Stirling Energy Systems, Inc.

BLM and CEC Staff Workshop
SES Solar Two Project

Cumulative and Alternatives Analysis
Tuesday, February 10, 2009

Creating a brighter future for humanity through SOLAR ENERGY

Agenda

- Introductions
- Background
- Cumulative Impact Analysis Approach
- Alternatives Development and Analysis

Cumulative Impacts Analysis with the MOU

- Cumulative Impacts Analysis Approach
- Analyzing Cumulative Impacts for PSA/DEIS
- Approach Demonstrations
  - Socioeconomics
  - Visual
  - Biological

Definition of Cumulative Impacts

- Additive or interactive impacts resulting from the **incremental** effect of the Project when added to past, present and reasonably foreseeable future actions.

- **Reasonably foreseeable** future actions or effects are those likely (or reasonably certain) to occur within the time frame used for the impact analysis.

Scope of Cumulative Impacts Analysis

- **Determine if the combined effects** of the past, present, and reasonably foreseeable future projects and development are **cumulatively significant**.

- If yes, determine whether **incremental effects** of the project are **cumulatively considerable.**

- NEPA – are there any significant project effects?

Cumulative Impacts Analysis Approach

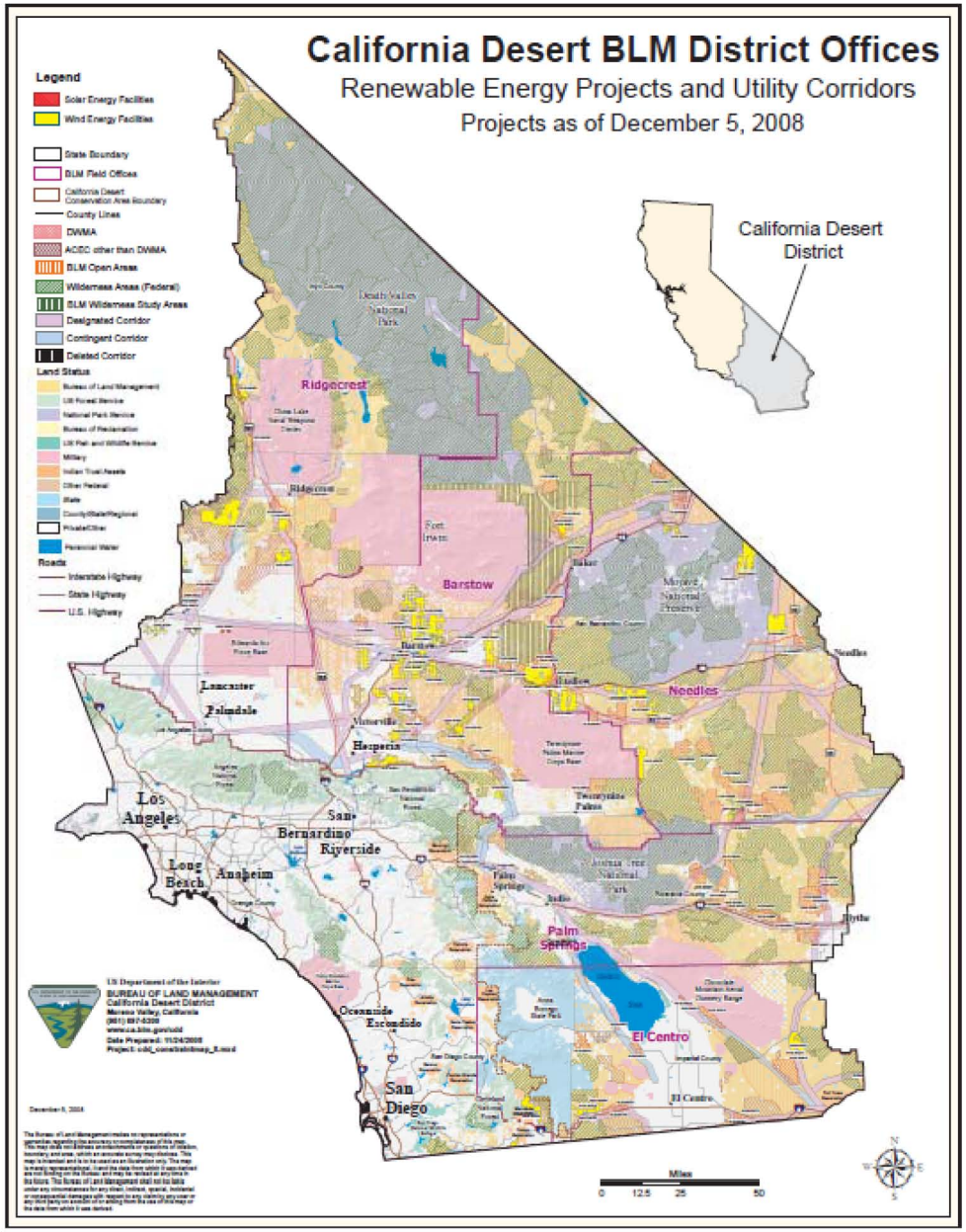
- Define the geographic and temporal scope of effect for each discipline.
- Evaluate project effects in combination with past and present projects and development.
- Evaluate the effects of the project with foreseeable future development that could occur within the area of geographic effect defined for each discipline.

