Agenda

Imperial County Transmission Consultation Stakeholder Meeting

Mercy Parker Helget
Sr. Stakeholder Engagement and Policy Specialist
July 14, 2014

Imperial County Transmission Consultation Meeting - Today's Agenda

Topic	Presenter
Welcome and Logistics	Mercy Parker Helget
Overview & Areas of discussion in the Consultation Process	Gary DeShazo
How the Consultation Process will Inform the ISO's 2014-2015 and subsequent Planning Processes	Neil Millar
2013-2014 Results: Deliverability from Imperial County and Southern California Reliability (LA Basin and San Diego)	Neil Millar
NREL SSStudy	Trieu Mai
Transmission Options & Potential Corridor Designations in Southern California in Response to Closure of SONGS	Susan Lee/Brewster Birdsall
Reallocation of Maximum Import Capability	Catalin Micsa
Open Discussion: Comments, Suggestions, Proposals	All
Next Steps	Gary DeShazo

Introduction & Overview

Imperial County Transmission Consultation Stakeholder Meeting

Gary DeShazo
Director – Regional Coordination, Infrastructure Development
July 14, 2014

There is varied interest in the Imperial County area including factors that drive the need for study

- Past efforts by the ISO & CPUC to enable renewable generation development in Imperial County
- Interest in geothermal generation development in the Salton Sea area
- Deliverability impacts related to early retirement of SONGS and the implementation of California's Once Through Cooling (OTC) requirements
- Recently performed high level environmental assessment of the area by the CEC and Aspen Environmental Group
- Possible synergies in achieving further reliability benefits in the LA Basin/San Diego area

There are three key objectives which the ISO seeks to achieve through the consultation effort

- Overview of the California ISO's 2014-2015 transmission planning effort to assess deliverability capability out of Imperial County into the California ISO
- Facilitate dialog on major 500 kV AC or HVDC transmission options from Imperial County to the ISO
  - Are there other options to consider?
  - Consideration of the existing CEC/Aspen environmental feasibility analysis of potential corridor designations in southern California
- Consider the possibility of reallocating a portion of the Maximum Import Capability that is allocated to the transmission path from Arizona to enable increased import capability from Imperial County

How the Consultation Process will Inform the 2014-2015 Transmission Planning Process

Imperial County Transmission Consultation Stakeholder Meeting

Neil Millar
Executive Director, Infrastructure Development
July 14, 2014

Informing the 2014-2015 transmission plan must follow the ISO's established transmission planning process

- 2014-2015 transmission planning process is underway and under guidance of the finalized study plan
- This consultation process needs to be completed by December 2014 commensurate with the preparation of the 2014-2015 transmission plan
- A final version of the discussion paper will be considered in the comprehensive transmission analysis of the 2014-2015 transmission planning process

Expectations of the Transmission Planning Processes:

- 2014-2015 Transmission plan underway:
  - Updating the residual need in the LA Basin/San Diego area
  - Updating deliverability analysis from the Imperial zone (capability with transmission already approved)
  - Identifying solutions (as a sensitivity for information purposes) for higher levels of renewables in the Imperial zone, relying on CPUC-provided portfolios

- 2015-2016 Transmission Plan and subsequent plans:
  - Will reflect new state policy direction as it emerges

2013-2014 Results: Deliverability from Imperial County and Southern California Reliability (LA Basin and San Diego)

Imperial County Transmission Consultation Stakeholder Meeting

Neil Millar
Executive Director, Infrastructure Development
July 14, 2014

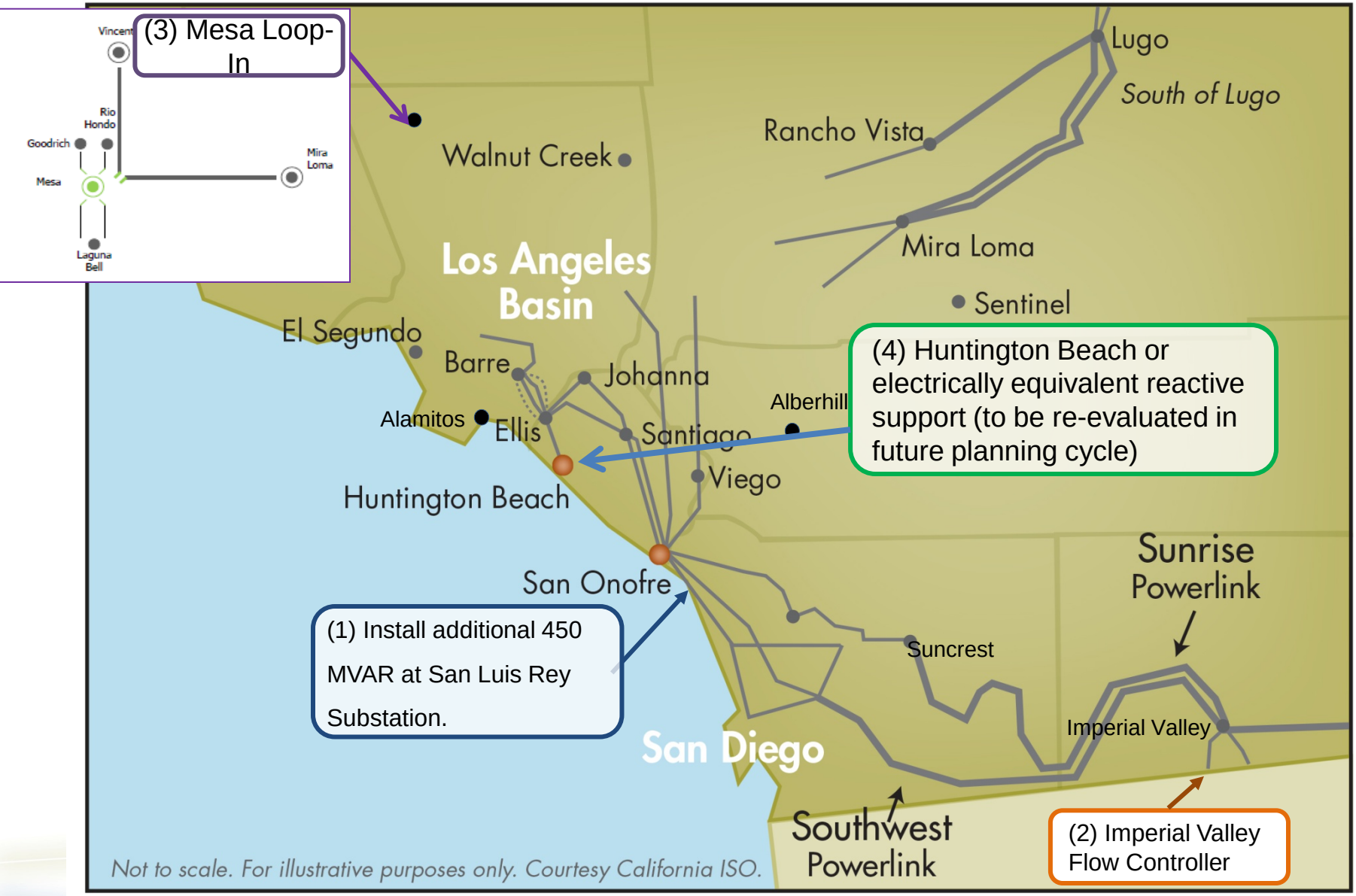
Since 2011 the ISO has targeted enabling renewable generation imports from Imperial County to the ISO

- Developed and implemented the “Deliverability of Resource Adequacy Capacity on Interties” (“Forward-looking MIC”)
- Supported the viability of renewable generation being considered in the CPUC’s 2011 RPS procurement
- Considered and approved modest transmission reinforcements to support a 1400 MW deliverability from IID
- The 2013-2014 transmission plan identified the impact of the SONGS retirement on forecast incremental deliverability from Imperial County area – and the ISO committed to studying possible mitigations in future cycles
- Policy direction (reflected in CPUC renewable generation portfolios) will be needed for further development to proceed for renewable generation

The ISO transmission plan for the LA Basin and San Diego area:

- Generally aligns with the “Preliminary Reliability Plan for LA Basin and San Diego” and is based on the premise that an array of resources will play a role in meeting the overall area needs:
  - Preferred resources (EE, DR, renewables, CHP) and storage
  - Transmission upgrades
  - Conventional generation
- Is based generally on the following assumptions:
  - The ISO Board-approved transmission upgrades,
  - The CPUC Decisions from LTPP Track 1, and
  - The study assumptions from the CPUC Track 4 Scoping Memo
- Is an iterative step in the coordination of the overall area needs with other agency processes, including the CPUC LTPP proceedings and the CEC IEPR processes

Transmission Upgrades Approved in the 2013-2014 Process (Solutions1,2 and 3 – Group 1 Projects)



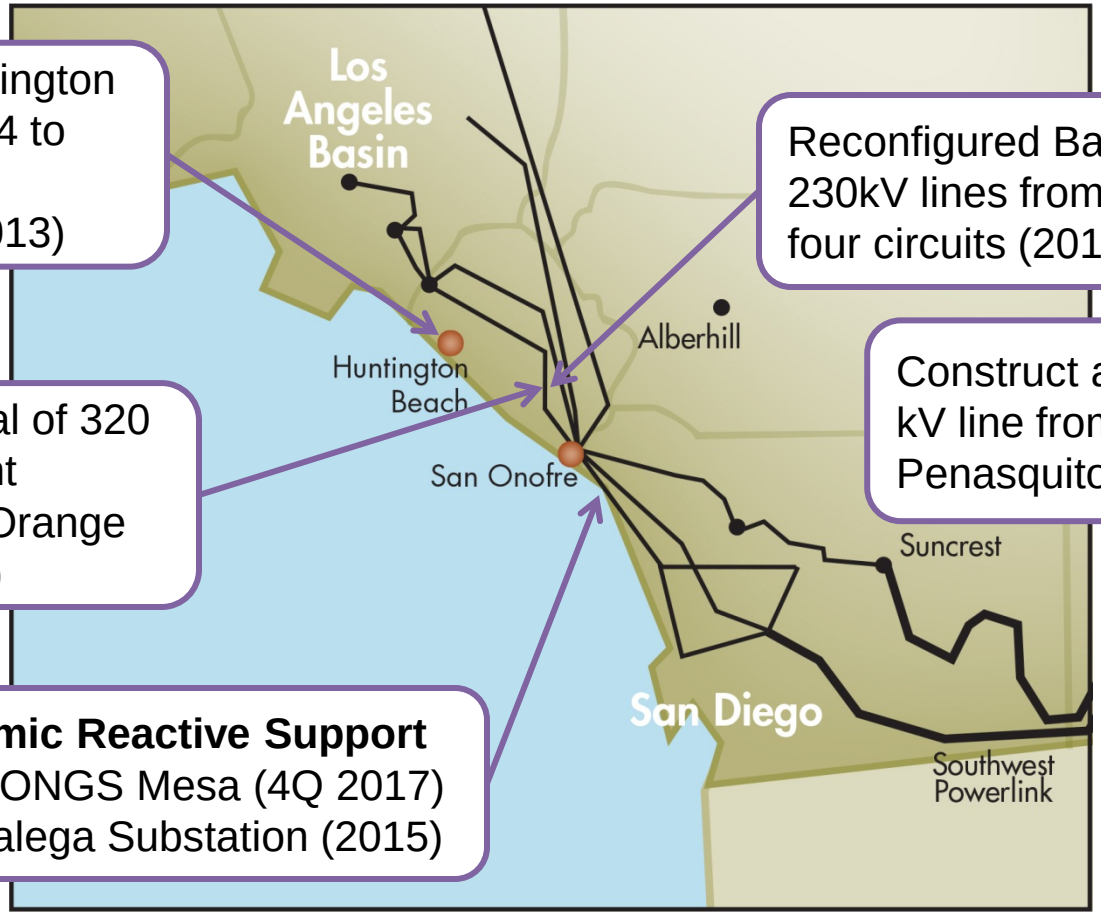
Completed Transmission Upgrades and Future Projects Previously Approved by the ISO Board of Governors

Converted Huntington Beach Units 3&4 to Synchronous Condensers (2013)

Reconfigured Barre-Ellis 230kV lines from two to four circuits (2013)

Construct an 11-mile 230 kV line from Sycamore to Penasquitos (2017)

Installed a total of 320 MVAR of shunt capacitors in Orange County (2013)



