

ADDENDUM to

**Specialist Report 1.0
Visual Resources**

**Oil and Gas Leasing EIS
on Lands Administered by the
Dixie National Forest**

Prepared For:
US Forest Service
Dixie National Forest
1789 N. Wedgewood Lane
Cedar City, Utah 84721

Prepared By:



8160 South Highland Drive
Sandy, Utah 84093

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Reviewed/Approved by: *Sue Baughman* Date: 6-27-2011
Sue Baughman

Addendum Table of Contents

1.0	Introduction.....	1
2.0	Changes between Draft and Final EIS	1
2.1	Revised Leasing Options	1
2.2	New GIS Model.....	2
2.3	Errata	2
2.3.1	Clarifications	2
2.3.2	Expanded Analyses	3
2.3.3	New information or Agency direction (since 2008)	3
3.0	Changes to Visual Resources	4
3.1	Revised Leasing Options and New Model	4
3.1.1	Night skies.....	4
3.1.2	Unassigned SIO	7
3.1.3	GIS Model output.....	8
3.2	Errata	9

Addendum Tables

Table 1	Changes to leasing options since the DEIS reflected in the new GIS model.	1
Table 1.5-2 (in part)	Leasing Options Assigned under each Alternative for Visual Resources.	4
Table 1.5-3	Acreage of Resource Components under each Leasing Stipulation by Alternative	8
Table 1.4-1	Acres of SIO Categories on the Dixie National Forest.....	9
Table 1.5-4	Division of land status within the CEA for visual resources	10

1.0 INTRODUCTION

This addendum updates Specialist Report 1.0: Visual Resources, which informed the DEIS. This addendum provides the supplemental information necessary to inform the FEIS and make a decision. The specific purposes of this supplement are to:

1. Provide an overview of changes between the Draft and Final EIS (**Section 2.0**).
2. Highlight the changes since the DEIS that were made specifically to protect Visual Resources or that are otherwise relevant to Specialist Report 1.0 (**Section 3.0**).

2.0 CHANGES BETWEEN DRAFT AND FINAL EIS

A number of changes were made to the DEIS in preparing the FEIS. These changes were primarily minor edits, corrections, and updates, and are reflected in the FEIS. Chapter 7 was added to the FEIS and contains an analysis of the public comments received on the DEIS and responses from the Dixie National Forest. The public involvement process since the DEIS is described in detail in Chapter 7, and summarized in Section 1.9.1 of the FEIS.

A Supplemental Information Report (SIR) was issued in January 2009 to address comments on the DEIS from agencies and the public concerning air resources and climate change. Other changes (i.e., not related to air and climate change) were not substantial changes to the proposed action, or significant new circumstances bearing on the proposed action (following 40 CFR Part 1502.9) that would require a supplemental DEIS. These changes are summarized in the following sections.

2.1 Revised Leasing Options

Several changes were made to the action alternatives, and specifically leasing options, in response to public comments on the DEIS. Other changes to leasing options reflect Forest or other Agency decisions made since the DEIS that have bearing on the resources analyzed. **Table 1** summarizes the changes to leasing options since the DEIS.

Table 1 Changes to leasing options since the DEIS reflected in the new GIS model.

Resource	DEIS Leasing Option	FEIS Leasing Option	Alternatives Affected
Inventoried Roadless Areas	NSO (mod*)	NSO	C, D1, and E1
SIO Unassigned	LN	CSU	B, C, D, and E
NPS Protective Measure (new)	n/a	NL	B
	n/a	NSO	C
ROS Primitive	NL	NSO	C
Sage-Grouse Leaks	1-mile buffer	2-mile buffer	B and C
Fisheries Habitat	300-foot buffer	500-foot buffer	C
Boreal Toad Habitat (new)	n/a	Added to "Forest Service-Sensitive Species and Suitable Habitat"	A-E
Desert Tortoise Habitat	various	No suitable habitat determination	A-E

Desert Tortoise Critical Habitat	various	No suitable habitat determination	A-E
Lava Fields over Sensitive Aquifers	NSO	NL	B and C
Class I Airsheds – 60 km buffer (new)	n/a	CSU	A-E
Iron Town Historic District	various	No acres on Dixie National Forest	A-E

*Actual leasing option CSU but called a “modified NSO.”

