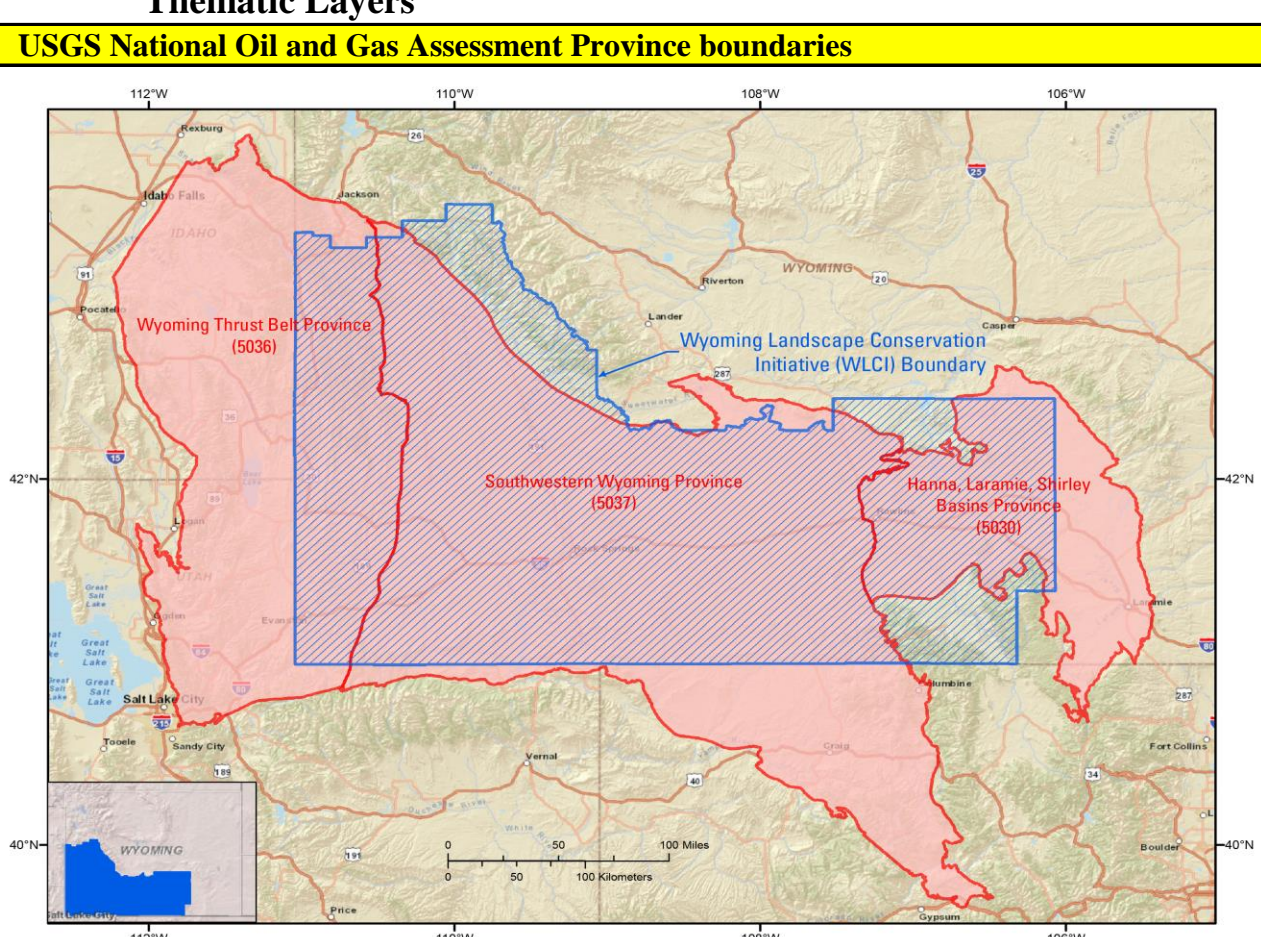
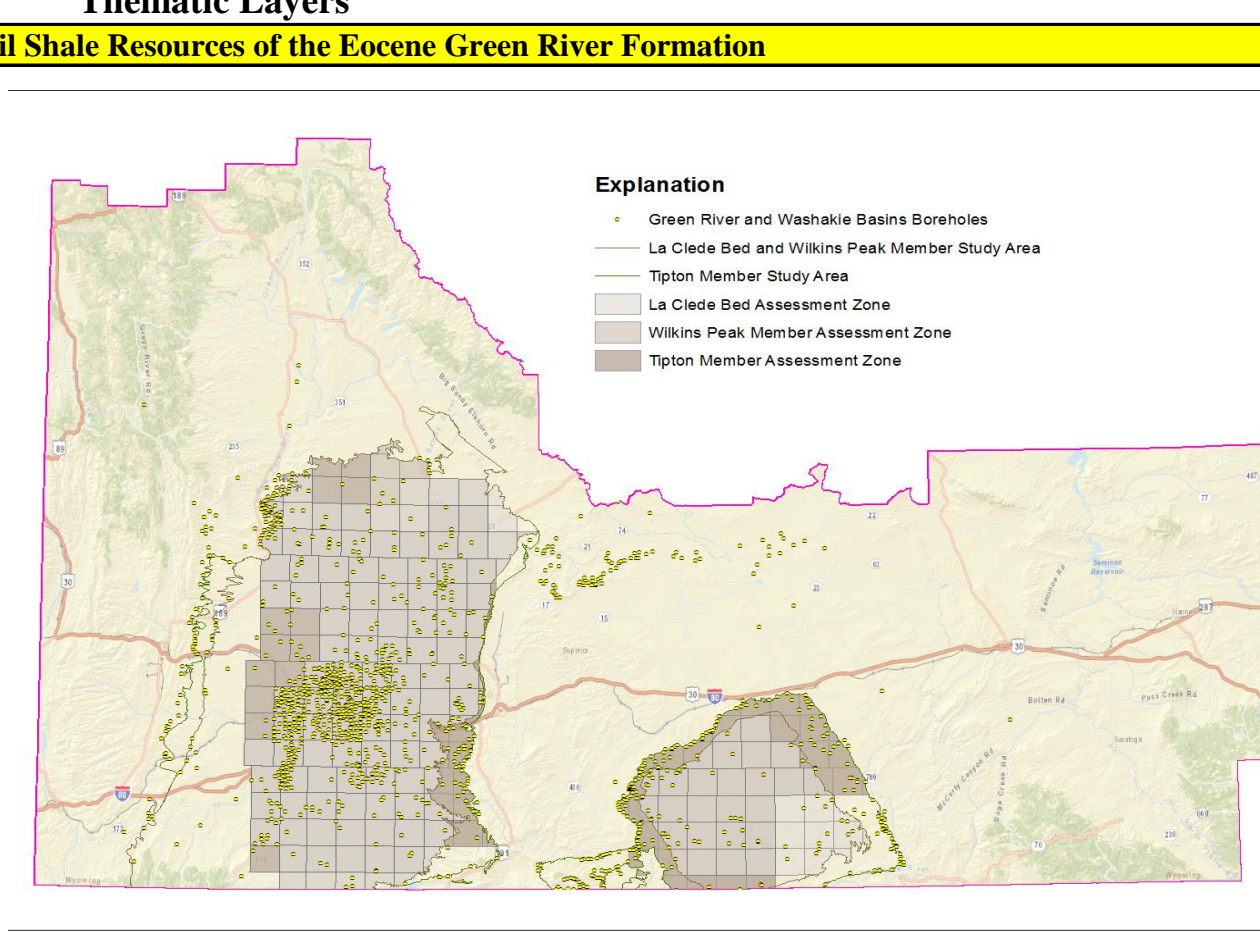
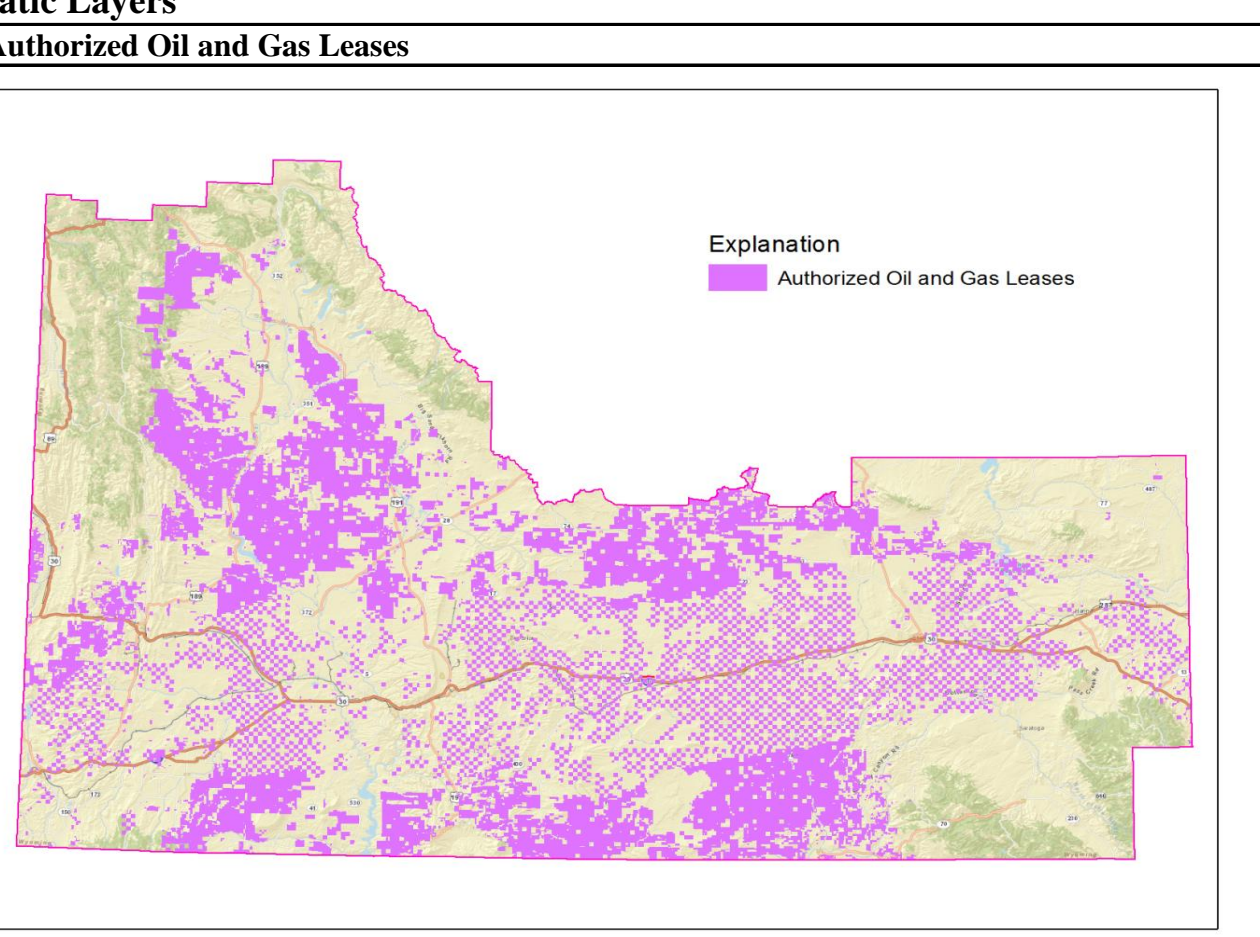
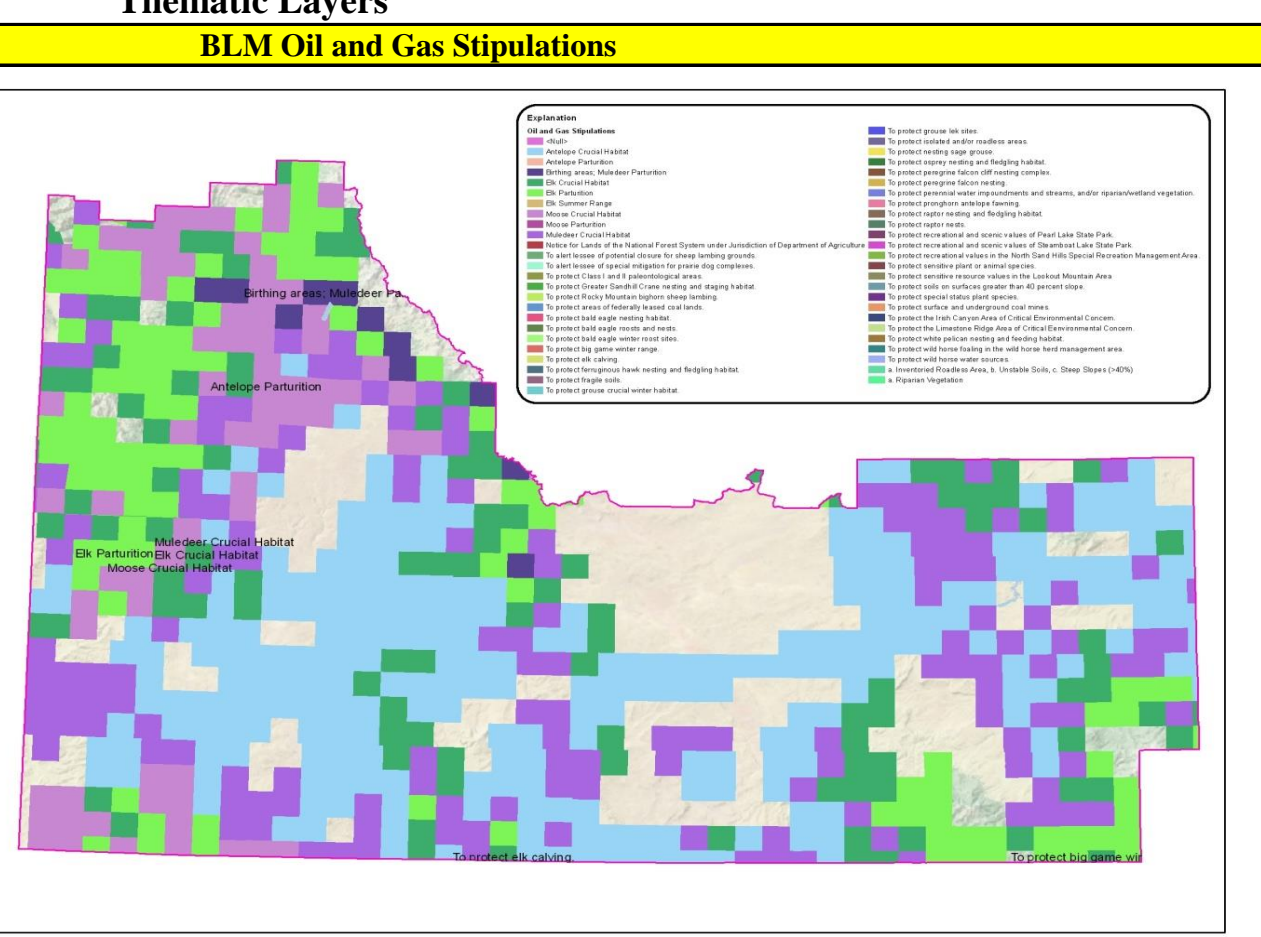
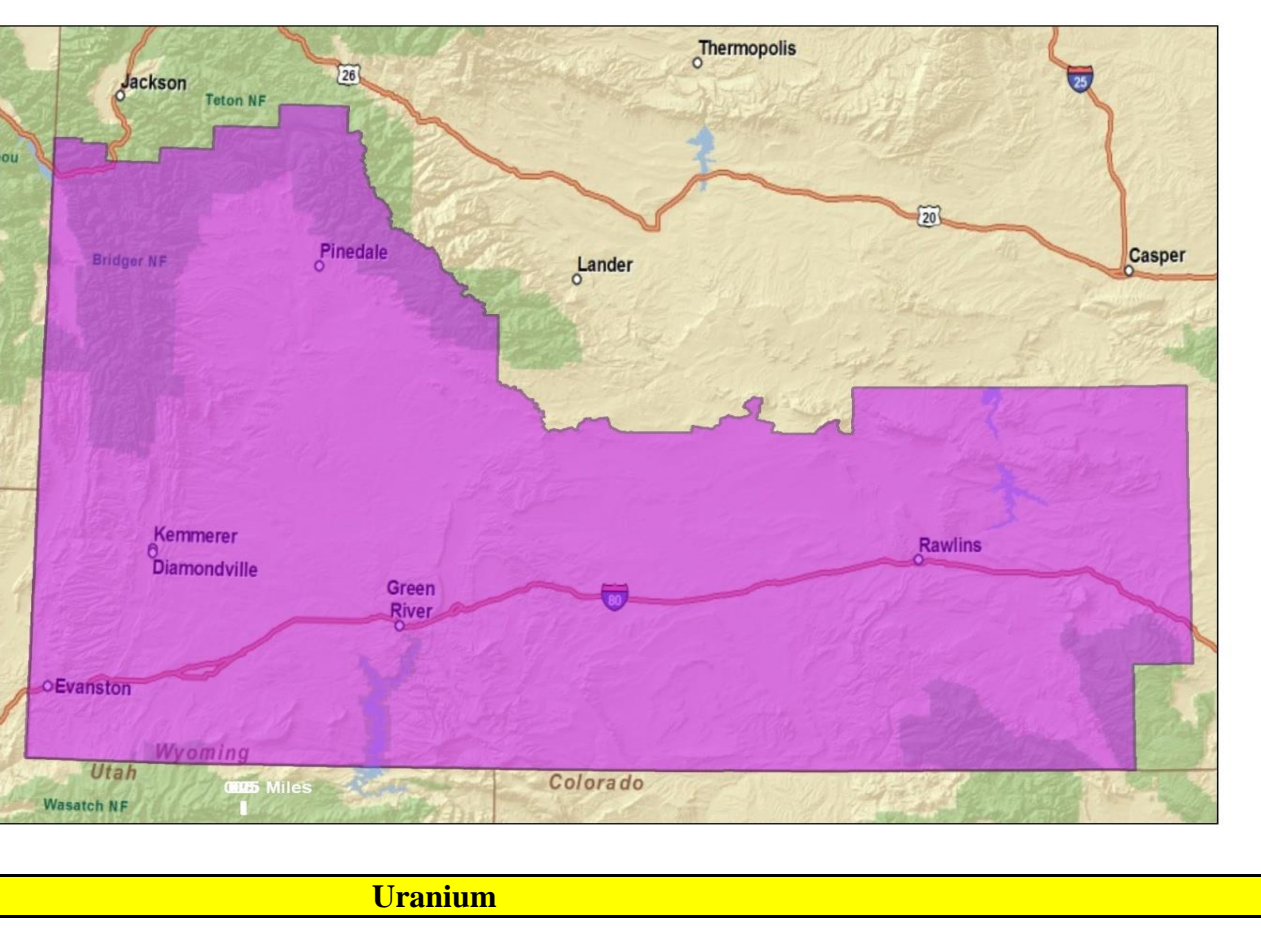
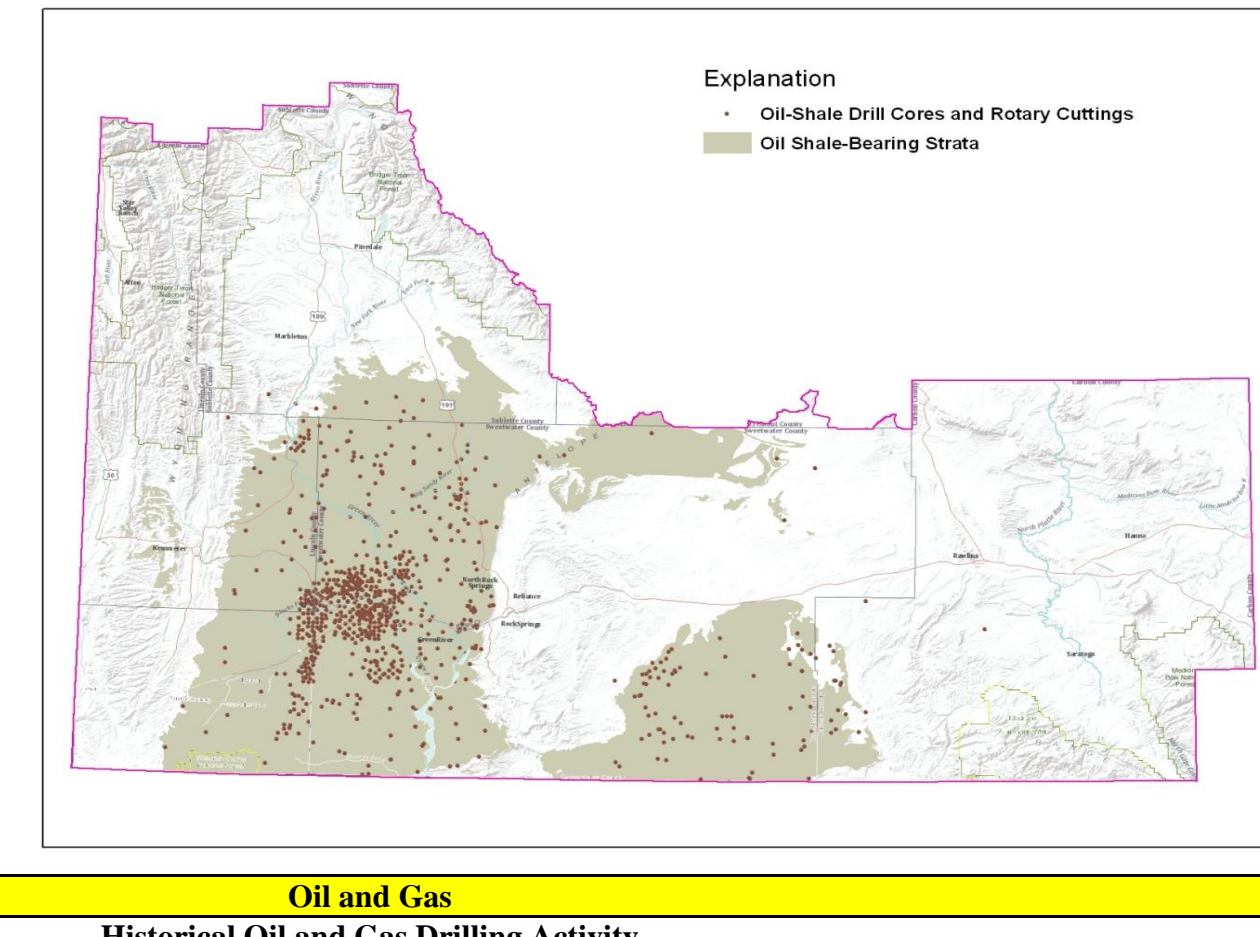
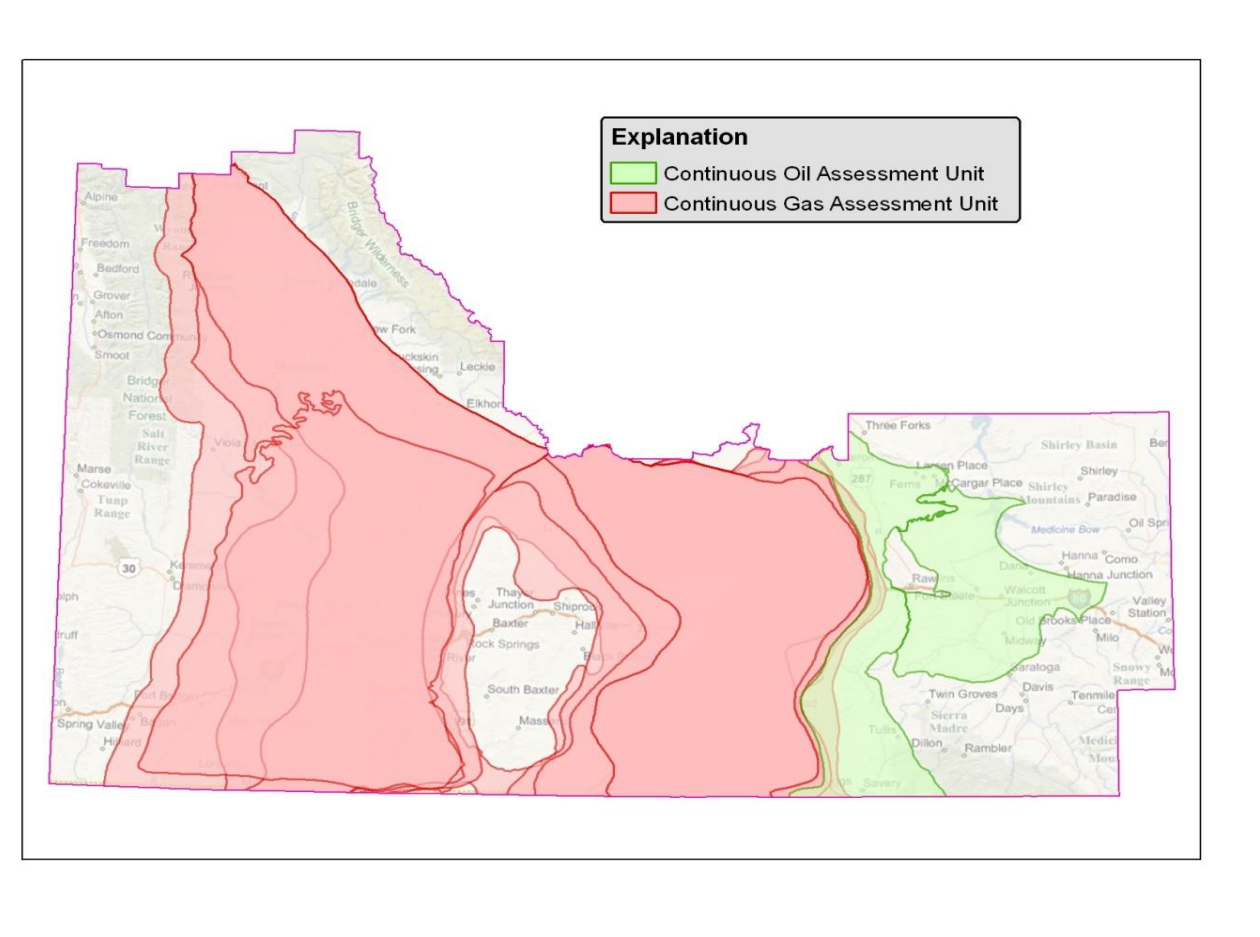
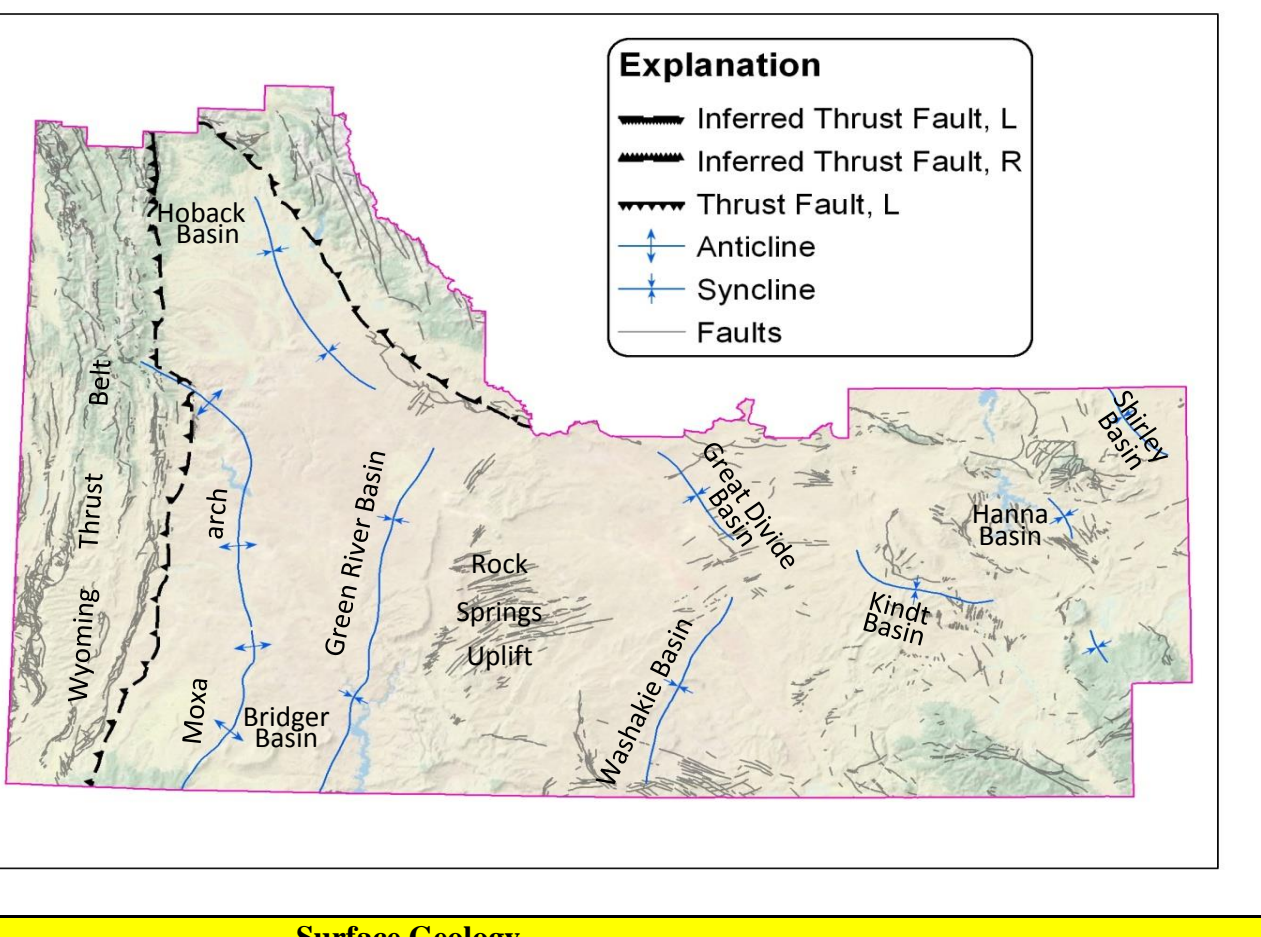
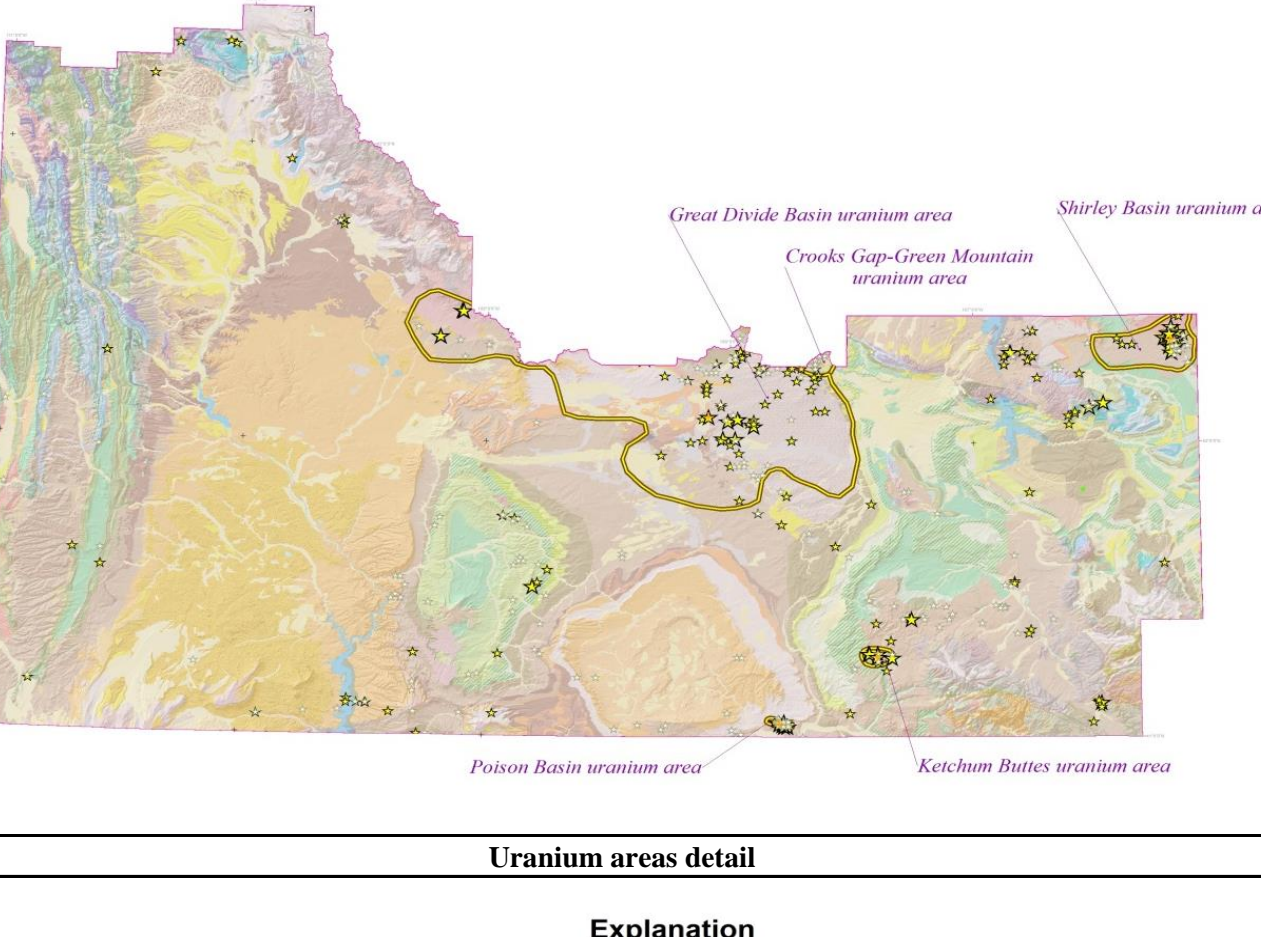
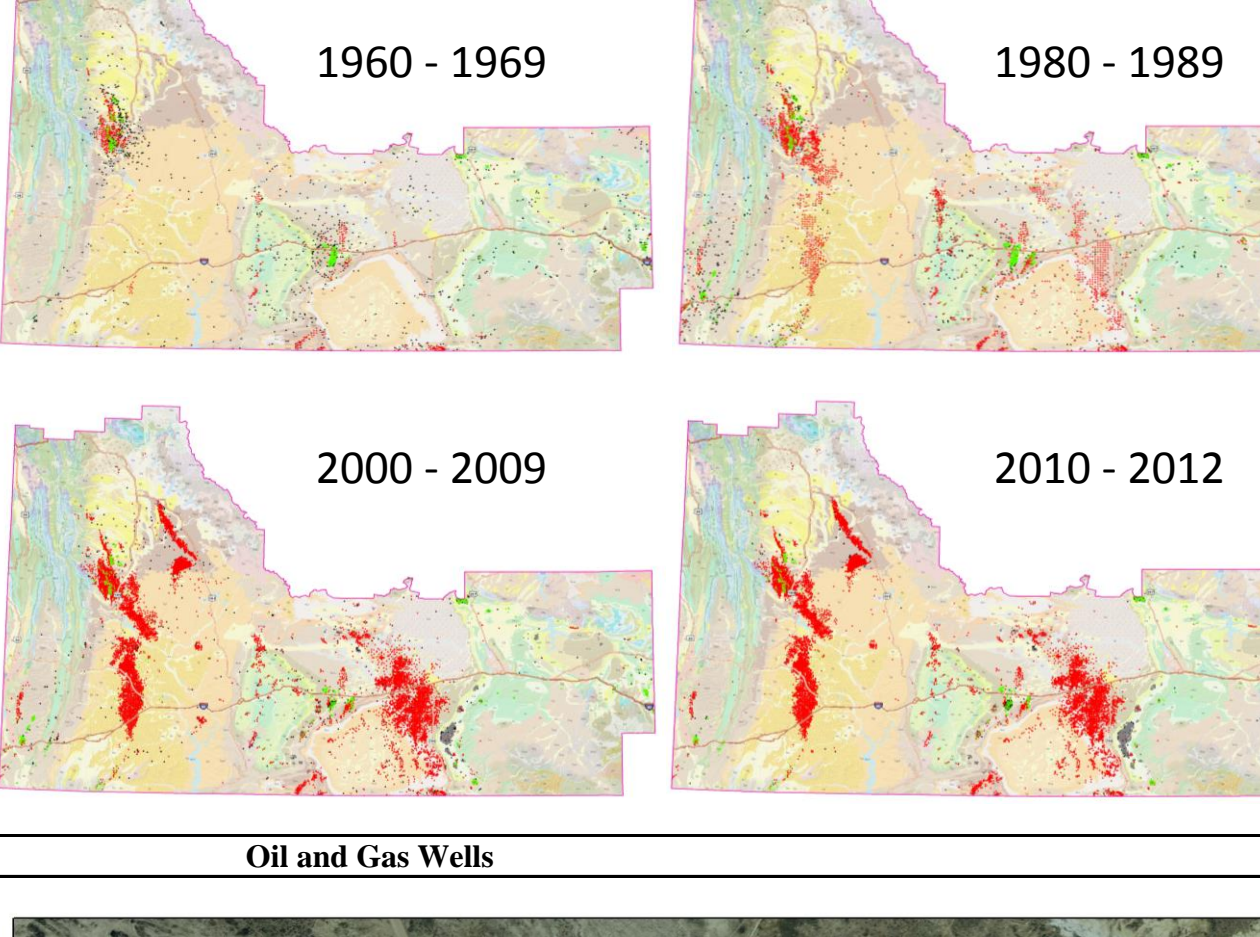
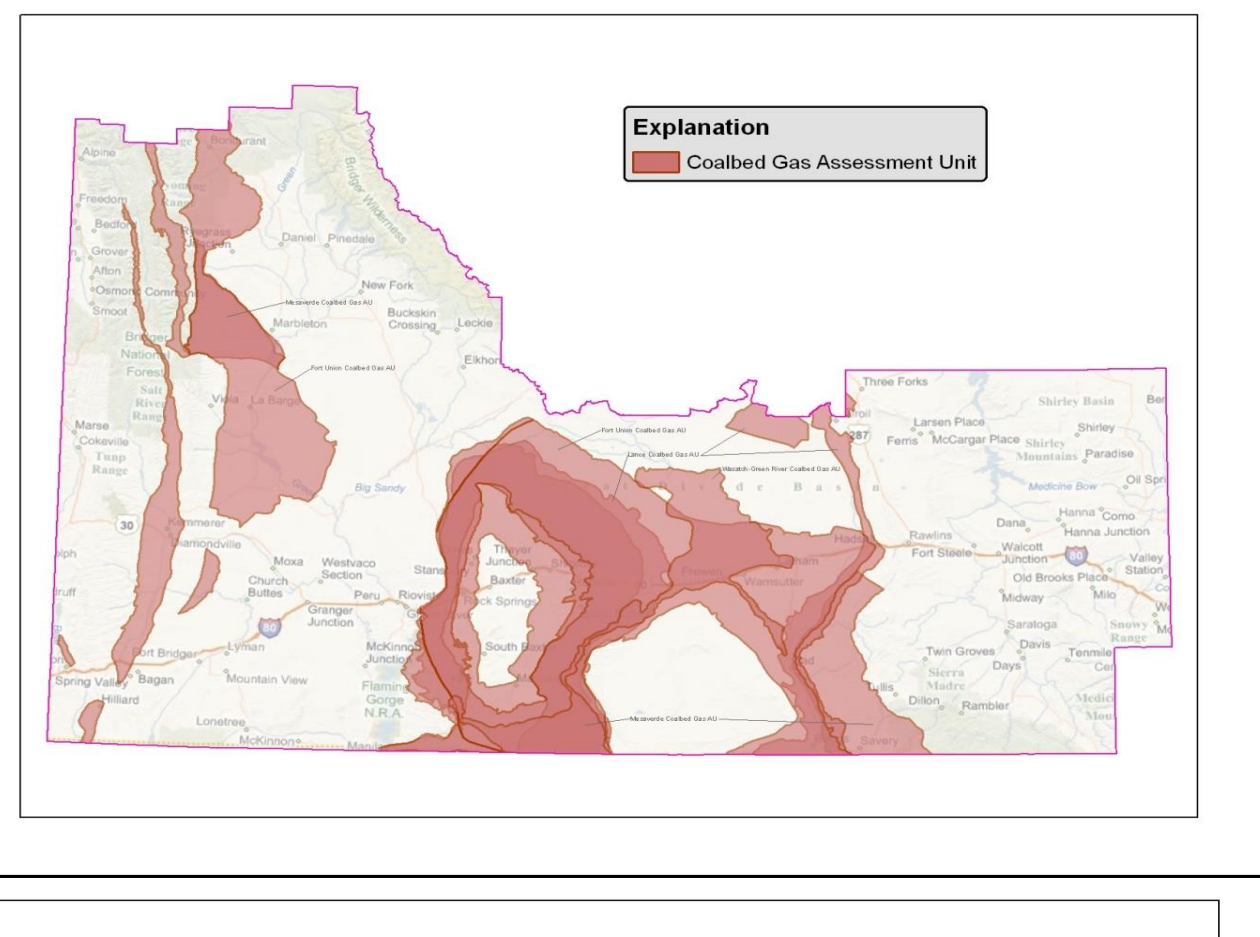
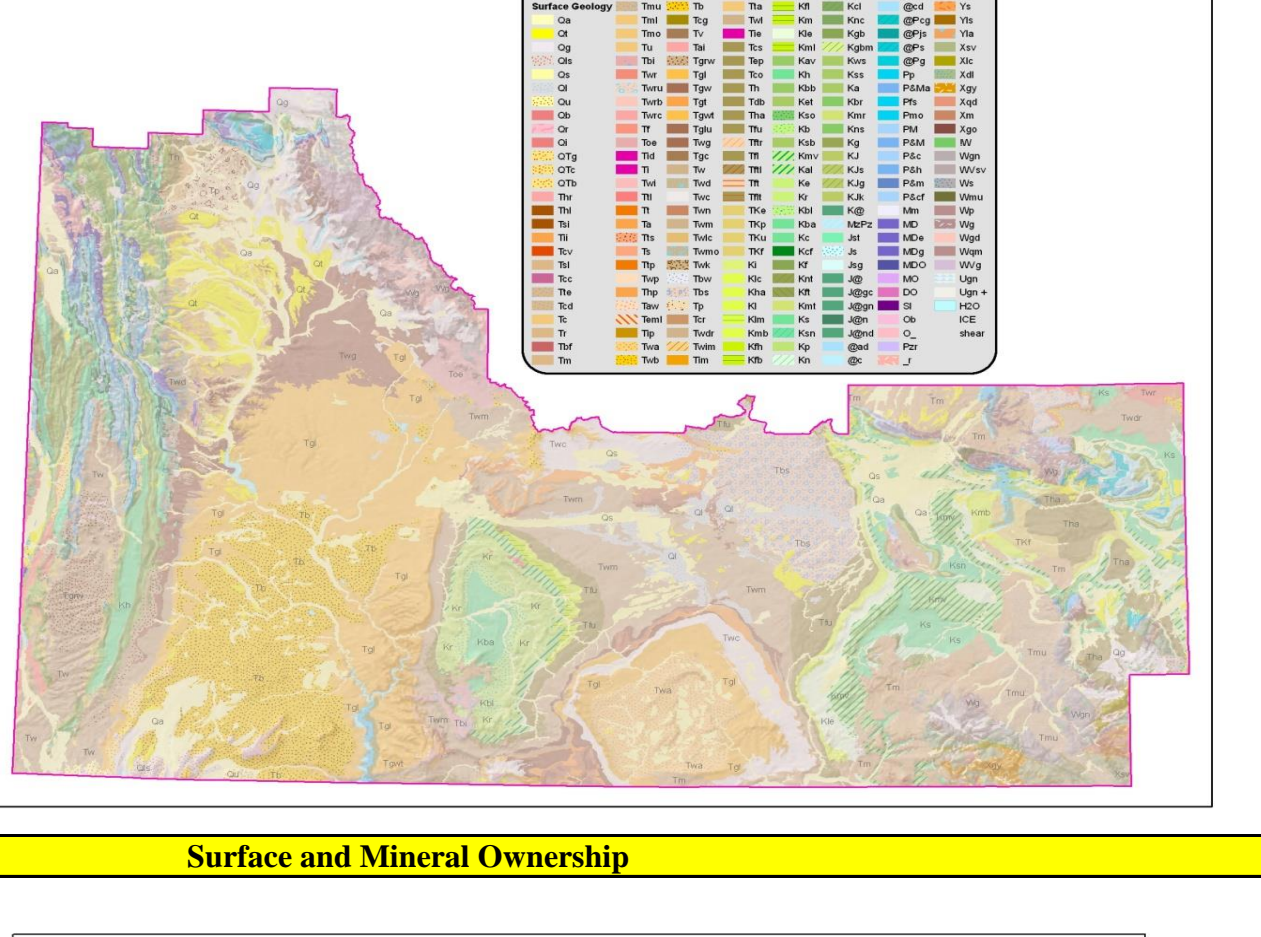
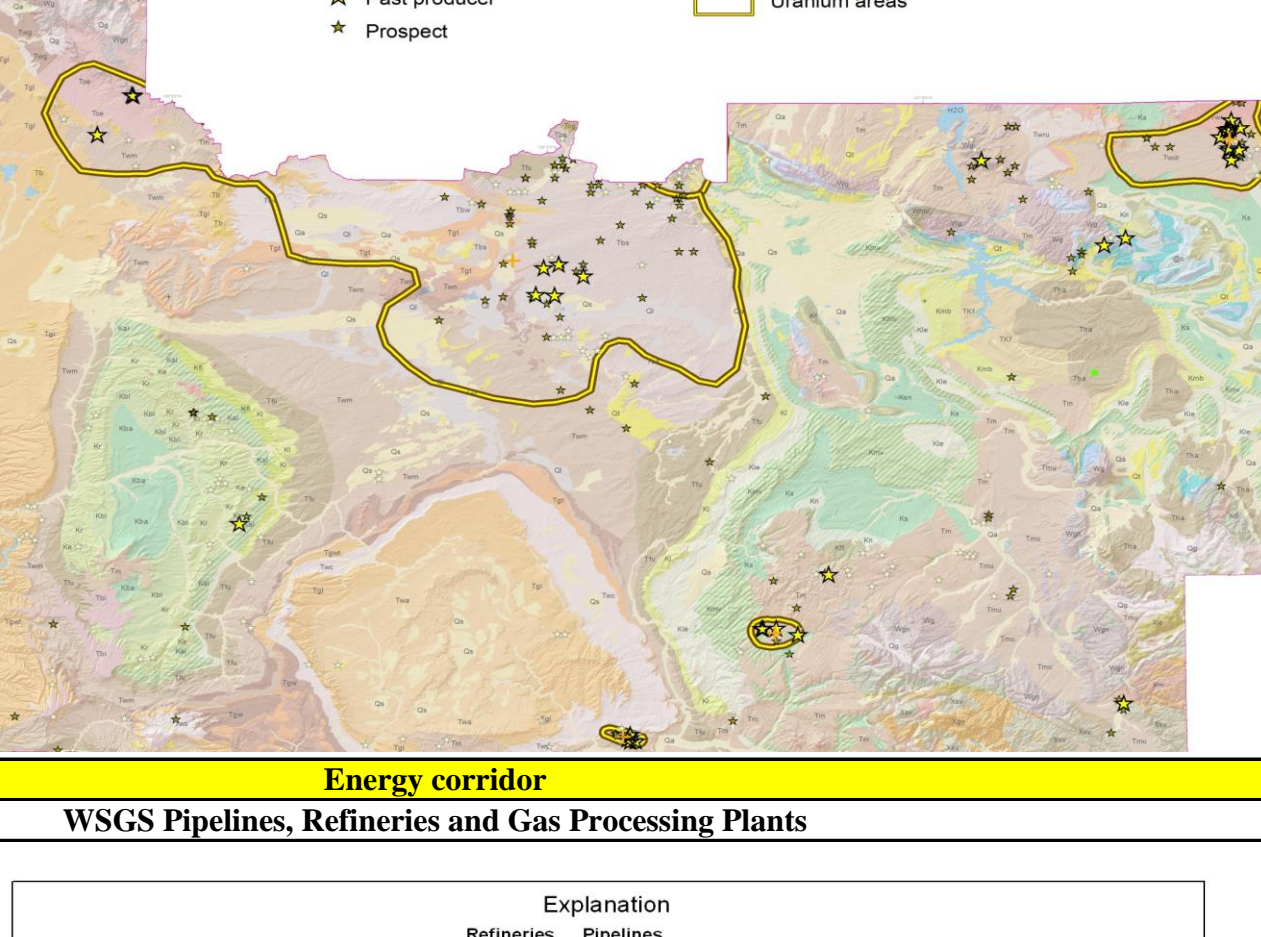
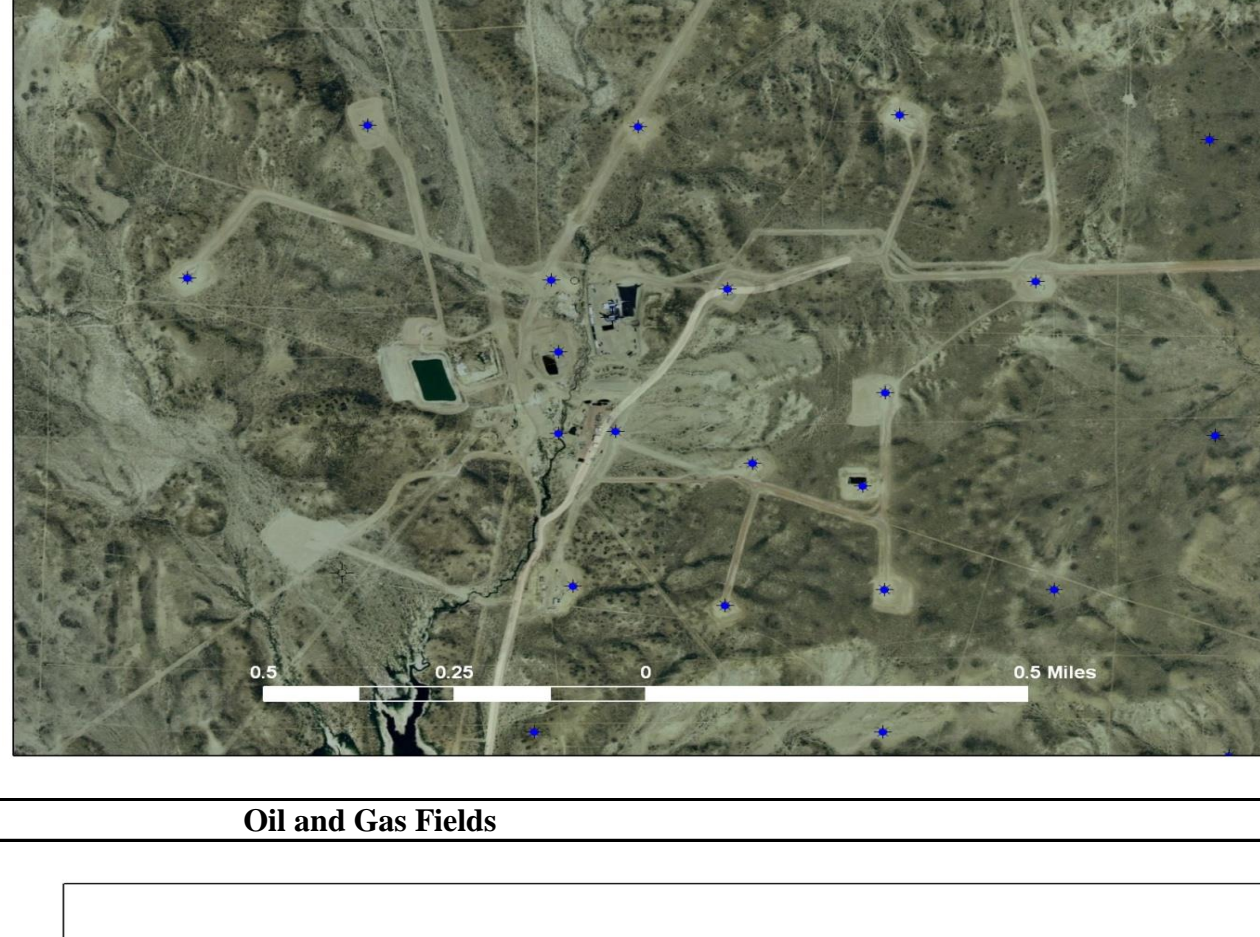
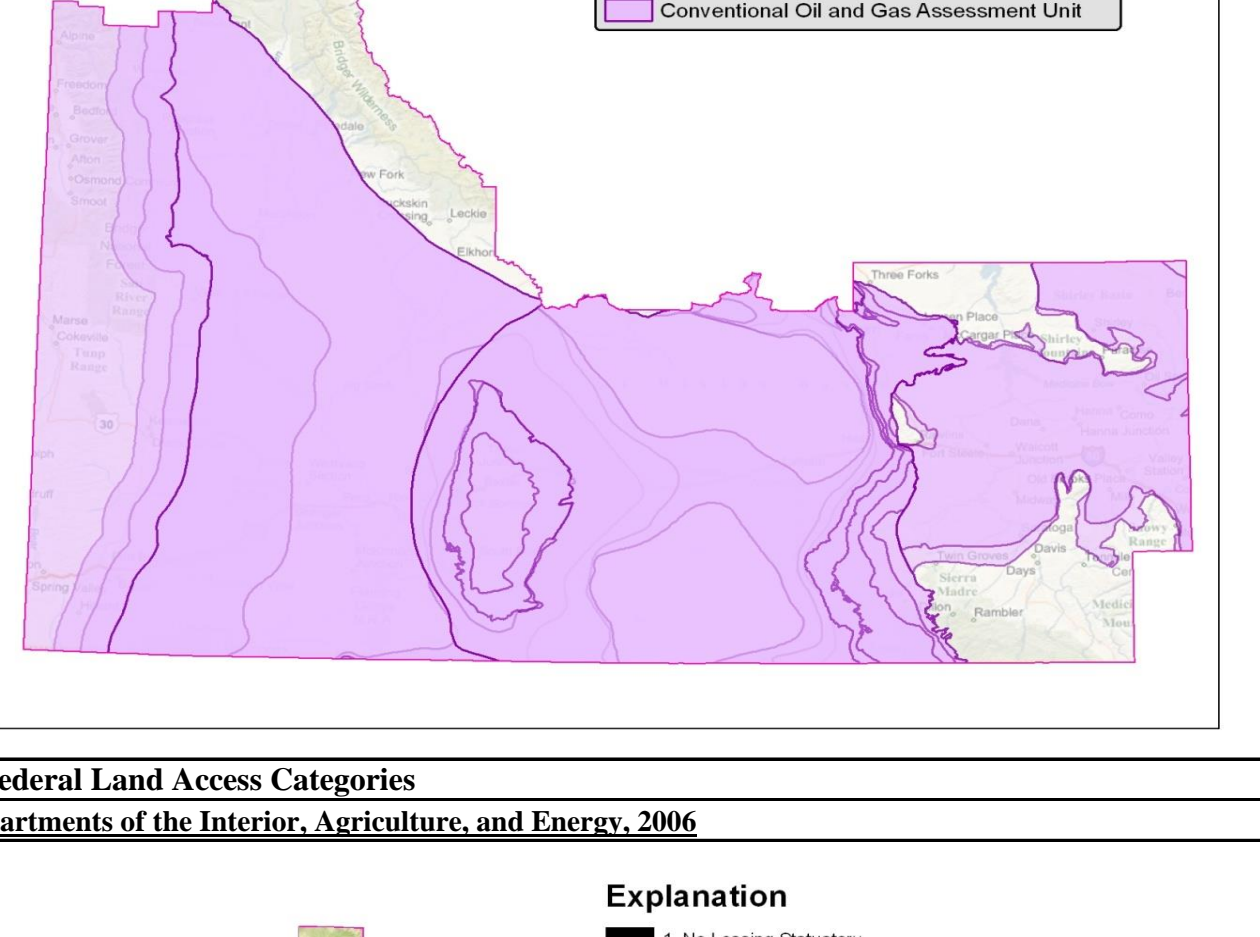
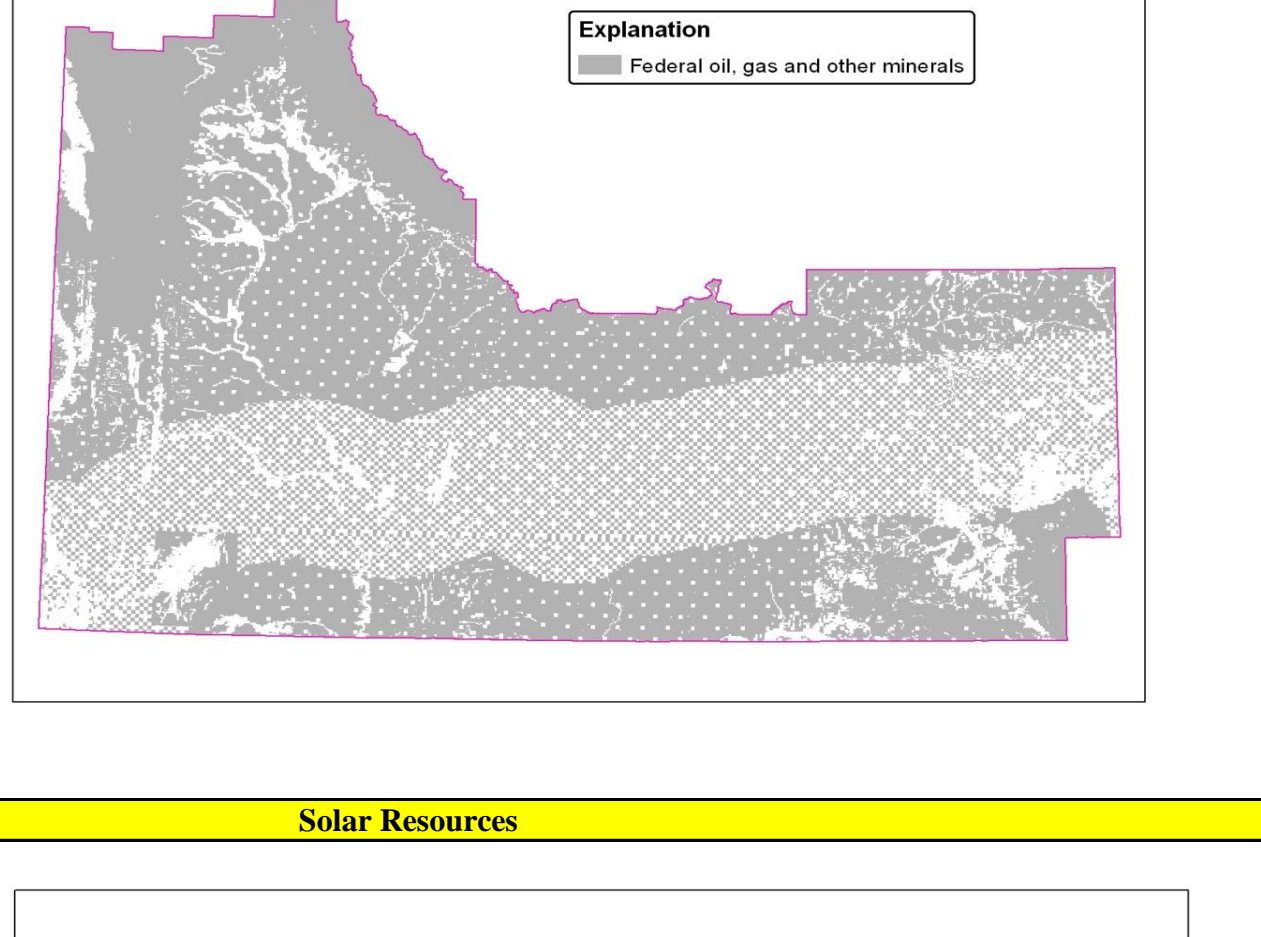
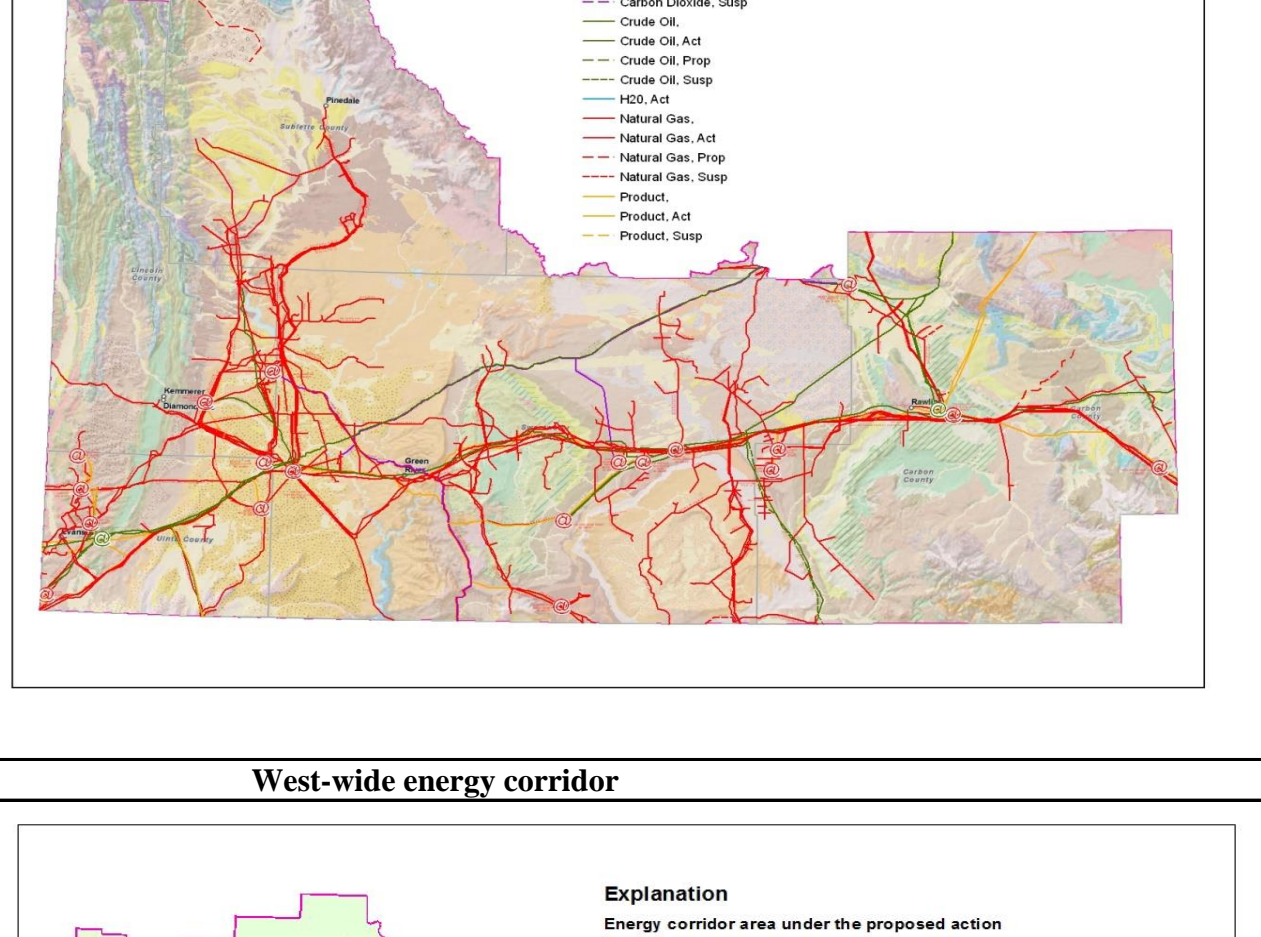
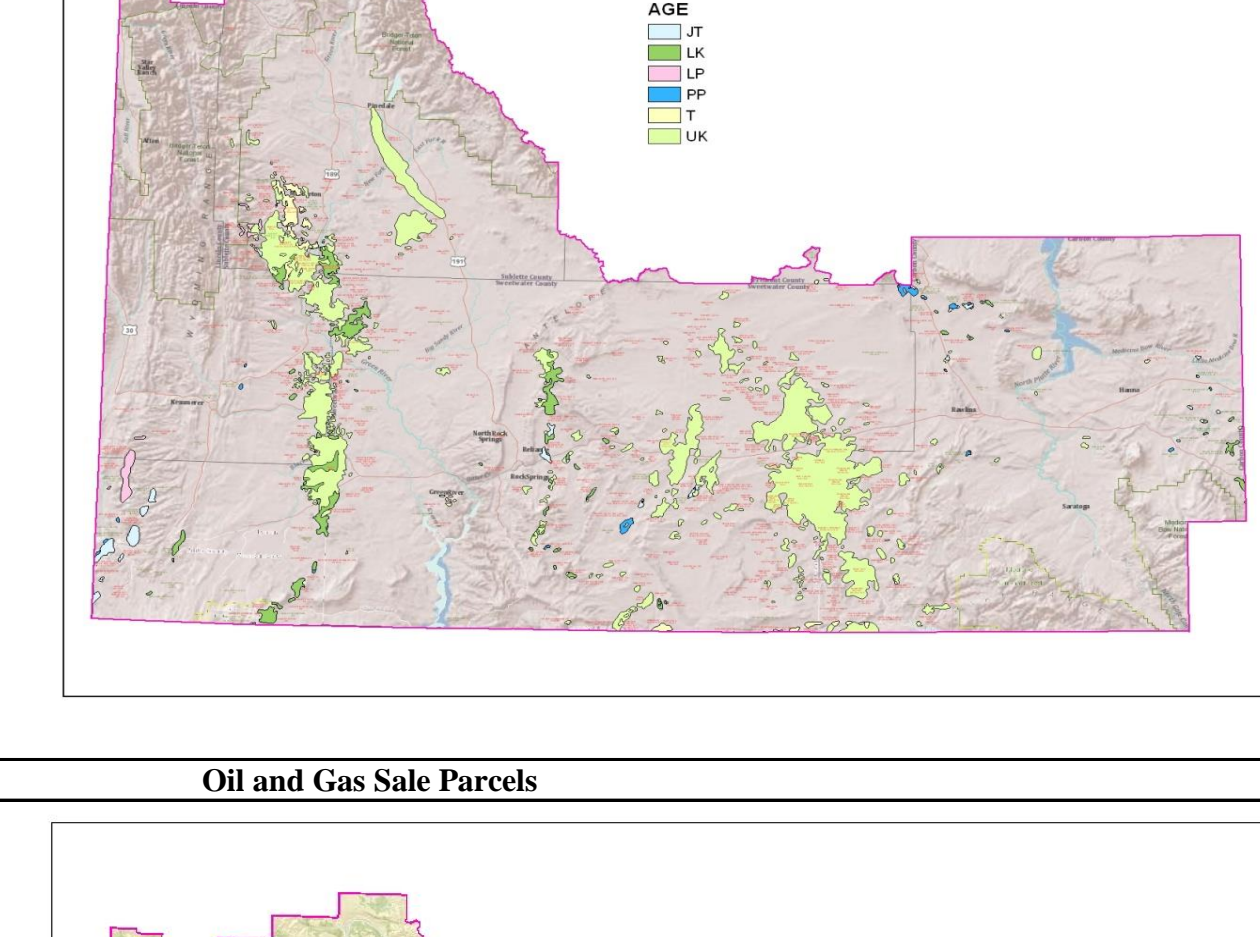
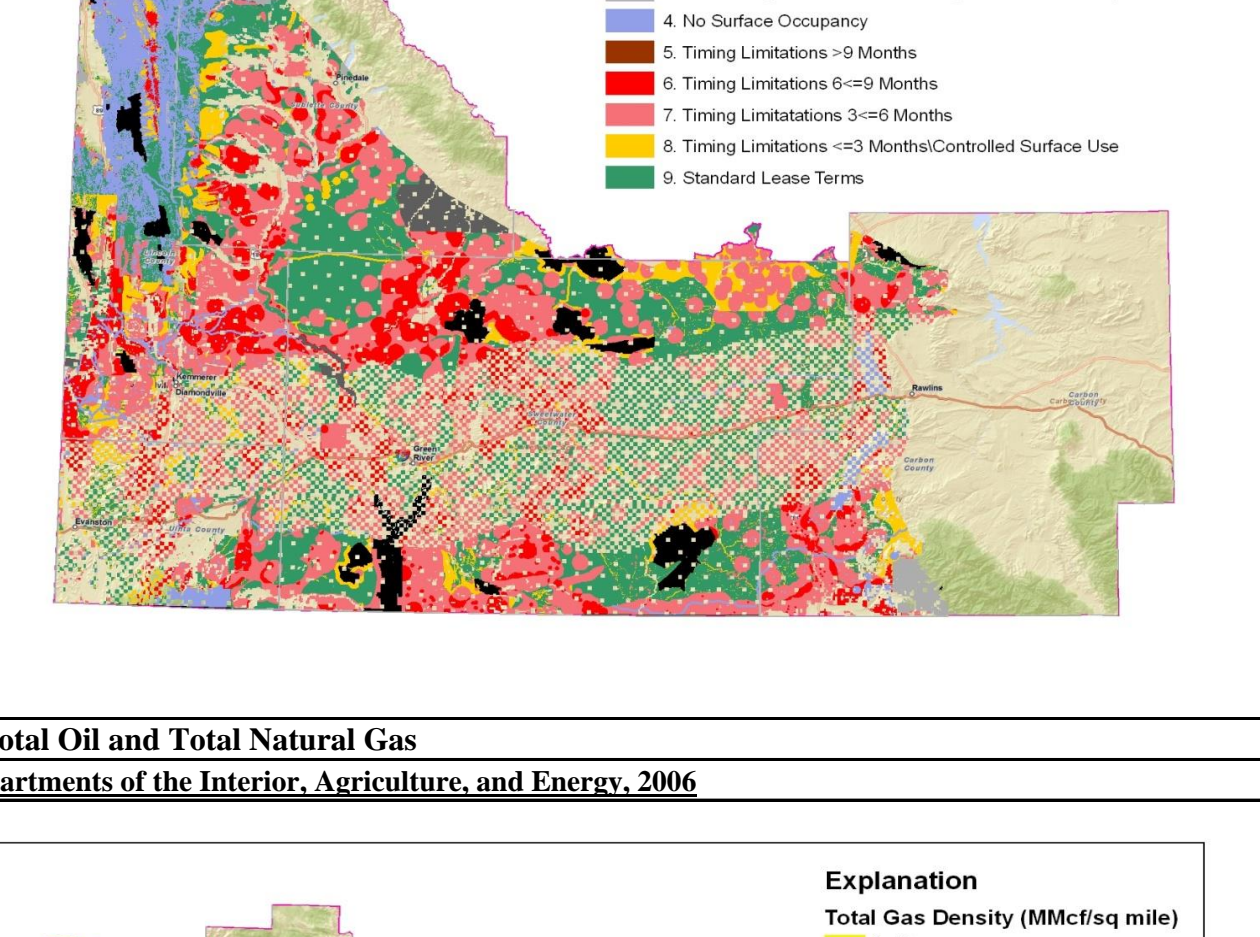
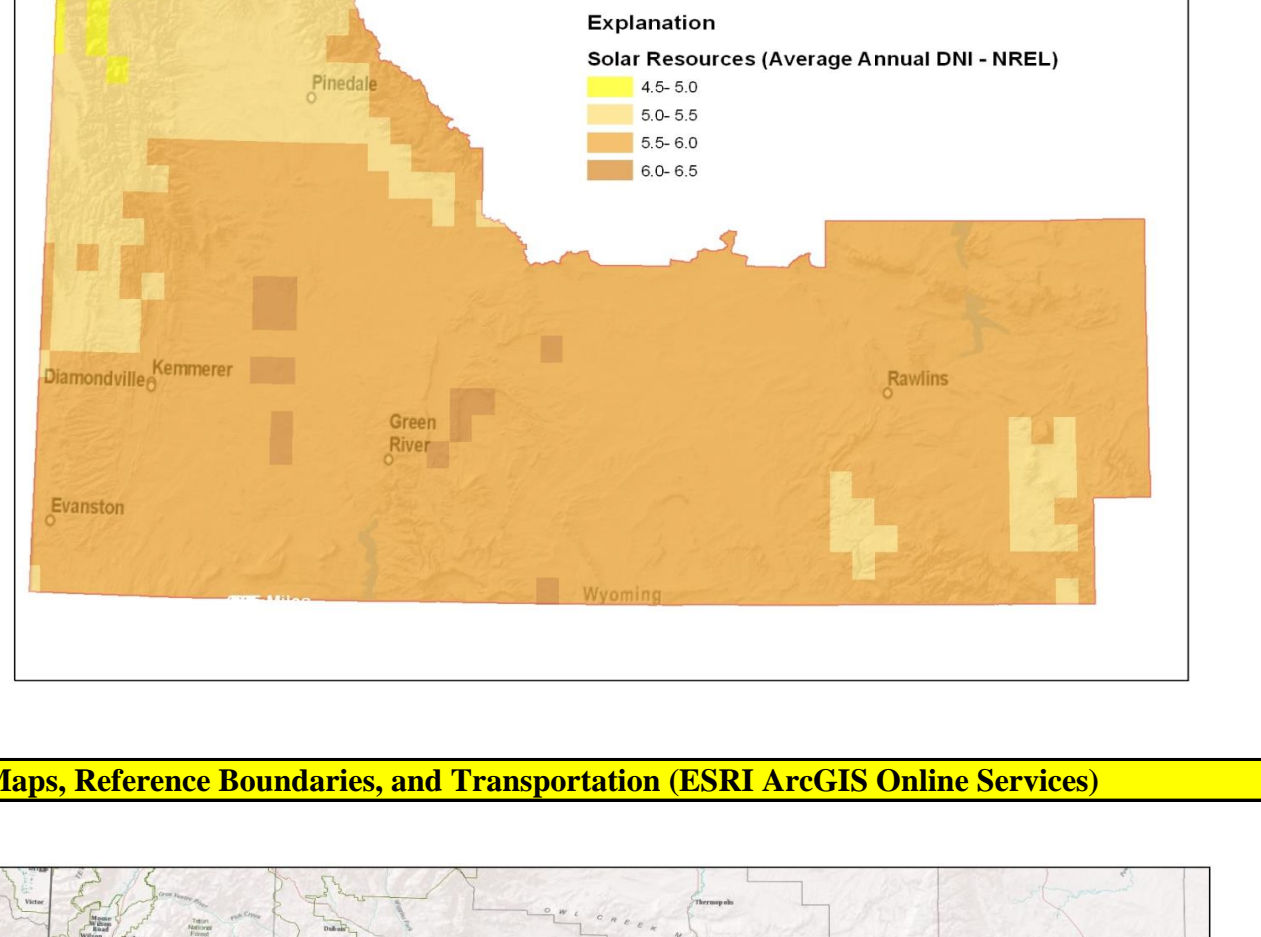
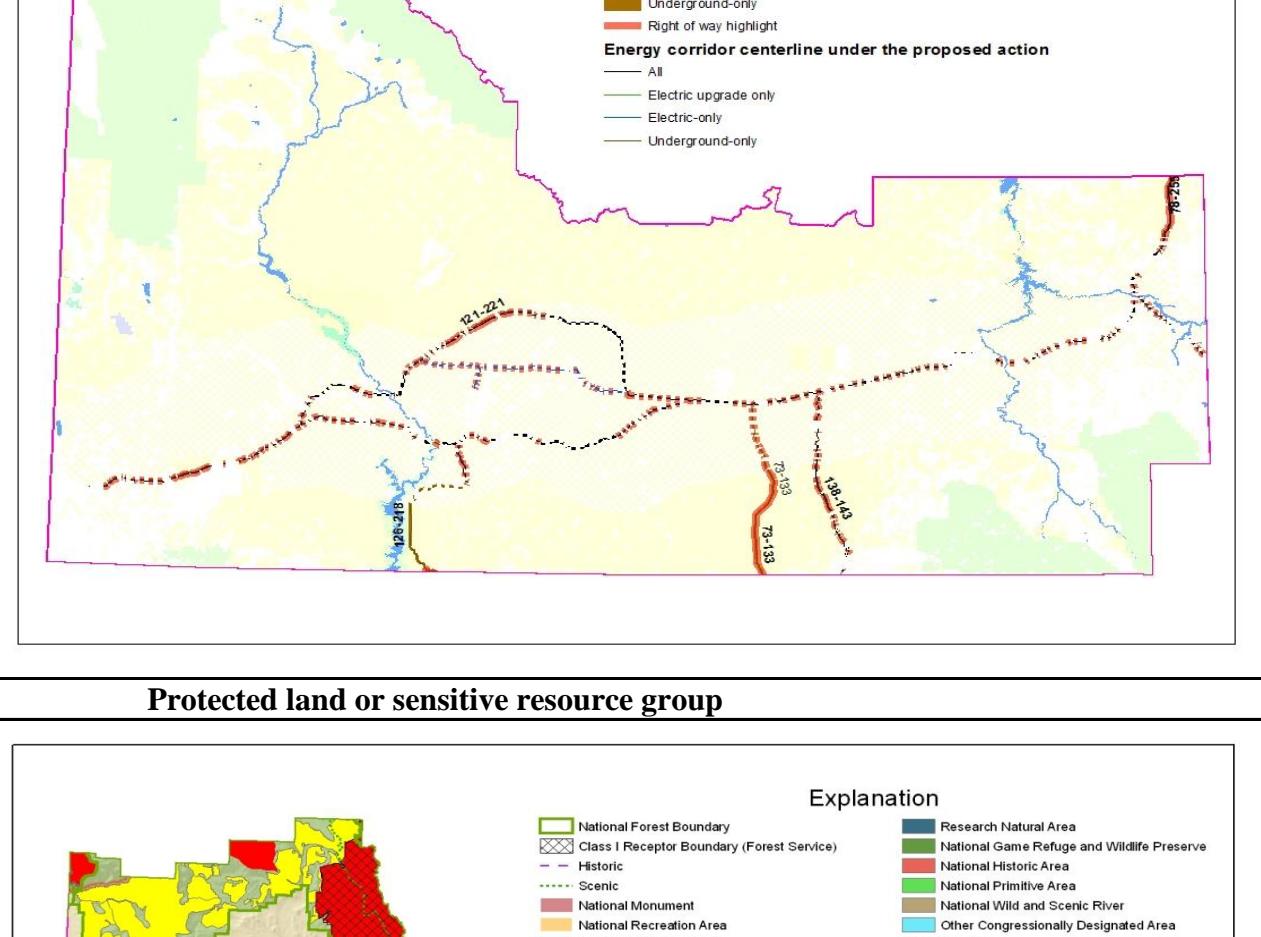
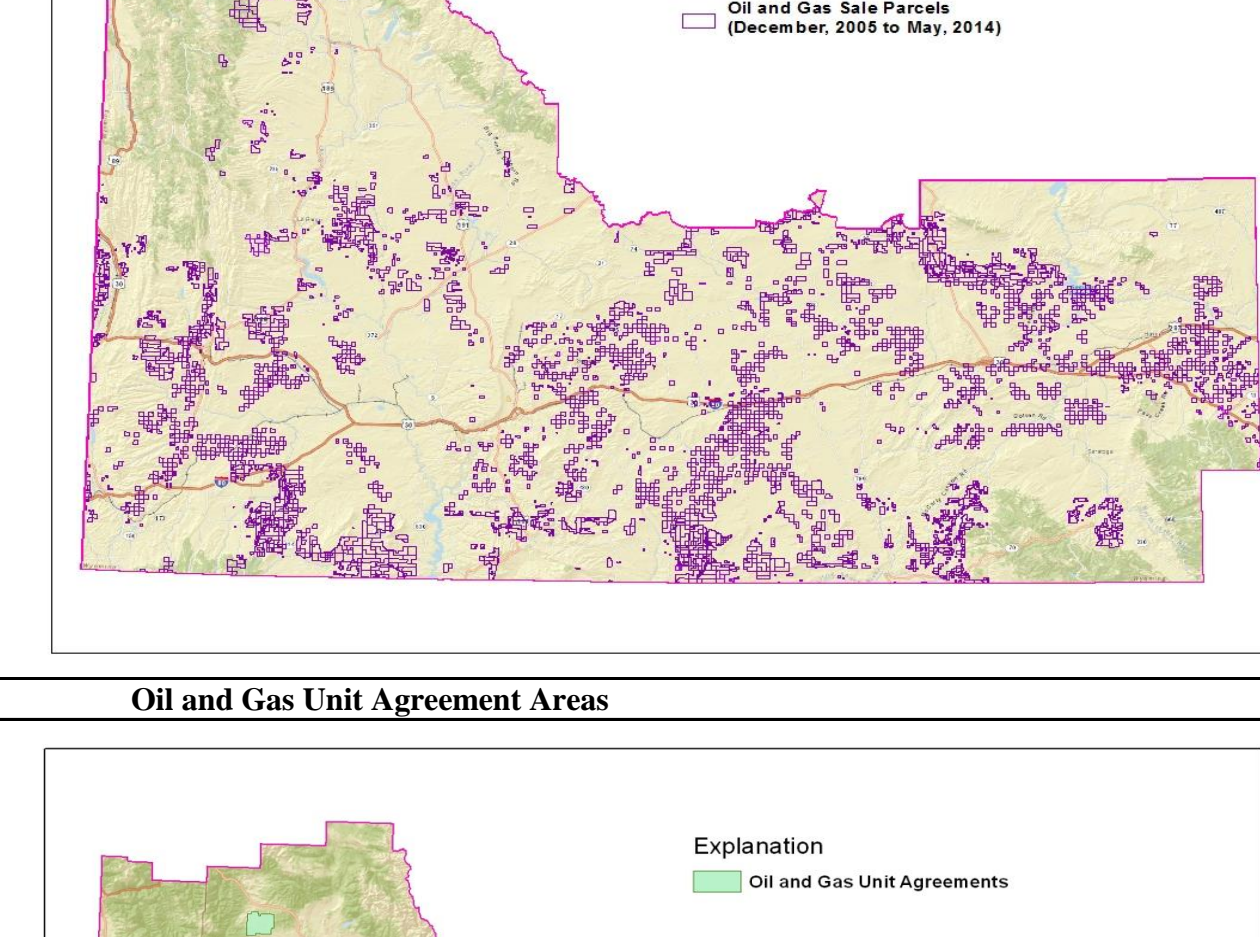
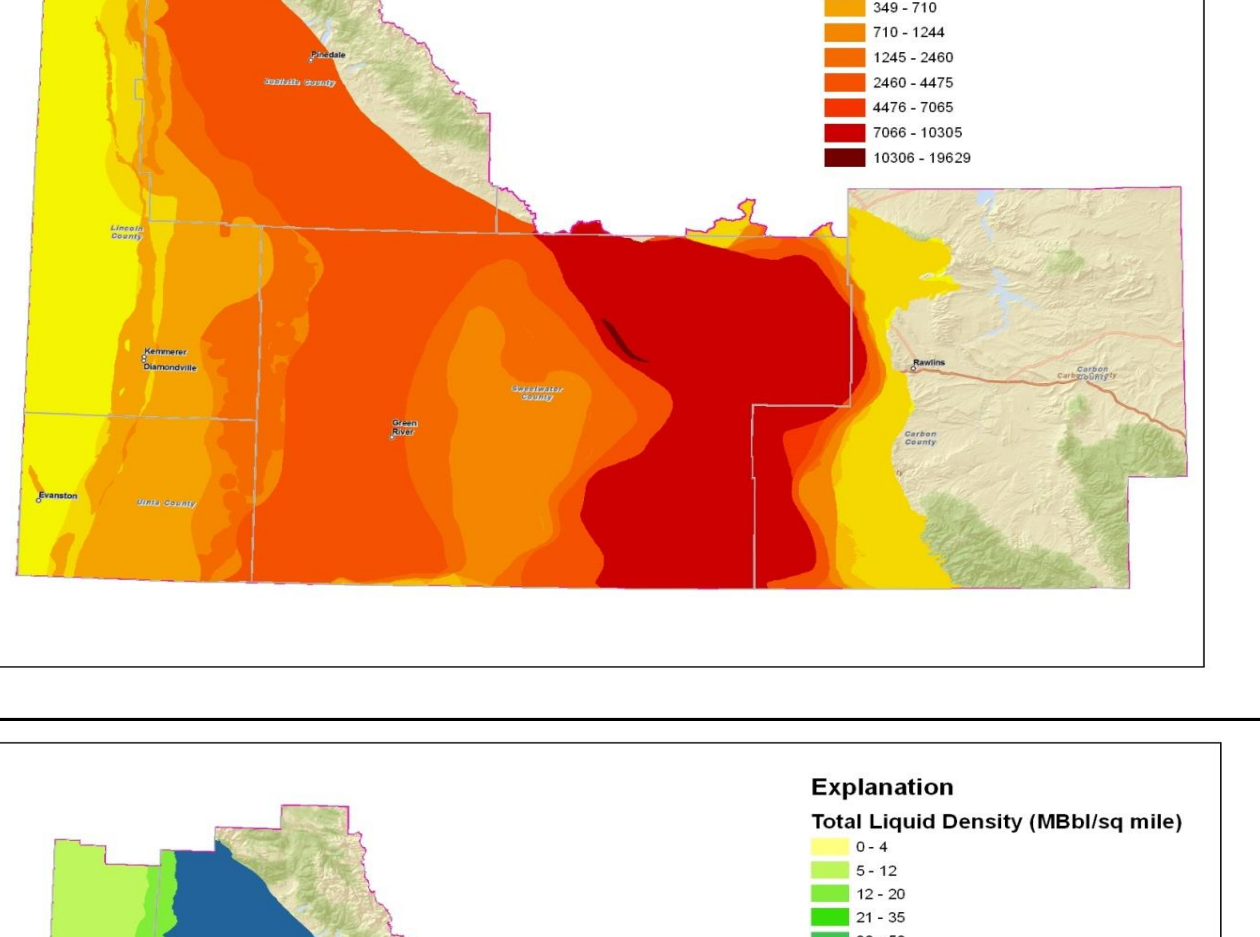
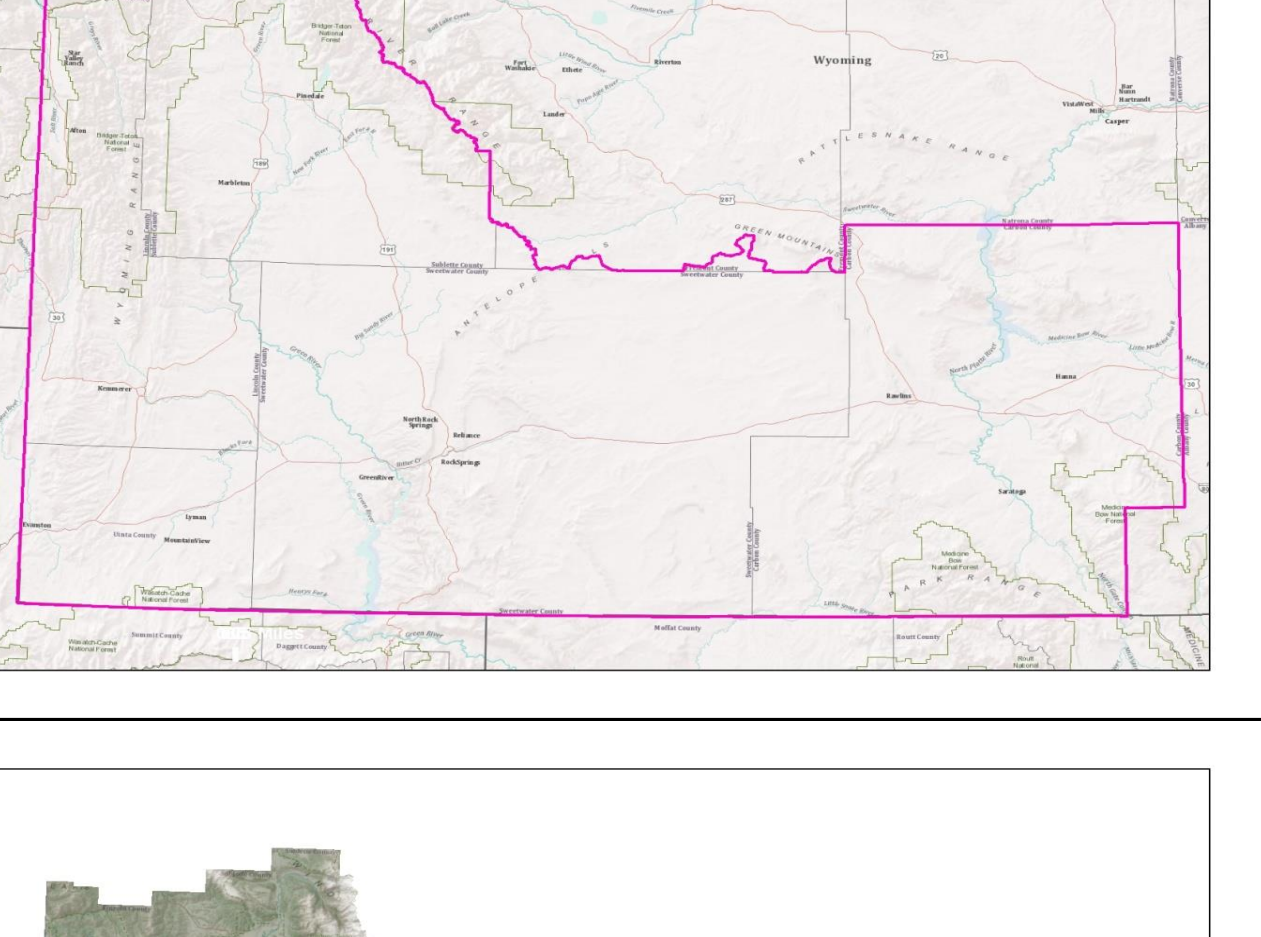
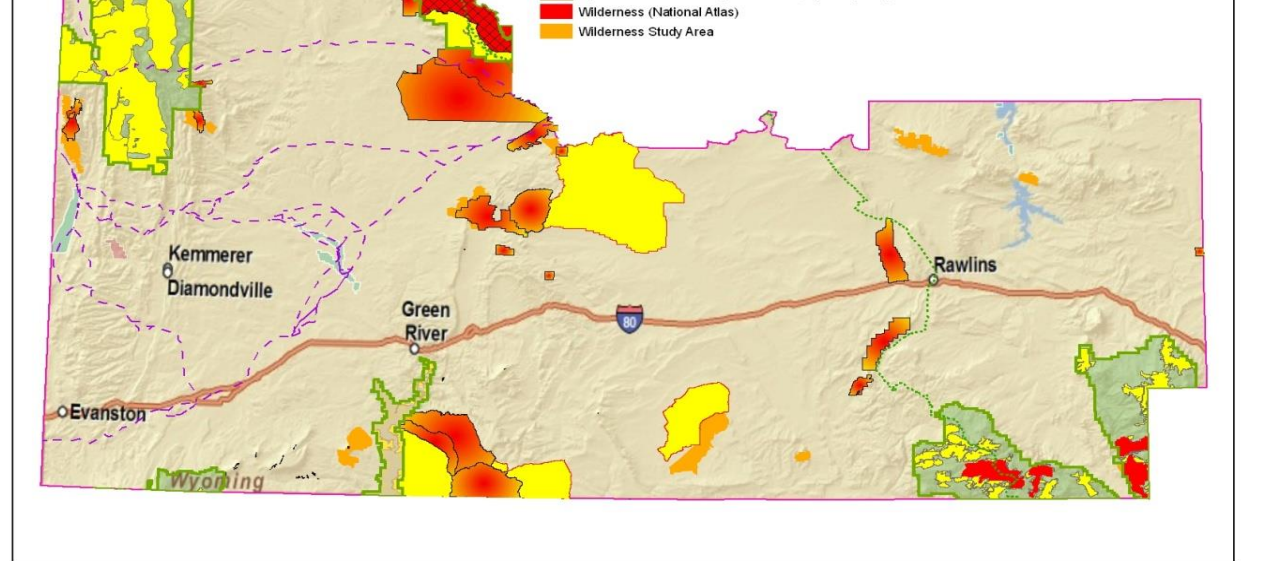
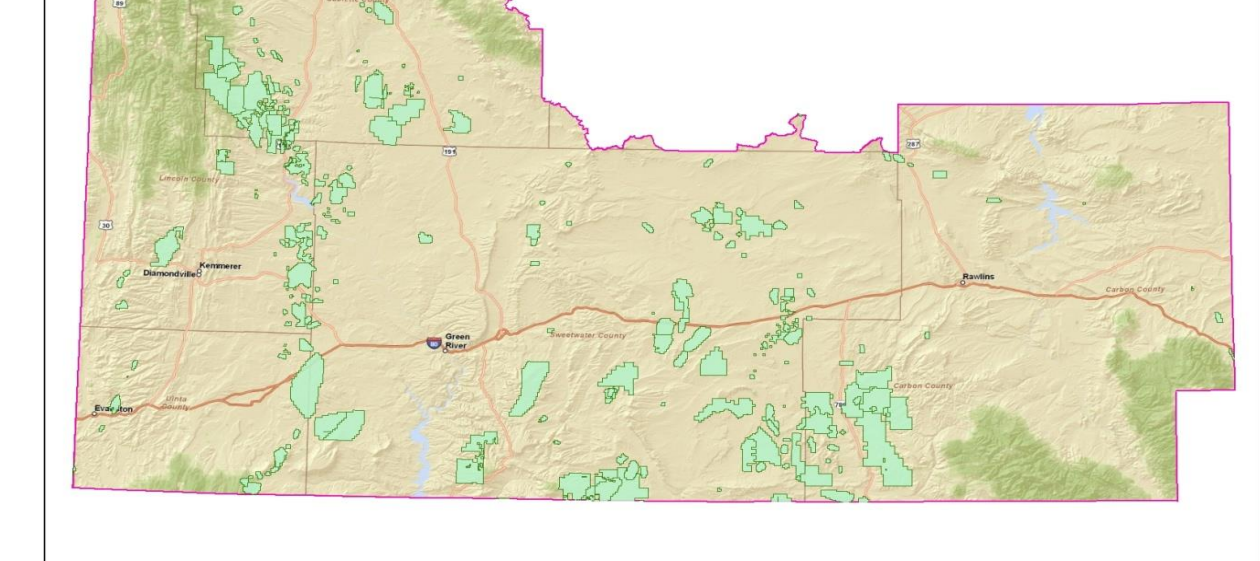
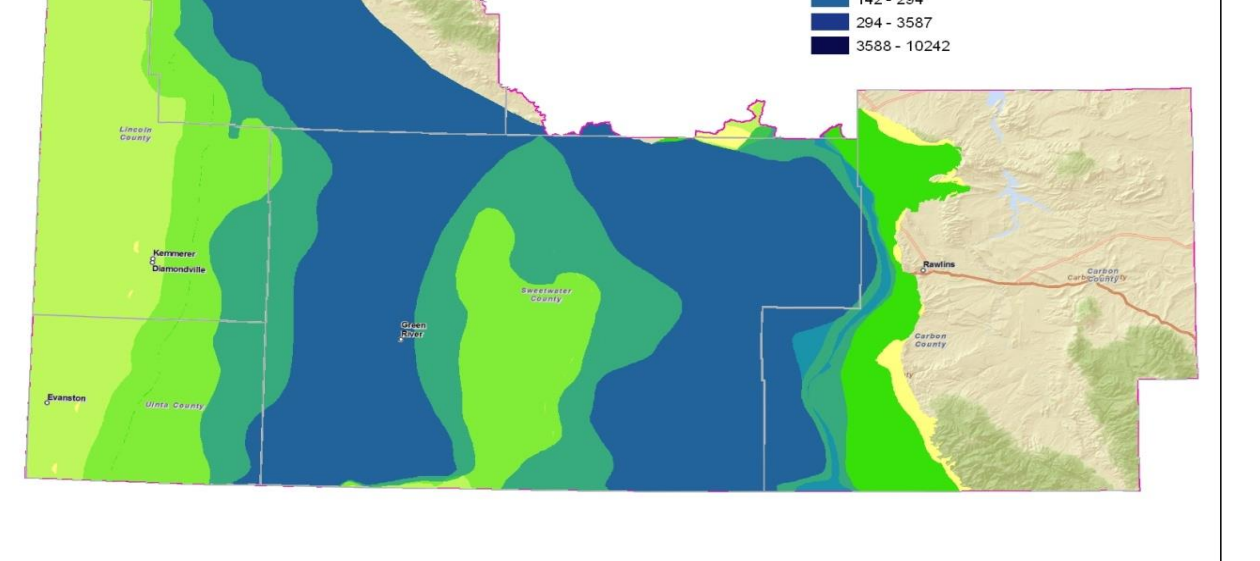



Table 1. Layer Information, described by their order in the GIS map files (MXD and PMF), table of contents.

Thematic Layers	Source	Thematic Layers	Source	Thematic Layers	Source	Thematic Layers	Source
USGS National Oil and Gas Assessment Province boundaries  <p>The U.S. Geological Survey (USGS) Central Energy Resources Science Center assesses oil and gas resources of the United States. The onshore and State water areas of the United States comprise 71 provinces. Within these provinces, hydrocarbon assessment units (AU) are defined and assessed. Each of these provinces is defined geologically, and most province boundaries are defined by major geologic changes.</p>	<p>http://energy.usgs.gov/OilAndGasAssessmentData/USGSNationalOilAndGasAssessmentProvinces</p>	Oil Shale Resources of the Eocene Green River Formation  <p>The USGS recently (2011) completed an assessment of in-place oil shale resources, regardless of grade, in the Eocene Green River Formation of the Green River Basin in southwestern Wyoming, northeastern Colorado, and northeastern Utah. Green River Formation oil shale is present in the Eocene Basin of western Colorado and in the Uinta Basin of eastern Utah and western Colorado. This assessment was published separately. No attempt was made to estimate the amount of oil that is economically recoverable because there has not yet been an economic method developed to recover the oil from Green River Formation oil shale. See http://pubs.usgs.gov/fs/2011/3063/.</p>	<p>U.S. Geological Survey, Oil Shale Assessment Team, 2011. Oil shale resources of the Eocene Green River Formation, Basin, Wyoming, Colorado, and Utah, U.S. Geological Survey, Digital Data Series, DDS-69-DD-6. Shapers, maps, variable, spatial data download. See http://pubs.usgs.gov/dds/69/dd-6/.