven distinct public planning processes since the mid 1970's, again and again identified the unique and special nature of the Fortification area is remarkable.

This Plan Amendment must outline this history, consider these previous decisions and outline the previously identified unique natural values and the critical watershed that deserve protection.

The Fortification, renowned for its scenic western vistas, the rugged “breaks country” with deep juniper filled draws that provide critical wildlife habitat, is becoming more valuable and unique everyday as the surrounding area becomes industrialized. This rugged breaks country and the area soils are also noted for being extremely fragile and erosive and will be impossible to reclaim.

Local historians say that Fortification received its name from an expedition that traveled through the area in the 1800's and became stranded by a snowstorm. As the story

1057

goes, the group was able to fortify themselves for the winter safely inside a fort build from Cottonwood trees. The area also boasts other important cultural history and paleontology.

This RMP amendment should reaffirm these existing values and examine them in light of the increasing threats to the resources in this area. We cannot emphasize enough that the Plan Amendment should explore the increasing value of the Greater Fortification resource due to the loss and fragmentation of habitat and other resources in the surrounding area due to the rapid CBM industrialization of the Powder River Basin. This is particularly important given imminent ongoing adverse impacts caused by climate change to the Powder River Basin's communities, water resources, wildlife, wildlife habitat, and overall ecological structure, function, and composition.

BLM's review must consider and account for the uniqueness offered by the Greater Fortification area in terms of the habitat, diversity and this high plains/prairie ecosystem as well as the role that an ecologically-intact Fortification area plays in protecting the Powder River Basin's ecological structure, function, and composition.

Please provide information on what other areas within the region and BLM's western lands that currently meet the resource values provided by the Fortification area and offer this type of dwindling habitat, bio-diversity and High Plains ecosystem and whether the loss of these areas is consistent with BLM's duties, pursuant to the Federal Land Policy and Management Act of 1976 ("FLPMA"): (1) to "protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values" of the public lands (43 U.S.C. § 1701(a)(8)); (2) prevent "permanent impairment of the productivity of the of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output" (43 U.S.C. § 1702(C)); and "prevent unnecessary or undue degradation of the lands" (43 U.S.C. § 1732(b)).

BLM should complete a detailed cost/benefit analysis of the economic tradeoffs of developing the leases in the Fortification versus trading them or buying them back in order to preserve the combination of non-mineral values within the area. Such an analysis would entail examining not only the market value of the gas itself, but the cost in terms of both dollars spent and energy expended to recover the gas, including the true cost of reclamation and the cost of resources lost as a direct result of the development process. BLM should consider whether these production "costs" might actually outweigh the amount of federal revenue the gas resource will yield.

These costs must then be weighed against the long-term benefits of preserving the area for current and future generations for its non-mineral values, including but not limited to visual resources, solitude and Wilderness quality resources, challenging outdoor recreation opportunities, wildlife viewing, and the real dollar value of hunting elk and other wildlife in the area.

3

A 2006 Outdoor Industry Foundation study showed that three-quarters of Americans take part in outdoor recreation. Topping the list of activities was wildlife viewing, followed by hiking and related activities. The study concluded that outdoor recreation and its combined “ripple effects” contributed \$730 billion to the American economy in 2006, with \$66 million from wildlife viewing alone. Hiking and other trail activities provided \$56 million, while hunting provided \$13 million.

Expansion of the Fortification boundary

In addition to a review of the lands identified for ACEC designation, the BLM needs to look at expanding the original Fortification Creek Special Management Area boundary to the south to incorporate the identified elk year long range and additional important habitats for sage grouse and mule deer. Moreover, BLM should not only consider expanding the Fortification boundary, but also the development of Fortification specific management protections to ensure that BLM and the public are afforded clear guidance concerning precisely how the Fortification Area is to be managed and what limits are necessary on existing and anticipated management activities relevant to the area. This may entail guidance involving activities both within the original boundary for the Fortification Area and proximate or adjacent to, which encompass the Greater Fortification Area (but which nonetheless may adversely impact the area and its resources).

We view these requests as essential components of BLM’s FLPMA duties, noted above, and BLM’s related duty, pursuant to the National Environmental Policy Act (“NEPA”), to consider a reasonable range of alternatives (42 U.S.C. § 4332(2)(C)(iii); 40 C.F.R. § 1502.14). This responsibility is particularly important here, given that Fortification – as attested to by the very fact that BLM is preparing an RMP Amendment and by the fact that oil and gas development activities have been subject to administrative challenges – has obviously been the subject of “unresolved conflicts concerning alternative uses of available resources.” 42 U.S.C. § 4332(2)(E).

