Department of Water and Power
City of Los Angeles

Renewable Energy Transmission Projects

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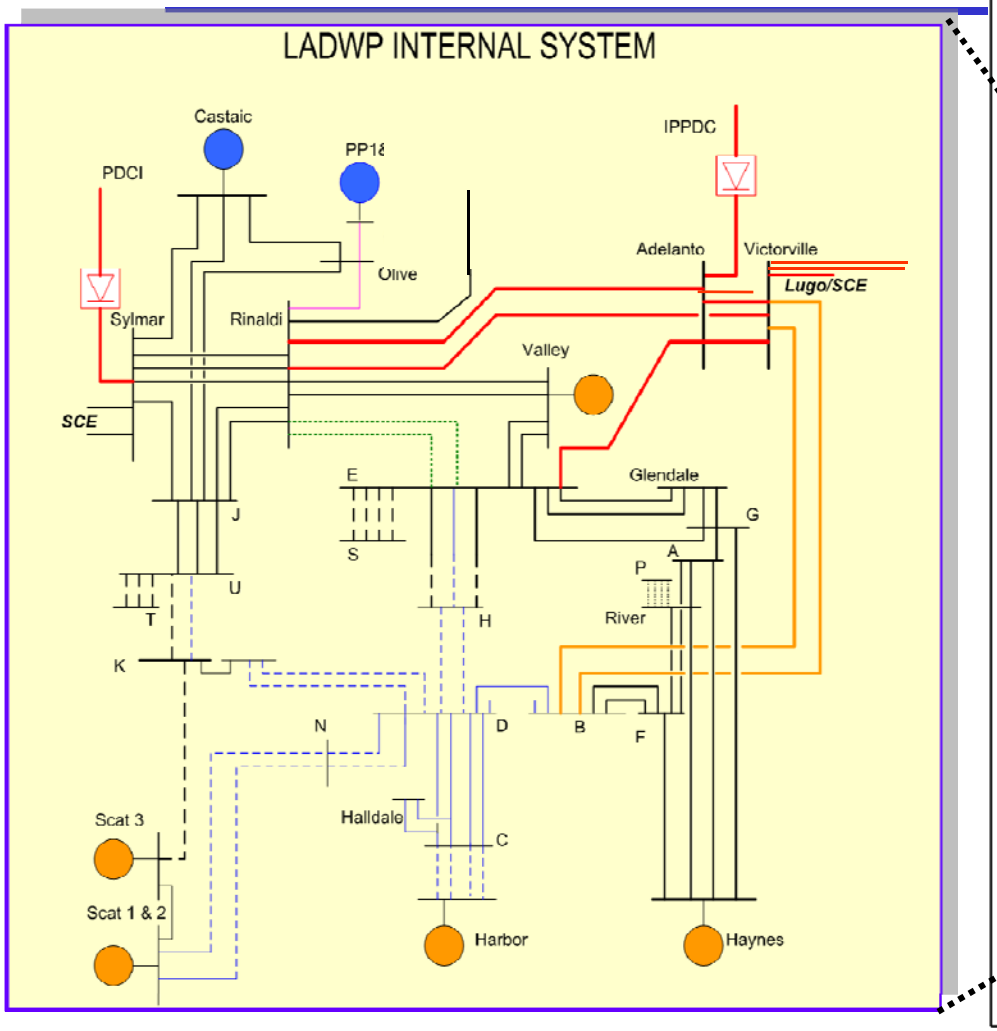
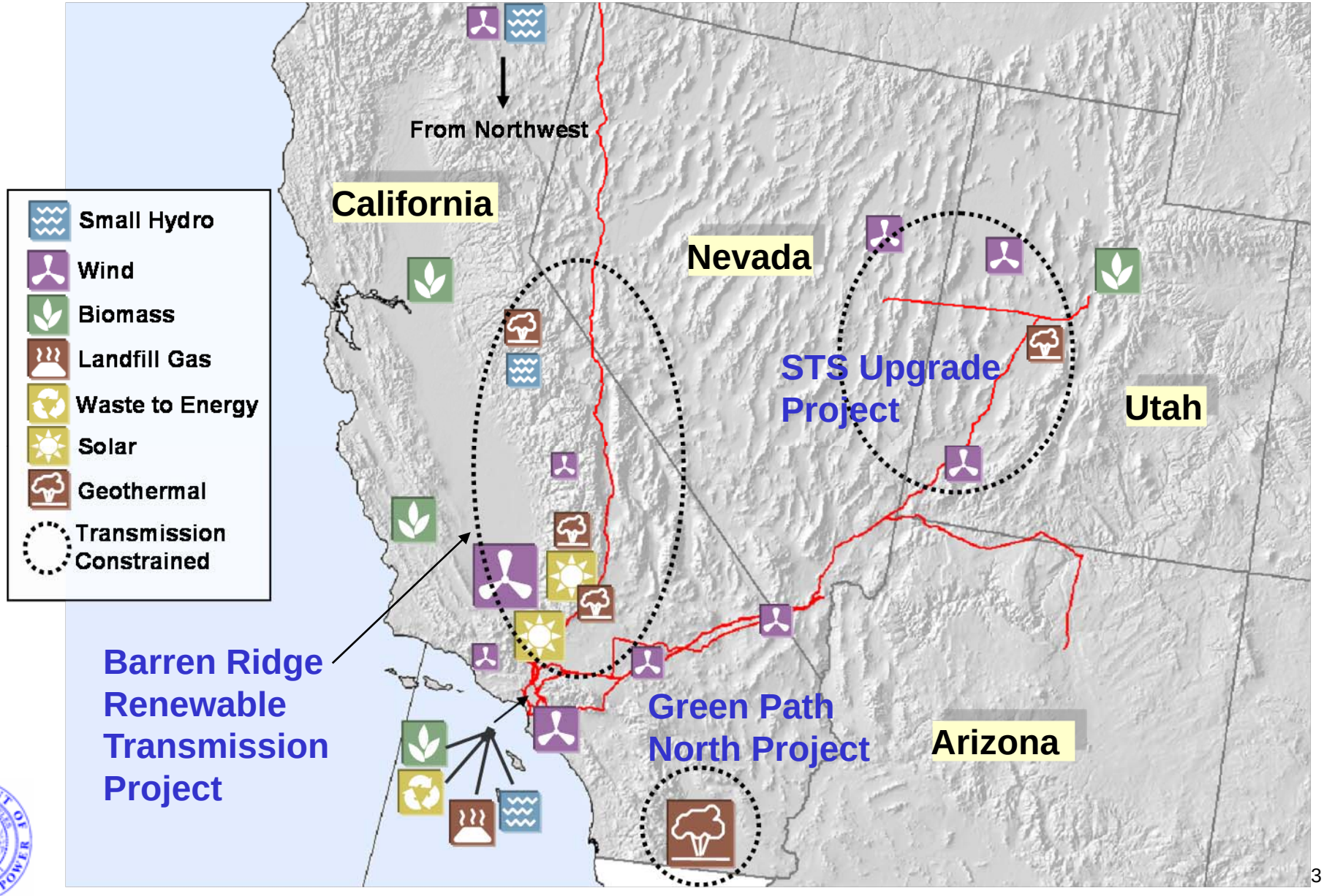
April 15, 2008