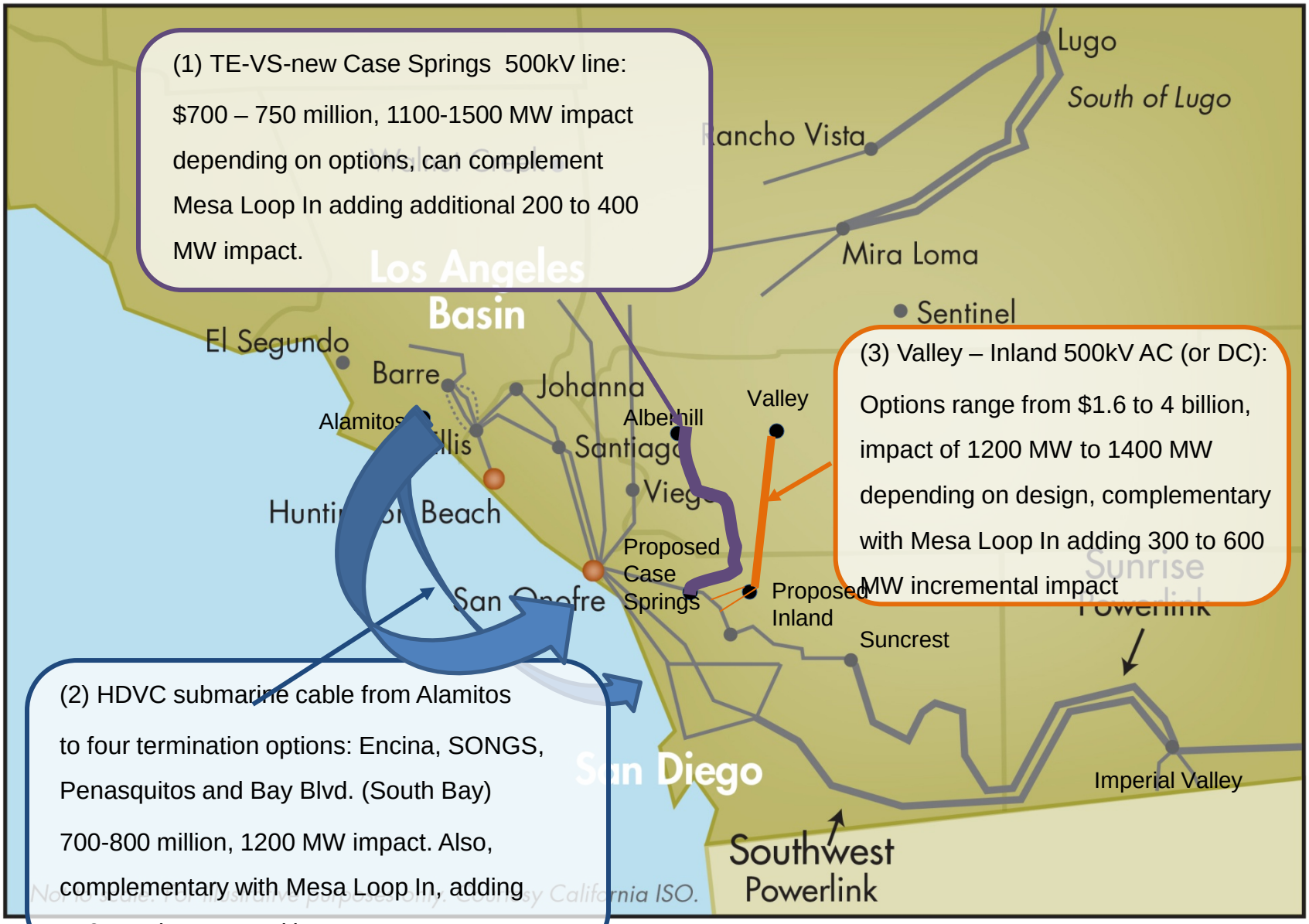
930 MVAR Dynamic Reactive Support

- 480 MVAR at SONGS Mesa (4Q 2017)
- 450 MVAR at Talega Substation (2015)

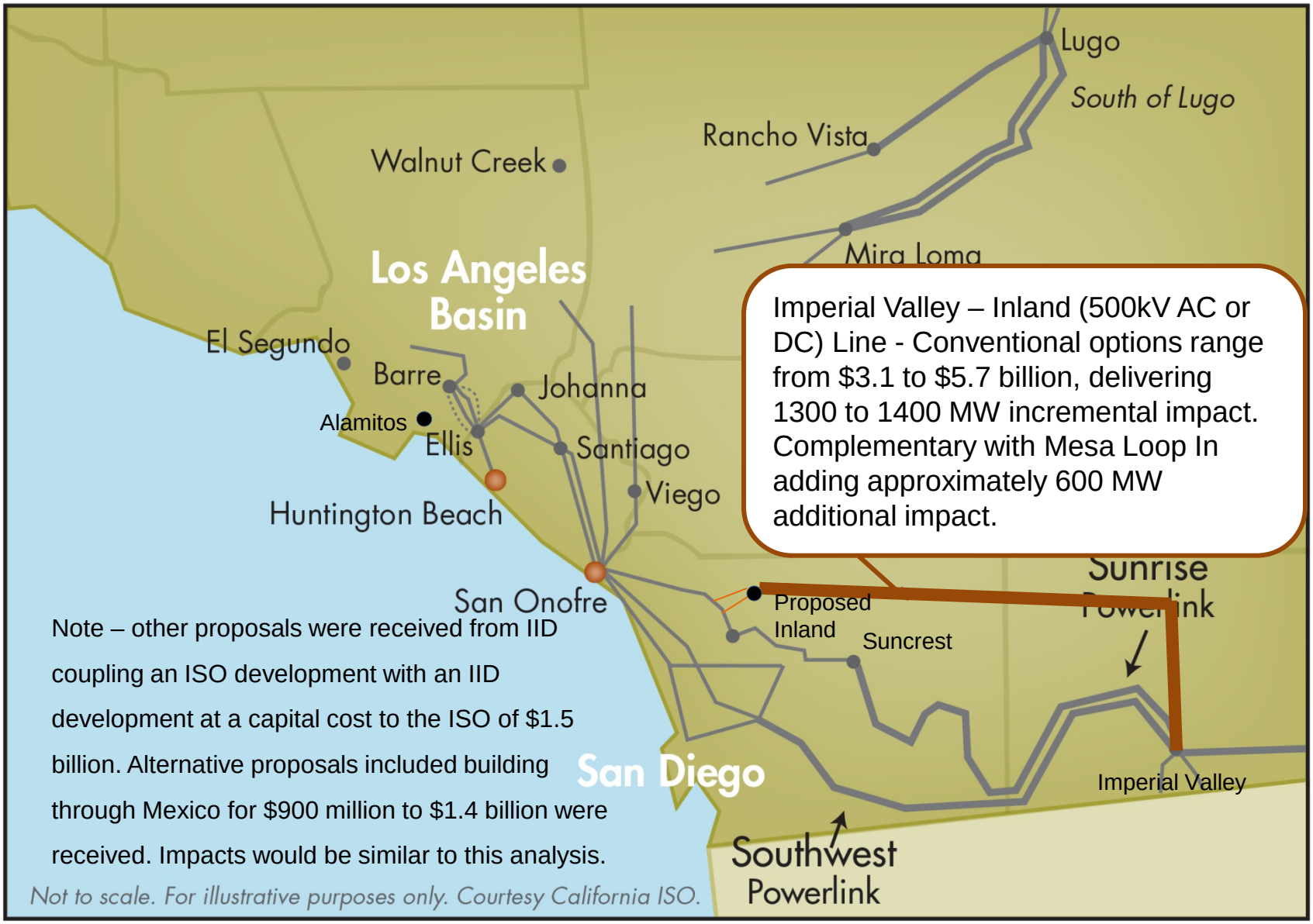
System analysis had focused on a range of options and alternatives in the 2013-2014 plan:

- Transmission options were studied assuming modest conventional generation development and;
  - Group I - Transmission upgrades optimizing use of existing transmission lines (approved)
  - Group II - Transmission lines strengthening LA/San Diego connection – optimizing use of corridors into the combined area.
  - Group III - New transmission into the greater LA Basin/San Diego area
- Effectiveness of various local preferred resource blends
- For comparative purposes, exclusively local conventional generation

Group II: New Transmission Lines Strengthening LA Basin and San Diego Connection



Group III: New Transmission Into the Greater LA Basin/San Diego Area



The transmission corridors involved with the Group II and Group III projects have generally been explored by the Aspen Environmental Group, which is one source the ISO is relying upon.

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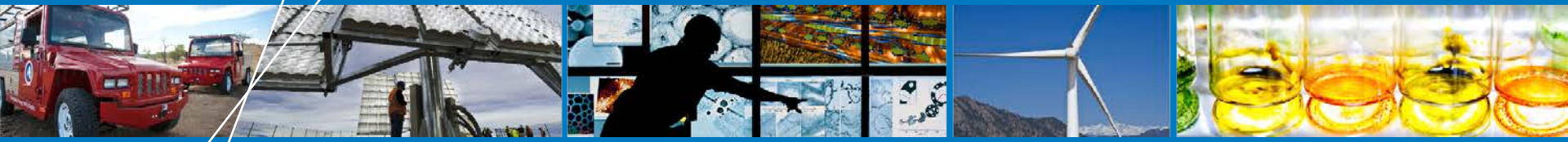
NATIONAL RENEWABLE ENERGY LABORATORY

The Potential for Renewable Energy Development to Benefit Restoration of the Salton Sea: Analysis of Technical and Market Potential



Project Update – July 14, 2014

Trieu Mai

Scott Haase

Brett Oakleaf

Overview

- NREL is providing technical support to Tetra Tech and the Salton Sea Authority through nine primary activities
- Goal: Provide the Authority with a better understanding of the potential for renewable energy, transmission and geothermal mineral development to offset restoration costs

Tasks

1. Stakeholder outreach/regional meetings
2. Review IID/EES consulting report and other relevant efforts
3. Develop regional renewable energy resource confirmation estimates (potential & cost)
4. Renewable energy technology status updates
5. State/Regional energy market analysis
6. Desalinization Analysis
7. Geothermal fluid mineral recovery market analysis
8. Final Report
9. Program management and coordination
10. Conduct Resource Planning Model (RPM) analysis *[not currently funded]*

Deliverables and Milestones

Task	Major Deliverables	Milestone
1	Meetings and local engagement	On-going
2	Report/study reviews	Sep-14
3	Resource update and analysis	Dec-14
4	Technology status update	Nov-14
5	Market analysis/update	Mar-15
6	Desal status and summary	Jan-15
7	Mineral extraction analysis	Mar-14
8	Draft Final Report	May-14
8	Final Report	Jul-15
9	On going reporting, calls, mgmt	On-going

Current Status

- Subcontract between NREL and Tetra Tech signed late May
- Initial processing and funding allocation in process
- Official project kick-off and visit to the region in late July/early August
- In-person participation planned for August board meeting

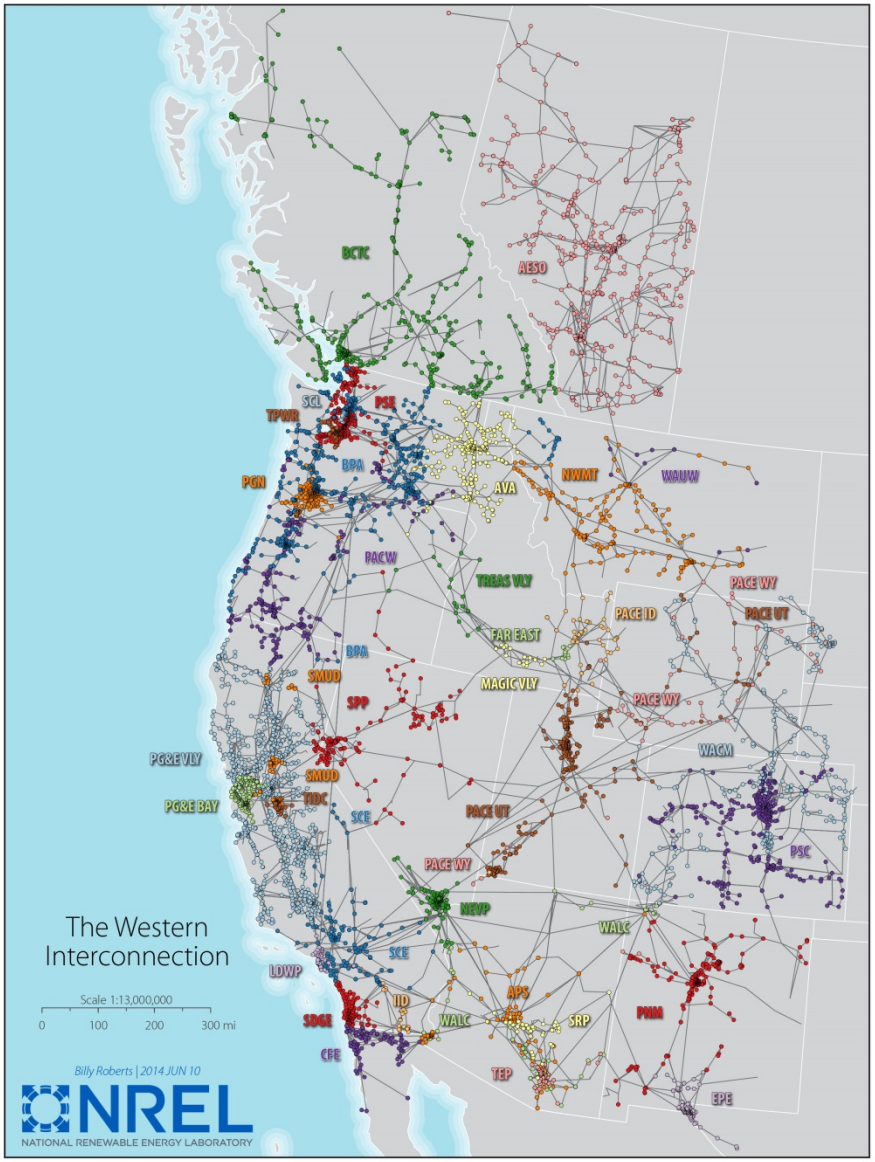
Regional Planning Model (RPM)