Cumulative Impacts Issues

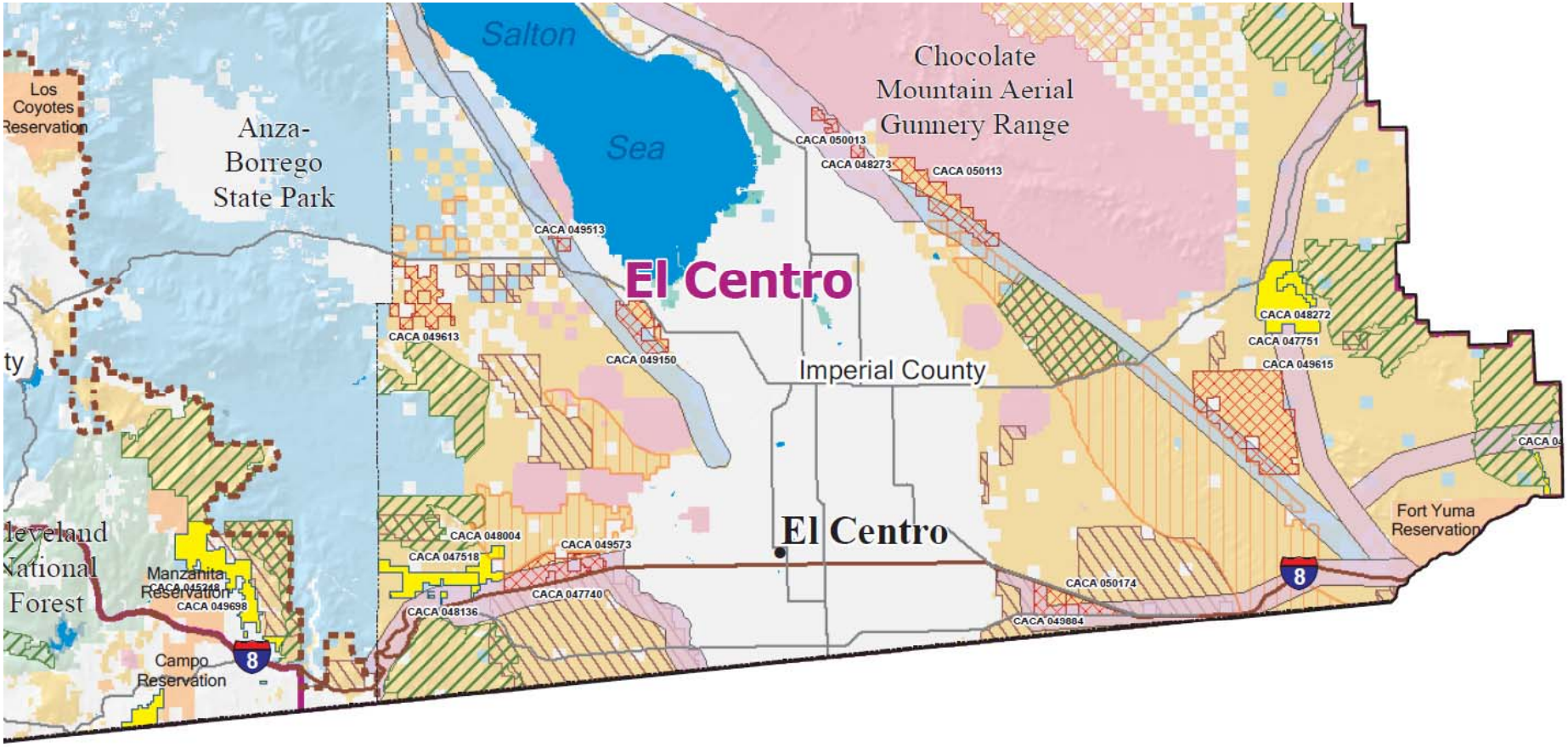
- Defining geographic and temporal scope of project effects by discipline.
- Identifying development and projects to consider as past, present, and reasonably foreseeable future actions.
- Determining the magnitude of effects from past, present, and reasonably foreseeable future development
  - Severity of impact
  - Likelihood of occurrence

