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[GSENM Wells-PipelinesEA DRFT MapsAppendix.docx](#)
[GSENM Wells-PipelinesEA DFT v2.docx](#)

Hi all,

A draft of Chapters 1 and 2 of the wells and pipelines EA is attached for your review. If there is a need to talk anything through please let me know. There are a handful of comments in this draft that require BLM resolution.

Thanks!

Ben

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GSENM Well and Pipeline Projects EA

Appendix X.1 – Maps

INSERT MAP

Map X.1. Proposed wells, pumps, storage tanks, troughs, and pipelines in the Upper Paria, Mud Springs, Cottonwood, and Lower Cattle allotments.

INSERT MAP

Map X.2. Proposed Sheep Creek Well and Pipeline Project.

INSERT MAP

Map X.3. Proposed Mud Springs Well and Pipeline Project.

INSERT MAP

Map X.4. Proposed 8 Mile/Paria Roughs Pipeline Extension Project.

INSERT MAP

Map X.5. Proposed Butler Valley Pipeline and Storage Tank Project.

INSERT MAP

Map X.6. Proposed Twentymile Pipeline Extension Project.

**United States Department of the Interior
Bureau of Land Management**

**Environmental Assessment
DOI BLM UT 0300 2017 0063 EA**

MONTH 2018

GSENM Well and Pipeline Projects

Location:

<i>Sheep Creek Well and Pipeline</i>	T37S R3W, Section 33
<i>Mud Springs Well and Pipeline</i>	T37S R1W, Section 13
<i>8 Mile/Paria Roughts Pipeline Extension</i>	T41S R2W, Section 34
<i>Butler Valley Pipeline and Storage Tank</i>	T39S R1W, Sections 10 and 11
<i>Twentymile Pipeline Extension</i>	T38S R5E, Section 12; T39S R6E, Section 29

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GSENM Well and Pipeline Projects
DOI BLM UT 0300 2017 0063 EA

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Appendix A Title

Appendix B Title

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GSENM Well and Pipeline Projects

DOI BLM UT 0300 2017 0063 EA

1.0 PURPOSE AND NEED

1.1 Introduction and Background

The Bureau of Land Management (BLM) Grand Staircase Escalante National Monument (GSENM) proposes to install a combination of wells, pumps, storage tanks, troughs, and/or pipelines in the Upper Paria, Mud Springs, Cottonwood, and Lower Cattle allotments. Map X.1 in Appendix X.1 provides an overview of allotments and projects. A summary of current conditions within each allotment as well as anticipated project elements is provided in Table X.1. Additional details related to the current condition within each allotment is provided in the affected environment discussion in Chapter 3.

Table X.1. Summary of Current Conditions within Each Project Area, Proposed Project Locations, and Anticipated Project Elements.

Project (Allotment)	Summary of Current Conditions Within Allotments	Anticipated Project Elements
Sheep Creek Well and Pipeline Replacement (Upper Paria)	The Upper Paria Allotment (approximately 113,216 acres) is located immediately adjacent to the communities of Tropic, Cannonville, and Henrieville, Utah and consists of federal public lands largely (95%) within GSENM. The largest vegetation type within the Upper Paria Allotment is pinyon-juniper. This allotment also includes grasslands (which are largely re-vegetated areas), sagebrush, saltbrush, and meadow. Key species within the allotment are crested wheatgrass (<i>Agropyron cristatum</i>) and Russian wild rye (<i>Elymus junceus</i>). There are currently 18 water-related range improvements installed within the allotment. However, the distribution of these improvements within the allotment results in uneven distribution of livestock (i.e., concentration of livestock at existing water sources). Several lentic (still) and lotic (flowing) water systems exist on the allotment as well including Henrieville Creek, Sheep Creek, the Upper Paria River, and Willis Creek. However, water availability and reliability are limiting in some areas of the allotment. Rangeland Health Assessment data indicate that the Standards and Guidelines for Rangeland Health are not being met for upland soils, riparian and wetland areas, and water quality. While grazing management practices or levels of grazing use are an important factor in not meeting Rangeland Health Standards for upland soils and riparian and wetland areas, the water quality standard is not being met due primarily to factors outside the control of the BLM (e.g., natural background conditions and influence of irrigation diversion dewatering).	Installation of a well, solar pump, and approximately 50 feet of pipeline. Existing troughs (4).
Mud Springs Well and Pipeline (Mud Springs)	The Mud Springs Allotment (approximately 16,291 acres) is located approximately 10 miles east of Henrieville, Utah and consists of federal public lands within GSENM. Vegetation within the allotment consists of primarily pinyon-juniper and sagebrush grasslands with a smaller component of ponderosa pine and Douglas fir. There are currently four water-related range improvements installed within the allotment. However, no surface waters occur on the allotment, so sufficient water is sometimes limiting. Rangeland Health Assessment data indicate that all Standards and Guidelines for Rangeland Health are being met on the allotment.	Installation of a well, solar pump, storage tank, approximately 2.5 miles of pipeline, and troughs (2).

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Table X.1. Summary of Current Conditions within Each Project Area, Proposed Project Locations, and Anticipated Project Elements.

