

## APPENDIX E: INTERDISCIPLINARY TEAM CHECKLIST

### INTERDISCIPLINARY TEAM CHECKLIST

RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)

Project Title: March 2019 Competitive Oil and Gas Lease Sale

NEPA Log Number: DOI-BLM-UT-G010-2018-0006-EA

File/Serial Number:

Project Leader: David Gordon

DETERMINATION OF STAFF: *(Choose one of the following abbreviated options for the left column)*

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Determination	Resource/Issue	Rationale for Determination	Signature	Date
PI	Air Quality & Greenhouse Gas Emissions	Leasing itself would not have impacts to air quality and GHG. However, should development occur on issued leases, emissions from earthmoving equipment, vehicle traffic, drilling and completion activities, separators, oil storage tanks, dehydration units, and daily tailpipe and fugitive dust emissions could adversely affect air quality. Emissions of NOx and VOC's from potential drilling and production may contribute to the ozone non-attainment issue in the Uinta Basin. If leased, if the Vernal Field Office receives an APD and a separate NEPA analysis would be conducted and any necessary air quality requirements would be applied.  Stipulation UT-S-01: Air Quality, and Lease Notices UT-LN-96 Air Quality Mitigation Measures, UT-LN-99 Regional Ozone Formation Controls, and UT-LN-102 Air Quality Analysis would be applied as appropriate.	Stephanie Howard	11/2/2018
NP	BLM natural areas	No natural areas present described by the Vernal RMP are present in the lease area.	Jessica Farmer	11/07/2018

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NI	Cultural: Archaeological Resources	<p>For the proposed action an intensive literature and data review were conducted for 93 parcels in the Vernal Field Office and one in the Moab Field Office. A total of 32,247 acres of previous cultural survey was conducted for the Vernal and Moab Field Office Parcels. Of the 32,247 acres, an average of approximately 24% has been previously surveyed for all parcels. The Literature search identified approximately 247 sites within the parcels of which 61 are recommended eligible or listed on the National Register of Historic Places (NRHP). The literature search also disclosed 151 ineligible sites within the proposed lease parcels. Eligible sites include a variety of both historic and prehistoric resources.</p> <p>The analysis for the March 2019 lease sale took into account such topics as areas surveyed within the parcel, percentage of the parcel surveyed, eligible sites within the proposed parcels, ineligible sites within the parcels, total sites within the Area of Potential Effect (APE) eligible sites within the APE, ineligible sites within the APE, percentage of the APE surveyed, projects within the parcel, and projects within the APE. A half mile buffer was analyzed around each parcel and consists of the APE for each parcel. Previous survey within the parcels varies from 0% to 100%, with varying coverage within each parcel.</p> <p>This exercise is only a literature review and only accounts for known resources and survey areas, parcel lessees will be responsible for adhering to Utah Lease Notice 68 which states, "This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA</p>	David Christensen	10/31/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated". This requires that any outdated survey areas will be resurveyed to current standards and new surveys will be conducted when a project is proposed within a leased parcel; before development can occur. In addition, careful placement of wells within each parcel can avoid significant cultural resources. Similarly, the topographic nature within each parcel can conceal sites with visual and other attributes and will thus help avoid indirect and cumulative effects through careful placement of wells within parcels where these sites exist. Any development within said parcels will take into account the effects to eligible cultural resources. Based on the NHPA Section 106 requirements, topographic complexity and the reasonable foreseeable development model of the proposed parcels, the BLM makes a determination of "No Adverse Effect to historic properties".</p>		
NI	Cultural: Native American Religious Concerns	No known Traditional Cultural Properties (TCPs) are identified within the APE. The proposed undertaking will not hinder access to or use of Native American religious sites. The BLM will send a letter to tribes, leaders and cultural specialists. Consultation is ongoing.	David Christensen	10/31/2018
PI	Designated Areas: Areas of Critical Environmental Concern	<p>Parcel 087 occurs within the Nine Mile Canyon ACEC. Relevance and important valued include, high scenery, cultural resources, and special status species.</p> <p>Parcel 229 occurs within the Red Creek ACEC. Relevance and Importance values include, regionally significant critical watershed.</p>	Jessica Farmer	11/07/2018
NP	Designated Areas: Wild and Scenic Rivers	None present as per GIS/RMP review.	Jessica Farmer	11/07/2018
NP	Designated Areas: Wilderness Study Areas	None present as per GIS/RMP review.	Jessica Farmer	11/207/2018

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NI	Environmental Justice	<p>As defined in EO 12898, minority, low-income populations and disadvantaged groups may be present within the counties involved in this lease sale. However, all citizens can file an expression of interest or participate in the bidding process (43CFR §3120.3-2). The stipulations and notices applied to the subject parcels do not place an undue burden on these groups. Leasing the nominated parcels would not cause any disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, or Native American Tribes because the minerals are federal and or the surface is private or BLM. In addition, the non-attainment area encompasses the majority of the populations within Duchesne and Uintah Counties, and therefore additional emissions from development would not disproportionately adversely affect minority or poverty populations.</p>	Brian Barnett	11/02/2018
NI	Farmlands (prime/unique)	<p>The act of leasing by itself will not have an impact on prime/unique farmlands. The Natural Resource Conservation Service (NRCS) has listed certain soil types as prime farmlands if the land is irrigated. Parcels 109, 170, 200, 226, 227, 260, 264, 266, and 405 contain soils that could be prime farmlands. However parcels 170, 200, 226, 227, and 260 show no signs of having been irrigated. Aerial photography shows that parcels 109, 264, and 266 have been irrigated in the past. Parcel 405 is under agricultural production and being irrigated by two irrigation pivots. If leased, any potential development would have to be approved by the private land owner, or would have to be bonded. Landowner coordination would be required as well. Therefore, the impacts do not warrant detailed analysis.</p>	David Gordon	11/5/2018
NI	Fuels/Fire Management	<p>Disturbance in this vegetation type could increase the amount of invasive plants, specifically <i>Bromus tectorum</i>. The increase of <i>Bromus tectorum</i> could lead to a change of ecosystem dynamics and an increase in fire frequency. Applying the Green River District Reclamation Guidelines should prevent additional hazardous fuels. There are no planned</p>	Blaine Tarbell	11/1/18

