



A  Sempra Energy utility



# SDG&E Transmission Comparison Study

Status Report

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STEP Meeting

# Technical Work Group



Santamaría	José	Comision Federal de Electricidad
Barajas	David	Imperial Irrigation District
Bhaumik	Ashish	California ISO - Operations, Alhambra
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Vartanian	Charlie	Southern California Edison
Elliott	Robert	California Public Utility Commission
Evans	Mike	Coral Power LLC
Green	Irina	California Independent System Operator
Kyei	John	California Independent System Operator
Kokanos	Barrie	Arizona Public Service
Kondoleon	Don	California Energy Commission
Laufenberg Gallardo	Clare	California Energy Commission
Kritikson	James	Kritikson & Associates for Coral
Padilla	Leslie	Sempra Energy Resources
Wait	Rexford	Nevada Hydro Co, LEAPS Project



# Assumptions



- Liberty & Perkins Phase Shifters
  - set to Non-Reg,  $\phi - 0$
- Mtn View, Pastoria & Silver Hawk Gen
  - In and On
- Mohave Gen
  - In and Off
- Base Case Date
  - In Service Date: 2007 vs 2010
- Path 49 Upgrades

# Stakeholder Input



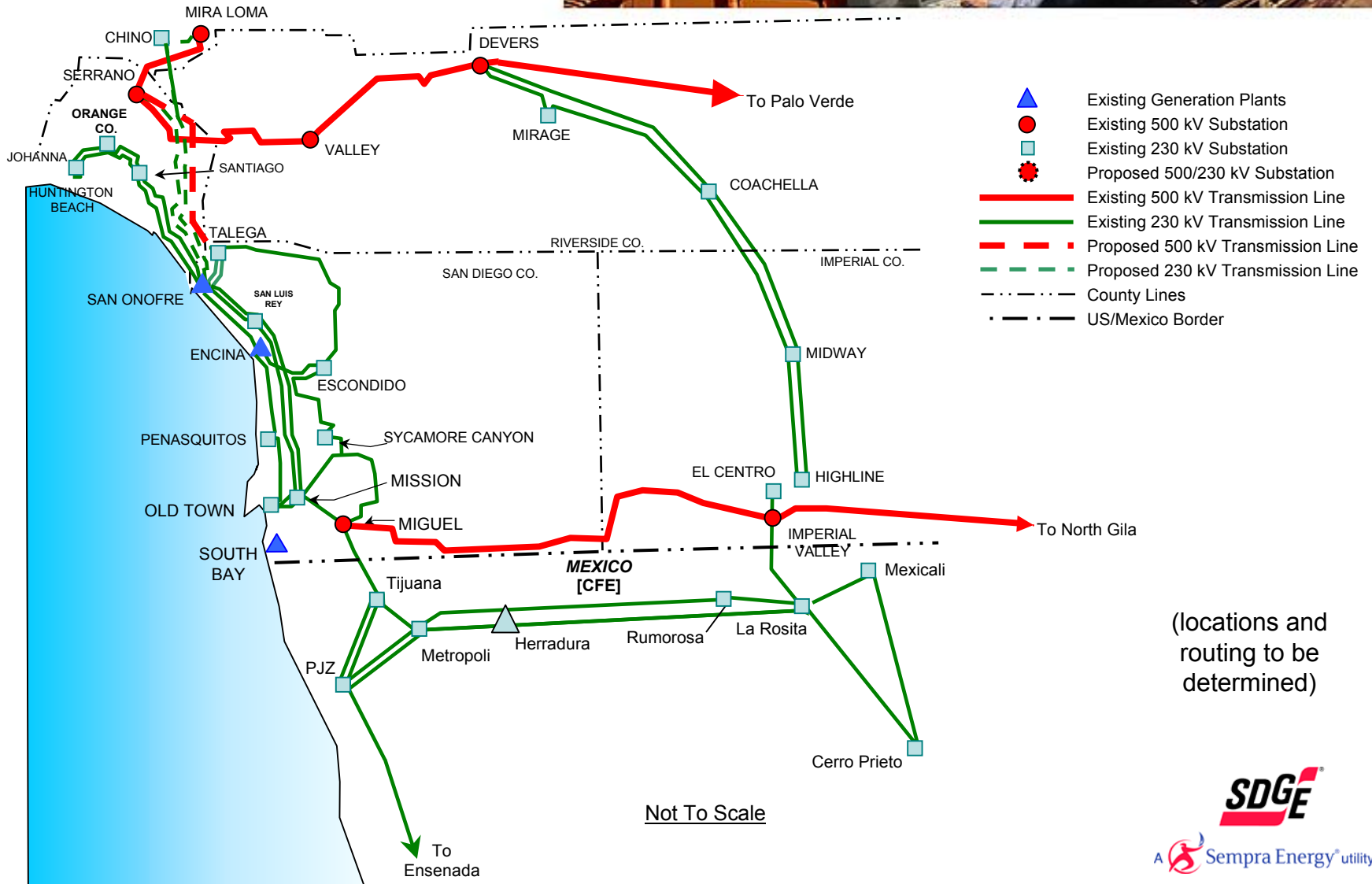
- New Alternatives
  - 4 basic new alternatives
- Topology and Modeling
  - JOV-U1 Gen attached to PJZ
  - JOV-U2 Gen attached to JOVITA
  - Palo Verde-Devers #1 – 5 segment model
  - Lugo-Mohave Compensation set at 26%
  - Lugo-Serrano Loop-in