Project (Allotment)	Summary of Current Conditions Within Allotments	Anticipated Project Elements
8 Mile/Paria Roughs Pipeline Extension (Cottonwood)	The Cottonwood Allotment (approximately 103,814 acres) is located approximately 13 miles south of Cannonville, Utah and consists of federal public lands within GSENM. Several vegetation types occur within the Cottonwood Allotment. Dominant vegetation groups are desert shrub, pinyon-juniper, grassland meadow, and sagebrush grassland. There are also several riparian corridors within the allotment which are dominated by cottonwood, willow, and tamarisk. There are currently 20 water-related range improvements installed within the allotment. In addition, several surface water bodies occur on the allotment including multiple springs, Cottonwood Creek, and the Paria River. However, water availability and reliability are limiting in some areas of the allotment. Rangeland Health Assessment data indicate that the Standards and Guidelines for Rangeland Health are not being met for water quality. However, this standard is not being met due primarily to factors outside the control of the BLM (e.g., natural background conditions).	Installation of 1 trough and approximately 1.25 miles of pipeline.
Butler Valley Pipeline and Storage Tank (Cottonwood)		Installation of 2 troughs, storage tank, and approximately 4.5 miles of pipeline.
Twentymile Pipeline Extension (Lower Cattle)	The Lower Cattle Allotment (approximately 81,368 acres) is located approximately 17 miles southeast of Escalante, Utah and consists of federal public lands within GSENM and the Glen Canyon National Recreation Area (GCNRA). Vegetation within the allotment is dominated by desert shrub and pinyon-juniper. There are currently 12 water-related range improvements installed within the allotment. In addition, multiple springs and flowing surface water bodies (Twentyfive Mile Creek, Scorpion Gulch, and Upper Coyote Gulch) occur on the allotment. However, water availability is limiting in some areas of the allotment. Rangeland Health Assessment data indicate that the Standards and Guidelines for Rangeland Health are not being met for upland soils, riparian and wetland areas, desired species, and water quality.	Installation of 2 troughs and approximately 3.25 miles of pipeline.

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1.2 Purpose and Need for the Action

The purpose of the BLM action is to provide reliable water storage and improve water availability for wildlife and livestock in the Upper Paria, Mud Springs, Cottonwood, and Lower Cattle allotments. Reliable water storage and improved water availability are also intended to improve livestock distribution (dispersing cattle throughout the area to take advantage of available forage and reduce concentration of livestock at existing water sources) and thereby enhance wildlife habitat and improve vegetation, soil, and water resource conditions across the allotments.

The need for the BLM action is based on lack of dependable water sources and/or resource impacts near existing water sources across portions of the aforementioned allotments.

1.3 Decision to be Made

Following the environmental analysis in the EA, the GSENM Manager will decide whether to implement the proposed well and pipeline projects and if so under what conditions, specifications, and provisions.

1.4 Conformance with BLM Land Use Plan(s)

The GSENM Management Plan (MMP), as amended by the Utah Greater Sage Grouse Resource Management Plan (RMP) Amendment finalized in September 2015 (BLM 1999, as amended 2015), currently governs and addresses water storage and water availability activities on GSENM lands. The projects, described in detail in Chapter 2.0, would fulfill the following water resources objective outlined in the MMP:

- “...ensure that appropriate quality and quantity of water resources are available for the proper care and management of the objects of the Monument.” (page 31)

Further, these projects would specifically conform to the following MMP decisions: WAT 1, WDEV 1, FW 7, and SOIL 1. The specific language contained in these MMP decisions is attached as Appendix X. In addition, the Proposed Action would not conflict with other decisions in the MMP.

1.5 Relationship to Laws, Regulations, Policies, Program Guidance, and Other Plans

A listing of directly relevant laws, regulations, policies, program guidance, and other plans is provided in Table X.2 along with a brief explanation of their relationship to the Proposed Action. The Proposed Action is consistent with these laws, regulations, policies, program guidance, and other plans.

Table X.2 Relevant Laws, Regulations, Policies, Program Guidance, and Other Plans

Relevant Law, Regulation, Policy, Program Guidance, or Plan	Relationship to the Proposed Action
Presidential Proclamation Establishing the Grand Staircase-Escalante National Monument (September 18, 1996)	The Presidential Proclamation establishing the GSENM directs the Secretary of the Interior to address the need for water for the proper care and management of the objects of the GSENM and actions that may be necessary pursuant to federal and state law to assure water availability. The well and pipeline projects proposed by the BLM directly address water needs and water availability in five locations across the GSENM.
Federal Land Policy and Management Act (FLPMA) of 1976	Title II Section 202 of FLPMA directs the development of land use plans for BLM lands. Once land use plans are developed, any approved project must be provided in the land use plan or be consistent with the decisions in the approved land use plan. As described in Section 1.4 above, these projects conform to the GSENM MMP.
Omnibus Public Land Management Act (OPLMA) of 2009	OPLMA established the National Landscape Conservation System (NLCS) to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations. OPLMA requires that NLCS units, including GSENM, be managed in a manner that protects the values for which the components of the system were designated. The GSENM Well and Pipeline Projects were proposed and designed to meet the objectives of OPLMA.
Utah's Standards for Rangeland Health (BLM 1997)	BLM Utah's Standards for Rangeland Health established the “standards” for rangeland health and “guidelines” for grazing management. The “standards” spell out the conditions to be achieved on BLM lands in Utah and the “guidelines” describe the practices to be applied to achieve the “standards”. Rangeland health standards focus on maintaining upland soils, riparian and wetland areas, desired species, and water quality in a healthy and sustainable condition. The GSENM Well and Pipeline Projects were proposed and designed to meet or make progress towards meeting rangeland health standards in each associated allotment.
Kane County, Utah General Plan (Kane County 2011)	The Kane County, Utah General Plan identifies multiple relevant key issues associated with the environment including protection of watersheds and multiple use management of public lands. Kane County also sets forth a goal to “[r]ecognize the presence of water resources in the county and the integral role these systems play in the natural and built environment.” Kane County further sets forth an objective to “[p]romote the development of the county’s mineral, water, manpower, industrial, historical, cultural, and other resources.” The Well and Pipeline Projects are consistent with the key issues, goals, and objectives identified above.

Table X.2 Relevant Laws, Regulations, Policies, Program Guidance, and Other Plans

Relevant Law, Regulation, Policy, Program Guidance, or Plan	Relationship to the Proposed Action
Garfield County Draft Resource Management Plan (Garfield County 2017)	The Garfield County Draft Resource Management Plan in Section X (X) identifies... NEED TO CONFIRM THAT GARFIELD COUNTY IS INCLUDED IN PROPOSED ACTION.

1.6 Scoping and Identification of Issues

1.6.1 Internal and External Scoping

A BLM interdisciplinary (ID) team formulated potential issues associated with the Proposed Action through an internal scoping process conducted between DATE and DATE. An ID team checklist (attached as Appendix X) was completed as part of the internal scoping process.