2.2 New GIS Model

The GIS model was re-run to incorporate the changes made to leasing options and the addition of new resources in the FEIS. The new model output, or the number of acres under each leasing option across the Forest, and revised baseline acres where appropriate, is reflected in each resource section in the FEIS. Regarding these specialist report updates (i.e., addendums), individual number replacements in the text that reflect the new model output for the FEIS are not listed in the errata sections. Instead, tables of data, usually replacing a specific table in the DEIS specialist report, are presented in each specialist report addendum to summarize the data changes in the FEIS.

2.3 Errata

Errata correct (**Section 2.3.1**) or expand on data previously presented (**Section 2.3.2**), or incorporate new information or decisions since the DEIS (**Section 2.3.3**).

2.3.1 Clarifications

Clarifications to the DEIS were made to correct errors or to eliminate confusion. Most were made as responses to public comments on the DEIS.

- Chapter 1
 - Section 1.5.2, Lands Not Legally Available for Leasing, clarification to language describing Utah Wilderness Act of 1984.
 - Section 1.5.2, Lands Not Legally Available for Leasing, clarification to language describing Split-estate parcels.
 - Section 1.8.2, 2001 Roadless Area Conservation Rule and Legal Activity, clarification to how Roadless Areas on the Dixie are officially identified.
- Chapter 3
 - Section 3.5.4, Aquatic Species and Habitat, clarification to which waterbodies on the Dixie are Blue Ribbon Fisheries, following a memo from the Blue Ribbon Fisheries Advisory Council dated 26 March 2006.
 - Section 3.6.2.3, Candidate Species, GIS error and clarification on acres of greater sage-grouse brood-rearing habitat within the Dixie.
- Chapter 4
 - All Sections, all effects determinations under NL were changed to “No Effect” (from “negligible”).
 - Section 4.6.4, Impacts of Connected Actions by Leasing Option, reducing impact adversity determinations for Utah prairie dog, greater sage-grouse, and pygmy rabbit.
 - Sections 4.6.4, 4.6.5, 4.9.4, and 4.9.5, Impacts of Connected Actions by Leasing Option and by Alternative: Reduced impact adversity determinations for pygmy rabbit, sensitive bats, sensitive raptors, big game, and marginally unstable slopes (soils) under CSU for some of the action alternatives due to misunderstanding

- (by the consultant) of the application of resource-specific CSUs.
 - Section 4.6.4, Impacts of Connected Actions by Leasing Option, road density was clarified as Open Motorized Road Density (OMRD).
 - Section 4.7.4, Impacts of Connected Actions by Leasing Option, clarification added to lava fields over sensitive aquifer impacts regarding the BLM Onshore Oil and Gas Order requirement for well casing.
 - Section 4.12.2.4 and 4.12.2.5, Class I Cumulative Impact Analysis and Visibility and Deposition Analysis, clarifications added (since SIR) regarding the need for additional air quality analyses for proposed projects and the criteria under which further analyses are required.
 - Section 4.12.2.7 (new), Direct Ozone Impacts, this section was added to clarify that ozone impacts are discussed in the cumulative effects section of Air Resources (5.12.3.1).
 - Section 4.17, Forest Plan Consistency Determination, assessments of compliance with the Forest Plan in the DEIS were eliminated due to the Forest Plan amendment that will be implemented to reflect the stipulations needed for resource protection.
- Chapter 5
 - Section 5.6.2, Past, Present, and Reasonably Foreseeable Future Actions, cumulative effects discussion regarding grazing effects to Utah prairie dog and greater sage-grouse expanded to include more of the scientific information available.

2.3.2 Expanded Analyses

Expanded analyses were made as a result of the comments received on the DEIS. Apart from the SIR, which presented a new analysis on Climate Change and other aspects of Air Resources not in the DEIS (e.g., ozone), the main areas with information added were night skies (Visual Resources, 3.2 and 4.2), unroaded/undeveloped areas (IRAs/WSRs, 3.3 and 4.3), and greater sage-grouse (Special Status Species, 3.6 and 4.6). In the case of greater sage-grouse, impact determinations were re-assessed for alternatives B-E. Scientific evidence or Agency direction not previously considered was added to these discussions in response to public comments on the DEIS from government agencies and environmental groups.