# New Alternatives



- Serrano – Talega
- North Gila – Central
- North Gila – Northern
- North Gila – Northern – Serrano/Valley
  - Each North Gila Option with Imperial Valley connection
  - Each Northern Option with & without a Phase Shifter

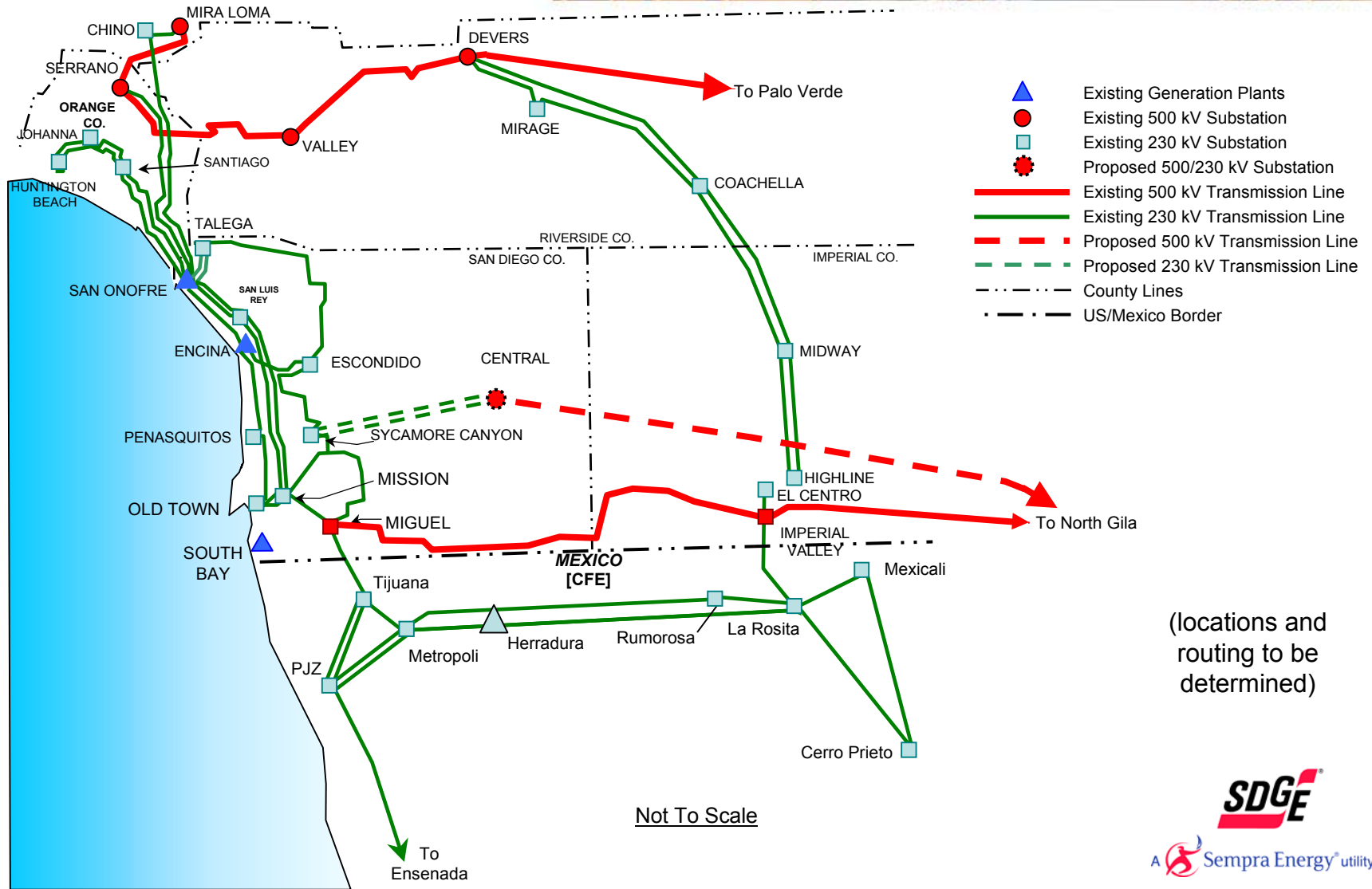
# Serrano – Talega



(locations and routing to be determined)