LADWP System

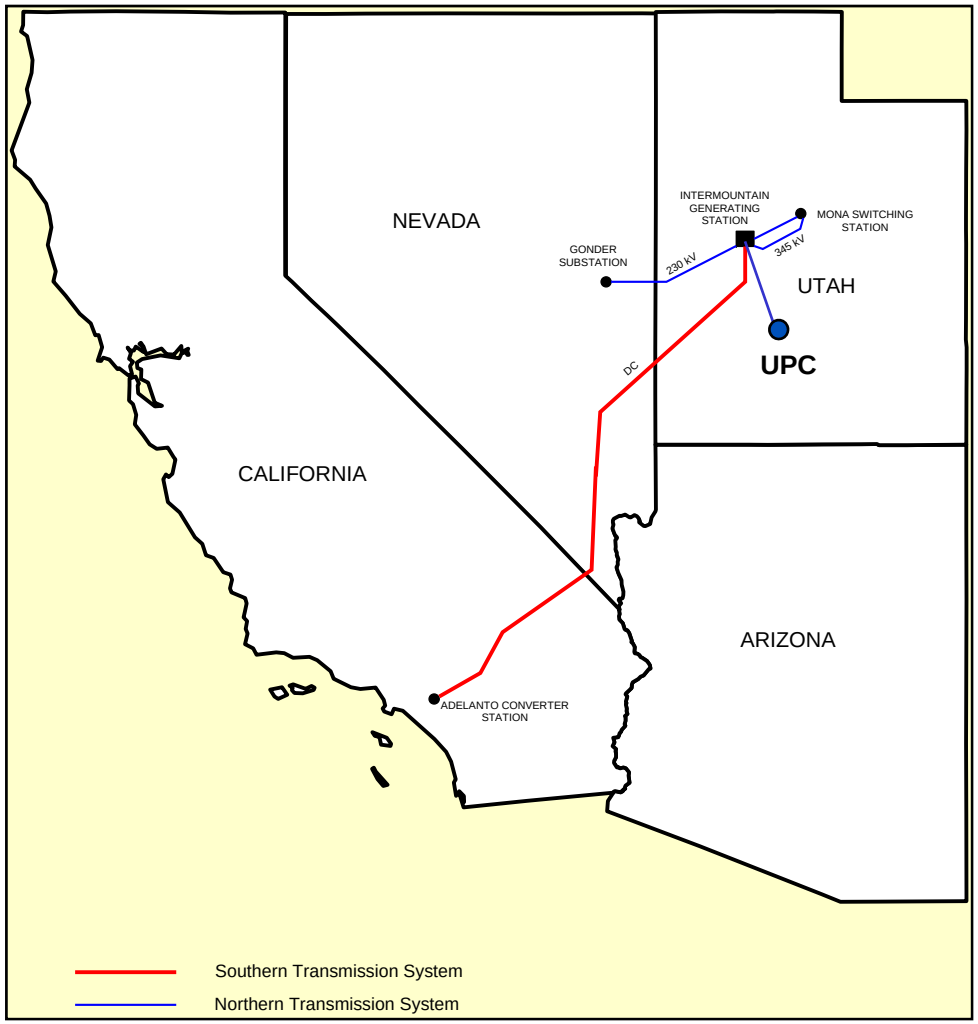


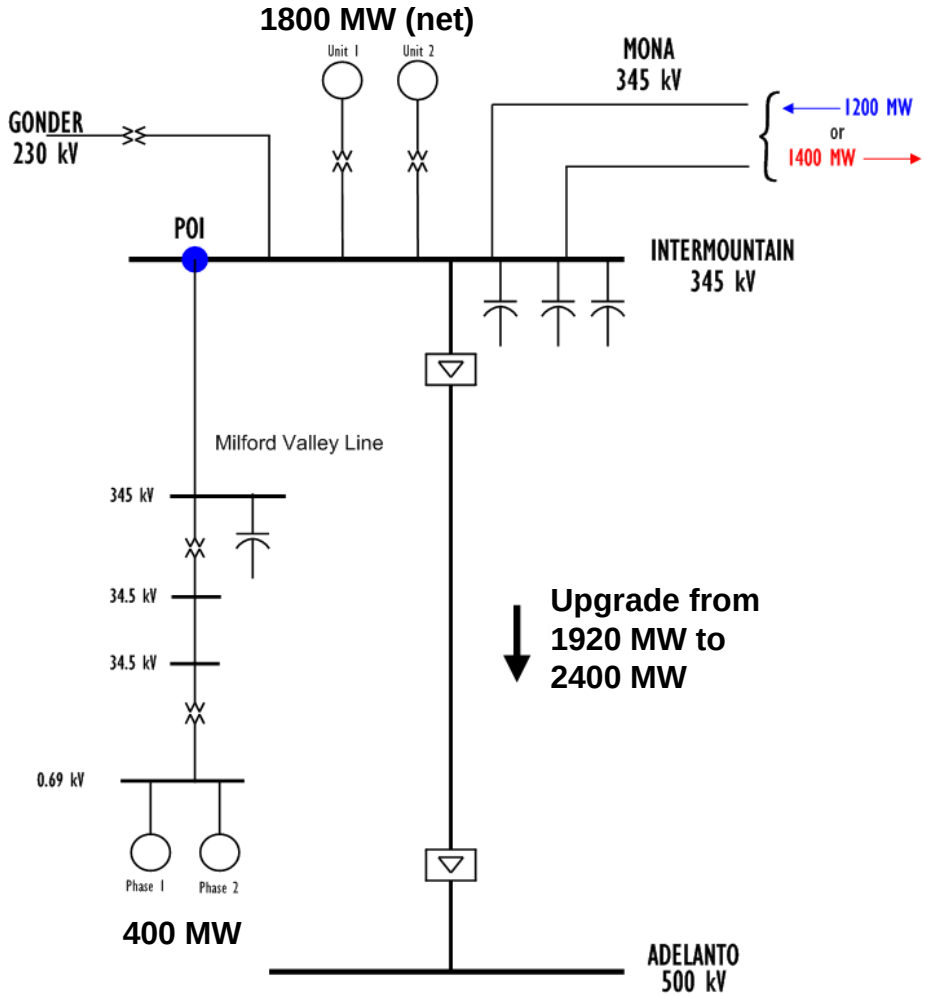
Renewable Energy Transmission Development Plan