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NI	Geology / Minerals / Energy Production	<p>hazardous fuels projects in the immediate area.</p> <p>There are multiple mineral resource deposits located in the area of the nominated parcels and include: Gilsonite, Phosphate, Oil Shale, Tar Sands, Coal/Coal Bed Methane, Locatable Minerals (Uranium, Silver, Copper, etc.), Saleable Minerals (Stone and Sand and Gravel), Geothermal, and Helium. These resource deposits ("prospectively valuable deposits") are to be protected during drilling, development, and abandonment as mentioned in Onshore Oil and Gas Order No. 1, Approval of Operation and No. 2, Drilling Operations. Adherence to these onshore orders will protect the minerals from any negative impacts. Therefore the finding of No Impact is appropriate</p> <p>The underground injection of hydraulic fracturing waste water in Utah presents little potential for inducing seismic activity. The majority of hydraulic fracturing waste 'fluids' are recycled and reused for future hydraulic fracturing jobs. There have been no reported earthquakes in Utah that were suspected of being produced (induced) from injecting fluids into oil and gas disposal wells..</p>	Dallas Nutt	11/2/2018
NI	Lands/Access	<p>The lease parcels are located within the Vernal Field Office Resource Management Plan planning area which allows for oil and gas development with associated road and pipeline rights-of-way.</p> <p>Current land uses within the areas identified in the lease parcels and adjacent lands consist of existing oil and gas development, wildlife habitat, recreational use, and sheep and cattle ranching. No existing land uses would be changed or modified by the implementation of the Proposed Action.</p> <p>Coordination with existing Right-of-Way holders in the proposed lease parcels would occur if their right-of-way would be affected.</p>	Brandi Perry Soni Snow	11/02/2018

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PI	Lands/Access: Adjacent Landowners	<p>There are several identified Uintah, Daggett, and Duchesne County Class B and D roads within the lease parcels. Coordination with Uintah/Daggett/Duchesne counties would need to occur if the roads need upgrading or other permits are required.</p> <p>Public Water Reserves (PWRs): Allow no new surface-disturbing activities within active flood plains, public water reserves, or 100 meters of riparian areas unless:</p> <ul style="list-style-type: none"> <li>• There are no practical alternatives</li> <li>• Impacts will be fully mitigated</li> <li>• The action is designed to enhance the riparian resources</li> </ul> <p>Parcels 227, 228, 229, 296, 309, 319, 321, 356, 358 and 359 are within a public water reserve. Application of Lease Notice 57 and Stipulation 123 is sufficient to protect the resource.</p>	Brandi Perry Soni Snow	11/02/2018
PI	Lands with Wilderness Characteristics	<p>Parcel 127, occurs partially or fully within the Archy Bench lands with wilderness characteristics inventory unit.</p> <p>Parcel 087 occurs partially or fully within the Badlands Cliffs lands with wilderness characteristics inventory unit.</p> <p>Parcel 066 occurs partially or fully within the Big Wash lands with wilderness characteristics inventory unit.</p> <p>Parcels 356, 358, and 359 occur partially or fully within the Cripple Cowboy lands with wilderness characteristics inventory unit.</p> <p>Parcels 177, 178, and 179 occur partially or fully within the Duck Rock lands with</p>	Jessica Farmer	11/07/2018

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		<p>wilderness characteristics inventory unit.</p> <p>Parcels 162 and 133 occur partially or fully within the Lower Bitter Creek lands with wilderness characteristics inventory unit.</p> <p>Parcel 298 occur partially or fully within the Mexico Point lands with wilderness characteristics inventory unit.</p> <p>Parcel 087 occurs partially or fully within the Pete’s Wash lands with wilderness characteristics inventory unit.</p> <p>Parcel 086 occurs partially or fully within the Sheep Wash lands with wilderness characteristics inventory unit.</p> <p>Parcels 318, 321, and 359 occur partially or fully within the Sweet Water lands with wilderness characteristics inventory unit.</p> <p>Parcel 179 occurs partially or fully within the White River lands with wilderness characteristics inventory unit.</p> <p>Parcels UTU78225, 122, and 124 occur partially or fully within the Wolf Point lands with wilderness characteristics inventory unit.</p>		
NI	Livestock Grazing & Rangeland Health Standards	The proposed action to lease parcels for mineral development will not impact Rangeland Health or Livestock Grazing as this action is only to lease parcels. Any effects would be analyzed in site specific plans should any leases pursue development of their leases.	Tracey Hart	11/02/2018
NI	Paleontology	<p>Per GIS inspection, there are no identified paleontological resources observed in the proposed parcels areas.</p> <p>If the parcel is leased and paleontological resources are uncovered during ground-disturbing activities, the operator would suspend all operation that would further disturb such materials and would immediately contact BLM's AO, who</p>	Dallas Nutt	11/2/2018