The BLM also solicited public comments on the Proposed Action through an external (public) scoping process. The public scoping period began on December 14, 2017, and finished on December 27, 2017. The BLM published a public notice in the X newspaper, published a public notice on the BLM's national NEPA register (<https://go.usa.gov/xRA2P>), and sent out a public scoping letter and requested comments within the 15 day public comment period. The mailing list can be found in the administrative record. Public scoping letters were sent to X recipients. X comment letters were received. The letters received were from X, X, and X. Substantive comments from these letters are reflected in the issues discussion below.

1.6.2 Issues Considered in Detail

The following issues for detailed analysis were identified during the internal and external scoping processes:

1.6.3 Issues Considered but Eliminated from Further Analysis

The following issues were considered but dismissed from detailed analysis:

2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION

2.1 Introduction

This EA analyzes the potential effects of implementing Alternative A (No Action) and Alternative B (Proposed Action). The No Action Alternative is considered and analyzed to provide a baseline against which to compare the impacts of the Proposed Action. No other alternatives were brought forward for detailed analysis (see Section 2.X for further details and rationale concerning alternatives eliminated from detailed analysis).

2.2 Alternative A No Action

Under the No Action Alternative, the BLM would not implement the proposal to install a combination of wells, pumps, storage tanks, troughs, and/or pipelines in the Upper Paria, Mud Springs, Cottonwood, and Lower Cattle allotments. Management of the areas would remain in accordance with the laws, regulations, policies, program guidance, and other plans described in section 1.5 above.

2.3 Alternative B Proposed Action

Under the Proposed Action Alternative, the BLM would install a combination of wells, pumps, storage tanks, troughs, and/or pipelines in the Upper Paria, Mud Springs, Cottonwood, and Lower Cattle allotments.

Anticipated elements of each project under the Proposed Action are summarized in Table X.3. Further details related to each project element are provided below on a project by project basis. Detailed project maps (Maps X.2 X.6) are located in Appendix X.1.

Table X.3. Summary of Anticipated Project Elements.

Project (Allotment(s))	Anticipated Project Elements
Sheep Creek Well and Pipeline Replacement (Upper Paria)	Installation of a well, solar pump, and approximately 50 feet of pipeline. Existing troughs (4).
Mud Springs Well and Pipeline (Mud Springs)	Installation of a well, solar pump, storage tank, approximately 2.5 miles of pipeline, and troughs (2).
8 Mile/Paria Roughs Pipeline Extension (Cottonwood)	Installation of 1 trough and approximately 1.25 miles of pipeline.
Butler Valley Pipeline and Storage Tank (Cottonwood)	Installation of 2 troughs, storage tank, and approximately 4.5 miles of pipeline.
Twentymile Pipeline Extension (Lower Cattle)	Installation of 2 troughs and approximately 3.25 miles of pipeline.
Well and Pipeline Summary Across All Projects	Installation of a total of two wells, two solar pumps, approximately 11.5 miles of pipeline, and seven troughs. A total of approximately 19 acres of surface disturbance.

Following project construction activities for all projects disturbed areas would be seeded with native grasses, forbs, and shrub species. All fill materials would be of similar color to those occurring at each site. Metal materials used in construction of project features would be non reflective and colored gray or dark brown. Total construction time is estimated to be approximately six weeks (or approximately 30 work days) though some construction timeframes

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may be closer to approximately two to four weeks or extend up to approximately eight weeks. The ideal construction window is between May and October though construction activities may fall outside this timeframe based on the availability of funding, personnel resources, site conditions, and other constraints. Project components would be maintained on an as needed basis.

2.3.1 Sheep Creek Well and Pipeline

This project would consist of installation of a well and solar pump, construction of well head and valve housing, and installation of approximately 50 feet of pipeline leading from the well to the existing distribution pipeline which feeds four existing troughs (project features are depicted in Map X.2). The well, drilled and cased to a depth of approximately 200 400 feet, would be located adjacent to the existing trough in T37S R3W, Section 33. Well drilling would be completed using a light truck mounted drill rig. Following well completion, a solar powered submersible pump would be installed and then connected to the Sheep Creek Pipeline. Two to four solar panels, each approximately 8 square feet in area, would be needed to power the solar pump. Solar panels would be pole mounted and placed immediately adjacent to the well. Small cover housing (approximately 12 square feet in area and approximately three feet in height) would be placed over the drill hole and wiring running to the pump. A total of approximately 1 acre of surface disturbance would occur to complete all components of this project.

2.3.2 Mud Springs Well and Pipeline

This project would consist of installation of a well and solar pump, storage tank, two troughs, and approximately 2.5 miles of pipeline (project features are depicted in Map X.3). The well, drilled and cased to a depth of approximately 200 400 feet, would be drilled using a light truck mounted drill rig. Following well completion, a solar powered submersible pump would be installed and then connected to a storage tank placed adjacent to the well. Two to four solar panels, each approximately 8 square feet in area, would be needed to power the solar pump. Solar panels would be pole mounted and placed immediately adjacent to the well. The storage tank would be approximately 50 feet in diameter and 5 feet high with a storage capacity of approximately 50,000 gallons. The bottom surface of the storage tank would consist of a concrete pad foundation approximately one foot thick hauled to the area using a cement truck. The sides of the storage tank would be made of galvanized steel. The storage tank would be covered by a corrugated tin lid with metal supports placed within the storage tank. Storage tank assembly would occur on site. The storage tank placement area (up to approximately 3,600 square feet in extent) would be cleared and leveled using a grader, bulldozer, backhoe or similar equipment prior to construction of the storage tank. The proposed 2.5 mile, 1.5 inch HDPE pipeline would be connected to the storage tank. The pipeline would be installed within or adjacent to the two track road located adjacent to the well and then proceed approximately 1 mile to the proposed east trough and approximately 1.5 miles to the west trough. These portions of the pipeline would be placed within or adjacent to Monument Road #301. The pipe would be buried 24 to 36 inches deep with either a backhoe or trencher or ripped in with a dozer equipped with a ripper and attached pipe layer. The east and west troughs would be up to 1,000 gallons in total capacity each and round or rectangular in shape. Each trough would occupy up to approximately 30 square feet in total area and be placed directly on the ground surface following clearing and grading using a grader or bulldozer or similar equipment. A total of approximately 3.8 acres of surface disturbance would occur to complete all components of this project.