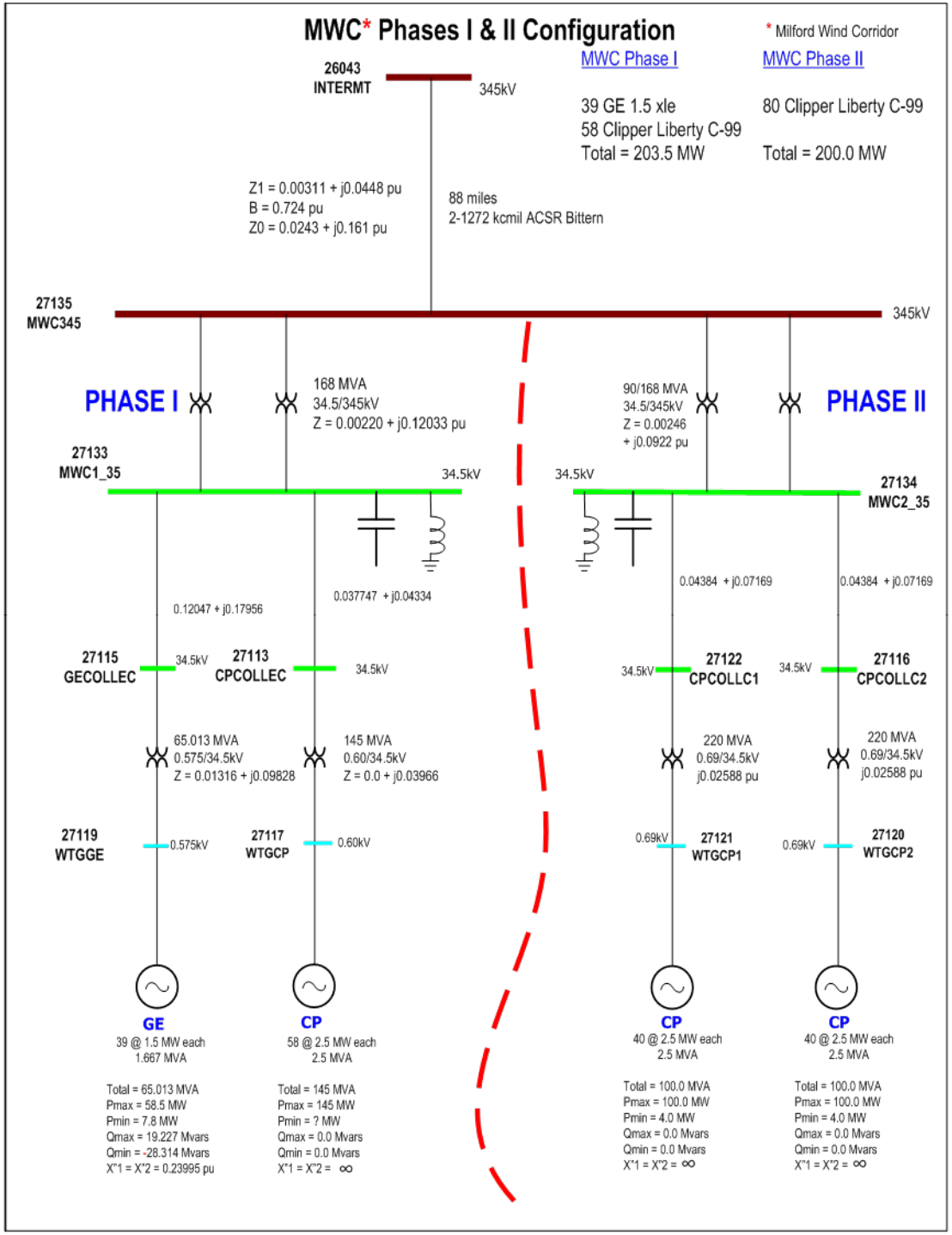


Southern Transmission System (STS) HVDC Upgrade Project

HVDC Upgrade Project and Wind Interconnection

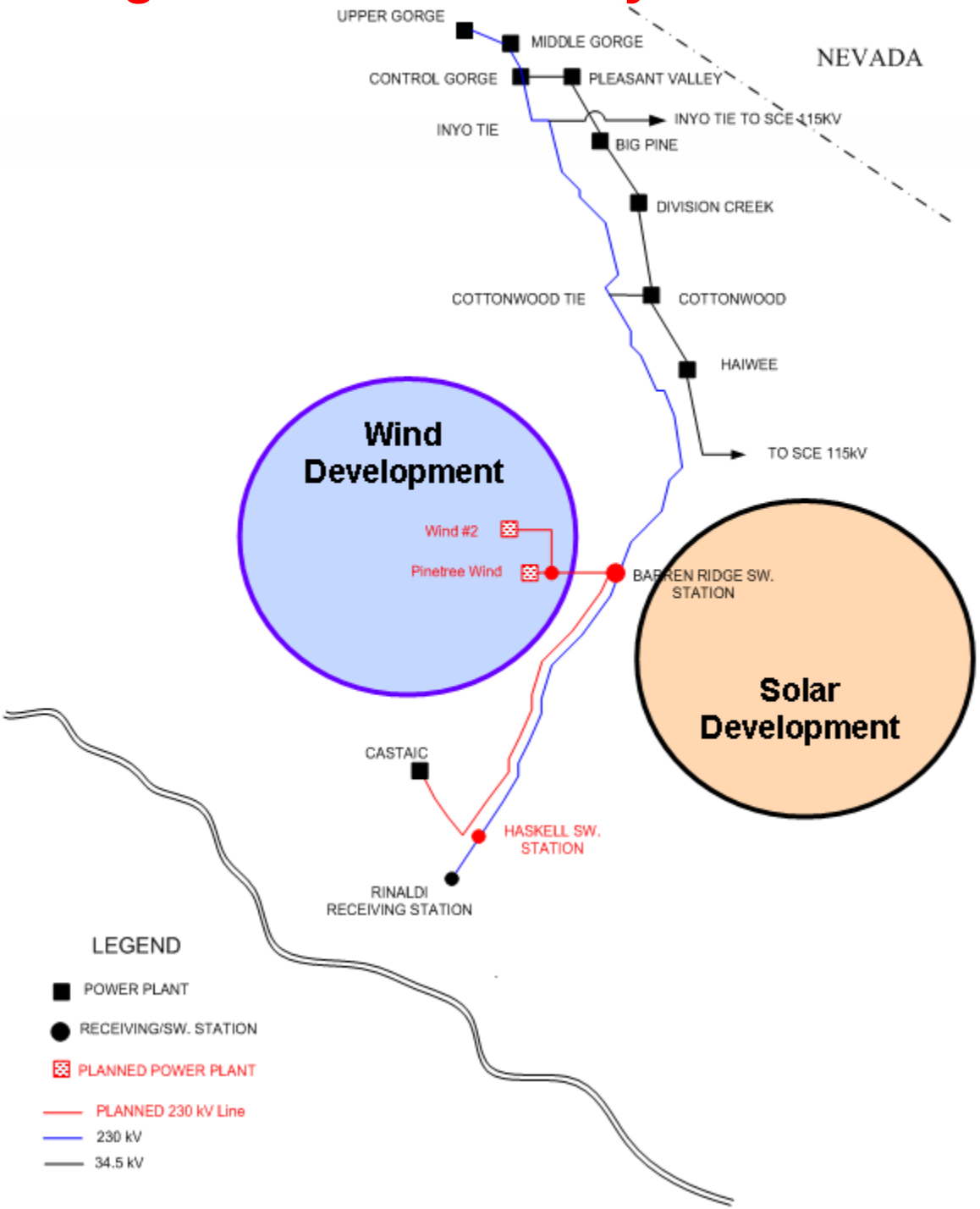




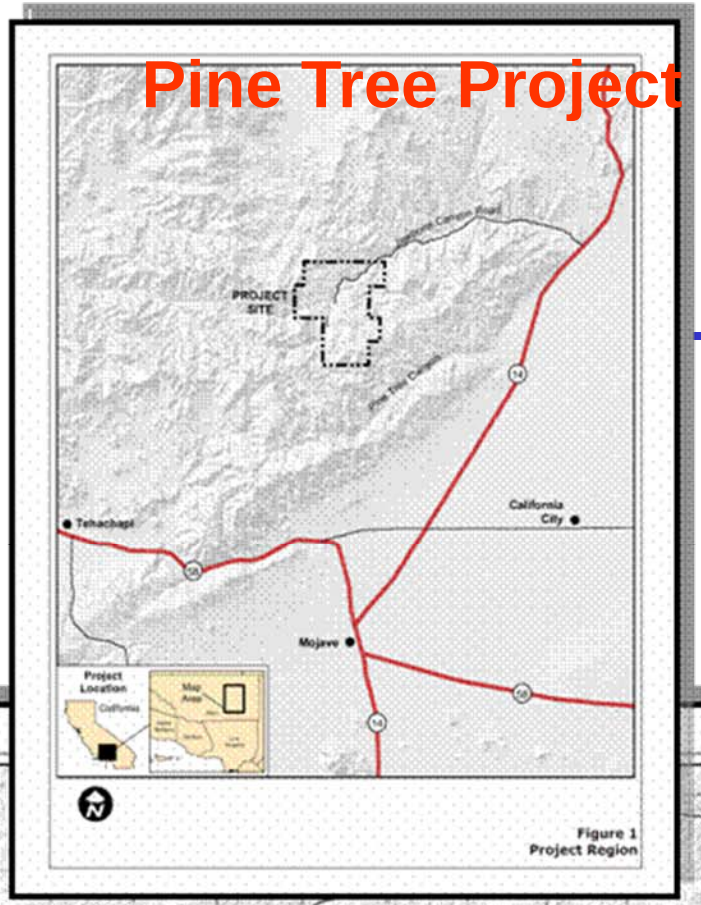

MWC* Phases I & II Configuration
* Milford Wind Corridor
MWC Phase I
39 GE 1.5 xle
58 Clipper Liberty C-99
Total = 203.5 MW
MWC Phase II
80 Clipper Liberty C-99
Total = 200.0 MW
26043
INTERMT
345kV
Z1 = 0.00311 + j0.0448 pu
B = 0.724 pu
Z0 = 0.0243 + j0.161 pu
88 miles
2-1272 kcmil ACSR Bittern
27135
