



Case No.



0000057809

Docket No.:

L-0000A-06-0295-00130

**SUPPLEMENTAL
PACKET #2**

AUGUST 2006

**APPLICATION FOR
A CERTIFICATE OF
ENVIRONMENTAL
COMPATIBILITY**

**DEVERS-PALO
VERDE NO.2
TRANSMISSION
LINE PROJECT**

Prepared for:

**Arizona Power Plant
and Transmission Line
Siting Committee**

Submitted by:

**Southern California
Edison Company**

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MR

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TABLE OF CONTENTS

TAB NO.

- 1 Testimony Presentation by Johannes P. Pfeifenberger on Costs and Benefits of the DPV2 Project in Arizona
- 2 Testimony Presentation by Randall Palmer on Visual Resources and Recreation in the Kofa NWR
- 3 BLM Right-of-Way Amendment Application
- 4 50 CFR 29.21
- 5 Comprehensive Management Plan, Kofa NWR & Wilderness

1



Telecommunications • Litigation • Finance • Environment • Energy

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**Testimony of
Johannes P. Pfeifenberger**

**before the
Arizona Power Plant and
Transmission Line Siting
Committee**

August 2006

Witness Background

- **Education**
 - ▶ M.S. (Dipl. Ingenieur) in Power Engineering and Energy Economics, University of Technology, Vienna, Austria, 1989
 - ▶ M.A. in Economics and Finance, Brandeis University, 1991
- **Professional**
 - ▶ Principal and Director of The Brattle Group, an economic consulting firm with offices in Cambridge, MA; Washington D.C.; San Francisco; London; and Brussels
 - ▶ Over 15 years of experience in energy economics, regulation, and policy
 - ▶ Co-manages The Brattle Group's utility practice area

Witness Background

- Experience
 - ▶ Assisting American Transmission Company in evaluation of transmission projects
 - ▶ Investigated 2000-01 Western power crisis and Enron gaming activities
 - ▶ Worked with independent transmission system operators (ISOs), including the California ISO (CAISO)
 - ▶ Testimony on transmission policy, utility rates, procurement planning, power contracts, and utility mergers before arbitration panel, FERC, and state regulatory commissions in CA, CO, IL, ME, and NY
 - ▶ Articles, reports, and presentations on transmission access, utility industry challenges, energy market modeling, ratemaking and incentive regulation, industry restructuring, and market power

3

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Overview of Testimony

- Regional perspective to provide context for DPV2
- Arizona results in SCE Report to CAISO
- Economic benefits of DPV2 on Arizona
- Impact on Arizona generation
- Impact on Arizona natural gas

4

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Summary of DPV2 Economic Impacts on Arizona

- DPV2 is important in regional transmission planning and reliability
- DPV2 provides a number of important economic benefits to Arizona
 - ▶ Reliability benefits
 - ▶ Construction and tax benefits
 - ▶ Liquidity, investment climate, and resource utilization benefits
 - ▶ Improved resource diversity and Arizona transmission access to low-cost coal and renewable resources
- The estimated value of these benefits to Arizona exceeds the estimate of Arizona costs found in SCE's report to CAISO

Summary of DPV2 Economic Impacts on Arizona

- DPV2 impact on Arizona generation is minimal because exports to California occur mostly during off-peak hours and off-peak seasons
 - ▶ Increases Arizona generation used for exports during peak load periods by only about 50 MW
- DPV2 impact on Arizona natural gas demand is minimal

Context for DPV2: Regional Perspective

The Need for New Transmission in the West

"Western Governors find that a strong and resilient transmission and distribution grid is critical to electricity affordability and reliability"

"Development of new electric transmission lines is important to allow the region to diversify its generating resources and protect the region from price and supply shortage shocks."

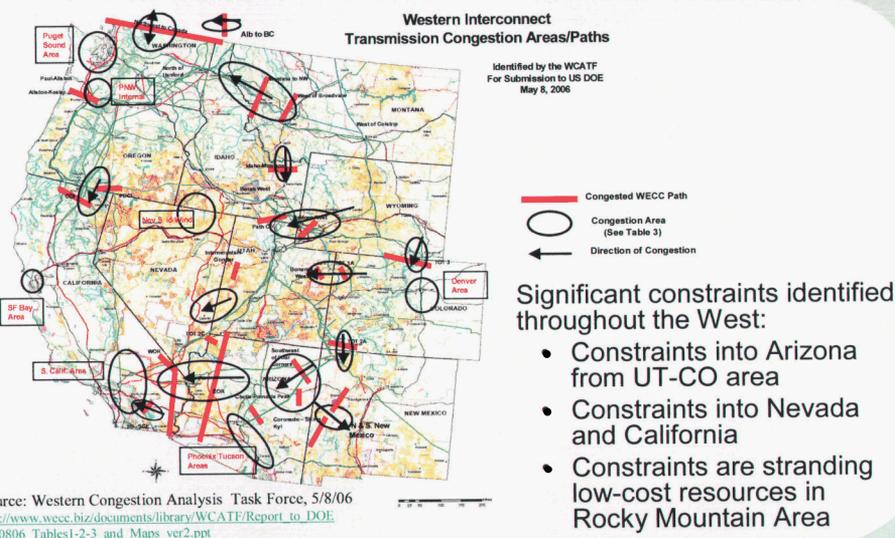
"Both inter- and intra-state transmission is needed to support [renewable] resources and should be fast tracked for permitting and environmental reviews ... Transmission is a critical limiting factor"

(Western Governors' Association Policy Resolution 06-10, "Clean and Diversified Energy for the West", p. 3; WGA 2006 Annual Report, p. 9; and Report of the Clean and Diversified Energy Advisory Committee (CDEAC) to the Western Governors, June 2006, p. 14) <http://www.westgov.org/wga/policy/06/clean-energy.pdf>; <http://www.westgov.org/wga/publicat/annrpt06.pdf>; <http://www.westgov.org/wga/initiatives/cdeac/CDEAC06.pdf>

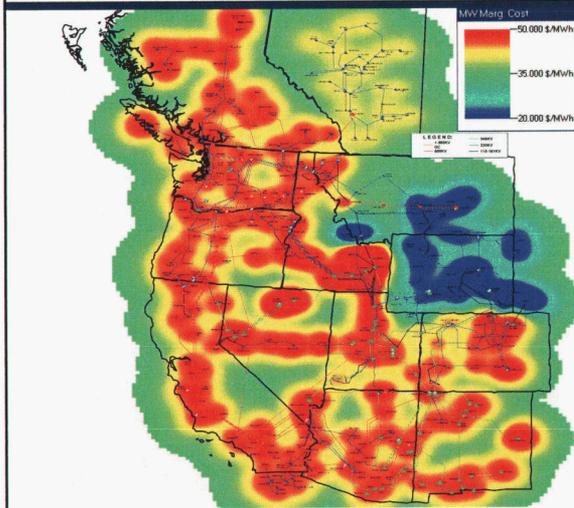
Regional Trade of Electricity and Other Energy

- Electric transmission facilitates regional trade of electricity, similar to trade in other products and services
- Trade across state lines is very common, including in energy products. For example:
 - ▶ Arizona does not have any oil refineries but imports its gasoline (approx. 3 billion gallons a year) from refineries in California (63%) and Texas (37%)
 - ▶ Baja LNG facility will supply both California and Arizona markets starting in 2008
 - ▶ Arizona utilities import power from plants in Colorado and New Mexico
 - ▶ Transmission projects (e.g., Frontier, TransWest Express) planned to bring low-cost coal and renewable resources in Rocky Mountain area to AZ, CA, NV and OR markets

Significant Constraints Exist Throughout the West



Constraints are Stranding Low-cost Resources



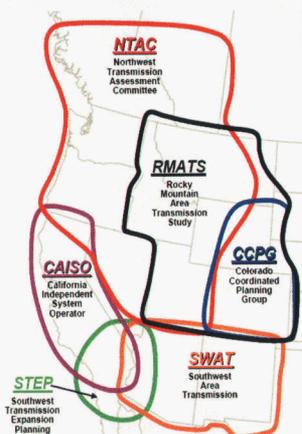
Rocky Mountain Area Transmission Study (as reported in Western Congestion Assessment Study, May 8, 2006)
http://www.wecc.biz/documents/library/WCATF/Report_to_DOE_050806_Templates_Report_ver3.doc

- RMATS congestion analysis shows low cost resources in WY and MT are trapped due to insufficient transmission capacity
- Stated RMATS objective: “construct new transmission to export an additional 3900 MW out of the RMATS region to meet needs in the West, particularly California”

11

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Transmission Options are Evaluated by a Number of Regional and Sub-regional Planning Efforts



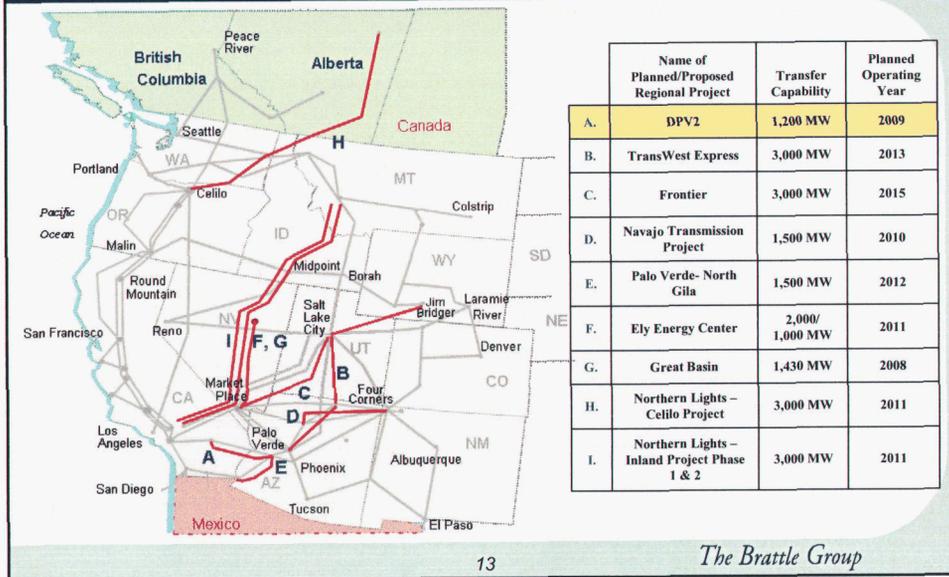
- Regional and sub-regional transmission planning groups
 - ▶ Groups include utilities, regulators, transmission providers, generators and other interested parties
 - ▶ WECC/SSG-WI studies region-wide needs and help coordinate sub-regional planning effort
- Committee on Regional Electric Power Coordination (CREPC)
 - ▶ Joint committee of the Western Interstate Energy Board (technical arm of WGA) and the Western Conference of Public Service Commissioners
 - ▶ Joined with WECC/SSG-WI to identify congested paths and facilitate planning
- Private initiatives
 - ▶ Frontier, TransWest Express, Northern Lights

RMATS - <http://www.state.wy.us/ldocx/subregional/home.htm> SWAT - <http://www.stpower.com/swat>
 CAISO - <http://www.caiso.com/boards/planning/index.html> STEP - <http://www.caiso.com/docs/2007/11/04/2007110417450022413.htm>
 NTAC - <http://www.nwsp.org/ntac> CCPG - <http://ccpg.hawaiienergy.com> CREPC 4.6.06 - SWAT Status of Transmission Expansion
http://www.westgov.org/wieb/meetings/crepcsprg2006/briefing/present/06Apr06/r_kondziolka.pdf

12

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DPV2 is Part of Regional Transmission Expansion



Arizona Results in SCE's Report to CAISO

Arizona Results of SCE's Report to CAISO

To understand the results in SCE's Report to the California ISO, it is important to understand:

- Background on California markets
- The meaning of terms and results shown in SCE's report to the CAISO
- DPV2 economic benefits not reflected in SCE's report

Arizona Results of SCE's Report to CAISO

To understand the results in SCE's Report to the California ISO it is important to understand:

- **Background on California markets**
- Meaning of terms and results shown in SCE's report
- DPV2 economic benefits not reflected in SCE's report

Overview of California Market Structure

- Restructuring of California utility industry in the late 1990s
 - ▶ California utilities (including SCE) were required to divest most of their generation assets to independent power producers and prevented to enter into long-term contracts
 - ▶ Formed CAISO to operate transmission system and spot market for power
- Changes since 2000-01 Western power crises
 - ▶ Instituted long-term resource planning under which utilities procure power through long-term contracts or plant ownership
 - ▶ Substantial new generation has been built in California and more is under construction or planned
 - ▶ New transmission has been and is being built to increase efficiency and insure against future market power abuses

DPV2 in Context of California Market Structure

- CAISO operates the transmission facilities for all its participants, which includes the regulated utilities (SCE, PG&E, SDG&E) and a number of small municipal utilities
 - ▶ SCE will own DPV2, but CAISO will operate and schedule it
 - ▶ No priority to SCE: all market participants have equal access to the additional transmission capacity, including Arizona utilities and independent generators
- All CAISO-operated transmission facilities are paid for by all users of the CAISO grid
 - ▶ DPV2 constructed and owned by SCE
 - ▶ DPV2 cost recovered from all users of the CAISO grid

Arizona Results of SCE's Report to CAISO

To understand the results in SCE's Report to the California ISO it is important to understand:

- Background on California markets
- **Meaning of terms and results shown in SCE's report**
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Arizona Results in SCE DPV2 Report

Arizona Benefits (Real \$2004 in millions)

	2009	2010	2011	2012	2013	2014
Consumer Surplus	(\$25)	(\$37)	(\$39)	(\$40)	(\$45)	(\$45)
URG Producer Surplus	\$18	\$27	\$29	\$29	\$31	\$30
Transmission Congestion Revenue	(\$1)	(\$2)	(\$2)	(\$2)	(\$2)	(\$2)
Net Benefits	(\$7)	(\$11)	(\$11)	(\$12)	(\$16)	(\$17)

Source: Figure 13, Appendix G, SCE Report to CAISO, March 17, 2005 update

Note:

- Only the "Net Benefits" are meaningful; shows a small (~0.2%) potential increase in variable costs to Arizona utilities before considering offsetting benefits
- "Consumer Surplus", "URG Producer Surplus", and "Transmission Congestion Revenues" are based on a calculation that assumes a fully restructured market in which power is sold and bought at spot market prices

Meaning of Terms Used in SCE Report

- SCE Report showing Arizona impact is based on CAISO TEAM framework and terminology for restructured markets:
 - ▶ "Consumer Surplus" assumes that Arizona utilities hypothetically supply all load at spot market prices
 - ▶ "URG Producer Surplus" are the hypothetical profits that Arizona's utilities would realize (and pass on to ratepayers) if all their generation was sold at spot market prices
 - ▶ "URG" means "utility-retained generation," e.g., generation owned by APS, SRP, TEP, not merchant generation
 - ▶ "Transmission Congestion Revenues" would be revenues collected by the Arizona utilities and passed on to customers if the utilities operated in a market with congestion pricing
- Only the sum, "Net Benefits" are a meaningful representation of Arizona costs (before considering offsetting benefits)

Features of SCE's Model Used for CAISO Report

- SCE studied DPV2 based on the CAISO's Transmission Economic Assessment Methodology ("TEAM")
- Used standard industry simulation model:
 - ▶ Estimates production costs and market clearing prices
 - ▶ Model inputs include existing and new generation and transmission facilities
 - ▶ Scenarios to capture uncertainties in load forecasts, natural gas prices, and hydro generation
- Like other models, also employs simplifying assumptions:
 - ▶ Perfect competition
 - ▶ No long-term contracts (all purchases at spot market prices)
 - ▶ No reliability dispatch of high-cost units
 - ▶ None of future Arizona generation is owned by utilities

Summary of Arizona Results in SCE Report to CAISO

- Only the sum, “Net Benefits,” measures estimated change in “costs” to Arizona utilities (before considering other benefits)
- Shows a small (~0.2%) potential increase in variable supply costs to Arizona utilities
- Even these “Net Benefits” overstate impact on Arizona:
 - ▶ Modeling assumptions overstate impact on quantified Arizona costs (e.g., assumes all new Arizona generation built by merchant generators)
 - ▶ The model does not address other offsetting benefits

Arizona Results of SCE's Report to CAISO

To understand the results in SCE's Report to the California ISO it is important to understand:

- Background on California markets
- Meaning of terms and results shown in SCE's report
- **DPV2 economic benefits not reflected in SCE's report**

“Net Benefits” Do Not Include Important Arizona Benefits

- The model used to quantify “Net Benefits” only focuses on variable operating costs and estimated market prices; it does not measure any other Arizona benefits
- Limited scope of this type of model is widely recognized

“The real societal benefit from adding transmission capacity come in the form of enhanced reliability, reduced market power, decreases in system capital and variable operating costs and changes in total demand. The benefits associated with reliability, capital costs, market power and demand are not included in this [type of] analysis.”

(SSGWI Transmission Report, Oct 2003; emphasis added)

DPV2 Benefits Not Reflected in SCE’s Report to CAISO

The DPV2 Project provides a number of important benefits to Arizona and the region as a whole:

- Increased reliability
- Benefits from construction and taxes
- Greater liquidity
- Greater fuel and load diversity
- Improved generation investment climate
- Improved resource utilization
- Complements and supports TransWest Express project
- Improved access to renewable resources

The estimated value of these benefits to Arizona exceeds the estimate of Arizona costs found in SCE’s report to CAISO

Discussion of Arizona Economic Benefits Provided by DPV2

Economic Benefits of the DPV2 Project

The DPV2 Project provides a number of important benefits to Arizona and the region as a whole:

- **Increased reliability**
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Conclusion: Benefits to Arizona expected to exceed costs

Examples of Major Transmission Outages

Event	Impact	Estimated Cost
12/82 Northwestern transmission outages	12,350 MW curtailed; 5.2 million customers in CA, NV and AZ	~\$60 million per hour
2/84 Pacific-AC-Intertie outage	7,900 MW curtailed; 3 million customers in southern WECC for up to two hours	~\$40 million per hour
7/96 WECC-wide outage	11,800 MW curtailed 2 million customers for several hours; CA and AZ part of "island" separated from rest of WECC	~\$60 million per hour
8/96 WECC-wide outage	28,000 MW curtailed; 7.5 million customers for up to 9 hours; Southern CA and AZ part of "island" separated from rest of WECC	~\$140 million per hour
7/04 Fire at Westwing substation	APS lost 25% of import capability into Phoenix area; narrowly escaped rolling blackouts	
1965, 1967, 1977, 1998, 2003	Large Eastern outages; cost of 2003 outage alone estimated to range from \$6 billion to \$29 billion	

Frequency of Transmission Outages

While large-scale outages of over 10,000 MW are relatively rare, there are many events with curtailments in the 100 MW to 10,000 MW range:

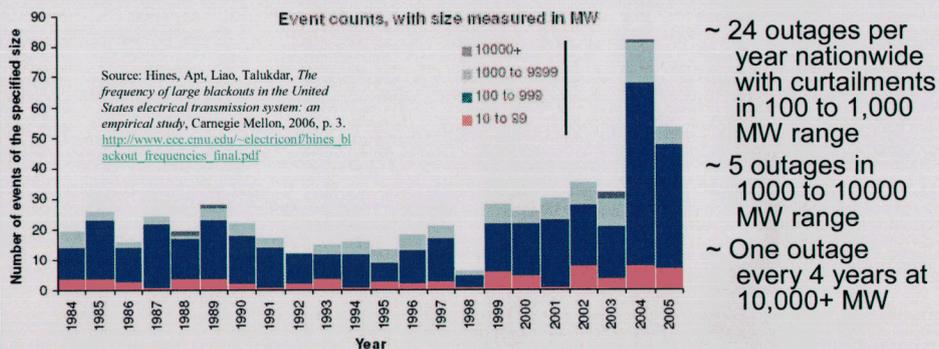


Figure 2.2 — Blackout frequencies for the years 1984 to 2005. Size here is measured in the number of MW interrupted. 2004 and 2005 data come from the EIA (2005 data is for Jan-Sept only), all other data is from the NERC DAWG records.

Reliability Benefit of DPV2

- Economic importance of reliability
 - ▶ Major Western outages in 1980s and 1990s curtailed up to 28,000 MW, costing hundreds of millions of dollars each
 - ▶ Several smaller, more localized outages each year
- Importance of Palo Verde to region-wide reliability
 - ▶ Palo Verde system elements affects even the Northwest
 - ▶ ACC staff found extreme events at Palo Verde would require curtailment of several thousand megawatts of load
- SCE studied reliability benefit of DPV2 during extreme contingencies at Palo Verde:
 - ▶ Contingencies studied based on ACC's PV Hub Risk Assessment
 - ▶ Shows that DPV2 would reduce "load drop" requirements of studied contingencies by up to 2,300 MW

Illustration of DPV2 Reliability Benefit

- Possible magnitude of DPV2 reliability benefit:
 - ▶ 5 contingencies over life of line (~1 event every 10 years)
 - ▶ DPV2 to avoid curtailment of 2,000 MW per event, 50% or 1,000 MW of it in Arizona
 - ▶ Duration of 2 to 6 hours per event
 - ▶ Consumer cost ("value of lost load") at least \$5,000/MWh on average
- Value of avoiding potential curtailment-related costs to Arizona consumers over life of DPV2 line:
 - ▶ \$50 million (2 hours x 1,000 MWh x \$5,000/MWh x 5 events); to
 - ▶ \$150 million (6 hours x 1,000 MWh x \$5,000/MWh x 5 events)
 - ▶ Possibly much more

Economic Benefits of the DPV2 Project

The DPV2 Project provides a number of important benefits to Arizona and the region as a whole:

- Increased reliability
- **Benefits from construction and taxes**
- Greater liquidity
- Greater fuel and load diversity,
- Improved generation investment climate
- Improved resource utilization
- Complements and supports TransWest Express project
- Improves access to renewable resources

Conclusion: Benefits to Arizona expected to exceed costs

Benefits from Construction and Taxes

Construction benefits*	\$86 million over 2 years (incl. \$7.2 million fiscal)
Property tax benefits*	\$17 million over 10 years
Merchant excise tax benefit	\$36 million over 10 years
Merchant corporate tax benefit	\$3.2 million over 10 years

*Source: Pollack Study, Exhibit J, p. 3

Economic Benefits of the DPV2 Project

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Conclusion: Benefits to Arizona expected to exceed costs

Importance of Liquidity at Palo Verde

- Liquidity is defined as the ease with which power can be bought or sold at the prevailing price
- The current lack of liquidity in power markets is very costly to market participants
- Significant ongoing efforts by industry and policy makers nationwide to improve liquidity
- Additional transmission is needed at the Palo Verde Hub to increase liquidity

Benefits of Increased Liquidity

- Lower transactions costs on all purchases and sales
- Lower risk premium built into market prices
- Lower risk of market manipulation
- Improved risk management
- Reduced risk of overpaying by Arizona utilities
- Improved long-term planning, contracting, and investment decisions
- Facilitates regulatory oversight through increased transparency

How DPV2 Improves Liquidity

- Allows more buyers and sellers to reach the Palo Verde hub
- Improves interconnection with more liquid Southern California hub
- Provides transmission to and from hub at more predictable costs and subject to less curtailment risk
- Reduces economic deliverability risk and hub price volatility caused by outages of individual generation or transmission assets in the region

Illustration of Transactions Cost Benefit

- Improving liquidity reduces the bid-ask spreads, a commonly-used measure of transactions costs
- Bid-ask spreads at less liquid hubs can be 50 cents to \$1.50 per MWh higher than at more liquid hubs
- With approx. 60 million MWh in annual purchases and sales by Arizona utilities, 10 to 25 cents in reduced transaction costs saves \$6 million to \$15 million per year in the long-term
- This is only one of the discussed liquidity-related benefits

Economic Benefits of the DPV2 Project

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Conclusion: Benefits to Arizona expected to exceed costs

Benefits of Greater Fuel and Load Diversity

Additional transmission capability between California, Arizona, and surrounding regions means:

- Greater fuel diversity for generation (coal, hydro, renewables, nuclear)
- Increased diversity in fuel transportation options (e.g., pipelines, LNG)
- Diversification benefits due to different times of peak loads

Result: less volatile market prices

lower region-wide cost

Increased reliability of supply

Economic Benefits of the DPV2 Project

The DPV2 Project provides a number of important benefits to Arizona and the region as a whole:

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- Greater fuel and load diversity
- **Improved generation investment climate**
- Improved resource utilization
- Complements and supports TransWest Express project
- Improved access to renewable resources

Conclusion: Benefits to Arizona expected to exceed costs

DPV2 Improves Generation Investment Climate

- Independent power producers as “manufacturers” will locate where costs are low and products can reach markets
- Transmission into Palo Verde has lagged behind generation development; underutilized IPP generation and depressed market prices will make additional generation investment less attractive
- If DPV2 not approved
 - ▶ Palo Verde generation would be stranded more permanently, undermining off-system sales opportunities and financial health of generation owners
 - ▶ Would signal regulatory risks and poor investment climate to future generation developers

Improved Investment Climate Benefits Arizona

- Stranding generation at Palo Verde would come at significant long-term costs
 - ▶ With 500 to 600 MW of annual load growth, Arizona needs to add substantial new supplies as early as 2011 irrespective of DPV2
 - ▶ Poor investment climate would increase the required return on investment for all new generation plants needed to supply Arizona
- Illustration of potential benefits
 - ▶ Total capital costs will gradually increase as new generation investment needs to be added
 - ▶ If the required return on investment increases by just 0.1 percent (e.g., from 10% to 10.1%), total capital costs of the cumulative new generation investment increase by \$60 million per year over the life of DPV2

Economic Benefits of the DPV2 Project

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- **Improved resource utilization**
- Complements and supports TransWest Express
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Conclusion: Benefits to Arizona expected to exceed costs

DPV2 Lowers Costs by Improving Resource Utilization

- DPV2 increases utilization of significantly underutilized generation capacity at Palo Verde, particularly during off-peak hours and off-peak seasons
- Increased off-system sales opportunities reduces costs to Arizona utilities and their ratepayers

“From our perspective, that line has the potential to expand our wholesale power markets, and the California market offers some important business opportunities ... Greater access into those markets helps us to reduce our own customers’ costs. APS views it positively. Anything that continues to improve and strengthen the Western grid can only be seen as positive”

California Energy Markets, July 28, 2006, p. 18 (quoting Alan Bunnell, an APS spokesman)

Economic Benefits of the DPV2 Project

The DPV2 Project provides a number of important benefits to Arizona and the region as a whole:

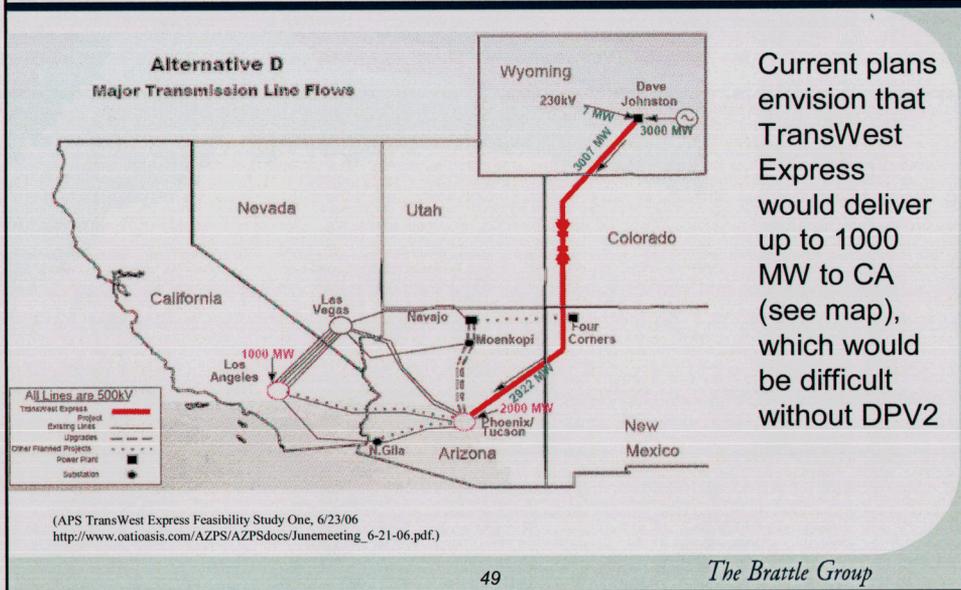
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- **Complements and supports TransWest Express**
- Improved access to renewable resources

Conclusion: Benefits to Arizona expected to exceed costs

DPV2 Complements TransWest Express Project

- TransWest Express would bring up to 3,000 MW of efficient, low-cost coal and wind generation in Rockies to Western markets around 2013:
 - ▶ 1,500 to 2,000 MW to Arizona
 - ▶ 500 to 1,000 MW to California
 - ▶ up to 1,000 MW to Utah and Nevada
- Feasibility in part dependent on integration with DPV2 and other transmission projects (e.g., Frontier, Northern Lights)
- Without DPV2, Rocky Mountain partners likely will find TransWest Express to be a less attractive option to reach desired markets compared to alternatives lines

TransWest Express Project Requires AZ-CA Path

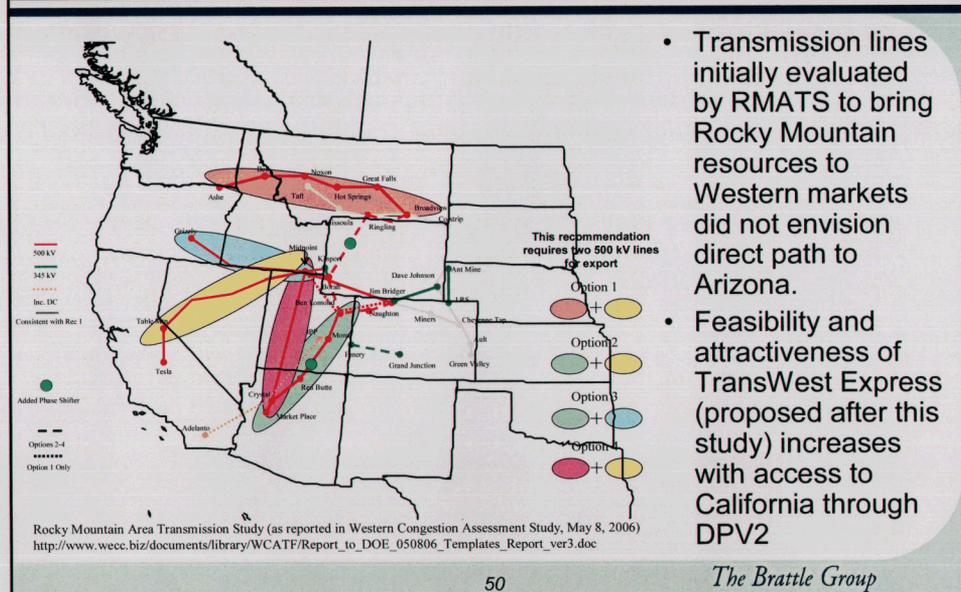


Current plans envision that TransWest Express would deliver up to 1000 MW to CA (see map), which would be difficult without DPV2

49

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Alternative Transmission Paths Explored by RMATS



- Transmission lines initially evaluated by RMATS to bring Rocky Mountain resources to Western markets did not envision direct path to Arizona.
- Feasibility and attractiveness of TransWest Express (proposed after this study) increases with access to California through DPV2

50

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Illustration of TransWest Express-Related Benefits

- Even modest delays of TransWest Express would likely be very costly to Arizona
 - ▶ Lost value of low-cost imports
 - ▶ Increased project costs
- Illustration of annual cost advantage of power imported from low-cost resources in Wyoming area:
 - ▶ Approx. \$20/MWh resource cost differential between Arizona and Wyoming
 - ▶ Envisioned deliveries of TransWest Express to Arizona: 1,500 to 2,000 MW
 - ▶ At approx. 80% capacity utilization, Arizona would import 10 to 15 million MWh a year.
 - ▶ Value: \$200 million to \$300 million for each year of delay

Economic Benefits of the DPV2 Project

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- **Improved access to renewable resources**

Conclusion: Benefits to Arizona expected to exceed costs

Improved Access to Renewable Resources

- “Both inter- and intra-state transmission is needed to support [renewable] resources and should be fast tracked for permitting and environmental reviews ... Transmission is a critical limiting factor”

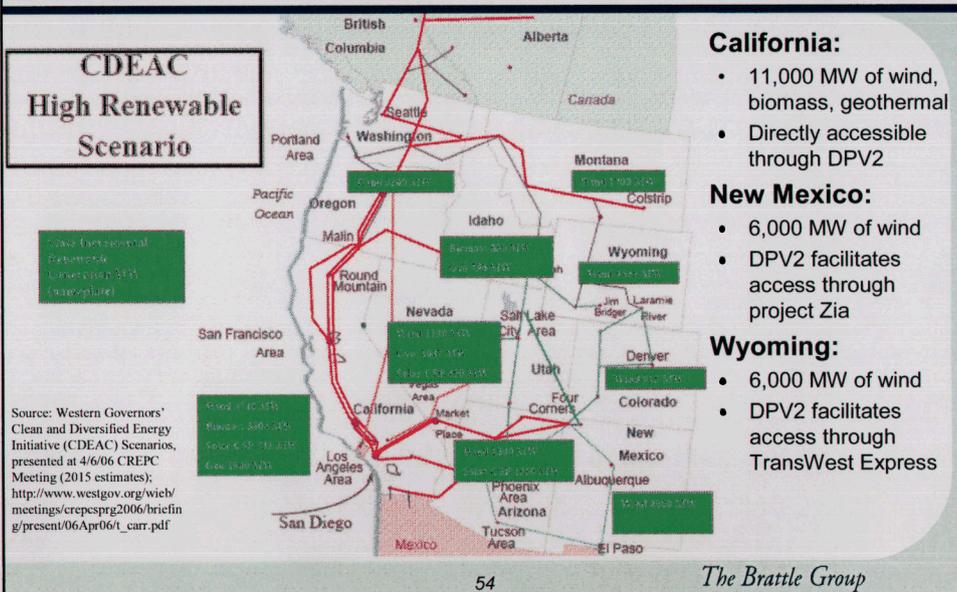
(Report of the Clean and Diversified Energy Advisory Committee (CDEAC) to the Western Governors, June 2006)

- DPV2 offers or facilitates improved transmission access to significant amounts of renewable generation
 - ▶ Improves access to substantial renewable resources in southern California (11,000 MW of wind, biomass, geothermal)
 - ▶ Facilitates Arizona access to 6,000 MW of wind resources in Rocky Mountain Area by facilitating TransWest Express
 - ▶ Facilitates transmission access to 6,000 MW of wind resources in New Mexico by facilitating project Zia

53

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Improved Access to Renewable Resources



54

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Proposed New Arizona Renewable Resource Standards

- Increasing to 5% in 2015 and 15% in 2025, 70% of which could be imported
- Arizona utilities would need to add approx. 200 MW per year of renewable resources in 2013-15 period
- “Arizona has abundant solar energy, but is somewhat limited in availability of other major renewable energy resources. ... Arizona utilities will need to have access to low-cost renewable energy resources both from inside as well as from outside of Arizona.”

(ACC Staff Report, “Proposed Amendments to the Environmental Portfolio Standard Rules, Docket No. RE-00000C-05-0030, February 2006, p. 12)

Benefit of Access to Renewable Resources

- Transmission is needed to provide access to low-cost renewables
- For example, if project Zia were to be delayed by one year, building more solar instead of lower-cost wind power in New Mexico would increase costs by \$130 million
 - ▶ In 2015, approximately 150 MW of renewable resources could be imported by Arizona utilities to satisfy the renewable resource standard
 - ▶ The cost of solar power will exceed that of wind power plants by \$800 to \$1000 per kW of installed capacity

Economic Benefits of the DPV2 Project

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Conclusion: Benefits to Arizona expected to exceed costs

Overall Impact: Arizona Benefits Exceed Costs

	Description and Order of Magnitude	2006 Present Value (\$millions)	
		2009-2015	2009-2055
Costs			
1. Increases in Arizona "costs" (SCE report)	\$11-17 million per year	(\$52)	(\$148)
Benefits			
2. Construction benefits	\$86 million in 2008-09	\$64	\$64
3. Annual tax benefits			
Property taxes	\$17 million over 10 years	\$5	\$9
Exise taxes on natural gas	\$36 million over 10 years	\$9	\$27
IPP corporate income taxes	<u>\$3.2 million over 10 years</u>	<u>\$0.8</u>	<u>\$2</u>
Subtotal	\$56 million over 10 years	\$15	\$39
4. Reliability benefits	\$50-150 million over life of line	\$11	\$20
5. Liquidity benefits	\$6-15 million per year	\$20	\$54
6. Diversification benefits	reduced risk	n/a	n/a
7. Improved investment climate	increasing to \$60 million per year	\$3	\$47
8. Improved resource utilization	lower Arizona costs	n/a	n/a
9. Synergies with TransWest Exp.	\$200+ million, more diversity	\$90	\$90
10. Renewable resource access	\$130+ million, more diversity	\$48	\$48
Total benefits		\$251	\$361
Net benefits		\$199	\$214

DPV2 Impact on Arizona Generation

59

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Minimal Impact on Availability of Arizona Generation

- SCE study shows DPV2 increases Arizona generation output mostly during off-peak seasons and hours:
 - ▶ Only approx. 30-50 MW during July/August peak hours
 - ▶ Approx. 100 MW during June-Sept peak hours
 - ▶ Approx. 230 MW on average over the course of the entire year
- 50 MW of additional on-peak generation means:
 - ▶ DPV2 on-peak impact is only 0.25% of AZ generating capacity
 - ▶ At 500-600 MW annual load growth, it will move up Arizona's need for new generating capacity by 1 month some time after 2011
- Increases utilization of Arizona resource with only minimal effects on generation capacity available to serve Arizona peak loads

60

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Why is DPV2's Impact on AZ Generation so Small?