</p>	Authorized Oil and Gas Leases  <p>This data theme represents authorized oil and gas leases in the WLCI. Stipulations are applied when new oil and gas leases are issued. Stipulations and conditions of approval are requirements that are attached to Federal oil and gas leases and drilling permits for environmental protection and other reasons and are subject to change over time (U.S. Department of the Interior, Agriculture, and Energy, 2006).</p>	<p>http://www.govaccession.org/arcgis/rest/services/Oil_Gas/MapServer</p>	BLM Oil and Gas Stipulations  <p>Oil and gas stipulations as defined by the BLM and served from the Geocommons. Data current to July, 2008.</p>	<p>http://www.govaccession.org/arcgis/rest/services/BLM_Oil_Gas/MapServer</p>
Wyoming Landscape Conservation Initiative area  <p>This theme represents the boundary of the Wyoming Landscape Conservation Initiative (WLCI). The WLCI is part of the Healthy Lands Initiative. http://www.blm.gov/pdnp/press/2009/0001/090101/wyominglandscapeconservationinitiative.html South: Wyoming-CO and Wyoming-UT State Line West: Wyoming-TX and Wyoming-IDaho State Line North: Lincoln-Teton-Sage-Teton-Sublette-Fremont County Line; Following the Fremont County Line to the crossing of the Continental Divide and Fremont County; Carbon-Natrona County Line. East: Carbon-Albany County Line</p>	<p>http://www.wlci.gov/</p>	Oil-Shale Drill Cores and Rotary Cuttings  <p>For several decades, the USGS has collected cores and cuttings and other subsurface data from boreholes drilled in the Eocene Green River Formation oil-shale deposits in the Great Divide, Green River, and Washable Basins of southwestern and south-central Wyoming. In Wyoming, the Green River Formation was deposited in Late Eocene during the early to middle Eocene epoch. The richest oil-shale deposits are in the Wilkins Peak, Tipton Shale, and Laramie Members (Roehler, 1992); as many as 77 persistent beds of oil shale were identified in the Wilkins Peak Member by Roehler (1992). A database was compiled that includes about 47,000 Fischer assays from 186-core holes and 240 rotary drill holes. Most of the oil shale data are from analyses performed by the former U.S. Bureau of Mines oil shale laboratory in Laramie, Wyoming, with some analyses made by private laboratories. Because of an increased interest in oil shale, a CD-ROM containing location data for 971 Wyoming oil-shale drill holes, Fischer assay data and oil-yield histograms for the Green River oil-shale deposits in southwestern Wyoming was released to the public (USGS Oil Shale Assessment Team, 2008).</p>	<p>U.S. Geological Survey, Oil Shale Assessment Team, 2008. Fischer Assays of Oil-Shale Drill Cores and Rotary Cuttings from the Green River Basin, Wyoming, U.S. Geological Survey, Digital Data Series, DDS-69-DD-6. See http://pubs.usgs.gov/dds/69/dd-6/.