



FINAL
Oil and Gas Management Plan
Environmental Impact Statement
Big Thicket National Preserve

TEXAS

December 2005



In 1916, Congress created the NATIONAL PARK SERVICE in the Department of the Interior to

...promote and regulate the use of the Federal areas known as national parks, monuments, and reservations...by such means and measures as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. (NPS Organic Act, 16 USC 1)

Final
OIL AND GAS MANAGEMENT PLAN
ENVIRONMENTAL IMPACT STATEMENT
December 2005

BIG THICKET
National Preserve
Hardin, Jefferson, Orange, Liberty, Tyler, Jasper and Polk Counties
Texas

Prepared by
United States Department of the Interior • National Park Service



United States Department of the Interior

NATIONAL PARK SERVICE

Big Thicket National Preserve

3785 Milam

Beaumont, Texas 77701

(409) 839-2689

FAX 839-2599

IN REPLY REFER TO:

D18 (BITH)

X(L3025)

Dear Reader:

Enclosed is the Final Oil and Gas Management Plan (Final Plan) and Environmental Impact Statement (EIS) for Big Thicket National Preserve, Texas. This document describes and analyzes the impacts of three alternatives, including the No-Action alternative, for managing existing and anticipated oil and gas operations associated with the exercise of nonfederal interests underlying Big Thicket National Preserve.

The Draft O&GMP/EIS was released in December 2004. The National Park Service received 71 comment letters on the Draft Plan/EIS, containing 199 substantive comments on the adequacy of the Draft Plan/EIS and the merits of the alternatives presented. The Final Plan/EIS includes responses to the substantive comments received on the Draft Plan/EIS (Chapter 5). This document contains the Preferred Alternative (Alternative B), which is a slightly modified version of the Preferred Alternative published in the Draft Plan/EIS.

The Final Plan/EIS will have a 30-day "no action" period as required by the National Environmental Policy Act regulations, which will begin when the U.S. Environmental Protection Agency Notice of Availability is published in the *Federal Register*. Following the 30-day "no action" period, a Record of Decision will be published.

All questions or inquiries should be directed to:

Linda Dansby, EIS Project Manager
Office of Minerals/Oil and Gas Support
Intermountain Region
National Park Service
P.O. Box 728
Santa Fe, New Mexico 87504-0728

Sincerely,

Art Hutchinson
Superintendent

Department of the Interior • National Park Service

**Final
Oil and Gas Management Plan
Environmental Impact Statement
for
Big Thicket National Preserve
Hardin, Jefferson, Orange, Liberty, Tyler, Jasper, and Polk Counties
Texas**

Abstract: This Final Oil and Gas Management Plan and Environmental Impact Statement (Final Plan/EIS) describes and analyzes three alternatives for managing existing and anticipated oil and gas operations associated with the exercise of nonfederal oil and gas interests underlying the Preserve, and existing transpork oil and gas pipelines and activities in their associated rights-of-way:

- Alternative A (No-Action/Current Management)
- Alternative B (Preferred Alternative)
- Alternative C (Environmentally-Preferable Alternative)

Lead Agency: National Park Service

Type of Action: (X) Administrative () Legislative

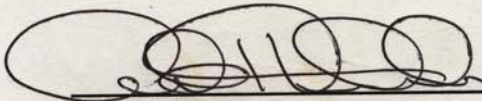
For Further Information Contact:

Linda Dansby, EIS Project Manager
Office of Minerals/Oil and Gas Support
Intermountain Region
National Park Service
P.O. Box 728
Santa Fe, New Mexico 87504-0728
Telephone: 505-988-6095

The 30-day No-Action period will begin when the U.S. Environmental Protection Agency Notice of Availability is published in the *Federal Register*.

Recommended:

Approved:


Art Hutchinson
Superintendent
Big Thicket National Preserve
Date 8/11/05

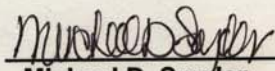

Michael D. Snyder
Director
Intermountain Region
Date 8/11/05

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

SUMMARY

PURPOSE AND NEED FOR THIS PLAN	S-1
PLANNING DIRECTION	S-2
PLAN ALTERNATIVES	S-4
Reasonably Foreseeable Development Scenarios	S-4
Summary of Plan Alternatives.....	S-5
ENVIRONMENTAL CONSEQUENCES	S-7
THE NEXT STEP	S-7

CHAPTER 1 INTRODUCTION

PURPOSE AND NEED FOR THIS PLAN	1-1
SPECIAL MANDATES AND DIRECTION	1-2
NPS Organic Act and General Authorities Act	1-2
Big Thicket National Preserve Enabling Act.....	1-4
General Management Plan Direction.....	1-5
NPS Nonfederal Oil and Gas Rights Regulations, 36 CFR 9B	1-7
Directional Drilling.....	1-8
Regulation of Transpark Oil and Gas Pipelines and Activities in Associated Rights-of-Way	1-9
Applicable Legal and Policy Requirements.....	1-10
THE PLANNING PROCESS	1-13
Establishing a Planning Team	1-13
Developing Planning Objectives	1-16
Scoping with the Public and Governmental Agencies.....	1-16
Identifying Resources and Concerns, and Collecting Data.....	1-17
Resources and Concerns to be Addressed in the Plan	1-18
Resources and Concerns Evaluated and Dropped from Detailed Analysis	1-21
Local and Regional Economies	1-22
Park Operations for Fire and Facility Management	1-23
Possible Conflicts between the Proposed Action and Land Use Plans, Policies, or Controls.....	1-24
Sustainability and Long-term Management, and Energy Requirements and Conservation Potential	1-24
Environmental Justice	1-24
Prime and Unique Farmlands.....	1-24
Generating and Evaluating Alternatives	1-24

CHAPTER 2

PART 1, PLAN ALTERNATIVES

INTRODUCTION	2-1
FUTURE MODIFICATIONS TO THE OIL AND GAS MANAGEMENT PLAN	2-3
APPLICABILITY OF THIS PLAN IF THE BOUNDARIES OF THE PRESERVE ARE MODIFIED, PARK FACILITIES ARE CONSTRUCTED, OR AREAS CHANGE IN RESPONSE TO DYNAMIC ENVIRONMENTAL PROCESSES	2-3
APPLICABILITY OF THIS PLAN TO CURRENT NONFEDERAL OIL AND GAS OPERATIONS.....	2-3
EXEMPTIONS FROM THIS PLAN	2-3
TYPES OF OIL AND GAS OPERATIONS	2-4
Geophysical Exploration	2-4
Drilling and Production Operations	2-5
REASONABLY FORESEEABLE DEVELOPMENT SCENARIO	2-5
SPECIAL MANAGEMENT AREAS.....	2-9
DESCRIPTION OF THE ALTERNATIVES	2-11
Alternative A, No-Action/Current Management	2-12
Alternative B, Preferred Alternative.....	2-13
Alternative C, Maximum Resource Protection	2-14
ENVIRONMENTALLY PREFERRED ALTERNATIVE.....	2-15
ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS	2-16
Nonfederal Oil and Gas Exploration, Drilling and Production Would not be Allowed in Big Thicket National Preserve	2-16
Nonfederal Oil and Gas Drilling and Production Operations Would not be Allowed in Big Thicket National Preserve.....	2-17
Amending NPS Nonfederal Oil and Gas Regulations – 36 CFR Part 9B.....	2-17
Oil and Gas Operations would be Subject only to State Regulation	2-17
Purchase the Nonfederal Mineral Rights in the Preserve	2-17

CHAPTER 2

PART II, CURRENT LEGAL AND POLICY REQUIREMENTS

NONFEDERAL OIL AND GAS RIGHTS REGULATIONS	2-63
Overview of 36 CFR 9B Plan of Operations Process.....	2-64
Overview of 36 CFR 9.32(e) Application Process.....	2-67
Applicability of NEPA	2-68
Collection of Resource Information by Prospective Operators.....	2-68
Access to Surface Location Outside Park Boundaries	2-69
Monitoring	2-69
Applicability of the 9B Regulations to Transpark Pipelines	2-69
NPS MANAGEMENT POLICIES, LEGAL REQUIREMENTS, AND PERFORMANCE STANDARDS.....	2-73
Air Quality	2-73
Soils	2-73
Water Resources	2-74
Floodplains	2-74

Vegetation.....	2-75
Wetlands	2-75
Fish and Wildlife	2-76
Species of Special Concern.....	2-76
Cultural Resources	2-77
Archeological Surveys.....	2-79
Unanticipated Discovery	2-79
Damage to Previously Identified Sites.....	2-80
Visitor Use and Experience.....	2-80
Lightscape Management.....	2-80
Soundscape Management	2-81
Human Health and Safety.....	2-81
High Pressure Precautions	2-82
Open Flow/Control of Wild Wells	2-82
Control of Contaminating and Hazardous Substances	2-82
Hurricane Preparedness.....	2-84
Integrated Pest Management.....	2-84
Protection of Park Development and Survey Monuments	2-85

CHAPTER 2

PART III, MITIGATION MEASURES

PART III, OPERATING STIPULATIONS AND MITIGATION MEASURES FOR NONFEDERAL OIL AND GAS OPERATIONS.....	2-87
--	------

CHAPTER 3

AFFECTED ENVIRONMENT

INTRODUCTION	3-1
DESCRIPTION OF THE STUDY AREA	3-1
NONFEDERAL OIL AND GAS DEVELOPMENT	3-3
History of Oil and Gas Development in the Region.....	3-3
Nonfederal Oil and Gas Development within the Preserve.....	3-4
Active Oil and Gas Operations	3-4
Plugged and Abandoned Oil and Gas Wells	3-8
Historic Saltwater Disposal Area	3-10
Geophysical Exploration	3-10
Existing Transpark Oil and Gas Pipelines and Associated Rights-of-Way	3-11
Administration of Nonfederal Oil and Gas Program	3-15
AIR QUALITY	3-15
GEOLOGIC RESOURCES.....	3-17
Overview	3-17
Subsurface Geology	3-17
Soils.....	3-20
Soil Erodibility	3-20
Soil Compaction.....	3-20
Shrink-Swell Potential	3-21

Flooding Frequency	3-21
Recharge Potential and Water Conditions	3-21
Distinctive Landforms	3-22
Sand Mounds	3-22
WATER RESOURCES	3-23
Climate	3-23
Major Drainages	3-24
Minor Hydraulic Features	3-24
Flow: Quantity, Timing, Floodplains, Diversions	3-25
Water Quality	3-26
Monitoring Programs/Studies	3-26
General Water Quality/Hydrochemical Regime	3-26
Regulatory Framework	3-26
NPS Stream Categories	3-27
State Designated Stream Segments and Uses	3-27
Anti-Degradation Policy	3-27
Groundwater	3-28
Wells	3-29
Groundwater Quality	3-29
Individual Watersheds	3-30
The Neches River	3-30
Big Sandy/Village Creek Watershed	3-31
Pine Island Bayou Watershed	3-33
Menard Creek Watershed	3-35
FLOODPLAINS	3-36
Riparian Corridors	3-37
VEGETATION	3-39
Upland Vegetation Community	3-40
Slope Vegetation Community	3-43
Floodplain Vegetation Community	3-44
Ecological Research and Monitoring Areas	3-45
Fire Monitoring Plots	3-45
Long-Term Monitoring Plots	3-46
The Royal Fern Bog Research Plot	3-46
WETLANDS	3-46
FISH AND WILDLIFE	3-49
Introduction	3-49
Mammals	3-50
Birds	3-50
Reptiles and Amphibians	3-50
Fish	3-50
Invertebrates	3-50
Habitat Fragmentation	3-51
Population Isolation	3-51
Edge Habitat	3-51
SPECIES OF SPECIAL CONCERN	3-51
Overview of Species	3-51
Birds	3-53
Fish	3-54

Mammals	3-55
Plants.....	3-55
Reptiles.....	3-56
CULTURAL RESOURCES.....	3-57
Archeological Resources	3-57
Historic Structures	3-58
Ethnographic Resources	3-58
American Indian Tribes	3-59
Non-Indian Associated Groups	3-60
Park User/Affinity Groups.....	3-60
Cultural Landscapes	3-60
Association with Native Americans	3-61
Association with Euroamericans	3-61
Association with Transportation Avenues: Waterways and Railroads.....	3-61
Association with 19 th and 20 th Century Timber Industry	3-61
Association with 20 th Century Petroleum Industry	3-62
Association with Big Thicket National Preserve	3-62
VISITOR USE AND EXPERIENCE	3-62
Visitor Use Areas	3-63
Day Use Areas.....	3-63
Hiking Trails	3-63
Canoe Routes	3-65
Birding Hot Spots	3-65
Roads	3-66
Hunting and Trapping.....	3-66
Park Administrative Areas.....	3-67
Other Use Areas	3-68
Cemeteries.....	3-68
Inholdings.....	3-68
Visitor Use Statistics	3-68
Seasonal Visitor Use Patterns	3-69
Visual Quality, including Night Sky, as a Component of Visitor Experience	3-69
Natural Quiet as a Component of Visitor Experience.....	3-70
Visitor Perception of Oil and Gas Operations	3-72
Human Health and Safety.....	3-72
Wild Character – Solitude	3-72
ADJACENT LAND USES AND RESOURCES	3-73

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

INTRODUCTION	4-1
Impact Intensity Thresholds	4-1
Organization of Impact Discussions.....	4-2
Directional Drilling from Outside the Preserve	4-3
IMPACTS ON NONFEDERAL OIL AND GAS DEVELOPMENT	4-4
Introduction	4-4
Methodology for Assessing Impacts	4-4

Impacts on Nonfederal Oil and Gas Development under Alternative A (No Action/Current Management)	4-5
Impacts on Nonfederal Oil and Gas Development under Alternative B (Preferred Alternative).....	4-8
Impacts on Nonfederal Oil and Gas Development under Alternative C	4-10
IMPACTS ON AIR QUALITY	4-11
Introduction	4-11
Methodology for Assessing Impacts	4-12
Impacts on Air Quality under Alternative A (No Action/Current Management)	4-13
Impacts on Air Quality under Alternative B (Preferred Alternative)	4-17
Impacts on Air Quality under Alternative C	4-19
IMPACTS ON GEOLOGIC RESOURCES	4-21
Introduction	4-21
Methodology for Assessing Impacts	4-21
Impacts on Geologic Resources under Alternative A (No Action/Current Management)	4-22
Impacts on Geologic Resources Under Alternative B (Preferred Alternative).....	4-28
Impacts on Geologic Resources under Alternative C	4-31
IMPACTS ON WATER RESOURCES.....	4-34
Introduction	4-34
Methodology for Assessing Impacts	4-34
Impacts on Water Resources under Alternative A (No Action/Current Management)	4-35
Impacts on Water Resources under Alternative B (Preferred Alternative)	4-42
Impacts on Water Resources under Alternative C	4-46
IMPACTS ON FLOODPLAINS	4-49
Introduction	4-49
Methodology for Assessing Impacts	4-49
Impacts on Floodplains under Alternative A (No Action/Current Management)	4-50
Impacts on Floodplains under Alternative B (Preferred Alternative)	4-55
Impacts on Floodplains under Alternative C	4-58
IMPACTS ON VEGETATION	4-61
Introduction	4-61
Methodology for Assessing Impacts	4-61
Impacts on Vegetation under Alternative A (No Action/Current Management)	4-61
Impacts on Vegetation under Alternative B (Preferred Alternative).....	4-67
Impacts on Vegetation under Alternative C	4-69
IMPACTS ON WETLANDS	4-72
Introduction	4-72
Methodology for Assessing Impacts	4-72
Impacts on Wetlands under Alternative A (No Action/Current Management)	4-73
Impacts on Wetlands under Alternative B (Preferred Alternative).....	4-80
Impacts on Wetlands under Alternative C.....	4-83

IMPACTS ON FISH AND WILDLIFE	4-86
Introduction	4-86
Methodology for Assessing Impacts	4-86
Impacts on Fish and Wildlife under Alternative A (No Action/Current Management)	4-87
Impacts on Fish and Wildlife under Alternative B (Preferred Alternative)	4-95
Impacts on Fish and Wildlife under Alternative C	4-97
IMPACTS ON SPECIES OF SPECIAL CONCERN.....	4-99
Introduction	4-99
Methodology for Assessing Impacts	4-100
Impacts on Species of Special Concern under Alternative A (No Action/Current Management)	4-101
Impacts on Species of Special Concern under Alternative B (Preferred Alternative).....	4-109
Impacts on Species of Special Concern under Alternative C	4-112
IMPACTS ON CULTURAL RESOURCES.....	4-115
Introduction	4-115
Methodology for Assessing Impacts	4-116
Impacts on Cultural Resources under Alternative A (No Action/Current Management)	4-117
Impacts on Cultural Resources under Alternative B (Preferred Alternative)	4-121
Impacts on Cultural Resources under Alternative C	4-123
IMPACTS ON VISITOR USE AND EXPERIENCE	4-126
Introduction	4-126
Methodology for Assessing Impacts.....	4-127
Impacts on Visitor Use and Experience under Alternative A (No Action/Current Management)	4-127
Impacts on Visitor Use and Experience under Alternative B (Preferred Alternative).....	4-135
Impacts on Visitor Use and Experience under Alternative C	4-138
IMPACTS ON ADJACENT LAND USES AND RESOURCES.....	4-139
Introduction	4-139
Methodology for Assessing Impacts	4-140
Impacts on Adjacent Land Uses and Resources under Alternative A (No Action/Current Management)	1-141
Impacts on Adjacent Land Uses and Resources under Alternative B (Preferred Alternative)	4-145
Impacts on Adjacent Land Uses and Resources Alternative C.....	4-147
COMPARATIVE ANALYSIS OF THE PROPOSED ACTION AND ALTERNATIVES.....	4-149
Impairment.....	4-149
Enhancement of Long-term Relationship between Local Short-term Uses of the Environment and Maintenance And Productivity.....	4-150
Irreversible or Irretrievable Commitments of Resources	4-151
Unavoidable Adverse Impacts that Cannot be Avoided Should the Action be Implemented	4-151