The Air Resources analysis expanded upon in the SIR was further expanded in response to public comment on the SIR. Areas with new information include NAAQS for nitrogen oxides and ozone, secondary PM_{2.5} analysis, updated ozone monitoring data from Zion NP, an expanded ozone analysis based on the UBAQS, and additional information on the impacts to sagebrush habitat from climate change.

2.3.3 New information or Agency direction (since 2008)

The following decisions, regulations, or information were incorporated in the FEIS where applicable:

- Omnibus Public Land Management Act 2009
- Memorandums 1042-154 (2009) and 1042-155 (2010) (RACR)
- Wild and Scenic Rivers Suitability Study (2008)
- Forest Service Strategic Plan (2007-2012)
- National Visitor Use Monitoring Study (2010)
- Motorized Travel Plan (2009)

- Dixie National Forest Annual Monitoring Reports (2008 and 2009)
- Dixie National Forest Aquatic Monitoring Amendment (2010)
- Conservation Agreements for southern leatherside (UDWR 2010)
- New BLM RFPs – Cedar City and Richfield Field Offices (both 2008)
- Alton Coal Development update
- Updated R4 TESP list (2011)
- New definition of Sensitive Fisheries Habitat on the Dixie (=occupied *and suitable*; 2009)
- Updated occurrence and habitat data for TES species on the Dixie (2008-2010)
- Biological Opinion from USFWS (2011), including Lease Notices
- USFS SOPA (since 1st quarter 2011; updates to Foreseeable Future Actions)
- BLM IM No. UT 2010-055 (Protection of Ground Water Associated with Oil and Gas Leasing, Exploration, and Development – Utah BLM)

3.0 CHANGES TO VISUAL RESOURCES

3.1 Revised Leasing Options and New Model

Two changes were made to leasing options for visual resources between the DEIS and FEIS: these pertain to night skies (**Section 3.1.1**) and Unassigned SIO (**Section 3.1.2**). Modified leasing options for visual resources in the FEIS are shown in the table below.

Table 1.5-2 (in part) Leasing Options Assigned under each Alternative for Visual Resources.

SIO	Alternative				
	A	B	C	D	E
SIO Unassigned	NL	CSU	CSU	CSU	SLT
NPS Protection	NL	NL	NSO	SLT	SLT

3.1.1 Night skies

The main change to visual resources between the DEIS and FEIS analysis pertains to night skies. For the purpose of protecting this resource, new leasing options were created for areas around Bryce Canyon National Park. These leasing options were applied after the revised GIS model (for the FEIS) was run. In all, 1,284 acres of NL were applied around BCNP under Alternative B and 1,925 acres of NSO were applied around BCNP under Alternative C.

The following changes should be made to Specialist Report 1.0 to reflect the expanded discussion and analysis for night skies:

Page 9 (**Section 1.4.5**)

- Add to end of the first paragraph:

The Bryce Canyon National Park Management Plan reiterates the concern about night sky conservation, stating that minor increases in artificial light and air pollution can seriously jeopardize the night skies, and that continued increases in air pollution and artificial lights could have a serious negative impact on visitors' experience (BCNP 1987).

Page 17 (**Section 1.5.4**)

- Replace 4th paragraph, starting with 5th sentence:

This can be done by shielding light fixtures to eliminate direct uplight and being careful that they shine inward to the working area of the rig and not outward (Luginbuhl et al. 2009a and 2009b; Dustin Doucett, Petroleum Engineer, Utah Division of Oil, Gas, and Mining, Personal Communication). Focus and illumination engineering can be utilized to make the rig less visible from outside of the drilling location at night (Barry Olsen, Personal Communication). In addition, limits on the timing of operations, height of light poles, and wattage intensities can be used to limit light pollution (see mitigations in Appendix C). The potential for light pollution would be minor to moderate, depending upon the site, and temporary.