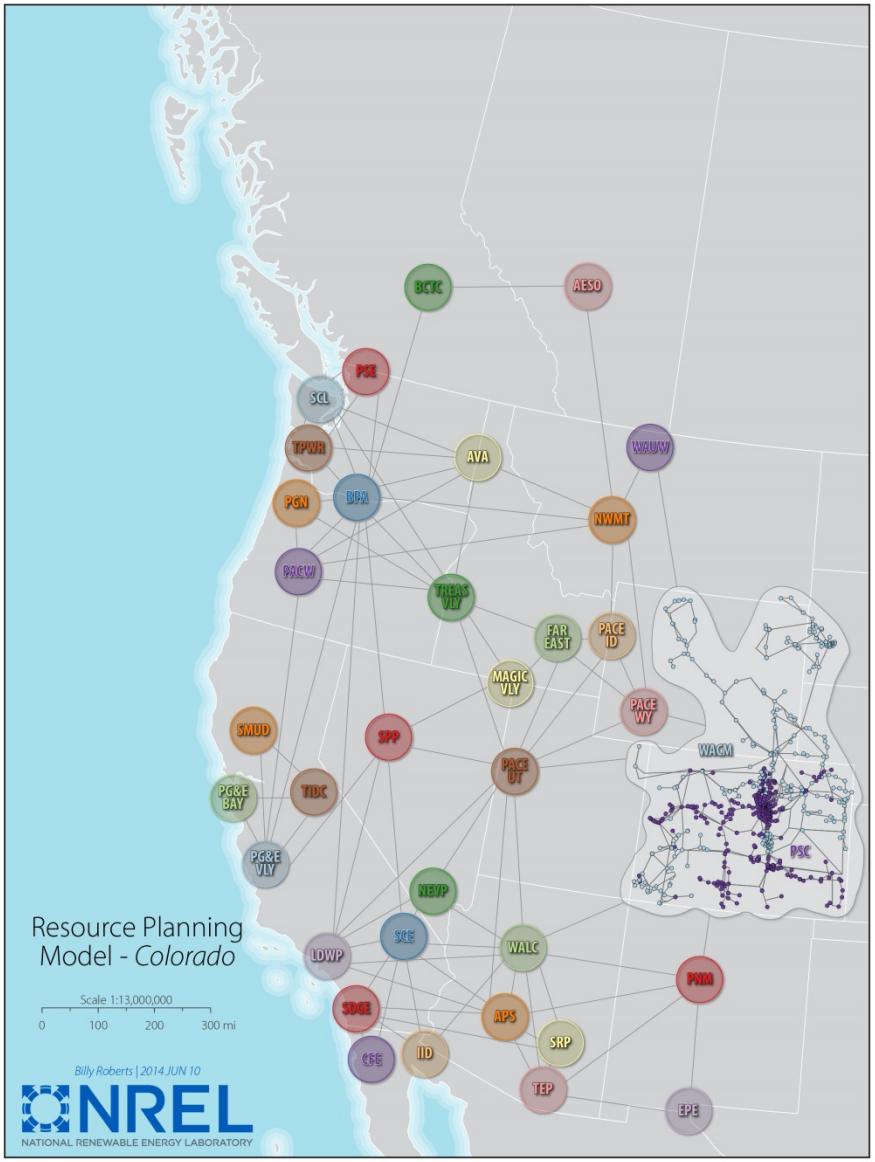
- **Capacity expansion model for a *regional* electric system over a utility planning horizon (10-20 year)**
- **Includes hourly chronological dispatch, unit commitment, and detailed system operation representation**
- **High spatial resolution informs mid- to long-term generator (renewable and non-renewable) siting options**
- **Initial version designed for the bulk power system in Colorado (and surrounding areas)**
- **Current Version includes data for all of Western Interconnection with specific models for CO and AZ**
  - Base data from WWSIS 2 study (i.e. TEPPC 2020 used in Plexos model)

Mai, T.; Drury, E.; Eurek, K.; Bodington, N.; Lopez, A.; Perry, A. (2013). Resource Planning Model: An Integrated Resource Planning and Dispatch Tool for Regional Electric Systems. 69 pp.; NREL Report No. TP-6A20-56723.

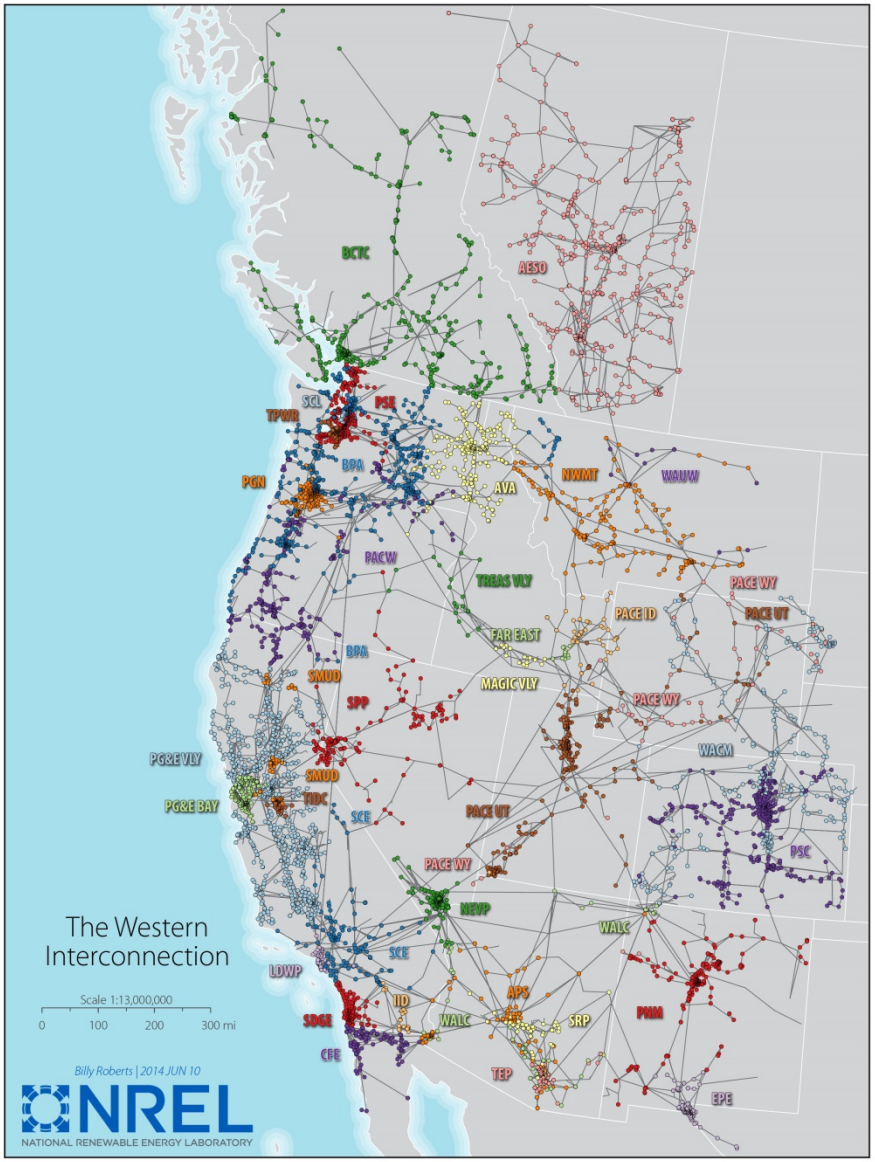
http://www.nrel.gov/docs/fy13osti/56723.pdf

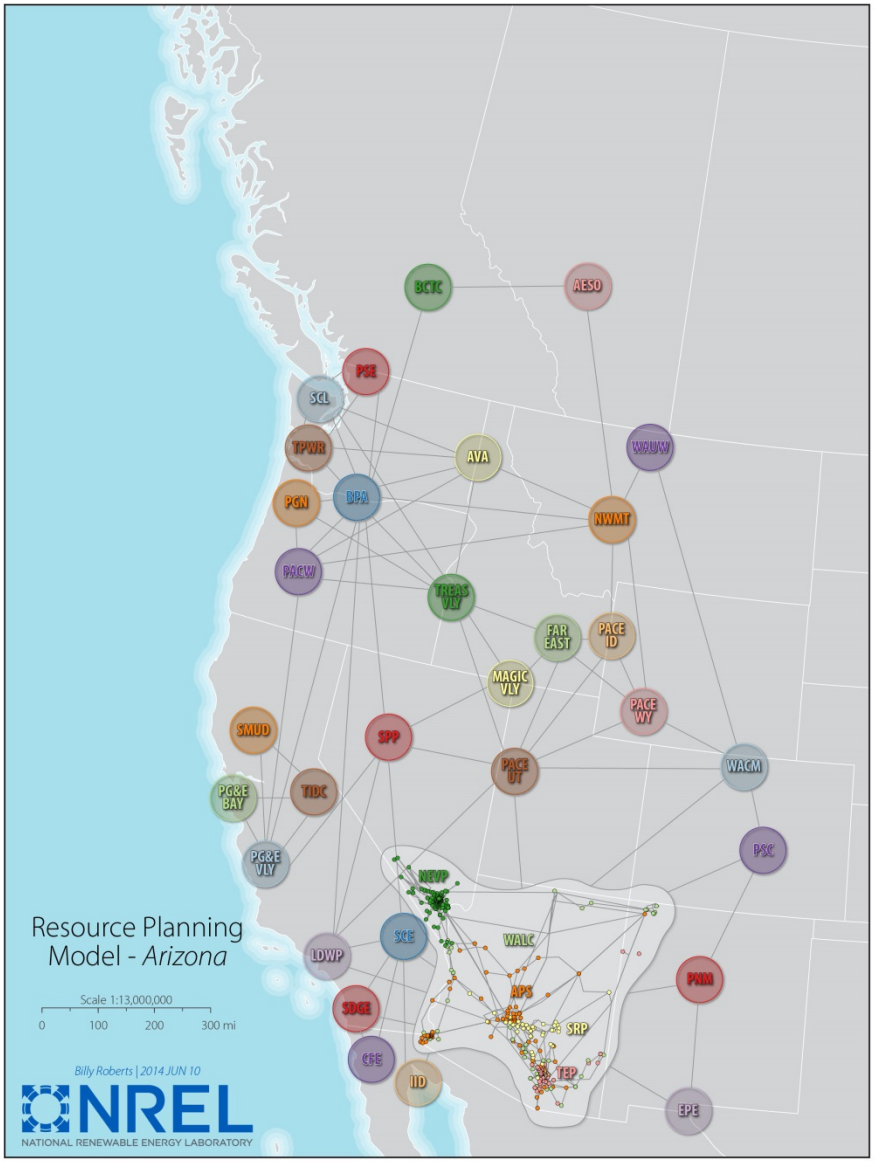
Complete Western Interconnection data for all major units & lines in a flexible platform to develop regional models (CO)



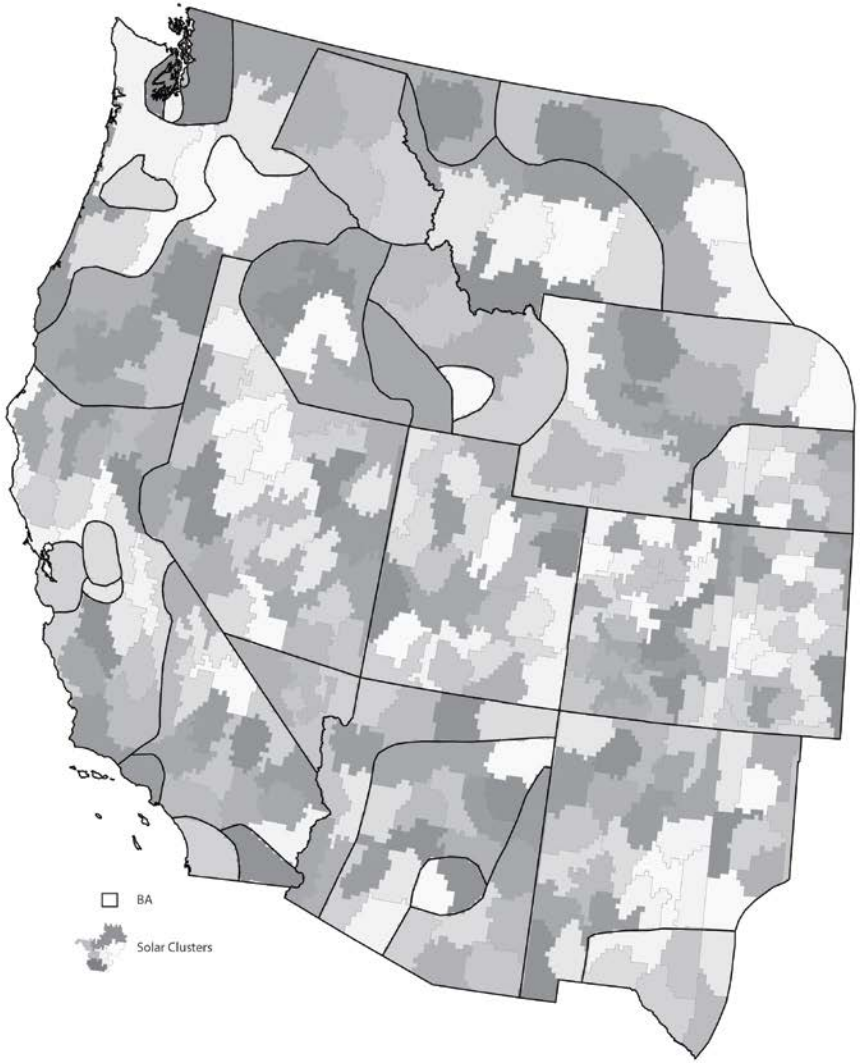


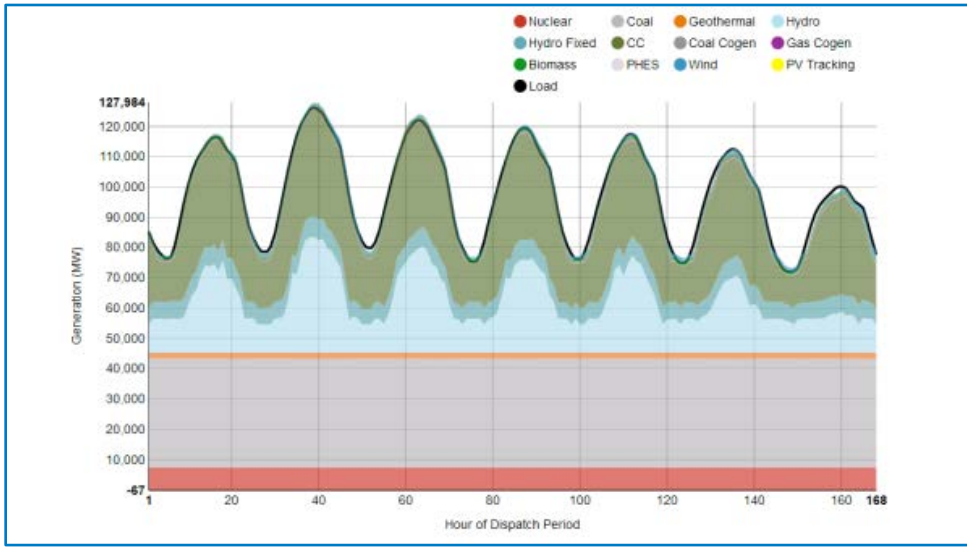
Complete Western Interconnection data for all major units & lines in a flexible platform to develop regional models (AZ)