With specific regard to wildlife habitat and diversity in the area:

- The RMP amendment should provide baseline information concerning the Fortification elk herd, including population and habitat information on both an absolute and spatial level (i.e., total acreage and location of acreage to assess habitat viability and connectivity), and the social and economic value of the herd, in particular relative to hunting. Additionally, the RMP amendment should detail – both quantitatively and qualitatively – the various direct, indirect, and cumulative impacts suffered by the elk herd and identify and require appropriate management protections designed to constrain those impacts within acceptable levels. Such protections may consist of lease-specific protections, but, based on our experience with development in the Powder River Basin as a whole, we believe that area-wide protections that transcend individual lease parcels are essential. To assist this effort, we are submitting for the RMP consultant’s review

and analysis the comments of Dr. William Alldredge regarding the Fortification elk herd.

- Similar baseline information, impacts analysis, and management protections concerning Mule deer, Pronghorn antelope, Whitetail deer, sage grouse, Wild turkey, and other extant wildlife populations of songbirds, raptors, amphibians, predators, and prairie dogs, as well as these species' habitat, should also be provided.

The Importance of the Powder River and her fisheries

The RMP amendment should examine the inclusion and expansion of the Fortification area to include protection of the Powder River which is the western border of the current Fortification Creek Special Management Area. The amendment should explore expansion of the ACEC boundary or the special management area boundary which would encompass the Powder River. At the very least, the Plan Amendment should include the unique and ecologically valuable characteristics of the Powder River to inform and substantiate BLM's efforts to comply with its FLPMA and NEPA duties and thereby protect the area.

The Powder River is identified by several government and private entities as unique within North America. It is one of the last remaining wild prairie streams and it is home to several rare or threatened warm water fish. The BLM should include the Wyoming Game and Fish research and analysis of the importance and unique nature of the Powder River fishery. This report has been supported by and presented to BLM for the BLM's working group on adaptive management regarding CBM development.

Of the 32 fish species in the Powder River and its tributaries, 25 are native. Most of these species are adapted to fluctuating environmental conditions, particularly turbidity, salinity, flow levels, and water temperature. In a recent evaluation of the Great Plains, the Nature Conservancy rated the Powder River's biodiversity as "very high" and identified it as an "ecologically significant area." The Nature Conservancy description is worth quoting: "In an inventory of all streams in the Great Plains of Wyoming, the Powder River was found to support the most intact assemblage of fish species. Notable among these is the Sturgeon Chub, a globally rare species..."

The Powder River (and its tributaries) is one of the last strongholds for several native fish species, including several that are rare, declining, or both. Of particular note are the sturgeon chub, shovelnose sturgeon, and western silvery minnow. The first two species are incredibly rare in Wyoming and found in only the Powder River (and Bighorn River for the sturgeon chub). The western silvery minnow is found in only a handful of rivers in the state.

The sturgeon chub is ranked G2/S1S2 by the Natural Heritage Network. This means it is considered globally imperiled and critically imperiled in the state. The

sturgeon chub requires large, free-flowing rivers characterized by swift flows, highly variable flow regimes, braided channels, high turbidity and sand/fine gravel substrates. Altering the flow temperature, flow regime and chemical composition, particularly selenium and salt content all of which will be impacted by coalbed methane development, will harm these rare fish and threaten their survival in the Powder River. The shovelnose sturgeon, found only in the Powder River in Wyoming, is also critically imperiled in the state. Both are ranked very high by the Wyoming Game and Fish Department (WGFD) as well: NSS1 and NSS2. The western silvery minnow is S2, or imperiled in the state, and is also ranked NSS1 by the WGFD. This is the highest conservation status ranking given by the WGFD. This fish was previously a candidate species, considered for listing under the ESA.

A Specific BLM Plan for Protection of Fortification Resources from Oil and Gas Development

The Fortification Plan amendment should provide a breakdown of leases offered in the Fortification area, a map of the leases and who holds them, and the required protections provided by the leases related to area and acreage. Moreover, BLM should assess these lease-based protections to determine whether they are adequate to mitigate or, if necessary, prevent adverse impacts to the Fortification’s non-mineral resources and values. If not, BLM should then consider additional protections to protect the Fortification’s non-mineral resources and values within acceptable limits. We surmise that reliance on the lease protections alone in the Fortification is inadequate and BLM must therefore address, at a comprehensive level, not just at the individual lease or APD level, how development may proceed, if at all, within acceptable limits. This is particularly so given the fact that the Fortification’s non-mineral resources and values transcend individual lease parcels and thus require comprehensive, landscape-scale management and protection. That said, stipulations governing the leases we have reviewed in the area state:

“Surface Occupancy or use within the Fortification creek area will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts.”