</p>	USGS Oil and Gas Assessment Units  <p>The USGS conducts assessments of undiscovered, technically recoverable oil and natural gas. Over the last several decades, the USGS methodology has been the Government's standard for oil and gas resource estimation. The USGS assessment process estimates the volume of undiscovered oil, natural gas, and natural-gas liquids that have the potential to be added to reserves during a thirty-year forecast period. Assessment results are based on known or estimated geologic input parameters including: trapping mechanism, source rock, reservoir quality, and size of known accumulations. Because of the uncertainty about the input parameters, the assessment result is expressed as a probability distribution of potential resources in the assessment unit (U.S. DOI, 2006). Using the geology-based assessment methodology, the USGS estimated means of:</p>	<p>http://pubs.usgs.gov/dds/69/dd-6/</p>	Geologic Structures  <p>Symbols from the Oil and Gas Map of Wyoming (DeBruin, 2007) and the Geologic Map of Wyoming (Love and Christiansen, 1985) show approximate locations of major basins, the areal extent of the Moen arch, three faults defining the eastern boundary of the Overthrust Belt, major thrust faults on the northeastern edge of the Green River Basin and other faults.</p>	<p>http://files.wy.usgs.gov/arcgis/rest/services/GeologicStructures/MapServer</p>
Uranium  <p>Renewed demand for uranium in the last few years has resulted in increased exploration and development of several areas in and immediately adjacent to the WLCI. Uranium mineralized areas at Kenilworth Basin, Pikes Basin, Shirley Basin, and Green Divide Basin are nearly all within the WLCI and the southern end of the Crooks Gap-Green Mountain overlaps the northern margin of WLCI (Wilson, 2014).</p>	<p>http://pubs.usgs.gov/of/2014/</p>	Historical Oil and Gas Drilling Activity  <p>The ArcGIS oil and gas wells feature class was developed to provide a historical perspective of drilling activity for the WLCI area. These data, organized from the Wyoming Oil and Gas Conservation Commission (WOGCC), have been processed by the USGS and are now available as online resources. This product complements the 2009 USGS publication on oil and gas development in southwestern Wyoming (Brewick, 2009), by approximating, based on database attributes, both beginning and ending dates of drilling activity. Each well is assigned a start year and a stop year. This product also complements the 2011 USGS publication on oil and gas development in southwestern Wyoming (Brewick, 2011), by adding more recent well information. These data represent decades of oil and gas drilling (1900 to 2012), and will facilitate a landscape-level approach to integrated science assessments, science-based resource management and science-based decision making.