2.3.3 8 Mile/Paria Roughs Pipeline Extension

This project would consist of installation of one trough and approximately 1.25 miles of pipeline (project features are depicted in Map X.4). The proposed pipeline would originate at the existing Fivemile Pasture trough located in T41S R2W, Section 34. The water for this trough is supplied by the existing Kitchen Corral Pipeline. The proposed 1.25 mile pipeline would be constructed of 1.5 inch diameter HDPE pipe buried 24 to 36 inches deep with either a backhoe or trencher or ripped in with a dozer equipped with a ripper and attached pipe layer. From the Fivemile Pasture trough, the proposed pipeline would proceed north approximately 0.3 miles to intersect with Monument Road #564. The pipeline would be placed within or adjacent to this road for approximately one mile to the point of interconnection with the proposed trough. The trough would be up to 1,000 gallons in total capacity and round or rectangular in shape. The trough would occupy up to approximately 30 square feet in total area and be placed directly on the ground surface following clearing and grading using a grader or bulldozer or similar equipment. A total of approximately 2 acres of surface disturbance would occur to complete all components of this project.

2.3.4 Butler Valley Pipeline and Storage Tank

This project would consist of installation of two troughs, a storage tank, and approximately 4.5 miles of pipeline (project features are depicted in Map X.5). The proposed pipeline would be constructed of 1.5 inch diameter HDPE pipe buried 24 to 36 inches deep with either a backhoe or trencher or ripped in with a dozer equipped with a ripper and attached pipe layer. The pipeline would originate at the existing storage tank located at the Butler Valley Well and proceed along the Butler Valley Well access road until it intersects with Monument Road #400 (also known as Cottonwood Road). From this location the pipeline would proceed east to intersect with administrative Monument Road #423A. The pipeline would intersect with the proposed storage tank in this approximate location. The pipeline would be placed within or adjacent to the aforementioned roads. The storage tank would be approximately 50 feet in diameter and 5 feet high with a storage capacity of approximately 50,000 gallons. The bottom surface of the storage tank would consist of a concrete pad foundation approximately one foot thick hauled to the area using a cement truck. The sides of the storage tank would be made of galvanized steel. The storage tank would be covered by a corrugated tin lid with metal supports placed within the storage tank. Storage tank assembly would occur on site. The storage tank placement area (up to approximately 3,600 square feet in extent) would be cleared and leveled using a grader, bulldozer, backhoe or similar equipment prior to construction of the storage tank. The proposed troughs would be located in T39S R1W, Sections 10 and 11. The troughs would be up to 1,000 gallons in total capacity each and round or rectangular in shape. Each trough would occupy up to approximately 30 square feet in total area and be placed directly on the ground surface following clearing and grading using a grader or bulldozer or similar equipment. A total of approximately 6.85 acres of surface disturbance would occur to complete all components of this project.

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2.3.5 Twentymile Pipeline Extension

This project would consist of installation of two troughs and approximately 3.85 miles of pipeline (project features are depicted in Map X.6). The proposed pipeline would interconnect with the existing Twentymile Pipeline in T38S R5E, Section 12. From this location it would cross under Hole in the Rock Road and proceed approximately 0.5 mile to intersect with an unnamed two track road. The pipeline would follow the two track road for approximately 0.85 mile at which point a 0.5 mile pipeline spur would be installed to the first of two troughs. From

where the spur line connects to the main line, the pipeline would proceed southward to the second trough located at T39S R6E, Section 30. The pipeline would be constructed of 1.5 inch diameter HDPE pipe buried 24 to 36 inches deep with either a backhoe or trencher or ripped in with a dozer equipped with a ripper and attached pipe layer. The troughs would be up to 1,000 gallons in total capacity each and round or rectangular in shape. Each trough would occupy up to approximately 30 square feet in total area and be placed directly on the ground surface following clearing and grading using a grader or bulldozer or similar equipment. A total of approximately 5.7 acres of surface disturbance would occur to complete all components of this project.

2.3.6 Design Features

Design features are those measures or procedures incorporated into the Proposed Action which would reduce or avoid adverse impacts. Design features associated with the Proposed Action are summarized in Table X.4. Design feature abbreviations are identified to simplify references to design features as needed later in the analysis.

Table X.4. Design Features Associated with the Proposed Action.

Resource Issue	Design Feature Abbreviation	Design Feature Description
General		
Cultural Resources		
Water Resources		
Soils and Biological Soil Crusts		
Vegetation Resources		
Noxious and Invasive Weeds		
Wildlife Resources		

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2.4 Alternatives C X (Other Action Alternatives)

Pending determination of need for action alternatives in addition to the Proposed Action.

2.5 Alternatives Considered but Eliminated from Further Analysis

Pending internal and external scoping results.

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3.0 **AFFECTED ENVIRONMENT**

3.1 **Introduction**

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area as identified in the Interdisciplinary Team Checklist found in Appendix ___ and presented in Chapter 1 of this assessment. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4.

3.2 **General Setting**

Briefly describe the environmental setting of the project area, include physiographic province, general climate, major vegetation types [if not discussed elsewhere in this Chapter], elevation, historical uses; precipitation, and any other general information that helps the reader understand the area. Site specific maps and photographs should be included.

For additional information refer to 43 CFR 46.125 and BLM Handbook H-1790-1 sections 6.7.1, 6.7.2, and 8.3.5.

3.3 **Resources/Issues Brought Forward for Analysis**

Describe the affected environment for only those resources identified as "PI" in the Checklist and discussed in Chapter 1. Do not present resources that have been assigned a "NP" or "NI". Describe in detail the existing environment, conditions, and trends related to each resource for which there is an issue are described in detail. This narrative provides the indicators, and units of measure that will be subsequently analyzed for degree of change in Chapter 4.