They also contain language stating that these leases: **include the area mapped on the Buffalo RMP Map; they protect elk crucial winter and parturition ranges; and include protecting the Fortification Creek Wilderness Study area.** In addition they state that, **“this requirement may include development operations and maintenance of facilities.”**

While these lease stipulations have been identified as some of the strongest BLM lease protections available, they may nonetheless be inadequate to mitigate adverse impacts within acceptable limits. This Plan Amendment is therefore an opportunity to provide the type of specific management planning and protection that the Fortification area deserves, providing a landscape-scale management regime for the area that guides how each lease can and should be developed, how existing lease stipulations will be

adhered to, whether strengthened conservation protections are necessary to constrain adverse impacts within acceptable levels and, ultimately, how the area's non-mineral resources will be affirmatively protected and managed into the future.

To do this, BLM must first determine whether identified impacts to wildlife populations and habitat, in particular from oil and gas development, can be mitigated within acceptable limits of degradation. *See* 43 U.S.C. §§ 1702(c), 1732(b). This, of course, requires BLM to precisely delineate such limits (relative to both population and habitat). *Id.* If, for example, elk are driven out (and mule deer or other wildlife), as BLM documented would occur under current 80-acre spacing in their, **Environmental Report: Coalbed Natural Gas Effects on the Fortification Creek Area Elk Herd - September 2007**, please explain and analyze, specifically: (1) how those impacts are acceptable; (2) whether protective measures can be deployed to mitigate such impacts within acceptable limits; or, (3) if they cannot, whether BLM will exercise its authority to prevent such impacts. Of course, such explanations are also important for the Fortification's other wildlife populations and habitats.

Using these explanations and analysis, BLM should establish a long-term management plan for the area to identify if and how development could proceed within acceptable limits of degradation or, if such impacts cannot be so mitigated, how BLM will prevent such impacts. This should include an analysis of management alternatives that consist of at least: (1) a complete ban on drilling in the area; (2) a phased drilling plan that controls both the timing and location of drilling and ensures proper reclamation and restoration of the land's resources; (3) a ban on surface disturbing activities within the area through the exclusive use of advanced drilling techniques, e.g., horizontal drilling, that only allow extraction to proceed from development located outside the area or, at the least, outside of core habitat areas and connective habitat corridors. Notably, each of these alternatives may require a program providing for the termination or exchanges of leases and the acquisition or exchange of private land to ensure protection of the area. On this front, certain management alternatives may be outside the BLM's jurisdiction. However, that does not obviate the fact that they are nonetheless reasonable and thus must be considered. 40 C.F.R. § 1502.14(c). In this situation, consideration of such reasonable alternatives can provide a basis for action and oversight by other entities – including Powder River Basin Resource Council and Wyoming Outdoor Council, the lessees themselves, the State of Wyoming, private landowners and communities in the vicinity, or even the U.S. Congress.

It is important to emphasize that each alternative crafted by BLM must account for direct, indirect, and cumulative impacts. In accomplishing this task, BLM must not look only at the impact of anticipated development within the Fortification area but must also address existing development, and the cumulative impact of development, within the broader area surrounding the Fortification area. Simply put, the Fortification area is not an ecological island, isolated from the broader landscape but, in fact, is an integral anchor of the broader landscape's ecological structure, function, and composition – values that serve the long-term interests of the communities and wildlife that inhabit that broader landscape.

The Challenges of Reclamation

BLM must also address demonstrable failures of oil and gas development to meet interim or final reclamation requirements, including reseeding, failures to control the spread of noxious weeds, and failures to control the extensive erosion caused by development— erosion BLM has documented. (See BLM Report: Surface Compliance of Coal Bed Natural Gas (CBNG) Development in North Central Wyoming by Benjamin E. Kniola and Julian Serafin Gil, November, 5, 2005.) Moreover, *reclamation* is different from *restoration*, and BLM should therefore address and disclose to the public the extent to which reclamation does not actually restore ecological structure, function, and composition, and whether the failure to provide for such restoration is acceptable. For example, even if a well site is reclaimed, soil resources could be permanently impaired, water resources may become too degraded to recover, wildlife may have been permanently driven away, and vegetation degraded to the point that it cannot provide viable wildlife habitat. On this front, speculation is unacceptable; demonstrable, real world examples of successful reclamation – and, where necessary, *restoration* – of similar lands must be provided.