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NI	Plants: Invasive and Noxious Weeds	would arrange for a determination of significance and, if necessary, recommend a recovery or avoidance plan per RMP (BLM 2008c). Invasive plant and noxious weed species may be present in the parcels proposed for leasing. The act of leasing would not introduce or spread invasive plant and noxious weed infestations in the Project Area. Development within leased parcels would require site-specific analysis and mitigation which would be conducted as these projects are proposed.	Christine Cimiluca	11/5/2018
NI	Plants: Native Communities	The Proposed Action of leasing the parcels would not result in the removal of native vegetation or disturbance to native plant communities. Site-specific analysis of vegetation/native plant community impacts would be conducted after the parcels are leased and projects requiring vegetation removal or disturbance are proposed.	Christine Cimiluca	11/5/2018
PI	Plants: BLM Sensitive	Suitable and / or occupied habitat for the following BLM Sensitive plant species has been documented within the proposed project area, per BLM GIS special status plant species data: Hamilton milkvetch ( <i>Astragalus hamiltonii</i> ) Barneby's catseye ( <i>Cryptantha barnebyi</i> ) Graham's catseye ( <i>Cryptantha grahamii</i> ) Goodrich beardtongue ( <i>Penstemon goodrichii</i> ) sterile yucca ( <i>Yucca sterilis</i> ) General and species-specific lease stipulations and / or notices would be attached to the lease parcels that may contain suitable and /or occupied habitat for these plant species.	Christine Cimiluca	10/22/2018
PI	Plants: Threatened, Endangered, Proposed, or Candidate	Suitable, potential and / or occupied habitat for the following TEPC plant species has been documented within the proposed project area, per BLM GIS special status plant species data: Clay reed-mustard ( <i>Hesperidanthus argillaceus</i> ) Shrubby reed-mustard ( <i>Hesperidanthus suffrutescens</i> ) Graham's beardtongue ( <i>Penstemon grahamii</i> ) White River beardtongue ( <i>Penstemon albifluvis</i> ) Pariette cactus ( <i>Sclerocactus brevispinus</i> ) Uinta Basin hookless cactus ( <i>Sclerocactus wetlandicus</i> ) Ute ladies'-tresses ( <i>Spiranthes diluvialis</i> )	Christine Cimiluca	10/22/2018

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PI	Recreation	<p>General and species-specific lease stipulations and / or notices would be attached to the lease parcels that may contain suitable, potential and /or occupied habitat for these plant species.</p> <p>Parcel 087 occurs within the Nine Mile SRMA.</p> <p>Parcel 296 occurs within the PR Spring Campsite.</p> <p>Parcel Occurs 229 partially within the Three Corners campsite.</p> <p>Parcels 178, 179, 209, 210, and 211 occur within or in close proximity to the Whiter River corridor. Potential impacts to recreationist floating White River due to oil and gas development include noise, and visual impacts from the sights and sounds of oil and gas development and production. Future detailed analysis of proposed development plans would be necessary in order to mitigate the impact to river recreationists by considering proposed locations, topography, equipment, distance from the river, and timing drilling and construction operations to occur during times of the year when recreationists are likely to not be on the river.</p>	Jessica Farmer	11/07/2018
NI	Socio-Economics	No detailed analysis is required for this proposal. The socioeconomic impacts from oil and gas development throughout the Uinta Basin was disclosed in the VFO RMP EIS.	Brian Barnett	11/02/2018
NI	Soils: Physical / Biological	The act of leasing by itself will have no impacts on soils (physical/biological). However it is anticipated that if a parcel is sold, there will be surface disturbance done to develop the lease. The RFD gives an estimated surface disturbance per parcel, if the parcel were to be sold. However it is impossible at this time to analyze the site specific impacts to soils, because the majority of the parcels have different soil types and biological soil crust across them. With the submission of site specific surface disturbance plans, impacts to soils will be analyzed. The implantation of lease notices and stipulations will help reduce impacts to	Brian Barnett	10/30/2018

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		<p>soils. The following lease notices and stipulations will be applied.</p> <p>UT-LN-60: All parcels except parcels 262, 381, 382, 383, 384 and 405</p> <p>UT-LN-61: All parcels except parcels, 236, 262, 337, 381, 382, 383, 384 and 405</p> <p>UT-S-96: All parcels except parcels 236, 262, 337, 381, 382, 383, 384 and 405</p> <p>UT-S-99: All parcels except parcels 236, 262, 381, 382, 383, 384 and 405</p> <p>UT-S-100: All parcels except parcels 236, 262, 381, 382, 383, 384 and 405</p>		
PI	Visual Resources	<p>Parcels 177, 178, 179, 211, 212, 298, 318, 321, 358, and 359 occur partially or fully within Visual Resource Management Class (VRM) II.</p> <p>The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line color, and texture found in the predominant natural features of the characteristic landscape.</p> <p>Parcels 066, 087, 097, 100, 101, 102, 108, 109, 110, 111, 112, 115, 117, 122, 124, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 177, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 211, 112, 213, 214, 217, 218, 226, 227, 228, 229, 264, 266, 268, 271, 272, 273, 274, 276, 295, 296, 305, 309, 313, 318, 319, 320, 321, 337, 356, 358, 359, 405, and UTU78225 occur partially or fully within VRM Class III.</p> <p>The objective of class III is to partially retain the existing character of the landscape. The level of change to the landscape should be moderate. Management activities may attract the attention of the casual observer, but should not dominate the view of the casual observer. Changes should</p>	Jessica Farmer	11/07/2018