CHAPTER 5 CONSULTATION AND COORDINATION

INTRODUCTION	5-1
Scoping Analysis	5-1
LIST OF DOCUMENT RECIPIENTS	5-5
Federal Government	5-5
Tribal Government	5-6
State Government	5-6
Regional, County and City Government Agencies and Commissions	5-7
Oil and Gas Industry	5-8
Organizations and Business	5-9
Universities and Colleges	5-10
Newspapers and Magazines	5-10
Radio and Television	5-11
COMMENTS AND RESPONSES	5-12

CHAPTER 6 PREPARERS AND CONSULTANTS

PREPARERES	6-1
CONSULTANTS	6-5

APPENDICES

A	Enabling Legislation for Big Thicket
B	National Park Service Nonfederal Oil and Gas Rights Regulations 36 CFR 9B
C	Federal Laws, Regulations, Executive Orders, Policies and Guidelines that Apply to Nonfederal Oil and Gas Operations
D	Types of Oil and Gas Operations
E	Remaining Oil and Gas Resources Beneath Big Thicket National Preserve Assessment Methodology
F	Guideline for the Detection and Quantification of Contamination At Oil and Gas Operations
G	U.S. Fish and Wildlife Service County-By-County Listing Threatened and Endangered Species and Species of Concern
H	Texas Parks and Wildlife Department Special Species List
I	National Park Service Well Plugging Guide for Nonfederal Oil and Gas Wells in the State of Texas

BIBLIOGRAPHY

GLOSSARY

INDEX

LIST OF FIGURES

Figure S.1.	Region/Vicinity Map for Big Thicket National Preserve	S-3
Figure 2.1.	Map of Protected Areas Preservewide under Alternative A, for Geophysical Exploration	2-28
Figure 2.2.	Map of Protected Areas Preservewide under Alternative A, for Drilling and Production.....	2-29
Figure 2.3.	Map of Special Management Areas under Alternative B, for Geophysical Exploration	2-30
Figure 2.4.	Map of Special Management Areas under Alternative B, for Drilling and Production.....	2-31
Figure 2.5.	Map of Special Management Areas under Alternative C, for Geophysical Exploration	2-32
Figure 2.6.	Map of Special Management Areas under Alternative C, for Drilling and Production.....	2-33
Figure 2.7.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Beaumont Unit.....	2-35
Figure 2.8.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Beech Creek Unit	2-37
Figure 2.9.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Big Sandy Creek Unit.....	2-39
Figure 2.10.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Hickory Creek Savannah Unit	2-41
Figure 2.11.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Lance Rosier Unit.....	2-43
Figure 2.12.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Lower Neches River Corridor Unit.....	2-45
Figure 2.13.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Menard Creek Corridor Unit	2-47
Figure 2.14.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Neches Bottom/Jack Gore Baygall Unit	2-49
Figure 2.15.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Pine Island-Little Pine Island Bayou Corridor Unit.....	2-51

Figure 2.16.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Turkey Creek Unit	2-53
Figure 2.17.	Map of Protected Areas under Alternative A and Special Management Areas under Alternatives B and C, in the Upper Neches River Corridor Unit.....	2-55
Figure 3.1.	Nonfederal Oil and Gas Development.....	3-9
Figure 3.2.	Floodplains Map.....	3-38
Figure 3.3.	Map of Potential Natural Vegetation of Big Thicket National Preserve	3-41
Figure 3.4.	Wetlands Map	3-48
Figure 3.5.	Visitor Use, Administrative and Other Uses	3-64
Figure 3.6.	Sound Level Comparison Chart.....	3-71

LIST OF TABLES

Table 1.1.	Legal and Policy Requirements Governing Nonfederal Oil and Gas Operations.....	1-10
Table 1.2.	Special Management Areas	1-17
Table 1.3.	Issue Statements	1-19
Table 2.1.	Projected Surface Disturbance Associated with the Reasonably Foreseeable Development Scenario.....	2-8
Table 2.2.	Basis for Proposed Designation of Special Management Areas in Big Thicket National Preserve under Alternatives B and C	2-10
Table 2.3.	Description of the Extent that Each Alternative Meets the Planning Objects Presented in this Plan/EIS	2-19
Table 2.4.	Summary of Alternatives	2-21
Table 2.5.	Summary of Operating Stipulations for each Alternative.....	2-27
Table 2.6.	Summary of Operating Stipulations, Beaumont Unit.....	2-34
Table 2.7.	Summary of Operating Stipulations, Beech Creek Unit.....	2-36
Table 2.8.	Summary of Operating Stipulations, Big Sandy Creek Unit	2-38
Table 2.9.	Summary of Operating Stipulations, Hickory Creek Savannah Unit.....	2-40
Table 2.10.	Summary of Operating Stipulations, Lance Rosier Unit	2-42
Table 2.11.	Summary of Operating Stipulations, Lower Neches River Corridor Unit	2-44
Table 2.12.	Summary of Operating Stipulations, Menard Creek Corridor Unit.....	2-46
Table 2.13.	Summary of Operating Stipulations, Neches Bottom/Jack Gore Baygall Unit.....	2-48
Table 2.14.	Summary of Operating Stipulations, Pine Island-Little Pine Island Bayou Corridor Unit.....	2-50
Table 2.15.	Summary of Operating Stipulations, Turkey Creek Unit.....	2-52
Table 2.16.	Summary of Operating Stipulations, Upper Neches River Corridor Unit.....	2-54
Table 2.17.	Summary of Impacts	2-56
Table 2.18.	NPS Processing Time for a 36 CFR 9B Plan of Operations.....	2-66
Table 2.19.	Summary of Compliance Requirements for Directional Drilling Proposals from Surface Locations Outside Parks.....	2-71
Table 2.20.	Operating Stipulations and Mitigation Measures for Nonfederal Oil and Gas Geophysical Exploration Operations	2-88

Table 2.21.	Operating Stipulations and Mitigation Measures for Nonfederal Oil and Gas Drilling and Production Operations	2-94
Table 2.22.	Operating Stipulations and Mitigation Measures for Nonfederal Oil and Gas Well Plugging, Abandonment, and Site Reclamation	2-105
Table 3.1.	Big Thicket National Preserve, Unit Acreages	3-2
Table 3.2.	Nonfederal Oil and Gas Operations	3-4
Table 3.3.	Two-Dimensional and Three-Dimensional Seismic Surveys.....	3-11
Table 3.4.	Existing Transpark Oil and Gas Pipelines within Big Thicket National Preserve	3-12
Table 3.5.	Acreage and Proportion of Slope Classics by Preserve Unit	3-17
Table 3.6.	Generalized Stratigraphic Formations in the Vicinity of the Big Thicket National Preserve	3-19
Table 3.7.	Characteristics of the Soil Classics Described in this Plan/DEIS	3-22
Table 3.8.	Potential Natural Vegetation of Big Thicket National Preserve	3-40
Table 3.9.	Cowardin Classification System Wetlands in the Big Thicket National Preserve	3-47
Table 3.10.	State and Federally Listed Candidate, Threatened and Endangered Species Believed to Occur in Big Thicket National Preserve	3-52
Table 3.11.	Annual Visitation at Big Thicket National Preserve	3-68
Table 3.12.	Ambient L90 Sound Levels at Various Locations within Big Thicket National Preserve	3-70
Table 5.1.	Scoping Analysis, Big Thicket National Preserve Oil and Gas Management Plan/Environment Impact Statement.....	5-2

THIS PAGE INTENTIONALLY LEFT BLANK

ACRONYMS AND ABBREVIATIONS

2-D	2-dimensional seismic survey
3-D	3-dimensional seismic survey
9B Regulations	NPS's Nonfederal Oil and Gas Rights Regulations (36 CFR 9B)
ACHP	Advisory Council on Historic Preservation
ARPA	Archeological Resources Protection Act
ASMIS	NPS Archeological Sites Management Information System
bbl	barrel (of petroleum product)
bcf	billion cubic feet (of gas)
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CLI	Cultural Landscape Inventory
CLPR	Current Legal and Policy Requirements
CO	carbon monoxide
COAs	Conditions of Approval
COE	U.S. Army Corps of Engineers
CZMP	Coastal Zone Management Program
CWA	Clean Water Act
dBA	decibels (signifies A-weighting network has been used)
DM	Departmental Manual
DO	dissolved oxygen
DO-12	Director's Order 12, NPS National Environmental Policy Act Guidelines
DO-28	Director's Order 28, NPS Cultural Resources Management Guidelines
DO-77-1	Director's Order 77-1, Protection of Wetlands
DO-77-2	Director's Order 77-2, Floodplain Management
DOT	Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EO	Executive Order
ESA	Endangered Species Act of 1973
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRM	Flood Insurance Rate Maps
FONSI	Finding of No Significant Impact
FR	<i>Federal Register</i>
FWS	U.S. Fish and Wildlife Service
GLO	Texas General Land Office
GMP	General Management Plan
GPS	Global Positioning System
H ₂ S	hydrogen sulfide
IDT	Interdisciplinary Team
km	kilometer
L ₉₀	Measure of background sound level exceeded 90 percent of the time
m ³	cubic meter
M	thousand
MMGD	Millions of Gallons per Day
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MMB	million barrels
NAAQS	National Ambient Air Quality Standards

NAD	North American Datum
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act of 1969
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act of 1966
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent [to Prepare an Environmental Impact Statement]
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NPS-66	NPS Minerals Management Guidelines
NPS-77	NPS Natural Resources Management Guidelines
NRHP	National Register of Historic Places
NSU	No Surface Use
NWI	National Wetlands Inventory
PA	NPS Servicewide Programmatic Agreement Between NPS, SHPO, and ACHP
ONRW	Outstanding Natural Resource Waters
OPA	Oil Pollution Act
pers. comm.	personal communication
pH	Potential of Hydrogen (measure of acidity)
P.L.	Public Law
PM	Particulate Matter
PNV	Potential Natural Vegetation
ppt	parts per trillion
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
RRC	Railroad Commission of Texas
RFD	Reasonably Foreseeable Development
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-Way
RV	recreational vehicle
SFM	Statement for Management
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan (Clean Air Act)
SMA	Special Management Area
SO ₂	sulfur dioxide
SOF	Statement of Findings
SPCC	Spill Prevention, Control, and Countermeasure Plan
SSWCB	State Soil and Water Conservation Board
TDS	total dissolved solids
T&E	Threatened and Endangered (plants, animals and invertebrates)
TCEQ	Texas Commission on Environmental Quality (formerly TNRCC –Texas Natural Resource Conservation Commission)
TPWD	Texas Parks and Wildlife Department
TWC	Texas Water Commission
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USMAB	U.S. Man and the Biosphere Program
USCG	U.S. Coast Guard
U.S.C.	U.S. Codes
USGS	U.S. Geological Survey
VOCs	volatile organic compounds
§	section symbol

SUMMARY



SUMMARY

PURPOSE AND NEED FOR THIS PLAN

When the Preserve was created, the U.S. Government acquired surface ownership within the area, but either private entities or the State of Texas retained subsurface mineral interests. Thus, the federal government does not own any of the subsurface oil and gas rights in the Preserve. Also, the U.S. Government did not acquire any of the transpark oil and gas pipeline encumbrances. While no statutory authority exists for granting new rights-of-way for oil and gas pipelines, pipelines may be constructed within existing rights-of-way in conformance with the terms of the legal document creating the rights-of-way.

The National Park Service (NPS) evaluates project-specific proposals for oil and gas production and transportation on a case-by-case basis by applying a variety of Current Legal and Policy Requirements prior to issuing a permit under the NPS's Nonfederal Oil and Gas Rights Regulations at 36 CFR Part 9, Subpart B, or Special Use Permits under 36 CFR Parts 1-5. Many Current Legal and Policy Requirements involve other state and federal agencies who either are responsible for issuing specific resource-protection permits, or are agencies with whom the NPS consults to seek technical reviews and recommendations. It is important to keep in mind that NPS-specific regulations only apply to nonfederal oil and gas operations occurring within park boundaries. When the NPS is concerned about the spillover effects of operations outside park boundaries on park resources and values, the NPS works cooperatively with others (e.g., state and local governmental entities, other federal agencies, operators and landowners) to get park protection concerns addressed up front. In the event that activities outside park boundaries cause damage to park resources or values, the NPS can seek damages through special authority set forth at 16 U.S.C. § 19jj. The best practice, however, is to convince others to put measures in place to avoid such damages in the first place.

At this time, while the NPS has comprehensive regulations governing nonfederal oil and gas development in parks, the Service does not have a comprehensive plan guiding oil and gas activities within the Preserve. Operators are often uncertain of the impact mitigation stipulations that apply in different areas of the Preserve to protect Preserve resources and values, visitor use and experience, and human health and safety. Unique areas of the Preserve having special resource values are vulnerable to impacts from a wide range of oil and gas activities. Existing and future oil and gas operations in the Preserve have the potential to impact Preserve resources and values.

The purpose of this Oil and Gas Management Plan (Plan) for the Preserve is to clearly define a direction for long-term management of existing and anticipated oil and gas operations associated with the exercise of nonfederal oil and gas interests underlying the Preserve, and existing transpark oil and gas pipelines and activities in their associated rights-of-way, while protecting Preserve resources, visitor use and experience, and human health and safety, and preventing impairment to Preserve resources and values. When approved, this Oil and Gas Management Plan/EIS will be the first comprehensive plan ever prepared for the Preserve to manage activities associated with the exploration and development of nonfederal oil and gas within the Preserve. It is the intent of this planning effort to provide comprehensive, consistent direction for the Preserve for the next 15 to 20 years, and possibly longer, if there are no major changes in technology, and impacts do not significantly change from those described; and to arrive at that direction through public participation. This is a programmatic management plan that establishes a general framework for managing oil and gas operations. By itself, it does not authorize any on-the-ground activities. The NPS will authorize specific projects by reviewing and approving operator-submitted plans of operations or special use permit applications. Before doing so, the NPS will conduct further analysis in accordance with the

National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act of 1966 (NHPA), the Endangered Species Act of 1973 (ESA), and other applicable federal laws.

Figure S.1 is a Region/Vicinity Map. The Preserve contains 15 separate units, comprising 98,735 acres. However, this Plan/EIS addresses only 12 units comprising 88,132 acres because the Federal Government has not acquired the 10,600 acres in the remaining 3 units that were added to the Preserve in 1993. Until the Federal Government acquires the remaining lands, they lie outside the scope of the NPS's Nonfederal Oil and Gas Rights Regulations (36 CFR 9B).

The NPS Nonfederal Oil and Gas Rights regulations (36 CFR Part 9, Subpart B), hinge on an operator needing access on or across federally-owned or controlled lands or waters in the Preserve. When an operator can reach his/her private oil and gas right in a park without such access, the regulations do not apply.

Transpark oil and gas pipelines have their point of origin and end point outside parks, and, for the most part are not supporting nonfederal oil and gas operations in parks. As a result, they are not subject to the NPS's 9B regulations. However, if a nonfederal oil and gas operation in the Preserve connects to such a pipeline via a flowline or gathering line, then that portion of the flowline or gathering line crossing the Preserve would be subject to the 36 CFR 9B regulations.

While most transpark oil and gas pipelines are not subject to the 36 CFR 9B regulations, they are either subject to federal Department of Transportation (DOT) regulations at 49 CFR Subtitle B, Ch 1, Parts 190-199, Texas State (Railroad Commission of Texas) requirements, and other applicable federal and state laws. With respect to activities within transpark oil and gas pipeline rights-of-ways, the NPS has existing regulatory authority to control those activities codified at 36 CFR Parts 1-5, which consists of general regulations controlling a variety of activities in parks. To the extent that a proposed activity in a right-of-way triggers the general regulations, a special use permit must be obtained from the NPS before the conduct of the activity. Mowing and trimming vegetation, inspection or testing pipelines, and installing, shutting down or replacing pipelines, are common activities in pipeline rights-of-way requiring a Special Use Permit.

PLANNING DIRECTION

This Plan/EIS has been prepared with guidance provided through special mandates and direction. These include the NPS Organic Act, the Preserve's enabling act, the Service's 36 CFR 9B regulations, the Preserve's General Management Plan, and a variety of existing laws, regulations and policies. These "Current Legal and Policy Requirements" are described in Chapter 1, Chapter 2 (Part II) and Appendix C.