High Spatial and Temporal Resolution





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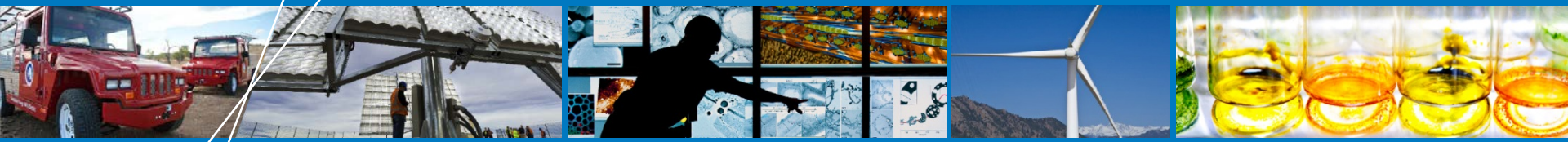

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Transmission Options and Potential Corridor Designations in Southern California in Response to Closure of San Onofre Nuclear Generating Station (SONGS)

Overview of Environmental Feasibility Analysis

Presented by Susan Lee and Brewster Birdsall
Aspen Environmental Group

at the

California Independent System Operator's
Imperial County Transmission Consultation Workshop
July 14, 2014

Purpose of Transmission Options Report

Energy Commission staff requested that Aspen prepare environmental feasibility analysis to:

- Inform the Energy Commission staff and California ISO about environmental feasibility concerns related to potential electric transmission options under consideration by the California ISO in response to the closure of the San Onofre Nuclear Generating Station (SONGS)
- Provide an early-stage evaluation of the potential transmission corridors in the Southern California study area
- Evaluate alternatives provided by CEC and ISO in early October 2013

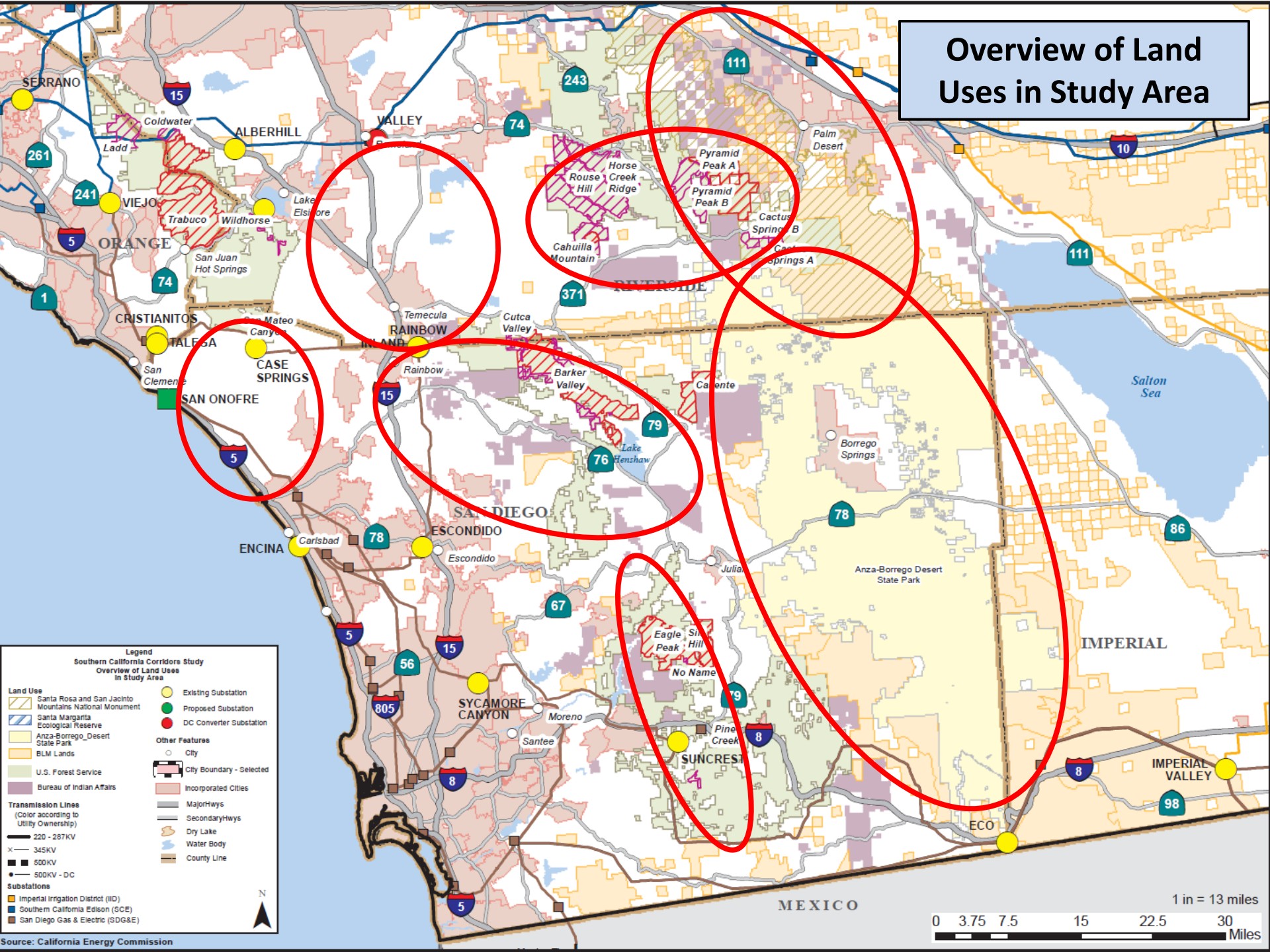
Report is available at:

http://www.energy.ca.gov/2014publications/CEC-700-2014-002/CEC-700-2014-002.pdf

Relevant CEQA & NEPA Documents

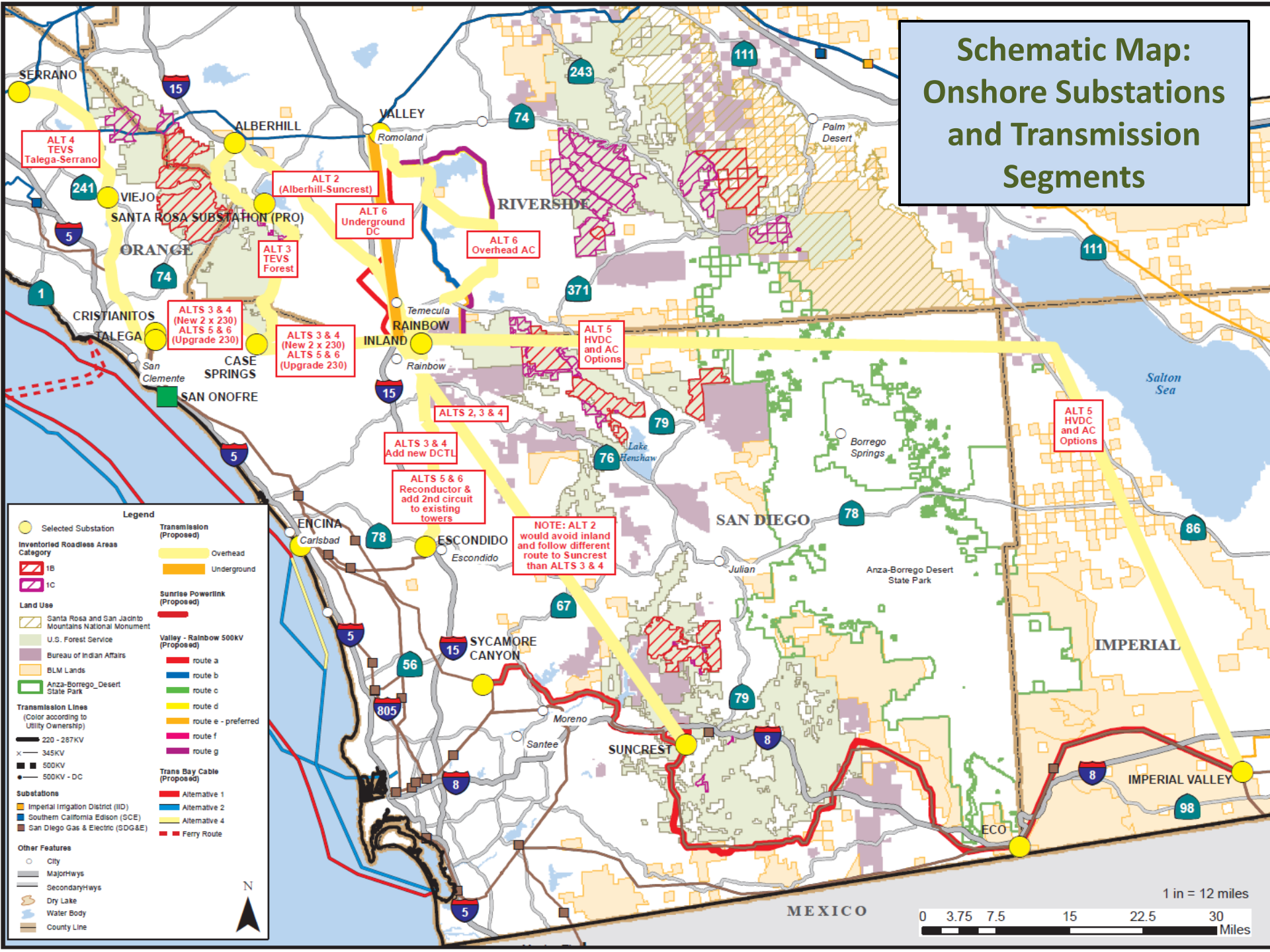
Aspen documents prepared for CPUC and BLM:

- **Devers-Palo Verde No. 2 EIR/EIS**
  - Approved 2007 (Colorado River-Devers-Valley)
  - Includes Devers-Valley #2 500 kV segment
- **Sunrise Powerlink EIR/EIS**
  - Approved 2008 (Southern Route Alternative)
- **Talega-Escondido/Valley-Serrano EIR (aka LEAPS)**
  - Surveys and scoping completed for CPUC
  - No document prepared; Forest route was to be evaluated
- **West of Devers Upgrade EIR/EIS**
  - In progress 2014 / Morongo Band land included
  - Likely to be considered for approval first half of 2015


Overview of Land Uses in Study Area
SERRANO
ALBERHILL
VALLEY
Coldwater
Ladd
VIEJO
Trabuco
Wildhorse
Lake Elsinore
ORANGE
San Juan Hot Springs
CRISTIANITOS
TALEGA
San Mateo Canyon
CASE SPRINGS
San Clemente
SAN ONOFRE
Temecula
RAINBOW
INLAND
Rainbow
Cutca Valley
Barker Valley
Lake Henshaw
Horse Creek Ridge
Rouse Hill
Cahuilla Mountain
Pyramid Peak A
Pyramid Peak B
Cactus Spring B
Cactus Springs A
Palm Desert
RIVERSIDE
Salton Sea
Borrego Springs
Anza-Borrego Desert State Park
Julian
SAN DIEGO
ESCONDIDO
Escondido
Carlsbad
ENCINA
SYCAMORE CANYON
Moreno
Santee
Eagle Peak
No Name
Pine Creek
SUNCREST
IMPERIAL
IMPERIAL VALLEY
ECO
MEXICO
Legend
Southern California Corridors Study
Overview of Land Uses in Study Area
Land Use
Santa Rosa and San Jacinto Mountains National Monument
Santa Margarita Ecological Reserve
Anza-Borrego_Desert State Park
BLM Lands
U.S. Forest Service
Bureau of Indian Affairs
Transmission Lines (Color according to Utility Ownership)
220 - 287KV
345KV
500KV
500KV - DC
Substations
Imperial Irrigation District (IID)
Southern California Edison (SCE)
San Diego Gas & Electric (SDG&E)
Existing Substation
Proposed Substation
DC Converter Substation
Other Features
City
City Boundary - Selected
Incorporated Cities
MajorHwys
SecondaryHwys
Dry Lake
Water Body
County Line
N
1 in = 13 miles
0 3.75 7.5 15 22.5 30
Miles
Source: California Energy Commission

Land Uses as Siting Constraints

- Anza Borrego Desert State Park (ABDSP)
- Santa Rosa – San Jacinto National Monument
- National Forest (NF) Lands
- Tribal Lands
- Marine Corps Base (MCB) Camp Pendleton
- Agua Tibia Wilderness
- Developed areas
- Rural residential areas
- Regional parks
- Scenic highways and scenic areas