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		<p>repeat the basic elements found in the predominant natural features of the characteristic landscape.</p> <p>Parcels 086, 087, 107, 108, 111, 127, 129, 130, 131, 132, 133, 162, 172, 173, 175, 176, 179, 260, 261, 271, 273, 278, 279, and 309 occur partially or fully within VRM Class IV. The objective of Class IV is to provide for management activities that require major modifications to the existing character of the landscape. The level of change to the landscape can be high. The management activities may dominate the view and may be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic visual elements of form, line, color, and texture.</p> <p>Parcels 178, 223, and 234 occur in BLM managed lands which are currently unclassified in the VRM management classification system.</p>		
NI	Wastes (hazardous/solid)	SOPs, BMPs and design features would be applied at the APD stage as COAs and these would sufficiently manage hazardous or solid wastes. The creation or storage of wastes would not occur as a result of lease issuances.	Brian Barnett	11/02/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Water: Groundwater Quality	<p>Leasing would not, by itself, authorize any subsurface disturbances which could affect groundwater quality. Site-specific effects cannot be analyzed until an exploration or development application is received, after leasing has occurred. However, any development proposal on the leases would be subject to the standard lease terms, the protective lease notices and stipulations identified in Appendix A (UT-LN-56 Parcels 177, 178, 179), and all applicable laws, regulations and onshore orders in existence at the time of lease issuance. Site-specific analysis would be required prior to the approval of any ground disturbance proposal on the leases. No additional impacts beyond those analyzed in the Vernal PRMP FEIS Section 4.15.2.4 and 4.23.13 are anticipated to water resources from the leasing of these parcels.</p>	Dallas Nutt	
		<p>Hydraulic Fracturing is a technique developed in the 1940's. Around 2000, the technique was combined with directional drilling to dramatically increase production from deposits previously considered uneconomical. (EPA, 2016, p. 4)</p> <p>The hydraulic fracturing water cycle describes the use of water in hydraulic fracturing, from water withdrawals to make hydraulic fracturing fluids, through the mixing and injection of hydraulic fracturing fluids in oil and gas production wells, to the collection and disposal or reuse of produced water. These activities can impact drinking water resources under some circumstances. Impacts can range in frequency and severity, depending on the combination of hydraulic fracturing water cycle activities and local- or regional-scale factors. The following combinations of activities and factors are more likely than others to result in more frequent or more severe impacts:</p> <ul style="list-style-type: none"> <li>○ Water withdrawals for hydraulic fracturing in times or areas of low water availability, particularly in areas with limited or declining groundwater resources;</li> <li>○ Spills during the management of hydraulic fracturing fluids and chemicals or</li> </ul>	Sheri Wysong	11/2/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>produced water that result in large volumes or high concentrations of chemicals reaching groundwater resources;</p> <ul style="list-style-type: none"> <li>○ Injection of hydraulic fracturing fluids into wells with inadequate mechanical integrity, allowing gases or liquids to move to groundwater resources;</li> <li>○ Injection of hydraulic fracturing fluids directly into groundwater resources;</li> <li>○ Discharge of inadequately treated hydraulic fracturing wastewater to surface water resources; and,</li> <li>○ Disposal or storage of hydraulic fracturing wastewater in unlined pits, resulting in contamination of groundwater resources.</li> </ul> <p>"The above conclusions are based on cases of identified impacts and other data, information, and analyses presented in the report. Cases of impacts were identified for all stages of the hydraulic fracturing water cycle. Identified impacts generally occurred near hydraulically fractured oil and gas production wells and ranged in severity, from temporary changes in water quality to contamination that made private drinking water wells unusable." (EPA 2016 pp 1-2)</p> <p>If hydraulic fracturing should occur in an area where there is no vertical separation between the hydraulically fractured rock formation and the bottom of the potential underground drinking water source, hydraulic fracturing fluid may be introduced into the source. However, the occurrence of hydraulic fracturing within a potential drinking water source is low, concentrated in a few fields in Wyoming and Montana. (EPA 2016 p. 27)</p> <p>Attachment 1 to this checklist verifies that hydraulic fracturing the parcels is well enough separated from the usable aquifers to prevent impacts from hydraulic fracturing the wells.</p> <p>The measures required (spill containment systems, casing integrity testing, pit lining), etc. for all wells drilled in Utah, hydraulic fractured or not, are adequate to prevent hydraulic fracturing fluids as well as hydrocarbons and produced water from the wells to prevent ground/surface water contamination. The Utah Division of Oil,</p>		

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		<p>Gas and Mining has promulgated rules to prevent environmental impacts from hydraulic fracturing (Utah Administrative Code R649-3-39). Further analysis/mitigation of impacts is not warranted.</p> <p>No additional impacts beyond those analyzed in the Vernal PRMP FEIS Section 4.15.2.4 and 4.23.13 are anticipated to water resources from the leasing of these parcels.</p>		
NI	<p>Water: Hydrologic Conditions (stormwater)</p>	<p>Leasing of the proposed leases would not, by itself, authorize any ground disturbances effecting hydrologic conditions. Site-specific effects cannot be analyzed until an exploration or development application is received, after leasing has occurred. However, any development proposal on the leases would be subject to the standard lease terms, the protective lease notices and stipulations identified in Appendix A, and all applicable laws, regulations and onshore orders in existence at the time of lease issuance. Site-specific analysis would be required prior to the approval of any ground disturbance proposal on the leases.</p> <p>The before mentioned conditions along with the following notices applied to parcels will result in negligible expected impacts to these resources</p> <p>UT-LN-128 Parcels 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 127, 129, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173,</p>	Jerrad Goodell	11-1-2018

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		<p>175, 176, 177, 178, 179, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 215, 217, 218, 219, 220, 226, 227, 228, 229, 260, 261, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 327, 357, 358, 359, 78225</p> <p>UT-LN-53 Parcels 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 127, 129, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 176, 177, 178, 179, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 215, 217, 218, 219, 220, 226, 227, 228, 229, 260, 261, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 327, 357, 358, 359, 78225</p> <p>UT-LN-56 Parcels 177, 178, 179</p> <p>UT-LN-57 Parcels 169, 227, 228, 229, 296, 318, 321, 357, 358, 359</p> <p>UT-S-123 Parcels 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 127, 129, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 176, 177, 178, 179, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 215, 217, 218, 219, 220, 226, 227, 228, 229, 260, 261, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 327, 357, 358, 359, 78225</p>		
NI	Water: Municipal Watershed / Drinking Water Source Protection	<p>Leasing would not, by itself, authorize any disturbances which could affect these resources. Site-specific effects cannot be analyzed until an exploration or development application is received, after leasing has occurred. However, any development proposal on the leases would be subject to the standard lease terms, and all applicable laws, regulations and onshore orders in existence at the time of lease issuance.</p> <p>The before mentioned conditions along with the following notice applied to</p>	Jerrad Goodell	11-1-2018