On November 16, 1998, the NPS published a Notice of Intent to Prepare an Oil and Gas Management Plan/Draft Environmental Impact Statement in the *Federal Register*. The publication of this notice, in addition to the mailing of a Public Scoping Newsletter, and a scoping open house held in Beaumont, Texas, on December 3, 1998, invited the general public, as well as federal, state, and local government agencies, to identify issues and submit comments to the NPS regarding the proposed planning effort. In December 2004, the NPS released the Draft Plan/EIS for a 60-day public review and comment period that was subsequently extended 30 days until March 10, 2005. A total of 71 comment letters were received from which the NPS determined there were 199 substantive comments. A description of the consultation and coordination process, and a reprint of the comment letters and NPS responses are included in Chapter 5.

Figure S.1. Region/Vicinity Map for Big Thicket National Preserve

Based on internal and public scoping, the interdisciplinary team developed the following planning objectives and a list of resources and concerns to evaluate in this Plan/EIS.

Planning Objectives:

- Identify Preserve resources and values susceptible to adverse impacts from oil and gas operations.
- Establish performance standards and impact mitigation measures for oil and gas operations to protect and prevent impairment to Preserve resources and values from adverse impacts from oil and gas operations.
- Establish performance standards and impact mitigation measures for oil and gas operations to avoid or minimize impacts from oil and gas operations on visitor use and enjoyment, and human health and safety.
- Provide holders of oil and gas rights reasonable access for exploration and development.
- Provide pertinent information to oil and gas operators to facilitate planning and compliance with NPS and other applicable regulations.

Resources and concerns evaluated in this Plan/EIS include:

- Nonfederal Oil and Gas Development
- Air Quality
- Geologic Resources
- Water Resources
- Floodplains
- Vegetation
- Wetlands
- Fish and Wildlife
- Species of Special Concern
- Cultural Resources
- Visitor Use and Experience
- Adjacent Land Uses and Resources

For each of the resources and concerns listed above, the interdisciplinary team developed issue statements to define problems or benefits that might occur should oil and gas operations continue. Based on the evaluation of these resources and concerns, and public input received during scoping, the planning team also identified Special Management Areas (SMAs) to protect Preserve resources and values that are most susceptible to adverse impacts from oil and gas operations. The issue statements, and particularly the SMAs, were used in developing and evaluating alternatives. The issue statements are in Chapter 1. A description of the affected environment is in Chapter 3.

PLAN ALTERNATIVES

Reasonably Foreseeable Development Scenario

The United States Geological Survey (USGS) and the NPS collaborated during the EIS planning process to estimate the undiscovered hydrocarbon resources in the Preserve and to develop a projection of the type and extent of operations that could occur to develop these resources. The USGS assessment is in Appendix E. Based on the USGS assessment, the NPS prepared a reasonably foreseeable development (RFD) scenario that projects the types of activities and the amount of surface disturbance that could occur to explore for and produce the remaining oil and gas resources underlying the Preserve. The NPS developed the RFD scenario with the assumption that 3-D seismic surveys would be conducted throughout the Preserve.

When preparing the RFD scenario for the Draft Plan/EIS, the NPS used USGS's mean probability (average) of undiscovered oil and gas resources. In the Draft Plan/EIS, it was estimated that over the next 15 to 20 years, up to 29 wells could be drilled which could disturb up to 153 acres within and outside the Preserve. Since the NPS prepared the RFD scenario in 1999, 19 wells have been drilled to explore for and produce the hydrocarbons underlying the Preserve. Even though 29 wells have not been drilled to-date, it is possible that these estimates could be attained in the near future. Conversely, it is possible that drilling may slow down and the RFD scenario in the Draft Plan/EIS may still be valid for the life of the Plan/EIS.

Due to the public comments received on the Draft Plan/EIS and the current increase in drilling activity, the NPS has decided to develop a revised RFD scenario for the Final Plan/EIS. The NPS has decided to use the 25% probability estimate in the revised RFD scenario. It is estimated that over the next 15 to 20 years, up to 40 wells could be drilled which could disturb up to 241 acres within and outside the Preserve. The RFD scenario is further described in Chapter 2, Part I, Plan Alternatives.

Summary of Plan Alternatives

Three alternatives are presented in Chapter 2, Part I. These alternatives were developed to meet the stated objectives of this Plan/EIS to a large degree and provide a reasonable range of options to manage exploration, drilling, production and transportation of nonfederal oil and gas within the Preserve. Alternative A – No Action is required by the National Environmental Policy Act (NEPA) and describes the continued management of oil and gas operations in the Preserve under Current Legal and Policy Requirements (CLPR). Alternatives B and C incorporate the use of Special Management Areas, performance standards, and mitigation measures to protect specific resources and values in the Preserve, consistent with the purposes and values of the Preserve and state and federal resource protection mandates. Alternative B is the NPS's preferred alternative. Alternative C is the environmentally preferred alternative. Table S.1 is a Summary of Operating Stipulations under Each Alternative. Following is a summary of the three plan alternatives.

Under any alternative:

- The level of development theorized in the RFD scenario, summarized above, would be the same under all three alternatives.
- If a drilling operation is not permitted in a Protected/Special Management Area, the operator could directionally drill a well from a surface location outside the area.
- In all areas of the Preserve, Current Legal and Policy Requirements would be applied and could result in the discovery of previously unknown, important cultural resources, species of special concern, and other resource areas in which No Surface Use, timing stipulations, and other mitigation measures could be applied. The term "Current Legal and Policy Requirements," as used in the description of alternatives means application of all pertinent federal and state laws, regulations, policies, and direction governing oil and gas operations conducted in the Preserve. These include NPS regulations at 36 CFR 9B, which require operators to use technology and methods least damaging to Preserve resources (i.e., performance standards and implementation strategies) while ensuring the protection of human health and safety. The CLPR are listed in Table 1.1 and Chapter 2, Part II, and are described in Appendix B – National Park Service Nonfederal Oil and Gas Rights Regulations at 36 CFR Part 9B, and Appendix C – Federal Laws, Regulations, Executive Orders, Policies and Guidelines that Apply to Nonfederal Oil and Gas Operations.
- There are existing and abandoned but unreclaimed operations on approximately 989 acres, some of which are in areas where new operations would not be permitted under Alternatives A, B, and C. Existing operations would continue to operate, but must comply with applicable CLPR, performance standards, operating stipulations, and mitigation measures presented in this Plan/EIS.

Table S.1. Summary of Operating Stipulations under Each Alternative

(Acreage totals exclude overlapping areas for each Protected Area/SMA.)

Big Thicket National Preserve		Total Area: 88,132 Acres	
ALTERNATIVES	PROTECTED AREAS under ALTERNATIVE A	SMAs under ALTERNATIVE B	SMAs under ALTERNATIVE C
Total Area with Operating Stipulations¹	56,538 acres ²	<75,293 acres ³	75,293 acres
GEOPHYSICAL EXPLORATION OPERATIONS – NO SURFACE USE			
Total area	7,462 acres ²	11,512 acres	39,657 acres
Designated Areas	Fire Monitoring Plots with no offset Long-term Monitoring Plots with no offset Royal Fern Bog Research Plot w/no offset Visitor Use, Administrative and Other Use Areas with 500' offset ¹ Waterways with 500' offset ¹	Fire Monitoring Plots with 50' offset Long-term Monitoring Plots with 150' offset Royal Fern Bog Research Plot with 150' offset Visitor Use, Administrative and Other Use Areas with 500' offset ¹ Waterways with 500' offset ¹	Fire Monitoring Plots with 50' offset Long-term Monitoring Plots with 150' offset Royal Fern Bog Research Plot with 150' offset Visitor Use, Administrative and Other Use Areas with 500' offset ¹ Waterways with 500' offset ¹ Riparian Corridors Rare Vegetation Communities Rare Forested Wetland Communities
GEOPHYSICAL EXPLORATION OPERATIONS – TIMING STIPULATIONS			
Total area	52,272 acres ²	52,272 acres	52,272 acres
Designated Areas	Birding Hot Spots with 500' offset ¹ (3/1-5/30 and 9/1-11/30) Hunting Areas (10/1-1/15)	Birding Hot Spots with 500' offset ¹ (3/1-5/30 and 9/1-11/30) Hunting Areas (10/1-1/15)	Birding Hot Spots with 500' offset ¹ (3/1-5/30 and 9/1-11/30) Hunting Areas (10/1-1/15)
DRILLING AND PRODUCTION OPERATIONS – NO SURFACE USE			
Total area	7,493 acres ²	<46,273 ³	46,273 acres
Designated Areas	Fire Monitoring Plots with no offset Long-term Monitoring Plots with no offset Royal Fern Bog Research Plot with no offset Visitor Use, Administrative and Other Use Areas with 500' offset ¹ Birding Hot Spots with 500' offset ¹ Waterways with 500' offset ¹	Fire Monitoring Plots with 150' offset Long-term Monitoring Plots with 150' offset Royal Fern Bog Research Plot with 150' offset Visitor use, Administrative and Other Use Areas with 1500' offset Birding Hot Spots with 1500' offset Waterways with 500' offset ¹ Riparian Corridors ³ Rare Vegetation Communities Rare Forested Wetland Communities	Fire Monitoring Plots with 150' offset Long-term Monitoring Plots with 150' offset Royal Fern Bog Research Plot with 150' offset Visitor Use, Administrative and Other Use Areas with 1500' offset Birding Hot Spots with 1500' offset Waterways with 500' offset ¹ Riparian Corridors Rare Vegetation Communities Rare Forested Wetland Communities

¹Nonfederal oil and gas operations may not be conducted within 500 feet from perennial, intermittent, or ephemeral watercourses, or within 500 feet of any structure or facility (excluding roads) used for unit interpretation, public recreation or for administration of the unit, unless specifically authorized by a plan of operations, as per CLPR at 36 CFR § 9.41(a). The area covered by this operating stipulation from waterways has not been mapped and will be determined on a case-by-case basis during project scoping and the preparation of a Plan of Operations.

²The Protected Areas denoted under Alternative A are not formally designated as SMAs, but the “No Surface Use” and “Timing Stipulations” have been applied on a case-by-case basis.

³The Riparian Corridor SMA under Alternative B would be NSU, except drilling and production could be permitted adjacent to existing roadways and within previously disturbed areas, subject to CLPR (including NPS Floodplain Management Guidelines and 36 CFR § 9.41(a)). No new roads would be permitted. Associated flowlines and gathering lines could be located within previously disturbed areas, with a minimum 500' offset from perennial, intermittent, or ephemeral watercourses.

ENVIRONMENTAL CONSEQUENCES

Table S.2 is a Summary of Impacts. The full impact analysis is in Chapter 4, Environmental Consequences. For all of the alternatives in this Plan/EIS, impacts from operations in the Preserve would be mitigated to avoid impairment of Preserve resources and values.

Under all three alternatives, the impacts are generally the same because the level of development projected under each alternative would be the same as theorized under the RFD scenario. The key difference between the alternatives and their potential impacts is where impacts could occur. Under Alternative A, Current Legal and Policy Requirements would preclude operations in Protected Areas. Under Alternatives B and C, Protected Areas and additional resource areas with offsets are formally designated as Special Management Areas where the No Surface Use stipulation would preclude operations from occurring in an increasingly larger acreage of the Preserve. Alternative C would preclude operations in the greatest area of the Preserve, and is likely that most wells would be directionally drilled from outside the Preserve to develop hydrocarbons underlying the Preserve.

Impairment findings are included in each conclusion statement for each Preserve resource or value. A comparative analysis of the potential for impairment to Preserve resources and values is also provided at the end of Chapter 4. Under all three alternatives, impairment to Preserve resources and values would not occur because current law, regulation, and policy preclude Preserve resource managers from authorizing nonfederal oil and gas operations that would impair Preserve resources and values.

Alternative A, Status Quo/Current Management, would provide less information to guide operators in planning and development of plans of operations and directional drilling applications than the other alternatives presented in this Plan/EIS. There has been no formalized Preserve-wide oil and gas management plan and specific resource protection goals (called performance standards) and operating stipulations would continue to be applied on a case-by-case basis. This increases the likelihood that the location of certain resources and application of mitigation measures could be overlooked on any given proposed operations.

Alternatives B and C were developed to provide consistent oversight of oil and gas operations and ensure protection of Preserve resources and values. The formal designation of Special Management Areas and operating stipulations in Alternatives B and C would reduce the level of potential impact or impairment to resources and values particularly susceptible to adverse impacts from oil and gas operations. The implementation of a comprehensive oil and gas management plan under any of the three alternatives would provide more certainty to oil and gas operators and consistent application of Current Legal and Policy Requirements. The formal designation of SMAs and operating stipulations under Alternatives B and C would provide better assurance for the protection of Preserve resources and values from potential impairment from nonfederal oil and gas operations.

THE NEXT STEP

The Final Plan/EIS has been released for a standard 30-day “No Action” period. The 30-day No Action period begins from the publication date of the U.S. Environmental Protection Agency’s Notice of Availability of this Final Plan/EIS in the *Federal Register*. Following the 30-day No Action period, the NPS will issue a Record of Decision (ROD), and publish the ROD in the *Federal Register*. Upon issuance of the ROD, the selected plan alternative will be implemented.

Table S.2. Summary of Impacts

The following terms are used in this impact summary chart:

Short-term – up to 3 years duration **Long-Term** – up to 20 years or more **CLPR** – Current Legal and Policy Requirements **NSU** – No Surface Use

Alternative A No Action/Current Management	Alternative B Preferred Alternative	Alternative C Maximum Resource Protection
SUMMARY OF ALTERNATIVES		
<p>Geophysical Exploration would not occur in Protected Areas where CLPR would not permit operations on 7,462 acres; or within 500 feet of waterways. In addition to the areas where the NSU stipulation would apply year-round, surface uses for geophysical exploration operations would not be permitted in hunting areas (52,272 acres) or within 500 feet of birding hot spots (135 acres) during specified times. In all other areas of the Preserve, exploration operations could be permitted on up to 465 acres.</p> <p>Drilling and production operations would not occur in Protected Areas where operations would not be permitted under Current Legal and Policy Requirements on 7,493 acres; or within 500 feet of waterways. Operations on 989 acres including existing (24.2 acres) and abandoned (unreclaimed sites comprising 376 acres) operations, and transpark pipelines (589 acres) would continue to adversely impact geologic resources in the Preserve. In all other areas of the Preserve, up to 40 new wells could be located on up to 241 acres.</p> <p>Plugging/Abandonment/Reclamation: There would be no new operations to plug, abandon or reclaim in areas where exploration, drilling and production would not be permitted in Protected Areas. In all other areas of the Preserve where exploration, drilling and production operations could be permitted, there is a potential for up to 465 acres to be reclaimed in association with exploration operations, and up to 241 acres to be reclaimed in association with new drilling and production operations. In addition, there are operations on 989 acres including existing (24.2 acres) and abandoned (unreclaimed sites comprising 376 acres) operations, and transpark pipelines (589 acres) located throughout the Preserve that would be reclaimed in the future, some of which are in Protected Areas.</p>	<p>Geophysical Exploration would not occur in SMAs where the No Surface Use stipulation would be applied on 11,512 acres, or within 500 feet of waterways. In addition to the areas where the NSU stipulation would apply year-round, surface uses for geophysical exploration operations would not be permitted in the Hunting Areas SMA (52,272 acres) or within 500 feet of Birding Hot Spots (135 acres) during specified times. In all other areas of the Preserve, exploration operations could be permitted on up to 465 acres.</p> <p>Drilling and Production would not occur in designated SMAs where the No Surface Use stipulation is applied on up to 46,273 acres, or within 500 feet of waterways. Drilling and production operations may be permitted in the Hunting Areas SMA (52,272 acres). Operations on 989 acres including existing (24.2 acres) and abandoned (unreclaimed sites comprising 376 acres) operations, and transpark pipelines (589 acres) would continue to adversely impact geologic resources in the Preserve. In all other areas of the Preserve, up to 40 new wells could be located on up to 241 acres.</p> <p>Plugging/Abandonment/Reclamation: There would be no new operations to plug, abandon or reclaim in areas where exploration, drilling and production would not be permitted in SMAs. In all other areas of the Preserve where exploration, drilling and production operations could be permitted, there is a potential for up to 465 acres to be reclaimed in association with exploration operations, and up to 241 acres to be reclaimed in association with new drilling and production operations. In addition, there are operations on 989 acres including existing (24.2 acres) and abandoned (unreclaimed sites comprising 376 acres) operations, and transpark pipelines (589 acres) located throughout the Preserve that would be reclaimed in the future, some of which are in SMAs.</p>	<p>Geophysical Exploration would not occur in SMAs where the No Surface Use stipulation would be applied on 39,657 acres, or within 500 feet of waterways. In addition to the areas where the NSU stipulation would apply year-round, surface uses for geophysical exploration operations would not be permitted in the Hunting Areas SMA (52,272 acres) or within 500 feet of Birding Hot Spots (135 acres) during specified times. In all other areas of the Preserve, exploration operations could be permitted on up to 465 acres.</p> <p>Drilling and Production would not occur in designated SMAs where the No Surface Use stipulation is applied on 46,273 acres, or within 500 feet of waterways. Drilling and production operations may be permitted in the Hunting Areas SMA (52,272 acres). Operations on 989 acres including existing (24.2 acres) and abandoned (unreclaimed sites comprising 376 acres) operations, and transpark pipelines (589 acres) would continue to adversely impact geologic resources in the Preserve. In all other areas of the Preserve, up to 40 new wells could be located on up to 241 acres.</p> <p>Plugging/Abandonment/Reclamation: There would be no new operations to plug, abandon or reclaim in areas where exploration, drilling and production would not be permitted in SMAs. In all other areas of the Preserve where exploration, drilling and production operations could be permitted, there is a potential for up to 465 acres to be reclaimed in association with exploration operations, and up to 241 acres to be reclaimed in association with new drilling and production operations. In addition, there are operations on 989 acres including existing (24.2 acres) and abandoned (unreclaimed sites comprising 376 acres) operations, and transpark pipelines (589 acres) located throughout the Preserve that would be reclaimed in the future, some of which are in SMAs.</p>