This is of particular concern given that the Fortification area is one of the last undeveloped areas within the Powder River Basin. In this context, the resiliency of the Fortification area to withstand permanent impacts and degradation could be compromised by past, present, and reasonably foreseeable impacts and degradation caused to the broader landscape. And, relatedly, development of the Fortification area, even if viable standing alone, may compromise the efficacy of protections and reclamation provisions provided to developed areas outside of the Fortification area. Fundamentally, this goes to a key point: BLM cannot look at the Fortification area in a piecemeal fashion but must, instead, look at the broader landscape, the cumulative impacts suffered by that broader landscape, and the Fortification area’s ecological role within that broader landscape.

Global Warming, Climate Change, and Greenhouse Gas Emissions Resulting from BLM-Authorized Oil and Gas Development

Over the course of the last several years, the debate over global warming-induced climate change centered on whether global warming was in fact occurring and how fast. That debate has been put to rest by the Intergovernmental Panel on Climate Change (“IPCC”). The IPCC’s most recent working group reports, as well as the IPCC’s Synthesis Report, demonstrate that climate change – in particular as a result of anthropogenic drivers causing global warming – is a pressing issue that must immediately be addressed by the world’s communities.¹ The debate, accordingly, is now shifting to

¹ The IPCC Synthesis Report is available at www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf. The individual working groups are available at www.ipcc.ch/ipccreports/ar4-wg1.htm (The Physical Science Basis), www.ipcc.ch/ipccreports/ar4-wg2.htm (Impacts, Adaptation, and Vulnerability), and www.ipcc.ch/ipccreports/ar4-wg3.htm (Mitigation of Climate Change).

how we can mitigate global warming by reducing greenhouse gas emissions, and, most relevant here, how we can adapt our communities and ecosystems to withstand climate change impacts.

The Department of the Interior itself acknowledges that “[t]here is a consensus in the international community that global climate change is occurring and that it should be addressed in governmental decision making” and that “climate change is impacting natural resources that the Department of the Interior (Department) has the responsibility to manage and protect.” U.S. Department of the Interior, Secretarial Order No. 3226 § 1 (January 19, 2001). Accordingly, the Secretary of the Interior mandated that:

Each bureau and office of the Department will consider and analyze potential climate change impacts when undertaking long-range planning exercises, when setting priorities for scientific research and investigations, when developing multi-year management plans, and/or when making major decisions regarding the potential utilization of resources under the Department’s purview. Departmental activities covered by this Order include, but are not limited to, programmatic and long-term environmental reviews undertaken by the Department, management plans and activities developed for public lands, planning and management activities associated with oil, gas and mineral development on public lands, and planning and management activities for water projects and water resources.

Secretarial Order No. 3226 § 3. This order is, notably, self-executing and “effective immediately.” Secretarial Order No. 3226 § 4. While the Department has not provided specific guidance to BLM, this does not obviate BLM’s responsibility to comply with Secretarial Order 3226. Secretarial Order No. 3226 reflects BLM’s existing legal responsibility to manage and protect our public lands in accord with FLPMA and NEPA. For example, as noted by the IPCC, climate change will cause, if it is not already causing, degradation to wildlife populations and habitats. In this context, BLM already has the authority if not the responsibility pursuant to FLPMA to prevent or mitigate such degradation through, in particular, RMP planning, by: (1) prohibiting activities that may constitute the proverbial ‘straw that broke the camel’s back’ in light of existing and anticipated climate change impacts; (2) by reducing the greenhouse gas emissions footprint of its own or authorized activities; and (3) by affirmatively protecting and restoring ecological structure, function, and composition with the aim of improving the land’s resiliency to climate change. 43 U.S.C. §§ 1701(a)(7), 1701(a)(8), 1702(c), 1712, 1732(b). Moreover, pursuant to NEPA, BLM already must address direct, indirect, and cumulative impacts of climate change, must consider alternatives in light of those impacts, and has been given mechanisms to address incomplete or unavailable information. 42 U.S.C. §§ 4321, 4331, 4332(2)(C), 4332(2)(E); 40 C.F.R. §§ 1502.14, 1502.22, 1508.7, 1508.8.

We therefore request that BLM: (1) quantify anticipated greenhouse gas emissions that would result from existing and anticipated oil and gas development in the

Fortification Area (this may require a cumulative assessment of greenhouse gas emissions in the entire Powder River Basin given that the 2003 Powder River Basin FEIS did not address greenhouse gas emissions); (2) consider technological controls and mitigation measures designed to reduce anticipated greenhouse gas emissions from oil and gas within acceptable limits (e.g., by tiering to science-based reduction goals outlined in the IPCC's work); (3) consider the impact of climate change to the Fortification area's non-mineral resources; and (4) consider management alternatives designed to protect and, if necessary, restore the Fortification area's ecological structure, function, and composition with the aim of improving the land's resiliency to climate change.