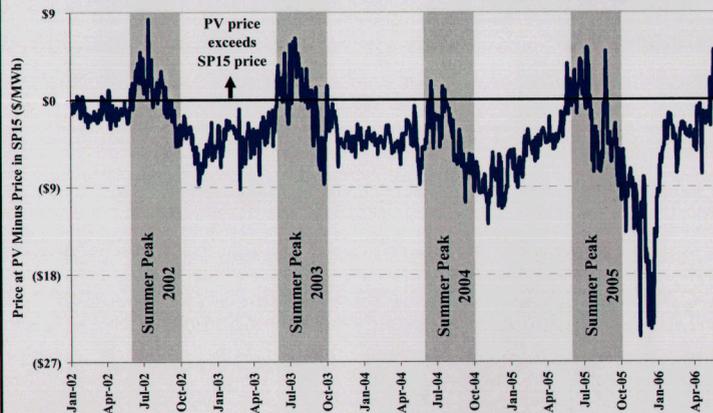
- SCE's study shows average flows on 1,200 MW DPV2 line are 910 MW:
 - Average generation in Arizona increases by approx. 230 MW
 - Remainder (approx. 680 MW) comes from reduced flow on other transmission lines and reduced Arizona exports to other, less profitable markets
- Imports into California economic only when Arizona spot prices are low when Arizona generation is not needed to serve Arizona load
- During summer peak, high spot market prices in Arizona tend to make exports into California uneconomic

61

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Why is DPV2's Impact on AZ Generation so Small?

PV-SP Price Differentials for DA Peak Energy (Jan 1, 2002-Jun 15, 2006)



Source:
DA volume-weighted average prices from ICE, available at <https://www.theice.com/marketdata/naPower/naPowerHistory.jsp>.

Price at Palo Verde (PV) exceeds price in Southern California (SP) during summer peak periods

Makes uneconomic most imports from PV during summer peak hours

DPV2 will not change these fundamentals

62

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DPV2 Impact on Arizona Natural Gas Supply

63

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Impact of DPV2 on Natural Gas Use by Generators

- DPV2 only slightly increases natural gas used for power generation in Arizona
 - ▶ Average natural gas use by Arizona generators increases by 3.5-3.8% in 2010-2015
- But leaves natural gas used by generators in region virtually unchanged
 - ▶ Natural gas use up only 0.05% in regional market area (California, Arizona, southern Nevada, and northern Mexico)
 - ▶ Natural gas use slightly down in entire West (WECC)
 - ▶ Increased utilization of Arizona generation reduces natural gas use of other (less efficient) power plants, particularly in California

64

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Planned Pipeline and Storage Expansions

- DPV2 increase of Arizona Winter peak gas demand is minimal (38-75 MMcf/d) compared to already-planned new supplies:
 - ▶ Phoenix Lateral (Transwestern) 500 MMcf/d
 - ▶ Arizona Natural Gas Storage (El Paso) 350 MMcf/d
 - ▶ North Baja Expansion (TransCanada/Sempra) 572 MMcf/d
 - ▶ SoCalGas Turnback of El Paso Capacity 557 MMcf/d
- Two in-state expansions will ease local gas transmission constraints in the Phoenix area
 - ▶ El Paso's FERC-approved East Valley Lateral project
 - ▶ Transwestern's planned Phoenix Lateral

Summary of DPV2 Economic Impacts in Arizona

Summary of DPV2 Economic Impacts on Arizona

- DPV2 is important in regional transmission planning and reliability
- DPV2 provides a number of important economic benefits to Arizona
 - ▶ Reliability benefits
 - ▶ Construction and tax benefits
 - ▶ Liquidity, investment climate, and resource utilization benefits
 - ▶ Improved resource diversity and Arizona transmission access to low-cost coal and renewable resources
- The estimated value of these benefits to Arizona exceeds the estimate of Arizona costs found in SCE's report to CAISO

Summary of DPV2 Economic Impacts on Arizona

- DPV2 impact on Arizona generation is minimal because exports to California occur mostly during off-peak hours and off-peak seasons
 - ▶ Increases Arizona generation used for exports during peak load periods by only about 50 MW
- DPV2 impact on Arizona natural gas demand is minimal

Qualifications of Johannes P. Pfeifenberger

Johannes Pfeifenberger is a Principal and Director of *The Brattle Group* where he co-manages the firm's utility practice area. He received a M.A. in Economics and Finance from Brandeis University and holds a M.S. ("*Diplom Ingenieur*") in Electrical Engineering, with a specialization in Power Engineering and Energy Economics from the University of Technology in Vienna, Austria. Before joining *The Brattle Group* in 1991, Mr. Pfeifenberger was a consultant with Cambridge Energy Research Associates of Cambridge, Massachusetts, and a research assistant at the Institute of Energy Economics in Vienna, Austria.

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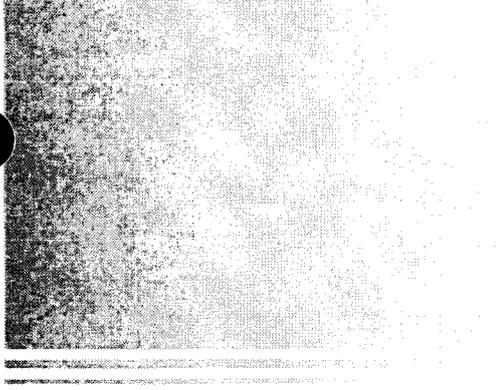
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2

Randall D. Palmer

**Environmental Planning Group (EPG)
Coordinator - Visual Resource Studies**



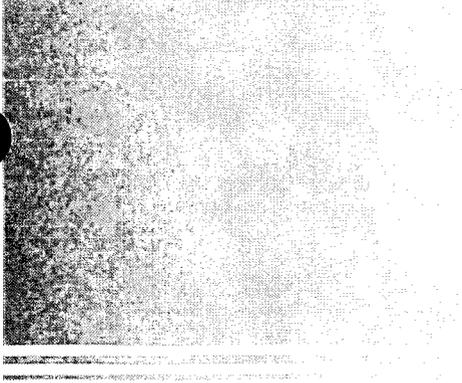
Witness Background

• Education

- MLA, Landscape Architecture, Harvard University, 1984
- BS, Outdoor Recreation – Landscape Architecture, Colorado State University, 1980

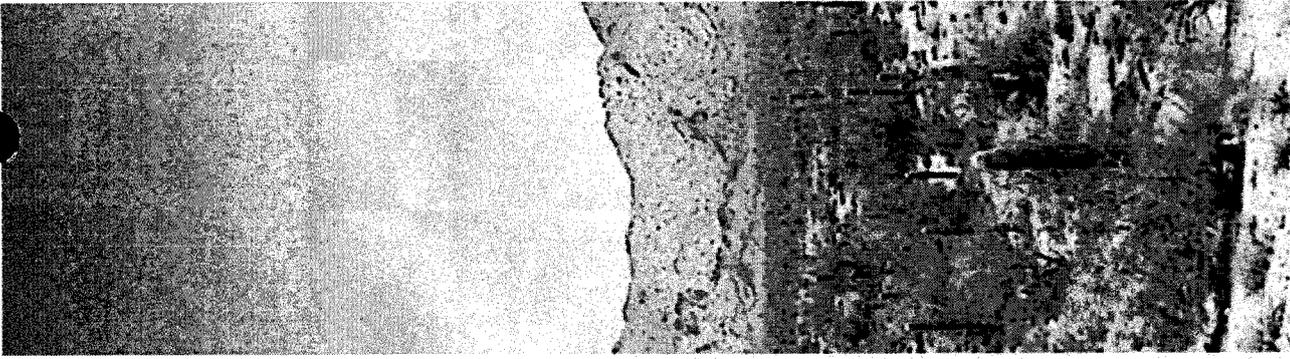
• Experience

- MJP Associates, Fort Collins, Colorado 1977-1980
- Teaching and Research Assistant, Harvard University 1983-1984
- Instructor of Landscape Architecture, Colorado State University, University of Colorado 1984-1985
- Dames & Moore, 1984-1999
 - Visual (including simulations), Recreation, and Land Use Specialist
 - Project Manager
- Environmental Planning Group (EPG) Phoenix, Arizona 1999-2006
 - Partner, Principal, and Project Manager
 - Visual, Recreational, and Land Use Specialist



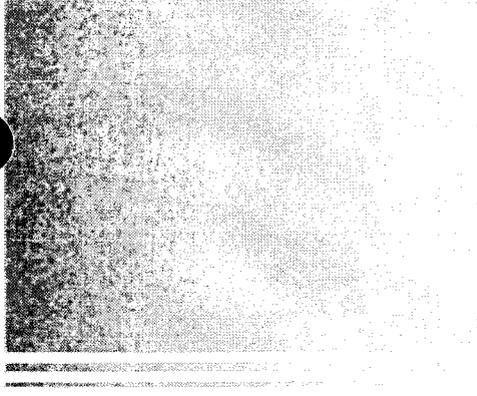
Related Project Experience

- Managed/coordinated over 20 energy related studies including EISs, EAs, ERs, CUPs, PEAs, DNAs for low-high voltage transmission lines, substations, and power plants
- Served as visual resource/land use specialist on an additional 15 energy related projects
- Seven 500kV transmission lines
- Experience in Arizona, California, many other western states, and Canada
- Testified before the State Siting Committee on 4 previous occasions
- Federal lands including BLM, USFWS (refuges), USFS, NPS, BIA, BOR
- Experience and Familiarity with BLM (VRM), USFS (VQO), visual methods and systems
- Experience with transmission lines in context with environmentally (visually) sensitive settings



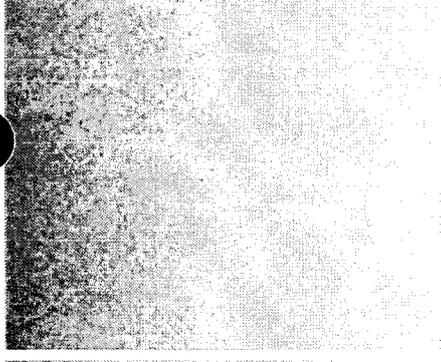
Role in DPV2 Project

- Developed visual resource assessment methodology
- Principal investigator for visual resource studies for the PEA and CEC application
- Supervised visual resource study team



Scope of Testimony

- **Visual studies approach**
 - Reasoning for approach
 - Visual study components
- **Analysis on the Kofa NWR**
 - Visual inventory
 - Overview of conditions on the Kofa
 - Visual impacts and recreational uses
- **Comparison with other studies**
- **Summary**



Visual Study Approach

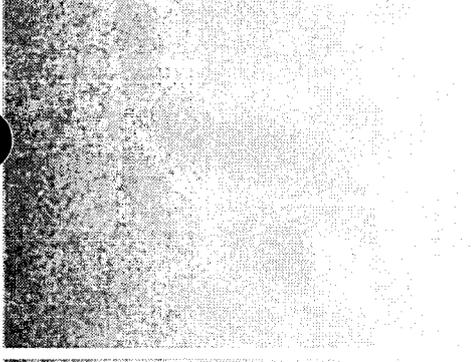
The approach was based on Bureau of Land Management (BLM) Visual Resource Management (VRM) concepts (Handbooks BLM 8410-1 and 8431-1) given that:

1. The BLM manages a large portion of the lands within the project area in Arizona (BLM lead and presence of a designated utility corridor on public lands)
2. The predominance of landscape settings crossed by the 500kV transmission line (especially in Arizona) are natural, and the need for consistency in the characterization of inventory elements and impacts (e.g., methods should not change at jurisdictional boundaries if the landscape setting remains similar as in the case of the Kofa NWR
3. The need to maintain consistency with past visual resource study methods used for 500kV transmission lines as approved by the Arizona Power Plant and Transmission Line Siting Committee

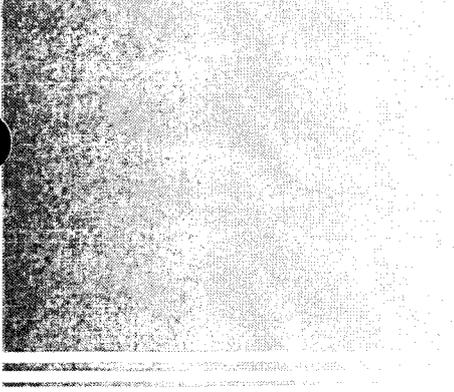


Visual Study Components

- **Visual Inventory**
 - Scenic Quality
 - Sensitive Viewers
- **Visual Impact Assessment**
 - The contrast introduced by the new transmission line as it affects scenic quality and sensitive viewers



Visual Inventory



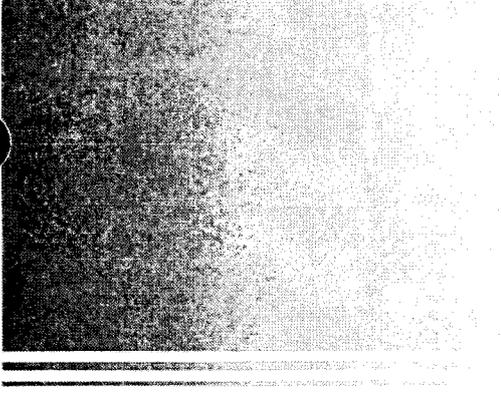
Scenic Quality

- Scenic Quality is a measure of the visual appeal of an area of land. As defined by the BLM, the premise of this evaluation is that all public lands have scenic value, but areas with the most variety have the greatest scenic value.
- Lands were rated based on their aesthetic appeal (scenic quality) using seven factors:
 - Landform
 - Vegetation
 - Water
 - Color
 - Adjacent scenery
 - Scarcity
 - Cultural modifications
- Ratings:
 - Class A Scenery – Distinctive Quality/ Maximum Variety
 - Class B Scenery – Moderate Variety
 - Class C Scenery – Common/Minimal Variety



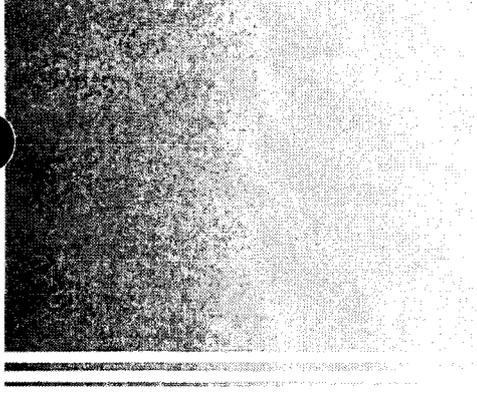
Summary of Scenic Quality

- While portions of the Kofa are more scenic than others, the terrain and associated vegetation crossed by the proposed transmission line are Class B and Class C scenery
- The landscape has been modified by the presence of the existing DPV1 500kV transmission line, natural gas pipeline, road, ancillary facilities and signs



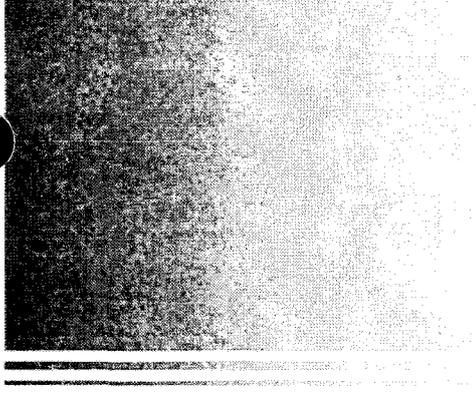
Visual Sensitivity

- Visual sensitivity reflects the degree of concern for scenic quality and change in views from sensitive viewer locations within the project area (e.g., recreation views)
- Factors used in the identification of sensitive viewers included:
 - type of users
 - amount of use
 - public interest
 - adjacent land use
 - special areas
- Factors used in the identification of the effects to these viewers included the distance to the proposed project and special viewing conditions



Viewer Sensitivity

- **Viewer sensitivity:**
 - was determined to be high, based on the designation as a National Wildlife Refuge, in conjunction with the adjacent Wilderness Area(s)
- **Sensitive viewer locations:**
 - were primarily associated with the pipeline road, or from dispersed recreation use areas (wilderness and backcountry views), with limited formally designated recreation sites



Distance Zones

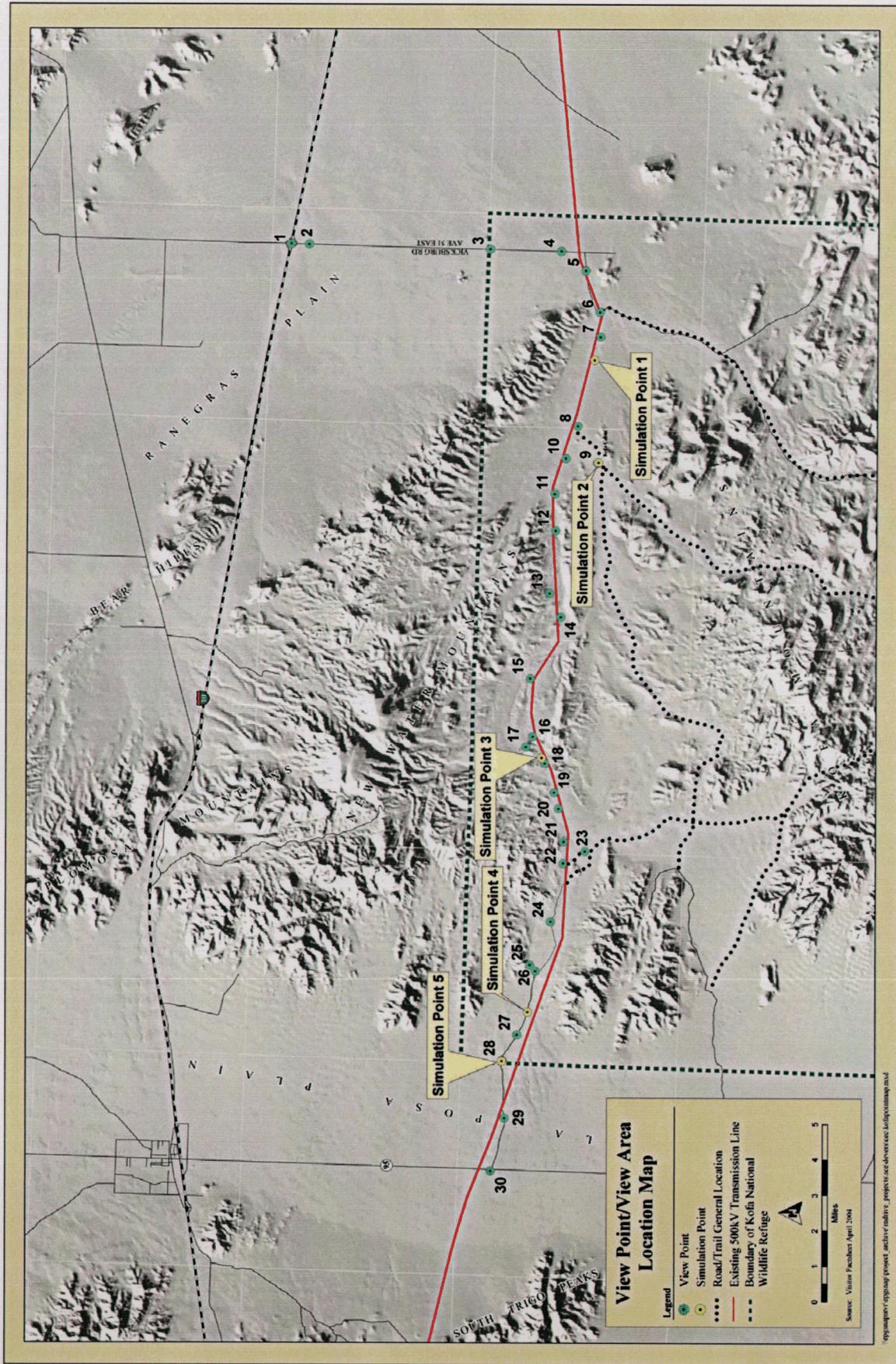
- Having identified sensitive viewers, the next step in the inventory was the identification of the distance from which new facilities would be viewed, and the general condition of these views.
 - Foreground Views - Typically, individual objects are seen in greater detail in the foreground (0 to 0.5 mile).
 - Middleground Views - The middleground (0.5 to 3 miles) is an area where objects are typically viewed in relationship to patterns rather than individual features.
 - Background Views - In the background (3 to 15 miles) landscapes are viewed as horizon lines and tones where atmospheric conditions often dominate.
- Viewing conditions range from open, to partially/fully screened, and backdropped to skylined



Overview of Project Area



View Location Map



Visual Impacts

- The measure of potential adverse impacts on visual resources is based on visual contrast and the effects of this contrast on the project setting (scenic quality) and to sensitive viewers.
- Visual contrast is a measure of the degree of perceived change that would occur in the landscape due to the construction and operation of the proposed Devers-Harquahala transmission line.
- Consistent with BLM procedures, contrast was evaluated based on landform, vegetation and structure contrast.



Visual Contrast

- **Landform Contrast** - associated with the construction of roads and tower pad sites
- **Vegetation Contrast** - removal of vegetation (vegetation manipulation) associated with road construction, tower pad sites, and conductor clearance
- **Structure Contrast** - introduction of new structures and potential contrast with other structures in the landscape (e.g., existing 500kV transmission line, gas pipeline, etc.)



Contrast Levels

- **None** - The element contrast is not visible or perceived.
- **Weak** - The element contrast can be seen but does not attract attention.
- **Moderate** - The element contrast begins to attract attention and begins to dominate the characteristic landscape.
- **Strong** - The element contrast demands attention, will not be overlooked, and is dominant in the landscape.



Mitigation

- Matching existing tower types
- Matching spans and tower heights to the extent feasible
- Selective tower placement
- Use of dulled steel structures and non-specular conductors
- Use of existing access roads



Landform Contrast

- No major additional new access would be required for the construction of towers and the stringing of conductors (use of existing pipeline road, and existing spur roads, to the extent feasible)
- Grading and modifications to landforms in the area are anticipated to be limited and associated primarily with access to, and leveling of, tower pad sites
- Overall landform contrast for the project on the Kofa NWR would be moderate/weak



Vegetation Contrast

- Given the existing access, vegetation clearing (primarily desert scrub and creosote) would be primarily limited to spur road construction and leveling of tower pad sites
- Overall vegetation contrast for the project on the Kofa NWR would be moderate/weak



Structure Contrast

- The proposed DPV2 500kV transmission line would parallel the existing DPV1 line
- New structures (similar in form, line, color, and texture) would match existing DPV1 structures
- Spans and tower heights would match the existing DPV1 facilities to the extent feasible
- Overall structure contrast for the project on the Kofa NWR would be weak



Overall Project Contrast

- Overall Project Contrast would be moderate/weak to weak (the element contrast can be seen but does not attract attention to the project or dominate the view). The proposed 500kV line will be designed similar to the existing line, match existing tower spans, and is anticipated to require limited grading and vegetation removal.



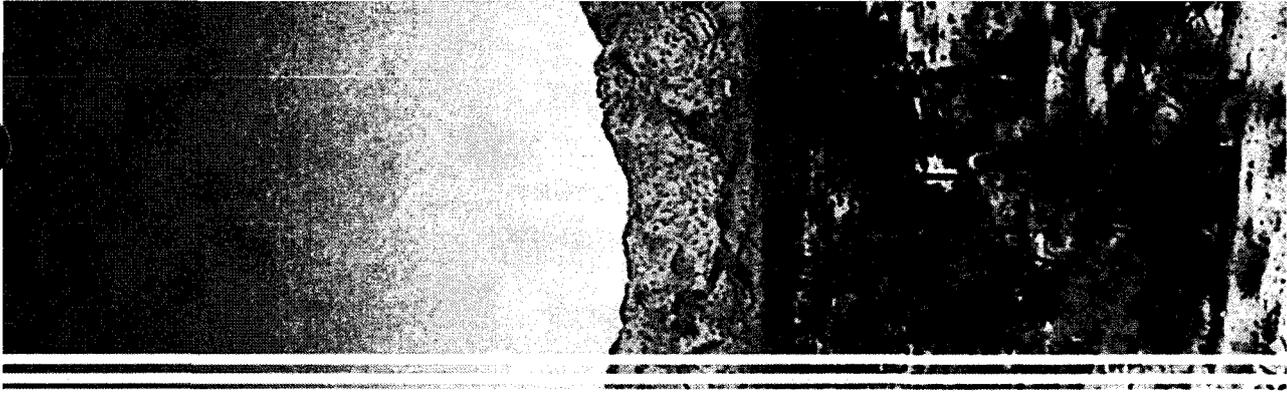
Impacts to Scenic Quality

- The contrast levels were evaluated in context with the scenic quality in order to determine overall impacts to scenic quality.

PROJECT CONTRAST	SCENIC QUALITY RATING		
	A	B	C
Strong	high	high-mod	mod-high
Moderate/Strong	high-mod	mod-high	moderate
Moderate	mod-high	moderate	mod-low
Moderate/Weak	moderate	mod-low	low -mod
Weak	mod-low	low -mod	low

Impacts to Scenic Quality

- As illustrated in the previous table, impacts to scenic quality on the Kofa NWR are expected to be generally low to moderate-low
- While portions of the Kofa are more scenic than others, the terrain and vegetation crossed by the proposed project are class C and B, and the setting has been modified by the presence of the existing natural gas pipeline, pipeline road, associated pipeline facilities and signs, and the existing DPV1 500kV transmission line
- Introduction of the new 500kV line adjacent to the existing line, and in a modified corridor, would result in less than significant impacts to the overall scenic quality of this area of the Kofa NWR



Impacts to Sensitive Viewers

- The recreational users in the Kofa NWR, Kofa Wilderness Area and New Water Mountains Wilderness Area were determined to be of high sensitivity.
- The *Kofa National Wildlife Refuge and Wilderness and New Water Mountains Wilderness Interagency Management Plan and Environmental Assessment (1996)*, estimated approximately 50,000 users per year on the Kofa NWR and 500 users per year for the New Water Mountains Wilderness Area.
- Annual visitor estimates, based on vehicle counts, are approximately 6,000 on the eastern end of the corridor and 7,000 at the western end of the corridor (2005).
- Field reviews indicated that a total of 18 individuals had visited the Kofa Cabin in April, 2006 and a total of 7 individuals in May, 2006 (sign-in sheet).



Impacts to Sensitive Viewers

- Project contrast levels were evaluated in context with the distance from which the transmission line would be viewed from sensitive viewpoints.

PROJECT CONTRAST	DISTANCE ZONES				
	0 to 1/2 mile	1/2 to 1 mile	1 to 2 miles	2 to 3 miles	3 + miles
Strong	high	high-mod	mod-high	moderate	mod-low
Moderate/Strong	high-mod	mod-high	moderate	mod-low	low-mod
Moderate	Mod-high	moderate	mod-low	low-mod	low
Weak/Moderate	moderate	mod-low	low-mod	low	low
Weak	mod-low	low-mod	low	low	low

Impacts to Sensitive Viewers

- The proposed project will be seen from the Kofa NWR and wilderness areas from locations ranging from the immediate foreground along the existing pipeline/transmission line access road (0 - 1/2 mile) to the middleground and beyond (dispersed recreation use).
- These views are within the context of the existing transmission line where the landscape has been previously disturbed (modified) and contrast levels are weak to weak/moderate.
- Based on this assessment, impacts to sensitive viewers on the Kofa NWR are expected to be generally low to moderate.



Comparison with Other Studies

- Previous and Current Visual Studies for the Devers-Palo Verde #2 Project:
 - SEIS (1987, WESCO/BLM)
 - PEA (2005, EPG/SCE)
 - CEC Application (2006, EPG/SCE)
 - DEIR/EIS (2006, Aspen/BLM)



Summary

- The proposed route across the Kofa NWR parallels an existing 500kV transmission line in a modified setting for the entire length
- This location of facilities combined with project design and mitigation effectively reduces impacts to visual resources on the Kofa NWR





Viewpoint 1 - Looking South



Viewpoint 2 - Looking South



Viewpoint 3 - Looking South



Viewpoint 3 - Entry to the Kofa NWR Looking South



Viewpoint 3 - Ramada at Entry



Kofa National Wildlife Refuge

Permitted	Prohibited
• Riding/Horseback	• Off-road vehicle
• Wildlife/antelopes	• Traps
• Observation	• Feeding/baiting
• Photography	• Littering
• Camping	• Firearms
• (1 day only)	• Collecting

• Vehicle travel only on posted roads



Viewpoint 3 – Entry Looking South



Viewpoint 4 - Looking South



Viewpoint 4 - Zoom to Transmission Structure



Viewpoint 4 - Looking South



Viewpoint 5 – Pipeline Road Looking West



Spur Road



Spur Road and Tower Pad Area



View From Beneath Tower, West Along the Right-of-Way



Viewpoint 6 – Looking West



Viewpoint 7 - Looking West



Pipeline Facilities



Viewpoint 8 - Looking West



Viewpoint 8 - Looking East



Viewpoint 9 - Kofa Cabin



Viewpoint 9 - Looking North from Kofa Cabin Entry Road



Viewpoint 10 - Looking West



Rehabilitation Activities



Viewpoint 11 - Looking Northwest



Viewpoint 12 - Looking West



Viewpoint 13 - Looking Southeast From The New Water Mountains Wilderness Area



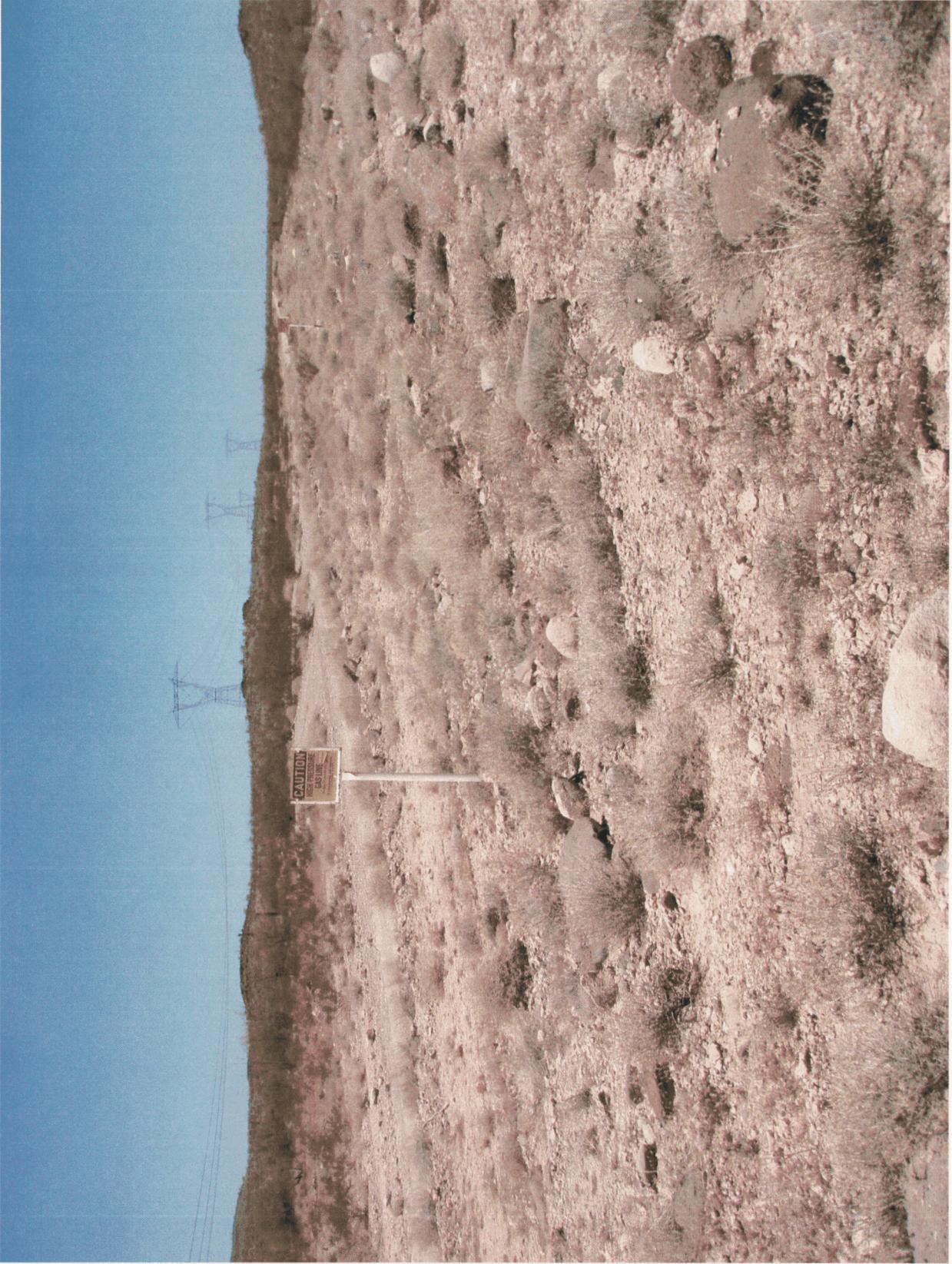
Viewpoint 13 - Looking South From the New Water Mountains Wilderness Area



Viewpoint 13 - Looking Southwest From The New Water Mountains Wilderness Area



Viewpoint 14 - Looking Northwest



Viewpoint 15 - Looking West



Viewpoint 15 - Looking Southeast



Viewpoint 16 - Looking West



Viewpoint 16 - Zoom



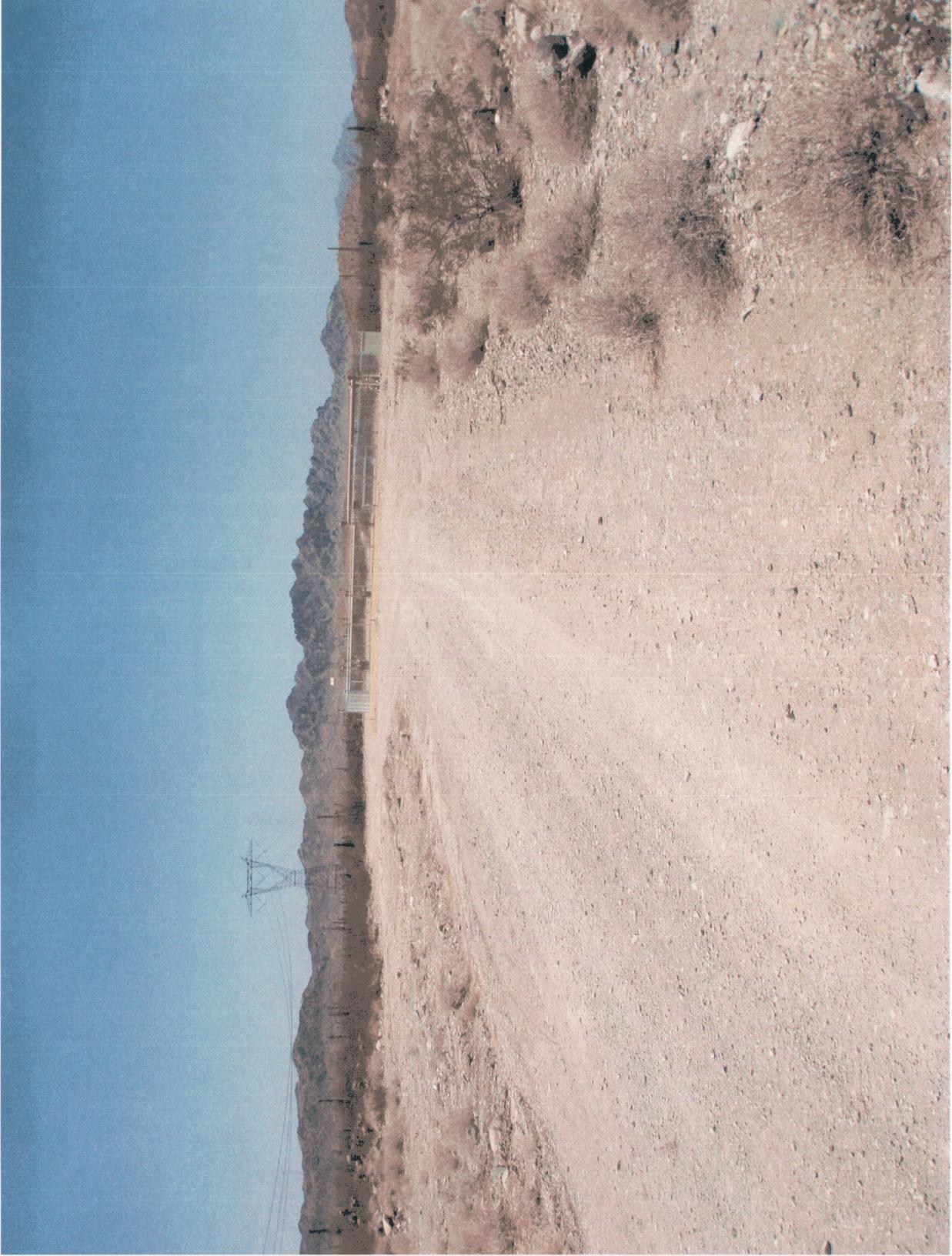
Viewpoint 17 - Looking Southwest



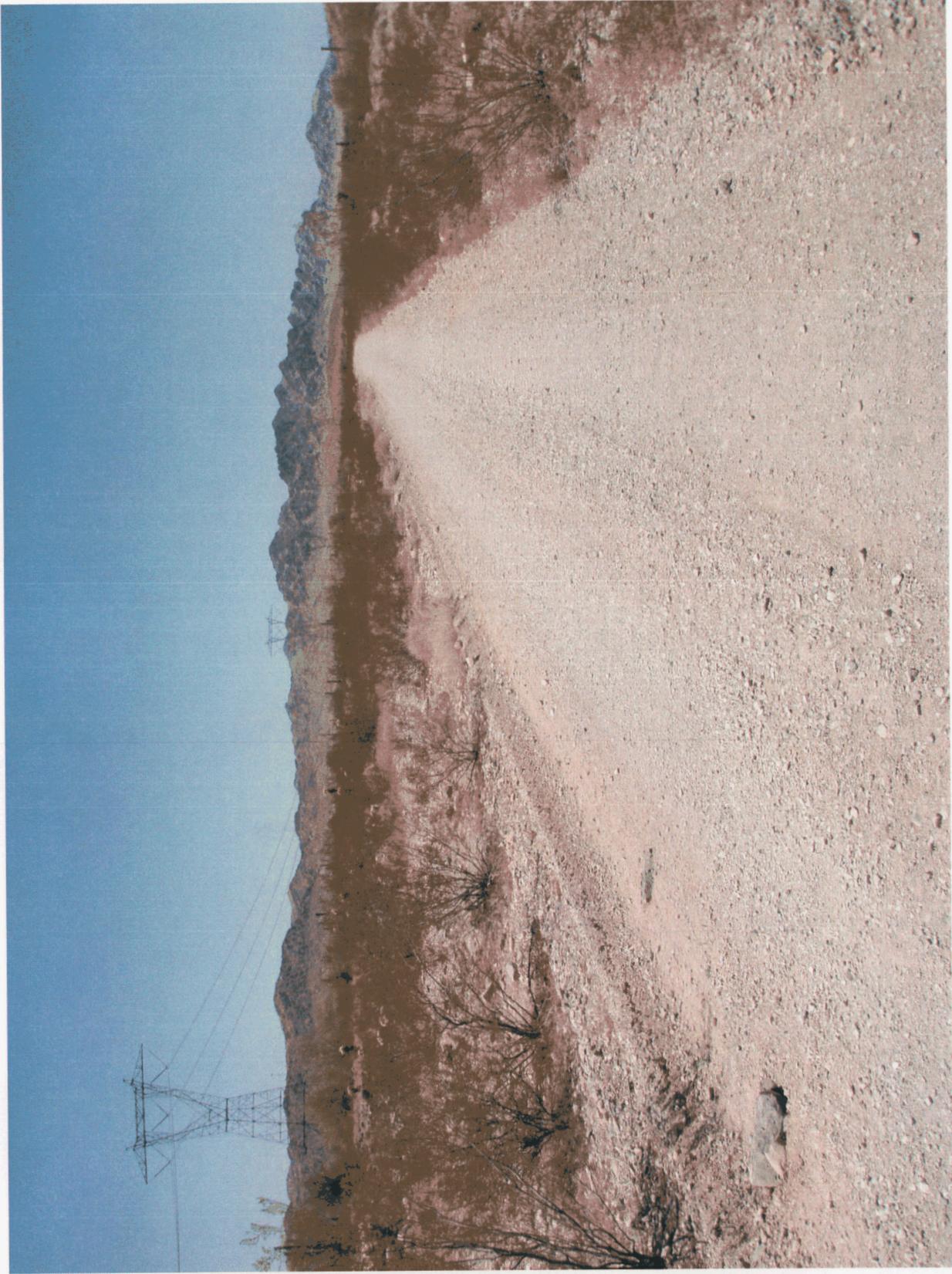
Downhill from Viewpoint 17 - Looking Southwest