Alternative A No Action/Current Management	Alternative B Preferred Alternative	Alternative C Maximum Resource Protection
1. IMPACTS ON NONFEDERAL OIL AND GAS DEVELOPMENT		
<p>Project Planning – minor, beneficial impacts.</p> <p>Geophysical Exploration – minor to moderate, adverse impacts.</p> <p>Drilling and Production – minor to moderate, adverse impacts.</p> <p>Plugging/Abandonment/Reclamation – minor to moderate, adverse impacts.</p> <p>Cumulative Impacts – negligible, adverse impacts.</p>	<p>Project Planning – minor to moderate, beneficial impacts.</p> <p>Geophysical Exploration – similar to Alternative A.</p> <p>Drilling and Production – similar to Alternative A.</p> <p>Plugging/Abandonment/Reclamation – minor, adverse impacts.</p> <p>Cumulative Impacts – negligible, adverse impacts.</p>	<p>Project Planning – same as Alternative B.</p> <p>Geophysical Exploration – minor to major, adverse impacts.</p> <p>Drilling and Production – minor to major, adverse impacts.</p> <p>Plugging/Abandonment/Reclamation – same as Alternative B.</p> <p>Cumulative Impacts – negligible, adverse impacts.</p>
2. IMPACTS ON AIR QUALITY		
<p>Impacts could be localized, as well as contribute to regional air quality impacts.</p> <p>Geophysical Exploration – short-term, negligible, adverse impacts.</p> <p>Drilling and Production – short- to long-term, negligible to minor, adverse impacts from operations in the Preserve; and ranging from no affect to short- to long-term, minor, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – short-term, negligible, adverse impacts from operations in the Preserve; and ranging from no affect to short-term, negligible, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Cumulative Impacts – moderate adverse impacts on the regional airsheds. But, with adherence to state and federal standards and requirements, regional airsheds are expected to be maintained or improved.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative A, except that air quality in designated SMAs would be better protected.</p> <p>Drilling and Production – similar to Alternative A, except that air quality in designated SMAs would be better protected.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that air quality in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of air quality in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative B, except that air quality in designated SMAs would be better protected.</p> <p>Drilling and Production – same as Alternative B.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative B, except that air quality in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternatives A and B, except that designation SMAs over a larger area with the NSU stipulation would ensure widespread protection of air quality in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>
3. IMPACTS ON GEOLOGIC RESOURCES		
<p>Geophysical Exploration – localized, short-term, negligible to minor, adverse impacts.</p> <p>Drilling and Production – localized, short- to long-term, negligible to moderate, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – localized, short-term, negligible to minor, adverse impacts from operations in the Preserve; and ranging from no affect to</p>	<p>Geophysical Exploration – similar to Alternative A, except that geologic resources in designated SMAs would be better protected.</p> <p>Drilling and Production – similar to Alternative A, except that geologic resources in designated SMAs would be better protected.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that geologic resources in designated SMAs would be better protected.</p>	<p>Geophysical Exploration – similar to Alternative B, except that geologic resources in designated SMAs would be better protected.</p> <p>Drilling and Production – same as Alternative B.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative B, except that geologic resources in designated SMAs would be better protected.</p>

Alternative A No Action/Current Management	Alternative B Preferred Alternative	Alternative C Maximum Resource Protection
<p>indirect, localized to widespread, short-term, minor, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Cumulative Impacts – negligible, beneficial impacts in the Preserve; and negligible to minor, adverse impacts on geologic resources in the Lower Neches River Watershed.</p> <p>Impairment Analysis – no impairment.</p>	<p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of geologic resources in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Cumulative Impacts – same as Alternative A and B, except that NSU designation in all SMAs except the Hunting Areas SMA would ensure widespread protection of geologic resources in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>
4. IMPACTS ON WATER RESOURCES		
<p>Geophysical Exploration – localized, short-term, negligible to minor, adverse impacts.</p> <p>Drilling and Production – localized short- to long-term, negligible to moderate, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – localized, short-term, negligible to moderate, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, minor, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Cumulative Impacts – negligible, beneficial impacts in the Preserve; and minor to moderate, adverse impacts in the Lower Neches River Watershed.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative A, except that water resources in designated SMAs would be better protected.</p> <p>Drilling and Production – similar to Alternative A, except that water resources in designated SMAs would be better protected.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that water resources in designated SMAs would be better protected. Indirect effects from wells directionally drilled and produced from outside the Preserve would range from no affect to localized to widespread, short- to long-term, moderate, adverse impacts.</p> <p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of water resources in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative B, except that water resources in designated SMAs would be better protected.</p> <p>Drilling and Production – same as Alternative B.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative B, except that water resources in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternatives A and B, except that designation of SMAs over a larger area with the NSU stipulation would ensure widespread protection of water resources in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>
5. IMPACTS ON FLOODPLAINS		
<p>Geophysical Exploration – localized, short-term, negligible to minor, adverse impacts.</p> <p>Drilling and Production – localized, short- to long-term, negligible to moderate, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – localized, short-term, negligible to minor, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p>	<p>Geophysical Exploration – similar to Alternative A, except that floodplains in designated SMAs would be better protected.</p> <p>Drilling and Production – similar to Alternative A, except that floodplains in designated SMAs would be better protected.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that floodplains in designated SMAs would be better protected.</p>	<p>Geophysical Exploration – localized, short-term, negligible adverse impacts.</p> <p>Drilling and Production – indirect, short- to long-term, negligible to minor, adverse impacts from operations in the Preserve; and ranging from no affect to short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the.</p> <p>Plugging/Abandonment/Reclamation – same as Alternatives A and B.</p>

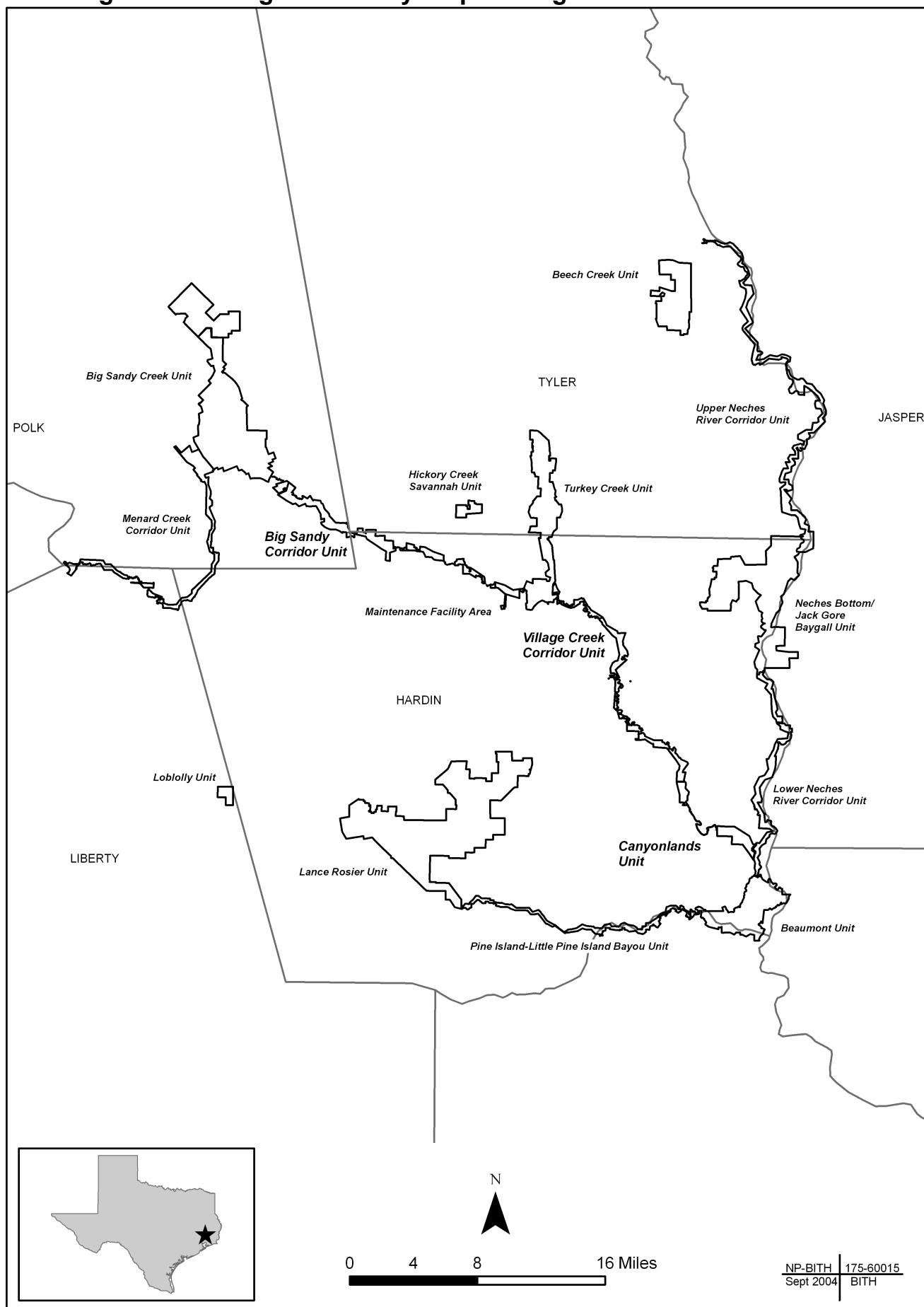
Alternative A No Action/Current Management	Alternative B Preferred Alternative	Alternative C Maximum Resource Protection
<p>Cumulative Impacts – negligible, beneficial impacts in the Preserve; and minor to moderate, adverse impacts in the Lower Neches River Watershed.</p> <p>Impairment Analysis – no impairment.</p>	<p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of floodplains in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Cumulative Impacts – same as Alternatives A and B, except that designation of SMAs over a larger area with the NSU stipulation would ensure widespread protection of floodplains in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>
6. IMPACTS ON VEGETATION		
<p>Geophysical Exploration – localized, short-term, negligible to minor, adverse impacts.</p> <p>Drilling and Production – localized, short- to long-term, minor to moderate, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – localized, short- to long-term, negligible to minor, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, minor, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Cumulative Impacts – negligible, beneficial impacts in the Preserve; and minor to moderate, adverse impacts in the Lower Neches River Watershed.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative A, except that vegetation in designated SMAs would be better protected.</p> <p>Drilling and Production – similar to Alternative A, except that vegetation in designated SMAs would be better protected.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that vegetation in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of vegetation in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – localized, short-term, negligible to moderate, adverse impacts.</p> <p>Drilling and Production – localized, short- to long-term minor to moderate, adverse impacts from operations in the Preserve, and ranging from no impact to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative B, except that vegetation in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternatives A and B, except that designation of SMAs over a larger area with the NSU stipulation would ensure widespread protection of vegetation in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>
7. IMPACTS ON WETLANDS		
<p>Geophysical Exploration – localized, short-term, negligible to minor, adverse impacts.</p> <p>Drilling and Production – localized, short- to long-term, negligible to moderate, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – localized, short- to long-term, negligible to minor, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, minor, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Cumulative Impacts – negligible, beneficial impacts in the Preserve; and moderate, adverse impacts in the Lower Neches River Watershed.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative A, except that wetlands in designated SMAs would be better protected.</p> <p>Drilling and Production – similar to Alternative A, except that wetlands in designated SMAs would be better protected.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that wetlands in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of wetlands in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative B, except that wetlands in designated SMAs would be better protected.</p> <p>Drilling and Production – same as Alternative B.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative B, except that wetlands in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternatives A and B, except that designation of SMAs over a larger area with the NSU stipulation would ensure widespread protection of wetlands in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>

Alternative A No Action/Current Management	Alternative B Preferred Alternative	Alternative C Maximum Resource Protection
8. IMPACTS ON FISH AND WILDLIFE		
<p>Geophysical Exploration – localized, short-term, negligible to minor, adverse impacts.</p> <p>Drilling and Production – localized, short- to long-term, minor to moderate, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – localized, short- to long-term, negligible to minor, adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short-term, minor, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Cumulative Impacts – negligible, beneficial impacts in the Preserve; and negligible to minor, adverse impacts in the Lower Neches River Watershed.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative A, except that fish and wildlife in designated SMAs would be better protected.</p> <p>Drilling and Production – similar to Alternative A, except that fish and wildlife in designated SMAs would be better protected.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that fish and wildlife in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of fish and wildlife in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative B, except that fish and wildlife in designated SMAs would be better protected.</p> <p>Drilling and Production – same as Alternative B.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative B, except that fish and wildlife in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternatives A and B, except that designation of SMAs over a larger area with the NSU stipulation would ensure widespread protection of fish and wildlife in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>
9. IMPACTS ON SPECIES OF SPECIAL CONCERN		
<p>Geophysical Exploration – no adverse impacts.</p> <p>Drilling and Production – no adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – no adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, minor, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Cumulative Impacts – negligible, beneficial impacts in the Preserve; and minor to moderate, adverse impacts in the Lower Neches River Watershed.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative A, except that species of special concern in designated SMAs would be better protected.</p> <p>Drilling and Production – same as Alternative A.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that species of special concern in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of species of special concern and perpetuate habitat for species in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Geophysical Exploration – similar to Alternative B, except that species of special concern in designated SMAs would be better protected.</p> <p>Drilling and Production – same as Alternative B.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative B, except that species of special concern in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternatives A and B, except that designation of SMAs over a larger area with the NSU stipulation would ensure widespread protection of species of special concern and perpetuate habitat for species in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>
10. IMPACTS ON CULTURAL RESOURCES		
<p>Geophysical Exploration – no adverse impacts.</p>	<p>Geophysical Exploration – similar to Alternative A, except that cultural resources in designated SMAs would be better protected.</p>	<p>Geophysical Exploration – similar to Alternative B, except that cultural resources in designated SMAs would be better protected.</p>

Alternative A No Action/Current Management	Alternative B Preferred Alternative	Alternative C Maximum Resource Protection
<p>Drilling and Production – no adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, moderate, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Plugging/Abandonment/Reclamation – no adverse impacts from operations in the Preserve; and ranging from no affect to indirect, localized to widespread, short- to long-term, minor, adverse impacts from wells directionally drilled and produced from outside the Preserve.</p> <p>Cumulative Impacts – negligible, beneficial impacts in the Preserve; and minor to moderate, adverse impacts in the Lower Neches River Watershed.</p> <p>Impairment Analysis – no impairment.</p>	<p>Drilling and Production – similar to Alternative A, except that cultural resources in designated SMAs would be better protected.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative A, except that cultural resources in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of cultural resources in these areas of the Preserve.</p> <p>Impairment Analysis – no impairment.</p>	<p>Drilling and Production – same as Alternative B.</p> <p>Plugging/Abandonment/Reclamation – same as Alternative B.</p> <p>Cumulative Impacts – same as Alternatives A and B, except that designation of SMAs over a larger area with the NSU stipulation would ensure widespread protection of cultural resources in the Preserve.</p> <p>Impairment Analysis – no impairment.</p>
11. IMPACTS ON VISITOR USE AND EXPERIENCE AND ADMINISTRATIVE AREAS		
<p>Visitor Use and Experience – exploration, drilling and production operations in the Preserve would result in localized, short- to long-term, negligible to moderate, adverse impacts, and reclamation operations would result in localized, long-term, moderate, beneficial impacts. Wells directionally drilled from outside the Preserve would result in impacts ranging from no affect to indirect, localized, short- to long-term, moderate, adverse impacts; and reclamation would result in indirect, localized moderate, adverse and beneficial impacts.</p> <p>Human Health and Safety – negligible, adverse impacts.</p> <p>Cumulative Impacts – negligible, adverse impacts.</p>	<p>Visitor Use and Experience – similar to Alternative A, except that visitor use and experience and administrative areas in designated SMAs would be better protected.</p> <p>Human Health and Safety – similar to Alternative A, except that visitor use and experience and administrative areas in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternative A, except that designation of SMAs with the NSU stipulation would provide consistent protection of visitor use and experience and human health and safety in these areas of the Preserve.</p>	<p>Visitor Use and Experience – exploration, drilling and production operations in the Preserve would result in localized, negligible to minor, adverse impacts, and reclamation operations would result in localized, moderate, beneficial impacts. Drilling and production of wells directionally drilled from outside the Preserve would result in impacts ranging from no affect to short- to long-term, moderate, adverse impacts; and reclamation would result in localized moderate, adverse and beneficial impacts.</p> <p>Human Health and Safety – similar to Alternative B, except that visitor use and experience and administrative areas in designated SMAs would be better protected.</p> <p>Cumulative Impacts – same as Alternatives A and B, except that designation of SMAs with the NSU stipulation would ensure more widespread protection of visitor use and experience and human health and safety in these areas of the Preserve.</p>
12. IMPACTS ON SOCIOECONOMICS – ADJACENT LAND USES AND RESOURCES		
<p>Geophysical Exploration – localized, short-term, negligible to moderate, adverse impacts.</p> <p>Drilling and Production – short- to long-term, minor to major, adverse impacts, depending on the resource protection measures employed.</p> <p>Plugging/Abandonment/Reclamation – localized, negligible to major, adverse impacts, depending on the amount of reclamation performed.</p> <p>Cumulative Impacts – minor to major, adverse impacts.</p>	<p>Geophysical Exploration – localized, short-term, minor to major, adverse impacts.</p> <p>Drilling and Production – similar to Alternative A.</p> <p>Plugging/Abandonment/Reclamation – localized, negligible to major, adverse impacts, depending on the amount of reclamation performed.</p> <p>Cumulative Impacts – similar to Alternative A.</p>	<p>Geophysical Exploration – similar to Alternative B.</p> <p>Drilling and Production – similar to Alternative B.</p> <p>Plugging/Abandonment/Reclamation – similar to Alternative B.</p> <p>Cumulative Impacts – similar to Alternative B.</p>