Notably, BLM can quantify greenhouse gas emissions either through a top-down or bottom-up inventory and assessment of oil and gas equipment existing and anticipated in the Fortification area (or, perhaps, the entire Powder River Basin). Obviously a bottom-up inventory provides the best information but may be more costly for BLM to compile. Regardless, these inventories are doable, as attested to by Wyoming's own greenhouse gas inventory prepared by the Center for Climate Strategies which concluded, overall, that "[e]stimated methane and vented carbon dioxide emissions from the fossil fuel industry in Wyoming accounted for about 24% of the State's gross GHG emissions in 2005. Emissions from this sector doubled from 1990 to 2005 and are projected to increase by a further 10% between 2005 and 2020." Wyoming Greenhouse Gas Inventory and Reference Case Projections 1990-2020 at 7 (Spring 2007). These emissions, notably, are the second greatest source of greenhouse gas emissions in Wyoming. *Id.* at 5. Additionally, the American Petroleum Institute has published a compendium of greenhouse gas emissions methodologies that is considered by all to constitute the best available information. API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry (February 2004) (www.api.org/ehs/climate/new/upload/2004_COMPENDIUM.pdf) Moreover, there are a variety of proven measures to reduce greenhouse gas emissions from oil and gas development. For example, EPA's Natural Gas STAR program has been successful in assisting and evaluating reduction measures, in particular from methane. www.epa.gov/gasstar/. Indeed, this program reflects common sense and BLM should make participation in EPA's Natural Gas STAR program a requirement to do business on our public lands. Regardless, BLM should use the measures detailed in EPA's Natural Gas STAR program as a starting point to research additional reduction measures. Once compiled, BLM should consider whether these reduction measures should be built into future leases as mandatory stipulations and, for existing leases, required as conditions of approval.

Identification of Tracts for Exchange

The state of Wyoming has already indicated an interest in pursuing an exchange with BLM for the state section of land and minerals in the Wilderness Study area. We believe this is a worthy exchange and would urge BLM to pursue the identification of tracts for exchange with the state. We further ask that BLM pursue some additional private surface exchange tracts that would be available for land exchanges that were considered in the past by BLM in this area that cuts into the WSA and encompasses

1057

portions of Bull Creek and Deer Creek. These exchanges would help protect the WSA by exchanging private land adjacent to the critical WSA. These lands should also be examined for exchange in terms of providing a limited public walk in access to the Fortification Area and the Wilderness Study Area. Finally, BLM should examine the exchange of mineral leases for protection of the unique resources in this area.

Protection of Water Resources, Ephemeral drainages and Accompanying Gallery Cottonwood Forest in Fortification Creek

BLM is aware of the importance of water resources – both artesian and shallow wells – to the wildlife within the Fortification Area. The importance of these resources was discussed in the BLM’s recent elk report. The Amendment should identify these important ground and surface water resources and outline a plan for protection of this vital resource to maintain wildlife. Further, BLM has also identified the need to prohibit the discharge of CBM water to the surface or down the ephemeral drainages in the Fortification. BLM must document and disclose the nature of the vegetation and the critical habitat provided by these ephemeral drainages and the habitat provided by the Cottonwood Gallery Forest on Fortification Creek itself. BLM must also disclose the damage caused by CBM discharge water on the east side boundary of Fortification on Wild Horse Creek as a comparison and demonstrate what impacts the flooding of CBM discharge water has had on Wild Horse Creek. BLM needs to ensure that what happened on Wild Horse Creek and several other ephemeral drainages in the Powder River Basin does not happen to the Cottonwood Gallery Forest .

Maintain and Strengthen RMP Management Objectives

The BLM has identified the above need to review whether to maintain the RMP management objectives for any or all of the resource values in the area identified for the Fortification including steep slopes, erosive soils, elk habitat, archaeological and paleontological resources, visual resources including buried power and the geographic extent of those resource values. We would go a step further and emphasize that BLM needs to review whether the RMP management objectives need to be strengthened.

As we mentioned previously, the history of the value of the Fortification area has been documented in repeated planning documents over a 35-year span. Additionally, leases have been issued with specific strict stipulations for protection of these resources. Please explain how these values and lease requirements can be eliminated in this process? Please explain how this can be done as an Environmental Assessment as was indicated in the scoping meeting in Sheridan?