Page 18 (Section 1.5.4)

- Replace last sentence in 1st paragraph with:

When stray lighting is an environmental issue for such sites, the operator could reduce impacts using methods such as limiting height of light poles, timing of lighting operations, limiting wattage intensity, and constructing light shields (Dustin Doucett, Petroleum Engineer, Utah Division of Oil, Gas, and Mining, Personal Communication) as presented in Appendix C.

Page 19 (Section 1.5.4.1)

- Add after 1st sentence in “No Lease” section

A NL stipulation was applied in 1,284 acres surrounding Bryce Canyon National Park under Alternative B.

Page 19 (Section 1.5.4.1)

In “No Surface Occupancy” section:

- Replace last 2 sentences in 1st paragraph with:

Under Alternatives B, C, and D, NSO applies to lands designated with Very High SIO. Under Alternatives B and C, NSO also applies to lands designated as High SIO (see Table 3.2-1 in Chapter 3). In addition, an NSO stipulation was applied after the analysis in 1,925 acres surrounding Bryce Canyon National Park under Alternative C.

- Add at the end of 1st sentence under Measurement Indicator #1:

, including areas surrounding Bryce Canyon National Park.

Page 20 (Section 1.5.4.1)

In “Controlled Surface Use” section:

- Remove Measurement Indicator #1 (and text).

Page 22 (Section 1.5.4.2)

- Remove last paragraph before “**Measurement Indicators.**”
- Replace text under “Measurement Indicator #1” with:

According to Barry Olsen, drill equipment manufacturing representative, the lumen ratings for derrick lights all vary. Based upon this, the total lumens for each phase would be completely variable depending upon equipment utilized. As noted above, the drill rig lighting can be mitigated to minimize the visibility of the site (Appendix C). However, minor to moderate impacts to dark night skies are still possible wherever oil and gas developments occur. These impacts would be short-term in the case of an exploration development and long-term in the case of a production development.

Page 24 (Section 1.5.4.3)

- Add after 1st sentence in “Alternative A” section

There would be no effects to night skies under No Action (*Measurement Indicator #1*).

Page 26 (Section 1.5.4.3)

- Replace last paragraph in “Alternative B” section with:

With the exception of Alternative A, this alternative provides the most protection for the scenic resources of the Forest. Alternative B would have negligible impacts to night skies (*Measurement Indicator #1*), except in the few areas of CSU (4 percent of the Forest), where developments would be possible; in these areas impacts would be minor to moderate. There would be no effect to night skies in areas surrounding Bryce Canyon National Park, which are NL. Alternative B would be in compliance with the SIOs, with considerations made for facility location and site design in Moderate SIO areas adjacent to viewing corridors (*Measurement Indicator #3*). This alternative would be consistent with the 2000 Dixie Scenery Management System Land and Resource Management Plan amendment (*Measurement Indicator #4*).

Page 26 (Section 1.5.4.3)

- Add after 1st sentence of last paragraph in “Alternative C” section:

Like Alternative B, Alternative C would have negligible impacts to night skies (*Measurement Indicator #1*), except in the areas of CSU (14 percent of the Forest) where impacts could be minor or moderate. All areas surrounding Bryce Canyon National Park (1,926 acres) would be NSO, which would reduce night sky impacts (*Measurement Indicator #1*) to negligible levels.

Page 27 (Section 1.5.4.3)

- Add after 1st sentence of last paragraph in “Alternative D with NSO in Inventoried Roadless Areas”:

In these and other NSO areas (41 percent of the Forest), impacts to night skies would be negligible (*Measurement Indicator #1*). In other areas (CSU and SLT; 53 percent of the Forest), impacts to night skies could be minor to moderate.

Page 27 (Section 1.5.4.3)

- Add after last sentence of third paragraph in “Alternative D with CSU in Inventoried Roadless Areas”:

Impacts to night skies (*Measurement Indicator #1*) would be as described under Alternative D1, except there would be fewer areas covered by NSO (9 percent of the Forest under D2).

- Add after last sentence of second paragraph in “Alternative E with NSO in Inventoried Roadless Areas”

Impacts to night skies (*Measurement Indicator #1*) would be as described under Alternative D1, except 35 percent of the Forest would be covered by NSO (negligible impacts) and the remainder available for leasing (59 percent) would be covered by SLT (minor to moderate impacts).