THIS PAGE INTENTIONALLY LEFT BLANK

Figure S.1. Region/Vicinity Map for Big Thicket National Preserve



INTRODUCTION

CHAPTER

1



CHAPTER 1

INTRODUCTION

PURPOSE AND NEED FOR THIS PLAN

The purpose of this Oil and Gas Management Plan/Environmental Impact Statement (Plan/EIS) for Big Thicket National Preserve (hereinafter referred to as the “Preserve”) is to analyze alternative approaches that could be implemented over the next 15-20 years for managing existing and anticipated oil and gas operations associated with the exercise of nonfederal oil and gas interests underlying the Preserve, and surface activities for existing transpark oil and gas pipelines in their associated rights-of-way. This is a programmatic management plan that establishes a general framework for managing oil and gas operations. By itself, it does not authorize any on-the-ground activities. The NPS will authorize specific projects by reviewing and approving operator-submitted plans of operations or special use permit applications. Before doing so, the NPS will conduct further analysis in accordance with the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act of 1966 (NHPA), the Endangered Species Act of 1973 (ESA), and other applicable federal laws.

Congress established Big Thicket National Preserve in 1974 “to assure the preservation, conservation, and protection of the natural, scenic, and recreational values of a significant portion of the Big Thicket area in the State of Texas and to provide for the enhancement and public enjoyment thereof.” (16 U.S.C. 698(a)) When the Preserve was created, private entities retained the subsurface mineral interests on most of these lands, while the State of Texas retained the subsurface mineral interests underlying the Neches River and navigable reaches of Pine Island Bayou. Thus, the Federal Government does not own any of the subsurface oil and gas rights in the Preserve, yet the National Park Service (NPS) is required by its laws, policies and regulations to protect the Preserve from any actions, including oil and gas operations, that may adversely impact or impair Preserve resources and values. Prior to the NPS promulgating regulations pertinent to activities associated with nonfederal oil and gas rights, the NPS managed these activities by issuing special use permits. Since the implementation of NPS regulations in 1979 to manage nonfederal oil and gas rights at 36 CFR 9B, the NPS has annually requested funds to develop an Oil and Gas Management Plan/EIS. Funding was approved in 1997 to proceed with development of the Plan/EIS.

The proposed action is to adopt a comprehensive plan for management of oil and gas operations consistent with the purpose and values of the Preserve and NPS mandates for resource protection. At this time, there is no comprehensive oil and gas management plan to guide oil and gas activities within the Preserve. Currently, the NPS evaluates project-specific proposals for oil and gas exploration, production, and transportation on a case-by-case basis by applying a variety of Current Legal and Policy Requirements prior to issuing a permit under the regulatory framework of the NPS’s Nonfederal Oil and Gas Rights Regulations (36 CFR 9B regulations) or Special Use Permits (36 CFR Parts 1-5). Many Current Legal and Policy Requirements involve other state and federal agencies who either are responsible for issuing specific resource-protection permits, or are agencies with whom the NPS consults to seek technical reviews and recommendations. Operators are often uncertain of the standards and requirements that NPS applies to protect resources, visitor use and experience, and human health and safety.

This Plan/EIS will be the first comprehensive plan ever prepared for the Preserve to manage activities associated with the exploration and development of nonfederal oil and gas. It is the intent of this planning effort to provide comprehensive, consistent direction for the Preserve for the next 15 to 20 years, and possibly longer, if there are no major changes in technology, and impacts do not

significantly change from those described; and to arrive at that direction through public participation. This Plan/EIS is the result of ongoing interaction with the public and affected government agencies which began in November 1998 (see Chapter 5, Consultation and Coordination sections).

The analysis area for this Plan/EIS includes the Preserve and extends approximately ½-mile outside the Preserve boundaries to include directional wells sited outside Preserve boundaries.

Oil and gas operations and transpark pipelines could potentially adversely impact natural and cultural resources, visitor use and experience, and human health and safety. The NPS must ensure that only appropriately planned and designed operations are approved; and that cumulative impacts are fully analyzed so that resources are not impaired to the degree that compromises the ecological integrity of the Preserve. Identifying potential impacts and applying appropriate operating standards, including no surface access and time/seasonal restrictions, along with other mitigation techniques, will avoid or mitigate adverse impacts. This Plan/EIS will provide up-front information on the location of Special Management Areas and suggest needed mitigation. Current Legal and Policy Requirements that apply to nonfederal oil and gas operations are explained in this document. Mitigation measures that may be included in plans of operations or attached as conditions of approval are also described.

Three alternatives are presented in this Plan/EIS. Alternative A, No Action/Current Management, is required by the National Environmental Policy Act and describes the continued management of oil and gas operations in the Preserve under Current Legal and Policy Requirements. Current Legal and Policy Requirements would apply to any alternative management plan that is selected for implementation. Alternative B emphasizes the development of a programmatic oil and gas management plan that would guide nonfederal oil and gas operations in the Preserve. Special Management Areas (SMAs) would be formally designated in the Preserve where resources and values would be particularly susceptible to adverse impacts from oil and gas operations, and operating stipulations specific to each SMA would be applied. Alternative B is the preferred alternative. Alternative C emphasizes avoiding new surface disturbance and its associated impacts throughout the Preserve. Alternative C is the environmentally preferred alternative.

SPECIAL MANDATES AND DIRECTION

This section describes the special mandates and direction that govern the scope of the Oil and Gas Management Plan for the Preserve. Special mandates define the constraints of what the Plan/EIS must include. It comprises the Preserve's enabling act which defines the purpose and significance of the Preserve, and Current Legal and Policy Requirements which define existing guidance based on laws, regulations, manuals, policies, and executive orders that apply to nonfederal oil and gas operations. Direction is also provided in planning documents for the Preserve.

NPS Organic Act and General Authorities Act

The NPS Organic Act (16 U.S.C. §§ 1 *et seq.*) provides the fundamental management direction for all units of the National Park System. Section 1 states that the NPS shall:

“...promote and regulate the use of the federal areas known as national parks, monuments, and reservations...by such means and measures as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

The National Park System General Authorities Act, 16 U.S.C. § 1a-1, affirms that while all national park system units remain "distinct in character," they are "united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage." The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, the Redwood Act Amendments to the General Authorities Act clarified Congress' mandate to the NPS to protect park resources and values. The Amendments state, in part: "The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established except as may have been or shall be directly and specifically provided by Congress." (16 U.S.C. § 1a-1)

The NPS Organic Act and the General Authorities Act prohibit an impairment of park resources. The NPS Management Policies state that an impact to any park resource or value may constitute impairment. An impact would be more likely to constitute an impairment to the extent it affects a resource or value whose conservation is: 1) necessary to fulfill a specific purpose identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment is an impact that, in the professional judgement of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot be reasonably further mitigated, of an action necessary to preserve or restore the integrity of park resources or values.

NPS Management Policies use the terms "resources and values" to mean the full spectrum of tangible and intangible attributes for which the parks are established and are being managed, including the Organic Act's fundamental purposes (as supplemented), and any additional purposes as stated in a park's establishing legislation. Park resources and values that are subject to the no impairment standard include: the biological and physical processes which created the park and that continue to act upon it; scenic features; natural visibility; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures and objects; museum collections; and native plants and animals.

The NPS also includes the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the National Park System, and the benefit and inspiration provided to the American people by the National Park System among the values that are subject to the no impairment standard. Finally, unless the activity is required by statute, NPS cannot allow an activity in a park if it would involve or result in:

- 1) inconsistency with the park's enabling legislation or proclamation, or derogation of the values or purposes for which the park was established;
- 2) unacceptable impacts on visitor enjoyment due to interference or conflict with other visitor use activities;
- 3) consumptive use of park resources;
- 4) unacceptable impacts on park resources or natural processes; and
- 5) unacceptable levels of danger to the welfare or safety of the public.

For these reasons, this Plan/EIS provides an analysis of the potential of each alternative to leave park resources and values unimpaired relative to existing and future oil and gas operations. The Plan/EIS provides in Chapter 4 an analysis of oil and gas operations for each resource identified as potentially affected by oil and gas operations to determine the potential for impairment.

Big Thicket National Preserve Enabling Act

Congress established the Big Thicket National Preserve on October 11, 1974 (Public Law 93-439, 16 U.S.C. § 698 – 698e).

Under the NPS Organic Act (16 U.S.C. § 3) and § 4(b) of the Big Thicket National Preserve enabling Act (16 U.S.C. § 698c(b)), Congress authorized the Secretary of the Interior to promulgate regulations to manage nonfederal oil and gas operations associated with development of nonfederal oil and gas underlying the Preserve. These regulations, the NPS's Nonfederal Oil and Gas Rights Regulations, are published at Title 36 of the Code of Federal Regulations, Part 9, Subpart B (36 CFR Part 9B).

The establishment of Big Thicket as a national preserve created a new National Park System category, which meets different criteria than other parks and recreation areas within the System. These criteria were set forth in the House of Representatives committee report (House Committee Report No. 93-676) pertaining to the establishment of Big Thicket National Preserve and Big Cypress National Preserve, approved on the same date, as follows:

“In the past, the Congress has authorized and established many areas for inclusion in the National Park System: national parks, national monuments, national recreation areas, national historic sites, and others. A systematic effort has been made to establish standards or criteria for each of these different categories in an effort to maintain the integrity of the values which each attempts to serve. The description of the [Big Thicket] area as a national preserve will establish a new category which can serve as a feasible and desirable vehicle for the consideration of other nationally significant natural areas which differ from the qualities attributed to national parks and national recreation areas. The committee chose to call the area a preserve rather than a reserve, feeling that such distinction may be important. Reserve refers to stock – a commodity held for future use. Preserve refers more definitively to the keeping or safeguarding of something basically protected and perpetuated for an intended or stated purpose, as with the specific objectives for [Big Thicket] provided by this legislation.

In general, national preserves will be areas of land and/or water which may vary in size, but which possess within their boundaries exceptional values or qualities illustrating the natural heritage of the Nation. Such areas would often be characterized by significant scientific values, including, but not limited to, ecological communities illustrating the process of succession, natural phenomena, or climax communities. In addition, they could be characterized by a habitat supporting a vanishing, rare or restricted species; a relict flora or fauna persisting from an earlier period; or large concentrations of wildlife species. Other scientific, geologic, geomorphic or topographic values might also contribute to the purposes for which an area might be recognized.

The principal purpose of these areas should be the preservation of the natural values which they contain. They might differ, in some respects, from national parks and monuments insofar as administrative policies are concerned. Hunting, for example, subject to reasonable regulation by the Secretary, could be permitted to the extent compatible with the purposes for which the area is established. Other activities, including the extraction of minerals, oil, and gas could be permitted if such activities could be conducted without jeopardizing the natural values for which the area seeks to preserve. Management of the watershed resources might also be appropriate if that would enhance the value of the preserve as it serves other needs.

All management activities within these areas should be directed toward maintaining the natural and scientific values of the area, including the preservation of the flora and fauna and the reestablishment of the indigenous plant and animal life, if possible. Areas where

scientific discoveries or historical events took place would contribute to the values of the preserve and should be managed in a manner which will maximize both the natural and historical values.

National preserves may accommodate significant recreational uses without impairing the natural values, but such public use and enjoyment would be limited to activities where, or periods when, such human visitation would not interfere with or disrupt the values which the area is created to preserve.

Construction of physical facilities of any kind would be minimized and would be limited to those developments which are essential to the preservation and management of the area and the safety of the public. To the extent such facilities are deemed necessary and appropriate they would be constructed in a manner which would minimize their impact on the environment and their intrusion on the natural setting.”

General Management Plan Direction

The General Management Plan (GMP) is the major planning document for all National Park System units. The GMP sets forth the basic philosophy of the unit, and provides strategies for resolving issues and achieving identified management objectives required for resource management and visitor use. The GMP includes environmental analysis and other required compliance documentation.

The NPS approved a General Management Plan for the Preserve in September 1980. In the GMP, all decisions concerning the management, use, and development of the Preserve are directed toward achieving the following objectives:

Natural Resource Management

- To perpetuate and protect the Preserve's unique mixture of temperate and subtropical botanical communities
- To initiate joint planning and natural resource management programs with neighboring landowners to promote continued compatible land use
- To establish cooperative agreements or memorandums of understanding with all necessary state agencies to ensure adequate control, preservation, and management of Preserve lands
- To proceed with research activities that provide baseline data necessary for future planning and management efforts and for the evaluation of the environmental impacts of human use on the Preserve

Cultural Resource Management

- To identify, protect, preserve, and interpret the Preserve's cultural resources (including the remains of pioneer homesteads, early lumber mills, oil drilling operations, and Indian archeological sites, [and ethnographic and cultural landscape resources]) in accordance with legislation, executive requirements, NPS policies, and the purpose for which the Preserve was established

Land Acquisition

- To continue to acquire land through the approved land acquisition plan, ensuring preservation of the biological ecotones and providing interpretive capabilities within the authorized boundary

Development

- To complete initial planning documents and initiate interpretive and development concepts as soon as practical, keeping in mind the limiting constraints placed in P.L. 93-439
- To encourage by whatever means available the use of private capital in the development of necessary visitor accommodations and facilities at strategic locations outside the boundaries of the Preserve

Interpretation and Education

- To foster understanding and appreciation of the Preserve's unique and interesting mixture of vegetative communities, wildlife, and cultural resources through provision of varied interpretive and educational programs
- To encourage educational use and scientific study of the preserve by schools and other groups interested in the Preserve's rich variety of natural resources
- The GMP recognized human use of resources such as oil, gas, timber, homesteads, and hunting and fishing as an interpretive theme.

Maintenance

- To maintain the Preserve's resources in a manner that most effectively and efficiently responds to the decentralized nature of the Preserve units

Special Uses

- To develop and maintain the capability to realistically assess impacts caused by allowable special uses within required regulation time frames

Management Zoning

- The General Management Plan designated management zones for the Preserve, taking into consideration that the diverse biological, physical, and historical resources within the Preserve have different inherent values and varying sensitivity to human use. The intent of zoning is to recognize these differences and to focus future management on the particular types of activities and developments appropriate for each zone. The zoning system applied is common to most National Park System units – the natural, historic, development, and special use zones. Most of the Preserve is designated “natural zone”, which places management emphasis on conservation of natural resources and processes while providing for uses that do not adversely affect these resources and processes. However, public hunting, trapping, and fishing preclude any attempt at strict fauna preservation. And, because mineral rights were not acquired by the National Park Service, the exploration for and extraction of oil and gas continues in and around the Preserve. The National Park Service recognizes that it cannot enforce more restrictive zoning within the Preserve while the foregoing uses continue. All new nonfederal oil and gas production sites are placed in an Exploration/Mining Subzone, and the sites are removed from their previous

management zones. When nonfederal oil and gas operations end, the area is reclaimed and the zone reclassified.

NPS Nonfederal Oil and Gas Regulations, 36 CFR 9B

The NPS Nonfederal Oil and Gas Rights Regulations at 36 CFR Part 9, Subpart B, and other regulatory requirements establish standards for the conduct of oil and gas activities within a unit so park managers can ensure that those activities are conducted in a manner that protects park resources and values. The NPS must determine that these activities do not impair park resources and values to the extent they preclude visitor enjoyment of the park now and for future generations. The 9B regulations provide the NPS with an existing regulatory framework to manage the effects of oil and gas operations within the parks. The application and implementation of these regulations must be assessed parkwide as well as for each site specific oil and gas activity to determine if these activities have the potential to impair park resources and values.