For example, if the potentially affected resource is wildlife and the issue is impacts on mule deer winter range describe the indicators: present location, extent, condition, and use etc., of the mule deer winter range in Chapter 3, and then analyze how these indicators would change in Chapter 4. Describe and analyze the same indicators in the same units of measure, e.g., acres of habitat. For additional information, see Section 6.7 of the BLM NEPA Handbook.

The description of the affected environment should portray what is, not what would be if the proposal is approved, and should avoid any impact language that is appropriate for Chapter 4 discussions. Make sure the affected environment tracks in logic, order of presentation, level of detail indicators and units of measure with the environmental impacts section.

The following are guidelines to assist in development and presentation of this chapter:

- *Limit the discussion of environmental elements to only that which is necessary to understand the effects of the alternatives. Do not include encyclopedic information, but summarize what is needed for assessment/analysis.*
- *Describe the affected environment with the same indicators and units of measure used in Chapter 4.*
- *Summarize and incorporate by reference wherever possible. Remember that referenced material must be available to a reviewer and the reviewer told where the information can be obtained.*
- *Site-specific resource clearances, reports, surveys, or inventories need to be properly referenced.*
- *Present environmental components/resources in a consistent order throughout the document, e.g., alphabetical order, magnitude of conflict, etc.*

For additional information refer to 43 CFR 46.125 and BLM Handbook H-1790-1 sections 6.7.1, 6.7.2, and 8.3.5.

3.3.1 Resource 1

For consistency, the potentially impacted resources must be addressed in the same order presented in Chapters 1 and 4.

- **Issue 1**
- **Issue 2**

3.3.2 Resource 2

Continue until all resources are presented.

- **Issue 1**
- **Issue 2**

4.0 ENVIRONMENTAL IMPACTS

4.1 Introduction

This chapter presents the environmental effects of the alternatives to the resources identified as potentially impacted in the Interdisciplinary Team Checklist found in Appendix ___ and presented in Chapters 1 and 3 of this assessment. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative effects are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable actions regardless of what agency or person undertakes such other actions.

Analysis of the environmental consequences (impacts) is separate and distinct from preparation of the EA. Impact analysis is a thinking, investigative, and analytical process completed by an interdisciplinary team. Preparation of the EA is a writing, editorial, and publication process that is necessary to document the investigation and impact analysis made by the team. Do not use the word significant in the analysis or EA. Most courts have interpreted "major" to reinforce, but not to have a meaning independent from the term "significantly."

Provide the context, magnitude and intensity of the impact so that the decision maker can determine significance when the FONSI and DR are prepared. For additional information refer to BLM Handbook H-1790-1 section 6.4.

Your EA must identify the known or predicted effects that are related to the issues (40 CFR 1500.4(c), 40 CFR 1500.4(g), and 40 CFR 1502.16. The terms "effects" and "impacts" are synonymous in the CEQ regulations (40 CFR 1508.8). An issue differs from an effect analysis; an issue describes an environmental problem or relation between a resource and an action, while effects analysis predicts the degree to which the resource would be affected upon implementation of action.

Provide any analysis assumptions and/or management guidelines that will help define the limits of analysis. If all mitigation has been included in the descriptions of the alternatives, state that: "Because all known mitigating measures have been included in the Descriptions of the Alternatives, the environmental consequences described below are unavoidable." When this is the case, Mitigation Measures and Residual Impacts sections should not be included in this chapter.

4.2 Direct and Indirect Impacts

Follow the outline provided below for all alternatives analyzed in detail.

Identify and analyze direct and indirect impacts on the affected environment caused by the change agents (actions) described for the proposed action, including any policies or standard program requirements. The order of presentation, level of detail, indicators and units of measure should be the same as in Chapter 3. Analysis can be divided into the following component parts:

- *Cause of the impact: What would cause an impact, i.e., change, in the present or future environment?*
- *Nature of the impact: What would be affected and how would it be affected?*
- *Context and intensity: Where would the impact occur? What is the geographic location and extent of change? What is the magnitude or degree of change? How can the magnitude be expressed qualitatively (empirically measurable units) or quantitatively (relative comparative terms)?*

Clarity of expression, logical thought processes, and rational explanations are more important than length or format in the discussion of impacts. For additional information refer to 43 CFR 46.310 (e), (f), and (g) and BLM Handbook H-1790-1 sections 6.8 and 8.3.6. Following these guidelines will help the decision-maker and the public understand your analysis:

- *Use objective, professional language without being overly technical.*
- *Avoid subjective terms such as good, bad, positive and negative. The term significant has a very specific meaning in the NEPA context. While it is a common descriptor, do not use it in NEPA documents unless it is intended to take on the NEPA meaning.*
- *Avoid the use of acronyms.*
- *Make sure to reference applicable general assumptions in section 4.2 also describe any resource specific assumptions.*
- *If data are incomplete or lacking refer to 40 CFR 1502.22 for guidance.*

If necessary information is incomplete or lacking, and cannot be obtained, it must be disclosed along with why the data would be useful. For additional information refer to 43 CFR 46.125 and BLM Handbook H-1790-1 section 6.7.2.

4.2.1 Resource 1

Describe the methodology used to conduct the analysis and why the methodology was used (40 CFR 1502.24). This explanation must include a description of any limitations inherent in the methodology. If there is substantial dispute over models, methodology, or data, you must recognize the opposing viewpoint(s) and explain the rationale for your choice of analysis. You may place discussions of methodology in the text or in the appendix of the document. To the extent possible, we recommend that the analysis of impacts be quantified.

The analytical assumptions, including geographic and temporal scope, the baseline for analysis, as well as reasonably foreseeable future actions must be clearly stated. Explain any assumptions made when information critical to the analysis was incomplete or unavailable (40 CFR 1502.22).