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		<p>parcels will result in negligible expected impacts to these resources</p> <p>UT-LN-56 Parcels 177, 178, 179 No additional impacts beyond those analyzed in the Vernal PRMP FEIS Section 4.15.2.4 and 4.23.13 are anticipated to water resources from the leasing of these parcels.</p>		
NI	<p>Water: Steams, Riparian Wetlands, Floodplains</p>	<p>Parcels 97, 100, 109, 110, 112, 115, 122, 264, 266, and 276, are near Willow Creek which is on Utah's impaired water list due to boron. Parcels 123 and 356 are near Bitter Creek which is on Utah's impaired water list due to boron, selenium, temperature, and total dissolved solids. Parcels 212, 217, and 218 are near Evacuation Creek, which is on Utah's impaired waters list due to boron, selenium, temperature, and total dissolved solids. Leasing would not, by itself, authorize any ground disturbances which could affect these resources. Site-specific effects cannot be analyzed until an exploration or development application is received, after leasing has occurred. However, any development proposal on the leases would be subject to the standard lease terms, and all applicable laws, regulations and onshore orders in existence at the time of lease issuance.</p> <p>The before mentioned conditions along with the following notices applied to parcels will result in negligible expected impacts to these resources</p> <p>UT-LN-53 Parcels 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 127, 129, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 176, 177, 178, 179, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 215, 217, 218, 219, 220, 226, 227, 228, 229, 260, 261, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 327, 357, 358, 359, 78225</p>	Jerrad Goodell	11-1-2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>UT-LN-128 Parcels 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 127, 129, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 176, 177, 178, 179, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 215, 217, 218, 219, 220, 226, 227, 228, 229, 260, 261, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 327, 357, 358, 359, 78225</p> <p>No additional impacts beyond those analyzed in the Vernal PRMP FEIS Section 4.15.2.4 and 4.23.13 are anticipated to water resources from the leasing of these parcels.</p> <p>In addition, stipulation 123 NO SURFACE OCCUPANCY – RIPARIAN, FLOODPLAINS, AND PUBLIC WATER RESERVES would be applied all parcels except the following to protect surface waters and riparian areas by avoiding surface disturbance or implementing engineering controls: 262, 381, 382, 383, 384, and 405.</p>		
NI	Water: Surface Water Quality	<p>Leasing would not, by itself, authorize any ground disturbances which could contribute runoff affecting surface water quality. Site-specific effects cannot be analyzed until an exploration or development application is received, after leasing has occurred. However, any development proposal on the leases would be subject to the standard lease terms, the protective lease notices and stipulations identified in Appendix A, and all applicable laws, regulations and onshore orders in existence at the time of lease issuance. Site-specific analysis would be required prior to the approval of any ground disturbance proposal on the lease parcels.</p> <p>The before mentioned conditions along with the following notices applied to parcels will result in negligible expected impacts to these resources.</p> <p>UT-LN-128 Parcels 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 127, 129, 130,</p>	Jerrad Goodell	11-1-2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 176, 177, 1781 179, 197, 198, 199, 200, 201, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 215, 217, 218, 219, 220, 226, 227, 228, 229, 260, 261, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 327, 357, 358, 359, 78225</p> <p>UT-LN-53 Parcels 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 127, 129, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 176, 177, 1781 179, 197, 198, 199, 200, 201, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 215, 217, 218, 219, 220, 226, 227, 228, 229, 260, 261, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 327, 357, 358, 359, , 78225</p> <p>UT-LN-56 Parcels 177, 178, 179</p> <p>UT-LN-57 Parcels 169, 227, 228, 229, 296, 318, 321, 357, 358, 359</p> <p>UT-S-123 Parcels 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 127, 129, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 176, 177, 1781 179, 197, 198, 199, 200, 201, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 215, 217, 218, 219, 220, 226, 227, 228, 229, 260, 261, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 327, 357, 358, 359, 78225</p> <p>No additional impacts beyond those analyzed in the Vernal PRMP FEIS Section 4.15.2.4 and 4.23.13 are anticipated to water resources from the leasing of these parcels.</p>		
NI	Water: Water Rights	Leasing itself would not have impacts to water rights. However, should development occur on the proposed lease parcels, water rights could be impacted by the development of oil	Jerrad Goodell	11-1-2018