Not To Scale

# North Gila – Central

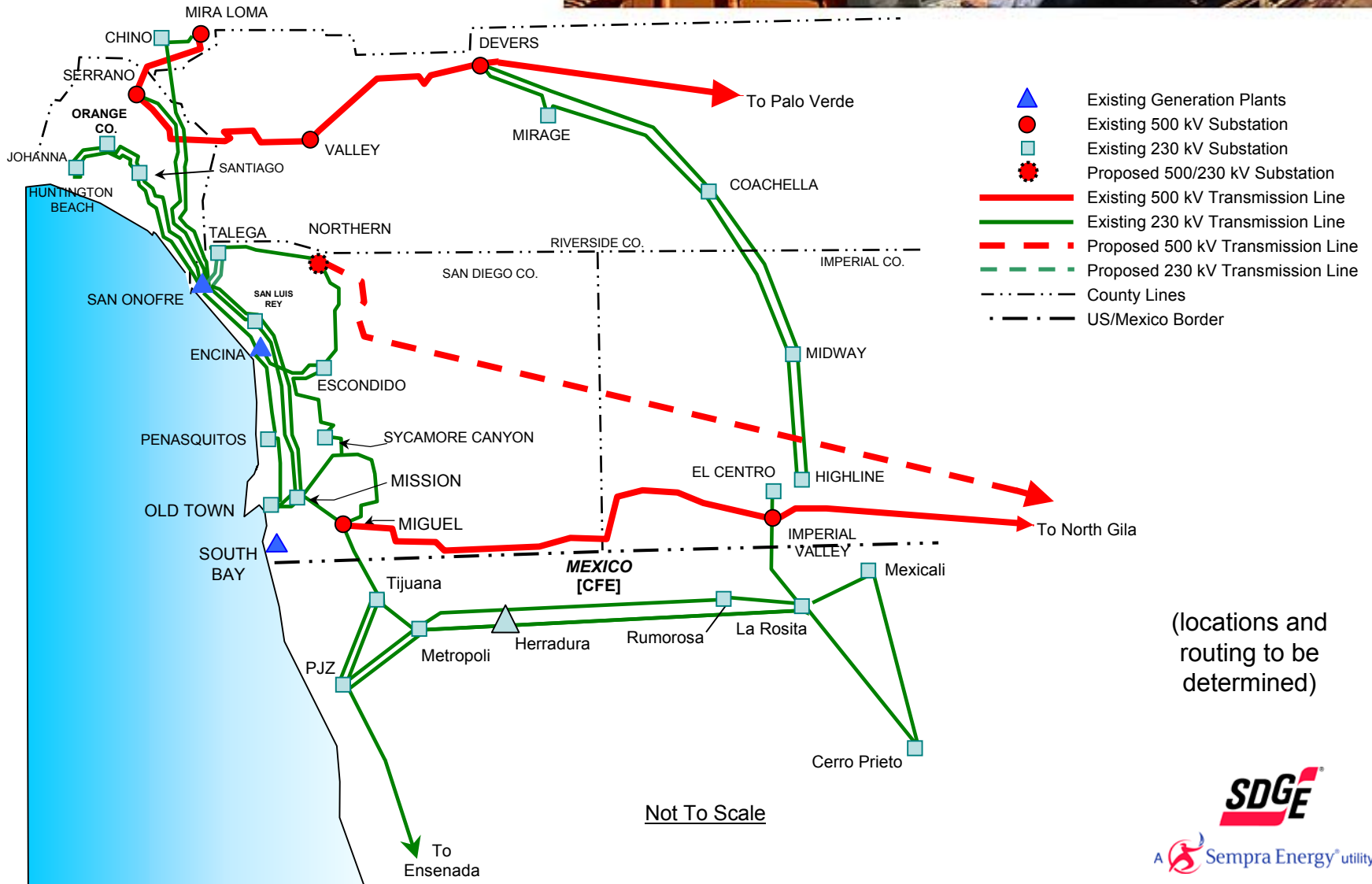


(locations and routing to be determined)