Example: *The visual resource analysis was conducted using a GIS-based viewshed analysis from the Colorado River, which was selected as a key observation point (KOP) because of the number of viewers on the river during the spring, summer, and fall season. The GIS-based analysis did not take into consideration vegetative screening. Additionally, the resolution of the digital elevation model used to conduct the analysis likely excludes some topographical features that may provide screening.*

4.2.1.1 Alternative A Proposed Action

Example:

Issue: How much winter forage for mule deer in Herd Unit 10A would be lost due to the proposed fire?

1) Clearing of 2 acres of land for installation of the water tank would decrease forage production used by deer in the winter months by 400 pounds per year for the 30-year life of the water tank. The decrease in forage production would eliminate feed for one deer for 1 month. The 5,000 undisturbed acres in Herd Unit 10A would continue to produce about 1 million pounds of forage each year. This is sufficient to feed approximately 2,500 deer. Since there are only an estimated 600 deer in the herd unit, there would be sufficient forage available to feed the herd through the winter.

4.2.1.2 Alternative B No Action

Explain that if the proposal is rejected, there would be no direct or indirect impacts from the proposed action. However, do describe the impacts of the actions that would continue even if the proposed action is not approved. For additional information refer to BLM Handbook H-1790-1 section 6.8.

4.2.1.3 Alternative C X Reasonable Alternatives

Continue in this outline format to present all relevant resources and issues

4.2.1.4 Mitigation Measures

This section is not required if all mitigation has been identified in the descriptions of the alternatives. Describe any measures not included in the description of the proposed action which could mitigate some or all of the impacts identified in the analysis of environmental impacts. If all the measures are incorporated into the proposed action, state that no measures other than those incorporated into the proposed action have been identified. State whether the mitigation measure(s) would completely or partially negate the environmental impact. If additional mitigation is identified for several resources, add a new alternative to the EA and analysis that incorporates all of the proposed mitigation. In this case, eliminate the mitigation measures and residual impact sections of the EA. For additional information refer to 43 CFR 46.130 and Section 6.8.4 of the BLM NEPA Handbook.

4.2.1.5 Residual Impacts

This section is not required if all mitigation has been identified in the descriptions of the alternatives. Describe the impacts on the affected environment which would remain after application of the mitigation measures, if any. Be sure to analyze the impacts of the proposed mitigation measures on other resources. For example, treatment of invasive/non-native species using chemicals may result in impacts on water quality, or other resources that must be analyzed in the EA. For additional information refer to BLM Handbook H-1790-1 sections 6.8.4.

4.2.1.6 Monitoring and Compliance

Monitoring and/or compliance can provide important information regarding desired outcomes compared to actual outcomes. The main purposes of NEPA related monitoring are to: evaluate the quality of the NEPA document, ensure compliance with the NEPA decision, measure the effectiveness or success of application stipulations, and evaluate the validity of NEPA decisions. Provide the following information as part of the analysis process:

- *Identify who would conduct the monitoring, including skills and equipment necessary and methods to be used.*
- *Describe the frequency and duration of the monitoring activity.*
- *Utilize Adaptive Management as applicable (43 CFR 46.145 and 46.310(d)).*

The suggested monitoring is identified in the EA. The commitment to this monitoring is made in the DR. If carried into the DR, the monitoring must be implemented as specified.

If monitoring is deemed unnecessary for an action, the following statement should be incorporated into the EA: "No monitoring needs have been identified for this action."

If monitoring needs have been described as a part of the proposed action, incorporate the following sentence: "The monitoring described in the proposed action would be sufficient for this action because . . . (insert rationale)."

4.2.2 Resource 2

Describe the methodology used to conduct the analysis as was discussed above under Resource 1.

4.2.2.1 Alternative A Proposed Action**Example:**

Issue: How much livestock grazing forage would be lost on the Verdant allotment?

The stripping of 200 acres of vegetation for the proposed mine would decrease available forage for livestock in the Verdant Allotment by 10 AUMs. The decrease of 10 AUMs in the 400 AUM allotments would reduce the allowable number of AUMs by 2.5%. This reduction in AUMs would reduce the number of allowable cattle by 2, or a decrease of 1%. The economic impact of reduction of the number of permitted cattle is analyzed in the socio-economic impacts section of this EA.

4.2.2.2 Alternative B No Action**4.2.2.3 Alternative C X Reasonable Alternatives****4.2.2.4 Mitigation Measures****4.2.2.5 Residual Impacts****4.2.2.6 Monitoring and Compliance****4.2.3 Resource 3**

Repeat as necessary.

4.3 Cumulative Impacts

The purpose of the cumulative effects section is to describe the interaction among the effects of the proposed action and these various past, present, and reasonably foreseeable actions.

The following is a basic cumulative impacts outline. The cumulative effects analysis will usually vary by resource. Remember to quantify impacts whenever possible.

- 1. Identify the resource being impacted.*
- 2. Identify the Cumulative Impact Area for the subject resource.*
- 3. Describe briefly why the Cumulative Impact Area is applicable.*
- 4. As appropriate for the subject resource, incorporate by reference cumulative analysis (including past, present, and reasonably foreseeable actions and their direct or indirect impacts) from existing documents and state why the referenced material is relevant.*
- 5. List or describe any additional past, present, and reasonably foreseeable actions ongoing in the Cumulative Impact Area beyond those previously analyzed in the documents referenced in step 4 that affect the subject resource.*
- 6. Briefly describe any additional direct and indirect impacts to the subject resource resulting from the past, present and reasonably foreseeable actions which were not previously analyzed and incorporated by reference.*
- 7. Briefly describe what the action alternative(s) will add to the past, present, and reasonably foreseeable impacts.*
- 8. If the no action alternative is a continuation of the existing situation, briefly describe what the no action will add to the cumulative impacts. If the no action alternative is to not approve the activity state:
"Because the No Action Alternative will not result in any direct or indirect impacts, it will not result in an accumulation of impacts."*

Examples are included on the following page. Refer to H-1790-section 6.8.3 for additional discussion on cumulative impacts.