The NPS, as a Federal Governmental entity, has authority to regulate nonfederal oil and gas exploration and production in units of the National Park System, including Big Thicket National Preserve. The authority to manage and protect federal property arises from the Property Clause of the United States Constitution. The Property Clause provides that “Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States . . .” U.S. Const. Art. IV, § 3, cl. 2.

Congress’ power over federally-owned lands is without limitations, and extends to conduct that occurs on or off federal land that affects federal lands. Courts have consistently upheld Congress’ broad delegation of authority to federal land managing agencies under the Property Clause in a variety of contexts. See Kleppe v. New Mexico, 426 U.S. 526 (1976); Stupak-Thrall v. United States, 70 F.3d 881 (6th Cir. 1995) (upholding Forest Service’s authority to regulate privately-held surface rights to a lake within a wilderness area); Duncan Energy Co. v. Forest Service, 50 F.3d 584 (8th Cir. 1995) (upholding Forest Service’s authority to regulate activities related to private mineral rights underlying National Forest); United States v. Vogler, 859 F.2d 638 (9th Cir. 1988) (upholding NPS regulation of access to a private mining claim in a park); Free Enterprise Canoe Renter’s Assoc. v. Watt, 711 F.2d 852 (8th Cir. 1983) (upholding NPS regulations requiring permit for canoe rental businesses located outside park); Minnesota v. Block, 660 F.2d 1240 (8th Cir. 1981) (upholding Forest Service regulation of snowmobile activities on state land).

In 1916, Congress exercised its power under the Property Clause and passed the NPS Organic Act, 16 U.S.C. §§ 1 *et seq.* Congress directed the NPS to “promote and regulate” units of the National Park System “to conserve the scenery and the natural and historic objects and the wild life therein to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” (16 U.S.C. § 1) Congress also mandated that the protection, management, and administration of such units “shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established...” (16 U.S.C. § 1a-1) Congress further authorized the Secretary of the Interior to “make and publish such rules and regulations as he may deem necessary or proper for the use of the parks...” (16 U.S.C. § 3)

Pursuant to Section 3 of the NPS Organic Act and individual park statutes (including the enabling act for Big Thicket National Preserve) the Secretary of the Interior promulgated regulations at 36 CFR Part 9, Subpart B (“9B regulations”) in 1979 to “insure that activities undertaken pursuant to [nonfederal oil and gas rights] are conducted in a manner consistent with the purposes for which the National Park System and each unit thereof were created, to prevent or minimize damage to the environment and other resource values, and to insure to the extent feasible that all units of the National Park System are left unimpaired for the enjoyment of future generations” (see 36 CFR §

9.30). The 9B regulations apply to operations that require access on or through federally-owned or controlled lands or waters in connection with nonfederally owned oil and gas in all National Park System units (36 CFR § 9.30(a)). "Operations" is broadly defined under the regulations to include all activities associated with the exploration for and production of nonfederally owned or controlled oil and gas, from gathering basic information to comply with the regulations to the transport of petroleum products (36 CFR § 9.31(c)). The critical component of the regulations is the requirement that an operator submit and obtain NPS approval of a proposed Plan of Operations before commencing oil and gas exploration or production activities (36 CFR § 9.36). Such plans are essentially a prospective operator's "blueprint" for conducting activities including impact mitigation and site reclamation. Operators are responsible for preparing a Plan of Operations that addresses all information requirements applicable to proposed operations. Operators must supply this information in sufficient detail to enable the NPS to effectively analyze the impacts of the proposed operations on the particular unit's resources and values, and to determine whether to approve the proposed plan (36 CFR § 9.36(c)). The park Superintendent's or Regional Director's decisions under the 36 CFR Part 9B regulations can be administratively appealed by the operator (see 36 CFR § 9.49). The 36 CFR 9B regulations are presented in Appendix B.

The 36 CFR 9B regulations fall within the broad scope of authority granted to the NPS from Congress under the NPS Organic Act – authority that includes the power to regulate conduct that occurs on or off federal land, which may affect federal lands. The United States need not own the mineral interest beneath Big Thicket National Preserve to regulate rights associated with that interest that may affect the federally-owned surface. However, the NPS limited the application of the 9B regulations to situations where operators must cross federally-owned or controlled lands or waters to reach their oil and gas rights in parks.

Both state and federal law govern the conduct of oil and gas operations at Big Thicket National Preserve. However, to the extent that state laws conflict with the federal statutory and regulatory requirements governing the exercise of nonfederal oil and gas rights at the Preserve, the state law must yield to federal requirements.

This planning effort is designed to provide Preserve staff and oil and gas operators with a comprehensive framework for the NPS to manage the development of nonfederal oil and gas. The planning process will not (indeed it cannot) effect a substantive change to the laws and regulations governing the management of park system resources. Changes to the NPS's governing laws and regulations are made either by Congress or by the NPS through rulemaking under the Administrative Procedures Act, respectively.

Directional Drilling. Most of the wells currently developing hydrocarbons beneath the Preserve have been directionally drilled from surface locations outside the Preserve. Section 9.32(e) of the NPS's 36 CFR 9B regulations governs operators that propose to develop their nonfederal oil and gas rights in any unit of the National Park System by directionally drilling a well from a surface location outside unit boundaries to a location under federally-owned or controlled lands within park boundaries. Per § 9.32(e), an operator may obtain an exemption from the 9B regulations if the Regional Director is able to determine from available data that a proposed drilling operation under the park poses *"no significant threat of damage to park resources, both surface and subsurface, resulting from surface subsidence, fracture of geological formations with resultant fresh water aquifer [sic] contamination or natural gas escape or the like."* It is limited in scope to those aspects of the directional drilling operation occurring within a unit in connection with exploration for and development of oil and gas resources, the right to which is not owned by the United States... (36 CFR § 9.31(c), underlining added). Operators seeking an exemption to the NPS 9B regulations must submit a § 9.32(e) Application for Directional Drilling. Further guidance on the NPS's directional drilling provision under § 9.32(e) is provided in Chapter 2, Part II.

Regulation of Transpark Oil and Gas Pipelines and Activities in Associated Rights-of-Way

Existing transpark oil and gas pipelines and their rights-of-way lie outside the scope of the 9B regulations. Transpark oil and gas pipelines have their point of origin and end point outside parks, and are operated by persons or entities exercising rights not tied to the oil and gas ownership within the park boundary. As a result, they are not subject to the existing 9B regulations. If a nonfederal oil and gas operation in a park connects to such a pipeline **via a flowline or gathering line** then that portion of the flowline or gathering line crossing the park would be subject to the 9B regulations, including the Plan of Operations requirement.

While most transpark oil and gas pipelines are not subject to the 9B regulations, they are either subject to federal Department of Transportation (DOT) regulations at 49 CFR Subtitle B, Chapter 1, Parts 190-199, Texas State requirements, and other applicable federal and state laws. The DOT regulations govern safety and environmental protection considerations affiliated with interstate pipelines. Specifically, the DOT regulations cover testing, reporting, inspection, maintenance, corrosion control and spill contingency plans of these pipelines. State regulations often mirror the federal requirements and govern intrastate pipelines. In the State of Texas, the Railroad Commission of Texas administers state requirements on oil and gas pipelines under Texas law (See Tx. Rev. Stat. §81.011(a) *et seq.*). Transpark pipeline operators should note that if park system resources are damaged from operation of that pipeline in a park unit, the NPS can exercise its authority under the Act of July 27, 1990, Pub. L. No. 101-337, 104 Stat. 379, codified as amended at 16 U.S.C. §§ 19jj through 19jj-4 (2000), to undertake all necessary actions to protect park system resources. Operators will be held liable to the United States for its response costs as well as for any damages to park system resources. See id. at § 19jj-1.

NOTE: In Big Thicket National Preserve, no statutory authority exists for granting new rights-of-way for oil and gas pipelines. However, new pipelines may be constructed within existing rights-of-way in conformance with the terms of the legal document creating the rights-of-way. When an entity seeks to construct a new pipeline carrying natural gas, it must first obtain a *certificate of public convenience and necessity* from the Federal Energy Regulatory Commission (FERC) (see 18 CFR § 157.7). FERC determines “where” new natural gas pipelines can be built while DOT regulates the “hows” from a public safety and resource protection perspective. FERC does not oversee the construction of oil and gas pipelines or regulate the supply and price of oil or oil products. In addition to authorizing the siting of natural gas lines, FERC also is responsible for establishing just and reasonable pricing rates for moving both natural gas and oil through pipelines in interstate commerce throughout the country.

With respect to activities within rights-of-way associated with transpark oil and gas pipelines, the NPS has existing regulatory authority to control those activities. The regulations are codified at 36 CFR Parts 1 and 5. They consist of general regulations controlling a variety of activities in parks. To the extent that a proposed activity in a right-of-way triggers the general regulations, a Special Use Permit must be obtained from the NPS before the conduct of the activity. Mowing and trimming vegetation, inspection or testing pipelines, and installing, shutting down or replacing pipelines, are common activities in pipeline rights-of-way requiring a Special Use Permit. Such activities are routine and provide for personal safety, leak or spill detection, and unencumbered response in the event of a spill or emergency.

Applicable Legal and Policy Requirements

Table 1.1, below, summarizes many, but not all, of the legal and policy mandates governing nonfederal oil and gas operations in the units of the National Park System. These include statutes, regulations, executive orders and NPS policies. All of the alternatives presented in this Plan/EIS are subject to these requirements. Appendix C, Federal Laws, Regulations, Executive Orders, Policies and Guidelines that Apply to Nonfederal Oil and Gas Operations contains summary descriptions of many of the Current Legal and Policy Requirements listed in Table 1.1.

Table 1.1. Legal and Policy Mandates Governing Nonfederal Oil and Gas Operations

AUTHORITIES	RESOURCES AND VALUES AFFORDED PROTECTION
National Park Service Laws and Applicable Regulations	
NPS Organic Act of 1916, as amended, 16 U.S.C. §§ 1 <i>et seq.</i>	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, threatened and endangered species, visitor use and experience, and visual resources
National Park System General Authorities Act, 16 U.S.C. §§ 1a-1 <i>et seq.</i>	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, threatened and endangered species, visitor use and experience, and visual resources
National Park Service Omnibus Management Act of 1998, 16 U.S.C. §§ 5901 <i>et seq.</i>	Any living or non-living resource
NPS Nonfederal Oil and Gas Regulations – 36 CFR Part 9, Subpart B	All, e.g., air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, Threatened and Endangered species, visitor use and experience
Park System Resource Protection Act, 16 U.S.C. § 19jj	Any living or non-living resource that is located within the boundaries of a unit of the National Park System, except for resources owned by a nonfederal entity
Enabling Act for Big Thicket National Preserve, 16 U.S.C., § 698a	Natural, scenic, and recreational values
Other Applicable Federal Laws and Regulations	
American Indian Religious Freedom Act, as amended, 42 U.S.C. §§ 1996 – 1996a; 43 CFR Part 7	Cultural and historic resources
Antiquities Act of 1906, 16 U.S.C. §§ 431-433; 43 CFR Part 3	Cultural, historic, archeological, paleontological resources
Archaeological Resources Protection Act of 1979, 16 U.S.C. §§ 470aa – 470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7	Archeological resources
Clean Air Act, as amended, 42 U.S.C. §§ 7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23	Air resources
Coastal Zone Management Act of 1972, 16 U.S.C. § 1451 <i>et seq.</i> , 15 CFR Parts 923, 930, 933	Coastal waters and adjacent shoreline areas
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601-9675; 40 CFR Parts 279, 300, 302, 355, and 373	Human health and welfare and the environment
Endangered Species Act of 1973, as amended, 16 U.S.C. §§ 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450	Plant and animal species or subspecies and their habitat, which have been listed as threatened or endangered by the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS)
Federal Insecticide, Fungicide, and Rodenticide Act, as amended (commonly referred to as Federal Environmental Pesticide Control Act of 1972), 7 U.S.C. §§ 136 <i>et seq.</i> ; 40 CFR Parts 152-180, except Part 157	Human health and safety and the environment
Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701 <i>et seq.</i> ; 43 CFR Part 2200 for land exchanges and 43 CFR Parts 1700-9000 for all other BLM activities	Federal lands and resources administered by the Bureau of Land Management
Federal Water Pollution Control Act of 1972 (commonly	Water resources, wetlands, and waters of the U.S.

AUTHORITIES	RESOURCES AND VALUES AFFORDED PROTECTION
referred to as Clean Water Act), 33 U.S.C. §§ 1251 <i>et seq.</i> ; 33 CFR Parts 320-330; 40 CFR Parts 110, 112, 116, 117, 230-232, 323, and 328	
Historic Sites, Buildings, and Antiquities Act (Historic Sites Act of 1935), 16 U.S.C. §§ 461-467; 18 CFR Part 6; 36 CFR Parts 1, 62, 63, and 65	Historic sites, buildings and objects
Lacey Act, as amended, 16 U.S.C. §§ 3371 <i>et seq.</i> ; 15 CFR Parts 10, 11, 12, 14, 300, and 904	Fish and wildlife, vegetation
Migratory Bird Treaty Act, as amended, 16 U.S.C. §§ 703-712; 50 CFR Parts 10, 12, 20, and 21	Migratory birds
National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321 <i>et seq.</i> ; 40 CFR Parts 1500-1508	The human environment (e.g., cultural and historic resources, natural resources, biodiversity, human health and safety, socioeconomic environment, visitor use and experience)
National Historic Preservation Act of 1966, as amended, 16 U.S.C. §§ 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810	Cultural and historic properties listed in or determined to be eligible for listing in the National Register of Historic Places
Native American Graves Protection and Repatriation Act, 25 U.S.C. §§ 3001-3013; 43 CFR Part 10	Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony
Noise Control Act of 1972, 42 U.S.C. §§ 4901-4918; 40 CFR Part 211	Human health and welfare
Oil Pollution Act, 33 U.S.C. §§ 2701-2761; 15 CFR Part 990; 33 CFR Parts 135, 137, and 150; 40 CFR Part 112; 49 CFR Part 106	Water resources, natural resources
Pipeline Safety Act of 1992, 49 U.S.C. §§ 60101 <i>et seq.</i> ; 49 CFR Subtitle B, Ch 1, Parts 190-199	Human health and safety, and the environment
Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 <i>et seq.</i> ; 40 CFR Parts 240-280; 49 CFR Parts 171-179	Natural resources, human health and safety
Rivers and Harbors Act of 1899, as amended, 33 U.S.C. §§ 401 <i>et seq.</i> ; 33 CFR Parts 114, 115, 116, 321, 322, and 333	Shorelines and navigable waterways, tidal waters, wetlands
Safe Drinking Water Act of 1974, 42 U.S.C. §§ 300f <i>et seq.</i> ; 40 CFR Parts 141-148	Human health, water resources
Executive Orders	
Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971)	Cultural resources
Executive Order 11988 – Floodplain Management, 42 Fed. Reg. 26951 (1977)	Floodplains, human health, safety, and welfare
Executive Order 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977)	Wetlands
Executive Order 12088 – Federal Compliance with Pollution Control Standards, 43 Fed. Reg. 47707 (1978)	Natural resources, human health and safety
Executive Order 12630 – Governmental Actions and Interference with Constitutionally Protected Property Rights, 53 Fed. Reg. 8859 (1988)	Private property rights, public funds
Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, amended by Exec. Order No. 12948, 60 Fed. Reg. 6379 (1995)	Human health and safety Minority populations and low-income populations
Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)	Native Americans' sacred sites
Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999)	Vegetation and wildlife
Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)	Migratory birds
Executive Order 13212 – Actions to Expedite Energy-Related Projects, 66 Fed. Reg. 28357 (2001)	Production, transmission, and conservation of energy

AUTHORITIES	RESOURCES AND VALUES AFFORDED PROTECTION
Policies, Guidelines and Procedures	
NPS Management Policies (2001)	All resources including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, threatened and endangered species, visitor use and experience, visual resources
Dept. of the Interior, Departmental Manual, DM 516 – NEPA policies (1980)	All resources including cultural resources, historic resources, natural resources, human health and safety
Dept. of the Interior, Departmental Manual, DM 517 – Pesticides (1981)	Human health and safety, and the environment
Dept. of the Interior, Departmental Manual, DM 519 – Protection of the Cultural Environment (1994)	Archeological, prehistoric resources, historic resources, Native American human remains, and cultural objects
Dept. of the Interior, Onshore Oil and Gas Order Number 2, Section III, Drilling Abandonment Requirements, 53 Fed. Reg. 46,810 - 46,811 (1988)	Human health and safety
NPS Director's Order 12 and Handbook – Conservation Planning, Environmental Impact Analysis, and Decision Making (2001)	All resources including natural resources, cultural resources, human health and safety, socioeconomic environment, visitor use
NPS Director's Order 28 – Cultural Resource Management (1998)	Cultural, historic, and ethnographic resources
NPS Director's Order and Reference Manual 53 – Special Park Uses (2000)	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, threatened and endangered species, visitor use and experience, and visual resources
NPS 66 – Minerals Management Guideline (1990)	Natural resources, human health and safety
NPS Reference Manual 77 – Natural Resources Management (1991)	Natural resources
NPS Director's Order and Procedural Manual 77-1 – Wetland Protection (2002)	Wetlands
NPS Director's Order and Procedural Manual 77-2 – Floodplain Management (2003)	Floodplains
Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation," 48 Fed. Reg. 44716 (1983), also published as Appendix C of NPS Director's Order 28 – Cultural Resource Management	Cultural and historic resources
Government-to-Government Relations with Native American Tribal Governments, Presidential Memorandum (April 29, 1994)	Native Americans – Tribal rights and interests
Selected Texas Laws and Regulations	
Texas Natural Resources Code, Title 2, Chapter 40 (Oil Spill Prevention and Response Act of 1991, also liability for natural resources damages from spills), TX. NAT. RES. CODE tit. 2, § 40 (1991)	Human health and safety, natural resources
Texas Natural Resources Code, Title 3, Chapters 81 through 85 (oil and gas operations) (TAC tit. 16, part 1, § 3)	Human health and safety, natural resources
Title 16 Texas Administrative Code Part 1 – Railroad Commission of Texas, Chapter 3 – Oil and Gas Division	Human health and safety, natural resources

THE PLANNING PROCESS

The oil and gas management planning process consists of the following steps:

- establish a planning team;
- develop the purpose and need for the plan and the planning objectives;
- scope with the public and governmental agencies;
- identify resources and concerns, and collect data;
- identify resources and concerns to be addressed in the plan, and those to be dropped from further analysis;
- generate alternatives;
- assess the impacts of each alternative; and,
- document the results of the analysis.