Reasonably Foreseeable Future Development

- Identifying Future Development to be Used in Analyzing Cumulative Impacts
  - Probability of future development
    - Status of permissions
    - Constraints (transmission line access, cultural, etc.)
  - Severity of Impacts from future development
    - Unmitigated effects
    - Interaction between resources

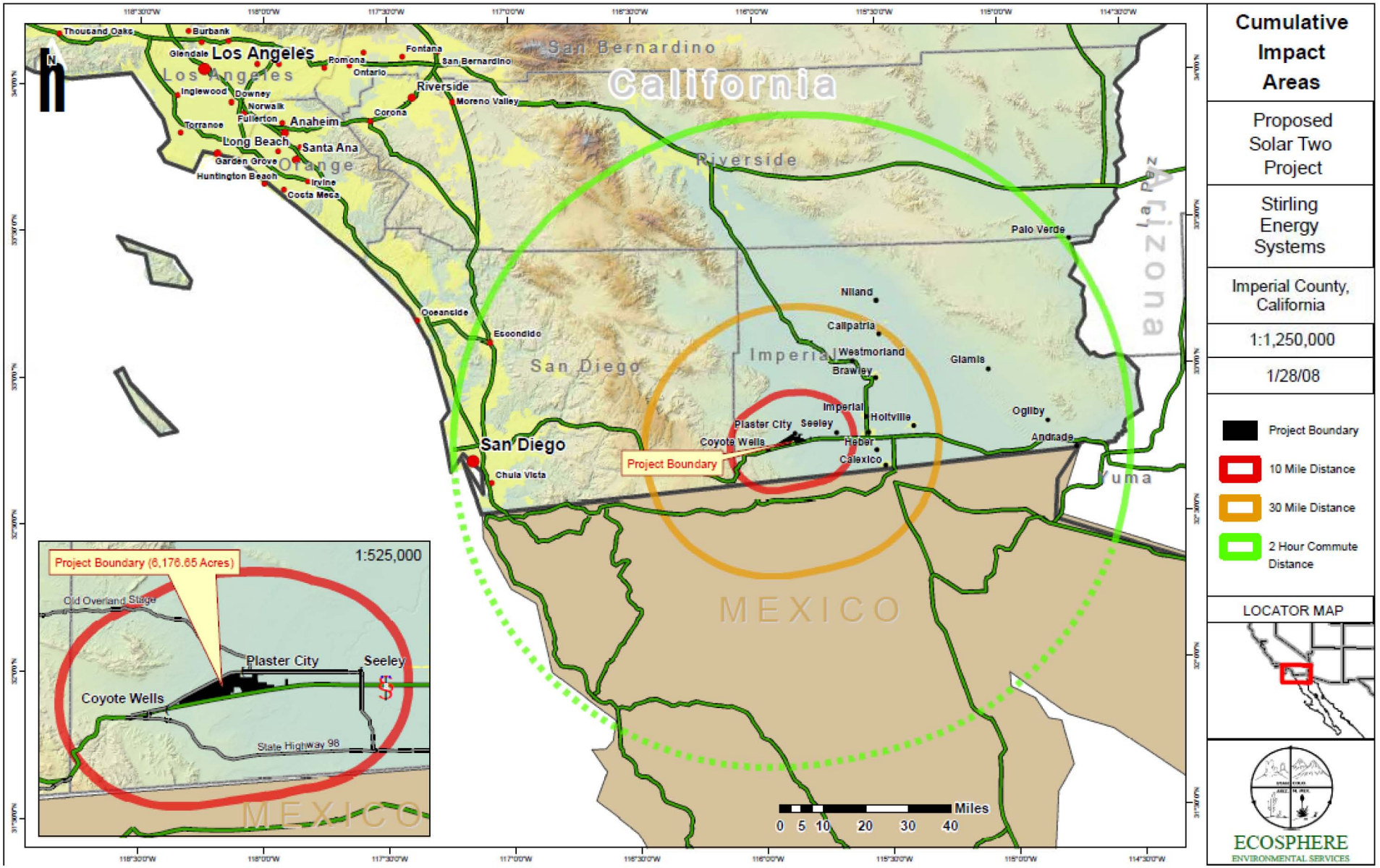

California Desert BLM District Offices
Renewable Energy Projects and Utility Corridors
Projects as of December 5, 2008
California Desert District
Legend
Solar Energy Facilities
Wind Energy Facilities
State Boundary
BLM Field Offices
California Desert Conservation Area Boundary
County Lines
DWMA
ACEC other than DWMA
BLM Open Areas
Wilderness Areas (Federal)
BLM Wilderness Study Areas
Designated Corridor
Contingent Corridor
Deleted Corridor
Land Status
Roads
Interstate Highway
State Highway
U.S. Highway
Ridgecrest
Barstow
Needles
Lancaster
Palmdale
Hesperia
Los Angeles
San Bernardino
Riverside
Long Beach
Anaheim
Palm Springs
Oceanside
Escondido
El Centro
San Diego
Miles
0 12.5 25 50