Schematic Map: Onshore Substations and Transmission Segments
SERRANO
ALBERHILL
VALLEY
Romoland
Palm Desert
ALT 4 TEVS Talega-Serrano
ALT 2 (Alberhill-Suncrest)
ALT 6 Underground DC
ALT 6 Overhead AC
RIVERSIDE
VIEJO
SANTA ROSA SUBSTATION (PRO)
ORANGE
ALT 3 TEVS Forest
CRISTIANITOS
TALEGA
ALTS 3 & 4 (New 2 x 230) ALTS 5 & 6 (Upgrade 230)
CASE SPRINGS
Temecula
RAINBOW
INLAND
Rainbow
ALT 5 HVDC and AC Options
San Clemente
SAN ONOFRE
ALTS 2, 3 & 4
ALTS 3 & 4 Add new DCTL
ALTS 5 & 6 Reconductor & add 2nd circuit to existing towers
NOTE: ALT 2 would avoid inland and follow different route to Suncrest than ALTS 3 & 4
Lake Henshaw
Borrego Springs
Salton Sea
ENCINA
Carlsbad
ESCONDIDO
Escondido
SAN DIEGO
Julian
Anza-Borrego Desert State Park
SYCAMORE CANYON
IMPERIAL
Moreno
Santee
SUNCREST
IMPERIAL VALLEY
ECO
MEXICO
Legend
Selected Substation
Inventoried Roadless Areas
Category
1B
1C
Land Use
Santa Rosa and San Jacinto Mountains National Monument
U.S. Forest Service
Bureau of Indian Affairs
BLM Lands
Anza-Borrego_Desert State Park
Transmission Lines
(Color according to Utility Ownership)
220 - 287KV
345KV
500KV
500KV - DC
Substations
Imperial Irrigation District (IID)
Southern California Edison (SCE)
San Diego Gas & Electric (SDG&E)
Other Features
City
MajorHwys
SecondaryHwys
Dry Lake
Water Body
County Line
Transmission (Proposed)
Overhead
Underground
Sunrise Powerlink (Proposed)
Valley - Rainbow 500kV (Proposed)
route a
route b
route c
route d
route e - preferred
route f
route g
Trans Bay Cable (Proposed)
Alternative 1
Alternative 2
Alternative 4
Ferry Route
N
1 in = 12 miles
0 3.75 7.5 15 22.5 30
Miles

Onshore Alternatives

- **Alternative 2: Alberhill to Suncrest**
- **Alternative 3: Enhanced TE/VS (Forest Route)**
- **Alternative 4: Enhanced TE/VS (Talega-Serrano)**
- **Alternative 5: Imperial Valley to Inland**
  - Overhead 500 kV AC or Overhead/Underground HVDC
- **Alternative 6: Valley to Inland**
  - Overhead 500 kV AC or Overhead/Underground HVDC

Other Alternatives Analyzed

Included in the Aspen report, but not addressed in ISO workshop:

- **Alternative 1 – Submarine Cable HVDC**
  - Offshore between existing substations in SCE and SDG&E
- **Alternative 7 – Imperial Valley Substation Expansion**
  - For flow control between other BAAs; approved in 2013/2014 ISO Transmission Plan
- **Alternative 8 – Mesa Substation Loop-In**
  - Expand SCE's Mesa to include 500 kV; approved in 2013/2014 ISO Transmission Plan

Transmission Segments Included in Each Alternative

	Alt 2 Alberhill to Suncrest	Alt 3 TE/VS (Forest)	Alt 4 TE/VS (Talega–Serrano)	Alt 5 Imperial Valley–Inland	Alt 6 Valley–Inland
500 kV – Alberhill to Warner	x				
500 kV – Alberhill to Case Springs		x			
500 kV – Talega to Case Springs to Inland		x			
500 kV – Inland to Warner		x	x		
500 kV – Warner to Suncrest	x	x	x		
500 kV – Serrano to Talega			x		
500 kV – Talega to Inland			x		
500 kV – Imperial Valley to Inland				x	
HVDC Option – Imperial Valley to Inland				x	
500 kV – Valley to Inland					x
HVDC Option – Valley to Inland					x
2 x 230 kV – Inland to Escondido (new double circuit)		x	x		
230 kV – Talega to Escondido (reconductor; upgrade to double circuit; loop into Inland Sub.)				x	x

Substations Required for Each Alternative

	Alt 2 Alberhill to Suncrest	Alt 3 TE/VS (Forest)	Alt 4 TE/VS (Talega–Serrano)	Alt 5 Imperial Valley–Inland	Alt 6 Valley–Inland
Alberhill (New 500/115 kV)	x	x			
Case Springs (New 500 kV)		x			
Inland (New 500 kV)		x	x	x	x
Suncrest (Existing 500/230 kV)	x	x	x		
Talega (Add 500 kV to 230/138 kV)		x	x		
Talega (Existing 230 kV)				x	x
Serrano (Existing 500/230 kV)			x		
Escondido (Existing 230 kV)		x	x	x	x
Imperial Valley (Add 500 kV or HVDC)				x	
Valley (Add 500 kV or HVDC)					x
San Onofre and Huntington Beach (Synchronous Condenser Sites)		x	x		
Japanese Mesa (SDG&E SONGS Mesa 69 kV) (Phase Shifter Site)				x	x

Routing Details and Jurisdictions for Each Alternative

	Alt 2 Alberhill to Suncrest	Alt 3 TE/VS (Forest)	Alt 4 TE/VS (Talega–Serrano)	Alt 5, 1A Imperial Valley–Inland (500 kV)	Alt 5, 1B Imperial Valley–Inland (HVDC)	Alt 6, 2A Valley–Inland (500 kV)	Alt 6, 2B Valley–Inland (HVDC)
Length in Original Description Provided	65.0	137.2	n/a	145	145	35	35
Length of New 500 kV or HVDC based on potential routing presented in this report	105.3	138.6	142.4	140.0	142.2	40.0	30.0
Length of Underground Segment(s)	0	0	0	0	36.3	0	29.9
BLM Land	0.4	0.3	0.3	33.3	32.8	0	0
Forest Service Land	17.7	46.3	21.9	2.2	2.2	0	0
Military Land (Pendleton)	0	10.0	10.2	0	0	0	0
State Lands Commission	0.8	2.0	2.0	0.7	5.1	0	0
State Parks	0	0	0	19.6	19.9	0	0
Tribal Land	0	3.6	3.6	3.6	3.6	0	0
Unincorporated County	61.5	76.0	88.8	80.6	78.2	32.0	11.2
Incorporated City	24.7	0	15.2	0	0	6.5	18.7

Likelihood of Successful Permitting

Key to Summary Table: Likelihood of Successful Permitting and Construction

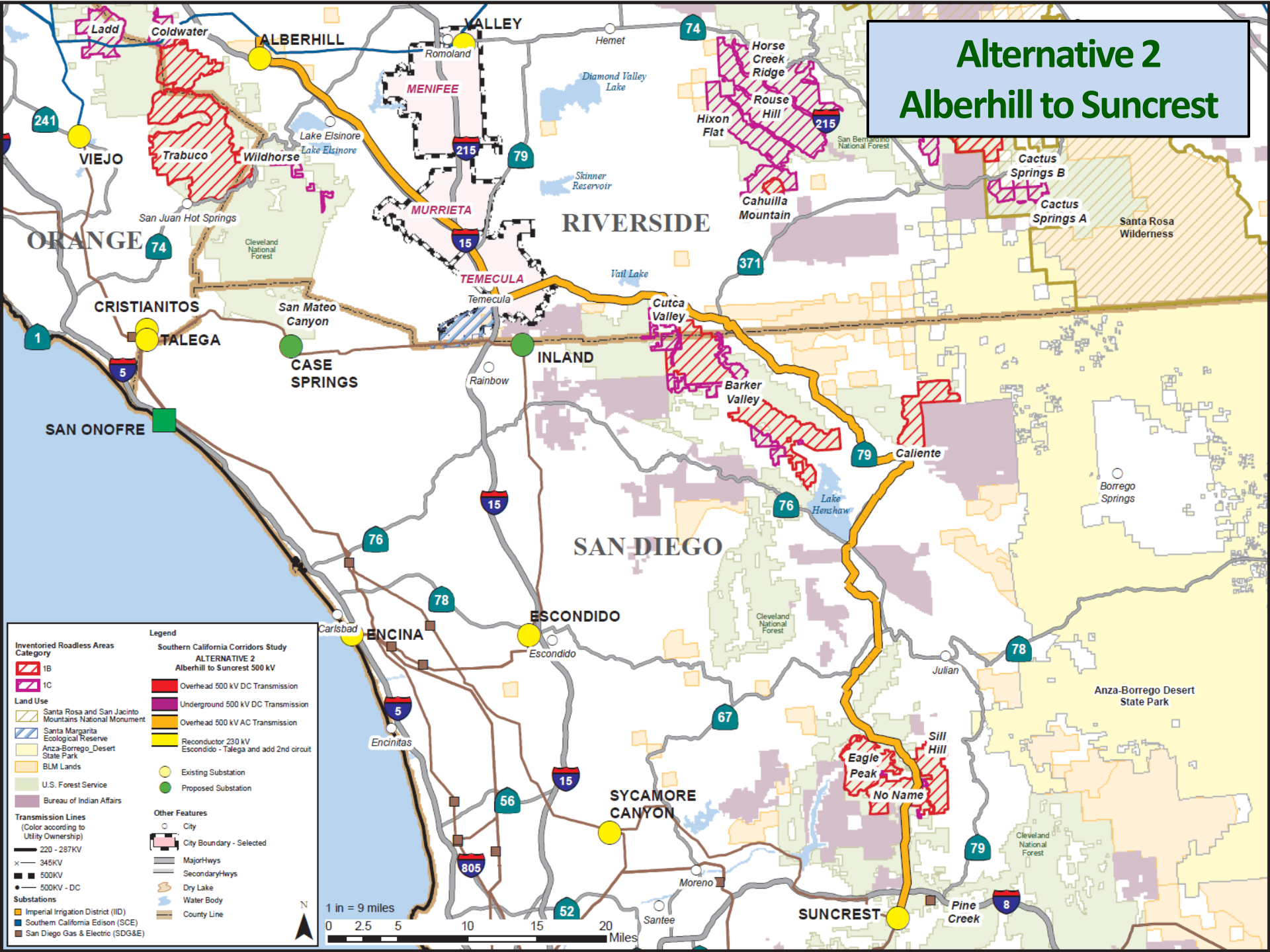
■ **Green**: Possible	No major obstacles to permitting or construction
■ **Yellow**: Possible but Challenging	Siting constraints but likely can be overcome
■ **Orange**: Challenging	Serious siting challenges that may not be resolvable
■ **Red**: Very Challenging	Very serious siting challenges that may make routes infeasible

Transmission Alternatives: Permitting Likelihood by Segment

Alternative	Description	Likelihood of Successful Permitting
Alternative 2. Alberhill to Suncrest	I-15 to SR 79	**Very Challenging**
Alternative 3. Enhanced TE/VS (Forest Route)	Alberhill to Inland	**Challenging**
	Inland to Suncrest	**Very Challenging**
Alternative 4. Enhanced TE/VS (Talega-Serrano Route)	Serrano to Inland	**Challenging**
	Inland to Suncrest	**Very Challenging**
Alternative 5, 1A. Imperial Valley to Inland (500 kV Overhead)	Imp Vy to ABDSP	**Possible but Challenging**
	Overhead ABDSP	**Very Challenging**
	West of ABDSP	**Very Challenging**
Alternative 5, 1B. Imperial Valley to Inland HVDC (Overhead and Underground)	Imp Vy to ABDSP	**Possible but Challenging**
	Underground ABDSP	**Challenging**
	West of ABDSP	**Challenging**
Alternative 6, 2A. Valley to Inland (500 kV Overhead)	Overhead 500 kV	**Very Challenging**
Alternative 6, 2B. Valley to Inland (HVDC All Underground)	Underground HVDC	**Possible but Challenging**

