APPENDIX 10

Wildlife Monitoring and Mitigation Matrix

Wildlife Monitoring and Mitigation Matrix

SPECIES	CRITERIA	METHOD	CHANGES THAT WILL BE MONITORED	SPECIFIC CHANGE REQUIRING MITIGATION	MITIGATION RESPONSES
Mule Deer	Change in Mesa deer numbers	Current mule deer study, and use of WGFD data	Change in deer numbers in any year, or a cumulative change over all years, initially compared to average of 05/06 numbers (2856 deer)	15% change in any year, or cumulatively over all years, compared to reference area (Sublette mule deer herd unit [average 05/06 herd unit population is 27,254], or other mutually agreeable area).	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.
	Avoidance distances		Average of any 2-year avoidance distance from well pads and roads, and a concurrent change in deer numbers compared to average of 05/06 numbers (2856 deer)	Average of 0.5 km change per year over 2 years, and a concurrent 15% change in deer numbers in any year, compared to reference area (Sublette mule deer herd unit [average 05/06 herd unit population is 27,254], or other mutually agreeable area).	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.
Antelope	Change in Anticline antelope numbers	WMI antelope study; TRC project; and use of WGFD data	Change in antelope numbers in any year, or a cumulative change over all years, initially compared to first year of available antelope data	15% change in any year, or cumulatively over all years, compared to reference area (Sublette antelope herd unit or other, mutually agreeable area)	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.
	Size of habitat fragments used		Use by antelope in any year, initially compared to first year of available antelope habitat use data, and a concurrent change in antelope numbers compared to first year of available antelope data	10% change in habitat availability for one year, and a concurrent 15% change in antelope numbers for that year, compared to reference area (Sublette antelope herd unit or other mutually agreeable area).	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.

SPECIES	CRITERIA	METHOD	CHANGES THAT WILL BE MONITORED	SPECIFIC CHANGE REQUIRING MITIGATION	MITIGATION RESPONSES
Sage Grouse	Number of active leks in identified lek complexes	Lek counts according to protocol	Active use on 70% of total current leks; Active use on 70% of leks in each complex (the development area complexes include the Mesa, Duke's Triangle, and Yellow Point complexes) compared to 2007 data	30% change in total number of active leks, or 30% change in the number of leks in a single complex [1]	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.
	Peak numbers of males attending lek complexes[1]		Total average 2-year change in numbers of males attending development area lek complexes (the Mesa, Duke's Triangle, or Yellow Point lek complex), compared to the East Fork, Speedway, or Ryegrass reference lek complexes	Average of 30% change in numbers over 2 years compared to reference area[1]	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.
	Nesting success and habitat selection	Current sage grouse study; WGFD data	Change in nesting success compared to reference areas, or change in nesting success and a concurrent change in habitat selection by nesting hens in relation to development disturbance	Average of 15% per year change over 2 years in nesting success compared to reference area, or a 0.5 km increase in avoidance distance per year over 2 consecutive years and a concurrent change of an average of 15% per year change over 2 years in nesting success compared to reference area	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.

SPECIES	CRITERIA	METHOD	CHANGES THAT WILL BE MONITORED	SPECIFIC CHANGE REQUIRING MITIGATION	MITIGATION RESPONSES
Sage Grouse (cont.)	Winter concentration area use	Monitoring according to protocol	Change in winter concentration area use compared to reference area (once initial data is available), and a concurrent change in the total average 2 year numbers of males attending development area lek complexes (the Mesa, Duke's Triangle or Yellow Point lek complex), compared to the East Fork, Speedway, or Ryegrass reference lek complexes	Average of 15% per year change in amount of winter habitat used over 2 years compared to reference areas, and a concurrent average of 30% change in numbers over 2 years compared to reference area	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.
	Noise levels	Decibel monitoring from March 1-May 15 at lek sites	Noise levels demonstrated to impact peak lek use by male sage grouse and a concurrent change in the total average 2-year numbers of males attending development area lek complexes (the Mesa, Duke's Triangle, or Yellow Point lek complex), compared to the East Fork, Speedway, or Ryegrass reference lek complexes	Decibel levels at the lek more than 10 dBA above background measured from the edge of the lek (2000 ROD, p.27), and a concurrent average of 30% change in peak numbers of male birds over 2 years vs. reference area.	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.
Sensitive Species[2]	Occurrence of species and change in numbers of each species	TRC data, existing and continued	3-year change in presence/absence of species, and in numbers of individuals of each species, compared to reference areas; nest activity and success for raptors	3 consecutive years of change in presence or absence of a species, or an average of 15% change in numbers of individuals each year over 3 years; 3 consecutive years of change in nesting activity or nest success of raptors	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.

SPECIES	CRITERIA	METHOD	CHANGES THAT WILL BE MONITORED	SPECIFIC CHANGE REQUIRING MITIGATION	MITIGATION RESPONSES
Sensitive sagebrush associated bird species[3]	Occurrence of species and change in numbers of each species	TRC data, existing and continued	3-year change in presence/absence of species, and in numbers of individuals of each species, compared to reference areas	3 consecutive years of change in presence or absence of a species, or an average of 15% change in numbers of individuals each year over 3 years[4]	Select mitigation response sequentially as listed below, implement most useful and feasible and monitor results over sufficiently adequate time for the level of impact described by current monitoring.