Viewpoint 18 - Looking East



Viewpoint 19 - Looking West



Viewpoint 20 - Looking West



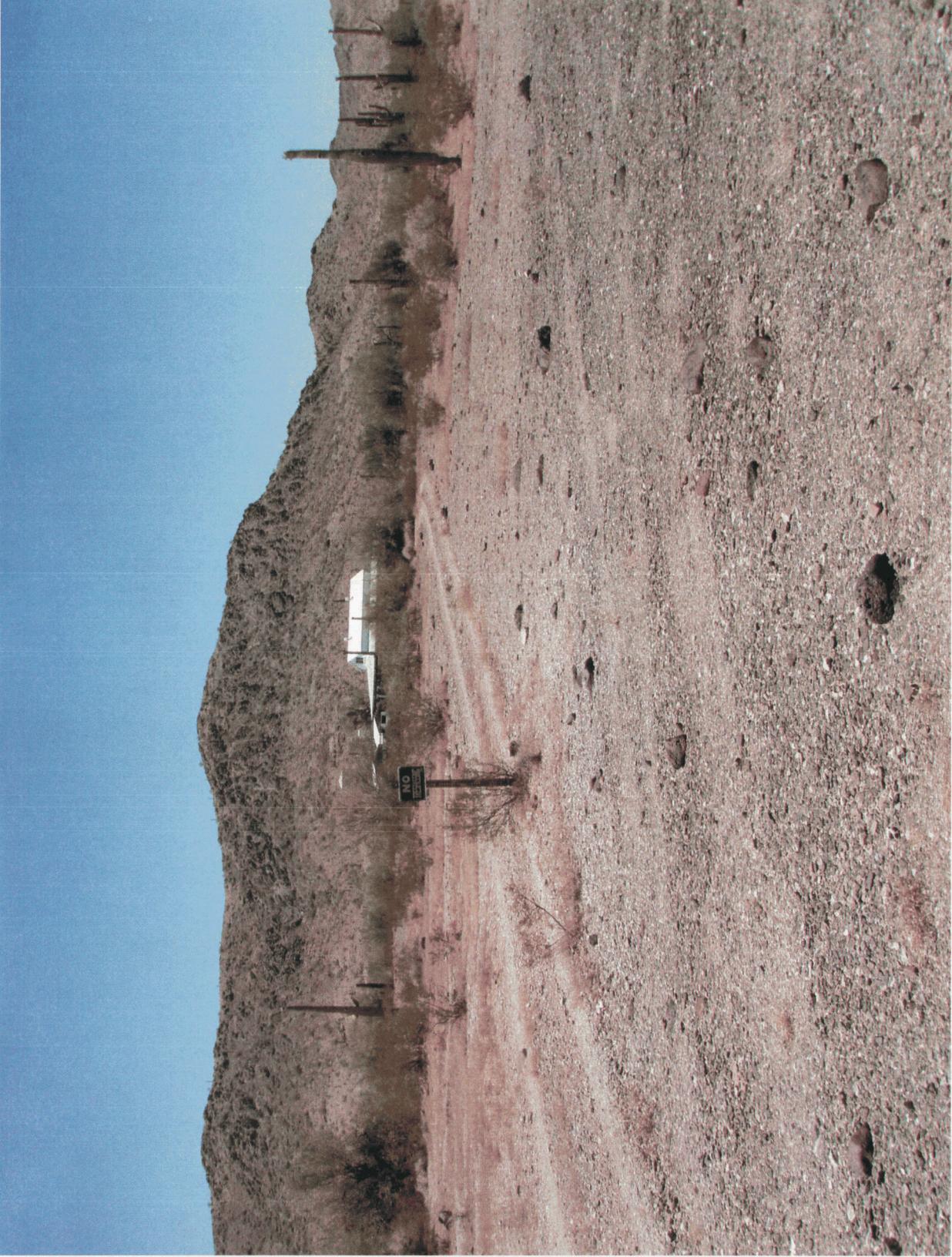
Viewpoint 21 – Looking South



Viewpoint 21 – Looking Southwest



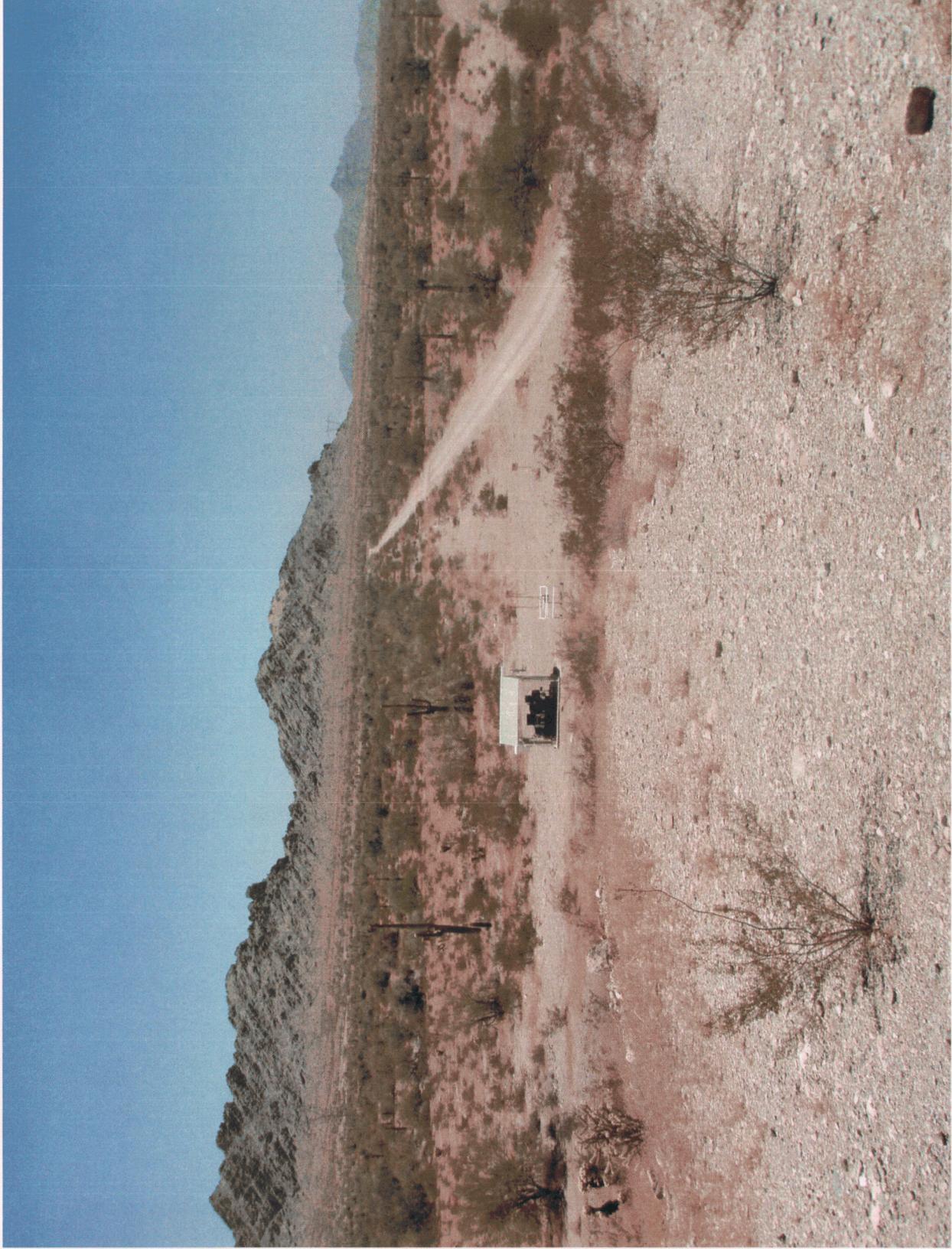
Viewpoint 22 – Looking East



Viewpoint 23 - View of Residence



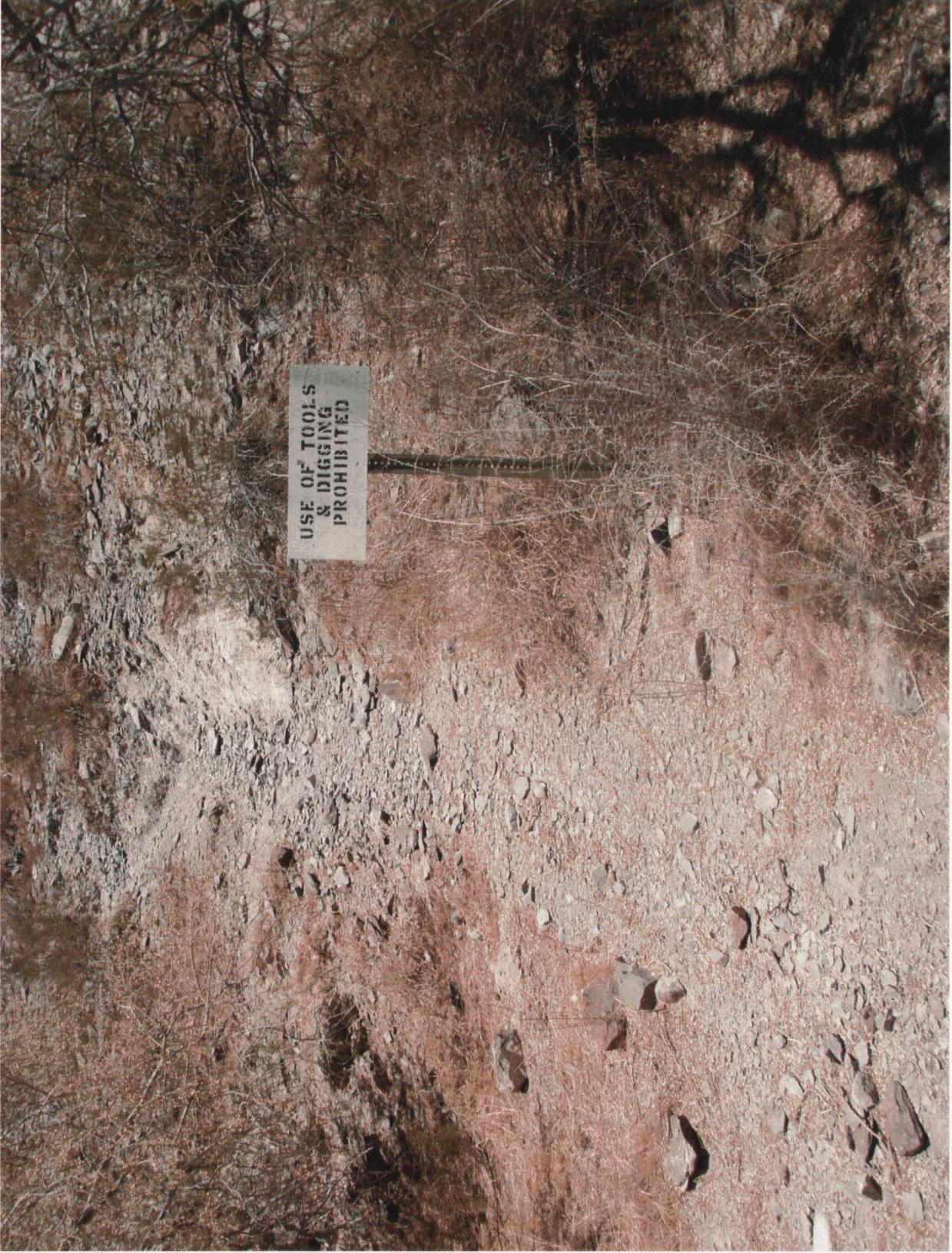
Viewpoint 23 - View from Residence Entry Road Looking North



Viewpoint 24 - Looking Southwest



Viewpoint 24 - Looking South



Viewpoint 25 – Crystal Hill Area Hiking Trail



Viewpoint 25 - View from Trail Looking Southwest



Viewpoint 25 - View from Trail Looking Southwest



Viewpoint 25 - Looking South



Viewpoint 25 - Looking South



Viewpoint 25 - Looking Southeast



Viewpoint 26 - View from Crystal Hill Dispersed Camping Area Looking South



Viewpoint 26 - View from Crystal Hill Dispersed Camping Area Looking South



Viewpoint 27 - Looking East



Viewpoint 28 - Entry to Kofa NWR Looking Southeast



Viewpoint 28 - Looking South



Viewpoint 28 - Looking South



Viewpoint 29 - Looking East



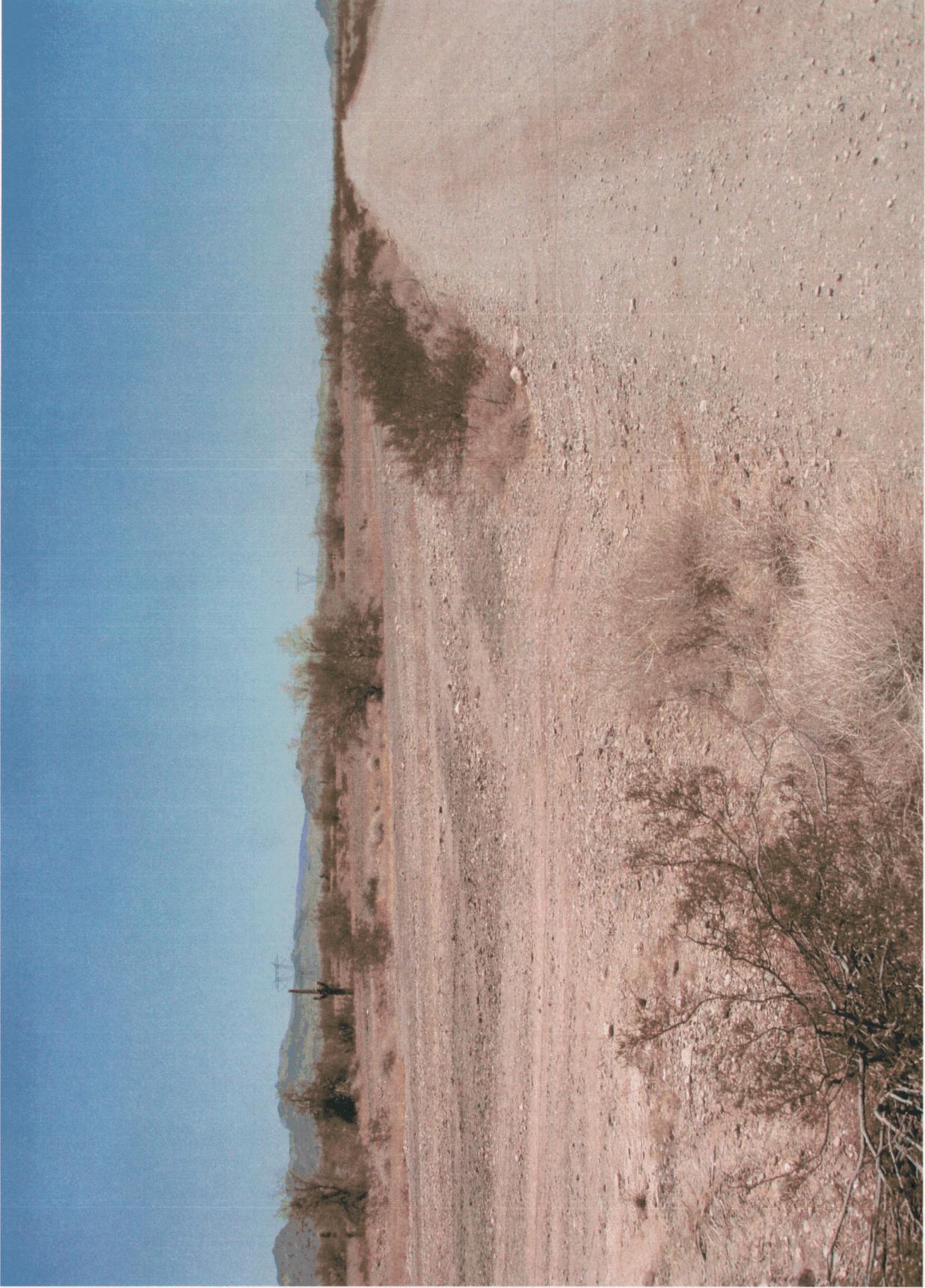
Viewpoint 30 - Looking North At US 95



Viewpoint 30 - Looking North



Viewpoint 30 - Looking Northeast



Viewpoint 30 - Looking East



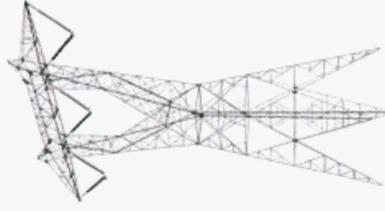
Existing Condition - View looking west along the pipeline road through the KOFA National Wildlife Refuge and existing pipeline and 500kV transmission line corridor. Photograph taken 7-12-06 at 2:11 p.m. using a 50mm focal length.



Viewpoint is located on the pipeline road west of the eastern entrance to the KOFA National Wildlife Refuge approximately 492 feet from the existing transmission line.



Simulation - Proposed 500kV transmission line on the south side of the existing 500kV Transmission Line.



Typical 500kV single-circuit lattice steel tower. Proposed towers are simulated to match existing tower heights and spans.

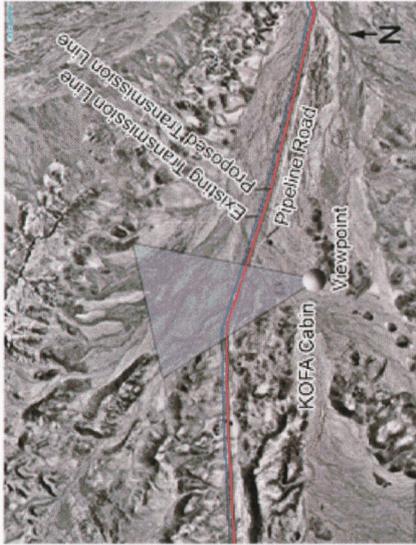
Simulation 1



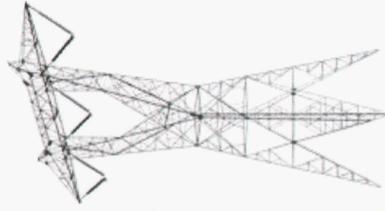
Existing Condition - View looking north-northwest towards the existing 500kV transmission line with the New Water Mountains in the background. Photograph taken 7-12-06 at 2:23 p.m. using a 50mm focal length.



Simulation - Proposed 500kV transmission line on the south side of the existing 500kV transmission line.



Viewpoint is located at the KOFA cabin approximately 5,249 feet from the existing 500kV transmission line.



Typical 500kV single-circuit lattice steel tower. Proposed towers are simulated to match existing tower heights and spans.

Simulation 2



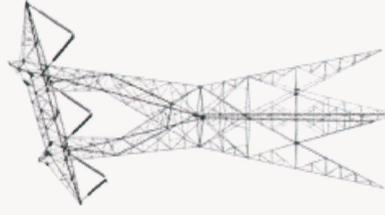
Existing Condition - View looking west along the pipeline road towards an existing 500kV transmission line, pipeline, and pipeline ancillary facilities. Photograph taken 7-12-06 at 3:06 p.m. using a 50mm focal length.



Simulation - Proposed 500kV transmission line on the south side of the existing 500kV transmission line.

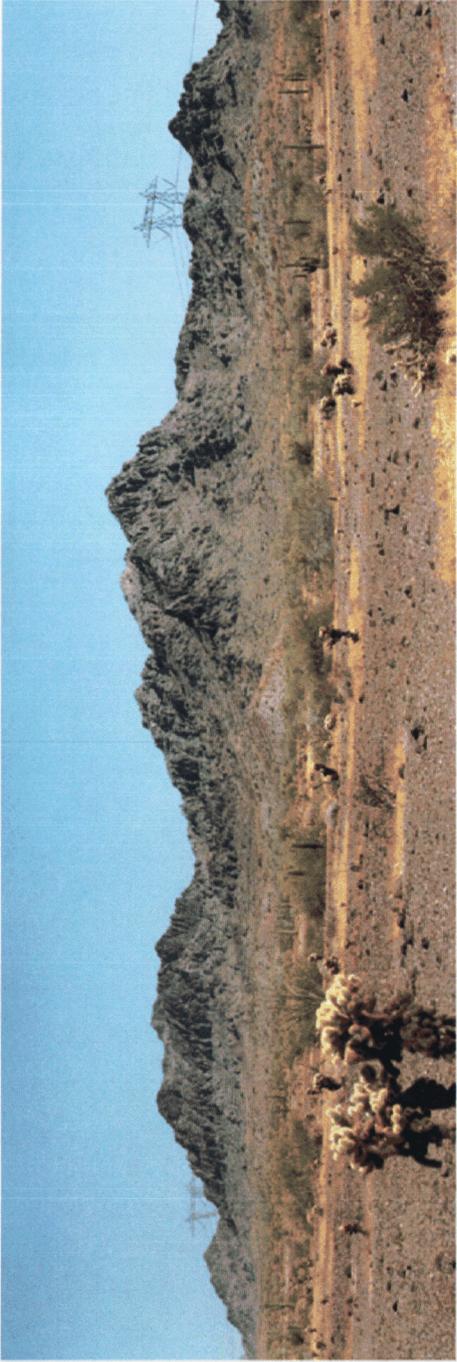


Viewpoint is located on the pipeline road approximately 557 feet to the north of the existing 500kV transmission line.

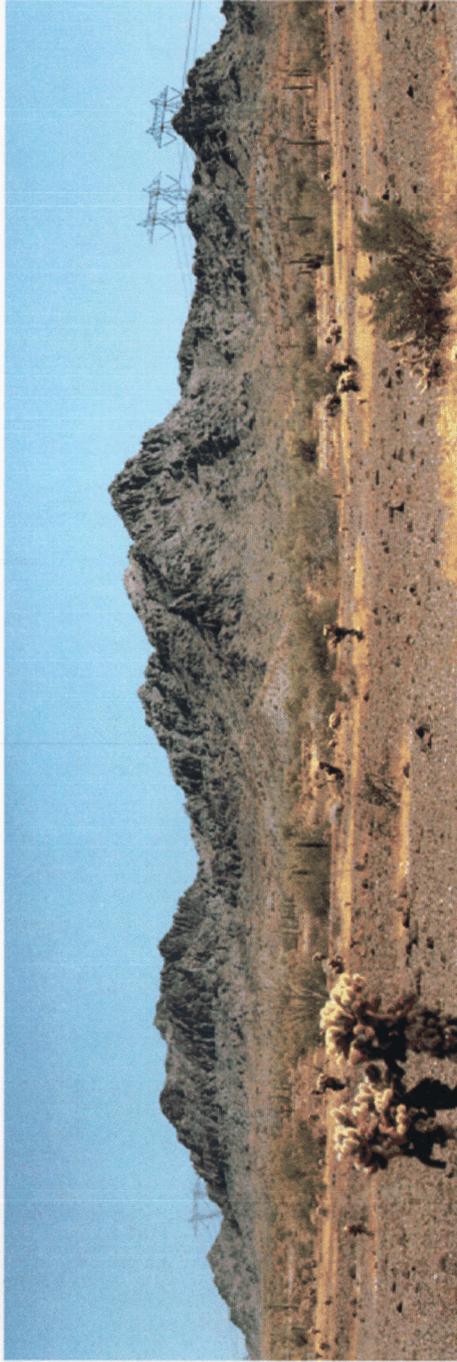


Typical 500kV single-circuit lattice steel tower. Proposed towers are simulated to match existing tower heights and spans.

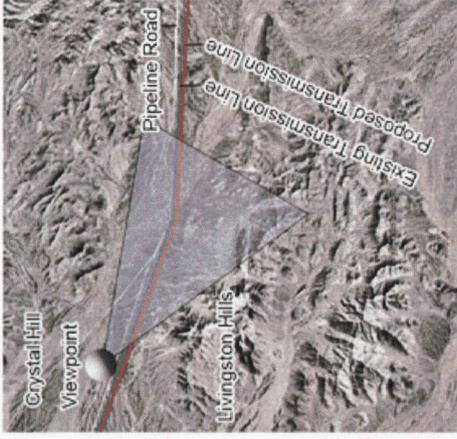
Simulation 3



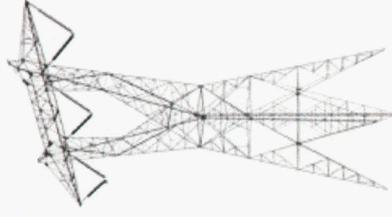
Existing Conditions – Looking southeast toward the Livingston Hills approximately 4.8 miles east of US 95, in the Kofa National Wildlife Refuge. Photograph taken 5/10/06 at 4:35pm using a 50mm focal length.



Simulation - Proposed 500kV transmission line on the south side of the existing 500kV transmission line..



Viewpoint looking southeast from Crystal Hill Road toward the Livingston Hills, approximately 1/8 mile north of DPV1 approximately 1,115 feet from existing 500kV transmission line.



Typical 500kV single-circuit steel lattice tower used in simulations. Tower/structure design has been provided by SCE engineering and is conceptual.

Simulation 4



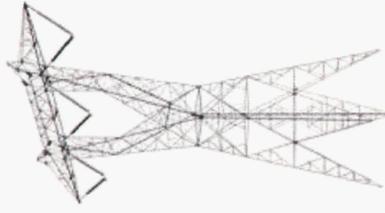
Existing Condition - View looking southeast towards the KOFA National Wildlife Refuge and KOFA Mountains.
 Photograph taken 7-12-06 at 3:56 p.m. using a 50mm focal length.



Simulation - Proposed 500kV transmission line on the south side of the existing 500kV transmission line.



Viewpoint is located at the western entrance to the KOFA approximately 2,362 feet from the existing 500kV transmission line.



Typical 500kV single-circuit lattice steel tower. Proposed towers are simulated to match existing tower heights and spans.

Simulation 5

3



SOUTHERN CALIFORNIA
EDISON[®]

An EDISON INTERNATIONAL[®] Company

United States Department of the Interior
Bureau of Land Management
690 W. Gamet Ave.
P. O. Box 581260
N. Palm Springs, Ca. 92258-1260

May 20, 2005

Attn.: John Kalish

Subject: Devers-Palo Verde #2
Application for Amendment
CA 17905 & AZ 23805

Southern California Edison (SCE) is the holder of Right of Way Grant (Grant) CA 17905 & AZ 23805 (one document) issued by the Bureau of Land Management (Bureau) for the Devers-Palo Verde #2 (DPV2) 500 kilovolt (kV) transmission line. This Grant is currently 130' wide. Based upon electrical needs in California,

SCE is requesting that the Bureau amend the existing Right-of-Grant for DPV2 as summarized below and described in more detail in the attached Application to Amend the Grant.

- 1) construction of a new series capacitor site in Arizona (an additional 75 ft X 321 ft = .55 acres);
- 2) construction of a new series capacitor site in California (an additional 75 ft X 321 ft = .55 acres);
- 3) construction of a 500 kV switchyard called the Midpoint Substation (Midpoint) west of Blythe, California. The preferred location and one alternate site (Wiley Well) are located on BLM land. The other alternate site (Mesa Verde) is located on private land. Midpoint would be constructed if SCE and Desert Southwest Power, LLC, agree to share a single 500 kV transmission line between Blythe and Devers (Total necessary is 1,000 ft X 1,900 ft = 43.62 acres);
- 4) addition of a land parcel upon which SCE would construct the 500 kV transmission line in Arizona as the line proceeds to a new termination point at the Harquahala Generating Station Switchyard, located approximately 16 miles northwest of PVNGS. SCE prefers to terminate the proposed 500kV transmission line at the Harquahala

Generating Station Switchyard; however, SCE must retain the existing right-of-way to the PVNGS to preserve the ability to implement the Palo Verde sub-alternate route described in the response to Question 13a.iii) in this application and authorized in the existing DPV2 Right of Way grant (add'l r/w necessary 100 ft X 5280 ft = 12.12 acres).

5) Revision to Exhibit B-6, Visual Mitigation Measure 2 to allow DPV2 tower heights and spacing to be different than the existing DPV1 line towers and spacing in certain circumstances, as discussed in Section 17.b) of this application.

These five revisions to the existing DPV2 Right of Way grant are considered the "Project". The Project areas on BLM land not previously identified in the existing Right of Way grant are as follows:

Facility	Section	Township	Range	Distance	PEA Map
Arizona Series Capacitor	18	2N	14W	75 ft X 321 ft	3-2a
California Series Capacitor	6	6S	14E	75 ft X 321 ft	3-2b
Midpoint Substation					
Preferred Site	26	2N	21E	1,000 ft x 1,900 ft	3-2a
Wiley Well Alternate Site	5	3N	20E	1,000 ft x 1,900 ft	3-2a
500kV Transmission Line	34	2N	8W	100 ft X 5,280 ft	*

* Project area location shown on Attachments A and B.

SCE filed an Application for a Certificate of Public Convenience and Necessity (CPCN) with the California Public Utilities Commission (CPUC) for DPV2 on April 11, 2005. SCE understands that the BLM must evaluate the potential environmental impacts associated with the amendments to the DPV2 Right of Way Grant pursuant to the National Environmental Policy Act. To assist the BLM in its evaluation, April 13, 2005 SCE delivered copies of the Proponent's Environmental Assessment (PEA) that was included in the CPUC filing. The PEA describes the entire DPV2 project because the CPUC has not previously approved the construction of this project. Although the BLM only needs to review the amendments to the existing, previously approved Right of Way Grant, the PEA may be used for that more limited NEPA review by focusing on the changes described in this amendment application.

Enclosed are one original and four (4) copies of an Application to Amend the Grant to allow the additional right of way for the series capacitors, the additional parcel, Midpoint Substation and the revision to Exhibit B-6.

If you have any questions or need additional information, please call me at
(714) 870-3176.

Sincerely,


Laura L. (Solorio) Verdugo
Right of Way Agent

Llv
Enclosure

APPLICATION FOR TRANSPORTATION AND
UTILITY SYSTEMS AND FACILITIES
ON FEDERAL LANDS

FORM APPROVED
OMB NO. 1004-0189
Expires: October 31, 2005

FOR AGENCY USE ONLY

NOTE: Before completing and filing the application, the applicant should completely review this package and schedule a preapplication meeting with representatives of the agency responsible for processing the application. Each agency may have specific and unique requirements to be met in preparing and processing the application. Many times, with the help of the agency representative, the application can be completed at the preapplication meeting.

Application Number

Date filed

1. Name and address of applicant (include zip code) So. Calif. Edison Company 1851 W. Valencia, Bldg F Fullerton, Ca. 92833		2. Name, title, and address of authorized agent if different from Item 1 (include zip code) Laura Solorio Right of Way Agent		3. TELEPHONE (area code) Applicant (714) 870-3176 Authorized Agent Same as above	
4. As applicant are you? (check one) a. <input type="checkbox"/> Individual b. <input checked="" type="checkbox"/> Corporation* c. <input type="checkbox"/> Partnership/Association* d. <input type="checkbox"/> State Government/State Agency e. <input type="checkbox"/> Local Government f. <input type="checkbox"/> Federal Agency * If checked, complete supplemental page		5. Specify what application is for: (check one) a. <input type="checkbox"/> New authorization b. <input type="checkbox"/> Renewing existing authorization No. c. <input checked="" type="checkbox"/> Amend existing authorization No. CA 17905 + AZ 23805 (one document) d. <input type="checkbox"/> Assign existing authorization No. e. <input type="checkbox"/> Existing use for which no authorization has been received* f. <input type="checkbox"/> Other* * If checked, provide details under Item 7			
6. If an individual, or partnership are you a citizen(s) of the United States? <input type="checkbox"/> Yes <input type="checkbox"/> No N/A					
7. Project description (describe in detail): (a) Type of system or facility, (e.g., canal, pipeline, road); (b) related structures and facilities; (c) physical specifications (length, width, grading, etc.); (d) term of years needed; (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction (Attach additional sheets, if additional space is needed.) See attachment.					

8. Attach a map covering area and show location of project proposal	Maps attached
9. State or local government approval: <input type="checkbox"/> Attached <input type="checkbox"/> Applied for <input type="checkbox"/> Not required	
10. Nonreturnable application fee: <input type="checkbox"/> Attached <input type="checkbox"/> Not required	To be determined by BLM.
11. Does project cross international boundary or affect international waterways? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If "yes," indicate on map)	
12. Give statement of your technical and financial capability to construct, operate, maintain, and terminate system for which authorization is being requested.	

Southern California Edison is technically and financially capable of constructing, operating, and maintaining the system described in this application.

13a. Describe other reasonable alternative routes and modes considered.

See attachment

b. Why were these alternatives not selected?

See attachment

c. Give explanation as to why it is necessary to cross Federal Lands.

See attachment

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency. (Specify number, date, code, or name)

See attachment

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal (construction, operation, and maintenance); (b) estimated cost of next best alternative; and (c) expected public benefits.

See attachment

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

See attachment

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

See attachment

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

See attachment

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any of the right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 9601 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

See attachment

20. Name all the Department(s)/Agency(ies) where this application is being filed.

USDI - Bureau of Land Management

690 W. Summit

P.O. BOX 581260

Palm Springs, Ca. 92258-1260

I HEREBY CERTIFY, That I am of legal age and authorized to do business in the State and that I have personally examined the information contained in the application and believe that the information submitted is correct to the best of my knowledge.

Signature of Applicant

[Signature]

Date

5/13/05

Title 18, U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 3)

SF-299, page 2

APPLICATION FOR TRANSPORTATION AND UTILITY SYSTEMS
AND FACILITIES ON FEDERAL LANDS

GENERAL INFORMATION
ALASKA NATIONAL INTEREST LANDS

This application will be used when applying for a right-of-way, permit, license, lease, or certificate for the use of Federal lands which lie within conservation system units and National Recreation or Conservation Areas as defined in the Alaska National Interest Lands Conservation Act. Conservation system units include the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, and National Forest Monuments.

Transportation and utility systems and facility uses for which the application may be used are:

1. Canals, ditches, flumes, laterals, pipes, pipelines, tunnels, and other systems for the transportation of water.
2. Pipelines and other systems for the transportation of liquids other than water, including oil, natural gas, synthetic liquid and gaseous fuels, and any refined product produced therefrom.
3. Pipelines, slurry and emulsion systems, and conveyor belts for transportation of solid materials.
4. Systems for the transmission and distribution of electric energy.
5. Systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communications.
6. Improved rights-of-way for snow machines, air cushion vehicles, and all-terrain vehicles.
7. Roads, highways, railroads, tunnels, tramways, airports, landing strips, docks, and other systems of general transportation.

This application **must** be filed simultaneously with each Federal department or agency requiring authorization to establish and operate your proposal.

In Alaska, the following agencies will help the applicant file an application and identify the other agencies the applicant should contact and possibly file with:

Department of Agriculture
Regional Forester, Forest Service (USFS)
Federal Office Building, P.O. Box 21628
Juneau, Alaska 99802-1628
Telephone: (907) 586-7847 (or a local Forest Service Office)

Department of the Interior
Bureau of Indian Affairs (BIA)
Juneau Area Office
9109 Mendenhall Mall Road, Suite 5, Federal Building Annex
Juneau, Alaska 99802
Telephone: (907) 586-7177

Bureau of Land Management (BLM)
222 West 7th Ave., Box 13
Anchorage, Alaska 99513-7599
Telephone: (907) 271-5477 (or a local BLM Office)

National Park Service (NPS)
Alaska Regional Office, 2525 Gambell St., Rm. 107
Anchorage, Alaska 99503-2892
Telephone: (907) 257-2585

U.S. Fish & Wildlife Service (FWS)
Office of the Regional Director
1011 East Tudor Road
Anchorage, Alaska 99503
Telephone: (907) 786-3440

Note-Filings with any Interior agency may be filed with any office noted above or with the: Office of the Secretary of the Interior, Regional Environmental Officer, Box 120, 1675 C Street, Anchorage, Alaska 99513.

(For supplemental, see page 4)

Department of Transportation
Federal Aviation Administration
Alaska Region AAL-4, 222 West 7th Ave., Box 14
Anchorage, Alaska 99513-7587
Telephone: (907) 271-5285

NOTE - The Department of Transportation has established the above central filing point for agencies within that Department. Affected agencies are: Federal Aviation Administration (FAA), Coast Guard (USCG), Federal Highway Administration (FHWA), Federal Railroad Administration (FRA).

OTHER THAN ALASKA NATIONAL INTEREST LANDS

Use of this form is not limited to National Interest Conservation Lands of Alaska.

Individual departments/agencies may authorize the use of this form by applicants for transportation and utility systems and facilities on other Federal lands outside those areas described above.

For proposals located outside of Alaska, applications will be filed at the local agency office or at a location specified by the responsible Federal agency.