</p>	<p>http://energy.usgs.gov/Research/Database/SouthernWyomingHistoricalOilAndGasDrillingActivity</p>	Oil and Gas Wells  <p>The USGS conducts assessments of undiscovered, technically recoverable oil and natural gas. Over the last several decades, the USGS methodology has been the Government's standard for oil and gas resource estimation. The USGS assessment process estimates the volume of undiscovered oil, natural gas, and natural-gas liquids that have the potential to be added to reserves during a thirty-year forecast period. Assessment results are based on known or estimated geologic input parameters including: trapping mechanism, source rock, reservoir quality, and size of known accumulations. Because of the uncertainty about the input parameters, the assessment result is expressed as a probability distribution of potential resources in the assessment unit (U.S. DOI, 2006). Using the geology-based assessment methodology, the USGS estimated means of:</p>	<p>http://pubs.usgs.gov/dds/69/dd-6/</p>	Surface Geology  <p>This geologic map was prepared as part of a study of digital methods and techniques as applied to complex geologic maps. The geologic map was digitized from the original maps used to prepare the published Geologic Map of Wyoming (Love and Christiansen, 1985) and is 1:800,000 scale. Each vector and polygon was given attributes derived from the original 1985 geologic map. The data are intended to be used as a base geologic map, and are accessible online (Green and Drouillard, 1994).</p>	<p>http://pubs.usgs.gov/of/1994/of-94-0425/</p>
Uranium area detail  <p>This graphic shows an example of working in ArcMap with the oil and gas wells layer and Satellite Imagery. Visit http://www.usgs.gov/arcgis/rest/services/USGSStateWells for more recent recommended update frequency is twice per year.</p>	<p>http://www.usgs.gov/arcgis/rest/services/USGSStateWells</p>	Oil and Gas Fields  <p>This data theme was developed by the Wyoming State Geological Survey in 2007 to show where oil and gas producing areas exist in Wyoming (DeBruin, 2007).</p>	<p>http://www.wy.usgs.gov/arcgis/rest/services/StateWells</p>	Federal Land Access Categories  <p>This data theme represents surface and mineral ownership for Wyoming, and is intended to represent the ownership information on master title plans (MTP). Where surface Federal ownership boundaries are identified by the agency of jurisdiction. All other parcels are identified as either private or State. Mineral ownership identifies only the Federal interest. Definition query shows Federal oil, gas and other minerals (BLM, 2011).</p>	<p>http://pubs.usgs.gov/fs/2011/3025/fs-2011-3025/</p>	Surface and Mineral Ownership  <p>This data theme represents surface and mineral ownership for Wyoming, and is intended to represent the ownership information on master title plans (MTP). Where surface Federal ownership boundaries are identified by the agency of jurisdiction. All other parcels are identified as either private or State. Mineral ownership identifies only the Federal interest. Definition query shows Federal oil, gas and other minerals (BLM, 2011).</p>	<p>http://www.blm.gov/wy/arcgis/rest/services/public_public_data/arcgis/rest/services/ownership</p>