MWC345
345kV
PHASE I
168 MVA
34.5/345kV
Z = 0.00220 + j0.12033 pu
90/168 MVA
34.5/345kV
Z = 0.00246
+ j0.0922 pu
PHASE II
27133
MWC1_35
34.5kV
34.5kV
27134
MWC2_35
0.037747 + j0.04334
0.04384 + j0.07169
0.04384 + j0.07169
0.12047 + j0.17956
27115
GECOLLEC
34.5kV
27113
CPCOLLEC
34.5kV
34.5kV
27122
CPCOLLC1
34.5kV
27116
CPCOLLC2
65.013 MVA
0.575/34.5kV
Z = 0.01316 + j0.09828
145 MVA
0.60/34.5kV
Z = 0.0 + j0.03966
220 MVA
0.69/34.5kV
j0.02588 pu
220 MVA
0.69/34.5kV
j0.02588 pu
27119
WTGGE
0.575kV
27117
WTGCP
0.60kV
0.69kV
27121
WTGCP1
0.69kV
27120
WTGCP2
GE
39 @ 1.5 MW each
1.667 MVA
CP
58 @ 2.5 MW each
2.5 MVA
CP
40 @ 2.5 MW each
2.5 MVA
CP
40 @ 2.5 MW each
2.5 MVA
Total = 65.013 MVA
Pmax = 58.5 MW
Pmin = 7.8 MW
Qmax = 19.227 Mvars
Qmin = -28.314 Mvars
X"1 = X"2 = 0.23995 pu
Total = 145 MVA
Pmax = 145 MW
Pmin = ? MW
Qmax = 0.0 Mvars
Qmin = 0.0 Mvars
X"1 = X"2 = ∞
Total = 100.0 MVA
Pmax = 100.0 MW
Pmin = 4.0 MW
Qmax = 0.0 Mvars
Qmin = 0.0 Mvars
X"1 = X"2 = ∞
Total = 100.0 MVA
Pmax = 100.0 MW
Pmin = 4.0 MW
Qmax = 0.0 Mvars
Qmin = 0.0 Mvars
X"1 = X"2 = ∞