Establishing a Planning Team

The first step in the planning process was to establish an interdisciplinary planning team (IDT). The IDT consists of approximately 55 team members, including NPS, U.S. Geological Survey (USGS), and contract technical specialists. Eighteen NPS staff are chiefly responsible for developing the Plan/EIS. Two members have worked in the oil and gas industry, while eight others have experience working with the oil and gas industry on regulatory and operational issues. Other NPS staff who contributed to the production of the Plan/EIS provide expertise in the areas of geographic information systems; environmental statutes and regulations; and a range of resource issues and concerns including nonfederal oil and gas development, air quality, geology, water resources, floodplains, vegetation, wetlands, fish and wildlife, threatened and endangered species, cultural resources, visitor use and experience, and adjacent land uses and resources.

Through internal and public scoping, the planning team identified no cooperating agencies in the development of the Oil and Gas Management Plan/EIS.

Through internal scoping, the planning team identified the following federal and state agencies that may be involved in the permitting process for nonfederal oil and gas operations and transparks pipeline activities within the Preserve. None of these agencies asked to be a cooperating agency. The agencies and affiliated groups include:

- The NPS consults with the following entities on a project-by-project basis if a proposal could have effects on floodplains or wetlands:

**U.S. Environmental Protection Agency,
Federal Emergency Management Agency,
U.S. Fish and Wildlife Service,
U.S. Geological Survey,
U.S. Army Corps of Engineers,
Natural Resources Conservation Service,
State A-95 (EO12372) Clearinghouse, and
River Basin Commissions, which may include the Trinity River Authority,
Upper Neches River Municipal Water Authority, Angelina and Neches River
Authority, and Lower Neches Valley Authority.**

If the proposed action involves locating operations in a floodplain or wetland, a Statement of Findings (SOF) will be prepared. The Statement of Findings documents why there is no practicable alternative to locating in or impacting these areas and certifies that no critical

actions are involved. The SOF is made available for review and comment concurrently with the NEPA analysis.

- **U.S. Fish and Wildlife Service (FWS).** Pursuant to the Endangered Species Act, the NPS consults with the FWS on a project-by-project basis to request an updated list of federally-listed threatened, endangered, and sensitive species in the project area, and to evaluate the adequacy of resource survey information and associated mitigation measures being employed to avoid potential adverse impacts to listed species or their habitat.
- Also pursuant to the Endangered Species Act, the NPS consults with the **Texas Parks and Wildlife Department** on a project-by-project basis to request an updated list of state-listed species, and to evaluate the adequacy of resource survey information and associated mitigation measures being employed to avoid or mitigate potential impacts to state-listed threatened/endangered species or their habitat.
- **Texas Parks and Wildlife Department, Texas State General Land Office, and Texas Commission on Environmental Quality (formerly the Texas Natural Resource Conservation Commission)** share natural resource trusteeship of the biota (plant and animal life), submerged lands, and groundwater, respectively, at Big Thicket National Preserve.
- **Texas Commission on Environmental Quality (TCEQ)** is the designated state on-scene coordinator for onshore oil and all chemical releases. The TCEQ also is the state agency designated by the U.S. Environmental Protection Agency to administer the statewide permitting program under the Clean Air Act. Pursuant to Section 401 of the Clean Water Act, TCEQ is also responsible for conducting Section 401 state water quality certification reviews of COE Section 404 permit applications for the discharge of dredge or fill material into the water of the United States, including wetlands. TCEQ is the lead agency that administers the Section 401 certification program except with respect to oil and gas exploration and production, which is the responsibility of the Railroad Commission of Texas (TNRCC, 1999).
- **Texas State General Land Office** administers the leasing program for state-owned oil and gas. In the Preserve, the state's oil and gas are located beneath the Neches River and navigable reaches of Pine Island Bayou. It also administers the federally-approved Coastal Zone Management Program (CZMP), which includes a portion of the Beaumont Unit of Big Thicket National Preserve. The NPS would coordinate with the Coastal Coordination Council to seek a consistency determination with the CZMP whenever a plan of operations may have the potential to adversely affect coastal natural resource areas.
- **U.S. Coast Guard and U.S. Environmental Protection Agency** respond to releases of contaminating and hazardous substances in coastal and terrestrial environments, respectively. The NPS reports releases of oil and contaminating and hazardous substances to the National Response Center under the requirements of the National Contingency Plan.
- **Texas State Historic Preservation Officer (SHPO).** Pursuant to § 106 of the National Historic Preservation Act, the NPS consults with the SHPO on a project-by-project basis to evaluate the adequacy of cultural resources information and to assess and mitigate effects on cultural resources.

- **Railroad Commission of Texas (RCT).** This State agency administers state requirements for oil and gas production and pipeline safety and environmental protection under its Statewide Oil and Gas Rules. RCT regulates and controls the orderly exploration, development, and production of oil, gas, and geothermal resources for the State under its Conservation Rules and Regulations, which apply to all fields and districts in the State. Operations within RCT jurisdiction include, but are not limited to: a) drilling, operating, or producing any oil, gas, or oil and gas waste disposal well; b) transporting, reclaiming, treating, processing, or refining crude oil, gas, and products; c) discharging, storing, handling, transporting, reclaiming, or disposing of oil and gas waste; d) operating a directional survey company; e) operating a pipeline; and f) operating as a cementer approved for plugging wells.
- **U.S. Army Corps of Engineers (COE)** administers § 404 permitting for dredge and fill into waters of the United States. Operations that require a § 404 permit would consult with the Corps of Engineers. The COE would also approve wetlands delineations by operators and evaluate potential direct and indirect impacts on wetlands.

However, in many cases, the § 404 permit program does not meet the wetlands protection directives of E.O. 11990 for National Park resources. E.O. 11990 covers a broader range of actions that can adversely impact wetlands, including groundwater withdrawals, water diversions, drainage, pumping, flooding, dredging, channelizing, filling, nutrient enrichment, diking, impounding, placement of structures or other facilities, and other activities that degrade natural wetland processes, functions, or values.

The Corps of Engineers also administers permitting under § 10 of the Rivers and Harbors Appropriation Act of 1899. A Department of Army authorization is required for work in, on, or below navigable waters of the United States. Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. (33 CFR § 329.4)

- **Department of Transportation** administers several federal statutes pertinent to oil and gas pipeline safety and environmental protection. The Department's pipeline regulations are codified at 49 CFR Parts 190 through 195.

In addition to the state and federal agencies listed above, the NPS identified groups with ethnographic affiliation with Big Thicket National Preserve. Pursuant to Section 106 of the National Historic Preservation Act, the NPS is responsible for determining whether or not historic properties to which American Indian Tribes may ascribe cultural or religious significance may be affected by its undertakings. The **Alabama-Coushatta Tribe of Texas** and **Coushatta Tribe of Louisiana** were consulted during the development of this plan because their customary homeland was in the north and west edges of the Big Thicket. The NPS consulted with the Tribes to inform them of the planning process and issues that could affect lands and resources that may be significant to them, and to determine if there were any resource issues with which the Alabama and Coushatta Tribes had traditional cultural association. During an October 1998 meeting between the NPS and representatives of the tribes, specific ethnographic resources that might be affected by oil and gas developments were identified. In particular, preservation of the Coushatta Trace, bisecting the Big Sandy Unit, was identified. To ensure the preservation of ethnographic resources, the NPS will continue to consult with the Tribes on a case-by-case basis as proposed plans of operations are submitted.

Developing Planning Objectives

The planning objectives of this Plan/EIS are to:

- Identify Preserve resources and values susceptible to adverse impacts from oil and gas operations.
- Establish performance standards and impact mitigation measures for oil and gas operations to protect and prevent impairment to Preserve resources and values from adverse impacts from oil and gas operations.
- Establish performance standards and impact mitigation measures for oil and gas operations to avoid or minimize impacts from oil and gas operations on visitor use and enjoyment, and human health and safety.
- Provide holders of oil and gas rights reasonable access for exploration and development.
- Provide pertinent information to oil and gas operators to facilitate planning and compliance with NPS and other applicable regulations.

Scoping with the Public and Governmental Agencies

Public scoping is required under the National Environmental Policy Act (NEPA). Scoping involves the solicitation of comments from the public regarding projects that are considered “major federal actions” under the NEPA. Issues and concerns raised by the public during scoping are used by the NPS to establish what topics need to be addressed in the EIS and to develop a reasonable range of alternatives to address these issues and concerns. The public scoping process undertaken during the development of the Plan/EIS is described in Chapter 5, Consultation and Coordination.

All issues, concerns, and alternatives identified during public scoping have been considered by the NPS for inclusion in the Plan/EIS. A Scoping Analysis is provided in Table 5.1, Consultation and Coordination chapter, which lists public comments received during scoping.

While the NPS considers public comments throughout the EIS process, specific opportunities for the public to submit comments are during the public scoping period and during the public review of a Draft Plan/EIS. During the review of the Draft Plan/EIS, the public was encouraged to review and evaluate the analysis and provide written comments to the NPS whether the issues that were raised during scoping have been adequately addressed and whether the analysis of environmental impacts is sufficient. The Draft Plan/EIS is followed by the Final Plan/EIS that includes corrections and additions to the text. All substantive written comments submitted on the Draft Plan/EIS are addressed by the NPS either by providing clarification of information, modifying text, or directly responding in the Final Plan/EIS. This Final Plan/EIS contains a reprint of all substantive comment letters and NPS responses. The Final Plan/EIS will be released for a standard 30-day “No Action” period prior to the NPS issuing a Record of Decision (ROD). Upon issuance of the ROD, the selected plan alternative will be implemented.

Identifying Resources and Concerns, and Collecting Data

The interdisciplinary team, through comments submitted during the public scoping period, identified the following resources and concerns that could be affected by implementation of the Plan/EIS:

Resources

- Air quality
- American beech-southern magnolia-loblolly pine forests
- Cultural resources
- Ecological research and monitoring plots
- Fish and wildlife
- Geology and soils
- Old growth trees
- Park administrative areas
- Royal Fern Bog research plot
- Riparian corridors
- Sandhill pine forests
- Swamp cypress-tupelo forests
- Species of special concern
- Upland pine forests
- Vegetation
- Visitor use areas
- Water resources and floodplains
- Wetland baygall shrub thickets
- Wetland pine savannas
- Wetlands

Concerns

- Adjacent land uses and resources
- Local and regional economies
- Park operations (prescribed fire and facility management)
- Nonfederal oil and gas development
- Visitor use and experience, including human health and safety

During 1998 and 1999, additional information and field data were collected in the areas of wetlands, archeology, noise, and visitor use and experience. All of the topics listed above were analyzed by the planning team and presented and discussed during the public scoping process described above. Criteria were developed to evaluate relative importance of these resources and concerns in relation to the Preserve and the proposed oil and gas operations.

Based on the planning team's evaluation of these resources and concerns, and input received during public scoping, Special Management Areas were identified as being particularly susceptible to adverse impacts from oil and gas activities or are essential to maintain the ecological integrity of the Preserve. These Special Management Areas are:

Table 1.2. Special Management Areas

RESOURCE/VALUE	SPECIAL MANAGEMENT AREA (SMA)
Floodplains	Riparian Corridors, including: <ul style="list-style-type: none">• Floodplain Hardwood Forests• Floodplain Hardwood Pine Forests
Vegetation	Ecological Research and Monitoring Plots, including: <ul style="list-style-type: none">• Fire Monitoring Plots• Long-term Monitoring Plots Rare Vegetation Communities, including: <ul style="list-style-type: none">• Upland Pine Forests• American Beech-Southern Magnolia-Loblolly Pine Forests• Sandhill Pine Forests• Old Growth Trees

RESOURCE/VALUE	SPECIAL MANAGEMENT AREA (SMA)
Wetlands	<p>Rare Forested Wetland Communities, including:</p> <ul style="list-style-type: none"> • Wetland Baygall Shrub Thickets • Swamp Cypress-Tupelo Forests • Wetland Pine Savannas • Old Growth Trees <p>Ecological Research and Monitoring Plots, including:</p> <ul style="list-style-type: none"> • Royal Fern Bog Research Plot
Visitor Use, Administrative and Other Use Areas	<p>Visitor Use and Other Use Areas</p> <ul style="list-style-type: none"> • Day-Use Areas (26 boat ramps, picnic areas and parking areas) • Hiking Trails (9) • Canoe Routes (4) • Administrative Areas (4) • Cemeteries (3) • Private Residences (2) • Birding Hot Spots (seasonally at 8 locations) • Hunting Areas (seasonally in 5 units)

Resources and Concerns to be Addressed in the Plan

The Council on Environmental Quality regulations, at 40 CFR § 1501.7(a)(2) require the NPS to “Determine the scope and the significant issues to be analyzed in depth in the environmental impact statement,” and (3) “Identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review, narrowing the discussion of these issues in the statement to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere.”

Of the resources and concerns initially listed, the following were considered environmental issues warranting further study, and are carried through the EIS for detailed analysis.

- Nonfederal Oil and Gas Development
- Air Quality
- Geologic Resources
- Water Resources
- Floodplains
- Vegetation
- Wetlands
- Fish and Wildlife
- Species of Special Concern
- Cultural Resources
- Visitor Use and Experience
- Adjacent Land Uses and Resources

For each of the resources and concerns listed above, the interdisciplinary team developed issue statements to define problems (or benefits) pertaining to oil and gas development in the Preserve (Table 1.3.). Issue statements describe a cause and effect relationship between an activity and a resource.

The remaining topics on the initial list of resources and concerns were not carried through for detailed analysis. The reasons for dismissing them are discussed at the end of this chapter.