Energy corridor  <p>This theme contains oil refineries and natural gas processing plants, current to Sept. 25, 2002. The Programmatic Environmental Impact Statement (PEIS) for oil, gas and hydrogen pipelines and electricity transmission and distribution facilities, for example, energy corridors. The Agencies have prepared a programmatic environmental impact statement (PEIS) entitled "Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States" (DOE-ES-0386) to address the environmental impacts from the proposed "action" and "no-action" alternatives. Because the proposed action may affect floodplains and wetlands, the PEIS includes a floodplain and wetlands assessment and the Record of Decision will include a floodplain statement of findings (U.S. Department of Energy, Interior (Bureau of Land Management), Agriculture (Forest Service), and Defense, 2010).</p>	<p>http://pubs.usgs.gov/of/2014/</p>	Oil and Gas Sale Parcels  <p>This data theme identifies oil and gas sale parcels, which can eventually become leases. The stipulations/restrictions for each parcel are printed in the lease notice.</p>	<p>http://www.blm.gov/wy/arcgis/rest/services/public_public_data/arcgis/rest/services/energy</p>	Total Oil and Total Natural Gas  <p>In November, 2008, Congress passed and President Clinton signed the Energy Act of 2000 (also referred to as the Energy Policy and Conservation Act (EPCA)). The Act directed the Secretary of the Interior, in consultation with the Secretaries of Agriculture and Energy, to conduct an inventory of oil and natural gas resources beneath offshore Federal lands. In 2006, the Scientific Inventory of Offshore Federal Lands: Oil and Gas Resources and the Extent and Nature of Restrictions or Impediments to Their Development—Phase II Cumulative Inventory, was published and included the Wyoming Thrust Belt and the Greater Green River Basin Provinces. The report provides an inventory of the extent and nature of limitations to development of these resources and does not make any policy recommendations in response to its findings (U.S. Department of the Interior, Agriculture, and Energy, 2006).</p>	<p>http://www.blm.gov/arcgis/rest/services/TotalOilAndTotalNaturalGas</p>	Solar Resources  <p>This data provides monthly and annual average daily solar resource cover surface cells of 0.1 degrees in both latitude and longitude, or about 10 km in size. This data was developed using the State University of New York/Albany satellite radiation model. The model was developed by Dr. Richard Freese and collaborators at the National Renewable Energy Laboratory and other universities for the U.S. Department of Energy. Specific information about the model can be found in Freese and others, 2002. This data theme is derived from geospatial weather variables, daily snow cover, rain, and monthly means of atmospheric water vapor, trace gases, and the amount of aerosols in the atmosphere, to calculate the hourly total insolation (sun and sky), falling on a horizontal surface. Atmospheric water vapor, trace gases, and aerosols are derived from a variety of resources. A modified 3D model is used to calculate clear sky direct normal (DN), which is then adjusted as a function of the ratio of clear sky global horizontal (GHI) and the model predicted GHI. See http://www.and.gov/solar/.</p>	<p>http://www.and.gov/solar/</p>