Not To Scale



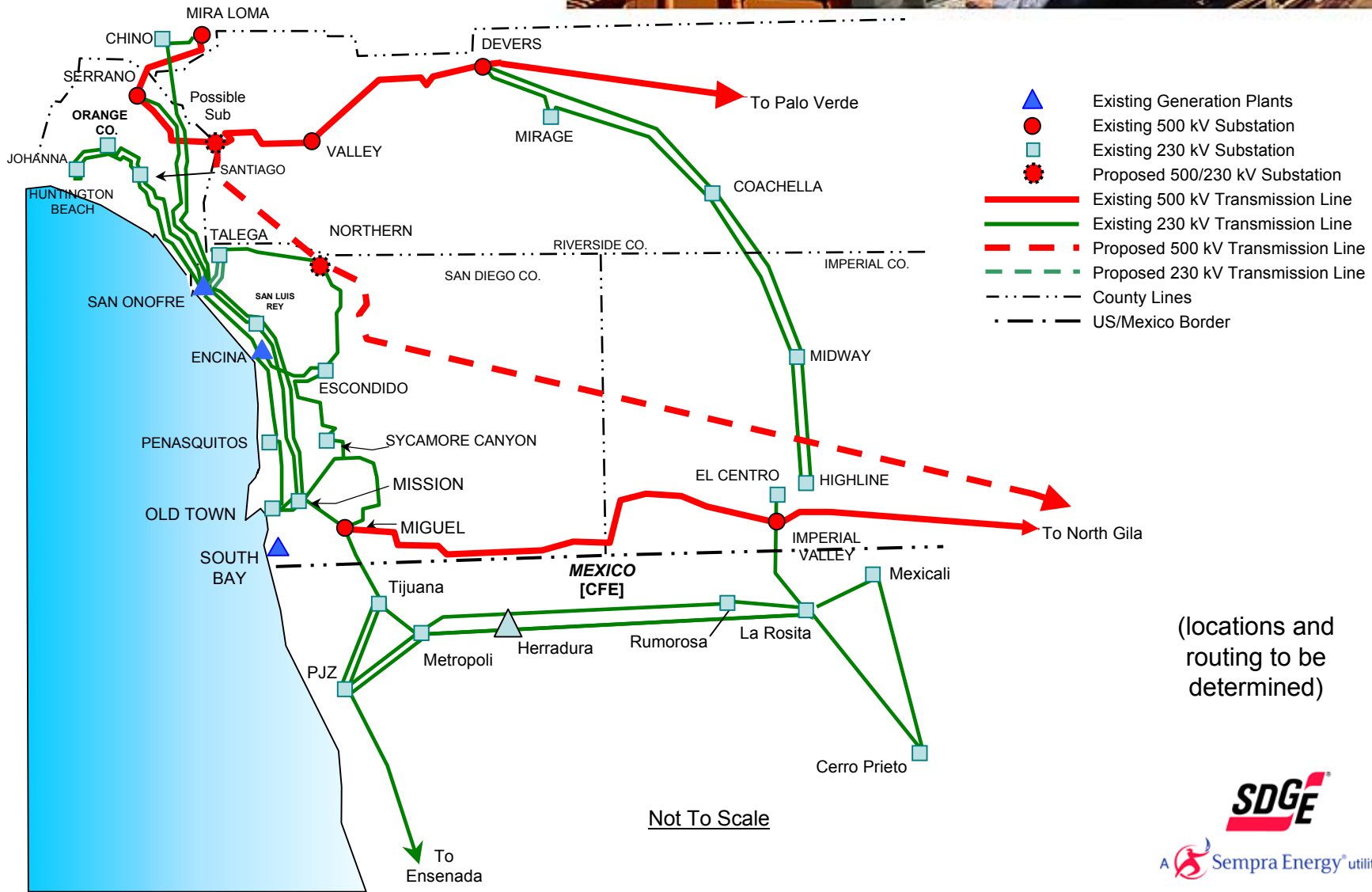
# North Gila – Northern



(locations and routing to be determined)

Not To Scale

# North Gila – Northern – Serrano/Valley



(locations and routing to be determined)

Not To Scale

# Original Alternatives



- Imperial Valley – Central
- Imperial Valley – Northern
- Imperial Valley – Miguel # 2 (500 kV)
- Imperial Valley – Miguel 230 (230 kV)
- Serrano/Valley – Northern
- Imperial Valley-North-Serrano/Valley

# Study Progress



- Base Case Development
- Base Case Review –Significant changes to
  - Topology, Load, Generation (dispatch)
  - SCE, IID, CFE
- Reviewing 2<sup>nd</sup> Round of Thermal Runs
- Stability Data Clean-up
- Evaluating Economic Analysis Options
  - ABB Grid View Software
  - SSG-WI Database

# Some Preliminary Results 1



- Northern Routes require PAR (FACTS)
  - Free flow is only about 250 MW – Northern Route
  - Free flow is about 750 MW – Full Route
- IV-Miguel 230 kV (CFE)
  - 3 IV-ROA 230 kV
  - 4 TJI-ROA 230 kV