Example 1: Livestock Grazing

The CIAA for livestock grazing is the Olsen AMP Grazing Allotment, which is the only allotment affected by the proposed action or alternatives. Cumulative impacts livestock grazing would include the loss of AUMs for the life of the disturbance. In the cumulative impact area, past, present, and reasonably foreseeable activities include oil and gas activities, recreation activities (including OHV use), and prescribed burns. The incremental impacts of all but the oil and gas activities are impossible to quantify. Table 5-6 below, displays the past and reasonably foreseeable impact of oil and gas development on AUMs in the Olsen AMP grazing allotment.

Example: Table 5-6 AUMs Lost from Past and Reasonable Foreseeable Oil and Gas Developments in the Olsen AMP Grazing Allotment

	Total Allotment AUMs	Past Action AUMs Lost	RFD AUMs Lost	AUMs Lost per Alternative	Total Reasonably Foreseeable AUMs Lost	% of Total Allotment AUMs Lost
Alternative A	134,307	29	97	12	138	0.1%
Alternative B	134,307	29	97	6	132	0.1%
Alternative C	134,307	29	97	6	132	0.1%
Alternative D	134,307	29	97	0	126	0.1%

In addition to loss of AUMs; increased roads within the Project Area would cumulatively contribute to difficulties in controlling livestock as more natural barriers to livestock movement are removed, and as more livestock use roads as travel routes; increased road and pipeline ROWs could contribute to changes in water flow, thereby reducing flows to livestock ponds; loss of vegetation and increased traffic and human activity in the Project Area could contribute to livestock displacement that is occurring throughout the Project Area as a result of recreational activities and other land uses. These past, present, and future construction activities, and other visual and noise impacts in the Project Area could cause livestock to move to adjacent undisturbed areas, thereby leading to additional livestock impacts on vegetation in those locations.

Example 2: Paleontological Resources

As potential impacts to paleontological resources across a geographic landscape are not additive, the cumulative impact area of analysis is the project area which covers 21,760 acres. As was disclosed in the River Bend/West Willow Creek EA (UT-080-97-049) past actions include 182 oil and gas wells within the River Bend Unit (pre-1997) resulting in 710 acres of surface disturbance. There were 301 additional wells proposed within the River Bend/West Willow Creek EA, with a total surface disturbance of 895 acres. The 4 additional wells proposed in this EA would be part of the wells conceptually approved through the 1997 EA. Future actions in the vicinity include, the River Bend Infill EA which could vertically and directionally drill 484 wells, including 128 wells previously approved under the 1997 River Bend EA, resulting in a total of 1,103 acres of disturbance. A total of 2,708 acres would be cumulatively disturbed (12 % of total land area in the Unit), which is a conservative total due to the overlapping of analyzed acres between the 1997 and ongoing River Bend EAs. Additional past, present, and reasonably foreseeable activities in the project area include some OHV use and vegetation treatment activities. The surface disturbance, if any, associated with these activities is impossible to quantify due to their dispersed nature. Paleontological surveys are conducted in areas with high potential for producing paleontological resources prior to approval of surface disturbing activities, and identified paleontological resources are avoided or collected. However, paleontological resources that are not visible on the surface could be unknowingly damaged or destroyed by construction activities. Unknown paleontological resources could be disturbed on up to 2,708 acres. The proposed action would make up 9.5 acres of the total disturbance. The no action alternative would not result in an accumulation of effects.

4.3.1 Resource 1

4.3.1.1 Cumulative Impact Analysis Area

Describe the geographic boundaries of cumulative impact analysis for each of the resources analyzed.

4.3.1.2 Past and Present Actions

Past or ongoing actions that affect the same components of the environment as the proposed action are:

Describe and explain the actions and activities that are in place or ongoing that affect the same environmental components that the proposed and alternative actions would affect.

4.3.1.3 Reasonably Foreseeable Actions

The following reasonably foreseeable future actions would cumulatively affect the same resources in the cumulative impact area as the proposed action and alternatives.

Include a reasonably foreseeable action scenario that identifies the actions and impact area(s). The NEPA Handbook (Section 6.8.3.4) defines a reasonably foreseeable action to those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

4.3.1.4 Cumulative Impact Analysis

Incorporate cumulative analysis from existing documents by reference and tier to the existing land use plan, as appropriate. If no cumulative effects are anticipated from the action, use the following: "It has been determined that cumulative impacts would be negligible as a result of the proposed action or alternatives because...." Refer to H-1790-1pages 57-61 for additional discussion on cumulative impacts.

Describe the interaction among the effects of the proposed action and these various past, present, and reasonably foreseeable actions.

How the different effects interact may help determine how you may best describe and display the cumulative effects analysis.

The cumulative effects analysis provides a basis for evaluating the cumulative effect relative to any regulatory, biological, socioeconomic, or physical thresholds. Describe how the incremental effect of the proposed action and each alternative relates to any relevant thresholds.

Distinguish between the impacts of the alternatives. Depending on the complexity of the project, it may be beneficial to have a separate fifth level subheading for each alternative.

4.3.2 Resource 2: (repeat as necessary)

4.3.2.1 Cumulative Impact Area

4.3.2.2 Past and Present Actions

4.3.2.3 Reasonable Foreseeable Action Scenario

4.3.2.4 Cumulative Impact Analysis

5.0 CONSULTATION AND COORDINATION

5.1 Introduction

The issue identification section of Chapter 1 identifies those issues analyzed in detail in Chapter 4. The Interdisciplinary Team Checklist provides the rationale for issues that were considered but not analyzed further. The issues were identified through the public and agency involvement process described in sections 5.2 and 5.3 below.

5.2 Persons, Groups, and Agencies Consulted

List all persons, agencies, and organizations consulted, and the purpose of such consultations. A table may be used for this purpose. This applies only to those consulted whose information assisted in the preparation of the EA, not those that commented on the EA during a public comment period. Sample wording is provided. The actual wording must be developed based on the circumstances of the proposal and results of the consultation process. For additional information refer to BLM Handbook H-1790-1 section 8.3.7.