SPECIFIC INSTRUCTIONS
(Items not listed are self-explanatory)

Item

- 7 Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.
- 8 Generally, the map **must** show the section(s), township(s), and range(s) within which the project is to be located. Show the proposed location of the project on the map as accurately as possible. Some agencies require detailed survey maps. The responsible agency will provide additional instructions.
- 9, 10, and 12 - The responsible agency will provide additional instructions.
- 13 Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.
- 14 The responsible agency will provide instructions.
- 15 Generally, a simple statement of the purpose of the proposal will be sufficient. However, major proposals located in critical or sensitive areas may require a full analysis with additional specific information. The responsible agency will provide additional instructions.
- 16 through 19 - Providing this information in as much detail as possible will assist the Federal agency(ies) in processing the application and reaching a decision. When completing these items, you should use a sound judgment in furnishing relevant information. For example, if the project is not near a stream or other body of water, **do not** address this subject. The responsible agency will provide additional instructions.

Application **must** be signed by the applicant or applicant's authorized representative.

If additional space is needed to complete any item, please put the information on a separate sheet of paper and identify it as "Continuation of Item".

SUPPLEMENTAL

NOTE: The responsible agency(ies) will provide additional instructions

CHECK APPROPRIATE
BLOCK

I - PRIVATE CORPORATIONS	ATTACHED	FILED*
a. Articles of Incorporation	<input type="checkbox"/>	<input type="checkbox"/>
b. Corporation Bylaws	<input type="checkbox"/>	<input type="checkbox"/>
c. A certification from the State showing the corporation is in good standing and is entitled to operate within the State.	<input type="checkbox"/>	<input type="checkbox"/>
d. Copy of resolution authorizing filing	<input type="checkbox"/>	<input type="checkbox"/>
e. The name and address of each shareholder owning 3 percent or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote and the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.	<input type="checkbox"/>	<input type="checkbox"/>
f. If application is for an oil or gas pipeline, describe any related right-of-way or temporary use permit applications, and identify previous applications.	<input type="checkbox"/>	<input type="checkbox"/>
g. If application is for an oil and gas pipeline, identify all Federal lands by agency impacted by proposal.	<input type="checkbox"/>	<input type="checkbox"/>
II - PUBLIC CORPORATIONS		
a. Copy of law forming corporation	<input type="checkbox"/>	<input type="checkbox"/>
b. Proof of organization	<input type="checkbox"/>	<input type="checkbox"/>
c. Copy of Bylaws	<input type="checkbox"/>	<input type="checkbox"/>
d. Copy of resolution authorizing filing	<input type="checkbox"/>	<input type="checkbox"/>
e. If application is for an oil or gas pipeline, provide information required by Item "I-f" and "I-g" above.	<input type="checkbox"/>	<input type="checkbox"/>
III - PARTNERSHIP OR OTHER UNINCORPORATED ENTITY		
a. Articles of association, if any	<input type="checkbox"/>	<input type="checkbox"/>
b. If one partner is authorized to sign, resolution authorizing action is	<input type="checkbox"/>	<input type="checkbox"/>
c. Name and address of each participant, partner, association, or other	<input type="checkbox"/>	<input type="checkbox"/>
d. If application is for an oil or gas pipeline, provide information required by Item "I-f" and "I-g" above.	<input type="checkbox"/>	<input type="checkbox"/>

* If the required information is already filed with the agency processing this application and is current, check block entitled "Filed." Provide the file identification information (e.g., number, date, code, name). If not on file or current, attach the requested information.

The Paperwork Reduction Act of 1995 requires us to inform you that: The Federal agencies collect this information from applicants requesting right-of-way, permit, license, lease, or certifications for the use of Federal lands. Federal agencies use this information to evaluate your proposal. No Federal agency may request or sponsor, and you are not required to respond to a request for information which does not contain a currently valid OMB Control Number.

BURDEN HOURS STATEMENT

The public burden for this form is estimated at 25 hours per response including the time for reviewing instructions, gathering and maintaining data, and

completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to: U.S. Department of the Interior, Bureau of Land Management (1004-0189), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401LS, Washington, D.C. 20240

A reproducible copy of this form may be obtained from the Bureau of Land Management, Land and Realty Group, 1620 L Street, N.W., Rm. 1000LS, Washington, D.C. 20036.

NOTICE

NOTE: This applies to the Department of the Interior/Bureau of Land Management (BLM).

The Privacy Act of 1974 provides that you be furnished with the following information in connection with the information provided by this application for an authorization.

AUTHORITY: 16 U.S.C. 310 and 5 U.S.C. 301.

PRINCIPAL PURPOSE: The primary uses of the records are to facilitate the (1) processing of claims or applications; (2) recordation of adjudicative actions; and (3) indexing of documentation in case files supporting administrative actions.

ROUTINE USES: BLM and the Department of the Interior (DOI) may disclose your information on this form: (1) to appropriate Federal agencies when concurrence or supporting information is required prior to granting or acquiring a right or interest in lands or resources; (2) to members or the public who have a need for the information that is maintained by BLM for public record; (3) to the U.S. Department of Justice, court, or other adjudicative body when DOI determines the information is necessary and relevant to litigation; (4) to appropriate Federal, State, local, or foreign agencies responsible for investigating, prosecuting violation, enforcing, or implementing this statute, regulation, or order; and (5) to a congressional office when you request the assistance of the Member of Congress in writing.

EFFECT OF NOT PROVIDING THE INFORMATION: Disclosing this information is necessary to receive or maintain a benefit. Not disclosing it may result in rejecting the application.

Project description:

In 1989, the US Department of the Interior – Bureau of Land Management (BLM) issued a Record of Decision to the Southern California Edison Company (SCE) for the Devers Palo Verde 2 (DPV2) 500 kilovolt (kV) transmission line project. Later that year, the BLM issued Right-of-Way Grant CA-17905 / AZ-23805 to SCE for the construction, operation, and maintenance of DPV2 across federal land, pursuant to Title V of the Federal Land Policy and Management Act of 1976. The route followed the existing DPV1 line and terminated at the Palo Verde Nuclear Generating Station (PVNGS).

In this application, SCE requests an amendment to the existing Right-of-Way Grant for DPV2 to accommodate the following:

- 1) construction of a new series capacitor site in Arizona (an additional 75 ft X 321 ft = .55 acres);
- 2) construction of a new series capacitor site in California (an additional 75 ft X 321 ft = .55 acres);
- 3) construction of a 500 kV switchyard called the Midpoint Substation (Midpoint) west of Blythe, California. The preferred location and one alternate site (Wiley Well) are located on BLM land. The other alternate site (Mesa Verde) is located on private land. Midpoint would be constructed if SCE and Desert Southwest Power, LLC, agree to share a single 500 kV transmission line between Blythe and Devers (Total necessary is 1,000 ft X 1,900 ft = 43.62 acres);
- 4) addition of a land parcel upon which SCE would construct the 500 kV transmission line in Arizona as the line proceeds to a new termination point at the Harquahala Generating Station Switchyard, located approximately 16 miles northwest of PVNGS. SCE prefers to terminate the proposed 500kV transmission line at the Harquahala Generating Station Switchyard; however, SCE must retain the existing right-of-way to the PVNGS to preserve the ability to implement the Palo Verde sub-alternate route described in the response to Question 13a.iii) in this application and authorized in the existing DPV2 Right of Way grant (add'l r/w necessary 100 ft X 5280 ft = 12.12 acres).
- 5) Revision to Exhibit B-6, Visual Mitigation Measure 2 to allow DPV2 tower heights and spacing to be different than the existing DPV1 line towers and spacing in certain circumstances, as discussed in Section 17.b) of this application.

These five revisions to the existing DPV2 Right of Way grant are considered the "Project". The Project areas on BLM land not previously identified in the existing Right of Way grant are as follows:

Facility	Section	Township	Range	Distance	PEA Map
Arizona Series Capacitor	18	2N	14W	75 ft X 321 ft	3-2a
California Series Capacitor	6	6S	14E	75 ft X 321 ft	3-2b
Midpoint Substation					
Preferred Site	26	2N	21E	1,000 ft x 1,900 ft	3-2a
Wiley Well Alternate Site	5	3N	20E	1,000 ft x 1,900 ft	3-2a
500kV Transmission Line	34	2N	8W	100 ft X 5,280 ft	*

* Project area location shown on Attachments A and B.

SCE filed an Application for a Certificate of Public Convenience and Necessity (CPCN) with the California Public Utilities Commission (CPUC) for DPV2 on April 11, 2005. SCE understands that the BLM must evaluate the potential environmental impacts associated with the amendments to the DPV2 Right of Way Grant pursuant to the National Environmental Policy Act. To assist the BLM in its evaluation, April 13, 2005 SCE delivered copies of the Proponent's Environmental Assessment (PEA) that was included in the CPUC filing. The PEA describes the entire DPV2 project because the CPUC has not previously approved the construction of this project. Although the BLM only needs to review the amendments to the existing, previously approved Right of Way Grant, the PEA may be used for that more limited NEPA review by focusing on the changes described in this amendment application.

(a) Type of system or facility: 500kV electrical transmission line, two series capacitor bank stations, and Midpoint. See Sections 3.1-3.4 of the PEA.

(b) Related structures and facilities: see Section 3.3 of the PEA for transmission line structures, Section 3.4 of the PEA for series capacitor facilities, and 3.1.2.2 for Midpoint.

(c) Physical specifications: see attached plot plan for series capacitors, attachment A and B for the transmission line, and Figure 3-1 of the PEA for Midpoint.

(d) Term of years needed: perpetual, consistent with existing Right of Way Grant.

(e) Time of year of use or operation: Year-round

(f) Volume or amount of product to be transported: The electric transmission line will transport approximately 2,700 amps of electricity under normal conditions and about 3,600 amps of electricity under contingency conditions.

(g) Duration and timing of construction: Construction of the entire transmission line and series capacitor banks will require approximately 2 years, including mobilization and demobilization of the workforce. See Section 3.5 of the PEA.

(h) Temporary work areas needed for construction: Material and equipment staging areas are needed for construction. See Section 3.5.4 of the PEA.

13a. Describe other reasonable alternatives routes and modes considered.

- i) Series Capacitor Banks: SCE considered installing the series capacitor banks at the existing Devers substation and Harquahala Switchyard.
- ii) Midpoint Substation: As discussed in Section 3.2.2.4 of the PEA, SCE has considered a preferred and two alternate sites for the substation. The two alternative locations are located to the west of the preferred site. They are referred to as the Wiley Well and Mesa Verde sites.
- iii) Transmission Line route section 34, T2N, R8W: As discussed below, other proposed transmission line projects are also considering terminating at the

Harquahala Switchyard. In addition to the BLM and CPUC, SCE must also receive approval of the DPV2 route in Arizona from the Arizona Corporation Commission (ACC). Due to the uncertainty of approval of SCE's proposed route to the Harquahala Switchyard by the ACC due to the possibility of competing applications, SCE considered the following two alternative routes to the proposed route to the Harquahala Switchyard:

- a. Harquahala-West subalternate route (see page 3-13 of the PEA).
Currently, Arizona Public Service (APS) is planning for a Palo Verde Hub to TS-5 500 kV transmission line that may parallel DPV1 between the PVNGS interconnection area and the Central Arizona Project Canal (CAP). The Harquahala-West subalternate route may become SCE's preferred route if the Palo Verde Hub to TS-5 line is constructed in a manner that would preclude the DPV2 line from entering the Harquahala Switchyard from the east.
- b. The Palo Verde subalternate route (see page 3-14 and Map 3-3 of the PEA). The Right-of-Way grant for construction of the DPV2 line is parallel to the DPV1 line from the Harquahala Switchyard Junction to PVNGS. This existing, subalternate route may become SCE's preferred route if the Palo Verde Hub to TS-5 line is constructed in a manner that would preclude the DPV2 line from entering the Harquahala switchyard from the east and the Harquahala -West subalternate is not approved by the ACC or any other agency with approval authority. SCE would relinquish this subalternate right-of-way route should either the proposed route or Harquahala-West subalternate route be utilized to allow termination of the DPV2 line at the Harquahala Switchyard.

13b. Why were these alternatives not selected?

- i) The series capacitor banks would be located at sites that would optimize system reliability performance due to the spacing between the new capacitors and existing substation sites. This spacing lowers short circuit duty, which in turn reduces the complexity in protection design and coordination as compared to the alternate locations. The selected sites are adjacent to the existing DPV1 series capacitor bank facilities whose locations were selected for the same reasons. Additionally, due to the prior construction of the DPV1 series capacitors, these two preferred sites are on partially disturbed land.
- ii) The preferred location for the Midpoint Substation is farther from I-10 than the Mesa Verde and Wiley Well alternate sites and would have less potential for visual impact to travelers. Additionally, the Mesa Verde site would require building a longer substation access road, creating a potential for greater environmental impact. The preferred site is located within an existing utility corridor with convenient access to existing regional transmission lines including the DPV1 and DPV2 lines and the existing 161 kV Western and IID north-south trending lines. The alternate sites would require longer new transmission lines to interconnect with the existing regional lines, which creates a potential for greater land disturbance and visual impact and would establish transmission lines outside the existing utility corridor.

- iii) The Harquahala-West subalternate route was not selected because it would result in more land disturbance than the preferred route, see section 5.3.1 of the PEA. Although the Harquahala-West alternative is the shortest route, this route has no existing transmission lines, whereas the proposed route traverses previously disturbed lands adjacent to the existing DPV1 transmission line and the Harquahala-Hassayampa transmission line.

As discussed in Section 2.3.2 of the PEA, for the proposed DPV2 project, SCE would construct a new 500 kV line from Devers to the Harquahala Switchyard instead of the PVNGS Switchyard. SCE would then use the existing Harquahala - Hassayampa 500 kV line to complete the electrical connection of the DPV2 Project to the Hassayampa Switchyard. The Hassayampa Switchyard is a satellite switchyard and is functionally equivalent to connecting at the PVNGS Switchyard, as is permitted in the existing DPV2 right-of-way grant. Terminating at the Harquahala Switchyard eliminates the potential ground disturbance to about 11 acres (8.9 acres of temporary disturbance) and the construction of an additional 27 transmission line towers (see PEA Section 5.3.1.2.) However, SCE would use the Palo Verde subalternate route directly to PVNGS if SCE is unable to obtain the right to use the Harquahala - Hassayampa 500 kV transmission line.

13c. Give an explanation as to why it is necessary to cross federal lands. The federal lands for the proposed series capacitors are within or adjunct to the corridor established for the DPV2 line in the 1989 right of way grant. The existing rights of way for the DPV1, DPV2, and Harquahala-Hassayampa transmission lines are also already partially on federal lands. Thus, installing the new facilities on these previously disturbed federal lands is the most efficient and least impacting proposal.

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency.

- i) The BLM approved the Right of Way Grant for the DPV1 project in 1978. This transmission line began operation in 1982.
- ii) The BLM approved the Right of Way Grant for the DPV2 project in 1989.
- iii) The BLM approved an amendment to the Devers - Palo Verde right of way grant to build the DPV1 series capacitors in 1984. The series capacitors are in operation.
- iv) SCE is aware that the BLM approved the Harquahala Generating Company project for the Harquahala Generating Station and Switchyard, and the Harquahala-Hassayampa transmission line.
- v) Based upon BLM staff recommendation, SCE will be submitting a separate application to the BLM for construction of a new telecommunications facility needed for the DPV2 project. The new facility is described in section 3.4.2 of the enclosed PEA. The facility would be located on BLM land, 1 mile northwest of Salome in La Paz County, Arizona in Section 31 T6N, R10W.

- vi) SCE understands that the BLM is considering a proposal to construct the Desert Southwest Transmission Line Project from Blythe to Devers.
- vii) SCE understands that the California Energy Commission is considering an application from Blythe Energy, LLC for the proposed Blythe Energy Project 230kV Transmission Line Modifications from SCE's Buck Boulevard substation in Blythe to Metropolitan Water District's Julian Hinds substation.
- viii) SCE is aware of a pending Arizona Public Service TS-5 transmission line project from a proposed substation north of Phoenix, Arizona to the PVNGS switchyard.

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal (construction, operation, and maintenance); (b) estimated cost of next best alternative; and (c) expected public benefits.

Please see PEA Chapter 2 for a discussion of Project need, alternatives, and benefits. Project cost information is provided under section 3.8 of the enclosed PEA. The cost of the series capacitors is shown in Table 3-10 of the PEA. The cost of the transmission line segment on Section 34, T2N, R8W is approximately \$600,000 and is included in the transmission line costs shown in Table 3-10. The need for the series capacitors is discussed in section 3.4.1 of the PEA. The potential need for the Midpoint Substation is discussed in Section 2.5 of the PEA. The transmission line segment on Section 34, T2N, R8W is needed to complete the proposed alignment into the Harquahala Generating Station switchyard. SCE expects that these improvements will allow for increased transmission of electric energy to the benefit of residents in the Southwest.

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

The new series capacitors, the Midpoint Substation, and the construction of the transmission line to the Harquahala Switchyard will not likely have any effects on the population and rural lifestyle in the area. Please see PEA Section 5.1.3, which presents a detailed discussion of potential project effects on the socio-economics, population and housing of the entire project area.

An estimated total of 205 construction personnel are expected to be needed for the entire project in California and Arizona. Approximately thirty construction personnel will be needed at any one time for construction of the series capacitor, Midpoint Substation, and Harquahala East transmission line segment described in this application. No permanent housing would be required since a long-term work force would not be needed after construction is completed. Temporary housing is available in the Project area. Workers involved with construction of the proposed facilities would commute from nearby communities (Blythe or Indio in California or Blythe or Goodyear in Arizona).

Project construction would benefit the economy of the local counties by providing construction employment and an increase in property tax revenues. The rural lifestyle of the area would be temporarily disturbed by the influx of workers during the construction

period, but would not be permanently affected once the Project becomes operational. Maintenance activities generally involve an annual inspection of the transmission line and will have little, short-term impact on the local area.

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

Please see the following six sections of the PEA:

a) air quality: Section 5.1.6 presents a detailed discussion of potential project effects on the air quality of the project area. Construction of the series capacitors, Midpoint Substation, and the additional transmission line will not have any adverse environmental impacts related to air quality. Construction activities will result in short-term vehicle and equipment emissions and dust. Vehicles and equipment will be maintained to manufacturers' specifications and best available control techniques will be used to minimize emissions. Water or other dust suppression measures will be used to minimize and control dust on disturbed surfaces.

b) visual impact: Sections 5.1.11 and 5.4.10 present a detailed discussion of potential project effects on the visual resources of the project area. The preferred and alternate Midpoint Substation sites are not located in close proximity to potential viewers. The proposed series capacitor and transmission facilities would be located adjacent to existing similar facilities, with existing access routes and other land modifications. Therefore project effects to visual resources of the area would be minimized.

Exhibit B-6, Visual Mitigation Measure 2 of the existing BLM Right-of-Way grant for DPV2 states:

“For the proposed alignment, tower spacing will correspond to the spacing of the existing transmission line, except where other resource concerns warrant. Additionally, new tower heights will be adjusted such that the top elevations of each set of towers (new and existing) are horizontal with each other. This will visually coordinate perceptions of towers and conductors as one element. Site specific conditions will determine when such mitigation is feasible. Other exceptions to these two measures are where towers will be sited to avoid sensitive features and/or to allow conductors to clearly span the features.”

. In a June 24, 2004 Board of Governors Motion (refer to weblink <http://www.caiso.com/docs/09003a6080/31/ac/09003a608031ac4d.pdf>), the California Independent System Operator (CAISO) directed SCE to complete an upgrade of the DPV1 series capacitors to a minimum 2700 amp rating. SCE system criteria require that a parallel line (in this case DPV2) have the same rating. This capacity rating necessitates that the heights of some of the proposed Devers-Harquahala towers be slightly taller than

the existing adjacent DPV1 towers and, in some locations, tower spacing may not correspond to the adjacent DPV1 towers, to provide adequate conductor ground clearance. SCE will comply with the above mitigation measure to the extent feasible. The DPV2 line would be constructed in a utility corridor adjacent to the DPV1 line and visual impacts would be less than significant even when compliance with this mitigation measure is not possible.

c) surface and ground water quality and quantity: Section 5.1.5 presents a detailed discussion of potential project effects on the hydrology of the project area. No groundwater would be used for construction or operations. Surface water run-off and sedimentation would be minimized because existing access routes would be used.

d) control or structural change on any stream or surface water bodies: Section 5.1.5 presents a detailed discussion of potential project effects on the hydrology of the project area. Placement of project facilities in streams and washes would be avoided wherever possible. Any streams or washes affected by construction of the series capacitors and the Midpoint Substation would be restored to pre-construction configuration in accordance with best management practices and any applicable regulatory requirements of any agencies from whom permits must be obtained for performing work in or affecting streams or washes, such as the U.S. Army Corps of Engineers.

e) existing noise levels: Section 5.1.9 presents a detailed discussion of potential project effects on noise levels in the project area. The series capacitor and Midpoint Substation sites are located in vacant desert areas with no residences or sensitive receptors located within audible range. Construction would comply with local noise ordinances. Audible noise associated with operation of the transmission line is a crackling or buzzing sound caused by corona discharge near the conductors or insulators. The level of corona-generated noise levels would be below ambient levels.

f) the surface of the land, including vegetation, permafrost, soil and soil stability: Section 5.1.8 presents a detailed discussion of potential project effects on the biological resources of the project area. Based on available information including recent field surveys, the project would not affect the biological resources of the project area. Section 5.1.4 presents a detailed discussion of potential project effects on the soils of the project area. Since existing access would be used, soil erosion would be minimized. Surfaces that were disturbed temporarily by construction would be revegetated.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

Please see PEA Section 5.1.8, which presents a detailed discussion of potential project effects on the biological resources of the project area. Construction activities could potentially result in some loss of habitat and potential for harm to threatened and endangered species within the direct construction area. However, implementation of appropriate mitigation measures is expected to reduce any impacts to less than significant. SCE will conduct desert tortoise protocol surveys of the California series capacitor site and applicable Midpoint Substation sites to collect data for use in a Biological Assessment. Impacts to listed species will need to be evaluated by the BLM

and the U.S. Fish and Wildlife Service to meet any regulatory requirements of any agencies from whom permits or take authorizations must be obtained.

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any of the right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

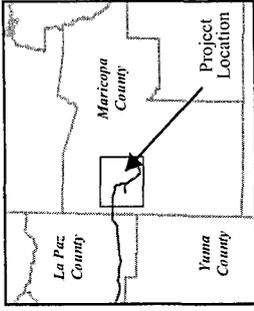
Please see PEA Section 5.1.13, which presents a detailed discussion of potential project effects related to hazardous materials. Project construction activities would involve the operation of heavy equipment and support vehicles, on site. A hazardous substance management, handling, storage, disposal, and emergency response plan have been included as part of the project design and are incorporated into SCE's standard construction, operation, and maintenance procedures. Operation of the proposed facilities would not cause the routine transport, use, or disposal of hazardous materials.

20. Name all the Department(s)/Agency(ies) where this application is being filed.

USDOJ – BLM
690 West Garnet
P.O. Box 581260
North Palm Springs, CA 92258-1260

DPV2 BLM Application5 05/10/05

ATTACHMENT A



- Proposed Devers - Palo Verde No. 2 500kV Transmission Line
- Existing Devers - Palo Verde No. 1 500kV Transmission Line
- Existing Harquahala - Hassayampa 500kV Transmission Line



EDISON

Not to Scale - Line separation shown for illustrative purposes.

To Devers

Proposed Devers - Palo Verde No. 2 (New Construction)



Devers - Palo Verde No. 1

Harquahala Generation Station

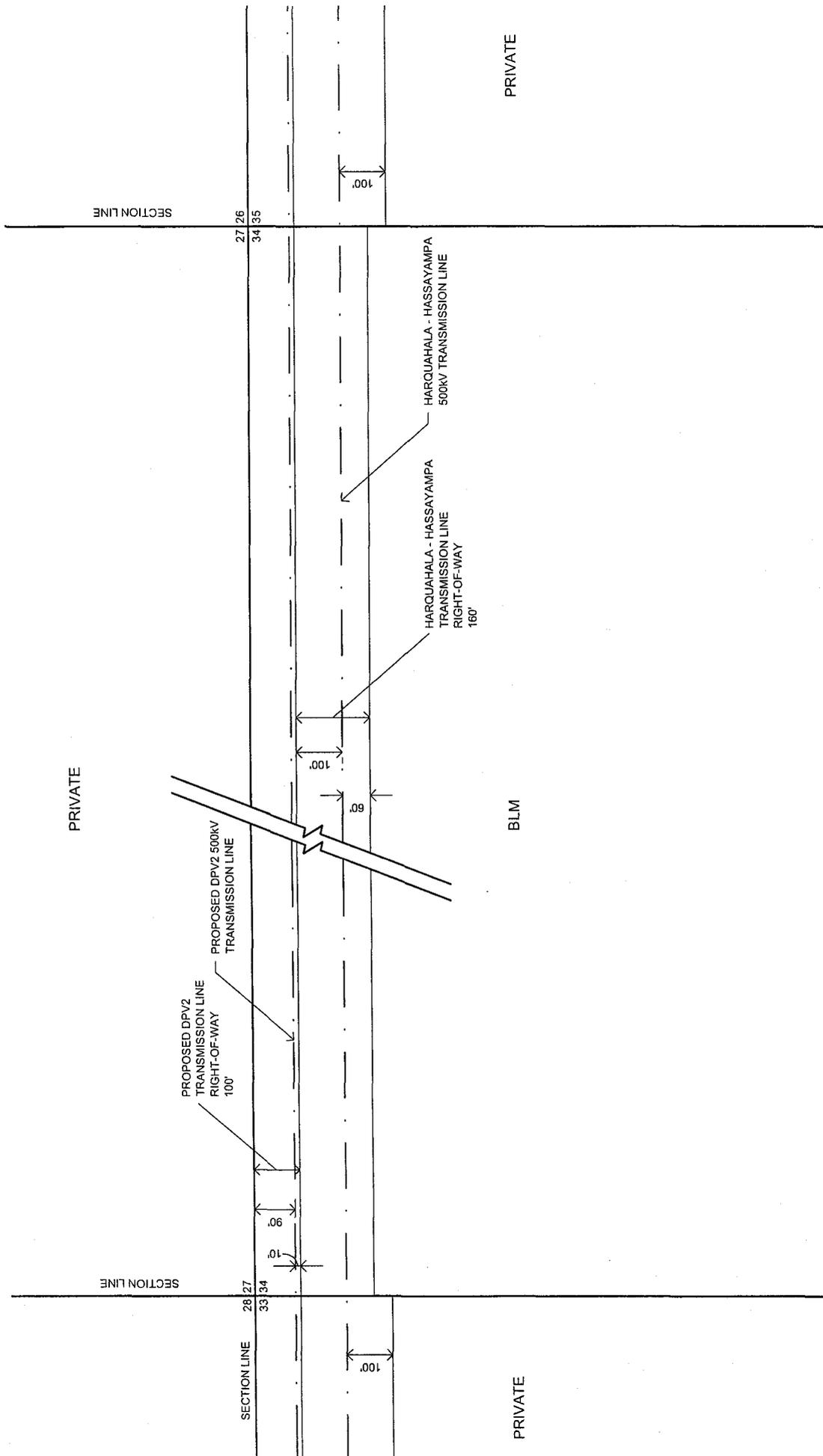
Portion of Proposed DPV2 Transmission Line which requires new right-of-way from BLM (See Attachment B)

Harquahala - Hassayampa

Palo Verde Switchyard

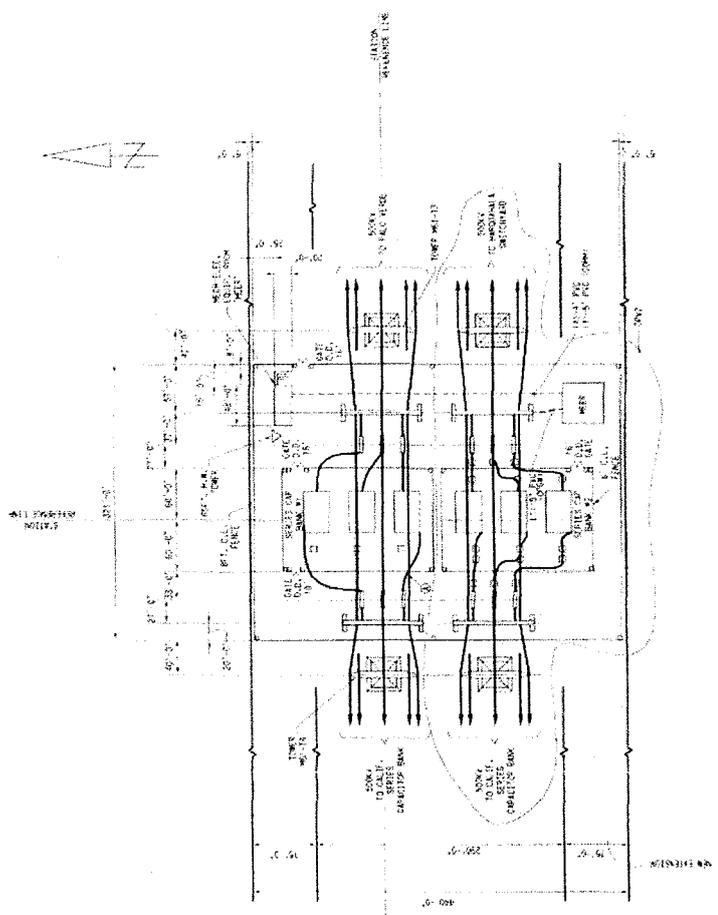
Hassayampa Switchyard

MARICOPA COUNTY



Attachment B
 Devers - Palo Verde No. 2
 Right-of-Way Application

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NOTE:
THIS DRAWING IS FOR INFORMATION ONLY.

SHEET NO.		PROJECT NO.		DATE		DRAWN BY		CHECKED BY		APPROVED BY	
500KV SERIES CAPACITORS		BANKS PLOT PLAN		1985		J. B. BAKER		J. B. BAKER		J. B. BAKER	
<p>EDISON ELECTRIC ENERGY COMPANY</p> <p>500KV SERIES CAPACITORS</p> <p>BANKS PLOT PLAN</p> <p>EDISON ELECTRIC ENERGY COMPANY</p>											
<p>DATE: 1985</p> <p>DRAWN BY: J. B. BAKER</p> <p>CHECKED BY: J. B. BAKER</p> <p>APPROVED BY: J. B. BAKER</p>											

DPV2 ARIZONA SERIES CAPACITORS DRAFT-0

4

Code of Federal Regulations Title 50 Wildlife and Fisheries

CHAPTER I—UNITED STATES FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

Subpart B—Rights-of-Way General Regulations

§29.21 What do these terms mean?

Compatible use means a proposed or existing wildlife-dependent recreational use or any other use of a national wildlife refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge. The term “inconsistent” in section 28(b)(1) of the Mineral Leasing Act of 1920 (30 U.S.C. 185) means a use that is not compatible.

Department means U.S. Department of the Interior unless otherwise specified.

National Wildlife Refuge System land means lands and waters, or interests therein, administered by the Secretary as wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas.

Other lands means all other lands, or interests therein, and waters administered by the Secretary through the U.S. Fish and Wildlife Service which are not included in National Wildlife Refuge System lands, e.g., administrative sites, research stations, fish hatcheries, and fishery research stations.

Project Manager means the officer in charge of the land under administration by the U.S. Fish and Wildlife Service.

[34 FR 19907, Dec. 19, 1969, as amended at 39 FR 5490, Feb. 13, 1974; 42 FR 43917, Aug. 31, 1977; 44 FR 42976, July 23, 1979; 48 FR 31655, July 11, 1983; 51 FR 7575, Mar. 5, 1986; 65 FR 62483, Oct. 18, 2000]

§29.21–1 Purpose and scope.

The regulations in this subpart prescribe the procedures for filing applications and the terms and conditions under which rights-of-way over and across the lands administered by the U.S. Fish and Wildlife Service may be granted.

(a) *National Wildlife Refuge System lands.* Applications for all forms of rights-of-way on or over such lands shall be submitted under authority of Pub. L. 89–669, (80 Stat. 926; 16 U.S.C. 668dd) as amended, or for oil and gas pipelines under section 28 of the Mineral Leasing Act of 1920 (41 Stat. 449; 30 U.S.C. 185) as amended by Pub. L. 93–153, following application procedures set out in §29.21–2. No right-of-way will be approved unless it is determined by the Regional Director to be compatible. See §29.21–8 for additional requirements applicable to rights-of-way for electric power transmission lines and §29.21–9 for additional requirements applicable to rights-of-way for pipelines for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom.

(b) *National Wildlife Refuge System lands—easement interest.* Applications for all forms of rights-of-way across lands in which the United States owns only an easement interest may be submitted to the Regional Director in letter form. No map exhibit is required, however, the affected land should be described in the letter or shown on a map sketch. If the requested right-of-way will not adversely affect the United States’ interest, the Regional

Director may issue a letter stating that the interest of the United States to the right-of-way easement would not be affected provided there would be no objection to a right-of-way by the fee owner. If the interest of the United States will be affected, application for the right-of-way must be submitted in accordance with procedures set out in §29.21-2.

(c) *Other lands outside the National Wildlife Refuge System.* Rights-of-way on or over other lands will be granted in accordance with controlling authorities cited in 43 CFR part 2800, or for oil and gas pipelines under section 28 of the Mineral Leasing Act of 1920 (41 Stat. 449; 30 U.S.C. 185) as amended by Pub. L. 93-153. See §29.21-8 for additional requirements applicable to rights-of-way for electric power transmission lines and §29.21-9 for additional requirements applicable to rights-of-way for pipelines for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any other refined product produced therefrom. Applications will be submitted in accordance with procedures set out in §29.21-2.

[34 FR 19907, Dec. 19, 1969, as amended at 36 FR 2402, Feb. 4, 1971; 39 FR 5490, Feb. 13, 1974; 42 FR 43917, Aug. 31, 1977; 44 FR 42976, July 23, 1979; 48 FR 31655, July 11, 1983]

§29.21-2 Application procedures.

(a) *Application.* (1) No special form of application is required. The application should state the purpose for which the right-of-way is being requested together with the length, width on each side of the centerline, and the estimated acreage. Applications, including exhibits, shall be filed in triplicate with the Regional Director for the region in which the State is located. A list of States in each region and the addresses of the Regional Directors are contained in paragraph (c) of this section.

(2)(i) All applications filed pursuant to this subpart in the name of individuals, corporations, or associations must be accompanied by a nonreturnable application fee. No application fee will be required of (A) State or local governments or agencies or instrumentalities thereof except as to rights-of-way, easements or permits under section 28 of the Mineral Leasing Act of 1920, as amended by Pub. L. 93-153, or (B) Federal Government agencies.

(ii) Application fees will be in accordance with the following schedule:

(A) For linear facilities (e.g., powerlines, pipelines, roads, etc.).

Length	Payment
Less than 5 miles.....	\$50 per mile or fraction thereof.
5 to 20 miles.....	\$500.
20 miles and over.....	\$500 for each 20 miles or fraction thereof.

(B) For nonlinear facilities, \$250 for each 40 acres or fraction thereof.

(C) Where an application includes both linear and nonlinear facilities, payment will be the aggregate of amounts under paragraphs (a)(2)(ii)(A) and (B) of this section.

(D) When an application is received, the Regional Director will estimate the costs expected to be incurred in processing the application. If the estimated costs exceed the payments under paragraph (a)(2)(ii) (A), (B), or (C) of this section by an amount greater than the cost of maintaining actual cost records, the Regional Director shall require the applicant to make periodic payments in advance of the incurrence of such costs by the United States except for the last payment which will reflect final reimbursement for actual costs of the United States in processing the application. Overpayments may be refunded or adjusted by the Regional Director as appropriate.

(E) The Regional Director shall, on request by an applicant or prospective applicant, give an estimate based on the best available cost information, of the costs which would be incurred by the United States in processing an application. However, reimbursement will not be limited to the estimate of the Regional Director if the actual costs exceed the estimate. Prospective applicants are encouraged to consult with the Regional Director in advance of filing an application in regard to probable costs and other requirements.

(3)(i) By accepting an easement or permit under this subpart, the holder agrees to reimburse the United States for reasonable costs incurred by the Fish and Wildlife Service in monitoring the construction, operation, maintenance, and termination of facilities within or adjacent to the easement or permit area. No reimbursement of monitoring costs will be required of (A) State or local governments or agencies or instrumentalities thereof except as to right-of-way, easements, or permits granted under section 28 of the Mineral Leasing Act of 1920 as amended by Pub. L. 93-153, or (B) Federal Government agencies.

(ii) Within 60 days of the issuance of an easement or permit the holder must submit a nonreturnable payment in accordance with the following:

(A) For linear facilities e.g., powerlines, pipelines, roads, etc.).

Length	Payment
Less than 5 miles.....	\$20 per mile or fraction thereof.
5 to 20 miles.....	\$200.
20 miles and over.....	\$200 for each 20 miles or fraction thereof.

(B) For nonlinear facilities, \$100 for each 40 acres or fraction thereof.

(C) Where an easement or permit includes both linear and nonlinear facilities, payment will be the aggregate amounts under paragraph (a)(3)(2)(ii) (A) and (B) of this section.

(D) When an easement or permit is granted the Regional Director shall estimate the costs, based on the best available cost information, expected to be incurred by the United States in monitoring holder activity. If the estimated costs exceed the payments under paragraph (a)(3)(2) (ii), (A), (B), or (C) of this section by an amount which is greater than the cost of maintaining actual cost records for the monitoring process, the Regional Director shall require the holder to make periodic payments of the estimated reimbursable costs prior to the incurrence of such costs by the United States. Overpayments may be refunded or adjusted by the Regional Director as appropriate.

(E) Following the termination of an easement or permit, the former holder will be required to pay additional amounts to the extent the actual costs to the United States have exceeded the payments required by paragraphs (a)(3)(ii)(A), (B), and (C) of this section.

(4) All applications filed pursuant to this subpart must include a detailed environmental analysis which shall include information concerning the impact of the proposed use of the environment including the impact on air and water quality; scenic and esthetic features; historic, architectural, archeological, and cultural features; wildlife, fish and marine life, etc. The analysis shall include sufficient data so as to enable the Service to prepare an environmental assessment and/or impact statement in accordance with section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) and comply with the requirements of the National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.), the Archeological and Historic Preservation Act of 1974 (16 U.S.C. 469 et seq.), Executive Order 11593 "Protection and Enhancement of the Cultural Environment" of May 13, 1971 (36 FR 8921), and "Procedures for the Protection of Historic and Cultural Properties" (36 CFR, part 800). Concerning the National Environmental Policy Act, the Regional Director may, at his discretion, rely on an environmental assessment or impact statement prepared by a "lead agency."