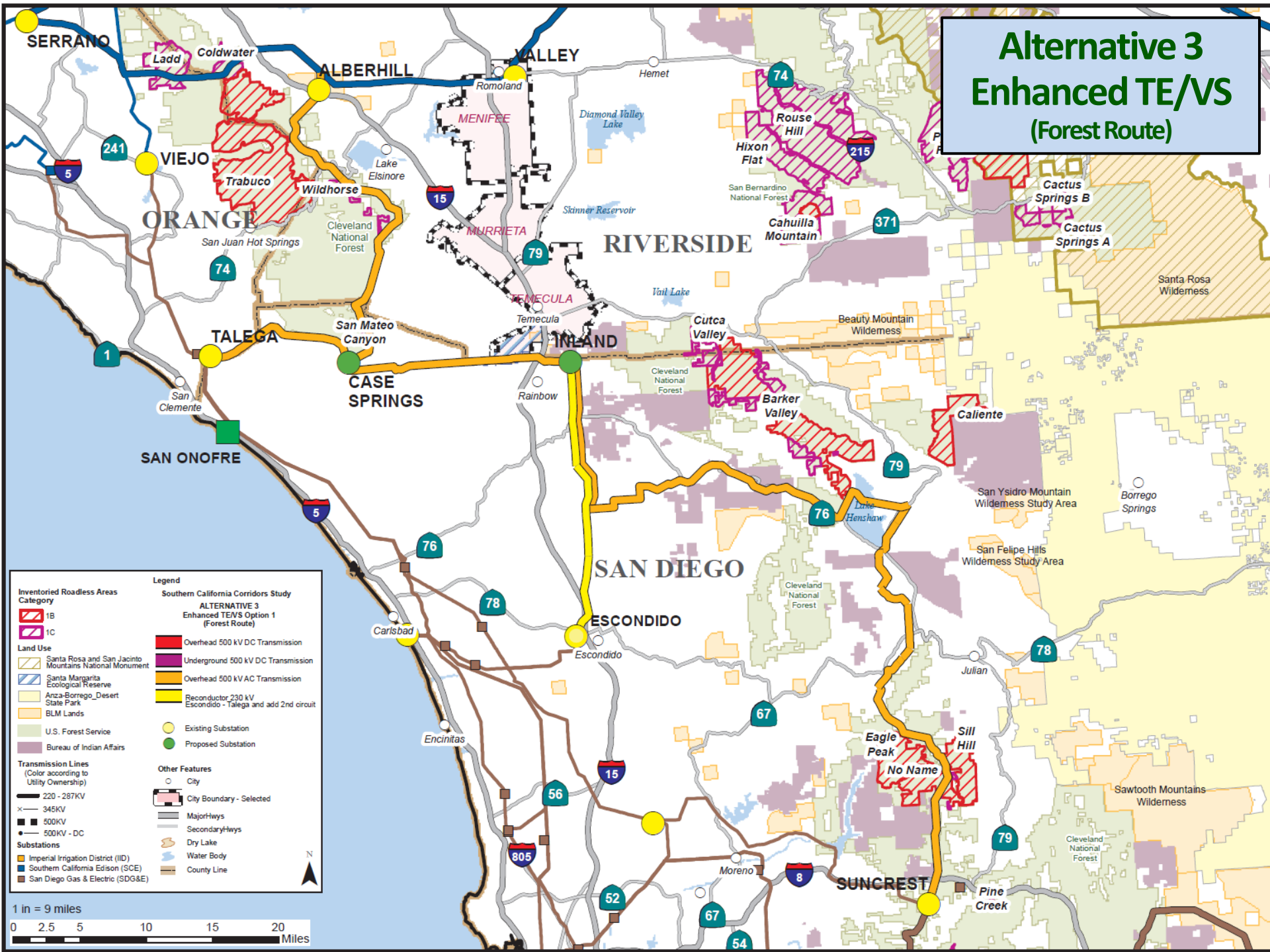
Routing Caveats

- Developing any of the transmission options would require viable project sponsors with experience and access to sufficient resources to develop and design an optimum route
- Full environmental and technical studies must be completed before any agency could approve a project within any of the potential corridors


Alternative 2
Alberhill to Suncrest
Ladd
Coldwater
ALBERHILL
VALLEY
Romoland
Hemet
MENIFEE
Diamond Valley Lake
Horse Creek Ridge
Rouse Hill
Hixon Flat
Cactus Springs B
Cactus Springs A
Santa Rosa Wilderness
Cahuilla Mountain
VIEJO
Trabuco
Wildhorse
Lake Elsinore
Skinner Reservoir
MURRIETA
San Juan Hot Springs
ORANGE
RIVERSIDE
Cleveland National Forest
TEMECULA
Temecula
Vail Lake
CRISTIANITOS
TALEGA
San Mateo Canyon
CASE SPRINGS
INLAND
Rainbow
Cutca Valley
Barker Valley
SAN ONOFRE
Caliente
Lake Henshaw
Borrego Springs
SAN DIEGO
Carlsbad
ENCINA
ESCONDIDO
Escondido
Julian
Anza-Borrego Desert State Park
Encinitas
Sill Hill
Eagle Peak
No Name
SYCAMORE CANYON
Moreno
Santee
SUNCREST
Pine Creek
1 in = 9 miles
0 2.5 5 10 15 20 Miles
N
Legend
Southern California Corridors Study
ALTERNATIVE 2
Alberhill to Suncrest 500 kV
Overhead 500 kV DC Transmission
Underground 500 kV DC Transmission
Overhead 500 kV AC Transmission
Reconductor 230 kV Escondido - Talega and add 2nd circuit
Existing Substation
Proposed Substation
Other Features
City
City Boundary - Selected
MajorHwys
SecondaryHwys
Dry Lake
Water Body
County Line
Inventoried Roadless Areas Category
1B
1C
Land Use
Santa Rosa and San Jacinto Mountains National Monument
Santa Margarita Ecological Reserve
Anza-Borrego_Desert State Park
BLM Lands
U.S. Forest Service
Bureau of Indian Affairs
Transmission Lines
(Color according to Utility Ownership)
220 - 287KV
345KV
500KV
500KV - DC
Substations
Imperial Irrigation District (IID)
Southern California Edison (SCE)
San Diego Gas & Electric (SDG&E)

Alternative 2, Alberhill to Suncrest: Major Constraints

1. Dense development in the City of Temecula
2. Longitudinal encroachment within Caltrans I-15 ROW
3. US Forest Service lands with restricted land use designations (roadless areas; proposed wilderness)
4. Scenic and low-density residential areas in northern San Diego County
5. Glider and small aircraft airport near Warner Springs


Alternative 3
Enhanced TE/VS
(Forest Route)
SERRANO
Ladd
Coldwater
ALBERHILL
VALLEY
Romoland
Hemet
MENIFEE
Diamond Valley Lake
Rouse Hill
Hixon Flat
215
74
241
5
VIEJO
Trabuco
Wildhorse
Lake Elsinore
15
ORANGE
San Juan Hot Springs
Cleveland National Forest
MURRIETA
Skinner Reservoir
San Bernardino National Forest
Cahuilla Mountain
371
RIVERSIDE
Cactus Springs B
Cactus Springs A
Santa Rosa Wilderness
79
74
TEMECULA
Temecula
Vail Lake
Beauty Mountain Wilderness
Cutca Valley
San Mateo Canyon
TALEGA
INLAND
1
CASE SPRINGS
Rainbow
Cleveland National Forest
Barker Valley
Caliente
San Clemente
SAN ONOFRE
5
76
Lake Henshaw
San Ysidro Mountain Wilderness Study Area
Borrego Springs
San Felipe Hills Wilderness Study Area
SAN DIEGO
Cleveland National Forest
78
Carlsbad
ESCONDIDO
Escondido
Julian
67
Encinitas
Eagle Peak
No Name
Sill Hill
Sawtooth Mountains Wilderness
15
56
805
Moreno
8
SUNCREST
Pine Creek
Cleveland National Forest
52
67
54
Legend
Southern California Corridors Study
ALTERNATIVE 3
Enhanced TE/VS Option 1
(Forest Route)
Overhead 500 kV DC Transmission
Underground 500 kV DC Transmission
Overhead 500 kV AC Transmission
Reconductor 230 kV Escondido - Talega and add 2nd circuit
Existing Substation
Proposed Substation
Inventoried Roadless Areas Category
1B
1C
Land Use
Santa Rosa and San Jacinto Mountains National Monument
Santa Margarita Ecological Reserve
Anza-Borrego_Desert State Park
BLM Lands
U.S. Forest Service
Bureau of Indian Affairs
Transmission Lines (Color according to Utility Ownership)
220 - 287KV
345KV
500KV
500KV - DC
Substations
Imperial Irrigation District (IID)
Southern California Edison (SCE)
San Diego Gas & Electric (SDG&E)
Other Features
City
City Boundary - Selected
MajorHwys
SecondaryHwys
Dry Lake
Water Body
County Line
N
1 in = 9 miles
0 2.5 5 10 15 20 Miles

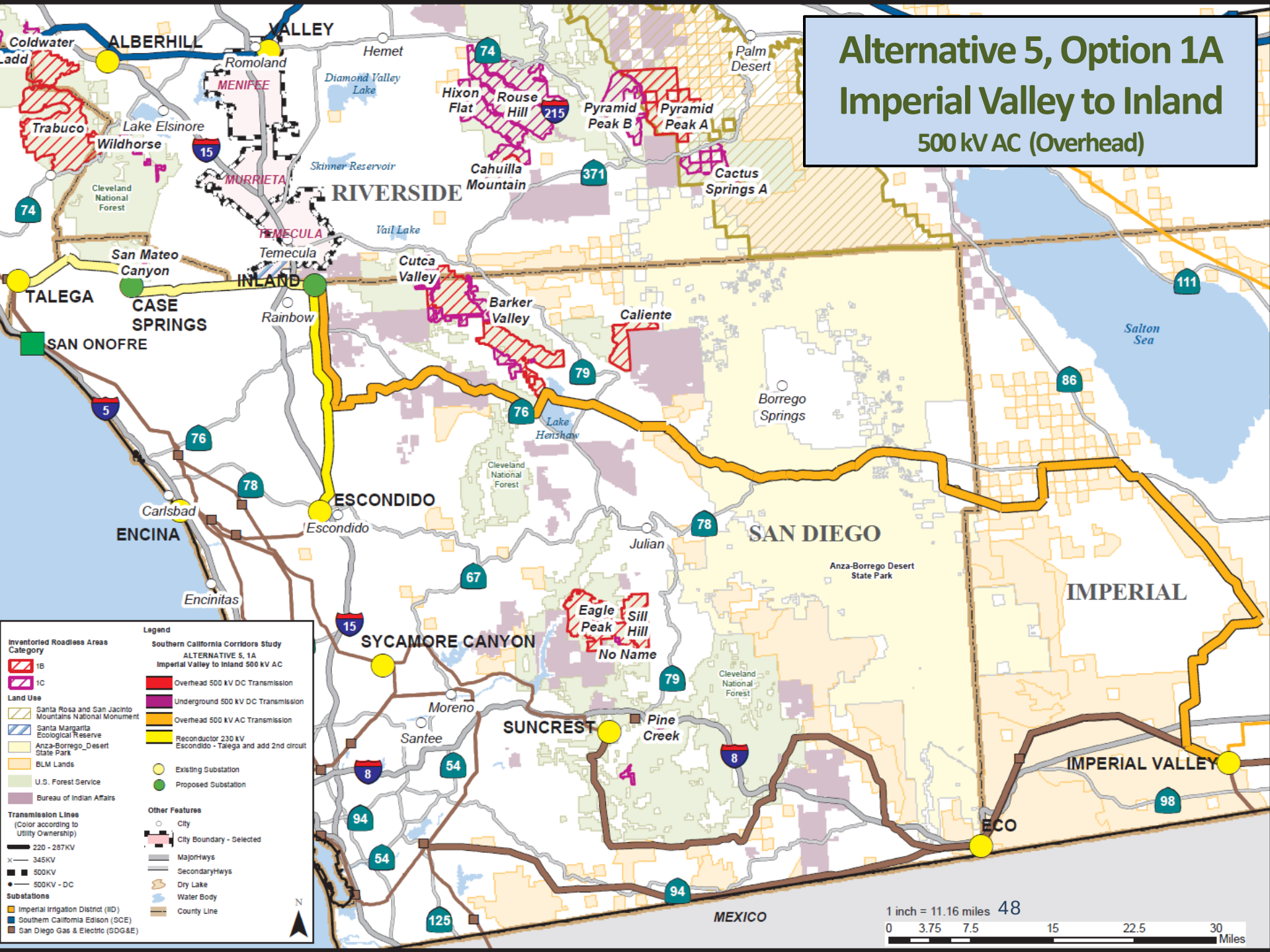
Alternative 3, Enhanced TE/VS (Forest Route): Major Constraints

1. ROW across La Jolla reservation
2. Expansion of Talega Substation
3. TE/VS route through CNF Trabuco Ranger District; CNF concerns
4. Expansion of ROW through MCB Camp Pendleton
5. Crossing CNF lands with restricted land use designations
6. Scenic and low-density residential areas in northern San Diego County
7. Expansion of ROW through Santa Margarita Ecological Reserve


Alternative 4
Enhanced TE/VS
(Talega-Serrano Route)
SERRANO
Ladd
Coldwater
ALBERHILL
VALLEY
Romoland
Hemet
MENIFEE
Diamond Valley Lake
VIEJO
Trabuco
Wildhorse
Lake Elsinore
ORANGE
MURRIETA
Skinner Reservoir
RIVERSIDE
Cahuilla Mountain
Cactus Springs B
Cactus Springs A
Cleveland National Forest
TEMECULA
Temecula
Vail Lake
TALEGA
San Mateo Canyon
INLAND
Cutca Valley
CASE SPRINGS
San Clemente
Rainbow
Barker Valley
Caliente
Lake Henshaw
SAN DIEGO
ENCINA
Carlsbad
ESCONDIDO
Escondido
Julian
Anza-Borrego Desert State Park
Encinitas
SYCAMORE CANYON
Sill Hill
Eagle Peak
No Name
Moreno
SUNCREST
Pine Creek
Santee
Legend
Inventoried Roadless Areas
Category
1B
1C
Land Use
Santa Rosa and San Jacinto Mountains National Monument
Santa Margarita Ecological Reserve
Anza-Borrego_Desert State Park
BLM Lands
U.S. Forest Service
Bureau of Indian Affairs
Transmission Lines
(Color according to Utility Ownership)
220 - 287 KV
345KV
500KV
500KV - DC
Substations
Imperial Irrigation District (IID)
Southern California Edison (SCE)
San Diego Gas & Electric (SDG&E)
Southern California Corridors Study
ALTERNATIVE 4
Enhanced TE/VS Option 2
(Coastal Route)
Overhead 500 kV DC Transmission
Underground 500 kV DC Transmission
Overhead 500 kV AC Transmission
Reconductor 230 kV Escondido - Talega and add 2nd circuit
Existing Substation
Proposed Substation
Other Features
City
City Boundary - Selected
MajorHwys
SecondaryHwys
Dry Lake
Water Body
County Line
N
1 in = 9 miles
0 2.5 5 10 15 20 Miles