BLM CDD Renewable Energy Projects



Approach Example: Socioeconomics

- Cumulatively significant effect
  - Direct impact: employment
  - Indirect impacts: population, housing, income, boom/bust cycle
- Area of Effect
  - Two-hour commute
- Reasonable Foreseeable Development
  - Other projects that require specialized skilled workers (renewable energy projects, transmission lines).


Cumulative Impact Areas
Proposed Solar Two Project
Stirling Energy Systems
Imperial County, California
1:1,250,000
1/28/08
Project Boundary
10 Mile Distance
30 Mile Distance
2 Hour Commute Distance
LOCATOR MAP
ECOSPHERE
ENVIRONMENTAL SERVICES
California
Arizona
MEXICO
Project Boundary
Project Boundary (6,176.65 Acres)
1:525,000
Old Overland Stage
Plaster City
Seeley
Coyote Wells
State Highway 98
Miles
0 5 10 20 30 40
Los Angeles
San Bernardino
Riverside
Orange
San Diego
Imperial
Yuma
Thousand Oaks
Burbank
Glendale
Pomona
Fontana
Ontario
Inglewood
Downey
Norwalk
Fullerton
Anaheim
Corona
Moreno Valley
Torrance
Long Beach
Santa Ana
Garden Grove
Huntington Beach
Irvine
Costa Mesa
Oceanside
Escondido
San Diego
Chula Vista
Palo Verde
Niland
Calipatria
Westmorland
Brawley
Glamis
Imperial
Holtville
Ogilby
Plaster City
Seeley
Coyote Wells
Heber
Andrade
Calexico

Example Worker Requirements

Worker Type	SES Solar Two Maximum Daily Requirement	Imperial County Workforce
Carpenter	47	80
Construction Crew	46	140
Electrician	113	210
Ironworker	48	130
From the SES Solar Two AFC Socioeconomic Analysis Table 5.10-6		

Approach Example: Visual Resources

- Significant or “Cumulatively Considerable Effects”?
  - Does the project’s degree of change meet BLM guidelines for VRM/VRI classes?
    - Need VRM/VRI classifications
    - Need Visual Impact Assessment (contrast rating)
  - Does CEC Scenic Resource Evaluation indicate significant changes?
- Geographic
  - Identify area of effect with viewshed mapping
- Temporal
  - Map current and future disturbances in project viewshed area and overlap viewshed profiles
  - Does the addition of the project to the viewshed in concert with current and future disturbance meet existing VRM/VRI?

Approach Example: Biological Resources

Flat-tailed horned lizard

- **Area of potential effect** – geography, potential habitat, and defined management areas (ACEC) for the lizard
- **Temporal:** Past, present, & RFAs within geographic boundaries
- **Significance Criteria:** Percentage of acres of habitat affected by past, present, and future actions in comparison with proposed action

Alternatives Development and Analysis

- **CEC and BLM Alternatives Analysis Needs**
  - CEC/CEQA Requirements
  - BLM/NEPA Requirements
  - What's been done to date & how this addresses agency needs