(b) *Maps.* A map or plat must accompany each copy of the application and must show the right-of-way in such detail that the right-of-way can be accurately located on the ground. Ties to Service land boundary corner monuments or some prominent cultural features which can be readily recognized and recovered should be shown where the right-of-way enters and leaves Service project land together with courses and distances of the centerline. The width of the right-of-way on each side of the centerline together with the acreage included within the right-of-way or site must also be shown. If the right-of-way or site is located wholly within Service project land, a tie to a Government corner or prominent cultural feature which can be readily recognized and recovered should be shown.

(c) *Regional or Area Director's Addresses.*

(1) For the States of California, Hawaii, Idaho, Nevada, Oregon and Washington:

Regional Director, U.S. Fish and Wildlife Service, Lloyd 500 Building, Suite 1692, 500 NE. Multnomah Street, Portland Oregon 97232.

(2) For the States of Arizona, New Mexico, Oklahoma, and Texas:

Regional Director, U.S. Fish and Wildlife Service, 500 Gold Avenue, P.O. Box 1306, Albuquerque, New Mexico 87103.

(3) For the States of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin:

Regional Director, U.S. Fish and Wildlife Service, Federal Building, Fort Snelling, Twin Cities, Minnesota 55111.

(4) For the States of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, and Virgin Islands:

Regional Director, U.S. Fish and Wildlife Service, Richard B. Russell, Federal Building, Suite 1200, 75 Spring Street, S.W., Atlanta, Georgia 30303.

(5) For the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, New Jersey, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia:

Regional Director, U.S. Fish and Wildlife Service, One Gateway Center, Suite 700, Newton Corner, Massachusetts 03158.

(6) For the States of Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming:

Regional Director, U.S. Fish and Wildlife Service, P.O. Box 25486, Denver Federal Center, Denver, Colorado 80225.

(7) For the State of Alaska:

Regional Director, U.S. Fish and Wildlife Service, 1101 E. Tudor Road, Anchorage, Alaska 99503.

[31 FR 16026, Dec. 15, 1966, as amended at 42 FR 43917, Aug. 31, 1977; 44 FR 42976, July 23, 1979; 48 FR 31655, July 11, 1983]

§29.21-3 Nature of interest granted.

(a) Where the land administered by the Secretary is owned in fee by the United States and the right-of-way is compatible with the objectives of the area, permit or easement may be approved and granted by the Regional Director. Generally an easement or permit will be issued for a term of 50 years or so long as it is used for the purpose granted, or for a lesser term when considered appropriate. For rights-of-way granted under authority of section 28 of the Mineral Leasing Act of 1920, as amended, for pipelines for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom, the grant may be for a term not to exceed 30 years and the right-of-way may not exceed 50 feet, plus the area occupied by the pipeline and its related facilities unless the Regional Director finds, and records the reasons for his finding, that, in his judgment, a wider right-of-way is necessary for operation and maintenance after construction, or to protect the environment or public safety. Related facilities include but are not limited to valves, pump stations, supporting structures, bridges, monitoring and communication devices, surge and storage tanks, terminals, etc. However, a temporary permit supplementing a right-of-way may be granted for additional land needed during construction, operation, maintenance, or termination of the pipeline, or to protect the natural environment or public safety.

(b) Unless otherwise provided, no interest granted shall give the grantee any right whatever to remove any material, earth, or stone for construction or other purpose, except that stone or earth necessarily removed from the right-of-way in the construction of a project may be used elsewhere along the same right-of-way in the construction of the same project.

[31 FR 16026, Dec. 15, 1966, as amended at 42 FR 43918, Aug. 31, 1977]

§29.21-4 Terms and conditions.

(a) Any right-of-way easement or permit granted will be subject to outstanding rights, if any, in third parties.

(b) An applicant, by accepting an easement or permit agrees to such terms and conditions as may be prescribed by the Regional Director in the granting document. Such terms and conditions shall include the following, unless waived in part by the Regional Director, and may include additional special stipulations at his discretion. See §29.21-8 for special requirements for electric powerlines and §29.21-9 for special requirements for oil and gas pipelines.

(1) To comply with State and Federal laws applicable to the project within which the easement or permit is granted, and to the lands which are included in the right-of-way, and lawful existing regulations thereunder.

(2) To clear and keep clear the lands within the easement or permit area to the extent and in the manner directed by the project manager in charge; and to dispose of all vegetative and other material cut, uprooted, or otherwise accumulated during the construction and maintenance of the project in such a manner as to decrease the fire hazard and also in accordance with such instructions as the project manager may specify.

- (3) To prevent the disturbance or removal of any public land survey monument or project boundary monument unless and until the applicant has requested and received from the Regional Director approval of measures the applicant will take to perpetuate the location of aforesaid monument.
- (4) To take such soil and resource conservation and protection measures, including weed control on the land covered by the easement or permit as the project manager in charge may request.
- (5) To do everything reasonably within his power, both independently and on request of any duly authorized representative of the United States, to prevent and suppress fires on or near, lands to be occupied under the easement or permit area, including making available such construction and maintenance forces as may be reasonably obtainable for the suppression of such fires.
- (6) To rebuild and repair such roads, fences, structures, and trails as may be destroyed or injured by construction work and upon request by the Regional Director, to build and maintain necessary and suitable crossings for all roads and trails that intersect the works constructed, maintained, or operated under the right-of-way.
- (7) To pay the United States the full value for all damages to the lands or other property of the United States caused by him or by his employees, contractors, or employees of the contractors, and to indemnify the United States against any liability for damages to life, person or property arising from the occupancy or use of the lands under the easement or permit, except where the easement or permit is granted hereunder to a State or other governmental agency which has no legal power to assume such a liability with respect to damages caused by it to lands or property, such agency in lieu thereof agrees to repair all such damages. Where the easement or permit involves lands which are under the exclusive jurisdiction of the United States, the holder or his employees, contractors, or agents of the contractors, shall be liable to third parties for injuries incurred in connection with the easement or permit area. Grants of easements or permits involving special hazards will impose liability without fault for injury and damage to the land and property of the United States up to a specified maximum limit commensurate with the foreseeable risks or hazards presented. The amount of no-fault liability for each occurrence is hereby limited to no more than \$1,000,000.
- (8) To notify promptly the project manager in charge of the amount of merchantable timber, if any, which will be cut, removed, or destroyed in the construction and maintenance of the project, and to pay the United States in advance of construction such sum of money as the project manager may determine to be the full stumpage value of the timber to be so cut, removed, or destroyed.
- (9) That all or any part of the easement or permit granted may be terminated by the Regional Director, for failure to comply with any or all of the terms or conditions of the grant, or for abandonment. A rebuttable presumption of abandonment is raised by deliberate failure of the holder to use for any continuous 2-year period the easement or permit for the purpose for which it was granted or renewed. In the event of noncompliance or abandonment, the Regional Director will notify in writing the holder of the easement or permit of his intention to suspend or terminate such grant 60 days from the date of the notice, stating the reasons therefor, unless prior to that time the holder completes such corrective actions as are specified in the notice. The Regional Director may grant an extension of time within which to complete corrective actions when, in his judgment, extenuating circumstances not within the holder's control such as adverse weather conditions, disturbance to wildlife during breeding periods or periods of peak concentration, or other compelling reasons warrant. Should the holder of a right-of-way issued under authority of the Mineral Leasing Act, as amended, fail to take corrective action within the 60-day period, the Regional Director will provide for an administrative proceeding pursuant to 5 U.S.C. 554, prior to a final Departmental decision to suspend or terminate the easement or permit. In the case of all other right-of-way holders, failure to take corrective action within the 60-day period will result in a determination by the Regional Director to suspend or terminate the easement or permit. No administrative proceeding shall be required where the easement or permit terminates under its terms.

(10) To restore the land to its original condition to the satisfaction of the Regional Director so far as it is reasonably possible to do so upon revocation and/or termination of the easement or permit, unless this requirement is waived in writing by the Regional Director. Termination also includes permits or easements that terminate under the terms of the grant.

(11) To keep the project manager informed at all times of his address, and, in case of corporations, of the address of its principal place of business and the names and addresses of its principal officers.

(12) That in the construction, operation, and maintenance of the project, he shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin and shall require an identical provision to be included in all subcontracts.

(13) That the grant of the easement or permit shall be subject to the express condition that the exercise thereof will not unduly interfere with the management, administration, or disposal by the United States of the land affected thereby. The applicant agrees and consents to the occupancy and use by the United States, its grantees, permittees, or lessees of any part of the easement or permit area not actually occupied for the purpose of the granted rights to the extent that it does not interfere with the full and safe utilization thereof by the holder. The holder of an easement or permit also agrees that authorized representatives of the United States shall have the right of access to the easement or permit area for the purpose of making inspections and monitoring the construction, operation and maintenance of facilities.

(14) That the easement or permit herein granted shall be subject to the express covenant that any facility constructed thereon will be modified or adapted, if such is found by the Regional Director to be necessary, without liability or expense to the United States, so that such facility will not conflict with the use and occupancy of the land for any authorized works which may hereafter be constructed thereon under the authority of the United States. Any such modification will be planned and scheduled so as not to interfere unduly with or to have minimal effect upon continuity of energy and delivery requirements.

(15) That the easement or permit herein granted shall be for the specific use described and may not be construed to include the further right to authorize any other use within the easement or permit area unless approved in writing by the Regional Director.

[31 FR 16026, Dec. 15, 1966, as amended at 42 FR 43918, Aug. 31, 1977]

§29.21-5 Construction.

(a) If construction is not commenced within two (2) years after date of right-of-way grant, the right-of-way may be canceled by the Director of the U.S. Fish and Wildlife Service at his discretion.

(b) Proof of construction: Upon completion of construction, the applicant shall file a certification of completion with the Regional Director.

[42 FR 43919, Aug. 31, 1977]

§29.21-6 Disposal, transfer or termination of interest.

(a) *Change in jurisdiction over and disposal of lands.* The final disposal by the United States of any tract of land traversed by a right-of-way shall not be construed to be a revocation of the right-of-way in whole or in part, but such final disposition shall be deemed and taken to be subject to such right-of-way unless it has been specifically canceled.

(b) *Transfer of easement or permit.* Any proposed transfer, by assignment, lease, operating agreement or otherwise, of an easement or permit must be filed in triplicate with the Regional Director and must be supported by a stipulation that the transferee agrees to comply with and be bound by the terms and conditions of the original grant. A \$25 nonreturnable service fee must accompany the proposal. No transfer will be recognized unless and until approved in writing by the Regional Director.

(c) *Disposal of property on termination of right-of-way.* In the absence of any agreement to the contrary, the holder of the right-of-way will be allowed 6 months after termination to remove all property or improvements other than a road and useable improvements to a road, placed thereon by him; otherwise, all such property and improvements shall become the property of the United States. Extensions of time may be granted at the discretion of the Regional Director.

[31 FR 16026, Dec. 15, 1966, as amended at 42 FR 43919, Aug. 31, 1977]

§29.21-7 What payment do we require for use and occupancy of national wildlife refuge lands?

(a) Payment for use and occupancy of lands under the regulations of this subpart will be required and will be for fair market value as determined by appraisal by the Regional Director. At the discretion of the Regional Director, the payment may be a lump sum payment or an annual fair market rental payment, to be made in advance. If any Federal, State or local agency is exempted from such payment by and any other provision of Federal law, such agency shall otherwise compensate the Service by any other means agreeable to the Regional Director, including, but not limited to, making other land available or the loan of equipment or personnel, except that any such compensation shall relate to, and be consistent with the objectives of the National Wildlife Refuge System. The Regional Director may waive such requirement for compensation if he finds such requirement impracticable or unnecessary.

(b) When annual rental payments are used, such rates shall be reviewed by the Regional Director at any time not less than 5 years after the grant of the permit, right-of-way, or easement or the last revision of charges thereunder, The Regional Director will furnish a notice in writing to the holder of an easement or permit of intent to impose new charges to reflect fair market value commencing with the ensuing charge year. The revised charges will be effective unless the holder files an appeal in accordance with §29.22.

[42 FR 43919, Aug. 31, 1977, as amended at 65 FR 62483, Oct. 18, 2000]

§29.21-8 Electric power transmission line rights-of-way.

By accepting a right-of-way for a power transmission line, the applicant thereby agrees and consents to comply with and be bound by the following terms and conditions, except those which the Secretary may waive in a particular case, in addition to those specified in §29.21-4(b).

(a) To protect in a workmanlike manner, at crossings and at places in proximity to his transmission lines on the right-of-way authorized, in accordance with the rules prescribed in the National Electric Safety Code, all Government and other telephone, telegraph and power transmission lines from contact and all highways and railroads from obstruction and to maintain his transmission lines in such manner as not to menace life or property.

(b) Neither the privilege nor the right to occupy or use the lands for the purpose authorized shall relieve him of any legal liability for causing inductive or conductive interference between any project transmission line or other project works constructed, operated, or maintained by him on the servient lands, and any radio installation, telephone line, or other communication facilities now or hereafter constructed and operated by the United States or any agency thereof.

§29.21-9 Rights-of-way for pipelines for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom.

(a) *Application procedure.* Applications for pipelines and related facilities under this section are to be filed in accordance with §29.21-2 of these regulations with the following exception:

When the right-of-way or proposed facility will occupy Federal land under the control of more than one Federal Agency and/or more than one bureau or office of the Department of the Interior, a single application shall be filed with the appropriate State Director of the Bureau of Land Management in accordance with regulations in 43 CFR part 2800.

Any portion of the facility occupying land of the National Wildlife Refuge System will be subject to the provisions of these regulations.

(b) *Right-of-way grants* under this section will be subject to the special requirements of section 28 of the Mineral Leasing Act of 1920 (30 U.S.C. 185), as amended, as set forth below. Gathering lines and associated structures used solely in the production of oil and gas under valid leases on the lands administered by the Fish and Wildlife Service are excepted from the provisions of this section.

(1) *Pipeline safety.* Rights-of-way or permits granted under this section will include requirements that will protect the safety of workers and protect the public from sudden ruptures and slow degradation of the pipeline. An applicant must agree to design, construct, and operate all proposed facilities in accordance with the provisions of parts 192 and/or 195 of title 49 of the CFR and in accordance with the Occupational Safety and Health Act of 1970, Pub. L. 91-596, including any amendments thereto.

(2) *Environmental protection.* An application for a right-of-way must contain environmental information required by §29.21-2(a)(4) of this subpart. If the Regional Director determines that a proposed project will have a significant affect on the environment, there must also be furnished a plan of construction, operations, and rehabilitation of the proposed facilities. In addition to terms and conditions imposed under §29.21-4, the Regional director will impose such stipulations as may be required to assure: (i) Restoration, revegetation and curtailment of erosion of the surface; (ii) that activities in connection with the right-of-way or permit will not violate applicable air and water quality standards in related facilities siting standards established by law; (iii) control or prevention of damage to the environment including damage to fish and wildlife habitat, public or private property, and public health and safety; and (iv) protection of the interests of individuals living in the general area of the right-of-way or permit who rely on the fish, wildlife, and biotic resources of the area for subsistence purposes.

(c) *Disclosure.* If the applicant is a partnership, corporation, association, or other business entity it must disclose the identity of the participants in the entity. Such disclosure shall include where applicable (1) the name and address of each partner, (2) the name and address of each shareholder owning 3 percentum or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote, and (3) the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.

(d) *Technical and financial capability.* The Regional Director may grant or renew a right-of-way or permit under this section only when he is satisfied that the applicant has the technical and financial capability to

construct, operate, maintain and terminate the facility. At the discretion of the Regional Director, a financial statement may be required.

(e) *Reimbursement of costs.* In accordance with §29.21-2(a)(3) of this subpart, the holder of a right-of-way or permit must reimburse the Service for the cost incurred in monitoring the construction, operation, maintenance, and termination of any pipeline or related facilities as determined by the Regional Director.

(f) *Public hearing.* The Regional Director shall give notice to Federal, State, and local government agencies, and the public, and afford them the opportunity to comment on right-of-way applications under this section. A notice will be published in the *Federal Register* and a public hearing may be held where appropriate.

(g) *Bonding.* Where appropriate the Regional Director may require the holder of a right-of-way or permit to furnish a bond, or other security satisfactory to him, to secure all or any of the obligations imposed by the terms and conditions of the right-of-way or permit or by any rule or regulation, not to exceed the period of construction plus one year or a longer period if necessary for the pipeline to stabilize.

(h) *Suspension of right-of-way.* If the Project Manager determines that an immediate temporary suspension of activities within a right-of-way or permit area is necessary to protect public health and safety or the environment, he may issue an emergency suspension order to abate such activities prior to an administrative proceeding. The Regional Director must make a determination and notify the holder in writing within 15 days from the date of suspension as to whether the suspension should continue and list actions needed to terminate the suspension. Such suspension shall remain in effect for only so long as an emergency condition continues.

(i) *Joint use of rights-of-way.* Each right-of-way or permit shall reserve to the Regional Director the right to grant additional rights-of-way or permits for compatible uses on or adjacent to rights-of-way or permit areas granted under this section after giving notice to the holder and an opportunity to comment.

(j) *Common carriers.* (1) Pipelines and related facilities used for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced therefrom shall be constructed, operated, and maintained as common carriers.

(2)(i) The owners or operators of pipelines subject to this subpart shall accept, convey, transport, or purchase without discrimination all oil or gas delivered to the pipeline without regard to whether such oil or gas was produced on Federal or non-Federal lands.

(ii) In the case of oil or gas produced from Federal lands or from the resources on the Federal lands in the vicinity of the pipelines, the Secretary may, after a full hearing with due notice thereof to the interested parties and a proper finding of facts, determine the proportionate amounts to be accepted, conveyed, transported or purchased.

(3)(i) The common carrier provisions of this section shall not apply to any natural gas pipeline operated by any person subject to regulation under the Natural Gas Act or by any public utility subject to regulation by a State or municipal regulatory agency having jurisdiction to regulate the rates and charges for the sale of natural gas to consumers within the State or municipality.

(ii) Where natural gas not subject to state regulatory or conservation laws governing its purchase by pipelines is offered for sale, each such pipeline shall purchase, without discrimination, any such natural gas produced in the vicinity of the pipeline.

(4) The Regional Director shall require, prior to granting or renewing a right-of-way, that the applicant submit and disclose all plans, contracts, agreements, or other information or material which he deems necessary to determine whether a right-of-way shall be granted or renewed and the terms and conditions which should be

included in the right-of-way. Such information may include, but is not limited to: (i) Conditions for, and agreements among owners or operators, regarding the addition of pumping facilities, looping, or otherwise increasing the pipeline or terminal's throughput capacity in response to actual or anticipated increases in demand; (ii) conditions for adding or abandoning intake, offtake, or storage points or facilities; and (iii) minimum shipment or purchase tenders.

(k) *Limitations on export.* Any domestically produced crude oil transported by pipeline over rights-of-way granted pursuant to section 28 of the Mineral Leasing Act of 1920, except such crude oil which is either exchanged in similar quantity for convenience or increased efficiency of transportation with persons or the government of an adjacent foreign state, or which is temporarily exported for convenience or increased efficiency of transportation across parts of an adjacent foreign state and reenters the United States, shall be subject to all of the limitation and licensing requirements of the Export Administration Act of 1969.

(l) *State standards.* The Regional Director shall take into consideration, and to the extent practical comply with, applicable State standards for right-of-way construction, operation, and maintenance.

(m) *Congressional notification.* The Secretary shall notify the House and Senate Committees on Interior and Insular Affairs promptly upon receipt of an application for a right-of-way for pipeline 24 inches or more in diameter, and no right-of-way for such a pipeline shall be granted until 60 days (not including days on which the House or Senate has adjourned for more than three days) after a notice of intention to grant the right-of-way together with the Secretary's detailed findings as to terms and conditions he proposes to impose, has been submitted to the Committees, unless each Committee by resolution waives the waiting period.

[42 FR 43921, Aug. 31, 1977]

5

***COMPREHENSIVE MANAGEMENT PLAN KOFA NWR & WILDERNESS
WILDERNESS MANAGEMENT PLAN NEW WATER MOUNTAINS WILDERNESS***

PREFACE

Adjacent locations and common wilderness management and wildlife habitat concerns led to a coordinated effort between the U.S. Fish and Wildlife Service (Service) and the Bureau of Land management (BLM) to develop one management plan that will cover both (Map 1) the New Water Mountains Wilderness (New Waters) and the Kofa National Wildlife Refuge and Wilderness (Kofa).

A joint Service/BLM management plan document has been published separate from this more detailed version. The joint agency document is shorter and does not contain a full description of agency legal mandates and policies as does this version. This version is meant to be used as the Refuge Manager's working tool as it contains some of the pertinent discussions regarding the major issues. Both documents attempt to integrate both agency concerns and issues in a way that recognizes the differences in legal mandates, but that focuses on the ecological relationship between the two wilderness areas. The plan objectives at the end of both documents are the result of consideration of the resources, the issues relative to the resources, and the respective agency mandates that come into play including the Wilderness Act.

TABLE OF CONTENTS

The Planning Area, Boundary, and Background: An Area of Ecological Concern	2
Plan Purpose and Legal Foundations	3
The Service	3
The BLM	3
Expected Planning Outcomes	4
Planning Perspectives	4
The Issues	5
Issue #1: Protection of Wilderness Values	5
Issue #2: Wildlife and Habitat Management	6
Issue #3: Recreation and Public Access	6
Issue #4: Minerals Management - Active Mining Claims -- Several unpatented mining claims exist within Kofa. Future activities in these areas could affect visual resource values and wildlife habitat within the planning area. This plan will establish strategies for minimizing impacts of all claims.	6
Issue #5: Minimizing Potential Impacts from Private Lands -- There are several private inholdings within the non-wilderness portion of Kofa and one private land parcel adjacent to the north end of the New Waters. Future activities in these areas could affect visual resource values and wildlife habitats within the planning area. This plan will establish strategies for eliminating potential impacts from these non-federal lands.	6
Issue #6:	6
Issues To Be Resolved Through Existing Policy	7
Issue #7: Cultural Resource Management	7
Issue #9: Scientific Research	7
Issue #10: Law Enforcement and Emergency Services	7
Issue #11: Military Ordnance Contamination	7
Issue #13: Military Overflights	8
UNIT 2 -- LEGAL, POLICY, AND ADMINISTRATIVE GUIDELINES	9
AND OTHER SPECIAL CONSIDERATIONS	9
Introduction	9
General Guidance Regarding Multi-jurisdictional Cooperation	9
BLM Lands	9
Refuge Lands	9
Multi jurisdictional Goal	9
Legal Mandates	10
Agency Wide Policy Directions	14
Fish and Wildlife Service Agency Mission	14
Service Wilderness Objectives (Manual 6 RM 8.2 and 8.3)	15
BLM Mission and Vision: Ecosystem Management	16
BLM Wilderness Management Goals	17
The Policy Role of the Arizona Game and Fish Department	18

Purpose Statements	18
Land, Jurisdictional, and Special Designation Considerations	19
Lands	19
Rights-of-Way	19
Adjacent Land Use	20
Cultural Resources	21
Relationship to Other Plans	22
Bureau of Land Management Resource Management Planning	22
La Posa Management Area Planning	22
Biological Diversity on Federal Lands (Keystone Report)	23
Service (Region 2) Biological Diversity Plan	23
Arizona State Comprehensive Outdoor Recreation Plans (SCORP)	23
NATURAL RESOURCE INVENTORY	25
Geological Resources	25
New Water Mountains Geology and Mining	25
Kofa NWR Geology and Mining	25
Water Developments	26
Wildlife and Habitat Resources	26
Wildlife Diversity	26
Endangered and/or Threatened Species	27
Desert Bighorn Sheep	27
Bighorn Sheep Transplantation Program	27
Desert Mule Deer	29
Sonoran Desert Tortoise	29
Habitat Resources	30
PUBLIC USE INVENTORY	32
Public Access to Wilderness Areas	32
Recreational Uses of Refuge and Wilderness Areas	32
PART II. ISSUE DISCUSSION	34
Wildlife and Habitat Management	35
Cooperative Efforts	35
Scarcity of Data	35
Desert Bighorn Sheep	36
Water Developments	38
Endangered, Threatened, or Candidate Species	40
Non Native Species	40
Public Use	41
Accessibility	41
Visitation	42
Compatibility of Uses	42
Wildlife Observation, Camping, Photography, and Opportunities for Solitude	43

Hunting	43
Summary	44
Minerals Management and Minimizing Impacts of Patented Mining Claims	45
Minerals Management in Wilderness	45
Valid mineral leases and mining claims	45
Valid Mining Claims	45
Patented mining claims	46
Summary	46
Surface Disturbances	46
Cultural Resource Management	47
Issues To Be Resolved Through Existing Policy	47
Management of Utility Corridors	47
Scientific Research	48
Law Enforcement and Emergency Services	48
Military Ordnance Contamination	48
Native American Religious Access	48
Military Overflights	48
 MANAGEMENT PROGRAM	 50
Objective 1: Preservation of Wilderness Values:	50
Objective 2. Wildlife and Habitat Management	53
Objective 3: Recreation, Legal Access and Public Information	57
Objective 4: Minerals Management	60
 PART V. PLAN EVALUATION	 61
 PART VI: IMPLEMENTATION SCHEDULE AND COST ESTIMATES	 62
 PART VII: APPENDICES	 64
APPENDIX A	64
APPENDIX B	66
APPENDIX C	68
APPENDIX D	70
.....	76
APPENDIX E	77
APPENDIX F	91
APPENDIX G	92
APPENDIX H	93
ENVIRONMENTAL ASSESSMENT	95

PART I:

The Planning Area, Boundary, and Background: An Area of Ecological Concern¹

This joint agency management plan is primarily concerned with Kofa NWR the adjacent New Waters. The goals and objectives contained in this document reflect a dominant wilderness management theme and focus on issues pertaining to Kofa and the New Waters, which are contiguous. Kofa consists of 665,400 total acres of which 510,900 acres is designated wilderness and is managed by the Service. The New Waters consist of 24,600 designated wilderness acres and is managed by the BLM. Both areas, along with various adjacent lands, form an ecological area that will be considered in this plan as the "area of ecological concern" (planning area).²

Historically, Kofa and the New Waters have played a central wildlife and wildlands conservation role in western Arizona. To counter dwindling populations of desert bighorn sheep in the earlier part of the century, a management theme relating to the recovery of the species had become necessary beyond the establishment of legal protection for the species under the Arizona State Game code.³ Thus, a clear and dominant strategy for the management of these historically "rocky, waterless sierras..." was designed specifically for the recovery of bighorn sheep populations.⁴

The Kofa Game Range was established in 1939 by Executive Order 8039 specifically for the recovery of bighorn sheep populations. Administrative responsibility for Kofa was shared by

¹ An Area of Ecological Concern can be defined as: "An essentially complete ecosystem (or set of interrelated ecosystems) of which one part cannot be discussed without considering the remainder." [*Malheur National Wildlife Refuge Master Plan and Environmental Assessment*, 1985, p. 7] For purposes of this plan both the New Water Mountains designated wilderness area, the Kofa NWR, and lands immediately adjacent to them are considered as the Area of Ecological Concern. The Service and the BLM realize this Area of Ecological Concern falls into a larger category of watersheds and ecoregions. For purposes of setting effective wildlife and wilderness management objectives, this plan needs to focus on a specifically defined geographical area (i.e., area of ecological concern) which will be termed the "planning area." Mineral Survey 3207, adjacent to the northwest side of the New Waters is also considered within the planning area.

As a point of clarification, the term "area of ecological concern" is an informal term used by the Service in its Comprehensive Management Planning process. It is not to be confused with the BLM's more formalized Area of Critical Environmental Concern (ACEC). An ACEC is an area of national or international significance that is threatened by adverse change -- a reduction or loss of values - unless special management attention is applied. With ACEC status, public land is managed to prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; or other natural systems or processes. The actions prompted by this kind of status are similar to those implied by Wilderness designation. By virtue of Wilderness designation, this kind of special focus is afforded an area.

²The La Posa Interdisciplinary Plan addresses management concerns for lands on the west and north side of the New Waters and Kofa. Several actions in the La Posa Plan have been coordinated with this planning effort to assist in preserving natural values of this planning area.

³ According to David Brown, the Arizona bighorn sheep population received legal protection with the establishment of the State Game Code in 1913. He writes: "Although enforcement of the game laws may have been lax, and bighorn sheep continued to be killed for meat and as trophies those populations in desert ranges too arid and precipitous for livestock persisted. Isolated and peripheral populations continued to be extirpated..." Brown, David, *Early History*, in *The Desert Bighorn Sheep in Arizona*, Raymond M. Lee, editor, (Phoenix, AZ.: State of Arizona, 1993); p.5.

⁴ Original source, Baird, S.F. 1859. Mammals. p. 1-62 in Emory (1959): Part 2 -- Zoology of the boundary. United States and Mexican boundary survey. Dept. of the Interior. Washington, D.C., as noted in Lee, Raymond M., *The Desert Bighorn Sheep in Arizona*, (Phoenix, Az.: State of Arizona, 1993) p.1.

the Service and the U.S. Grazing Service until 1946. In 1946, the game range came under joint management of the Service and the newly established BLM. The Service and BLM co-managed Kofa until sole jurisdiction of the refuge was given to the Service with Public Law 94-223 in 1976. As with all Federal lands, the BLM still manages mining claim recordation of processes for Kofa. With passage of the Arizona Desert Wilderness Act of 1990, portions of Kofa and New Waters were designated as part of the National Wilderness Preservation System. This gave both the Service and BLM a common legal mandate for managing these specially designated areas.

By implementing this plan, the Service and the BLM will continue important efforts on behalf of the bighorn sheep. Both agencies also hope to engage in several strategies to promote enhancement of natural habitats for a variety of native species. The Wilderness designations imply the implementation of strategies that engender ecological and landscape outcomes that stem from natural processes. Thus, these designations, while not changing the purposes of these areas or the importance of current activities, call for the consideration of these activities within the larger ecological contexts and within national wilderness goals inherent in the Wilderness Act of 1964 and the Arizona Desert Wilderness Act of 1990.

Plan Purpose and Legal Foundations

This document provides management direction for the planning area for the foreseeable future. For refuge purposes, a period of 10 years is determined to be the working timeframe of this plan. All other previous management direction for the planning area is amended and replaced by this plan. Any future management guidance whose sphere of influence covers this planning area shall abide by the provisions of this document and become an amendment thereto.

The Service -- Executive Order 8039⁵, the legal authority that established the Kofa National Wildlife Refuge, 6 Refuge Manual 8, the Title 50 43, Code of federal Regulations, Subpart 8560, will provide general management guidance for portions of the project area administered by the Service. Additionally general guidance for the project area will be provided by the Wilderness Act of 1964, the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668 *et seq.*), the Refuge Recreation Act of 1962 (16 U.S.C. 460 *et seq.*), and the Arizona Desert Wilderness Act of 1990.⁶

The BLM -- Direction for the New Waters in this plan is in conformance with the Lower Gila South Resource Management Plan. BLM Manual 8560 will provide general

⁵Section 1 of Executive Order 8038 states as follows: "Subject to the conditions expressed in the above mentioned acts and to all valid rights, the following described lands, in so far as title thereto is in the United States, are hereby withdrawn from settlement, location, sale, or entry, and reserved and set apart for the conservation and development of natural wildlife resources..."(Emphasis added)

⁶This CMP document contains a more inclusive list of appropriate citations of law and other general legal guidance relative to the management of national wildlife refuges on page 10.

management guidance for BLM portions of the project area. Additionally, general guidance for the project area will be provided by the Wilderness Act of 1964, the Federal Land Policy Management Act (FLPMA) of 1976 (43 U.S.C. 1701 et seq.), and the Arizona Desert Wilderness Act of 1990.

Expected Planning Outcomes -- The following are the desired outcomes of this planning effort for both the New Water and Kofa areas.

The planning effort will ensure that wilderness values will be incorporated into the management of both the New Water and Kofa designated wilderness areas.

The planning effort will ensure that all other applicable legal mandates and national policy direction are incorporated in the management of the Kofa NWR and the New Water Wilderness Area.

The planning effort will provide a systematic process for making and documenting decisions for both the Kofa NWR and the New Water Wilderness Area.

The planning effort will determine the capability of the Kofa NWR and the New Water Wilderness Area to further Service and BLM long-range resource plans, and to provide a means of evaluating accomplishments.

The planning effort should provide a systematic process for making and documenting decisions in each area.

The planning effort should establish broad management strategies that are, to the degree possible, consistent with a Sonoran desert ecosystem perspective.

This planning effort should provide a practical basis for budgeting requests to implement management programs leading to the achievement of objectives for both areas.

This planning effort should achieve an optimum level of public acceptance and/or support for the management strategies adopted through effective involvement in the planning process.

The planning effort should facilitate and encourage cooperative, coordinated, and integrated resource conservation planning and management throughout the Area of Ecological Concern.

Planning Perspectives -- The comprehensive management planning effort will integrate various perspectives to produce holistic management approaches for the overall planning area

(i.e., Kofa and New Water areas) and ultimately the surrounding landscape over the next 10 years. The plan includes the following:

Integration of a broad landscape perspective that integrates all natural components of the area of ecological concern including, wilderness and non wilderness areas and the surrounding landscape.

Integration of a more narrow perspective for national wildlife refuge related policy issues that affect management of both wilderness and non wilderness areas

Integration of a more narrow perspective for designated wilderness to be managed by the BLM.

An understanding of these perspectives and the relationships between them leads to the formulation of an integral set of objectives for both the New Waters and Kofa areas for the next 10 years or the foreseeable future.

The comprehensive management plan goals and objectives for Kofa, and Wilderness objectives for the New Waters form the practical basis for the development of reasonable sets of actions by both agencies both individually and cooperatively. The refuge objectives form the basis for realistic and justifiable budget requests. The acquisition of the necessary funding and resources is expected to influence the degrees of intensity of the implementation process for both agencies.

The Issues -- An issue is considered to be a problem or opportunity arising from agency directives, resource conflicts, and expectations as identified in the initial stage of this effort, by agency resource specialists and the public. In addressing the identified issues, there are dominant wilderness and wildlife management themes for the planning area that include guidelines both agencies must follow. The agencies have made an effort to learn what issues are most important to the public within considerations of how the area's resources are to be managed for the long-term.

The issues that were identified were separated into three categories: activity plan issues, and issues solved by policy. Following is the final list of issues.

- **Issue #1: Protection of Wilderness Values** -- The long-term preservation of wilderness values is mandated by the Wilderness Act. The Arizona Desert Wilderness Act of 1990 effected wilderness mandates in specific areas including those that are a part of this project area. Sub-issues include: *Effects of visitor uses, illegal vehicle trespass, monitoring of effects of uses, monitoring effects of uses, need for facilities to protect values, management of exotic species, and opportunities for environmental education and public outreach.*

- **Issue #2: Wildlife and Habitat Management** -- The Service has mandated habitat and wildlife management responsibilities. BLM manages wildlife habitat. In coordination with AGFD, both agencies are striving to manage the range of habitats within the planning area to support a diversity of wildlife including special status species. Included in this issue is the management of the various facilities and associated maintenance of artificial water catchments in and outside the wilderness areas. This plan establishes a range of wildlife and habitat management strategies within the context of wilderness and the surrounding areas. Sub-issues include: *Cooperative management; scarcity of data; desert bighorn sheep; water developments; endangered, threatened, and candidate species⁷; management of exotic/ non-native species including pathogenic organisms; and fire management.*
- **Issue #3: Recreation and Public Access** -- Access routes for hunting, wildlife observation, and camping have presented resource protection challenges throughout the refuge and the northwestern portion of the New Waters area. Legal public access needs to be acquired through patented land along the northwest portion of the New Waters. Sub-issues include: *Legal Access; hunting; wildlife observation, camping, and photography; wilderness opportunities for solitude⁸, and noncompatible uses of the planning area.*
- **Issue #4: Minerals Management - Active Mining Claims** -- Several unpatented mining claims exist within Kofa. Future activities in these areas could affect visual resource values and wildlife habitat within the planning area. This plan will establish strategies for minimizing impacts of all claims.
- **Issue #5: Minimizing Potential Impacts from Private Lands** -- There are several private inholdings within the non-wilderness portion of Kofa and one private land parcel adjacent to the north end of the New Waters. Future activities in these areas could affect visual resource values and wildlife habitats within the planning area. This plan will establish strategies for eliminating potential impacts from these non-federal lands.
- **Issue #6: Surface Disturbances:** The wilderness portion of the planning area contains several surface disturbances that affect the area's natural appearance. This plan

⁷The major part of the Service's guidance is contained within applicable sections of 50 CFR 25.11, 50 CFR 35.3, and 6 Refuge Manual 8.8. For the BLM portions of the planning area, sensitive species will be managed under existing policy outlined in BLM Manual 8560.34.

⁸ The Wilderness Act defines wilderness as: "A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation (emphasis added); (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

determines some strategies for minimizing the effects of existing disturbances on wilderness values.

Issues To Be Resolved Through Existing Policy

Both agencies have existing policies as noted to address the following issues.

Issue #7: Cultural Resource Management -- Several cultural features are contained within the planning area. These areas will be managed in compliance with the Archeological Resource Protection Act and the National Historic Preservation Act of 1966. Cultural resource studies will be authorized on a case-by-case basis and guided by existing policy in BLM Manual 8560.32 on the New Waters, and regulations in 50 CFR 271.63 and 35.11 for the refuge.

Issue #8: Management of Rights of Way -- Guidance for the management of utility easements in nonwilderness portions of Kofa can be found in 50 CFR 29.21. No additional guidance is needed.

Issue #9: Scientific Research -- Studies for management, scientific, educational, or historical/cultural purposes in the New Waters will be guided by BLM Manual sections 8560.18. Studies on the refuge will be guided by 6 Refuge Manual 8.9(h), 50 CFR 27.63, and 50 CFR 35.11..

Issue #10: Law Enforcement and Emergency Services -- There are established wilderness management policies and regulations in BLM Manual 8560.39 and 43 CFR 8560.3, and 6 Refuge Manual 8.8 and 50 CFR 35.5, that provide for law enforcement and emergency access and equipment uses in incidents involving public health and safety and violations of civil and criminal law. No additional guidance is needed.