Example: Table 5-1 Persons, Agencies and Organizations Consulted		
Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
U.S. Fish & Wildlife Service (USFWS)	Information on Consultation, under Section 7 of the Endangered Species Act (16 USC 1531)	The Service agrees, by letter dated , that the proposed action may affect but would not adversely affect listed species because..... (Refer to Appendix)
Utah State Historic Preservation Office (SHPO)	Consultation for undertakings, as required by the National Historic Preservation Act (NHPA) (16 USC 470)	SHPO has approved, by letter dated , that..... (Refer to Appendix)
Tribe	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA (16 USC 1531)	A meeting was held on (date) to describe and discuss the concerns of the Tribe concerning the proposed action. A follow-up letter was sent and/or phone calls made on (date(s)). The Tribe has responded by letter dated , that..... OR The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action.
U.S. Army Corps of Engineers	The project would require a permit from the Corps under authority of Section 404 of the Clean Water Act (33 USC 1251)	The Corps has indicated that the project meets the nationwide permit criteria which states.....
Utah Div. of Wildlife Resources	Consult with UDWR as the agency with expertise on impacts on game species.	Data and analysis regarding big game species incorporated into Chapters 3 and 4.

Table 5-1 Persons, Agencies, and Organizations Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions

5.3 Summary of Public Participation

Describe the process used to involve the public. Include the date of posting on ENBB, when and how scoping was conducted, dates of public meetings [if any], dates of public comment period [if any], etc. See Chapter 2 for guidance on public involvement.). For additional information refer to BLM Handbook H-1790-1 sections 6.9 and 8.3.7.

Do not include 5.3.1 5.3.3 in an EA is being released for public comment or if a public comment period is not offered.

Example: During preparation of the EA, the public was notified of the proposed action by posting on the Utah Internet Homepage on ____date. The process used to involve the public included _____. A public comment period was (not) offered (because....) between ____month/date/year and ____month/date/year.

5.3.1 Comment Analysis

Complete this section after the public comment period. List all individuals and organizations that provided comments with the exception of information that is protected by the privacy act. If appropriate, provide a succinct summary of the comments received or copies of the letters with the comments bracketed and numbered for response. For additional information refer to 43 CFR 46.305 and BLM Handbook H-1790-1 section 6.9.

5.3.2 Response to Public Comment

If applicable, group similar/like comments under appropriate headings if numerous comments are received. See Chapter 9 of the Guidebook for guidance and examples on responding to comments. For additional information refer to BLM Handbook H-1790-1 section 6.9.2.2.

5.4 List of Preparers

List all preparers, their area(s) of expertise, and the section(s) of the document they prepared. If the EA is prepared for BLM by a consultant, BLM should not be listed as an agency consulted, but rather included in the list of preparers. This information may be presented in table format. Sample wording is provided. The actual wording must be developed based on the actual preparers of the EA. Do not include the non-BLM preparers table if the document was prepared in-house.

Example: Table 5-2 BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Robert Raptor	Team Leader	Technical Coordination & Quality Control
Jim Rafter	Recreation Specialist	Impact analysis for recreation, and visual resource management
Stephen McCoy	Petroleum Engineer	Impact analysis for energy mineral resources

Example: Table 5-3 Non-BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document
John Smith	Team Leader	Technical Coordination & Quality Control
Mike Falcon	Wildlife Biologist	Impact analysis for big game, T&E animal species
Donna Bales	Soils/Watershed Specialist	Impact analysis for watershed, water quality, and reclamation

Table 5-2 BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document

Table 5-3 Non-BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document

6.0 REFERENCES, GLOSSARY AND ACRONYMS

6.1 References Cited

This chapter provides literature references for all citations within the body of the EA including documents tiered to or incorporated by reference. Specialists must turn in a complete list of references used in preparation of the EA. Cite published scientific information where possible. Include documents used such as a cultural surveys, Water Quality 303(d) list; and published soil surveys. Other credible references include published articles or studies in scientific journals; other agency and university studies; Utah statistics; published state/county socio-economic statistics; and published information provided on the internet.

There are various styles for the citations and references. Whatever style guide is selected, it is important to be consistent in using citations and references. Writers should use the reference worksheet provided in Appendix 6 of this Guidebook to record references cited in the analysis and EA, and submit it to the EA preparer for inclusion in the EA. Cite specific pages utilized or relied upon in your EA.

Common Examples:

1. Finch, Deborah M. and Scott H Stoleson, eds., 2000. *Status, Ecology & Conservation of the Southwestern Willow Fly catcher*. General Tech Report RMRS-GIR-60. Ogden, UT: USDA, Forest Service. Rocky Mountain Research Station. 131 pp.
2. MacMurphy, John. "Effects of streamside vegetation on water temperature." Personal telephone call. May, 24, 2010

6.2 Glossary of Terms

Optional - If the EA includes technical terms that must defined in order for the readers to understand the document, provide a glossary of terms (including the source for the definition) used in the EA. List in alphabetical order all technical terms or phrases used in the EA. Provide a source for the definition provided; explain if there may be any deviations from the official/legal definition used and why.

6.3 List of Acronyms

Optional - If several acronyms are used in the EA, provide a list of any abbreviations and their full translation as a courtesy to the reader. The acronyms and their translations should be listed in alphabetical order. Provide a definition for the acronym in the glossary, if appropriate. As an alternative, the list of acronyms may be included at the beginning of the document directly after the table of contents.

**APPENDIX A
INTERDISCIPLINARY TEAM CHECKLIST**

The appendices should include information that is necessary for understanding or supporting the analysis and text of the EA. This section may include any of the following, as necessary:

- *Detailed descriptions of project components necessary to support technical analysis*
- *Topographic maps or engineering drawings, referred to in text as figures or plates*
- *Photographs*
- *Any visual enhancements to help the reader*
- *Charts, graphs, figures, tables, etc.*
- *Technical reports*
- *Conclusion of consultation correspondence including determinations/concurrence*

All Utah BLM EAs will include the Checklist as an appendix. [Chapter 5 of the Guidebook].

Figure 1 1 Sample Figure Title