The National Environmental Policy Act (NEPA) requires BLM to demonstrate that there will **not be** a significant environmental impact before it can pursue an EA rather than an EIS to meet its environmental analysis obligations. The BLM must clearly demonstrate in this Plan Amendment regarding Fortification that the proposals will not cause significant environmental impacts to the valued resources in Fortification. BLM’s own research and admissions recently and over the past few years have already

identified significant impacts that will occur to the Fortification resources if development is allowed to proceed as it has in the rest of the Powder River Basin.

It is imperative that BLM lay out a Plan Amendment that recognizes and protects for current and future generations the unique and complex system of cultural and natural resource values that the Greater Fortification contains.

We look forward to working with BLM throughout the Plan Amendment process and to commenting on future documents regarding Fortification. Please keep us informed.

Sincerely,



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Bruce Pendery
Wyoming Outdoor Council
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Nada Culver
The Wilderness Society
BLM Action Center
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Denver, CO 80202

Mark Winland
Wyoming Wildlife Federation
P.O. Box 106
Cheyenne, WY 82003

1057

Attachments:

William Alldredge Elk Report, May 3, 2007 (via email and hand delivered)
William Alldredge Elk Report, July 19, 2007 (via email and hand delivered)
Bob Giurgevich Reclamation Report, July 19, 2007 (via email and hand delivered)
Walt Merschat Groundwater Report, July 16, 2007 (hand delivered only)
Wyoming Greenhouse Gas Inventory, Spring 2007 (via email and hand delivered)
CD of Photos of Fortification Area and Photos of CBM development impacts (hand delivered)

1058

Alex_Schubert@fws
.gov
01/05/2009 02:43
PM

BRMP_Rev_WYMail@blm.gov

To
cc

Subject
Fw: Scoping comments for the
Buffalo RMP Revision

Linda,

Please find attached USFWS scoping comments for the Buffalo RMP Revision.
A hard copy will follow.

(See attached file: Scoping comments for Buffalo RMP Revision.pdf)

Thanks.
Alex

Alex L. S. Schubert
Fish and Wildlife Biologist
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307.772.2374 ext. 238
(See attached file: Scoping comments for Buffalo RMP Revision.pdf)

1058



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
5353 Yellowstone Road, Suite 308A
Cheyenne, Wyoming 82009

In Reply Refer To:
ES-61411/W.02/WY09FA0031

JAN 05 2009

Memorandum

To: Field Manager, Bureau of Land Management, Buffalo Field Office; Buffalo, Wyoming

From: *Jon* Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne, Wyoming *Scott Hicks*

Subject: Scoping Comments for Buffalo Resource Management Plan

Thank you for the opportunity to provide scoping comments on the proposed Buffalo Resource Management Plan (RMP). The Buffalo RMP will replace the current Buffalo RMP. The revised Buffalo Field Office RMP will provide future direction for managing approximately 800,000 acres of U.S. Bureau of Land Management (Bureau)-administered surface land and 4.7-million acres of Bureau-administered mineral estate in Campbell, Johnson, and Sheridan counties in north-central Wyoming. Emerging issues and changing laws necessitate revision of the Buffalo RMP as described in the 2008 scoping notice. The Bureau is requesting the help of the public in identifying additional issues to be addressed in the planning effort.

In response to your request to review the proposed action, we are providing you with comments on (1) threatened and endangered species, (2) migratory birds, and (3) wetlands and riparian areas. The Service provides recommendations for protective measures for threatened and endangered species in accordance with the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Protective measures for migratory birds are provided in accordance with the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703 and the Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668. Wetlands are afforded protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act. Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act and the Fish and Wildlife Act of 1956, as amended, 70 Stat. 1119, 16 U.S.C. 742a-742j.

Threatened and Endangered Species

The following threatened or endangered species could occur in the project area:

Black-footed ferret: Black-footed ferrets (*Mustela nigripes*) may be affected if prairie dog towns are impacted. Please be aware that black-footed ferret surveys are no longer recommended in black-tailed prairie dog towns (see our February 2, 2004, letter previously provided to your

office). However, we encourage the Bureau to protect all prairie dog towns for their value to the prairie ecosystem and the many species that rely on them. We further encourage you to analyze potentially disturbed prairie dog towns for their value to future black-footed ferret reintroduction.

Blowout penstemon: Blowout penstemon (*Penstemon haydenii*) is a perennial herb with stems less than 12 inches tall. The inflorescence is 2-6 inches long and has 6-10 compact whorls of milky-blue to pale lavender flowers. Blowout penstemon was listed as endangered on October 1 1987. Blowout penstemon is known from multiple populations in western Nebraska (Fertig 2001). The plant's current known range in Wyoming consists of the Ferris dunes area in northwest Carbon County where the plant is restricted to two habitat types: steep, northwest facing slopes of active sand dunes with less than 5 percent vegetative cover; and on north facing sandy slopes, on the lee side of active blowouts with 25-40 percent vegetative cover. Known populations in Wyoming are found between 6680-7440 feet (Fertig 2001). However, recent surveys have indicated that systematic surveys may be warranted in some lower elevations (below 6700 feet) in Wyoming where active sand blowout features occur (BLM 2005, Fertig 2001).