West-wide energy corridor  <p>The Energy Policy Act of 2005, Public Law 109-58 (H.R. 6), enacted August 8, 2005, directs the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior to designate under their respective authorities corridors on Federal land in 11 western States for oil, gas and hydrogen pipelines and electricity transmission and distribution facilities, for example, energy corridors. The Agencies have prepared a programmatic environmental impact statement (PEIS) entitled "Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States" (DOE-ES-0386) to address the environmental impacts from the proposed "action" and "no-action" alternatives. Because the proposed action may affect floodplains and wetlands, the PEIS includes a floodplain and wetlands assessment and the Record of Decision will include a floodplain statement of findings (U.S. Department of Energy, Interior (Bureau of Land Management), Agriculture (Forest Service), and Defense, 2010).</p>	<p>http://www.blm.gov/wy/arcgis/rest/services/public_public_data/arcgis/rest/services/energy</p>	Oil and Gas Unit Agreement Areas  <p>A unit agreement is submitted on behalf of owners of oil and gas interests, who wish to unite to facilitate the orderly, efficient, and timely development of the oil and gas resources within a unit area. The agreement designates one party as the operator and another party as the obligor to develop an exploration program to develop the oil and gas potential of the area on behalf of all committed interests. Where Federal or Tribal lands are to be committed to the unit agreement, approval by the Federal Government is required.</p>	<p>http://www.govaccession.org/arcgis/rest/services/OilAndGasUnitAgreementAreas</p>	Total Oil and Total Natural Gas  <p>The USGS has identified discrete oil and natural gas resource assessment units in the Phase II study areas. Resource assessment unit boundaries and oil and gas resource estimates within the assessment units were obtained in GIS format from the USGS. These assessment units were then aggregated in a GIS to create a resource-density map layer for each study area. The probabilistic mean estimate of hydrocarbon resource volumes for each USGS-defined assessment unit was utilized for this inventory. The assessed resources include oil, natural gas liquids (NGL), associated dissolved (AD) natural gas, non-associated natural gas (NAG) and liquids in gas reservoirs. Oil is a natural liquid of mostly hydrocarbon molecules. NGLs are liquids when produced to the surface, but exist in the gas phase in the subsurface. Natural gas is a mixture