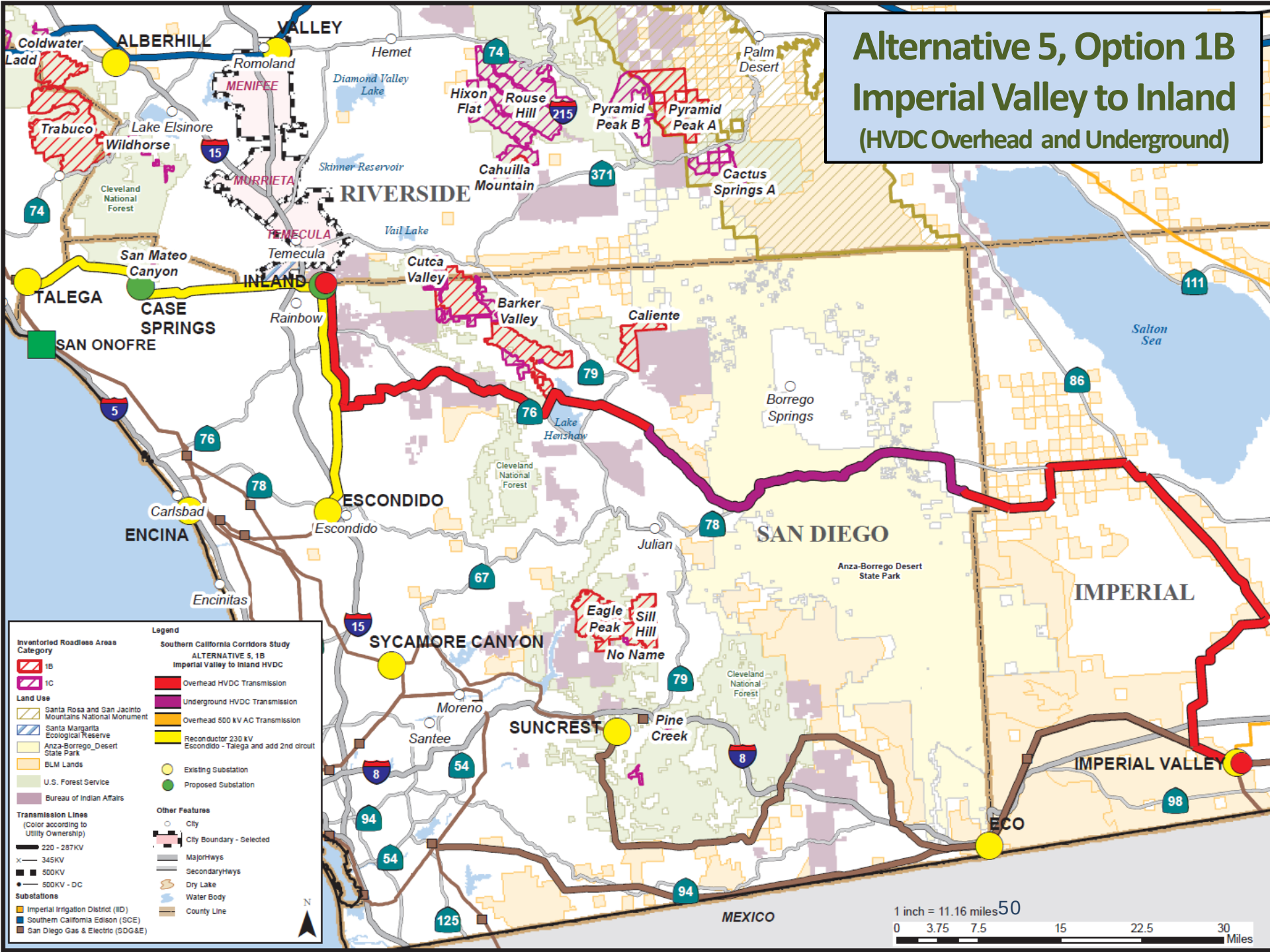
Alternative 4, Enhanced TE/VS (Talega-Serrano): Major Constraints

1. ROW across La Jolla reservation
2. Talega-Serrano segment requires expansion of facilities in existing ROW through Mission Viejo and other cities; transmission congestion north and west of Talega Substation
3. New ROW to accommodate 500 kV and 220 kV lines terminating in Talega
4. Expansion of Talega Substation
5. Expansion of ROW through MCB Camp Pendleton
6. Crossing CNF lands with restricted land use designations
7. Scenic and low-density residential areas in northern San Diego County
8. Expansion of ROW through Santa Margarita Ecological Reserve


Alternative 5, Option 1A
Imperial Valley to Inland
500 kV AC (Overhead)
Coldwater
Ladd
ALBERHILL
VALLEY
Romoland
MENIFEE
Hemet
Diamond Valley Lake
Hixon Flat
Rouse Hill
215
74
Palm Desert
Pyramid Peak B
Pyramid Peak A
Cactus Springs A
Trabuco
Wildhorse
Lake Elsinore
15
Skinner Reservoir
MURRIETA
RIVERSIDE
Cahuilla Mountain
371
Cleveland National Forest
74
TEMECULA
Temecula
Vail Lake
San Mateo Canyon
INLAND
Cutca Valley
Barker Valley
Caliente
TALEGA
CASE SPRINGS
Rainbow
SAN ONOFRE
79
111
Salton Sea
5
76
Lake Henshaw
Borrego Springs
86
Cleveland National Forest
78
ESCONDIDO
Carlsbad
Escondido
ENCINA
Julian
SAN DIEGO
Anza-Borrego Desert State Park
IMPERIAL
67
Encinitas
Eagle Peak
Sill Hill
No Name
SYCAMORE CANYON
15
79
Cleveland National Forest
Moreno
Santee
SUNCREST
Pine Creek
8
54
IMPERIAL VALLEY
94
98
ECO
54
94
MEXICO
125
1 inch = 11.16 miles
48
0 3.75 7.5 15 22.5 30 Miles
Legend
Southern California Corridors Study
ALTERNATIVE 5, 1A
Imperial Valley to Inland 500 kV AC
Overhead 500 kV DC Transmission
Underground 500 kV DC Transmission
Overhead 500 kV AC Transmission
Reconductor 230 kV Escondido - Talega and add 2nd circuit
Existing Substation
Proposed Substation
Other Features
City
City Boundary - Selected
MajorHwys
SecondaryHwys
Dry Lake
Water Body
County Line
N
Inventoried Roadless Areas
Category
1B
1C
Land Use
Santa Rosa and San Jacinto Mountains National Monument
Santa Margarita Ecological Reserve
Anza-Borrego_Desert State Park
BLM Lands
U.S. Forest Service
Bureau of Indian Affairs
Transmission Lines
(Color according to Utility Ownership)
220 - 287KV
345KV
500KV
500KV - DC
Substations
Imperial Irrigation District (IID)
Southern California Edison (SCE)
San Diego Gas & Electric (SDG&E)

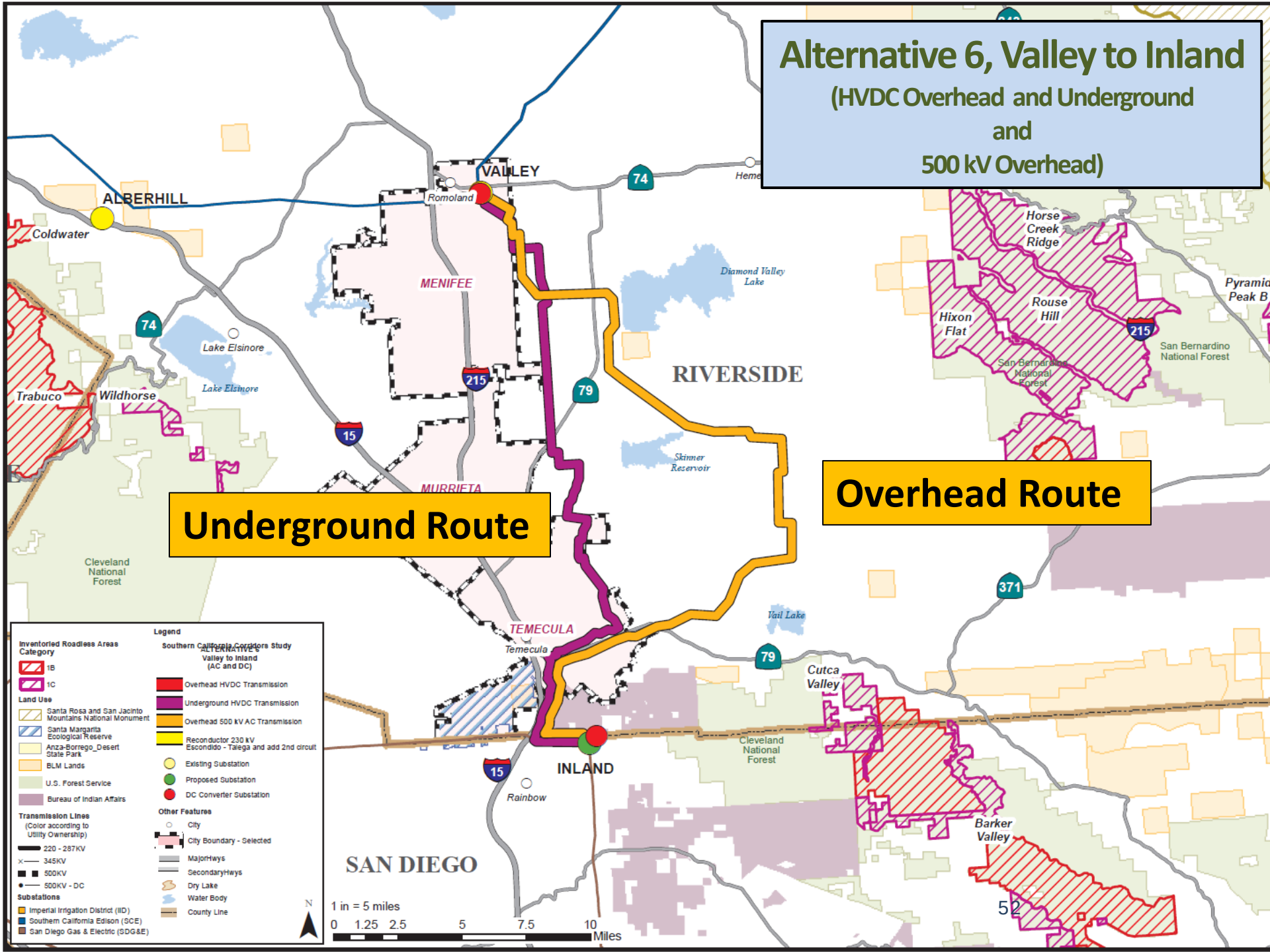
Alternative 5, Option 1A, IV to Inland (500 kV Overhead): Major Constraints

1. Overhead passage through Anza-Borrego Desert State Park
2. Inadequate ROW through ABDSP Wilderness
3. Passing through Angelina Springs designated Cultural Area and potential direct and indirect effects on numerous cultural resources
4. Diminishing the recreational and scenic value of ABDSP
5. ROW across La Jolla reservation
6. Scenic and low-density residential areas in northern San Diego County


Alternative 5, Option 1B
Imperial Valley to Inland
(HVDC Overhead and Underground)
Coldwater
Ladd
ALBERHILL
VALLEY
Romoland
MENIFEE
Hemet
Diamond Valley Lake
Palm Desert
Hixon Flat
Rouse Hill
Pyramid Peak B
Pyramid Peak A
Trabuco
Wildhorse
Lake Elsinore
Skinner Reservoir
Cahuilla Mountain
Cactus Springs A
MURRIETA
RIVERSIDE
Cleveland National Forest
TEMECULA
Temecula
Vail Lake
San Mateo Canyon
INLAND
Cutca Valley
Barker Valley
Caliente
TALEGA
CASE SPRINGS
Rainbow
SAN ONOFRE
Salton Sea
Borrego Springs
Lake Henshaw
ESCONDIDO
Carlsbad
Escondido
ENCINA
Julian
SAN DIEGO
Anza-Borrego Desert State Park
IMPERIAL
Encinitas
Eagle Peak
Sill Hill
No Name
SYCAMORE CANYON
Moreno
Santee
SUNCREST
Pine Creek
IMPERIAL VALLEY
ECO
MEXICO
1 inch = 11.16 miles
0 3.75 7.5 15 22.5 30 Miles
Legend
Southern California Corridors Study
ALTERNATIVE 5, 1B
Imperial Valley to Inland HVDC
Overhead HVDC Transmission
Underground HVDC Transmission
Overhead 500 kV AC Transmission
Reconductor 230 kV Escondido - Talega and add 2nd circuit
Existing Substation
Proposed Substation
Inventoried Roadless Areas
Category
1B
1C
Land Use
Santa Rosa and San Jacinto Mountains National Monument
Santa Margarita Ecological Reserve
Anza-Borrego_Desert State Park
BLM Lands
U.S. Forest Service
Bureau of Indian Affairs
Transmission Lines
(Color according to Utility Ownership)
220 - 287KV
345KV
500KV
500KV - DC
Substations
Imperial Irrigation District (IID)
Southern California Edison (SCE)
San Diego Gas & Electric (SDG&E)
Other Features
City
City Boundary - Selected
MajorHwys
SecondaryHwys
Dry Lake
Water Body
County Line
N

Alternative 5, Option 1B, IV to Inland (HVDC): Major Constraints

1. Construction disturbance and traffic obstruction through Anza-Borrego Desert State Park
2. Construction challenges related to bedrock and crossing of the Earthquake Valley Fault
3. Disturbance of desert bighorn sheep and likely seasonal construction constraints
4. ROW across La Jolla reservation
5. Scenic and low-density residential areas in northern San Diego County