Page 33 (Section 1.5.5.2)

- Add before first sentence of last paragraph in “Development and Population Growth”:

Population and development increases have brought higher levels of night lighting in proximity to National Parks and other areas where visitors seek solitude and the beauty of the night sky. Artificial light is ‘practically nonexistent’ in Bryce Canyon National Park such that the beauty of the night sky appears to be amplified (BCNP 1987).

3.1.2 Unassigned SIO

The other change to leasing options as pertains to visual resources was made to “Unassigned” SIO areas. Unassigned SIO are areas in which a visual analysis (to determine the SIO) is required prior to development. All areas with Unassigned SIO in the DEIS were given a CSU leasing option in the FEIS.

The following changes were made to Specialist Report 1.0 to reflect the new leasing options for SIO Unassigned areas:

Page 20 (Section 1.5.4.1)

- Replace 2nd paragraph in “Controlled Surface Use” section with:

CSU applies to High SIO areas under Alternative D, unassigned SIO areas under

Alternatives B, C, and D, and to Moderate SIO areas under Alternatives B and C. CSU would require the use of the Bureau of Land Management's (BLM)-established Best Management Practices (BMPs) and Dixie NF requirements as listed in Appendix C in the location and design of oil and gas exploration sites, and prior approval by the Dixie National Forest of proposed designs to reduce visual effects of exploration and production. Refer to Appendix D for descriptions of each CSU.

Page 21 (Section 1.5.4.1)

- Replace last 3 sentences in “Lease Notice” section with:

LN does not apply directly to visual resources.

3.1.3 GIS Model output

The output of the new GIS model as pertains to visual resources is shown in the revised **Table 1.5-3**.

Table 1.5-3 Acreage of Resource Components under each Leasing Stipulation by Alternative

Resource Component	Leasing Option ³	Alternative ^{1,2}						
		A	B	C	D1	D2	E1	E2
Very High (Wilderness and RNA's)	NA	85,707	85,707	85,707	85,707	85,707	85,707	85,707
	NL	4,213	4,195	4,088				
	NSO		19	126	4,213	4,213	3,217	
	CSU							
	SLT						997	4,213
High	NA	1,548	1,548	1,548	1,548	1,548	1,548	1,548
	NL	400,567	297,588	35,132				
	NSO		102,979	365,435	171,335	67,769	128,426	
	CSU				229,232	332,798		
	SLT						272,141	400,567
Moderate	NA	2,829	2,829	2,829	2,829	2,829	2,829	2,829
	NL	536,313	369,250	10,317				
	NSO		116,844	378,330	179,484	40,447	142,064	
	CSU		50,220	147,666	350,980	490,017		
	SLT				5,849	5,849	394,249	536,313
Low	NA	130	130	130	130	130	130	130
	NL	293,050	239,900	9,562				
	NSO		43,821	239,350	173,603	23,622	159,384	
	CSU		9,284	44,093	119,403	269,383		
	SLT						133,621	293,050
Unassigned	NA	154	154	154	154	154	154	154
	NL	305,153	223,580	3,429				
	NSO		68,228	262,418	137,775	6,069	132,814	
	CSU		13,346	39,306	167,378	299,084		
	SLT						172,339	305,153
NPS Park Protective Measure	NA							
	NL	1,285	1,285					
	NSO			1,926				

Resource Component	Leasing Option ³	Alternative ^{1,2}						
		A	B	C	D1	D2	E1	E2
	CSU				1,926	1,926		
	SLT						1,926	1,926

¹ Small discrepancies in the acreage presented for each alternative are due to the fact that the GIS database has limitations when applied over an extremely large area that result in an inability to calculate acreages that match exactly between alternatives. A more detailed table that separates the acreage by resource component and ranger district will be available in Appendix B.

² Alternatives D1, D2, E1, and E2 represent the dual analysis of Alternative D and E. D1 and E1 represent the acres available with NSO in all IRAs. D2 and E2 represent the acres with leasing allowed in IRAs under a less restrictive leasing option.

³ Areas not legally available (NA) for leasing (see Section 1.5.2) are included in the Table to provide context to the analysis.