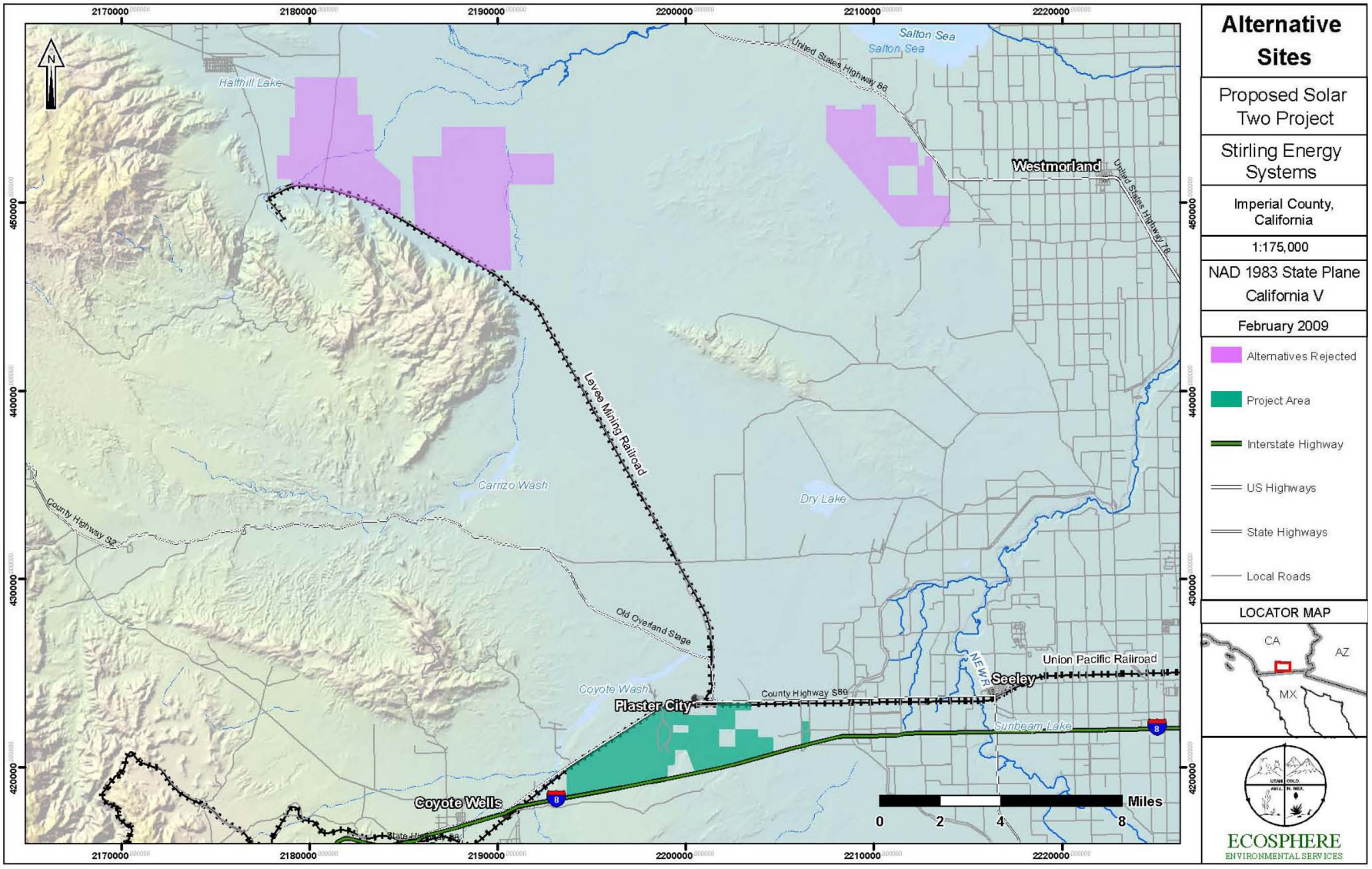
- **SES Solar II Purpose and Need –** meeting legislated renewable energy requirements and carbon emission reductions.

- **Siting Criteria**
  - Solarity
  - Land Area
  - LORS
  - Topography
  - Site Control
  - Cost
  - Wind Speed
  - Infrastructure
  - Environmentally Sensitive

- **Options Considered But Eliminated**
- **Viable Alternatives**
- **Land Use Classification Amendment**

Options Considered But Eliminated

- **Alternate Site 1 (Western)** – removed due to sensitive species, restricted airspace, cultural, hydrology concerns.
- **Alternate Site 2 (Northern)** – near Salton Sea, removed due to sensitive species and insufficient contiguous acreage.
- **Mesquite Lake - ** removed due to less than 6000 acres of available land, would not meet the purpose and need, not consistent with LORS, significant adverse impacts to adjacent land uses.
- **Wind Zero site –** removed since it does not have sufficient acres to meet the purpose and need.