<b>Determination</b>	<b>Resource/Issue</b>	<b>Rationale for Determination</b>	<b>Signature</b>	<b>Date</b>
NI	Water: Waters of the U.S.	<p>and/or gas wells. Leasing the proposed parcels would not, by itself, authorize any disturbances. Site-specific effects cannot be analyzed until an exploration or development application is received, after leasing has occurred. However, any development proposal on the lease parcels would be subject to the standard lease terms, the protective lease notices and stipulations identified in Appendix A, and all applicable laws, regulations and onshore orders in existence at the time of lease issuance. Site- specific analysis would be required prior to the approval of any ground disturbance proposal on the lease parcels.</p> <p>In light of existing knowledge regarding resource values on the subject leases, which is based upon the analysis in the VFO RMP [BLM2008] resource specialist knowledge, significant impacts beyond those already addressed in the Record of Decision for the VFO RMP are not anticipated to occur as a result of leasing the proposed parcels.</p> <p>No additional impacts beyond those analyzed in the Vernal PRMP FEIS Section 4.15.2.4 and 4.23.13 are anticipated to water resources from the leasing of these parcels.</p> <p>Waters of the U.S. are present within the leasing area. If developed there is a potential that disturbed soils could affect the water of the U.S. At the site specific APD stage the company must adopt a SPCC plan and storm water control plan to control any potential constituents from reaching Waters of the U.S.. If the company plans on affecting these waters directly, a Stream Alteration Permit would be required, and would also require additional NEPA to look at those changes.</p> <p>In light of existing knowledge regarding resource values on the subject leases, which is based upon the analysis in the VFO RMP [BLM2008] resource specialist knowledge, significant impacts beyond those already addressed in the Record of Decision for the VFO RMP are not anticipated to occur as a result of leasing the proposed parcels.</p> <p>No additional impacts beyond those analyzed in the Vernal PRMP FEIS</p>	Jerrad Goodell	11-1-2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		Section 4.15.2.4 and 4.23.13 are anticipated to water resources from the leasing of these parcels.		
PI	Wild Horses	<p>NI for Bonanza Herd Area:  The BHA boundary exists as designated by Congress in 1971; however, there are no longer wild horses present within the HA. Horses may be present on the BHA, but those animals fall within the estray livestock jurisdictions of the Northern Ute Tribe and/or Uintah County. 15 parcels are located within the BHA. Approximately 8,300 acres of proposed leased area occurs within the HA per the RFD provided. However, no Wild Free Roaming Horses exist within the area. And further issue analysis is not warranted in this document.</p> <p>PI for Hill Creek Herd Area and Winter Ridge Herd Area:  The proposed project is located within the HCHA and WRHA, which prior to the 2008 ROD were designated as a Herd Management Areas with an Appropriate Management Level or AML. However, until the horses are gathered, removed and the herd determined to be “legally zeroed out”, the horses will continue to be managed for. Several lease parcels offered in the Environmental Assessment do fall within each of these Herd Areas. However, only two the Herd Areas have wild free roaming horses present – HCHA and WRHA. Potential impacts may occur to the wild horses within these areas per the minimum reasonable and foreseeable scenario that has been developed for this document.</p>	Dusty Carpenter	11/5/18
PI	Wildlife: Migratory Birds (including raptors)	<p>Numerous bird species may migrate through, or nest within all proposed parcels. Project actions would be planned to occur after August 31 to mitigate for any impending impacts or disturbance during the nesting season (March 1 – August 31). Actual disturbance impacts would be analyzed and evaluated during the APD and NEPA process. Application of the lease notice UT-LN-45, if followed, would minimize impacts to nesting migratory birds during the breeding season and additional conditions may be applied following site-specific NEPA at the APD</p>		

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>stage. In addition, lease notice UT-LN-49 would apply to any migratory bird species that are identified on the Utah sensitive species list.</p> <p>NI- Raptors- Timing stipulations UT-S-261 and UT-S-325 would be applied to all parcels. In addition, lease notices, UT-LN-40, UT-LN-44, and UT-LN-49 would apply to any applicable raptor species and situations as needed to protect raptors and their associated habitats. Therefore, the stipulations and notices would provide adequate protection to all raptor species. For parcels 381 and 383 stipulation UT-S-420 would apply as well as the lease notices mentioned above to minimize impacts to raptors and their habitats</p> <p>NI- Bald eagle winter roosting areas were identified in parcels: 381 and 383, per GIS review. However, lease stipulations UT-S-281 and UT-S-420 would apply as well as lease notices, UT-LN-37, UT-LN-44, and UT-LN-107.</p>		
NI	Wildlife: Fish (designated or non-designated)	<p>Any water depletion from the Upper Colorado River Basin is likely to adversely affect critical habitat for the endangered fish of the Colorado River System. Lease notice T&amp;E-03 Endangered Fish of the Upper Colorado River Drainage Basin should be applied to all parcels. The Vernal Field office has a programmatic agreement with the USFWS that states water depletion projects less than 100-acre feet is likely to adversely affect the four endangered fish, however the USFWS service believes the recovery program for these species will adequately address the effects. It is estimated that 3-acre feet of water would be needed for the drilling and completion of 1 well. Not all water sources are considered to be depleting from the Green River Basin the impacts and total depletion will be analyzed in the APD stage.</p> <p>Several parcels include waters with populations of Colorado River cutthroat trout. Lease notice UT-LN-49 Utah Sensitive Species has been applied to all parcels.</p>	Jerrad Goodell	11-1-2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
PI	Wildlife: Non-USFWS Designated	<p>Impacts to habitat and water quality for all fish species are adequately addressed in the Surface Water Quality, and the Steams, Riparian, Wetlands, Floodplains sections of this document. Therefore detailed analysis is not required.</p> <p>PI- Greater Sage-grouse- GRSG Priority Habitat Management Areas (PHMA) within parcels: 226, 227, 228, and 229. These stipulations will be applied to these parcels:  UT-S- 347: 226, 227, 228, 229  UT-S-348: 226, 227, 228, 229  UT-S-349: 226, 227, 228, 229  UT-S-350: 226, 227, 228, 229  UT-S-352: 226, 227, 228, 229  UT-S-353: 226, 227, 228, 229  UT-S-354: 226, 227, 228, 229  UT-S-355: 226, 227, 228</p> <p>These notices will be applied to these parcels:  UT-LN-129: 226, 227, 228, 229  UT-LN-130: 226, 227, 228, 229  UT-LN-131: 226, 227, 228, 229  UT-LN-132: 226, 227, 228, 229  UT-LN-133: 226, 227, 228, 229</p> <p>GRSG General Habitat Management Areas (GHMA) within parcels: 66, 86, 87, 97, 100, 101, 102, 106, 107, 108, 109, 110, 111, 112, 115, 117, 124, 127, 129, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 170, 171, 172, 173, 175, 176, 177, 178, 179, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 211, 212, 213, 214, 217, 218, 260, 261, 262, 264, 266, 268, 271, 272, 273, 274, 276, 278, 279, 295, 296, 298, 305, 309, 318, 319, 320, 321, 337, 356, 358, 359, 381, 382, 383, and 384. These stipulations will be applied to these parcels:  UT-S-205: 271  UT-S-207: 271  UT-S-208: 381, 383</p> <p>These notices will be applied to these parcels:  UT-LN-131: All parcels, except 405 and UTU-78225  UT-LN-132: All parcels, except 405 and UTU-78225  UT-LN-133: 106, 127, 261, 271</p>		