Issue #11: Military Ordnance Contamination -- A possibility of ordnance contamination exists on the Refuge portion of the planning area due to past military activities. Ordnance has previously been recovered from the refuge. In the event that unexploded ordnance is discovered, the Department of Defense will be contacted for its removal using the minimum tool required for safe removal in accordance with 6 Refuge Manual 8.8 - A. This concern is not an issue for the New Waters.

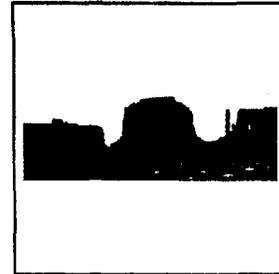
Issue #12: Native American Religious Access -- There have been no instances in which the Service or the BLM has been contacted by Native American tribes for arrangements to access spiritual sites. However, both agencies acknowledge that certain sites within the planning area are considered to be sacred. Both agencies will consider any requests by the Native American tribes in consideration of the Native American Religious Freedom Act.

Issue #13: Military Overflights -- The Arizona Desert Wilderness Act of 1990 states the following: "Nothing in this title shall preclude low level overflights of military aircraft, the designation of new units of special airspace, or the use or establishment of military flight training routes over wilderness areas designated by this title." The Service and BLM will continue to cooperate with the military in pursuing mutually beneficial opportunities to protect the integrity of wilderness airspace and the protection of natural resources within the planning area. .

UNIT 2 -- LEGAL, POLICY, AND ADMINISTRATIVE GUIDELINES AND OTHER SPECIAL CONSIDERATIONS

1. Introduction

This Unit outlines current legal, administrative, and policy guidelines for the management of national wildlife refuges, as well as those that provide guidance to the BLM relative to management of the New Waters. The Unit begins with the more general considerations, such as laws and executive orders for both the Service and BLM, then moves toward those guidelines that specifically apply to the Service and national wildlife refuges.



All of the legal, administrative, policy, and planning guidelines provide the framework within which management activities are proposed and developed. This guidance also provides the basis for a continued and improved partnership between the BLM and the Service and other natural resource agencies.

2. General Guidance Regarding Multi-jurisdictional Cooperation

As demonstrated by the participation of representatives from the Arizona Game and Fish Department (AGFD) at public meetings held for this planning effort, a third agency has a key interest in the development of this management plan. The AGFD, acting under the authority of the Arizona Game and Fish Commission, has responsibilities for the preservation and management of all wildlife species in the State of Arizona. Therefore, the AGFD will play a critical role during the planning and implementation of this plan. For wildlife resources on national wildlife refuges within the State of Arizona, the Service and the AGFD Department have always considered themselves as cooperative wildlife managers.

BLM Lands -- Management guidance for AGFD concerns on BLM portions of the planning area will be guided by the Master Memorandum of Understanding Between State of Arizona, Arizona Game and Fish Commission and Department of the Interior, Bureau of Land Management, March 1987.

Refuge Lands -- AGFD wildlife management concerns pertaining the Service portions of the planning area will be guided by legal and regulatory references cited below.

Multi jurisdictional Goal -- Due to the multi jurisdictional aspects of this planning effort, a specific goal of this plan is to ensure future coordination between the Service, BLM, and AGFD to promote the optimum protection of natural resources in the planning area and to provide for a naturally functioning ecosystem.

2. Legal Mandates

Administration of Kofa and New Waters is ultimately guided by bills passed by the United States Congress and signed into law by the President of the United States. These statutes are considered to be the law of the land, as are Executive Orders promulgated by the President. The following is a list of most of the pertinent statutes establishing legal parameters and policy direction to the National Wildlife Refuge System. Included are those statutes and mandates that pertain to the management of Wilderness and public domain lands.

Summary of Congressional Acts, Treaties, and other Legal Acts Relating to Administration of the National Wildlife Refuge System

1. *Lacey Act of 1900, as amended* (16 U.S.C. 701).
2. *Antiquities Act of 1906* (16 U.S.C. 431).
3. *Migratory Bird Treaty Act of 1918* (16 U.S.C. 703-711).
Migratory Bird Treaty Act of 1978 (40 Stat. 755).
4. *Migratory Bird Conservation Act (1929), as amended* (16 U.S.C. 715-715s).
5. *Migratory Bird Hunting Stamp Act of 1934* (U.S.C. 718-718h).
6. *Fish and Wildlife Coordination Act (1934), as amended* (16 U.S.C. 661-666).
7. *Historic Sites Act of 1935* (16 U.S.C. 461).
8. *Convention Between the United States of America and the Mexican States for the Protection of Migratory Birds and Game Mammals (1936)* (50 Sta. 1311).
9. *Convention of Nature Protection and Wildlife Preservation in the Western Hemisphere 1940* (56 Stat. 1354).
10. *Fish and Wildlife Act of 1956, as amended* (16 U.S.C. 742-742j).
11. *Refuge Recreation Act, as amended* (Public Law 87-714.76 Sta. 653; 16 U.S.C. 460k) September 28, 1962.
12. *Refuge Revenue Sharing Act of 1964* (16 U.S.C. 715s), *as amended* (P.L. 95-469, approved 10-17-78).
13. *Wilderness Act of 1964* (16 U.S.C. 1131-1136).

14. *Land and Water Conservation Fund Act of 1965, as amended* (16 U.S.C. 460L-4 to 460L-11), and as amended through 1987.
15. *National Wildlife Refuge System Administration Act of 1966* (16 U.S.C. 668dd-668ee).
16. *National Historic Preservation Act of 1966* (16 U.S.C. 470).
17. *National Environmental Policy Act of 1969, as amended* (42 U.S.C. 4321-4347).
18. *Protection and Enhancement of Environmental Quality Executive Order of 1970* (Executive Order 11514, dated March 5, 1970).
19. *Environmental Education Act of 1975* (20 U.S.C. 1531-1536).
20. *Use of Off-Road Vehicles on the Public Lands Executive Order of 1972, as amended* (Executive Order 11644, dated February 8, 1972, as amended by Executive Order 11989, dated May 24, 1977).
21. *Endangered Species Act of 1973* (16 U.S.C. 1531-1543 87 Stat. 884)(P.L. 93-205). *The Endangered Species Act as amended by Public Law 97-304, The Endangered Species Act Amendments of 1982*, dated February 1983.
22. *The Archeological Resource Protection Act of 1979* (P.L. 96-95, 93 Sta. 721, dated October 1979) (16 U.S.C. 470aa - 47011).
23. *Fish and Wildlife Conservation Act of 1980* (P.L. 96-366, dated September 29, 1980). ("Nongame Act") (16 U.S.C. 2901-2911; 94 Stat. 1322).
24. *Administrative Procedures Act* (5 U.S.C. 551-559, 701-706, 1305, 3105, 3344, 4301, 5362, 7521; 60 Stat. 237), as amended (P.L. 79-404, as amended).
25. *Bald Eagle Protection Act of 1940* (16 U.S.C. 668-668d; 54 Stat., as amended).
26. *Canadian United States Migratory Bird Treaty* (Convention Between the United States and Great Britain for Canada for the Protection of Migratory Birds. (39 Stat. 1702; TS 628), as amended.
27. *Clean Air Act* (42 U.S.C. 1857-1857f; 69 Stat. 322), as amended.
28. *Cooperative Research and Training Units Act* (16 U.S.C. 753a-753b, 74 Stat. 733), as amended. P.L. 86-686).

29. *Federal Aid in Wildlife Restoration Act* (16 U.S.C. 669-669i; 50 Stat. 917), *as amended*.
30. *Federal Land Policy Management Act of 1976* (43 U.S.C. 1701-1771, and other U.S.C. sections; 90 Stat. 2743). Public Law 94-579, October 1976.
31. *Federal Property and Administrative Services Act of 1949* (40 U.S.C. 471-535, and other U.S.C. sections; 63 Stat. 378), *as amended*.
32. *Fish and Wildlife Improvement Act of 1978* (16 U.S.C. 7421; 92 Stat. 3110) P.L. 95-616, November 1978.
33. *Freedom of Information Act* (5 U.S.C. 552; 88 Stat. 1561).
34. *Refuge Trespass Act* (18 U.S.C. 41; Stat 686).
35. *Transfer of Certain Real Property for Wildlife Conservation Purposes Act of May 1948*, (16 U.S.C. 667b-667d; 62 Stat. 240), *as amended*.
36. *Arizona Desert Wilderness Act of 1990*.

Bureau of Land Management Mandates

1. *BLM Manual 8560*
2. *Title 43, Code of Federal Regulations, Subpart 8560*
3. *Wilderness Act of 1964*
4. *Federal Land Policy and Management Act of 1976* (43 U.S.C. 1701 et seq.)
5. *Arizona Desert Wilderness Act of 1990*

State of Arizona Statutes

The following are pertinent sections of Arizona law which help clarify the role of AGFD in wildlife management activities within the State of Arizona.

1. Arizona Revised Statutes, Title 17, Sec. 102

Section 102 states: "Wildlife, both resident and migratory, native or introduced, found in this state except fish and bullfrogs impounded in private

ponds or tanks or wildlife and birds reared or held in captivity under a permit from the commission, are property of the state and may be taken at such times, in such places, in such manner and with such devices as provided by law or rule of the commission."

2. Arizona Revised Statutes, Title 17, Sec. 201

Section 201 states: "The laws of the state relating to wildlife shall be administered by the game and fish department."

3. Agency Wide Policy Directions

Fish and Wildlife Service Agency Mission

While the Service mission and purpose have been evolving since the early 1900s, it has always held on to a fundamental national commitment to threatened wildlife. The earliest national wildlife refuges and preserves are examples of this. Pelican Island, the first refuge, was established in 1903 for the protection of colonial nesting birds such as the snowy egret and the endangered brown pelican. The National Bison Range was instituted for the endangered bison in 1906, and Malheur NWR was established in Oregon in 1908 to benefit all migratory birds, with emphasis on colonial nesting species on Malheur Lake. It was not until the 1930s that the focus of refuge programs began to shift toward protection of migratory waterfowl (i.e., ducks and geese). As a result of drought conditions in the 1930s, waterfowl populations became severely depleted. During the next several decades, the special emphasis of the Service, then the Bureau of Sport Fisheries and Wildlife, became the restoration of critically depleted migratory waterfowl populations.

The passage of the Endangered Species Act of 1973 refocused the activities of the Service and other government agencies. This Act mandated the conservation of threatened and endangered species of fish, wildlife, and plants both through Federal action and by encouraging the establishment of state programs. In the late 1970s, the Bureau of Wildlife and Sport Fisheries was renamed the U.S. Fish and Wildlife Service, and its scope of wildlife conservation responsibilities was broadened to include endangered species and both game and nongame species. A myriad of other conservation oriented laws followed, including the Fish and Wildlife Conservation Act of 1980, which emphasized the conservation of nongame species.

The Service has no "organic" act on which to focus for the purposes of generating an agency mission. The agency mission has always been derived in consideration of the multitude of laws (as listed in Section 2 of this Unit) and treaties that collectively outlined public policy concerning wildlife conservation. The Department of the Interior Departmental Manual states the following:

*"The U.S. Fish and Wildlife Service is responsible for conserving, enhancing, and protecting fish and wildlife and their habitats for the continuing benefit of people through Federal programs relating to wild birds, endangered species, certain marine mammals, inland sport fisheries, and specific fishery and wildlife research activities."*⁹

⁹ Department Manual, 2 AM 2, Organization, 142 DM 1.1

National Wildlife Refuge System: Mission and Goals -- The National Wildlife Refuge System (System) is the only existing system of Federally owned lands managed chiefly for the conservation of wildlife. The System mission is a derivative of the Service mission. This mission was most recently revised by the President of the United States in Executive Order 12996 to reflect the importance of conserving natural resources for the benefit of present and future generations of people. The Executive Order states:

The mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the United States for the benefit of present and future generations.

The Executive Order continues by specifying broad guiding principles describing a level of responsibility and concern for the nation's wildlife resources for the ultimate benefit of the people. These principles are as follows:

Public Use: The Refuge System provides important opportunities for compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

Habitat: Fish and wildlife will not prosper without high-quality habitat, and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.

Partnerships: America's sportsmen and women were the first partners who insisted on protecting valuable wildlife habitat within wildlife refuges. Conservation partnerships with other Federal agencies, State agencies, Tribes, organizations, industry, and the general public can make significant contributions to the growth and management of the Refuge System.

Public Involvement: The public should be given a full and open opportunity to participate in decisions regarding acquisition and management of our National Wildlife Refuges.

Service Wilderness Objectives (Manual 6 RM 8.2 and 8.3)

1. Manage so as to maintain the wilderness resource for future benefit and enjoyment;
2. Preserve the wilderness character of the biological and physical features of the area;

3. Provide opportunities for research, solitude, and primitive recreational uses;
4. Retain the same level of pre-wilderness designation condition of the area;
and,
5. Ensure that the Works of man remain substantially unnoticeable.

BLM Mission and Vision: Ecosystem Management

The BLM is under congressional mandates to provide for orderly use and development of the public lands and to preserve the land and its resources from destruction. The Federal Land Policy and Management Act of 1976 (FLPMA) directs BLM to periodically inventory the lands and to project present and future uses in land use plans. These plans, management framework plans and resource management plans ensure that public lands are managed on a multiple use and sustained yield basis and that the quality of natural resources is preserved. The definition of multiple use is as follows:

"...[H]armonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output."¹⁰

Like the Service, the BLM has been evolving over the past two decades. New approaches are being implemented, moving away from traditional resource management strategies which emphasized commodity production and commercial use of natural resources. Management objectives were often designed to expedite the development, extraction, and/or production of resources on public lands. Other uses and values such as wildlife and fish habitats, some recreational activities, cultural, scenic, and aesthetic resources were often viewed as constraints or mitigation for more intensive uses. These emphases tended to separate BLM programs along functional lines. This lack of internal coordination detracted from the agency's ability to develop coherent and integrated management strategies with other government agencies, user groups, private landowners, and other interested parties.

In January 1994, the BLM introduced a statement of its new "vision" stating that the BLM is:

"...committed to safeguarding the ecological sustainability of the public's lands."¹¹

¹⁰ Cited from FLPMA, 43 U.S.C. 1702(e); Section 103, FLPMA of 1976.

¹¹ *Ecosystem Management in the BLM: From Concept to Commitment*, U.S. Department of the Interior, Bureau of Land Management, Washington, D.C., Jim Baca, Director, December 14, 1993.

The BLM's new vision called for the implementation of management actions that would conserve the diversity and protect the integrity of the land. In so doing, the BLM would hope to ensure that present and future generations would continue to derive economic, recreational, social, cultural, and aesthetic benefits from public lands. The major ingredient of this new vision has been the adoption of ecosystem management principles. The BLM expects that ecosystem management will assist them in coordinating efforts to identify and achieve the desired future condition of public lands at multiple geographic levels. The BLM is now engaging in the development of partnerships, sharing management responsibilities, and when appropriate, establishing common management goals with other federal, state, and private land managers, local communities, and other interested parties. This joint agency planning effort is one example of the new approach.¹²

BLM Wilderness Management Goals (BLM Manual 8561):

1. To provide for the long-term protection and preservation of the area's wilderness character under a principle of non-degradation. The area's natural condition, opportunities for solitude, opportunities for primitive and unconfined types of recreation, and any ecological, geological, or other features of scientific, educational, scenic, or historical value present will be managed so that they will remain unimpaired.
2. To manage the wilderness area for the use and enjoyment of visitors in a manner that will leave the area unimpaired for future use and enjoyment as wilderness. The wilderness resource will be dominant in all management decisions where a choice must be made between preservation of wilderness and visitor use.
3. To manage the area using the minimum tool, equipment, or structure necessary to successfully, safely, and economically accomplish the objective. The chosen tool, equipment, or structure should be the one that least degrades wilderness values temporarily or permanently. Management will seek to preserve spontaneity of use and as much freedom from regulation as possible.
4. To manage nonconforming but accepted uses permitted by the Wilderness Act and subsequent laws in a manner that will prevent unnecessary or undue degradation of the area's wilderness character.

¹² The new vision outlines the major tenants of ecosystem management including: (1) Sustain the productivity and diversity of ecological systems; (2) Use the best available scientific information as the corner stone for resource allocations and other land management decisions; (3) Involve the public in the planning process and coordinate with other federal, state, and private land owners; (4) Determine desired future ecosystem conditions based on historic, ecologic, economic, and social considerations; (5) Work to minimize and repair impacts to the land; (6) Base planning and management on long-term horizons and goals; (7) Reconnect isolated parts of the landscape; and, (8) Practice adaptive management.

The Policy Role of the Arizona Game and Fish Department

A third agency also has a key interest in the development of this management plan. The Arizona Game and Fish Department (AGFD), acting under the authority of the Arizona Game and Fish Commission, has responsibilities for the protection and management of all wildlife species in the State of Arizona.

Cooperative management guidance for BLM portions of the planning area are guided by BLM Manual 8560.34 and the Master Memorandum of Understanding between the Arizona Game and Fish Commission and Department of the Interior BLM, March 1987 (AGFD-BLM MOU). For wildlife resources on national wildlife refuges within the State of Arizona, the Service and the AGFD have always considered themselves as cooperative wildlife managers. Therefore, the AGFD also plays a major role in the development and implementation of this interagency document.

Kofa NWR and New Water Mountains Wilderness Area Purpose Statements

Kofa NWR and Wilderness -- Refuge Purpose Statements are primary to the management of each refuge within the System. The Purpose Statement is the basis on which primary management activities are determined. Additionally, these statements are the foundation from which "allowed" uses of refuges are determined through a defined "compatibility process." Sometimes Purpose Statements are given in the form of a statute, but in many cases, refuges were established by Executive Order. This is the case for the Kofa.

Executive Order 8038. The order states as follows:

Section 2. This range or preserve, so far as it relates to conservation and development of wildlife, shall be under the joint jurisdiction of the Secretaries of the Interior and Agriculture, and they shall have the power jointly to make such rules and regulations for its protection, administration, regulation, and improvement, and for the removal and disposition of surplus game animals, as they may deem necessary to accomplish its purposes and not inconsistent with State law, and the range or preserve, being within a grazing district duly established pursuant to the act of June 28, 1934, ch. 865, 48 Stat. 1269, as amended by the act of June 26, 1936, 49 Stat. 1976, shall be under the exclusive jurisdiction of the Secretary of the Interior so far as it relates to the public grazing lands and natural forage resources thereof: Provided, however, that all the forage resources in excess of that required to maintain a balanced wildlife population within this range or preserve shall be available for domestic livestock under rules and regulations promulgated by the Secretary of the Interior under the authority of the aforesaid act of June 28 1934, as amended..."

New Water Mountains Wilderness Area -- The established purpose for the New Water Mountain Wilderness is implied under the Arizona Desert Wilderness Act of 1990. Its sole purpose is to protect wilderness values.

5. Land, Jurisdictional, and Special Designation Considerations ¹³

Lands -- The chief stimulus behind the establishment of the Kofa was the concern for dwindling populations of the desert bighorn sheep throughout all of Arizona, New Mexico, and southern California including the New Water Mountains. Because early explorers usually traveled the river bottoms, valleys, and dry washes, sightings of desert bighorn were not frequent. However, Coues indicates as early as 1867 that the desert bighorn "...has a very extensive range, which includes nearly all the elevated mountains and broken regions."¹⁴

Originally, the Kofa was under joint management between the BLM and the Service. Since the Kofa's establishment in 1939 (Executive Order 8039, January 25, 1939), the Service has been assigned a cooperative management responsibility for the Kofa Game Range management. Since 1976, the Service has maintained sole responsibility for management of the Kofa¹⁵ For the New Water Wilderness Area, the BLM continues its joint relationship with the Arizona Game and Fish Department in their efforts to protect all wildlife populations within the designated area. The New Water role in Bighorn sheep management is significant as it contains one of the more critical lambing areas.

Rights-of-Way -- *U.S. West (Formerly, Mountain States Telephone and Telegraph)* -- A 100 foot square microwave repeater tower site is located in the Livingston Hills in the northwest corner of the Refuge. The right-of-way includes a 7-mile, 33 foot-wide access road right-of-way from the western boundary to the microwave tower site.

Arizona Public Service -- This right includes a 6-mile, 20 foot-wide 12 KV transmission line right-of-way from the western boundary to the U.S. West microwave tower.

El Paso Natural Gas Company -- This right includes a 130 foot-wide right-of-way that accommodates four buried natural gas pipelines plus a maintenance road which runs 24 miles (east/west) across the entire northern portion of the Refuge.

¹³ Please refer to PART II, Unit 1, Section 3 for a discussion of the problems related to land status and jurisdictional problems and questions.

¹⁴ Coues, E., The quadrupeds of Arizona. Am. Natural. 1:281-292, 351-363, 393-400, 531-541.

¹⁵ Kofa was jointly managed by the Service and the BLM until February 27, 1976 when the Game Range Bill amendments to the National Wildlife Refuge Administration Act (P.L. 94-223) transferred sole jurisdiction to the Service and changed the name to Kofa National Wildlife Refuge.

Southern California Edison Power Company -- This right includes a 160 foot-wide right-of-way accommodating a 500 KV power transmission line running 24 miles (east/west) across the entire northern portion of the refuge parallel to the El Paso Natural gas pipeline.

United States Army/ Yuma Proving Ground -- Yuma Proving Ground shares a 58-mile common boundary on the southern half of the refuge. The Secretary of the Interior has granted the Army permission to use 171,000 acres of the refuge as a buffer/flyover zone for weapons and associated munitions testing.

Private Lands -- There are two non-mineral private holdings within the refuge. Mrs. J.R. Livingston Holds 160 acres (NE 1/4 S24, T2N, R18W). Another 80 acres (W1/2, NE 1/4, S14, T2N, R18W) is privately held by Mrs. Leila Michaels.

Yuma County Highway Department -- Three county roads within the refuge are maintained by the County: (1) Castle Dome Road (5 miles); (2) King Valley Road (17 miles); and, (3) Vicksburg Road (3 Miles). The MST&T Road (8 miles) is maintained by the refuge.

Patented Mining Claims -- Forty-six patented mining claims (865 acres) are located on the refuge. Most of these are located on the southern edge of the Kofa Mountains in the vicinity of the historic King of Arizona Mine and on the southern edge of the Castle Dome Mountains, just south of the Castle Dome.¹⁶

Adjacent Land Use -- The land areas surrounding the Kofa NWR and the New Water Mountains Wilderness are owned by the State of Arizona, managed by the Bureau of Land management or are under the jurisdiction of the Department of Defense. The surrounding landscape consists primarily of desert range. There are some patented mining claims not included in the New Water Wilderness and some of the surrounding terrain is used for grazing. Like both the Kofa and New Water areas, vegetation is sparse where present consisting mostly of cacti, mesquite, palo verde, and small shrub. The New Water Mountains Wilderness is one part of the La Posa Management Area. The BLM is currently developing a management plan for this area in consideration of its relationship to all surrounding jurisdictions including the Kofa NWR and Wilderness Area.¹⁷

¹⁶ Also see Unit 3 Natural Resource Inventory, Mining and Geology

¹⁷ The New Water Mountain Wilderness is considered a part of the La Posa Management Area. The areas western boundary runs along the eastern boundary of the Colorado River Indian Tribe Reservation, through the Dome Rock Mountains, until intersecting with the Yuma Proving Grounds boundary. It continues down the Yuma Proving Grounds western boundary in a southerly direction until intersecting with the Cibola Lake road. Turning east it follows the Cibola Lake road to the eastern boundary of Yuma Proving Grounds and turns south until intersecting with State highway 95. The eastern boundary starts in the north, runs roughly parallel to Bouse Wash in the Rane grass Plains, staying west of state route 72, until meeting the Vicksburg road. At this point it follows the El Paso Natural Gas pipeline road past New Water pass to Midas Mine. It continues south through the Kofa mountains to De La Ossa Mine to Squaw Peak and through Hidden Valley Hills and attaches to the west boundary of the Kofa NWR, then heads south to the Yuma Proving Grounds boundary. The management area is approximately 67 miles in length.

Special Considerations: Cultural Resources

Kofa NWR and Wilderness -- Both Kofa and the New Waters have cultural resources that fit within three broad categories: prehistoric, historic, and traditional cultural/religious areas.¹⁸ Many of these sites have not been catalogued by either agency. Some, however, have undergone formal evaluation relative to the Archeological Resource Protection Act or the National Historic Preservation Act.¹⁹

Kofa NWR -- The Service files contain variable records of approximately 92 known or recorded archeological and historic sites on the Kofa Refuge. However, the actual number of reliably locatable sites may ultimately prove to be a good deal less, since more than half of the purported 92 site records are in fact little more than site "leads" offering only vague and incomplete locational references. Sources for this site information comes from the field notes of Malcolm J. and Frederick S. Rogers (1929-1941), and from the more contemporary and reliable site records resulting from linear site surveys conducted in 1977 and 1980-81 for pipeline and transmission line right-of-way projects. The linear survey conducted by Westec Services for the Palo Verde to Devers Transmission Line (1980-81) offers the highest specificity of site information on any portion of the Kofa Refuge. Recent site recording efforts by refuge volunteers Connel and Dawn Bergland also offer an unusually high resolution of information for rock art and other sites in the northern extent of the range.

As would be expected of such a marginal environment, all of the sites are indicative of ephemeral uses of the Kofa range. Cleared circles, rock rings and rock alignments, lithic and pottery scatters, small occurrences of ground stone artifacts and bedrock mortars, foot trails, and rock art sites point to highly transitory occupations either for short-term subsistence gathering purposes, or for travel and trade across the range. Purportedly, notations concerning the existence of several ground "intaglios" (geoglyphs), and also observations about a cremated burial, have been attributed to Malcolm Rogers, but to date there has been no verification of either. The San Diego Museum of Man, the repository for Rogers' field records, is unable to verify the existence of a skull fragment which Rogers once reported seeing at Palm Canyon.

There are no independant archeological dates for any of the Kofa sites. However, a small number of temporally diagnostic artifacts recovered at several locations offer clues to the chronology of the prehistoric occupation here. The majority of the sites point to the late prehistoric time period (A.D. 700 to post-1500) and are recognized as ancestral Yuman. Rogers

¹⁸ The definitions are as follows: Prehistoric site: Any location with physical remains or evidence of activity by aboriginal peoples prior to European contact. Historic site: Any location with physical remains or evidence of activity by euro-Asian peoples to modern times. Traditional cultural or religious site: Sites generally Native American in origin, range in age from prehistoric to modern, and are important for their sociocultural and religious values.

¹⁹ What assessments have occurred in this area have been conducted by the BLM and a very generic summary narrative can be found in the BLM Lower Gila South Resource Management Plan and Environmental Impact Statement (1985) pp. 37-39. Although the information in the RMP/EIS is for a much broader geographical region than the planning area, it characterizes in its Appendix 17 (pp. 283-285) the specific types of cultural resource sites which can be found on Kofa and the New Waters.

also reported several dart points attributed to the Archaic period (6000 B.C. to A.D. 300). Further detailed analysis of the rock art imagery, particularly in the eastern part of the range, could shed light on a possible Yuman/Hohokam ethnic boundary during the late prehistoric period.

New Water Mountains Wilderness -- Specifically, not much has been formally catalogued by the BLM within the New Water Mountains specifically. The Lower Gila South Wilderness Environmental Impact Statement (EIS) indicates that no National Register eligible cultural resource sites have been identified in the New Waters. Cultural resources were not an issue in the wilderness EIS. However, prehistoric petroglyph sites are present throughout the entire planning area. For example, there is one petroglyph site in the New Waters that dates from approximately 5 B.C. In addition to petroglyphs on several rock panels, this site contains a cave with the remains of a rock wall near the entrance. No additional sites with the same degree of development as this cultural feature are known within this wilderness area. A general inventory of cultural resources in this area would probably result in the discovery of additional sites. Levels of protection are heightened by the new status of the area as designated wilderness. Most of these sites will be inaccessible to motorized traffic.

6. Relationship to Other Plans

The following is an outline of the most prominent of existing planning efforts and documents that influence the future management of the Kofa NWR and the New Water Wilderness area.

Bureau of Land Management Resource Management Planning -- The BLM is and the Service are sister agencies within the Department of Interior. The BLM is responsible for the management of public lands throughout the Western United States. Lands within the Area of Ecological Concern are managed primarily by the Yuma District and Resource Offices. Each of the BLM land areas including designated wilderness is managed in accordance with the agency's Resource Management Planning process as dictated by the Federal Land Policy Management Act.

La Posa Management Area Planning -- As mentioned earlier, the New Water Mountain Wilderness Area is considered a part of the larger BLM La Posa Management Area. The La Posa Management Area is currently under the jurisdiction of the BLM Yuma Resource Area. The stated goal of the plan is as follows:

...to carry out resource management decisions of the Final Yuma District Resource Management Plan. The La Posa plan has been developed in an interdisciplinary arena involving BLM staff and other affected federal, state, and local entities. It will be a link between multiple-use allocation of public land and the actions necessary to implement such allocations. Upon completion of this interdisciplinary management plan, the BLM will be able to set management direction for resources and their use, identify specific

management actions, and establish the sequence of implementation for the management actions."

Biological Diversity on Federal Lands (Keystone Report) -- Representatives from the Service, the BLM, and other Federal agencies, Congressional committees, environmental organizations, commodity interests, professional associations, and academia, were active participants in a multi-agency dialogue attempting to address conservation of biological diversity on Federal lands. Efforts focused on formulating consensus recommendations for conserving biological diversity on lands managed by the major Federal land management agencies (Service, BLM, U.S. Forest Service, National Park Service, and Department of Defense).

The dialogues produced a document that recommended the development of a national goal to conserve, protect, and restore biological diversity on Federal lands. The participants determined that, because of its intrinsic value, biological diversity is important to sustain the health of ecological systems and to provide for human well-being. Though the conclusions of the report are only recommendations, the Service is considering implementation.²⁰

Service (Region 2) Biological Diversity Plan Draft -- In 1991, the Southwest Region initiated an effort to formally establish a region wide plan and program for biological diversity. The effort is ongoing for the region and a final draft is forthcoming.

The draft plan set out a purpose of identifying "goals, objectives, and strategies for the conservation of the natural biological diversity of the Southwest Region, with emphasis on those species and habitats which the Fish and Wildlife Service has primary statutory jurisdiction. This group includes Federally listed threatened and endangered species, migratory birds and anadromous or inter-jurisdictional fishes. On national wildlife refuges and fish hatcheries, Service management authority extends to all fish and wildlife species and their habitats, in coordination with respective State governments."²¹

The plan proposes the following objectives for: Monitoring, Research, Management, Education, Training, Partnerships, and International Partnerships.

Arizona State Comprehensive Outdoor Recreation Plans (SCORP) -- The major purpose of the SCORPs are to provide a comprehensive framework for the orderly planning, acquisition, development, and administration of Arizona's outdoor recreation resource. The 1983 SCORP identified recreation needs and implementation strategies. The need for natural resources conservation was one of the major issues identified and many activities in the plans

²⁰ Keystone Center, *Final Consensus Report of the Keystone Policy Dialogue on Biological Diversity on Federal Lands*, Keystone, Colorado, 1991.

²¹ Region 2, U.S. Fish and Wildlife Service, *Biological Diversity Plan Draft*, July 23, 1991.

are aimed at this issue. Priorities relative to wetlands acquisition and protection were included in the Arizona statewide priorities for 1983.

UNIT 3 -- NATURAL RESOURCE INVENTORY

This unit outlines in detail the extensive natural resources currently present within the planning area. Included are current geological, soil, and biological values.

1. Geological Resources

New Water Mountains Geology and Mining -- The northwest trending New Water Mountains, which make up the wilderness area, are in the Basin and Range physiographic province and are composed of Precambrian to Quaternary age rocks. The area is underlain primarily by Quaternary basalt and Cretaceous rhyolite and andesite; smaller amounts of Paleozoic and Mesozoic limestones, shale, sandstone, and quartzite also exist.²² Terrain is typical of the desert southwest and consists of steep mountains and sandy washes; the highest elevation is 3,639 feet on Black Mesa and the lowest elevation is about 1,800 feet along the periphery in the alluvial washes.

A minerals investigation was conducted by the U.S. Bureau of Mines in 1986, during the time the New Water Mountains were a Wilderness Study Area. At the time of the assessment, two pits were found within the study area, located in the New Water mining district. The assessment report indicated the following:

*"Many workings were found within 1 mile of the boundary. Little or no production came from these workings; no recent mining activity has taken place. BLM records indicate few mining claims are in the study area; however, about 200 unpatented mining claims are on the periphery. Twenty-three patented claims, the Moore claims, are adjacent to the northern boundary and cover the Eagle Eye Mine. Keith (1978, p. 165) states that about 518 tons of ore containing 175 tons of copper and 514 ounces of silver was produced from the New Water Mountains."*²³

Kofa NWR Geology and Mining -- The Kofa NWR displays a relief of two major block-faulted mountain ranges (Kofa and Castledome Mountains) typified by extensive exposures of bedrock, sparse vegetative cover, lack of soil development, steep slopes and structurally controlled drainage systems. Elevations range from 680 feet on the desert floor to 4,877 feet atop Signal Peak. Shallow, stony soils and rock outcrops are predominant in the mountainous and steep slope areas. Alluvial fans and valley floors are characterized by deep, gravelly, moderately fine textured soils high in lime concentrations.

²² Wilson, E.D., 1960, Geologic map of Yuma County, Arizona: Arizona Bureau of Mines, University of Arizona, scale 1:375,000. From U.S. Bureau of Mines, Mineral Land Assessment, 57-86, Open File Report/ 1986: Mineral Investigation of a Part of the New Water Mountains Wilderness Study Area (AZ-020-125), La Paz County, Arizona.

²³ Mineral Land Assessment, 57-86 cites S. B. Keith, 1978, Index of mining properties in Yuma County, Arizona: Arizona Bureau of Geology and Mineral Technology Bulletin 192, 185 p.

Refuge records indicate that the Kofa NWR has been closed to mineral entry since February 1974. Nevertheless, the unpatented claims continue to be illegally filed occasionally with the BLM. Legitimate mining claims filed prior to February 1974 continue to operate within the refuge, however, there are no patented claims within the designated wilderness within Kofa NWR.²⁴

Forty-six patented mining claims totaling approximately 865 acres are located in nonwilderness portions of the refuge. Most of these are located on the southern edge of the Kofa Mountains in the vicinity of the historic King of Arizona Mine and on the southern edge of the Castle Dome Mountains, just south of the Castle Dome. The Service has little control over surface disturbances on patented claims and cannot deny access to the claims or prevent legitimate mining activities.

2. Water Developments

Both the Kofa NWR and the New Water Mountains Wilderness have water resource developments available for use by wildlife. Most of these areas are developed as tanks, catchments, or wells. There are some natural springs as well. Development of wildlife water sources has been carried out on the refuge since it was first established. Throughout the years wildlife managers have believed that the development of water on the refuge has been instrumental in helping to restore the bighorn sheep populations. These water catchments are maintained with the assistance of the Arizona Game and Fish Department and the Arizona Desert Bighorn Sheep Society. In the case of the New Water Mountains Wilderness Area the four tanks present in the wilderness area are monitored by AGFD. In the case of Kofa NWR, water catchments are monitored primarily by refuge personnel. In both cases, water is transported to a limited number of these sites during seasons of extensive drought.²⁵

3. Wildlife and Habitat Resources

- **Wildlife Diversity:** Forty-five mammal species, 185 species of birds, and 47 species of reptiles are represented on the planning area.

²⁴ The Kofa volcanic geologic type composes more than 45% of the Castle Dome Mts. and virtually all of the Tank Mts. About 29% of the area is andesite, 14% metamorphosed sedimentary rock, less than 7% schist, and the remaining 5% is Quaternary basalt, rhyolite, and granite. U.S. Fish and Wildlife Service, KOFA NWR Desert Tortoise Survey, Castle Dome and Tank Mountains. Also see: The Geologic Map of Yuma County, AZ by Eldred Wilson, 1960. Also, a discussion of two major calderas (collapsed volcanos) and their ash-flow tuffs is given in a 1987 thesis by Michael J. Grubensky: Structure, Geochemistry, and Volcanic History of Mid-tertiary Rocks in the Kofa Region, Southwestern Arizona.

²⁵ Please see page 30, Wildlife and Habitat Resources of this document for additional details concerning the delivery of water to catchments.

- **Endangered and/or Threatened Species:** Peregrine falcons have been sighted but they are extremely rare. From time to time Brown pelicans are blown into the Yuma area by summer thunderstorms developing over the Gulf of California to the south.
- **Desert Bighorn Sheep --** The Desert Bighorn (*Ovis canadensis mexicana*) population at Kofa NWR is estimated at 800 to 1,000 sheep. Fourteen years of aerial surveys reflect a stable population with the exception of a low count in 1991. Transplants have been conducted for the past 15 years in coordination with Arizona Game and Fish Department. The refuge provides approximately 20% of Arizona's annual bighorn hunting permits.

Table 1. Kofa NWR Bighorn Sheep Survey Results 1980-1994

Year	Hours	Rams	Ewes	Lambs	Uncl.	Total	Est. # Sheep	Lambs/ 100 Ewes
1980	25.0	125	195	31	1	352		16
1981	36.1	143	229	44	1	417		21
1982	46.9	141	234	51	1	427		23
1983	49.5	147	260	50	1	458		19
1984	50.7	175	284	44	0	503		15
1985	51.2	149	264	61	0	474		23
1986	45.3	168	282	44	2	496		16
1987*	27.8	92	122	19	0	233	874	16
1988*	29.9	98	134	19	0	251	881	14
1989*	28.4	89	150	25	0	264	929	17
1990*	28.5	93	106	39	0	238	788	37
1991*	26.6	69	84	21	3	177	638	25
1992	51.4	139	255	46	0	440	739	18
1993	No survey.							
1994	52.8	151	270	36	2	457	887	14
Total	550.1	1779	2869	530	11	5187		Avg: 18

*Abbreviated Surveys

Bighorn Sheep Transplantation Program -- Every year since 1979 the with exception of 1991, the refuge has participated in a capture and transplant program of the Bighorn sheep. Refuge employees assist the Arizona Game and Fish Department in the capture using net guns from helicopters. The transplant results are noted in the table below. The animals are then are transported to various locations within Arizona in an effort to assist in the restoration of populations where they are indigenous. For instance, in 1992 all sheep were transported and released near Canyon Lake (Superstition Mountains) east of Phoenix.