Alternative Sites
Proposed Solar Two Project
Stirling Energy Systems
Imperial County, California
1:175,000
NAD 1983 State Plane California V
February 2009
Alternatives Rejected
Project Area
Interstate Highway
US Highways
State Highways
Local Roads
LOCATOR MAP
CA
AZ
MX
ECOSPHERE
ENVIRONMENTAL SERVICES
Salton Sea
Halfhill Lake
United States Highway 86
Westmorland
Levee Mining Railroad
Carrizo Wash
Dry Lake
County Highway S2
Old Overland Stage
Coyote Wash
Plaster City
County Highway S80
Union Pacific Railroad
Seeley
Sunbeam Lake
Coyote Wells
Miles
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2
4
8
2170000
2180000
2190000
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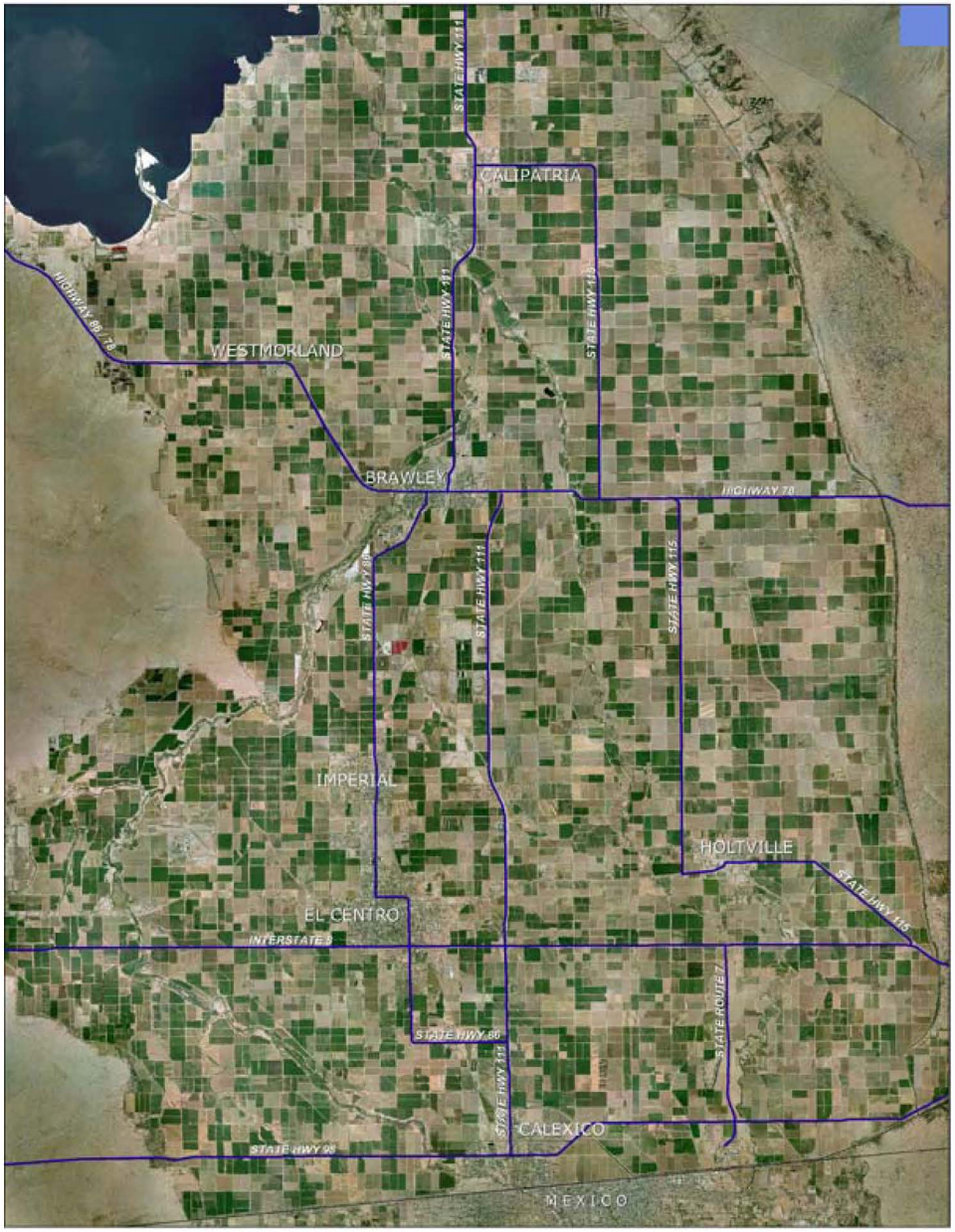
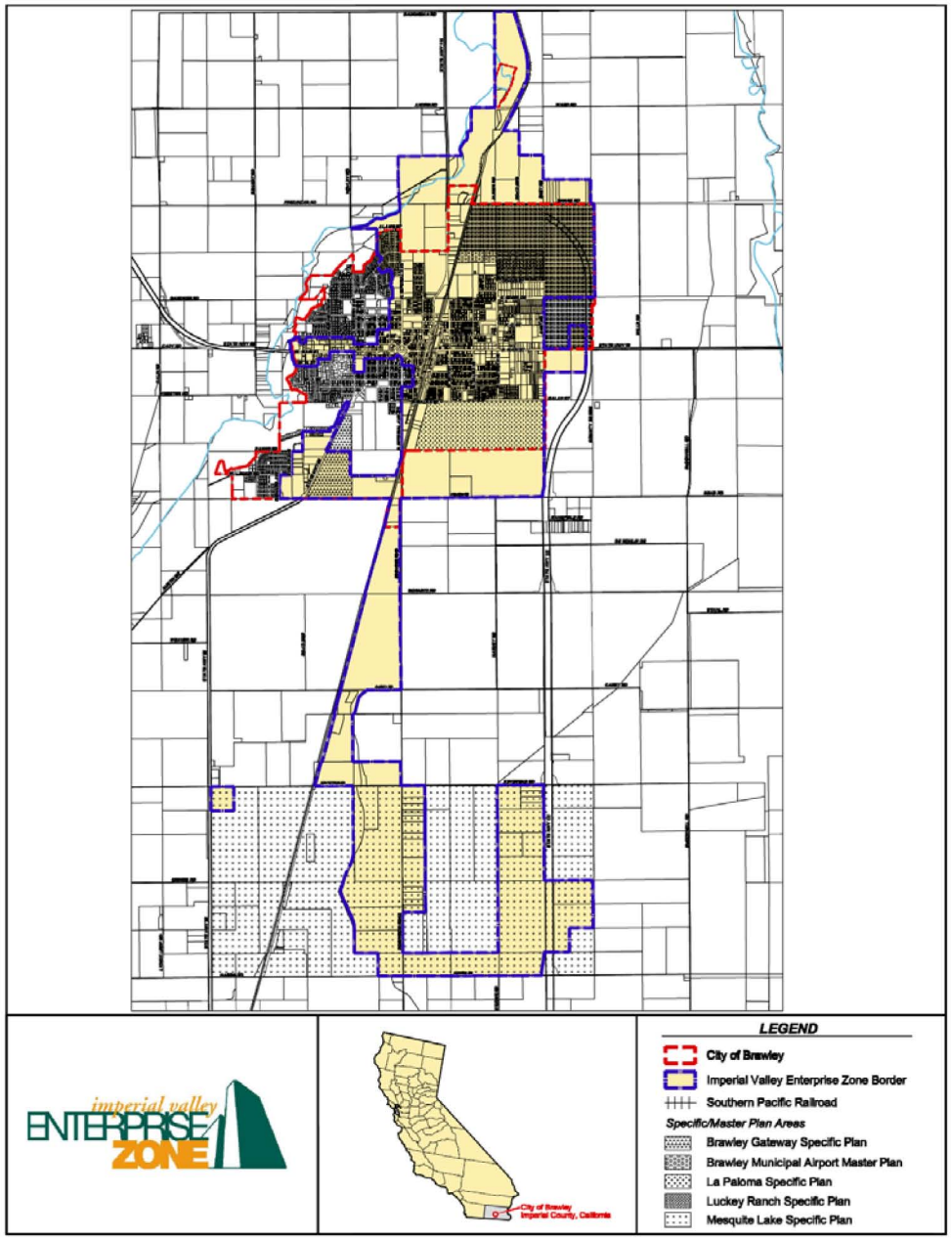
2210000
2220000
450000
440000
430000
420000