Table 1.3. Issue Statements

ISSUE STATEMENTS	
NONFEDERAL OIL AND GAS DEVELOPMENT	
A comprehensive oil and gas management plan would provide pertinent information about Current Legal and Policy Requirements, resource-specific performance standards, mitigation measures and operating stipulations that would guide nonfederal oil and gas operations in the Preserve so that both operators and NPS staff plan more efficiently for nonfederal oil and gas operations in the Preserve.	
An operator's uncertainty regarding applicable legal and policy requirements, performance standards, and mitigation measures could cause delays and increase planning time and costs. The lack of a comprehensive plan could result in project delays or, at worst, the denial of a Plan of Operations.	
AIR QUALITY	
Air quality in the Preserve is influenced by the Beaumont/Port Arthur/Orange and Houston/Galveston airsheds, and the Preserve is within the Nonattainment Area for ozone in Liberty, Hardin, Jefferson and Orange Counties. Specific pollutants can impair visibility, injure vegetation and fish and wildlife, damage materials, affect water quality (e.g., acidify water), and affect human health and welfare.	
Construction of roads, wellpads, production facilities, flowlines and pipelines; vehicle use on and off paved roads; and exhaust from combustion of gasoline and diesel-powered vehicles and equipment used for drilling and production operations will increase emissions of particulate matter which could affect air quality, including visibility in the general vicinity of the Preserve.	
Drilling, production, transport and storage of hydrocarbons; the use of gasoline and diesel-powered engines (vehicles, generators, compressors, etc.); and maintenance activities such as use of herbicides for vegetation control on and around operations sites, emit pollutants including nitrogen oxides, volatile organic compounds carbon monoxide, sulfur dioxide, particulate matter, and objectionable odors. These emissions could degrade air quality within the Preserve and could contribute towards regional air quality degradation. Nitrogen oxides and volatile organic compounds are primary precursors to ozone formation, which, depending on ambient concentrations, can have damaging effects on some vegetation and the health of humans and wildlife.	
GEOLOGIC RESOURCES	
Oil and gas activities including off-road vehicle use; shothole drilling and detonation; and construction, maintenance, and use of roads, wellpads, production facilities, flowlines and pipelines could increase surface runoff; increase soil erosion, rutting and compaction; affect the permeability of soils (and other soil characteristics); and could directly and indirectly affect the growth and regeneration of vegetation.	
Soils compacted by foot or vehicle use could reduce soil permeability, change surface drainage patterns, and hinder the penetration of plant roots. In general, clayey soils are more subject to compaction than sandy soils.	
The release of hydrocarbons or other contaminating and hazardous substances from vehicles and equipment, exploration and production operations, and flowlines and pipelines could alter the soil's chemical and physical properties. Changes in soil properties could result from direct contact with contaminants or indirectly via runoff from contaminated areas which could impair water quality, and affect the soil's ability to support plant and animal species and their habitat.	
WATER RESOURCES	
Off-road vehicle use; removal or modification of vegetation; and surface disturbance associated with the construction, maintenance and use of roads, wellpads, production facilities, flowlines and pipelines could increase soil erosion and sedimentation in surface waters. These activities could also alter surface and subsurface drainage patterns in the vicinity of operations which could change the overall amount and timing of stream flows – directly affecting stream channel structure or form, rate of meandering or migration, sedimentation, water quality, and the amount and type of aquatic habitat.	
The release of hydrocarbons, or other contaminating and hazardous substances from vehicles and equipment used for exploration and production operations, or from flowlines and pipelines could impair water quality. Impaired water quality could affect the growth and survival of vegetation, cause declines in fish and wildlife populations, affect recreational uses, and harm human health and safety.	
Reclamation of oil and gas sites could adversely affect water quality and quantity over the short-term. However, long-term benefits could occur when native vegetation communities and surface and subsurface water flow are re-established.	
FLOODPLAINS	
Floodplains comprise approximately 50 percent of the Preserve, and in some cases there may be no practicable alternative to locating roads, wellpads, production facilities, and flowlines and pipelines in or	

across floodplains. These activities could potentially harm (from the hydraulic and erosive forces of flooding) life, property, and floodplain resources, functions, values and uses.
The siting, maintenance, and use of roads, wellpads, production facilities, and flowlines and pipelines in floodplains, or the release of hydrocarbons or other contaminating and hazardous substances from these operations, could adversely affect floodplain functions, values and uses, including: the natural moderation of floods; water quality; sediment control; groundwater recharge or discharge; fish and wildlife habitat; maintenance of biodiversity; recreational opportunities; and natural beauty.
Reclamation activities such as re-establishing the contour of the area, surface and subsurface water flow; controlling non-native vegetation; and reestablishing native vegetation communities could restore natural and beneficial floodplain functions, values, and uses.
VEGETATION
Vegetation could be cut along survey and seismic lines, routinely cut along flowlines and pipelines or totally removed in areas for the construction of roads, wellpads, production facilities, and flowlines and pipelines. Vegetation removal could change the structure and composition of vegetation communities; alter wildlife habitat and species composition; increase storm runoff; and increase soil erosion and sedimentation in adjacent streams.
Roads, wellpads, production facilities, and flowlines and pipelines could disrupt surface and subsurface water flow, which may adversely affect the localized water budget necessary to maintain vegetation communities. There could be greater adverse impacts on upland vegetation communities such as the Sandhill Pine Forest, Upland Pine Forest, and Wetland Pine Savanna.
Ecological research and monitoring plots contribute to a better understanding of park resources and their use and management. Surface disturbance within plots may alter the accuracy of the study results.
The release of hydrocarbons, or other contaminating and hazardous substances could damage or kill vegetation via direct contact with contaminants, or indirectly via pathways from contaminated areas.
Reclamation of oil and gas sites could re-establish native vegetation communities and surface and subsurface drainage patterns, and provide for the safe movement of wildlife.
WETLANDS
Wetlands comprise approximately 40 percent of the Preserve, and there may be no practicable alternative to locating roads, wellpads, production facilities, and flowlines and pipelines in or across wetlands. Their use and maintenance could adversely affect wetland functions and values including: wetland processes; natural moderation of floods; sediment control; maintenance of water quality; groundwater recharge or discharge; habitat for fish and wildlife (including habitat for species of special concern); maintenance of biodiversity; recreational opportunities; and natural beauty.
The release of hydrocarbons, or other contaminating and hazardous substances in or near wetlands could adversely affect wetlands (i.e., wetland vegetation, soils and water), and the diverse assemblage of aquatic and terrestrial life supported by wetlands.
Reclamation of oil and gas sites could restore wetland functions and values. These activities could include re-establishing natural contours, surface and subsurface water flow, and natural vegetation communities and controlling non-native vegetation.
FISH AND WILDLIFE
Oil and gas activities including off-road vehicle use; shothole drilling and detonation; and construction, maintenance, and use of roads, wellpads, production facilities, and flowlines and pipelines, could adversely affect fish and wildlife. These activities could increase predation in open areas; directly harm or kill fish and wildlife; and disrupt wildlife feeding, denning, nesting, and spawning/reproduction. These activities could also result in avoidance of the area by wildlife due to increased noise and human presence.
Loss or modification of fish and wildlife habitat could occur from the construction of roads, wellpads, production facilities, and flowlines and pipelines. These activities could increase edge effects, increase human access, and alter wildlife species and composition.
The release of hydrocarbons or other hazardous and contaminating substances from vehicles, drilling and production equipment, leaks or rupture of flowlines and pipelines could injure or kill fish and wildlife. The adverse effects could become worse over time if fish and wildlife species ingest the contaminants and are consumed by other fish and wildlife species.
Heavy equipment used for reclamation operations could injure or kill fish and wildlife, and degrade water quality over the short-term. However, reclamation of oil and gas sites over the long-term could re-establish native vegetation communities and surface and subsurface water quality and quantity that support fish and wildlife populations.

SPECIES OF SPECIAL CONCERN
There are 48 species listed as threatened, endangered, or species of concern in the seven counties containing units of the Preserve. Approximately 28 of these species have been documented or have the potential to occur in the Preserve. Where there is the potential for adverse effects on a species or their habitat, mitigation would be required by the NPS, in consultation with the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department. Even with these protective measures in place, there is the potential for an incidental take of a threatened, endangered, or species of concern.
Reclamation of oil and gas sites could re-establish native vegetation communities and surface and subsurface drainage patterns that support threatened, endangered, or species of special concern.
CULTURAL RESOURCES
Seismic lines, roads, flowlines, and pipeline rights-of-way could increase access to cultural resources, and result in illegal activities such as vandalism, artifact collection, and excavation.
Detonation of seismic explosives; the construction and use of roads, wellpads, production facilities, and flowlines and pipelines; and containment or cleanup of leaks and spills could alter the distribution, disturb or destroy surface or buried archeological materials, and alter the condition of ethnographic resources, historic structures, and cultural landscapes.
Leaks and spills of hydrocarbons or other hazardous and contaminating substances from vehicles and equipment along access roads or from wellsites, production sites, or flowlines and pipelines could damage or destroy cultural resources.
VISITOR USE AND EXPERIENCE
Oil and gas operations could pose a threat to human health and safety from a number of sources, including, the use of roads by commercial vehicles (particularly vehicles with less maneuverability and visibility); moving equipment at wells and production facilities; improper well control; and flowline or pipeline failure. The spill or release of hydrocarbons or other contaminating and hazardous substances could be inhaled, absorbed, or ingested by human beings.
Oil and gas operations could adversely affect air quality; alter scenic resources; increase background sound levels; and impair water quality. These effects could adversely affect or preclude visitor uses and experiences in certain areas of the Preserve such as hunting, fishing, boating, swimming, picnicking, camping, participating in NPS programs, bird watching, nature study, and solitude.
ADJACENT LAND USES AND RESOURCES
Big Thicket National Preserve is made up of 15 separate units, 12 of which are analyzed in this Plan/EIS. Most of the Preserve is surrounded by public and private lands. Operators may decide to explore for and develop nonfederal oil and gas from underlying the Preserve from locations outside the Preserve. The siting of operations outside the Preserve could result in adverse impacts on adjacent landowners, resources and uses. Beneficial effects of siting nonfederal oil and gas operations outside the Preserve could include the construction or improvement of roads and bridges on adjacent lands.

Resources and Concerns Evaluated and Dropped from Detailed Analysis

For the following two resources and concerns, the interdisciplinary team concluded that, with application of all required mitigation under the required Current Legal and Policy Requirements, that the anticipated impacts would be negligible, so they were dropped from further analysis.

Details on these resources/issues are provided below.

- Local and Regional Economies
- Park Operations for Fire and Facility Management

In addition to the resources/concerns listed above, the following topics were dropped from further analysis. The basis for dismissing these topics is provided below.

- Possible Conflicts Between the Proposed Action and Land Use Plans, Policies, or Controls
- Sustainability and Long-term Management, and Energy Requirements and Conservation Potential
- Environmental Justice
- Prime and Unique Farmlands

The following discussion provides a brief summary of these topics and includes the specific reasons why these were eliminated from detailed evaluation.

Local and Regional Economies: Big Thicket National Preserve contributes to the local economy by adding sales, taxes, and employment related to the acquisition of services, supplies and materials needed to administer the Preserve. In addition, tourism-related expenditures contribute to the local economy and also create jobs to support tourism. The Preserve's impact on the local economy in fiscal year 2001, has been calculated by using the Money Generation Model, developed by the National Park Service's Office of Social Science. The Money Generation Model was originally developed by Dr. Ken Hornback (USDI, NPS, 1995). The purpose of the Money Generation Model is to estimate the impacts of NPS visitor spending on the local economy. Economic impacts are summarized in terms of sales, income, employment, and value added. The Money Generation Model focuses primarily on the economic impacts of visitor spending and uses an Excel workbook to carry out these calculations. Big Thicket National Preserve hosted 100,000 recreation visits in 2001. In 2001, visitors to Big Thicket National Preserve spent \$5.89 million dollars which supported a total of \$7.26 million in sales, \$2.60 million in personal income, 155 jobs, and \$4.10 million in value added.

In the event of a serious oil spill, release of hydrogen sulfide gas, accident involving serious personal injury or death, or fire, the public could perceive that the Preserve is not a desirable place to visit. Tourism could fall, resulting in reduced revenues to the local economy. However, the likelihood of this happening is relatively small, and nonfederal oil and gas operators are required to take technologically feasible precautions to prevent accidents and fires (36 CFR § 9.46).

During the period from January 2004 through January 2005, 1,272 drilling permits were issued by the Railroad Commission of Texas in the 29 counties comprising District 3. For the seven-county area encompassing the Preserve (Hardin, Jasper, Jefferson, Liberty, Orange, Polk, and Tyler Counties), 356 drilling permits were issued, comprising 28 percent of the District-wide total. Production for 2004 in District 3 totaled 40,929,218 bbls of oil and condensate, and 647,023,981 mcf natural gas from gas wells and casingheads. In the 7-county area encompassing the Preserve, production of oil from all sources totaled 12,164,350 bbls (30 percent of the District total), and 177,198,300 mcf natural gas from all sources (27 percent of the District total) (RRC 2004).

From 1998 through 2000, no wells were drilled in or outside the Preserve to develop the underlying hydrocarbons. From 2001 through June 2005, 19 directional wells were drilled from surface locations outside the Preserve to reach bottomhole targets beneath the Preserve. During 2004 and up to June 1, 2005, applicants received § 9.32(e) exemption determinations for 15 additional directional wells. The historic drilling activity in the Preserve is further described in the Nonfederal Oil and Gas Operations section in Chapter 3.

Hydrocarbon exploration, drilling, or production inside Big Thicket National Preserve would not be precluded under any of the alternatives presented in this Plan/EIS. Oil and gas targets that could not be drilled from surface locations within the Preserve could still be directionally developed by directional and/or horizontal drilling. In some cases, surface use restrictions may be exempted (see

Chapter 2, Exemptions from This Plan). Any changes in the level of oil and gas exploration and production resulting from this plan would be minor compared to the overall activity in the region.

Discernible changes in revenue flow, salaries, unemployment rates, utilization of local goods and services, or conflicts with existing ways of life are not expected. Since the impact to the local and regional economies from implementing any of the alternatives in this plan would likely be negligible, this impact topic was eliminated from further detailed analysis.

Park Operations for Fire and Facility Management: “The Preserve’s General Management Plan identifies three management zones: natural, development and special use zones. This zoning system, common to most natural parks, recognizes differences in resources and focuses future management on particular types of activities and developments appropriate for each zone. Management zoning specifies how the Preserve is to be managed at full plan [GMP] implementation, not merely how the area is currently managed (GMP 1980).”

Most of the Preserve is included in the natural zone, which places management emphasis on conservation of natural resources and processes while providing for uses that do not adversely affect these resources and processes. The development zone defines and limits areas in the Preserve that may be used for certain types of development to serve the needs of park management and the public. Design and environmental factors are fully considered before development plans are implemented. Present development includes the maintenance and meeting facility, Big Thicket Information Station, Big Thicket Visitor Center, Turkey Creek Ranch House, and day-use areas. For all operations in the natural zone, appropriate mitigation measures under Current Legal and Policy Requirements would require remediation of any environmental damage and reclamation of the disturbed area. Also, Current Legal and Policy Requirements, specifically 36 CFR § 9.41(a), provide that “surface operations shall at no time be conducted within 500 feet of any structure or facility (excluding roads) used for unit interpretation, public recreation or for the administration of the unit, unless specifically authorized by an approved plan of operations.” Application of this requirement is expected to avoid or minimize impacts on most Preserve operations.

The purpose of the Preserve’s Fire Management program is to restore vegetation structure and distribution through the natural interaction of fire in the landscape. Land use practices prior to establishment of the Preserve (especially fire suppression) have promoted an overabundance of Loblolly pine and brush in upland vegetation types and caused significant loss of upland grass/forb groundcover. Wildfire control and the protection of structures within the Preserve, and on adjoining lands, utilize tactics appropriate to the values at risk, fire intensity, and resource damage. Preserve fire staff would need to plan prescribed fire burns with consideration of existing oil and gas operations and pipelines. Fires that occur within oil and gas operations areas and within pipeline corridors would continue to be the responsibility of the operator, and response activities would generally follow the prescribed methods addressed in the operator’s plan of operations.

The facilities management program of the Preserve maintains the Preserve’s built structures (e.g., maintenance facility, Information Station), roads and trails, picnic areas, restrooms, and the infrastructure that supports these facilities and developments, which include water wells and electrical power. New oil and gas operations could result in increased use of Preserve roads that could likewise require increasing the frequency of road maintenance by the Preserve. In the event that road maintenance increases to a level beyond the Preserve’s current routine maintenance program, the Preserve could charge a fee for registration of commercial vehicles and use of roads pursuant to 36 CFR § 9.50.

In general, Preserve operations are not expected to be adversely affected more than negligibly by the proposed oil and gas development under any of the alternatives. Preserve operations that might be adversely affected are addressed in other topics that include the specific operation or area in question. Current Legal and Policy Requirements provide minimum standard protection, such as

provided by offsetting oil and gas operations a minimum 500 feet from park developments and visitor use areas, thereby avoiding conflicts between Preserve facility management activities and oil and gas operations. These requirements also provide adequate mechanisms to ensure wells are properly drilled and plugged to protect ground water quality and quantity. For these reasons, Preserve Operations, including Fire Management and Facilities Management were eliminated from further detailed analysis. Preserve management of nonfederal oil and gas activities, and pipeline right-of-ways, are discussed in Chapters 3 and 4.

Possible Conflicts between the Proposed Action and Land Use Plans, Policies, or Controls: This Plan/EIS is consistent with the NPS Organic Act, park enabling legislation, the General Management Plan for Big Thicket National Preserve, and all applicable policies and controls.

Sustainability and Long-term Management, and Energy Requirements and Conservation Potential: This Plan/EIS is not concerned with construction and maintenance of dwellings or structures for public use; therefore, this topic is not evaluated.

Environmental Justice: Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. None of the alternatives considered would result in disproportionate direct or indirect negative or adverse effects on any minority or low-income population or community. The impacts on the natural and physical environment that occur from any of the alternatives would not significantly and adversely affect any minority or low-income population or community. Therefore environmental justice was dismissed as an impact topic.

Prime and Unique Farmlands: As a result of a substantial decrease in the amount of open farmland, Congress enacted the Farmland Protection Policy Act (Public Law 97-98). In August 1980, the Council on Environmental Quality directed that federal agencies must assess the effects of their actions on prime or unique farmland soils classified by the U.S. Department of Agriculture’s Natural Resources Conservation Service (NRCS). Prime or unique farmland is defined as a soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland is defined as soil that produces specialty crops such as fruits, vegetables and nuts. Prime and unique farmland soils are those that are actively being developed and could be converted from existing agricultural uses to nonagricultural purposes, as described above. None of the soils in the project area are classified as prime or unique farmland soils. Therefore, the topic of prime and unique farmland soils was dismissed as an impact topic in this document.

Generating and Evaluating Alternatives

The issue statements, and SMAs, were used in developing and evaluating alternatives. The plan alternatives are described in Chapter 2. In addition to the No Action/Current Management Alternative, two plan alternatives are described and evaluated in this Plan/EIS. The history of nonfederal oil and gas development in the Preserve, and Preserve resources and values are described under Affected Environment, Chapter 3; and the impacts anticipated from the alternatives are described in detail in Chapter 4. A comparative summary of impacts is included in Tables S.2 and 2.17.