Alternative 6, Valley to Inland
(HVDC Overhead and Underground
and
500 kV Overhead)
Underground Route
Overhead Route
VALLEY
Romoland
ALBERHILL
Coldwater
MENIFEE
Lake Elsinore
Lake Elsinore
Trabuco
Wildhorse
RIVERSIDE
Diamond Valley Lake
Skinner Reservoir
MURRIETA
TEMECULA
Temecula
Vail Lake
INLAND
Rainbow
SAN DIEGO
Cleveland National Forest
Cleveland National Forest
Horse Creek Ridge
Rouse Hill
Hixon Flat
San Bernardino National Forest
Cutca Valley
Barker Valley
74
215
79
15
371
Legend
Southern California Corridors Study
ALTERNATIVE 6
Valley to Inland
(AC and DC)
Overhead HVDC Transmission
Underground HVDC Transmission
Overhead 500 kV AC Transmission
Reconductor 230 kV Escondido - Talega and add 2nd circuit
Existing Substation
Proposed Substation
DC Converter Substation
Other Features
City
City Boundary - Selected
MajorHwys
SecondaryHwys
Dry Lake
Water Body
County Line
Inventoried Roadless Areas
Category
1B
1C
Land Use
Santa Rosa and San Jacinto Mountains National Monument
Santa Margarita Ecological Reserve
Anza-Borrego_Desert State Park
BLM Lands
U.S. Forest Service
Bureau of Indian Affairs
Transmission Lines
(Color according to Utility Ownership)
220 - 287KV
345KV
500KV
500KV - DC
Substations
Imperial Irrigation District (IID)
Southern California Edison (SCE)
San Diego Gas & Electric (SDG&E)
N
1 in = 5 miles
0 1.25 2.5 5 7.5 10
Miles
52

Alternative 6, Option 2A, Valley to Inland, 500 kV Overhead: Major Constraints

1. Pechanga reservation
2. Agua Tibia Wilderness
3. Density of residential and commercial development
4. Southwestern Riverside County Multiple Species Core Reserve
5. Temecula Bike Path

Alternative 6, Option 2B, Valley to Inland, HVDC Underground: Major Constraints

1. Existing utilities in the road ROW
2. Engineering considerations
3. Electric and Magnetic Fields

Summary of Siting Challenges by Segment

Ranking	Alternative Name	Alternative Segment
Possible but Challenging	Alternative 5, 1A: Imperial Valley to Inland (500 kV Overhead)	Imperial Valley to ABDSP
	Alternative 5, 1B. Imperial Valley to Inland (HVDC Overhead & Underground)	Imperial Valley to ABDSP
	Alternative 6, 2B. Valley to Inland (HVDC All Underground)	Entire route
Challenging	Alternative 3. Enhanced TE/VS (Forest Route)	Alberhill to Inland (Forest Route)
	Alternative 4. Enhanced TE/VS (Talega-Serrano Route)	Serrano to Inland (parallel existing ROWs)
	Alternative 5, 1B. Imperial Valley to Inland (HVDC Overhead & Underground)	Underground ABDSP
		West of ABDSP
Very Challenging	Alternative 2. Alberhill to Suncrest	I-15 to SR 79
	Alternative 3. Enhanced TE/VS (Forest Route)	Inland to Suncrest
	Alternative 4. Enhanced TE/VS (Talega-Serrano Route)	Inland to Suncrest
	Alternative 5, 1A. Imperial Valley to Inland (500 kV Overhead)	Overhead ABDSP
		West of ABDSP
	Alternative 6, 2A. Valley to Inland (500 kV Overhead)	Overhead 500 kV (entire route)

Contact Information

Please direct questions to:

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  - California Energy Commission
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Questions?

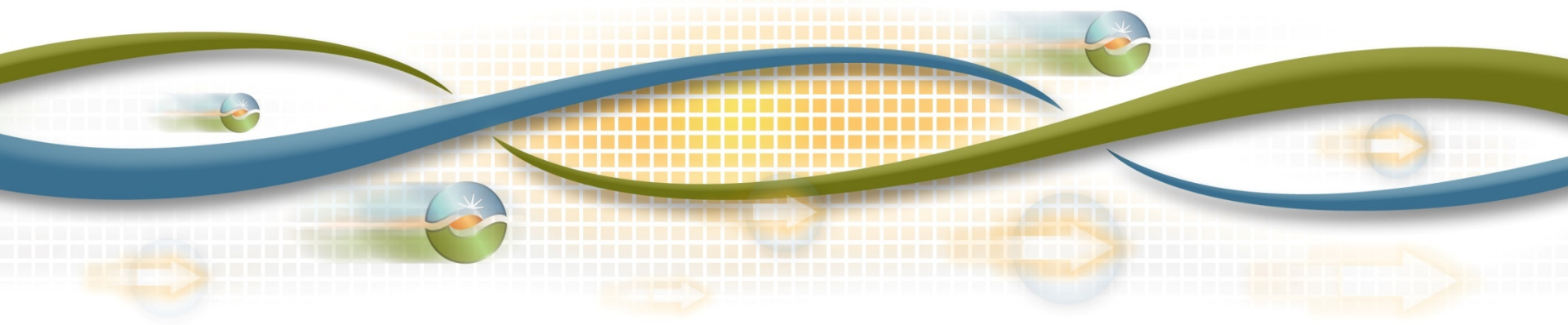
Reallocation of Maximum Import Capability

Imperial County Transmission Consultation Stakeholder Meeting

Catalin Micsa
Lead Engineer, Infrastructure Development
July 14, 2014

California ISO
Shaping a Renewed Future

Resource Adequacy Import Allocation or “Import Deliverability”



“Import Deliverability” is assigned every year to LSEs

- **Assignment of RA import capability to LSEs** – MIC on each intertie is available to LSEs for procuring RA capacity from external resources; it is not assigned directly to external resources.
- **Process for allocating MIC to LSEs** – Steps 2-13 in Tariff Section 40.4.6.2.1, Available Import Capability Assignment Process.
- **Annual determination of MIC** – MIC values for each intertie will still be calculated annually for a one-year term.

Maximum Import Capability (MIC) Methodology, Step 1

- **Historically Based**
  - Select 4 hours by choosing 2 in each one of the last two years (and different days within the same year) with the highest total net import level when peak load was at least 90% of the annual system peak load.
  - The average of net import schedules (0 MW is assigned when net imports are negative) + the average of unused ETC (adjusted for future year availability) technically should represent the Maximum Import Capability (MIC) for each tie.
  - In order to assure that all pre-RA import commitments (already paid by ratepayers) are allowed to count for RA until they expire, an uplift is added to the above established methodology for certain branch groups and this higher number is published and divided among LSEs as MIC.

Forward Looking MIC – What motivated the change

- **Low RA import capacity at certain interties limited ability of external resources to provide RA capacity and their ability to obtain project financing**
  - MIC is calculated on amount of energy ISO Balancing Authority Area ("BAA") imported historically during peak system load hours
  - Low MIC values at certain interties limited use of external resources in those areas to meet RA requirements
  - Inability to offer RA created a disadvantage for external renewable resources seeking contracts with load-serving entities within the ISO
  - Project financing for new resources depends on sufficient and stable long-term contractual revenue stream

Expanding Resource Adequacy ("RA") Import Capability

Solution consisted of two components

- Expansion of RA import capability is an element of public policy objective for Transmission Planning Process ("TPP") to identify needed transmission
  - Based on amount of external resources in 33% RPS portfolios, specify required or "target" Maximum Import Capability ("MIC") MW values for RA deliverability
  - Determine whether additional network upgrades are needed to support target MIC MW values
  - Include these upgrades in Comprehensive Transmission Plan
- In annual MIC assessment, expand MIC values to target levels as required in order to meet public policy objectives

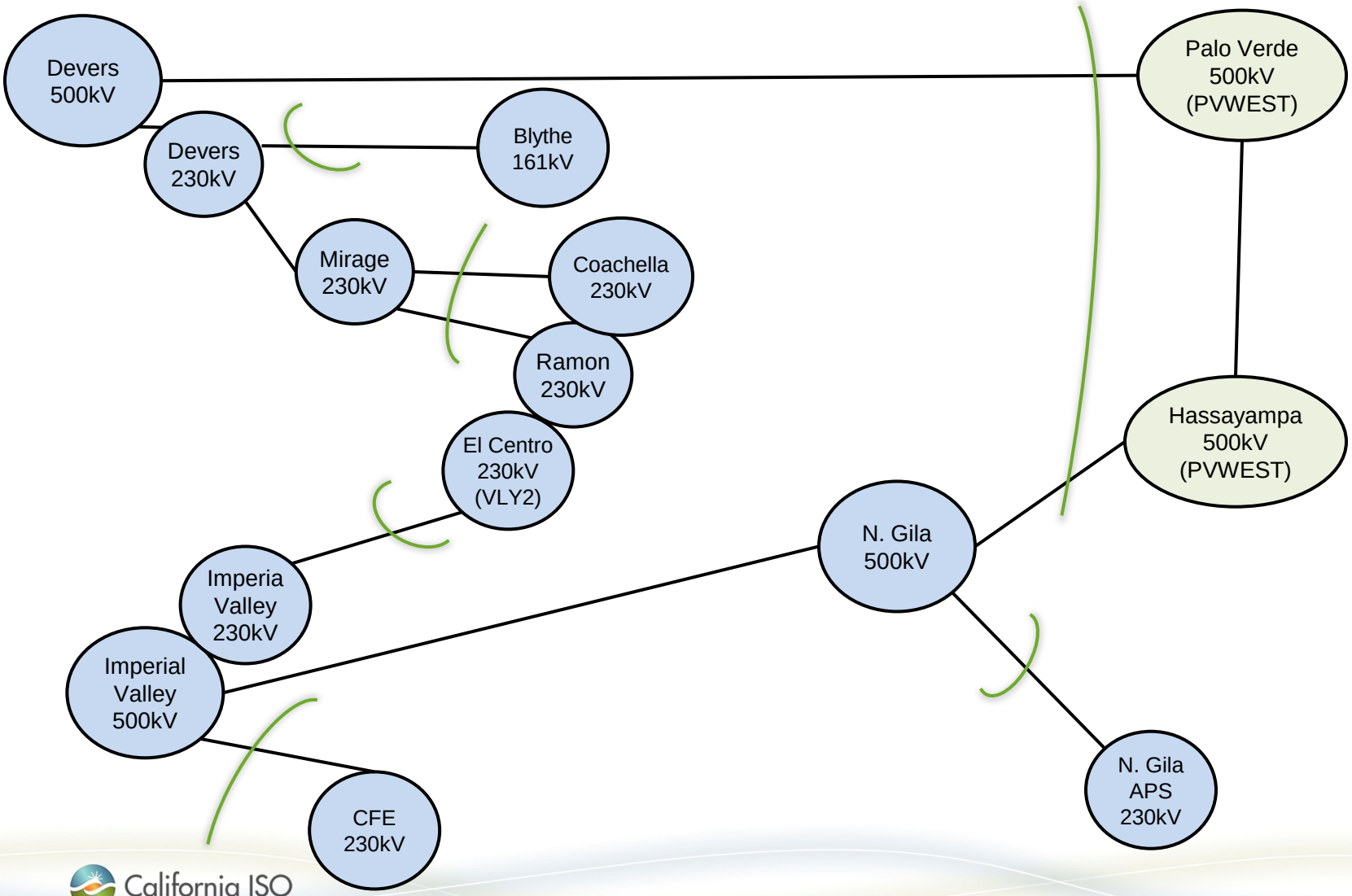
Assuring Deliverability for Resources Portfolios

- Expanded MIC open to all technology types if they are required in order to meet public policy goals
- Stakeholder opportunity to comment in TPP
- MIC expansion tied to policy-driven related transmission upgrades

To consider reallocating “Import Deliverability” among interties to meet potential IID needs:

- Reallocation has not been done or considered before
- May be done during deliverability studies based on effectiveness factors to the most limiting elements
- May be done only from interties that have more than the minimum required by public policy
- Requires:
  - stakeholder engagement process with broad stakeholder input
  - BPM(s) changes

Example: Arizona and IID deliverability interaction



How can IID RA Import Allocation be increased through reductions to other paths?

- North Gila intertie - steady
  - No remaining import capability available
- CFE intertie - steady
  - No import capability available
- Blythe intertie - steady
  - In 2015 – 68 MW available
- Palo Verde intertie – decreased by 400 MW
  - In 2015– 866 MW available (400 MW included in main portfolio)
  - 50% effectiveness factor to IID imports and could translate into 433 MW increase

Next Steps

Imperial County Transmission Consultation Stakeholder Meeting

Mercy Parker Helget
Sr. Stakeholder Engagement and Policy Specialist
July 14, 2014

Based on the information discussed in this consultation, the ISO seeks stakeholder input on the following . . .

- There are major 500 kV AC or HVDC transmission options from Imperial County to the ISO
  - Are there other options to consider?
  - Considering the information documented in the existing Aspen environmental feasibility analysis of potential corridor designations in southern California, what additional information could be provided to the Aspen to supplement their study?
- Is the reallocation of Maximum Import Capability from the transmission path from Arizona to the transmission paths from Imperial County a viable option? If so, what approaches should be considered by the ISO to implement this proposal?

Next Steps

Date	Milestone
July 28	Stakeholder comments to be submitted to regionaltransmission@caiso.com
No later than August 14	Post Revised Discussion Paper
August 28	Second Stakeholder Meeting or Call (if needed)
September 24-25	Stakeholder Meeting #2 of the 2014-2015 Transmission Planning Process
November 19-20	Stakeholder Meeting #3 of the 2014-2015 Transmission Planning Process
January 2015	California ISO Posts Draft 2014-2015 Transmission Plan