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>NI- 81,070 acres of mule deer crucial winter range occurs in parcels 100, 101, 102, 107, 108, 109, 110, 111, 112, 115, 117, 122, 124, 130, 131, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 175, 177, 178, 179, 211, 212, 213, 214, 217, 218, 268, 272, 273, 274, 276, 382, 384 and UTU-78225. However, stipulations UT-S-230 and UT-S-231 and lease notice UT- LN-02 would be applied; therefore, the stipulations and notice would provide adequate protection and is consistent with the Vernal RMP. For parcels 381 and 383 lease stipulation UT-S-235 would apply.</p> <p>NI- 6,388 acres fall within the identified mule deer migration corridor for parcels 165, 167, 169, 197 and 295. However, stipulation UT-S-251 would be applied; therefore, the stipulation and notice would provide adequate protection and is consistent with the Vernal RMP.</p> <p>NI- 17,250 acres of mule deer crucial fawning habitat occurs in parcels 169, 175, 177, 178, 179, 211, 227, 228, 229, 295, 296, 298, 318, 320, 321, 356, 358 359, and 382. However, stipulation UT-S-247 and lease notice UT-LN-02 would be applied; therefore, the stipulation and notice would provide adequate protection and is consistent with the Vernal RMP. For parcel 383 notice UT-LN-09 will be applied to minimize impacts to fawning mule deer.</p> <p>NI- 39,304 acres of elk crucial winter range occurs in parcels 66, 86, 87, 100, 101, 110, 111, 112, 115, 117, 122, 124, 132, 133, 134, 135, 136, 139, 141, 162, 165, 167, 169, 197, 218, 226, 227, 228, 274, 276, 298, 382, 384 and UTU-78225. However, stipulations UT-S-230 and lease notice UT-LN-02 would be applied; therefore, the stipulations and notice would provide adequate protection and is consistent with the Vernal RMP.</p> <p>NI- Parcels 381 and 383 have crucial elk winter range per GIS review. There are no stipulations or lease notices from the Salt Lake Office RMP that manage for elk winter range in these parcels. However, parcels 381 and 383 will have stipulation</p>		

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>UT-S-301 seasonal timing limitations, which will provide some seasonal protection of wildlife habitat in general.</p> <p>NI- 24,933 acres of elk crucial calving habitat occurs in parcels 066, 086, 87, 100, 169, 197, 198, 227, 228, 229, 295, 296, 298, 318, 319, 320, 321, 356, 358, and 359. However, stipulation UT-S-247 and lease notice LN-11 would be applied; therefore, the stipulation and notice would provide adequate protection and is consistent with the Vernal RMP.</p> <p>NI- According to UDWR GIS layers, there is 39,360 acres of pronghorn fawning habitat within the proposed lease sale parcels. BLM designated crucial habitat for pronghorn was identified in the proposed lease sale parcels 226, 227, 228, 381 and 383. For parcels 226, 227 and 228 stipulation UT-S-226 and UT-LN-16 and for parcels 381 and 383 notice UT-LN-14 will be applied to minimize impacts.</p> <p>Pronghorn fawning habitat (not crucial per the BLM RMP but crucial according to UDWR) was also identified in parcels 86, 87, 106, 108, 109, 129, 170, 171, 172, 173, 175, 176, 177, 179, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 229, 261, 262, 271, 278, 305, 309, 382, and 384. Lease sale notice UT-LN-16 will be applied to these parcels.</p> <p>NI- 80 acres of crucial year-long habitat and 216 acres of crucial spring/fall habitat were identified for Rocky Mountain bighorn sheep for parcels 381 and UTU-78225. However, lease notice UT-LN-20 will be applied to the parcels to minimize impacts to the species.</p> <p>NI- 341 acres of crucial winter moose habitat were identified in parcel 38, Lease notices UT-LN-05 will be applied to the parcels to minimize impacts to the species. There is also 1,550 acres of crucial year-long moose habitat for parcels 382, 383, and 384, however, lease notices UT-LN-05 and UT-LN-24 will be applied to minimize impacts.</p>		

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>NI- White-tailed prairie dog (BLM sensitive species) are potentially found in all parcels. Stipulation UT-S-218 and lease notices UT-LN-25 and UT-LN-49 would be applied to parcels that contain white-tailed prairie dog habitat in order to help minimize impacts. For parcels 381 and 383 stipulation UT-S-219 would apply as well as lease notice UT-LN-49.</p> <p>NI- Amphibians and Reptiles: Western (Boreal) toad, Great Plains toad and Smooth green snake are potentially found in all parcels. However, lease notice UT-LN-49 will be applied to all applicable parcels in order to help minimize impacts to these BLM Sensitive Species.</p> <p>In addition parcels 381 and 383 will have stipulation UT-S-301 seasonal timing limitation will apply in order to protect seasonal wildlife habitat in general.</p>		
NI	Wildlife: Threatened, Endangered, Proposed or Candidate	<p>NI-No parcels are within or near (within 0.5 miles) of Critical Mexican spotted owl habitat. Potential Mexican spotted owl (Threatened) habitat is identified for parcels: 122, 124, 197, 198, 214, 226, 229, 298, 318, 319, 321, 356, 358, 359 and UTU-78225, per GIS review. However, stipulations UT-S-261 and lease notices UT-LN-44 and T&amp;E-06 would be applied; therefore, the stipulations and lease notices would minimize impacts to breeding and nesting Mexican spotted owl and their associated habitats.</p> <p>NI- No parcels were identified within or near (within 0.5 miles) of Proposed Critical Habitat for yellow-billed cuckoo (Threatened) per GIS review. Parcels influenced by potential habitat include 178, 179, and 211; however, lease notices T&amp;E-31 and UT-LN-45 would be applied. For parcels 381 and 383 lease notice UT-LN-113 would apply as well as lease notice UT-LN-49. Therefore, the lease notices would minimize</p>		