of hydrocarbon gases consisting primarily of methane. Associated dissolved natural gas is that produced from oil fields, whereas non-associated natural gas is that produced from gas fields. The USGS assesses technically recoverable resources for each of these resource types, and these volumes were provided for the inventory. While modeled discretely in this analysis, for purposes of presentation in this inventory, undiscovered oil, NGL, and liquids associated with natural gas reservoirs were subsequently aggregated into a single "Total Oil" resource category. Similarly, AD and non-associated natural gas were combined as "Total Natural Gas" (U.S. Department of the Interior, Agriculture, and Energy, 2006).</p>	<p>http://www.blm.gov/arcgis/rest/services/TotalOilAndTotalNaturalGas</p>	Base Cartographic Maps, Reference Boundaries, and Transportation (ESRI ArcGIS Online Services)  <p>These Esri map services are designed to be used to overlay basemaps and thematic maps such as demographics or land cover for reference purposes. These services include: administrative boundaries, cities, water features, physiographic features, parks, landmarks, highways, roads, railways, and airports on a transparent background. The services were compiled from a variety of best-available sources from several data providers, including the USGS National Park Service, Tele Atlas, AND, and Esri. The services currently provide coverage for the world to a scale of approximately 1:1 M and coverage for the continental United States and Hawaii to a scale of approximately 1:70 K (Esri, 2010). NOTE: These services function correctly with ArcGIS version 9.3.1 or more recent, due to caching used in ArcMap prior to v.9.3.1. It can be used in ArcDoc 9.3 or more recent products (Esri, 2010).</p>	<p>http://www.arcgis.com/arcgis/rest/services</p>
Protected land or sensitive resource group  <p>This theme was compiled to analyze potential effects to visual resources in preparation of the Final Programmatic Environmental Impact Statement (PEIS) for Energy Corridors in the 11 Western States in accordance with Section 108 of the Energy Policy Act of 2005. Data sources are the administrative agencies of the Federal Government, including, but not limited to, the National Park Service, Bureau of Land Management, U.S. Forest Service and U.S. Geological Survey, (U.S. Department of Energy, Interior (Bureau of Land Management), Agriculture (Forest Service), and Defense, 2010).</p>	<p>http://www.blm.gov/wy/arcgis/rest/services/public_public_data/arcgis/rest/services/energy</p>	Oil and Gas Unit Agreement Areas  <p>A unit agreement is submitted on behalf of owners of oil and gas interests, who wish to unite to facilitate the orderly, efficient, and timely development of the oil and gas resources within a unit area. The agreement designates one party as the operator and another party as the obligor to develop an exploration program to develop the oil and gas potential of the area on behalf of all committed interests. Where Federal or Tribal lands are to be committed to the unit agreement, approval by the Federal Government is required.