Blowouts are formed as strong winds deposit sands from the windward side of a dune to the leeward side and result in a sparsely vegetated crater-like depression. Associated vegetation includes blowout grass, thickspike wheatgrass, lemon scurfpea, Indian ricegrass and western wheatgrass. Threats to the plant occur when sand dunes are removed or overly disturbed by vehicular traffic. Surveys should be conducted from mid-June to early-July when flowering occurs by knowledgeable botanists trained in conducting rare plant surveys. The Service does not maintain a list of "qualified" surveyors but can refer those wishing to become familiar with the blowout penstemon to experts who can provide training/services.

Ute ladies'-tresses: Ute ladies'-tresses (*Spiranthes diluvialis*) is a perennial, terrestrial orchid, 8 to 20 inches tall, with white or ivory flowers clustered into a spike arrangement at the top of the stem. *S. diluvialis* typically blooms from late July through August; however, depending on location and climatic conditions, it may bloom in early July or still be in flower as late as early October. *S. diluvialis* is endemic to moist soils near wetland meadows, springs, lakes, and perennial streams where it colonizes early successional point bars or sandy edges. The elevation range of known occurrences is 4,200 to 7,000 feet (although no known populations in Wyoming occur above 5,500 feet) in alluvial substrates along riparian edges, gravel bars, old oxbows, and moist to wet meadows. Soils where *S. diluvialis* have been found typically range from fine silt/sand, to gravels and cobbles, as well as to highly organic and peaty soil types. *S. diluvialis* is not found in heavy or tight clay soils or in extremely saline or alkaline soils. *S. diluvialis* seems intolerant of shade and small scattered groups are found primarily in areas where vegetation is relatively open. Surveys should be conducted by knowledgeable botanists trained in conducting rare plant surveys. *S. diluvialis* is difficult to survey for primarily due to its unpredictability of emergence of flowering parts and subsequent rapid desiccation of specimens. The Service does not maintain a list of "qualified" surveyors but can refer those wishing to become familiar with the orchid to experts who can provide training or services.

Species of Concern

Greater Sage-grouse: The Service is currently conducting a review to determine if the greater sage-grouse (*Centrocercus urophasianus*) warrants listing. Greater sage-grouse are dependent on sagebrush habitats year-round. Habitat loss and degradation, as well as loss of population connectivity have been identified as important factors contributing to the decline of greater sage-

1058

grouse populations rangewide (Braun 1998, Wisdom *et al.* 2002). Therefore, any activities that result in loss or degradation of sagebrush habitats that are important to this species should be closely evaluated for their impacts to sage-grouse. If important breeding habitat (leks, nesting, or brood rearing habitat) is present in the project area, the Service recommends no project-related disturbance March 1 through June 30, annually. Minimization of disturbance during lek activity, nesting, and brood rearing is critical to sage-grouse persistence within these areas. Likewise, if important winter habitats are present (Doherty *et al.* 2008), we recommend no project-related disturbance November 15 through March 14, annually.

We recommend you contact the Wyoming Game and Fish Department to identify important greater sage-grouse habitats within the project area, and appropriate mitigative measures to minimize potential impacts from the proposed project. The Service recommends surveys and mapping of important greater sage-grouse habitats where local information is not available. The results of these surveys should be used in project planning, to minimize potential impacts to this species. No project activities that may exacerbate habitat loss or degradation should be permitted in important habitats. Additionally, unless site-specific information is available, greater sage-grouse habitat should be managed following the guidelines by Connelly *et al.* 2000 (also known as the Western Association of Fish and Wildlife Agencies [WAFWA] guidelines).

In Wyoming, information suggests that greater sage-grouse populations are negatively affected by energy development activities, especially those that degrade important sagebrush habitat, even when mitigative measures are implemented (Braun 1998, Lyon 2000, Naugle *et al.* 2006). Greater sage-grouse populations can repopulate areas developed for resource extraction after habitat reclamation for the species (Braun 1987). However, there is no evidence that populations attain their previous levels and reestablishment of sage-grouse in a reclaimed area may take 20 to 30 years, or longer (Braun 1998). Therefore, this project should be carefully evaluated for long-term and cumulative effects on the greater sage-grouse, since reclamation may not restore populations to pre-activity levels. The Bureau should ensure this activity does not exacerbate greater sage-grouse declines on either a local or range-wide level.