- 2<sup>nd</sup>/3<sup>rd</sup> Transformers
  - Miguel 230/138 kV & 230/69 kV
  - Mission 230/69 kV
  - Penasquitos 230/69 kV

# Some Preliminary Results 2



- Increased line rating
  - Hassayampa-N Gila-Imperial Valley 500 kV
  - SONGS-San Luis Rey 230 kV (1,2,3)
  - South Bay-Telegraph Canyon 138 kV
- Line Upgrades
  - Sycamore Canyon-Penasquitos 230 kV
  - Miguel-Proctor Valley 138 kV
  - Kettner-B 69 kV
  - Old Town-Kettner 69 kV
- Several (SVD) Shunt Caps

# Sensitivities Being Considered



- Transmission
  - Palo Verde – Devers 500 kV # 2
  - Hassayampa – North Gila 500 kV # 2
  - Salton Sea Transmission Upgrades
- Generation
  - LEAPS Project Pumps and Generators
  - Salton Sea Generators
  - Other Renewable Generators
  - South Bay & Encina
  - Otay Mesa & Palomar
  - Mountain View, Pastoria, & Mohave

# Contact Information



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[www.SDGE.com/newline](http://www.SDGE.com/newline)

- STEP Website

<http://www.aiso.com/docs/2002/11/04/2002110417450022131.html>