3.2 Errata

Errata specific to Specialist Report 1.0 expand on or correct data previously presented, or incorporate new information or decisions since the DEIS. Some changes, clarification and updates to resource-specific data and analysis were made as a result of the comments received on the DEIS. The errata below update the original Specialist Report.

Page 5

- Replace Table 1.4-1 with the following:

Table 1.4-1 Acres of SIO Categories on the Dixie National Forest

Ranger District	SIO Very High	SIO High	SIO Moderate	SIO Low	SIO Unassigned	TOTAL ¹
	VQO Preservation	VQO Retention	VQO Partial Retention	VQO Modification		
Pine Valley	Pine Valley Wilderness: 49,994	54,003	160,747	60,179	135,815	462,712
	Other: 1,974					
	Total: 51,969					
Cedar City	Ashdown Gorge Wilderness: 6,932	Brian Head 1,457	99,165	Brian Head: 74	99,091	352,423
	Other: 264	Other: 109,069		Other: 36,370		
	Total: 7,195	Total: 110,527		Total 36,444		
Powell	Red Canyon Natural Area: 531	88,725	138,701	130,341	25,480	383,778
Escalante	Box-Death Hollow Wilderness: 25,557	148,860	140,529	66,171	45,921	430,706
	Antone Bench & Areas 2, 3, 4 & 5: 3,224					
	Other: 1,444					
	Total: 30,226					
Total Acres Per SIO Percent of Forest	89,921 6 %	402,115 25 %	539,142 33%	293,135 18 %	305,307 19%	1,629,619

lands						
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¹Totals may not add up exactly due to rounding

Page 23 (Section 1.5.4.3)

- Replace 4th and 5th sentences in 2nd paragraph with:

Under Alternatives D1 and E1, all acres within IRAs are NSO, whereas under D2 and E2, acres within IRAs are under a less restrictive leasing option (CSU or SLT, respectively).

- Replace last 3 sentences in 2nd paragraph with:

Low and Moderate SIO areas are mostly covered by equal or more restrictive leasing options, as a result of overlapping leasing options assigned to other resources.

Page 24 (Section 1.5.4.3)

- Replace last sentence in “Alternative A” section with:

This alternative would be consistent with the 2000 Scenery Management System Amendment to the Land and Resource Management Plan (*Measurement Indicator #4*).

Page 27 (Section 1.5.4.3)

- In last sentence of last paragraph of “Alternative D with NSO in Inventoried Roadless Areas,” replace “This alternative would likely..” with “This alternative may..”

Page 27 (Section 1.5.4.3)

- Replace beginning of first sentence, last paragraph in “Alternative D with CSU in Roadless Areas” with

This alternative provides for CSU in IRAs. CSU in High SIO areas may not meet objectives

Page 28 (Section 1.5.5.1)

- Replace Table 1.5-4 with the following:

Table 1.5-4 Division of land status within the CEA for visual resources

Land Management	Acres	Percent of Total CEA
Bureau of Land Management (BLM)	83,444	4
National Park Service	41,973	2
Private	109,777	6
State Lands	54,089	3

Forest Service	1,661,365	81
Forest Service Wilderness Areas ¹	85,323	4
Water	1,912	<1
Total	2,037,882	100

Page 33 (Section 1.5.5.2)

- Remove last sentence of 4th paragraph in “Development and Population Growth”

Page 29 (Section 1.5.5.2)

- Remove 2nd sentence of 2nd paragraph in “Recreation and Maintenance”

Page 36

- Add the following new references:

US Department of the Interior. National Park Service. 1987. Bryce Canyon National Park general management plan.

Luginbuhl, C. B., G. W. Lockwood, D. R. Davis, K. Pick, and J. Selders. 2009a. From the ground up I: light pollution sources in Flagstaff, Arizona. Publications of the Astronomical Society of the Pacific 121:185-203.

Luginbuhl, C. B., D. M. Duriscoe, C. W. Moore, A. Richman, G. W. Lockwood, and D. R. Davis. 2009b. From the ground up II: sky glow and near-ground artificial light propagation in Flagstaff, Arizona. Publications of the Astronomical Society of the Pacific 121:204-212.