TABLE 2

Kofa¹ (K) & New Waters (NW) Bighorn Sheep Removal
Harvest/Transplants 1979-1995

Year	Harvested Rams		Transplanted Rams Ewes				Transplant Location	Grand Total
	(K)	(NW)	(K)	(NW)	(K)	(NW)		
1979	9		4		4		Colorado/Devils Canyon (NPS)	20
1979			0.00		2		Texas/Black Gap (TX Game and Fish Dept.)	
1980	8		7		11		Arizona/Goat Mountains (USFS)	33
1980			0.00		6		New Mexico/Peloncillo Mtns. (BLM)	
1981	9		3		8		Arizona/ Red Field Canyon (USFS)	28
1981			2		4		Arizona/ Goat Mountains (USFS)	
1982	9		4		0.00		New Mexico/ Peloncillo Mountains (BLM)	24
1982			0.00		10		New Mexico/ Peloncillo Mountains (BLM)	
1983	11		8		16		Arizona / Horse Mesa (USFS)	35
1984	11		8		22		Arizona/ Coffee Flat (USFS)	43
1985	13		6		15		Arizona/ Black Mountain (BLM)	57
1985			7		13		Arizona/ Lion Mountain (USFS)	
1986	12		9		21		Arizona/ Peloncillo Mountains (BLM)	42
1987	14	4	8	5	22	7	(K) Arizona/ Superstition Mountains (USFS)	45
							(NW) Arizona/ Gila Bend Mountains	17
1988	16	4	6	3	24	9	(K) Arizona/ Galiuro Mountain (USFS)	47
							(NW) Arizona/ Gila Bend Mountains	16
1989	14		5		25		Arizona/ Superstition Mountains (USFS)	44
1990	14	3	2	1	13	8	(K) Arizona/ Peloncillo Mountains (BLM)	29
							(NW) Arizona/ Gila Bend Mountains	12
1991	14		0	0	0			14
1992	13		7		17		Arizona/ Superstition Mountains (USFS)	38
1993	15		5		25		AZ/Saucedo Mtns. (USAF)	46
1994	12		7		23		AZ/Granite Wash Mtns. (BLM)	42
1995	16		6		20		AZ/ Harcuvar	42

1. Unless indicated otherwise, the data is for Kofa.
2. Includes mortalities during capture.

- **Desert Mule Deer** -- The refuge conducts an annual desert mule deer survey. This species is also counted during the aerial sheep survey. The Arizona Game and Fish Department participates in these surveys.²⁶

Table 3

Kofa (K) & New Waters¹ (NW) Annual Aerial Deer Survey Results 1985-1996

Year	Bucks		Does		Fawns		Unclassified		Total	
	(K)	(NW)	(K)	(NW)	(K)	(NW)	(K)	(NW)	(K)	(NW)
1985	42	3	83	19	47	6	12	0	184	28
1986	37	12	102	20	18	12	3	6	160	50
1987	48	9	155	13	48	4	8	1	259	27
1988	29	7	117	9	23	7	5	1	174	24
1989	49	8	121	16	37	5	1	0	208	29
1990	24	6	125	19	17	8	0.00	0.00	166	33
1991	36	4	113	6	62	3	11	0	222	13
1992*	16	0	31	3	10	2	3	0	60	5
1993*	19	1	51	23	25	7	2	0	97	31
1994*	16	2	50	6	21	5	0.00	0.00	87	13
1995	10	2	40	6	14	5	3.00	0	67	13
1996	6	2	19	7	3	1	1.00	0	29	10
TOTAL	290	38	924	100	278	45	37	8	1,529	206

* Modified surveys. Modified surveys in years 1992 through 1994 are a sampling of approximately 16 % of the total surveyable deer habitat.

1. The New Waters has never been independently surveyed for mule deer. The Wilderness has always been included in the aerial surveys for Game Management Unit 44B. In addition to the wilderness, Unit 44B includes the Plomosa Mountains and has a total area of 630 mi.², of which there is an estimated 524 mi.² of mule deer habitat. Because of the mountainous terrain in the wilderness, aerial surveys are difficult to conduct. Unit 44B is considered a low-density deer unit.

- **Sonoran Desert Tortoise** -- Limited knowledge of this subspecies of the tortoise is the reason for recent emphasis on gathering more data. Abundant data on the Mojave subspecies in California can not be extrapolated to Arizona populations because of racial

²⁶ In 1992 only 9.3 hours of actual survey were flown. This is about one-half of 18.9 hours needed to fly all available deer habitat (751.46 square miles) in a fixed-wing aircraft. Flights before were based on one-half mile flight grids while in 1992 one-mile wide grids were flown to reduce survey costs. Areas previously flown but considered to be safety hazards for fixed-wing aircraft were not flown this year. Such areas could be surveyed by helicopter or sampled by foot surveys. In 1992 the buck:doe:fawn ratio (52:100:32) is markedly higher for bucks and slightly higher for fawns than the previous seven-year ratio (32:100:31). In 1993 241 deer were counted with a buck:doe:fawn ratio of 20:100:49.

differences in habitat selections between the two subspecies. The Mojave tortoise may be a derived taxon and by evolution the latest in subgenus *Xerobates*. Ecologically it may be an outlier population in an unfavorable climate while Arizona's populations may reflect a relatively stable existence in a favorable subtropical climate. Long Term field data on Sonoran tortoises should help answer management and disease questions that are now unanswerable and may serve as a comparison population for challenge tests on Mojave and Sonoran tortoises. In 1990 a tortoise survey was conducted between April and August. Twenty-eight variable length reconnaissance-type transects were drawn in the Castle Dome Mountains. One hundred forty-nine miles, requiring 92 transect hours, were completed in the Lower Colorado Valley and Arizona Upland subdivision communities of the Sonoran Desert scrub biome. The study concluded that tortoises occur in the Castle Dome and Tank Mountains in relatively low densities (probably lower densities than in the Kofa Mountains.) Only one live tortoise was seen and no URDS signs were noted. Judging from their sign, tortoises were not as active during this period as the Kofa and Livingston Hills populations were to the north. Only two sites of 44 sites surveyed had remains of eggshell fragments. One juvenile shell was found but no other signs, such as juvenile tracks, were found. The survey concluded that the combination of this survey and surveys in 1979 and 1989 indicates the tortoise population at Kofa NWR is healthy and of low density requiring a stabilized habitat. Cover site potential, highest in the less resistant volcanic base material, is the critical limiting factor resulting in patchy, isolated populations. The density/diversity of vegetation and the aspect seem to be of secondary and tertiary importance to distribution. No apparent changes seem warranted.²⁷

Habitat Resources

The Sonoran Desert ecosystem is comprised of relatively sparse vegetation throughout with the exception of intermittent stream beds that meander from mountains down through alluvial sediments onto low elevation basins. Creosote, ironwood, paloverde, and mesquite comprise much of the vegetation with many types of cacti, most notably the saguaro, dominating the landscape. Another important part of the habitat landscape are the desert flora that spawn only after spring rains deluge the lands following intense thunderstorms. These thunderstorms are very localized, but expel enough moisture to create ribbons of green throughout the desert landscape along drainage ways and cause the germination of dormant grass and forb seeds producing lush carpets of green albeit for very brief periods of time. During the very dominant dry seasons, the soils form a thin crust which harbor seeds for many years in some cases. The hard rains break the crust freeing the seeds for germination. When the short growing cycle is completed, the ground once again forms into a thin crust. These soils are sometimes called crypto biotic soils.

²⁷ In 1992 a radio telemetry research project was initiated on Kofa NWR. Four tortoises were fitted with battery powered radio transmitters which mount on the carapace. All telemetry and map data will be integrated into a computer data analysis system called Map and Image Processing System (MIPS).

Table 4
1990 Kofa NWR Water Tank Replenishment: TOTAL = 32,000 Gallons

Gallons of Water	Location
10,000	Charlie Died Tank
8,000	Black Hawk Tank
4,000	Figueroa Tank
6,000	Modesti Tank
4,000	Dixon Spring

In the extremely dry Sonoran Desert ecosystem, water is the primary habitat component and variable. Over the years, wildlife managers have learned to manipulate the conservation of water in the desert for wildlife management purposes. These water conservation efforts are usually in the form of water catchments and wells but include natural springs as well. Kofa NWR has a long history of water hole development projects aimed at improving wildlife numbers and distribution throughout the refuge. Most development projects involve either improvement of natural existing tanks and springs by installing silt dams, sun shades or water retention dams, or by constructing windmill powered wells. Even with these improvements some tanks occasionally go dry during extended dry periods such as occurred in 1990. To prevent large scale wildlife movement away from these areas, or even worse, wildlife die offs, water is hauled to these drought susceptible tanks when needed. Adequate rainfall occurred in both 1991 and 1992 and kept most tanks supplied with water. Until 1992, the refuge staff continued to collect data on the refuge flora by monitoring vegetation along 242 permanent transects located throughout the refuge. These were initiated in 1983 to document the changes resulting from the cessation of grazing on the refuge. Some improvements have been noted, but growth of desert flora is normally extremely slow, taking many years to recover from past land management practices. Since that time, the refuge has instituted a new program using videography to develop a comprehensive picture of the refuge's vegetation resources. It is expected that this information will be extremely useful in determining habitat suitability, conditions, and wildlife uses in the long term.

The refuge has an active program to prevent the entry of cattle and feral burros through fencing. A part of the monitoring program calls for the checking of the boundary fences periodically throughout the year. This program also deters the trespass of off the road vehicles.

UNIT 4 -- PUBLIC USE INVENTORY

The following inventories outline the general baseline activities of the Service and the BLM regarding public and allowable uses of the Kofa NWR and the New Water Mountains Wilderness.

Public Access to Wilderness Areas

New Water Mountains Wilderness Area -- The western boundary of the wilderness can be accessed via the Gold Nugget Road south of Interstate 10 (exit 26). The north-central part of the wilderness can be reached by the Ramsey Mine Road south of Highway 60. The Kofa Wilderness forms the southern boundary of the New Water Mountains Wilderness.

Kofa NWR -- The Kofa NWR wilderness area includes a total of 516,300 acres within the context of the 665,400 total refuge acres. Access to the designated wilderness areas can be made through any one of several roads that have been excepted from the wilderness designation (cherry-stemmed). From Highway 95, there are several routes which can be taken onto the Kofa NWR and in close proximity to designated wilderness. Most of these roads are not graded so that high-clearance and four wheel drive vehicles are recommended.

Mechanized, vehicular traffic is limited to designated roads. Off road vehicle travel is prohibited. All vehicles, including "all terrain vehicles," quadratracs and motorcycles and all operators must be licensed and insured for highway driving. Speed is limited to 25 miles per hour unless otherwise posted. Mountain bicycles are considered vehicles on the refuge.

Recreational Uses of Refuge and Wilderness Areas

New Water Mountains Wilderness Area -- The BLM manages public lands from a multiple use mandate. Thus, lands in the public domain, even those designated as wilderness, allow for the public to gain access and use these lands for recreational purposes such as hunting, wildlife observation, hiking, and camping. The New Water Mountains as a designated wilderness does allow these activities to occur holding to a "leave no trace" ethic. The BLM asks that visitors leave the area as they found it. For instance, if a fire ring is constructed, the BLM asks the visitor to dismantle it and bury the ashes before leaving the area. Visitors are asked to pack out all litter including those that might be considered biodegradable (i.e., orange peels, organic waste). As mentioned earlier, no mechanized transport are allowed on the wilderness areas.

Kofa NWR and Wilderness -- Kofa NWR allows recreational uses that are compatible with the purposes for which the refuge was established. Those that are allowed to occur within designated wilderness must also conform to fundamental wilderness ethics including no mechanized transport, leave no trace, etc. However, unlike lands managed by the BLM, the

refuge system considers wildlife management the primary function of a refuge and all other uses are considered secondary. These must undergo compatibility analysis and the refuge must certify that funding is available for the management of these activities.²⁸ The Wilderness Act considerations are then overlaid upon the refuge administration legal considerations for those areas of the refuge that are designated as wilderness (i.e., no mechanized transport, leave no trace, minimum tool, etc.).

At Kofa NWR, hunting, camping, hiking, wildlife observation, photography, sightseeing, and environmental education activities would all be allowed and considered compatible with both the purposes of the refuge and the wilderness designation. Part of this planning effort will be to establish monitoring objectives which will assist us in determining the levels of impact that is acceptable relative to uses and degrees of use.

²⁸ Public Law 89-669 (National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) authorized the Secretary of the Interior under regulations, to "permit the use of any area within the System for any purpose, including, but not limited to, hunting, fishing, public recreation and accommodations, and access whenever he determines that such uses are compatible with the major purposes for which the areas were established." Additionally, Public Law 87-714, the Refuge Recreation Act of 1962, as amended (76 Stat. 653; 16 U.S.C. 460k), prescribes the same compatibility standard with a focus on recreational uses including those that do "not directly relate to the primary purposes and functions of the individual areas," and that do not interfere with the primary purposes of the refuges." Also under this Act, the refuge must certify that funds are available for their development. [Bean, Michael J., *The Evolution of National Wildlife Law*, (Praeger, Publishers: New York, 1983)pp. 125-126.

PART II. ISSUE DISCUSSION

Introduction -- The Kofa NWR and the New Water Mountains Wilderness areas each make individual, unique, and significant contributions to the Area of Ecological Concern and the National wilderness system. The potential contribution of each of the areas is strengthened through coordinated and consistent management action. In order to manage resources consistently and efficiently, both the scientific elements of the resource (i.e., biological/natural resource factors) and the policy elements of managing the resource (i.e., overall policy concerns) must be considered in the planning process. Consideration of both results in coordinated management of the refuges, assuring a mix of natural resource gains for wildlife and plant communities within both wilderness areas and the Area of Ecological Concern.

This part of the Kofa NWR/ New Water Mountains Wilderness planning process analyzes the existing information base including agency policy issues, natural resource data, and public access and use data. The analysis, albeit informal, is a series of short discussion points summarizing the problem or opportunity that exists relative to each of the issues outlined earlier in this document. With respect to wildlife and habitat data, much pertains to the management of desert bighorn sheep populations. Other data is more scarce. Part of the purpose of this plan is to set objectives which will call for the collection of needed biological data that reflects the diversity present in these areas.

Issue Analysis -- As indicated earlier, an issue is considered to be a problem or opportunity arising from agency directives, resource conflicts, their resolutions, and public expectations as reflected through their participation. The following narratives attempt to integrate the issue and associated subissues with each agencies' responsibilities relative to those issues. Several of them do not need discussion because policy directives remain clear and subsequent objectives will be set in accordance with those directives.

THE ISSUES

Issue 1: Wildlife and Habitat Management

Cooperative Efforts -- Although habitat management is one of the principle responsibilities of both the BLM and the Service, the BLM has traditionally recognized the States as being the principle manager of wildlife on public domain lands including designated wilderness areas. The Service, on the other hand, considers the State's role with respect to wildlife management on National Wildlife Refuges as concurrent with its own. Both the Service and the BLM have engaged in a continuous and more intense dialogue with the States relative to a myriad of wildlife and habitat management issues including the protection of endangered species. Because of these slightly differing perspectives, it is essential that levels of communication and cooperation between the Service, the BLM, and the Arizona Game and Fish Department remain high concerning a wide array of issues.

Scarcity of Data -- The dominant wildlife and habitat management theme for the Kofa and News Water Mountains for many years has been the preservation of the desert bighorn sheep species. Consequently, information on a wide array of other species and habitats is scarce. As indicated earlier, up to 1992, the refuge staff collected data on the refuge flora by monitoring vegetation along 242 permanent transects located throughout the refuge. But as previously noted, this information is no longer collected because of the tremendous amount of time necessary to physically gather the data. The new aerial videography information will allow for the accurate mapping of the refuge's vegetation resources. This information will be extremely valuable for long term resource and decision making.

There are also surveys conducted, as noted earlier, regarding the status of the Sonoran desert tortoise. Much of the monitoring of this species is currently being done through a radio telemetry research project initiated in 1992. Information collected thus far does not indicate that changes in management are necessary. However, the existing vegetation transects are important sources of information regarding the status of the species on the refuge.

A newer and more recently initiated bat survey will be important in determining the relationship between bat species and the importance of maintaining their accessibility to abandoned mine shafts, even in the context of wilderness. However, in light of the wilderness designation, the refuge must scrutinize more carefully all of its wildlife management activities and their primary and secondary effects upon the wilderness resource. Although the Service has the duty to conduct wildlife management activities, it should do so with a "wilderness ethic" and with a responsibility to determine the minimum tools necessary to accomplish its tasks. If the refuge staff must gain access to an abandoned mine shaft within the wilderness boundaries, then it should document the purpose, the expected duration of the visit, and the minimum tool to be used, all in anticipation of the visit, if possible.

Desert Bighorn Sheep -- The major concentration of wildlife management activities within the project area has been directly related to the management of the desert bighorn sheep. Both the BLM and the Service have participated together since the inception of the Kofa Game Range in the 1930's in efforts to assist the dwindling populations of desert bighorn recover. The Kofa NWR, formerly the Kofa Game Range, was jointly administered by both of these agencies. Only in the 1970's did the Service become the sole manager of the Kofa NWR.²⁹

The New Water Mountains wilderness area has always been a contributing factor to the management of desert bighorn populations as it contains an important lambing area for the species. Both agencies participate with the Arizona Game and Fish Department in a desert bighorn transplantation program which is a key factor toward increasing the viability of the species within its statewide range.

There is no question that management of this species remains as one of the principle missions of the Kofa NWR and certainly the New Water Mountains will continue to play a significant role as well. However, the new considerations relative to the Wilderness designations require the Service and the BLM to review management techniques and their compatibility with wilderness principles.

The two principle management techniques to review are the use of mechanical means to survey, capture, and transplant sheep, and secondly, the management of artificial water catchments, access to them, and the use of mechanical methods of refurbishing and maintaining these systems. Both agencies, in cooperation with the State must continue to use the techniques necessary to carry out wildlife management mandates. However, the Service and the BLM are required to declare what "minimum tool" is to be employed. The predominant question for each agency can be stated as: Are the methods currently employed to manage desert bighorn sheep and habitat the minimum necessary to accomplish the objectives?

³⁰ Both agencies are directed to administer their respective areas designated as wilderness so as to:

²⁹ Lee, Raymond M. Editor, *The Desert Bighorn Sheep in Arizona* (Phoenix, AZ...: State of Arizona, 1993) . This volume contains a good historical outline of the national efforts to assist in the recovery of this species. While their range has been reduced significantly and while much in the way of urban expansion has affected desert bighorn habitat, this volume indicates that the viability of the species is no longer in question as it had been 20 years ago.

³⁰ **BLM Policy:** The principle direction with regard to abiding by the "minimum tool" concept comes from BLM Manual 8560, Section .1, Goals of Wilderness Management. Section .13 states: "Tools, equipment, or structures may be used for management when they are the minimum necessary for protection of the wilderness resource or when necessary in emergency situations for the health and safety of the visitor. Management must use the minimum tool, equipment, or structure necessary to successfully, safely, and economically accomplish the objective. The chosen tool, equipment, or structure should be the one that least degrades wilderness values temporarily or permanently."

Service Policy: The Service's direction regarding minimum tool is not as explicit in its policy guidelines. The Service defines "minimum tool" as: "The minimum action or instrument necessary to successfully, safely, and economically accomplish wilderness management objectives. The Service policy is explicit enough as to indicate that motorized equipment would not be permitted for wildlife surveys, access by veterinarian to treat sick livestock, inspections by refuge personnel, maintenance activities which can be accomplished on horseback, on foot, or with the use of other non-motorized modes of transportation. [USFWS Wilderness Policy, 8.8. Administrative guidelines]."

*"...preserve[ing] the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character."*³¹

As mentioned earlier, the management of desert bighorn sheep has been and remains historically central to the purpose for which the Kofa NWR was established. In point of fact, the language of the Wilderness Act eludes to the fact that wilderness designation implies that wilderness purposes are "supplemental" to already existing purposes attached to an area. This does not apply so much to BLM designations as they do to national wildlife refuges which have establishing purposes already in place. Thus, the Service is responsible to carry out a dual, but nonetheless interrelated, role of managing for bighorn sheep within the context of wilderness.

In both agency policies, certain uses existing prior to designation are allowed to continue. The BLM policy indicates that use of aircraft may be permitted to continue in wilderness areas where such uses were established prior to the date the area was designated thus allowing the use of helicopters for the netting and translocation of bighorn sheep. Both policies allow for excepting existing water resource facilities when explicitly recognized by Congress as being acceptable in specific wilderness areas, as in the case of those areas created by the Arizona Desert Wilderness Act of 1990.³² However, the Service and the BLM have a continuing responsibility to maintain the natural character of the landscape so as to leave the "imprint of man's work substantially unnoticeable."³³ The implication here is not so much the question of the existence of water catchments within wilderness, but rather the method each agency chooses to manage and maintain these existing facilities and manage access to them.

Biological Sustainability -- The Bighorn Sheep survey results from 1980 through 1992 as noted in Table 1, indicates the relative stability of the populations. Human encroachment still looms as the one negative influence upon sheep populations in the southwest and few models exist that can predict habitat utilization and animal movements.³⁴ While populations in

³¹ Wilderness Act of 1964, Section 4 (b), Public Law 88-577, (16 U.S.C. 1131-1136). Section 4(a) defines the use of wilderness areas as follows: "The purposes of this Act are hereby declared to be within and supplemental to the purposes for which national forests and units of the national park and wildlife refuge systems are established and administered..."

³² The Arizona Desert Wilderness Act of 1990 recognizes these existing water catchments as acceptable for both the Kofa NWR and the New Water Mountains Wilderness.

³³ Wilderness Act of 1964, Section 2(c)(1): An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable..."

³⁴ According to Stan Cunningham: "There have been few habitat models developed for bighorn sheep (*Ovis canadensis*). All have assumed that the quality of a given area can be linked to individual habitat attributes, but the criteria selected for each model varied. The three variables were common to all - forage conditions, water availability, and slope (basically food, water, and cover). Other variables considered have been land status, density of canopy (amount of brush), presence or absence of exotic or native ungulates, human disturbance factors, habitat distinctiveness, and size of area. [Cunningham, Stan, Evaluation of Bighorn Sheep Habitat, in *The Desert Bighorn Sheep in Arizona*, Raymond M. Lee, editor, (Phoenix, AZ.: Arizona Game and Fish Department, 1993)].

protected areas such as Kofa NWR and the New Water Mountains Wilderness, populations in other parts of the State are considered to be under threat due to habitat loss, especially in areas closest to urban expansion. Successes in improving populations at Kofa NWR through intensive water developments have resulted in cooperative arrangements, between the State of Arizona, the Service, and the BLM to transplant sheep to other areas of Arizona as indicated in Table 2. Biologically, there is still concern for the maintenance of current management techniques to foster the continued sustainability of this species. The sustainability has a relationship to potential harvest only in so much as the three agencies assesses population status prior to the allotment of permits for hunters. Surveys and climatic conditions also influence decisions about the number of the species to be hunted as well as transplanted. In short, a key role of the BLM, the Service, and the Arizona Game and Fish Department is to provide conditions for species sustainability and viability in the long run. The BLM, the Service, and the Arizona Game and Fish Department need to develop a long term view of achieving a goal of improving population statuses in transplant destinations so that at some point in the future, the Kofa NWR and the New Water Mountains Wilderness will no longer be the gene pool sources for other potentially sustainable populations in the southwest. The implication here is that as transplant destination populations become wholly sustainable, the natural solitude of these two wilderness areas will no longer be routinely intruded upon by the roaring blades of loud helicopters and the piercing sounds of net guns. Additionally, and more importantly, the sheep themselves will more seldomly experience the strain and stress of an exhausting chase across rugged terrain in hyper thermal conditions. The goal of having self sustaining populations of bighorn sheep throughout their natural and historic range will take continued enhanced cooperative efforts from all three agencies.

Water Developments -- The development of water sources for the bighorn sheep has been an important factor in species recovery since the 1950s. Cooperative efforts between the Arizona Game and Fish Department, the Arizona Desert Bighorn Sheep Society, and various federal agencies have resulted in the development of more than 100 water sources. Werner describes early efforts to involve backpacking materials to the project area limiting the size of developments. More recent efforts have involved the use of helicopters and large crews of volunteer labor resulting in the construction of larger dams that are more likely to provide permanent water sources. Werner states as follows:

*"Most of the efforts to develop water sources for bighorn sheep in Arizona have been improvements of tinajas, or natural scourholes in bedrock, and apron catchment construction. There are also a few wells with windmills which provide water to bighorn sheep. On an opportunistic basis, structures such as old mine cisterns have been improved to provide access and prevent trapping the bighorn sheep. In one case, a mine cistern provides a backup supply of water which can be pumped into an improved natural tinaja nearby."*³⁵

³⁵Werner, Bill, Water Development, in *The Desert Bighorn Sheep in Arizona*, Raymond M. Lee, editor, (Phoenix, Az.: Arizona Game and Fish Department, 1993).

The literature indicates that although few habitat models have been developed for bighorn sheep, water was among the three major variables common to available models. However the literature indicates that water distribution should not be rated so highly as to overshadow other important variables. Cunningham states that much of the relative importance of water to the species is based upon other variabilities such as elevation, temperature, and rainfall.³⁶ There is little question that good distribution of water in otherwise suitable habitat will result in the reduction of stress and increased disease transmission "brought on by the concentration of bighorn sheep around waters and associated bedding and lambing sites."³⁷ Thus, the agencies should continue to manage and maintain water development areas in such a manner as to ensure that catchments hold permanent sources of water. In seasons of drought, managers should continue to deliver water.

According to Remington, the future of bighorn sheep "is cautiously optimistic." Strategic water development programs and supplemental transplants are key management tools in the restoration of "moribund, low quality populations to historic carrying capacities."³⁸ However, as wildlife managers maintain water sources for the bighorn sheep, they should keep in mind the responsibilities resulting from wilderness designation. While access to many of the sites on the Kofa NWR are on nonwilderness corridor roads, the sites on wilderness areas should be gained access through and maintained by the minimum tool necessary to accomplish the work. For example, the use of electronic devices to monitor water levels might in fact be the minimum tool necessary to check the status of a particular tank. The alternative would be several trips into the wilderness which might have much more impacts on the landscape, especially if mechanical transport is used. It would be essential that placement of new technologies would have to be as unobtrusive as possible so as not to be evidenced by visitors.

The strategies developed in this plan must balance the need to manage for species health and viability while respecting the requirements and intent of the Wilderness Act. The needs of the species and the requirements of the Act are not necessarily in conflict. In fact, the habitat

³⁶ Cunningham states as follows: "Numerous studies have found that bighorn sheep distribution is restricted by water availability during the summer months (Simmons 1969, Bates and Workman 1983, Elenowitz 1984) During the dry June-September period, most bighorn sheep are found within a two-mile radius of permanent water (Blong and Pillard 1968, Leslie and Douglas 1979, Cunningham and Ohmart 1986). Lactating ewes require more water than other bighorn sheep and are nearly always found in close proximity to water sources (Turner and Weaver 1980). Thus, the distribution of available water sources must be considered....Despite these findings, water distribution should not be rated (in point scale) so highly that it overshadows other important areas. Some systems relied so heavily on water distribution that other areas of importance (wintering areas, lambing grounds, summer use areas after monsoons) may have been underscored. Many researchers have pointed out that water distribution has little correlation with bighorn sheep distribution in cooler seasons (McQuivey 1978, Leslie and Douglas 1979, Cunningham and Ohmart 1986. Holl (1982) pointed out that water distribution was a minimal factor in bighorn sheep distribution in an area of higher elevation receiving more rainfall. [Cunningham, Stan, Evaluation of Bighorn Sheep Habitat, in *The Desert Bighorn Sheep in Arizona*, (Phoenix, Az.: Arizona Game and Fish Department, 1993)]

³⁷ Hansen, C.G., 1971. Overpopulation as a factor in reducing desert bighorn populations. *Desert Bighorn Council Trans.* P. 46-52, as cited by Bill Werner, Water Development, in *The Desert Bighorn Sheep of Arizona*, Raymond E. Lee, editor, (Phoenix, Az.: Arizona Game and Fish Department, 1993)p 164. The inference here is that carrying capacity increases with the reduction of bighorn sheep density and the inhibiting effects of localized overpopulation.

³⁸ Remington, Richard, The Future of Bighorn Sheep in Arizona, in *The Desert Bighorn Sheep of Arizona*, Raymond E. Lee, editor, (Phoenix, Az.: Arizona Game and Fish Department, 1993)p. 262.

management work done to benefit bighorn sheep, including water development, could have a positive influence on the natural cycles of predation and succession for a diversity of life in the desert without detracting of wilderness attributes and values.

Endangered, Threatened, or Candidate Species³⁹ -- The endangered Peregrine falcon occurs on the refuge, although rarely. No other Federally endangered species occur within the project area except for an occasional Brown pelican that is blown in by storms blowing in from the gulf of California. While most of these species are well protected within the boundaries of the Kofa NWR and the New Water Mountains Wilderness areas, the principal concern will continue to be loss of habitat. Wilderness designation has given an added layer of protection within the refuge boundaries. The more BLM and Service land managers can learn about the current trends regarding the full range of habitats in the project area, the better future actions will be toward protecting all species and preempting the need to list any of them as endangered in the future.

Non Native Species -- Only one species has posed difficulty for wildlife managers within the project area. Wild burros have continued to pose the more significant threat to the Kofa and New Water Mountains areas. Burros compete with desert bighorn sheep for water and forage areas. Both the BLM and the Service have made efforts to eliminate burros and devise fencing techniques which prevent the burros from using water sources meant for native wildlife. Other non native threats to the area include salt cedar, and various species of exotic grasses including buffle grass.

As in the case for managing any habitat and wildlife within the project area, both the Service and the BLM must take into account the wilderness context. The method used for non native species elimination should be considered within the backdrop of other alternatives so that the objectives of elimination and respect for the wilderness character can be accomplished together. For instance, the elimination of salt cedar from watering areas and major drainage in the desert calls for aggressive landscape manipulation strategies that need to be considered for their short and long term effects. Both the BLM and the Service should develop strategies that are the minimum tool to accomplish the objectives.

Exotic grasses and weeds will undoubtedly pose difficulties in the conservation of the natural desert landscape. Both agencies will need to develop capabilities which will prevent their spread onto the refuge and wilderness areas. Certainly, improvements in the overall wildlife and habitat data base, and subsequent monitoring and analysis will assist the agencies' managers in better understanding the overall habitat characteristics and suitabilities within the project area. This will lead to the development of better alternative methods of controlling the spread of non native species.

³⁹ The major part of the Service's guidance is contained within applicable sections of 50 CFR 25.11, 50 CFR 35.3, and 6 Refuge Manual 8.8. For the BLM portions of the planning area, sensitive species will be managed under existing policy outlined in BLM Manual 8560.34.

Issue Two: Public Use

Accessibility -- Many of the preexisting roadways within the Kofa NWR and Wilderness and the New Water Mountains Wilderness Area were exempted from designation allowing outstanding opportunities to visit interior portions of the wilderness areas which might otherwise be much too far to hike or access on horse back. These "cherry stemmed" roads criss-cross the Kofa NWR in such a way as to allow for management access to water resources and for mine claimants to gain access to mining sites using motorized vehicles.⁴⁰

The New Water Mountains Wilderness being much smaller, has two cherry stemmed roads in the far western section of the wilderness. The western boundary of the wilderness can be accessed via the Gold Nugget Road south of Interstate 10. The north central part of the wilderness can be reached by the Ramsey Mine Road south of Highway 60. The New Water Mountains Wilderness offers many types of primitive recreation, such as extended backpacking and hiking trips, day hikes, and watching wildlife. Opportunities to photograph and hunt deer and desert bighorn sheep, landscape photography, and rock collecting are plentiful. The BLM should begin a monitoring process to assess the various uses, their intensity over time, and the overall impacts.

As noted earlier, public domain lands managed by the BLM are managed from a "multiple use" perspective. Restrictions resulting from wilderness designation are limited to the prohibition of non motorized transport and the "leave no trace" requirement. Refuge wilderness public uses, on the other hand, are subject to a wider array of guidelines.⁴¹ All recreational uses are considered secondary uses and must undergo annual assessments to determine a uses' compatibility with the purposes for which the refuge was established.⁴² When a use is allowed to occur on a refuge overlain with wilderness responsibilities, the manager must assess how he or she will monitor the use, its intensity overtime, and the overall impacts. Problem areas on the refuge with respect to access are anticipated to be areas where the public is not aware of a border between BLM and Service lands. For example, BLM La Posa area lands to the north of the Refuge and to the west of the New Water Mountains Wilderness are lands wherein off road motorized recreation takes place. The Refuge has had a number of off road recreationers accidentally enter the refuge. These transition areas need to be more closely monitored to prevent damage to refuge resources caused by these uses. Like the BLM the Service can employ "leave no trace" restrictions, and prohibitions of motorized transport. Perhaps, these transition areas could be clearly posted to prevent intrusions.

⁴⁰ A "cherry stem" road is road exempted from wilderness designation. Many times these roads are dead end roads extending up to and surrounded by wilderness. In the case of Kofa NWR and New Water Mountains Wilderness Areas, the wilderness boundary is 100 feet from the edge of the exempted road. Many of these roads may lead to range developments, mines, or inholdings and water resource developments.

⁴¹ The policy governing compatibility of uses on refuges are: Refuge Recreation Act of 1962, as amended ; Public Law 87-714; 76 Stat 653; 16 U.S.C. 460(k); and the National Wildlife Refuge System Administration Act of 1966 ; Public Law 89-699; (16 U.S.C. 66(dd)-668(ee).

⁴² A use may be determined to be compatible if it will not materially detract from or interfere with the purposes of the refuge unit.

Visitation -- Prior to 1993, it was difficult to estimate visitation on the Kofa NWR. A computer-based remote sensing system which was tested for two years did not render accurate data. Moisture and erratic software performance could not be corrected. In addition, the Kofa NWR headquarters is located in the City of Yuma, and it is difficult for field personnel to monitor ingress and egress from the major refuge access points consistently over time. However, in 1993, the Service purchased six traffic counters and installed them at five entrance points on the west boundary, and one on the north side of the refuge. The new counters have rendered reliable data indicating 1993's visitation to be approximately 50,000. But, the numbers of visitation alone do not assist the refuge in determining future management actions. Understanding the number of visitors along with the type, duration, and intensity of uses will be the data necessary to plan effective management actions in the future.

The predominant visitation area on the Kofa NWR is the Palm Canyon Trail. Visitors are comprised primarily of Yuma residents who travel to the site for an afternoon. The road leading to the Palm Canyon area has been exempted from wilderness designation. A developed parking facility exists with interpretive panels.

Compatibility of Uses -- In 1994, the refuge manager determined 3 recreational uses to be not compatible with the purposes for which the refuge was established: (1) rockhounding; (2) horseback riding; and, (3) rock climbing.⁴³

- *Rockhounding.* "Rock hounding," or the collection of mineral specimens from the surface, had been allowed, primarily in the Crystal Hill area (non wilderness) of the refuge. However, levels of the activity were such that commercial quantities appeared to have been taken from certain areas of the refuge. There may be a level if properly defined, and with certain restrictions that will allow for the activity to be compatible and thus allowable in non wilderness areas. The Service will need to properly define the limits of the use geographically, restrict the methods, and strictly monitor the affects. The collection ought to be restricted to only surface exposed specimens and all digging by hand or otherwise should continue to be prohibited.
- *Horseback Riding.* Horseback riding with no limitations had been allowed until the refuge manager determined that unlimited use resulted in severe soil disturbance, the introduction of exotic plant seeds, and damage to trees by tethering. With some restrictions in place such as the use of feeding containers, use of pellitized feed, and requirement for site restoration, the use of horses and pack animals could be considered compatible.
- *Rock Climbing.* Rock climbing has not been a popular recreational use on the refuge because of the softness of the rock faces. Rock climbers typically prefer harder granitic

⁴³Compatibility Determinations dated May 24, 1994 and approved September 21, 1994, indicated that these uses at that time were not "compatible" with refuge purposes. However, these determinations state: "...As a result of the planning process, modifications of the activity may be identified that would make it compatible." See January 1997 Compatibility Determinations for Rockhounding, Horseback Riding, and Technical Rock Climbing in the Appendix of this document.

surfaces. Nevertheless, the activity has been known to occur. The Service's approach nationally has been to allow the use on national wildlife refuges, provided that permanent anchors and the marking of routes be prohibited. With the establishment of these restrictions, the use can be considered compatible.

Uses determined to be compatible included: (1) Camping; (2) Hiking and Backpacking; (3) Wildlife Photography; (4) Wildlife Observation; (5) Hunting - Big Game; (6) Hunting - Upland Game; (7) Concessions - Guided Sport Hunting; (8) Concessions - Guided Tours.

Wildlife Observation, Camping, Photography, and Opportunities for Solitude⁴⁴ --

Camping. Although camping has been determined to be compatible, in the future, the refuge may need to consider establishing restrictions on the burning of native wood for campfires. Ironwood in particular is a native plant that is popular because of its hardness, and long burning qualities. It is the campfire wood of preference to many campers. Unfortunately, the species does not regenerate easily, and only under certain conditions. Sooner or later populations will dwindle unless steps are taken to restrict its use on the refuge. Camping presents opportunity for the concentration of sites where tradition has sculpted an imprint upon the landscape in the form of "fire rings." Permission to burn native downed wood could present opportunities for use of motorized saws and other modern tools. On the other hand, the importation of firewood from the outside might present the introduction of exotic insects. Again, because of access limitations, these considerations may not be as much concerns in the New Water Mountains Wilderness as in the Kofa NWR.

Wildlife Observation. Although hunting predominates as the recreation of choice in this area, wildlife observation and the so called non consumptive uses are gaining in popularity in all desert regions. More and more "snow birds" visit the desert southwest from northern climates during the winter months purely for the pleasure of observing. Unmonitored, this type of use will result in high concentrations in a limited number of areas of the wilderness resource and will tend to impact the naturalness as well as reduce the "opportunities for solitude." Nevertheless, concentrations of visitors in a few areas could eventually detract from the landscape's "untrammled" features thus showing the imprint of man. Monitoring will be a key activity for both agencies' land managers in efforts to allow for appreciation of the wilderness resources with a minimum of impact. Additionally, the Service must monitor each uses' compatibility with refuge purposes.