</p>	<p>http://www.govaccession.org/arcgis/rest/services/OilAndGasUnitAgreementAreas</p>	Total Oil and Total Natural Gas  <p>The USGS has identified discrete oil and natural gas resource assessment units in the Phase II study areas. Resource assessment unit boundaries and oil and gas resource estimates within the assessment units were obtained in GIS format from the USGS. These assessment units were then aggregated in a GIS to create a resource-density map layer for each study area. The probabilistic mean estimate of hydrocarbon resource volumes for each USGS-defined assessment unit was utilized for this inventory. The assessed resources include oil, natural gas liquids (NGL), associated dissolved (AD) natural gas, non-associated natural gas (NAG) and liquids in gas reservoirs. Oil is a natural liquid of mostly hydrocarbon molecules. NGLs are liquids when produced to the surface, but exist in the gas phase in the subsurface. Natural gas is a mixture of hydrocarbon gases consisting primarily of methane. Associated dissolved natural gas is that produced from oil fields, whereas non-associated natural gas is that produced from gas fields. The USGS assesses technically recoverable resources for each of these resource types, and these volumes were provided for the inventory. While modeled discretely in this analysis, for purposes of presentation in this inventory, undiscovered oil, NGL, and liquids associated with natural gas reservoirs were subsequently aggregated into a single "Total Oil" resource category. Similarly, AD and non-associated natural gas were combined as "Total Natural Gas" (U.S. Department of the Interior, Agriculture, and Energy, 2006).</p>	<p>http://www.blm.gov/arcgis/rest/services/TotalOilAndTotalNaturalGas</p>	Base Cartographic Maps, Reference Boundaries, and Transportation (ESRI ArcGIS Online Services)  <p>These Esri map services are designed to be used to overlay basemaps and thematic maps such as demographics or land cover for reference purposes. These services include: administrative boundaries, cities, water features, physiographic features, parks, landmarks, highways, roads, railways, and airports on a transparent background. The services were compiled from a variety of best-available sources from several data providers, including the USGS National Park Service, Tele Atlas, AND, and Esri. The services currently provide coverage for the world to a scale of approximately 1:1 M and coverage for the continental United States and Hawaii to a scale of approximately 1:70 K (Esri, 2010). NOTE: These services function correctly with ArcGIS version 9.3.1 or more recent, due to caching used in ArcMap prior to v.9.3.1. It can be used in ArcDoc 9.3 or more recent products (Esri, 2010).</p>	<p>http://www.arcgis.com/arcgis/rest/services</p>