Black-tailed prairie dog: The Service is currently conducting a review to determine if the black-tailed prairie dog (*Cynomys ludovicianus*) warrants listing under the Act (73 FR 73211). The black-tailed prairie dog may be found scattered in remnant populations throughout much of the range that it once occupied. A significant portion of existing occupied habitat rangewide occurs in a few large complexes. We encourage you to protect all prairie dog towns for their value to the prairie ecosystem and the many species that rely on them.

Migratory Birds

Under the MBTA and BGEPA, the Federal agency has a mandatory obligation to protect the many species of migratory birds, including eagles and other raptors which may occur on lands under its jurisdiction. Of particular focus are the species identified in the Service's *Birds of Conservation Concern 2002*. In accordance with the Fish and Wildlife Coordination Act (16 USC 2912 (a)(3)), this report identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing" under the Act. This report is intended to stimulate coordinated and proactive conservation actions among Federal, State, and private partners and is available at <http://www.fws.gov/migratorybirds/reports/bcc2002.pdf>.

In order to promote the conservation of migratory bird populations and their habitats, the Service recommends that the Federal agency implement those strategies outlined within the Memorandum of Understanding directed by the President of the U.S. under Executive Order 13186, where possible.

During project planning analysis of the following information is recommended to determine project effects to migratory birds:

1. The current status and habitat use of migratory birds in the project area. This may include number of individuals, breeding pairs, population trends, and active nests within and adjacent to the project area.
2. An analysis of the effects of the proposed action on migratory birds and their habitats. Measures that will reduce or eliminate adverse impacts to migratory birds, including protective buffers, seasonal restrictions, maintenance of habitat within the project area, raptor-proofing power lines, and netting of waste pits.
3. The projected short and long term impacts to migratory birds and their trends during and after project completion using monitoring, modeling and current literature.

Potential adverse effects to migratory birds from power lines should be identified and every attempt to mitigate such effects should be implemented. Structures that are identified as affecting birds should be made safe to prevent subsequent mortalities. If you determine that power poles and/or stretches of power line are resulting in electrocution of migratory birds, especially raptors, the Service requests that specific information be documented regarding these mortalities. Based on regulations pursuant to the MBTA and BGEPA, migratory bird carcasses may only be collected, possessed or moved by state game wardens, Service refuge officers, Service special agents, or persons holding a valid salvage permit issued by the Service and the applicable state. When a migratory bird mortality is observed the Service recommends that as much of the following information as possible be documented: legal location, GPS location, all identifying numbers from the nearest power pole, date of observation, species, photographs of pole (top section), and the dead bird, and directions to the scene. Please contact our office with the information and call or email Dominic Domenici of the Service's Law Enforcement Office at 307-261-6365 /dominic_domenici@fws.gov to report your observation and obtain further guidance. The Service appreciates your efforts to protect migratory birds.

Wetlands

The functions and values of wetlands are well documented and are especially important in the arid west. Substantial degradation diminishes the effectiveness of wetlands to function as food, cover, and breeding sites for wetland dependent species; sediment transport systems; water retention/storage sites; contaminant sinks; and chemical exchange sites. To ensure the Service has sufficient information to assess project impacts on wetlands, assessments should include:

1. An enumeration of the acreage of wetlands, by type, impacted by the proposed action.
2. A discussion of why wetlands cannot be avoided.
3. A description of the functions and values of the wetlands, including sediment transport, water storage, habitat for aquatic and terrestrial organisms, and contaminant sinks, as well as the potential risks of water removal for these functions and values.

1058

4. Measures that will reduce or eliminate adverse impacts to wetlands such as a mitigation plan to offset unavoidable impacts, protective buffers, seasonal and physical restrictions, maintenance of the natural hydrograph, and development and implementation of a monitoring program to track the effectiveness of mitigation measures.
5. Results of wetland monitoring or management activities in, or adjacent to, the proposed project site.
6. The anticipated short and long term effects to wetland and riparian areas during and after project completion.

We recommend addressing each of the above concerns where applicable to the project. We appreciate your efforts to ensure the conservation of Wyoming's natural resources. If you have questions regarding this letter or resources described above, please contact Alex Schubert of my office at the letterhead address or phone (307) 772-2374, extension 238.

cc: WGFD, Statewide Habitat Protection Coordinator, Cheyenne, WY (M. Flanderka)
WGFD, Non-Game Coordinator, Lander, WY (B. Oakleaf)

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