CALIPATRIA
WESTMORLAND
BRAWLEY
IMPERIAL
HOLTVILLE
EL CENTRO
CALEXICO
MEXICO
STATE HWY 111
STATE HWY 115
STATE HWY 86
STATE ROUTE 7
STATE HWY 98
INTERSTATE 8
HIGHWAY 78


imperial valley
ENTERPRISE
ZONE
City of Brawley
Imperial County, California
LEGEND
City of Brawley
Imperial Valley Enterprise Zone Border
Southern Pacific Railroad
Specific/Master Plan Areas
Brawley Gateway Specific Plan
Brawley Municipal Airport Master Plan
La Paloma Specific Plan
Luckey Ranch Specific Plan
Mesquite Lake Specific Plan

Land Use Plan Amendment

- California Desert Conservation Plan (CDCP) Land Use Plan Amendment
  - SES Solar Two site is Class L (Limited)
  - Amendment required for solar energy
  - Change to Class I (Intensive)

- BLM will use Solar Two EIS to support Land Use Plan Amendment

Example Alternatives for Solar Two Project

- No Action
- Preferred Alternative (750 MW – Excluding Cultural and ACEC areas [Alternative 3])
- 300 MW (Phase I only)
- Full-footprint Proposal (900 MW)

All Alternatives except No Action Would Require Land Use Plan Amendment

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Flat-tailed Horned Lizard (FTHL) Cumulative Impact Analysis

FTHL Cumulative Impacts Analysis Area

FTHL High Density Population Centers

FTHL Management Areas

Source: Flat-tailed Horned Lizard Rangewide Management Strategy, 2003 Revision

West Mesa Management Area

California

48789

48789

49614

48789

48004

47518

Yuha Desert Management Area

Mexico

N IMPERIAL AVE

DREW RD

OLD HIGHWAY 80

86

98

Miles

0 2 4 8

FTHL Cumulative Impacts Analysis

BIO 3

Proposed Solar Two Project

Stirling Energy Systems

Imperial County, California

1:180,000

NAD 1983 State Plane California V

February 2009

Legend

Proposed Solar 2 Project

Past and Present Projects

Transmission Line

Highway

Gypsum Plant

Reasonably Foreseeable Projects

BLM Applications for Solar

BLM Applications for Wind

LOCATOR MAP

CA

AZ

MX

ECOSPHERE

ENVIRONMENTAL SERVICES

2140000.000000 2150000.000000 2160000.000000 2170000.000000 2180000.000000 2190000.000000 2200000.000000 2210000.000000 2220000.000000 2230000.000000 2240000.000000 2250000.000000 2260000.000000

470000.000000 460000.000000 450000.000000 440000.000000 430000.000000 420000.000000 410000.000000 400000.000000 390000.000000

California

Mexico

West Mesa Management Area

Yuha Desert Management Area

DREW RD

N IMPERIAL AVE

BONDS CORNER RD

OLD HIGHWAY 80

Flat-tailed Horned Lizard (FTHL) Cumulative Impact Analysis

FTHL Potential Habitat

FTHL High Density Population Centers

FTHL Management Areas

Source: Flat-tailed Horned Lizard Rangewide Management Strategy, 2003 Revision

Miles

0 4.5 9 18

Flat-tailed Horned Lizard

Geographic Limits

Bio 1

Proposed Solar Two Project

Stirling Energy Systems

Imperial County, California

1:400,000

NAD 1983 State Plane California V

February 2009

Legend

Proposed Solar 2 Project

LOCATOR MAP

CA

AZ

MX

ECOSPHERE

ENVIRONMENTAL SERVICES

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440000.000000 430000.000000 420000.000000

48789 48789 49614 48789 48004 47518

Lack Rd Blais Rd Nice Rd Carter Rd Imler Rd Keystone Rd Mudd Rd Sweet Rd Edgar Rd Thompson Rd Pierle Rd Wienert Rd Wienert Rd Wheeler Rd Erskine Rd Kutz Rd House Rd Payne Rd Payne Rd Guthrie Rd Hall Rd Huff Rd Boley Rd Worthington Rd Westmorland Rd Cuin Rd Mealey Rd Magazine Rd Gullett Rd Forrester Rd Patrol Rd Aten Rd 4th St D St B St 8th St Hetzel Rd Curtis Rd Havens Rd Silsbee Rd Hackleman Rd Tucker Rd Haskell Rd Bennett Rd Low Rd Forrester Rd Ross Rd Brown Rd Evan Hewes Hwy Old Overland Stage Rte Painted Gorge Rd Munson Trl Road 2C01 Dunaway Rd Reynolds Rd Stevens Rd Westside Rd Hyde Rd Jessup Rd Derrick Rd Kramer Rd Brockman Rd Northrop Rd McCabe Rd Vaughn Rd Diehl Rd Wixom Rd Vogel Rd Harrigan Rd Drew Rd Mandrapa Rd Schaniel Rd Shell Canyon Rd Imperial Hwy Dos Cabeza Rd Vista de Anza Frontage Rd Clark Ln Mesolite Rd Molitar Rd Wahl Rd Lyons Rd Preston Rd Fisher Rd Kubler Rd Pullam Rd Rockwood Rd Anza Trail Rd

Miles 0 1.5 3 6

Past, Present, and Future Projects
Bio 2

Proposed Solar Two Project

Stirling Energy Systems

Imperial County, California

1:124,000

NAD 1983 State Plane California V

February 2009

Legend

Proposed Solar 2 Project

Past and Present Projects
- Transmission Line
- Highway
- Gypsum Plant

Reasonably Foreseeable Projects
- BLM Applications for Solar
- BLM Applications for Wind

LOCATOR MAP

CA AZ MX

UTAH COLO. ARIZ. N. MEX.

ECOSPHERE
ENVIRONMENTAL SERVICES