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>impacts to breeding and nesting yellow-billed cuckoo and their associated habitats on these parcels.</p> <p>NI- The black-footed ferret (Endangered, but considered a “non-essential” experimental population) primary management zone area is identified for parcels: 170, 171, 172, 173, 199, 200, 201, 202, 203, 204, 205, 206, 207, 305, and 337 per GIS review. However, stipulation UT-S-299 and lease notice T&amp;E-02 would be applied. Parcels considered important areas based off coordination with UDWR include 175, 176, 177, 208, and 309; only the lease notice would apply to these parcels. The stipulations and lease notice aforementioned would minimize impacts to breeding black-footed ferrets and their associated habitat.</p> <p>NI- Potential Canada Lynx (Threatened) habitat is identified for parcels: 381, 382, 383, and 384. However, lease sale notice T&amp;E- 10 will be applied to these parcels to help avoid and minimize impacts to Canada Lynx and their associated habitat.</p>		
NI	Woodlands/Forestry	Woodlands are present in areas of the proposed lease parcels. Leasing of the proposed parcels would not, by itself, authorize any ground disturbing activities that could affect woodlands. Site-specific effects cannot be analyzed until an exploration or development application is received, after leasing has occurred. However, any development proposal on the lease parcels would be subject to the standard lease terms, and all applicable laws, regulations and onshore orders in existence at the time of lease issuance. Site-specific	David Palmer	11/1/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		<p>analysis would be required prior to the approval of any ground disturbance proposal on the parcels. In light of existing knowledge regarding resource values on the subject parcels, which is based upon the analysis in the VFO RMP [BLM 2008b], BLM VFO resource specialist knowledge, and the protective measure that would be applied to the parcels if leased, significant impacts beyond those already addressed in the VFO RMP [BLM 2008b] are not anticipated to occur as a result of leasing the proposed parcels.</p>		

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
Environmental Coordinator			
Authorized Officer			

## Attachment 1: White Paper

### Consideration of Hydraulic Fracturing on Water Quality of Vernal Parcels

#### in BLM's March 2019 Lease EA

11/14/2018

The BLM is considering offering oil and gas leases throughout the Vernal Field Office. If a vertical well should strike a potentially profitable target, it may be hydraulically fractured as a vertical well, extended horizontally and hydraulically fractured, or more wells would be drilled and hydraulically fractured in the vicinity. The BLM has considered the potential hydraulic fracturing and possible impacts to groundwater resources and determined that detailed analysis is not necessary due to de minimal risk to surface and ground water resources.

The following considerations were used to reach this determination:

1. Connectivity between deep and shallow groundwater zones
2. Sensitivity of existing and potential groundwater resources
3. Reasonably foreseeable development
4. Water quality of oil and gas target zones

**1. Alterations to deep groundwater do not affect shallow groundwater resources.**

Within the 1 mile buffer of the Vernal parcels there is no communication of deep ground water and springs reaching the surface. Hydraulic fracturing would occur at depths much deeper than surface water and usable groundwater zones and therefore impacts to groundwater resources would not be expected.

**2. There are no sensitive groundwater resources such as drinking water supply.**

Sensitivity of impacts to groundwater resources is low because there are no drinking water protection zones or domestic water sources within or near the lease parcel area. Any future water development within or near the lease parcel area would also likely utilize the shallow Duchesne River-Uinta aquifer which would not be affected by oil and gas development, as per Onshore order # 2

**3. Reasonably foreseeable development projects limited oil and gas development.**

The reasonably foreseeable development scenario indicates a low density of oil and gas development which decreases the potential for negative impacts to groundwater. The

foreseeable development is small due to lack of historic production in the area. Only a fraction of these wells would show enough potential to support hydraulic fracturing and therefore any impacts would be dispersed.

4. Oil and gas target zones are not within usable aquifers.

Usable groundwater (Total Dissolved Solids <10,000 ppm) occurs deepest parallel to the northern flank of the basin adjacent to the Uinta Mountains, where the greatest amount of recharge occurs. Principle aquifers include: the Duchesne River and Uinta Formations (potentially usable water) and the Bird's Nest Aquifer in the upper Green River Formation (generally saline water and potential large-scale salt water disposal). The Duchesne River-Uinta aquifer is a complex system of shallow perched and artesian aquifers within the Parachute Creek Member of the upper Green River Formation routinely modeled as a basin scale confining unit at its base. The Bird's Nest Aquifer is characterized by high porosity volumes in areas where Nahcolite ( $\text{NaHCO}_3$ ) nodules have undergone dissolution. The Green River Formation also exhibits usable water within productive oil and gas zones and a trend of shallow saline water paralleling the Duchesne Fault Zone north of T5S USM. Each well will be evaluated using well logs to determine the locations of hydrocarbons and water, water zones will not be hydraulically fractured. Hydraulic fracturing jobs are designed to remain in one zone and not to communicate vertically into other strata. Hydraulic fracturing is a tool to create permeability laterally within a specific formation. Oil and gas exploration would occur in deep groundwater zones with existing poor water quality and therefore any negative impacts to water quality would have no effect to the human environment. There are no saltwater springs or other groundwater anomalies in the project area that would indicate a conduit exists between these deep zones and shallow zones.

BLM has considered these factors along with comments from the public and other agencies to determine whether to conduct a detailed analysis in the EA. For this analysis the BLM has determined that the level of potential impacts does not warrant a detailed analysis and therefore no additional discussion is necessary for this lease level EA.