Hunting. The dominant hunt program in both wilderness areas is the annual bighorn sheep hunt which is managed by the Arizona Game and Fish Department. The hunt season typically

⁴⁴ The Wilderness Act defines wilderness as: "A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation, (emphasis added); (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

falls within the first two weeks in December. All bighorn populations are managed by hunt units and permits are subsequently drawn by unit. In Arizona the desert bighorn sheep is a once-in-a-lifetime trophy and the odds of drawing a permit for the Kofa NWR are estimated to be about 1:160. Most hunters spend several days scouting during pre-season and plan on spending the entire hunting season afield. Guided hunts are common, especially for non-residents (limited to 10% of the total sheep permits statewide and 50% in any one unit. The average price for a guided hunt runs about \$6,500. The refuge issues a special use permit to guides. Sheep hunting success in the project area is usually high. For instance, the rate for 1993 was 100%. The total number of permits issued for Kofa NWR alone was 15 permits.

Other species hunted in the project area include mule deer, quail, cottontail rabbit, and predators (coyote, and fox). The Kofa NWR deer hunt occurs during the first part of November. The number of deer hunters is considerably more than bighorn sheep. For example, the Arizona Game and Fish Department issued a total of 500 permits (buck only) for the Kofa NWR hunt. Quail season begins around the first week in October during which quail hunters will incidentally take rabbits and predators. Quail availability is determined by the abundance of late winter and early spring rains which produce higher than usual amounts of forage (i.e., grasses).

Summary -- The estimated 50,000 visits for Kofa NWR alone is considerable. Visits to the New Water Mountains Wilderness are probably not as extreme because access by motorized vehicle is not as readily available. However, one hunt permit alone accounts for several visits as hunters scout locations. Depending upon relative concentrations of vehicle visits along the cherry stem roads, wilderness resources could be severely impacted. Even if direct access to the wilderness is achieved through horse or on foot, trails need to be monitored for possible impacts. Both the BLM and the Service should consider the establishment of a visitation monitoring protocol in order to determine if there are impacts to wildlife and habitat resources, and in general, if there are impacts to the general wilderness characteristics. A key question is: At what locations is access occurring, and at what frequency and intensity? Is man's footprint becoming permanent and irreversible? The objectives designed through this planning effort need to direct both agencies to implement strategies that will allow frequent assessments of current conditions, trends and desired conditions.⁴⁵

Any changes proposed in this plan will have to depend upon the relative impacts to any particular area that are tied to one or several secondary uses. Changes in allowable uses will depend upon both compatibility assessments as well as wilderness considerations. Again, a key ingredient is to establish effective monitoring of impacts of any allowed use.

⁴⁵ This planning effort does not rely on any one technique for the development of standards for the determination of desired conditions or limitations upon change from current conditions (i.e., Limits of Acceptable Change). The presumption of both agencies for the Kofa NWR and the New Water Mountains Wilderness Area is that the current conditions are for the most part the desired conditions. Objectives developed later in this plan will dictate the activities necessary to protect the current condition, monitor impacts, and in some instances implement a change. However, key toward determining future changes in management will depend upon each agency's ability to monitor impacts of use and their ability to collect reliable data. Again, from the Service's perspective, monitoring of impacts will be broader than those related to wilderness. Refuge monitoring will necessarily be a part of the overall compatibility assessment process.

Issue 3: Minerals Management and Minimizing Impacts of Patented Mining Claims⁴⁶

As indicated earlier, there are no active mining claims within the New Water Mountains Wilderness. The Kofa NWR, however, has several active claims, eight of which are on the designated wilderness. The Service is concerned with the effects of these activities upon refuge wildlife and habitat resources in addition to surface disturbance concerns. Other than to develop cooperative agreements with claim owners, the only possibility of gaining more control over these "in holdings" is to appraise and purchase them. Otherwise mine activities could continue indefinitely perpetuating the disturbances to wildlife, habitat, and what otherwise might be considered natural landscape of these areas.

Minerals Management in Wilderness⁴⁷ -- As of December 31, 1983, all units of the National Wilderness Preservation System not already withdrawn from the operation of the mineral location and leasing laws were withdrawn. The present status of almost all wilderness areas is that even though no more claims can be filed, validity must be determined for a considerable backlog of claims. Validity will be determined as mining plans of operation are submitted for approval or patent applications are filed. The nature of most mining operations is incompatible with the preservation concept of wilderness. Heavy machinery is often required, and the surface of the earth is usually changed in a substantial way. That an authorized mining operation occurs in wilderness is not license to proceed constrained only by normal policy considerations. The challenge to the Service and the BLM is to work with the private rights involved and minimize or avoid unnecessary impacts, direct and indirect, on the wilderness resource. It is important that wilderness managers be familiar with the private rights involved.

Valid mineral leases and mining claims -- Leases. These leases may continue under the stipulations of the lease to the termination of the lease and have similar rights as mining claims with valid discoveries.

Valid Mining Claims. These claims all have the potential to be patented. Those filed before the effective date of wilderness classification can be patented for both surface and subsurface title. Those filed after wilderness designation can be patented only for the subsurface mineral; in these cases, surface title remains with the government. The rights of claimants at various stages are subject to validity determination by a mineral examiner. Claims can vary from inactive to major extraction without ever going to patent. Because of a variety of tax and private landowner responsibilities that would be imposed on them, some claimants find it to their advantage to extract the mineral without obtaining patent to the land.

⁴⁶ Any future mining activities in the Kofa NWR would be guided by applicable sections of 50 CFR 27.64 and 50 CFR 29.31.

⁴⁷ Much of the following information is directly attributable to: *Management of the Wilderness Resource* (Fort Collins: Colorado State University, 1991), pp. (4-12)-(4-15). This handbook was authored as a collaborative effort among the Bureau of Land Management, National Park Service, Fish and Wildlife Service, Forest Service, College of Forestry and Natural Resources, and Division of Continuing Education at Colorado State University.

Patented mining claims -- Patented claims are of two types. Those resulting from pre-wilderness claims are, plain and simple, private land and are subject to Section 4 of the Wilderness Act. Those from post-wilderness claims and made after December 31, 1983, are split-estates with the mineral estate being private and being superior to the surface ownership, which remains with the government. Surface reclamation after mineral extraction can be the visible difference between the two. Managing the surface title in split-estates is a major challenge for wilderness managers. At the conclusion of any operation, the surface must be restored as "near as practicable" to its original condition.⁴⁸ As difficult as it may be, the wilderness manager's responsibility is to ensure that restoration is accomplished so that the long-term impacts on the naturalness of the wilderness are minimized in scope and duration. That is why it is important to cultivate and develop cooperative relationships with all claim owners.

Summary -- In order to protect and maintain wilderness values, both the BLM and the Service will have to attempt several strategies to mitigate and prevent impacts due to the various minerals related activities which can occur within wilderness.

With respect to valid mining claims, and patented claims, the Service must work to develop cooperative relationships with claim owners that result in excavation strategies that are the least harmful to the surrounding area for aesthetic and safety reasons. Should opportunities arise to purchase these rights, the Service should do so. Finally, for those claims that are on designated wilderness, when mining activities are concluded, the Service needs to enforce the provisions of the Wilderness Act which call for restoration of the site. Any claims on public domain lands in the vicinity of the New Water Mountains Wilderness need to be monitored for potential contaminants and other effects to the adjacent wilderness area.

Issue 4: Surface Disturbances -- In addition to surface disturbances related to mining activities, there are many instances within the planning area where disturbances to the natural landscape will tend to degrade the visitor's wilderness experience. Some examples of these disturbances include: developed water catchments, windmills, cabins, utility easements.

The New Water Mountains Wilderness area is small enough that areas where surface disturbances have occurred can readily be corrected. Most of these disturbances are related to the four water developments present within the wilderness. Access to these water developments for maintenance or refurbishment needs to be monitored to prevent the unnecessary compacting of ground. In addition, the BLM should consider in cooperation with the Arizona Game and Fish Department ways to make these developments less obtrusive to the natural landscape.

The Kofa NWR has many water developments in and out of wilderness. The Service needs to give strong consideration to the development of less intrusive strategies for monitoring water

⁴⁸ The Wilderness Act of 1964, Section 4(d)(3).

catchment status and condition. Radio telemetry is a method which would eliminate the need to physically check water tanks and catchments. However, should modern technology be imposed, both agencies must properly declare its use of the minimum tool, and it should be installed in a nonobtrusive manner. If windmills are in need of repair or replacement, care should be taken so as not to upgrade one technology with a more modern one. The more primitive tool needs to take precedent. If a windmill is constructed from wood, it should not be replaced with metal.

All cabins and artificial structures on either wilderness should undergo assessment for historical significance. If any such structure is not historically significant, it should be eliminated from the landscape unless it provides shelter for safety and health purposes.

It is important to properly map utility easements so as to better understand their relationship to the wilderness resource. The Kofa NWR contains six easements in addition to two private non-mineral in holdings, and 46 mining claims. All of these uses present the Service and the BLM with potential conflicts to both the wildlife and wilderness resources. Both agencies must develop cooperative management strategies with the owners of these rights to minimize impacts of their uses upon refuge and wilderness resources.

Issue Five: Cultural Resource Management

It is clear that the most important element of this issue is the fact that the greater portion of the project area has not been effectively assessed for the full range of cultural resources. Site investigations have been at best spotty on the Kofa NWR and almost non-existent within the New Water Mountains Wilderness. Objectives need to spell out cultural resource assessment priorities in terms of locations of focus. Research can play a critical role here, however, the caveat being that even this activity must abide by wilderness guidelines.

Issues To Be Resolved Through Existing Policy

Both agencies will appeal to existing policy directives to set objectives for the following issues. Guidance for managing these issues is clear and not much is offered in the way of flexibility. When it is anticipated that management of these issues will conflict with Wilderness Act driven goals and objectives, then the land managers of both agencies will have to determine special strategies that will result in the protection of the wilderness resource. Objectives for the following issues will be set based upon existing policy direction as noted.

Management of Utility Corridors -- Guidance for the management of utility easements in non-wilderness portions of the Kofa NWR can be found in 50 CFR 29.21. This guidance is a good framework from which to develop objectives regarding the management of these corridors by the easement owners. Objectives will be related to the monitoring of corridor use and potential impacts upon native plants including species of concern within wilderness.

In addition to monitoring, the refuge will develop cooperative efforts with easement users to ensure the protection of wilderness values where possible.

Scientific Research -- Studies for management, scientific, educational, or historical/cultural purposes will be guided by applicable BLM Manual sections 8560.18 and 8560.32 for the BLM portions of the planning area. The minimum tool considerations will be applicable.

Studies on the Refuge will be guided by 6 Refuge Manual 8.9(h), 50 CFR 27.63, and 50 CFR 35.11. Cultural resource studies will be authorized on a case by case basis and are subject to compliance with section 106 of the National Historic Preservation Act of 1966. This guidance provides an adequate framework to develop research-related objectives for both wilderness and non wilderness areas of the refuge. However, this plan will set refuge objectives for research with respect to its relative contributions to enhancement of the refuge's baseline wildlife and habitat management data. The minimum tool considerations will be applicable.

Law Enforcement and Emergency Services -- There are established wilderness management policies and regulations in BLM Manual 8560.39 and 43 CFR 8560.3, and 6 Refuge Manual 8.8 and 50 CFR 35.5, that provide for law enforcement and emergency access and equipment uses in incidents involving public health and safety and violations of civil and criminal law. This plan establishes that the guidance set out in these documents is appropriate and adequate for the refuge lands and the New Water area.

Military Ordnance Contamination -- A possibility of ordnance contamination exists on the Refuge portion of the planning area due to past military activities. Ordnance has previously been recovered from the Refuge. In the event that unexploded ordnance is discovered, the Department of Defense will be contacted for its removal using the minimum tool required for safe removal in accordance with 6 Refuge Manual 8.8 - A. This concern is not an issue for the New Water Mountains Wilderness.

Native American Religious Access -- There have been no instances in which the Service or the BLM has been contacted by Native American tribes for arrangements to access spiritual sites. However, both agencies acknowledge that certain sites within the planning area are considered to be sacred. Both agencies will consider any requests by the Native American tribes in consideration of the Native American Religious Freedom Act.

Military Overflights -- The Arizona Desert Wilderness Act of 1990 addresses military overflights. The Act states the following: "Nothing in this title shall preclude low level overflights of military aircraft, the designation of new units of special airspace, or the use or establishment of military flight training routes over wilderness areas designated by this title." Nevertheless, the Service and BLM will continue to cooperate with the military in pursuing mutually beneficial opportunities to protect the integrity of wilderness airspace and the

protection of natural resources within the planning area. This plan hopes to establish objectives for this kind of continuing outreach and cooperation.

PART IV. MANAGEMENT PROGRAM

Management Strategy

The management program is designed to protect natural resources and values of the planning area for the long-term, and to provide for public appreciation of the refuge as appropriate and compatible with the purposes for which it was established. In addition, the management program addresses national goals established for the National Wildlife Refuge System and the National Wilderness Preservation System.

This plan is issue driven. Within the framework of the legal mandates and policy guidelines outlined earlier, plan objectives are established to address planning area issues. Management actions are designed to meet the objectives. With the exception of administering two potentially shared law enforcement positions, each agency is responsible for accomplishing management actions specified for the areas within their respective jurisdiction.

Where possible, target dates to accomplish proposed actions are assigned. Monitoring will be conducted to gauge the effectiveness of management actions and determine if plan objectives are being met. In cases where motorized or mechanized equipment and vehicles are authorized in wilderness, activities should be scheduled for weekday periods instead of weekends to minimize potential impacts to visitors. During maintenance or repair of existing developments, every effort should be made to reduce visual impacts and minimize the need for maintenance that requires the use of motorized or mechanized equipment and vehicles in wilderness.

A rationale is included immediately below several items in this section to provide additional clarification.

Objective 1: Preservation of Wilderness Values:

Maintain or enhance the wilderness values of naturalness, outstanding opportunities for solitude and primitive recreation, and special features of the planning area by:

- Minimizing impacts of recreational use and visual impacts of authorized developments.
- Reducing or eliminating unauthorized vehicle/mechanized use
- Minimizing low level non-military administrative aircraft use through cooperation in scheduling with involved agencies.
- Reducing the frequency and need for administratively authorized motorized travel into wilderness.
- Preventing the establishment of a resident burro population in the New Waters. -Preventing the establishment of exotic plant species, particularly salt cedar. -Providing public education/information to prevent impacts to wilderness from recreational uses by 1997.
- Minimizing visual impacts from mining scars and former vehicle routes.

Rationale: the elements of objective #1 are important aspects of both agencies' responsibilities to carry out mandates of the Wilderness Act of 1964 and the Arizona Desert Wilderness Act of 1990. Meeting this objective will provide long-term preservation of the planning area's wilderness values by addressing aspects of issues 1,2,3,4,5,and 6 (in Part III of this document), and portions of each respective agency's own wilderness management policies.

Management Actions

1. New Waters -- Allow rockhounding as a use on the New Waters but limit use to hand methods that do not cause surface disturbances.

Kofa --Restrict rockhounding as a use on the Kofa NWR to the Crystal Hill area (as delineated on Map 1). Boundaries will be posted as per the following legal description: Township 2 N, Range 18 W, E 1/2 of Section 9; and all of Section 10. No detection equipment or hand tools will be allowed. Only the taking of surface occurring rocks will be permitted. If it is determined in the future that rockhounding activities are degrading the landscape, the Service may determine that rockhounding at any level "materially detracts and/or interferes with the purpose for which the refuge was established" and thus, may determine the use to be not compatible. Rockhounding is eliminated from the remainder of the Kofa NWR. Incorporate information regarding not leaving surface disturbances into agency outreach materials by 1997.

Rationale: Surface disturbances have routinely been left unreclaimed in the New Waters. In reference to rockhounding, BLM Manual 8560.31.E states: "Limit such use to hand methods or detection equipment that does not cause surface disturbance, such as metal detector or Geiger counter. In addition, methods must not be permitted that in any way adversely affect or degrade the wilderness resource or the experiences of visitors in the area."

In reference to rockhounding on the Kofa NWR, restrictions are set in place in accordance with 50 CFR 25.31. Past unrestricted rockhounding has resulted in the removal of large quantities of nonrenewable refuge resources. A compatibility determination was made that this use at past levels is not compatible so as to "materially detract from and/or interferes with the purposes for which the refuge was established." [Refuge Manual 5 RM 20.60] By restricting the use to the Crystal Hill area only, and limiting the activity to hand methods, the use is determined to be compatible. These restrictions are also implemented because it is not lawful to convert national public resources to private/commercial uses depleting resources that are not sustainable or renewable.

2. Continue adequate signing and distribution of information concerning restrictions (Information Displays, Map 1) to unauthorized vehicular/mechanized transport within wilderness areas. Emphasize practices that minimize surface disturbances.

3. Install barriers at the wilderness boundaries where signing alone is not effective in controlling unauthorized vehicle entry. Boulders, berms, plants or other natural materials will be preferred for use as barriers. However, if these prove ineffective, post and cable barriers will be constructed.

Rationale for Actions 2 and 3: Most of the potential for unauthorized mechanical/vehicle use is on the refuge portion of the planning area. These actions will improve opportunities for solitude, provide for the re-establishment of vegetation on existing surface disturbances, and prevent additional adverse impacts from unauthorized vehicle/mechanical use in wilderness.

4. Control the establishment of salt cedar (Tamarisk) or other exotic plant species at wildlife waters and remove discovered plants physically or with authorized chemicals.

5. Maintain existing burro fences and remove any nuisance burros that expand their range to include the planning area. The use of helicopters for burro removal will be allowed.

Rationale for Actions 4 and 5: By refuge policy, nonindigenous species are to be controlled and if possible removed from refuge lands. Burros are extremely competitive for scarce vegetative and watering resources with native wildlife. Tamarisk is a very aggressive exotic plant species that eventually displaces native vegetation.

6. Education and outreach will include: work with the Arizona Game and Fish Department to include visitor use impacts information in the annual hunting regulations by 1998; develop a joint agency brochure/map by 1998; participate in annual Quartzsite pow wow public information booth.

Rationale: Both agencies recognize the need to improve on efforts that provide public information for promoting practices that minimize adverse impacts to our natural resources and allow greater enjoyment of appropriate recreational and other opportunities. National Wildlife Refuge System goals call for management actions that foster public appreciation for wildlife and habitat resources and that are compatible with refuge purposes.

7. Clean up debris at 6 abandoned unpatented mining sites within Kofa and 1 site within the New Waters (Map 3) by the year 2001.

8. Reclaim 2 former vehicle routes (3.5 miles) in the refuge and 4 former vehicle routes (4.5 miles - Map 3) in the New Waters using hand tools and other non mechanized methods to minimize visual impacts and enhance wilderness values and opportunities.

Rationale for Actions 7 and 8: Past (within the last 40 years) mining activities and former vehicle routes have resulted in disturbances to natural features of the planning area and in some cases could affect public safety. Implementing these actions will provide for the restoration of natural features and enhance wilderness values and opportunities. Wildlife habitat will be enhanced by the revegetation of surface disturbances. There will

also be less potential for adverse impacts to wildlife from continued vehicle use in wilderness.

9. The Service will coordinate with the military to remove military debris as warranted.
10. Pursue options to establish 2 field positions by 1998 for the purpose of implementing resource protection, monitoring, and public outreach provisions of this management plan for the entire planning area.

Rationale: This action will provide for the attainment of resource protection plan provisions and the acquisition of needed data concerning potential conflicts between wildlife and recreation objectives. Issues 1, 2, 3, and 10, and components of objectives 2 and 3, are addressed by this action. Additionally, this proposal falls within the guidelines of current Departmental goals to shift more existing positions to the field level.

Monitoring for Objective 1.

1. Inspect wildlife water sites during routine inspections to check for the establishment of Tamarisk or other exotic plant species and implement action 4 as necessary.
2. During routine patrols of the planning area, monitor existing burro fences for impacts and presence of nuisance burros that expand their range to include the planning area. Implement action 5 as needed.
3. Monitor and document unauthorized uses of the planning area. Implement action 3 if warranted.
4. Monitor and document impacts of all authorized visitor uses within the planning area and recommend needed mitigation during yearly plan evaluations.
5. The Service will monitor rockhounding activity on Crystal Hill.

Objective 2. Wildlife and Habitat Management:

Within a dominant wilderness context, both agencies will maintain and enhance the natural diversity of flora and fauna within the Kofa/New Waters planning area by:

- Managing fire to maintain the areas natural values.
- Preventing the introduction of new exotic pathogens into the area that could adversely impact wildlife.
- Managing the planning area using the minimum tools needed for maintaining an optimal desert bighorn sheep population while providing for maximum viable species diversity.
- Providing for allowable resource uses within an ecologically compatible and sustainable framework while minimizing impacts to wilderness values.

- Identifying sensitive wildlife areas and minimizing visitor use conflicts.
- Eliminating potential impacts to wildlife habitat from probable mining activity on nonfederal lands within the planning area.

Management Actions

1. Reported fires will be monitored by air with minimum altitudes of 1000 feet above ground level, or by foot access. In the New Waters, fires that exceed or are expected to exceed a 5 chain per hour rate of spread will be suppressed. Kofa fires that threaten private property, have other than a low potential for spreading beyond the planning area, or present a significant threat to unique natural resources (i.e., native palms), or health and safety for the public, will be suppressed. Use non-motorized hand tools for suppression activities within wilderness portions of the planning area. Complete the rehabilitation of disturbances caused by fire suppression activities in accordance with BLM Manual 8560.35 and Refuge Manual 6 RM 8.8C, before suppression forces are released.

Rationale: There has been no recorded history of fires in the New Waters. Plant communities within the planning area are not fire adapted and suppressing fires that exceed a 5 chain per hour rate of spread will protect the area's natural values. Fires that have occurred on the refuge have been caused by human activity. These fires have burned themselves out with minimal intervention during the first burning period. There have been no long-term adverse impacts to wildlife or habitat from fire occurrence in the planning area.

2. Bighorn sheep capture and transplant work in the planning area will be considered annually in joint consultations between the AGFD and Kofa staff.

Rationale: Sheep capture within the New Waters is governed by the AGFD-BLM MOU. On the Kofa, the quantity of sheep designated for capture is dependent upon sheep surveys and habitat evaluations conducted on the refuge. The AGFD and the Kofa staff meet and agree upon the number of bighorn to be removed and time periods for capture. Factors to be considered are:

- Estimated population and trends.
- Minimum estimated population of 120 in the New Waters.
- Minimum estimated population of 800 on the refuge.
- Herd demographics (minimum of 50% ewes, 14 lambs:100 ewes).

The preceding factors will be considered but they will not mandate a permit denial or a removal of bighorn sheep.

The Service and AGFD will continue to track the overall level of achievement (i.e., attainment of long range goals) of the efforts to repopulate the desert bighorn in their

natural range. Transplant goals are to reestablish bighorn sheep throughout all suitable historic habitat. To achieve that, the following factors are considered:

- Suitable historic habitat (sufficient area, quality etc.).
- Conflicts with the success of the release (e.g. domestic sheep, human disturbance, etc.).
- Viability of current population in the transplant site.
 - Genetic viability (minimum sheep population of 50).
 - Predator threshold viability (dependent upon local influences).

3. Allow helicopter use as the minimum tool necessary for bighorn sheep capture operations.

Rationale: The use of helicopters to capture sheep for eventual transplantation has aided efforts to recover the desert bighorn in its natural range. Desert bighorn sheep recovery is a primary component of the Kofa's defined purpose. Other methods may incur extended intrusions into the wilderness with means that could be more harmful. For the BLM, this method of capture is defined in the AGFD-BLM MOU.

4. Accomplish routine inspections of all wildlife waters , with the exception of Charlie Died Tank, by non-mechanical means. Maintenance of wildlife waters in wilderness will also be conducted by non-mechanical means with the exception of those listed below:

-At Kofa #1 and Kofa #2, Adam's Well, King Well, and Charlie Died Tank, maintenance, and water supplementation will be allowed by vehicle.

-If needed during drought periods, water will be supplemented at Nugget Tank using motorized equipment or vehicles .

-The access method for emergency situations at wildlife waters will be determined by the Field Manager and/or Refuge Manager on a case-by-case basis, and where applicable, in consultation with AGFD. Maintenance, modification, and/or repair by motorized/mechanical means may be considered on a case by case basis.

5. The Service, BLM, and AGFD will evaluate options to install buried water systems at Charlie Died Tank and Modesti Tank, and improve the visual characteristics and/or reliability of Kofa #1 and #2 by redeveloping or relocating the wildlife waters.

6. Improve, redevelop, or enhance Nugget Tank to minimize visual impacts and reduce the need for water supplementation by 1998. The use of mechanized equipment will be allowed.

Rationale for Actions 4, 5, and 6 : Traditionally, these have been inspected using vehicle transport. Wildlife water sources on the Kofa are important components of wildlife management for the refuge. The Service recognizes the newer context created by wilderness designation. The options to be evaluated will assist in lessening the frequency of administrative use of vehicles and mechanical equipment, still allow for fulfillment of Kofa's important role in the recovery of bighorn sheep.

Inspection of waters by aerial means is not precluded by the wilderness act or by this plan. If aircraft landings are required within designated wilderness, advance approval by the Service or the BLM is necessary unless otherwise stated in this plan. Emergency and safety reasons are the exception.

7. Provide for the following flight operations. A 2 week advance notification of planned flights by AGFD to the appropriate agency is desirable.

- One low level bighorn sheep survey, averaging 8 hours of flight time in the New Waters and 60 hours on the refuge during the period of October 1 through November 30.
- One low-level javelina and mule deer survey, averaging 8 hours of flight time in the New Waters and 15 hours on the refuge during the period from January 1 through March 31.
- In addition, flights for monitoring water levels, supplemental wildlife surveys, or in response to emergency situations may occur if necessary.
- Helicopter landings will be allowed for the retrieval of telemetry equipment from a sick or dead animal.

Rationale: Implementing these provisions will minimize the number of flights over designated wilderness and improve efficiencies in time and money to acquire needed biological information throughout the planning area. Advance approval by the Service or BLM is necessary for aircraft landings within wilderness that are not provided for in this plan. Emergency and safety reasons are the exception.

8. Continue cooperative effort to identify needs and collect baseline data. The Service will complete all phases of the already established aerial videography project by the year 1999.

Rationale: All agencies recognize the need to collect as much relevant scientific data as possible to assist in efforts to manage habitat and wildlife in the planning area for its biologically diverse suitability and capability. The aerial videography project will provide fundamental vegetation baseline data once digitized.

9. Appropriate agencies will coordinate to establish seasonal closures of sensitive habitat to protect wildlife and plant species when needed. Such areas may include drought period water sources, lambing sites (Map 4), abandoned mine shafts and other sensitive habitats.

10. By 1998, inventory abandoned mine sites, the majority of which are outside the wilderness, and install gates in such a way as to allow for continued use of bats and other wildlife. If appropriate, the mine opening may be closed. For those mine openings that are found to be within wilderness, and present a safety hazard to the public, the manager will install the appropriate wildlife amenable gates using the minimum tool. Mechanized/motorized equipment will be allowed for installing gates or closing mine sites.

Rationale for Actions 9 and 10 : These actions will minimize the potential for adverse impacts from visitors on wildlife during crucial periods. The agencies must

be able to maintain the integrity of natural and appropriate manipulative processes so that wildlife, habitat, and wilderness mandates are met. In the case of abandoned mine shafts, closure will minimize risks to human safety.

11. Purchase from willing sellers, private inholdings (Map 3) within the Kofa portion of the planning area. There will be a purchase target of at least 1 inholding per year.

Rationale: This action will provide for the protection of wildlife habitat and visual values of the planning area.

Monitoring for Objective 2

1. Maintain monitoring logs of the administrative use of vehicles and/or mechanized equipment. Evaluate the logs annually and explore options to reduce the need for these type of administrative uses.
2. Monitor burn areas for the establishment of exotic plant species.
3. Monitor visitor uses and intensities of uses as to their effects and/or impacts on natural resources within the planning area. Recommend and implement mitigation to minimize adverse impacts as needed.

Objective 3: Recreation, Legal Access and Public Information:

Maintain high quality opportunities for recreation within the planning area, and where applicable, wildlife dependent , and/or primitive recreation that is compatible with the purposes for which the Kofa NWR and New Water Mountains Wilderness were established. These uses include wildlife observation, hiking, hunting, camping, photography, and solitude. This objective will be accomplished by:

- Providing public information that allows for public enjoyment of recreational opportunities in the planning area while promoting low impact use ethics for visitors.
- Establishing methods that will allow for the public to continually assess the quality of their recreational opportunities and thereby assist in determining appropriate future management decisions.
- Providing legal public access routes that promote dispersed use.
- Acquiring private lands that provide added recreational opportunities.
- Enhancing the quality of recreational opportunities by establishing special programs.
- Maintain environmental standards (air and water quality) to provide for enhanced visitor experience.

Rationale: All recreational activities on National Wildlife Refuges are secondary uses and are allowed when compatible with the primary purposes for which the refuges were established. Any existing recreational use must undergo annual review and any proposed use must undergo compatibility analysis. The above listed uses are those that have been determined to be compatible with the Kofa.

Management Actions

1. Establish (I-8 on Map 1 by 1998) and maintain information and interpretive displays at access points (Map 1) to the planning area as funding and staff levels permit.
2. As staffing and funding allow, conduct routine patrols of the planning area at least once per month.
3. Promote "Leave No Trace!" land use ethics by making appropriate information available at information displays and administrative sites.
4. By the end of 1998, include visitor registers at information displays (Map 1) to provide for public assessment and comment about the quality of their recreational and wildlife appreciation opportunities. Develop an appropriate register form to assist in providing needed monitoring information.
5. Keep existing authorized public access routes (Map 1) open to promote dispersed visitor use and maintain opportunities for solitude.
6. The BLM will pursue options to acquire a public easement through or purchase the entire land parcel described by Mineral Entry Patent 546603, adjacent to the New Waters in the northeast portion of the planning area (Map 3) by 1999.

Rationale: Providing legal public access would assist in meeting Objective 3 through more dispersed visitor use that would be allowed by making a larger portion of the New Waters legally accessible to the public. This property currently provides some of the more popular camping sites in the BLM portion of the planning area. Also, this action will provide for the protection of wildlife habitat and visual resources of the planning area, and therefore assist in meeting Objective 2.

7. The Service will continue to work with AGFD to manage the Alternate hunt (mule deer) Program on the Kofa portion of the planning area (State Game Management Unit 45).

Rationale: This action will allow for continuation of a quality deer hunt on the Kofa portion of the planning area. The objective is to reduce potential hunter crowding and increase hunter success rates. This action also contributes to the achievement of Objective #2.

8. Prohibit the use of permanent anchors and the marking of routes in support of technical rock climbing and rappelling in the planning area as authorized by 43 CFR 8560.1-2 and 50 CFR 25.21.
9. Allow horses, mules, burros, and llamas as recreational livestock in the planning area under these conditions: The use of feeding containers is required, water is to be packed in for

livestock, and surface disturbances at campsites are to be restored. Use of pelletized feed is recommended.

Rationale: The use of feeding containers will assist in preventing the introduction of exotic plants and pathogens from domestic livestock. Packing in water will eliminate any need for livestock to use water resources developed specifically for wildlife within the planning area. Cumulative habitat/resource degradation will be prevented from continued recreational livestock use. It is recognized that the use of recreational livestock by hunters and other users is one method of transporting game across long distances or as an alternative recreational opportunity. This action contributes to the achievement of Objective 2 and is authorized by 50 CFR 26.33 and 27.52 on Kofa and 43 CFR 8560.1-1 on the New Waters.

10. Allow campfires in the New Waters using dead, down and detached wood. Provide information at wilderness access displays to minimize use of campfires. Visitors to the New Waters will be encouraged to bring their own firewood. The BLM will consider campfire restrictions as a last resort.

11. Allow the use of dead, down, and detached wood for campfires in the nonwilderness corridors and other non wilderness areas within the Kofa NWR. Prohibit wood gathering and the possession of ironwood on Kofa NWR wilderness areas as authorized by 50 CFR 25.21 and 25.31. The Service will require visitors to Kofa NWR designated wilderness areas to bring their campfire wood as authorized by 50 CFR 26.33 or to bring charcoal or propane stoves. No native wood will be removed from the refuge.

Rationale for actions 10 and 11: Generally, campfires are used along nonwilderness corridors and throughout wilderness boundary perimeters where visitor use occurs more often. No data exists that compels the Service to completely disallow the use of dead, down and detached wood for campfires. However, the Service is compelled to conserve wilderness values until additional research can confirm that the resources' sustainability. This action also contributes to the achievement of Objective 2.

12. Enforce 25 mi/hr speed limit on all refuge maintained roads. Recommend to Yuma and La Paz County officials the implementation and enforcement of a 25 mi/hr speed limit on all county maintained roads within the Kofa NWR.

Rationale: The lower speeds on these dirt roads will reduce the number of dust particulates in the air to provide for maintaining air quality and will reduce mortalities to all wildlife, especially reptiles.

Monitoring for Objective 3

1. Inspect campsites where livestock use has occurred. Compile data on adverse impacts and assess the need to establish a special recreation use permit system for livestock on a yearly basis in the Kofa portion of the planning area.
2. Monitor for potential adverse impacts in the vicinity of frequently used campsites throughout the planning area and evaluate to determine if mitigation is needed.
3. Monitor visitor uses and intensities of uses as to their effects and/or impacts on natural resources within the planning area. Recommend and implement mitigation to minimize adverse impacts as needed.
4. Monitor data from public assessments of recreational opportunities in the planning area to assist in determining whether group size limits are warranted.
5. Compile visitor non-compliance data; evaluate annually and implement needed mitigation that will include appropriate interpretive messages at information displays.

Objective 4: Minerals Management

Minimize the environmental impacts of mining activities on all lands and resources within the planning area especially those directly related to wilderness by:

- Acquiring unpatented mining claims within the planning area.
- Monitoring activities on unpatented claims and performing mineral validity examinations if mining operations are proposed.

Management Actions

1. Encourage non-government entities to purchase unpatented claims on the Kofa NWR and allow claims to lapse. Contact at least 2 non-governmental entities by end of 1998.
2. By 1999, the Service will develop a Memorandum of Understanding with the BLM for mining claim validity examinations that would be performed if mining operations are proposed on active claims within Kofa wilderness. Provisions are to be made for project funding.

Rationale for Actions 1 and 2: Implementation of these actions will assist in the resolution of issue 4, and achieve BLM Wilderness Management Goals, and Service Wilderness Management Policy Objectives. Achievement of the objective will result in long-term preservation of the area's wilderness values while allowing both agencies to accomplish wildlife and habitat management mandates.

Monitoring for Objective 4:

Monitoring for the fulfillment of Objective 4 will be accomplished during annual plan evaluations.

PART V. PLAN EVALUATION

In coordination with AGFD, the Yuma Resource Area Manager and the Kofa NWR project leader (refuge manager) will conduct annual evaluations of the plan to:

1. Document completed management actions and adjust schedules for the following year if necessary.
2. Monitor to determine if the plan objectives are being met.
3. Recommend new management actions if needed.
4. Determine if the plan needs to be revised.

Needed revisions will amend the plan and be available for public review before being implemented.

PART VI: IMPLEMENTATION SCHEDULE AND COST ESTIMATES

TABLE 5 - RECURRING TASKS

TASK/ACTIVITY	WORKMONT HS (\$3500/MO.)	TASK ASSIGNMENT
Monthly Wilderness Patrols, Facilities Maintenance, Information Displays, Signs	6	Park/Law Enforcement Rangers/ Wilderness Specialist
Participate in annual Quartzsite Pow Wow public information booth	.5	Refuge/Resource Area Staff
Monitoring - Visitor Use, establishment of exotic species	3	Park/Law Enforcement Ranger/ Wilderness Specialist/ Biologists
Plan Evaluation	.5	Area/Refuge Managers/ Interdisciplinary Team/AGFD

TABLE 6 - NON-RECURRING TASKS

TASK/ACTIVITY	TARGET DATE	COSTS	TASK ASSIGNMENT
1. Implement restrictions on: rockhounding; fuel wood gathering; rock climbing; and use of recreational livestock. Develop educational materials for posting at locations I-1 to I-10 on Map 1 to promote low impact uses and inform the public of restrictions .	1998	\$ 2,500	Wilderness Specialist/ Refuge and Area Managers
2. Work with AGFD to provide information about fuel wood gathering restrictions on Kofa and requirements for livestock use in planning area for inclusion on yearly hunting regulations.	1998	\$ 1,000	State Office/Res. Area Wilderness Specialists/ Area/Refuge Managers
3. Construct information display at location I-8 on Map 1 in New Waters.	1998	\$ 400	Park Ranger/Wilderness Specialist
4. Establish visitor registers at locations I-1 to I-10 on Map 1.	1998	\$ 900	Refuge Mgr/ Wilderness Specialist
5. Develop BLM/Service MOU for mining validity examinations.	1999	¹	Refuge/Area Managers
6. Clean up debris at abandoned mining sites on Map 3 as follows: *1 to *6 *7	1996 to 2001 1997	\$ 15,000 \$ 1,000	Refuge Manager Pk. Ranger/W. Specialist
7. Reclaim former routes K-1 and K-2 and NW-1 to NW-4 on Map 3 as follows: K-1 & K-2 NW-1 to NW-4	1997 & 1998 1997 to 2000	\$ 5,000 \$ 10,000	Refuge Manager Pk. Ranger/W. Specialist
8. Pursue options to establish 2 field positions on Kofa.	1998	\$ 60,000	Refuge Manager
9. Inventory and gate or close abandoned mines on Kofa as appropriate.	1998	\$ 25,000	Refuge Manager
10. Improve wildlife waters at Nugget Tank.	1998	\$ 5,000	AGFD/BLM
.11. Improve wildlife waters at: Charlie Died Tank Modesti Tank	1998 2000	\$ 30,000 \$ 30,000	Refuge Manager
12. Improve wildlife waters : Kofa #1 and #2.	To be determined	\$ 30,000 \$ 30,000	AGFD/ BLM/Service- Wildlife Biologists
.13. Complete Kofa aerial videography project.	1999	\$ 5,000	Refuge Manager
. 14. Acquire public easement through or all property on Mineral Entry Patent 546603.	1999	\$100,000	State Office Realty Specialist/ Area Manager
15. Acquire private inholdings from willing sellers on Kofa.	2010	²	Refuge Manager
16. Acquire active mining claims from willing sellers on Kofa.	2010	²	Refuge Manager

1. No operational funding is needed; approximately 1 workmonth will be needed for Tasks 5 and 6.

2. Tasks 16 and 17 are long-term goals and acquisition estimates were not readily available.

PART VII: APPENDICES

included in the

*Kofa National Wildlife Refuge & Wilderness and New Water Mountains Wilderness
Interagency Management Plan and Environmental Assessment
(October 1996)*