[1] If the number of leks decline but the bird numbers on lek complexes do not, the mitigation threshold would not be surpassed. If the number of leks does not decline but the bird numbers on lek complexes does decline, the mitigation threshold would be surpassed. If both numbers of leks and birds decline, the mitigation threshold would obviously be surpassed.
[2] Bald eagle, burrowing owl, ferruginous hawk, pygmy rabbit, white-tailed prairie dog
[3] Brewer's sparrow, grasshopper sparrow, long-billed curlew, mountain plover, sage sparrow, sage thrasher
[4] Consideration will also be given to comparisons with other regional data (e.g., USFWS Breeding Bird Surveys)

MITIGATION RESPONSES

It should be noted that these mitigation responses all follow operational mitigation measures already in place for development of the field, and deal with the remaining unavoidable impacts from field development.

The mitigation process utilizes performance-based measures to proactively react to emerging impact changes early enough to assure both effective mitigation responses and a fluid pace of development over the life of the project. In that regard, this process is designed to provide certainty to the affected agencies and the public that impacts to wildlife will be addressed before consequences become severe or irreversible by monitoring changes and responding early. Initial mitigation will utilize Mitigation Responses 1, 2, and 3. Certainty of adequate results will be through implementation of a mitigation response followed by monitoring of mitigation results and, if the results are not satisfactory, repeating the process with another response from Mitigation Responses 1, 2, or 3 until the desired results are achieved or all feasible responses from this group are exhausted. It is fully anticipated that with multiple mitigation attempts with subsequent monitoring, it will be several years before modification of operations as noted in Mitigation Response 4 will be considered.

Sufficient time will be allowed for mitigation measures to demonstrate the desired result before the next mitigation response for each specific impact is required, and this expected time will be estimated when the measure is planned and implemented. If continued monitoring indicates that additional levels of impacts occur, beyond those already being mitigated, additional mitigation for those impacts will also occur, and will also initially utilize Mitigation Responses 1, 2, and 3. Priority for mitigation will be given to those habitats designated as most crucial or important (big game crucial winter ranges; sage grouse breeding, nesting, and winter habitats; raptor nesting areas; specific sensitive species habitats).

The process provides certainty for the Operators in that modification of operations through Mitigation Response 4 would not be considered until the previous sequential options were fully utilized. This certainty is further supported by utilization of a diverse review panel, if deemed necessary by the Operators, Wyoming Game and Fish Department, or the BLM, and selected by these entities, that would provide any needed information or advice regarding modification of operations.

Monitoring of unavoidable impacts that could result in a mitigation response is designed to identify those impacts directly attributable to oil and gas activities by isolating natural fluctuations in wildlife numbers and habitat use (e.g., severe winters, drought, wildfires, disease) as well as other unrelated cumulative man-made impacts (e.g., prescribed fires, hunting seasons) from those caused by the development of the Pinedale Anticline.

The first annual BLM/State Cooperator/Operator and 10-year development plan meeting will be held within 30 days of the signing of the ROD. A monitoring/mitigation plan will be initiated at that meeting to describe more specifically the details and process of monitoring and selection of actual mitigation responses. This plan will be updated each year, based on the monitoring and mitigation results and future needs that are apparent at that time. Monitoring methods, changes requiring mitigation, and responses are also subject to discussion and change as part of these meetings, and are subject to change in response to new research and other updated information as it becomes available.

Specific monitoring requirements for wildlife will be developed by the Wyoming Game and Fish Department, in cooperation with the operators and their contractors. When monitoring indicates a change requiring mitigation, serious mitigation efforts would be made to avoid the change becoming greater, as this may result in more costly and long-term responses to mitigate the impacts. Specific mitigation efforts will be discussed during the annual meetings. Once a change requiring mitigation happens, mitigation will need to be continued for the life of the impact and any reclamation associated with it. Mitigation measures dealing with habitat impacts will nearly always need to be long-term in nature (habitat enhancements, Conservation Easements, etc.) in order to achieve appropriate results and assure their usefulness.

Discussions on mitigation responses will first evaluate on-site measures, followed by off-site measures, in the order of sequence noted below.

On-site

1. Protection of flank areas from disturbance (e.g., voluntary lease suspensions, lease buyouts, voluntary limits on area of delineation/development drilling) to assure continued habitat function of flank areas, and to provide areas for enhancement of habitat function.
2. Habitat enhancements of SEIS area (both core/crest and flanks) at an appropriate (initially 3:1) enhancement-to-disturbance acreage ratio.

On-site/Off-site

3. Conservation Easements or property rights acquisitions to assure their continued habitat function, or provide an area for enhanced habitat function (e.g., maintenance of corridor and bottleneck passages, protection from development, establishment of forage reserves, habitat enhancements at an appropriate (initially 3:1) enhancement-to-disturbance acreage ratio).

Modification of operations

4. Recommend, for consideration by Operators and BLM, adjustments of spatial arrangement and/or pace of ongoing development.