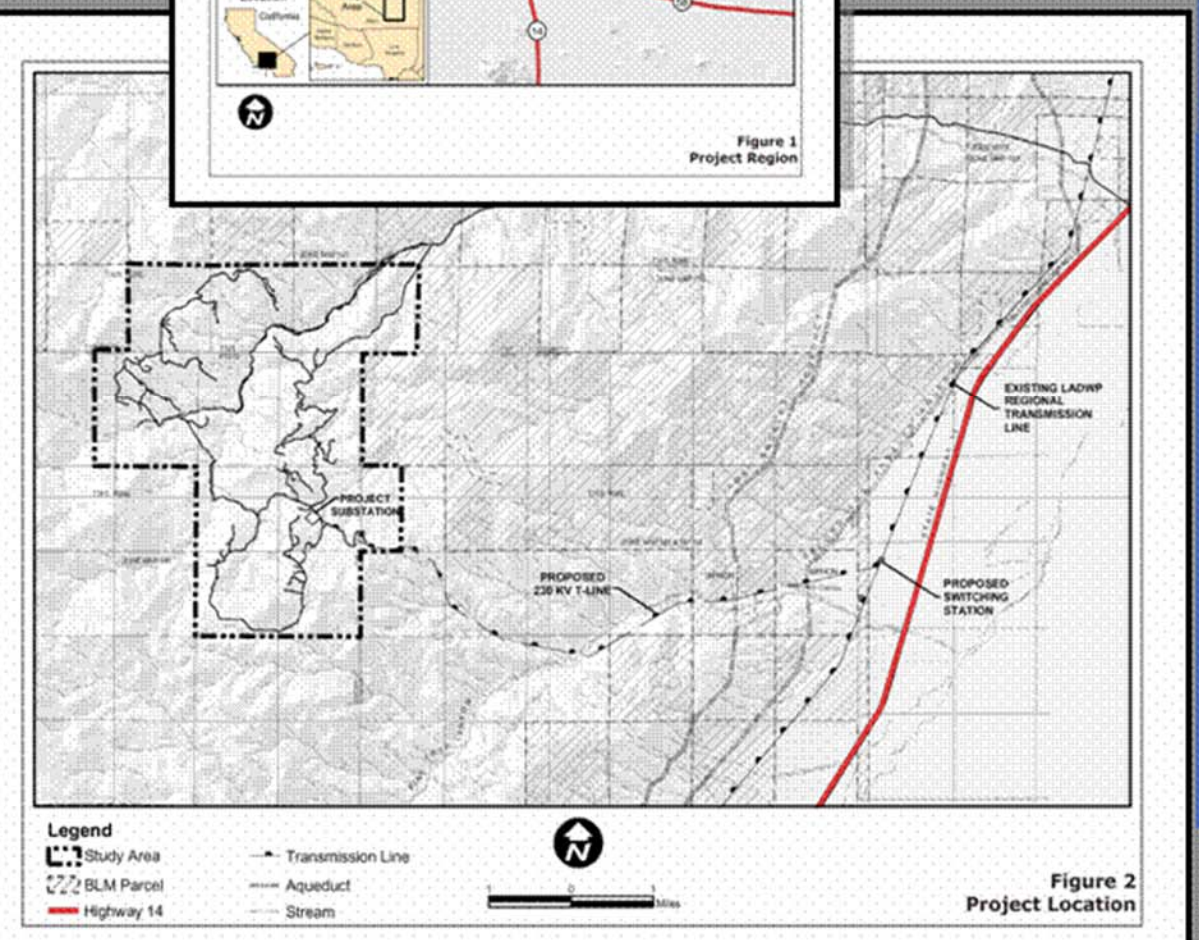
Barren Ridge Renewable Transmission Project

Owens Gorge Transmission System

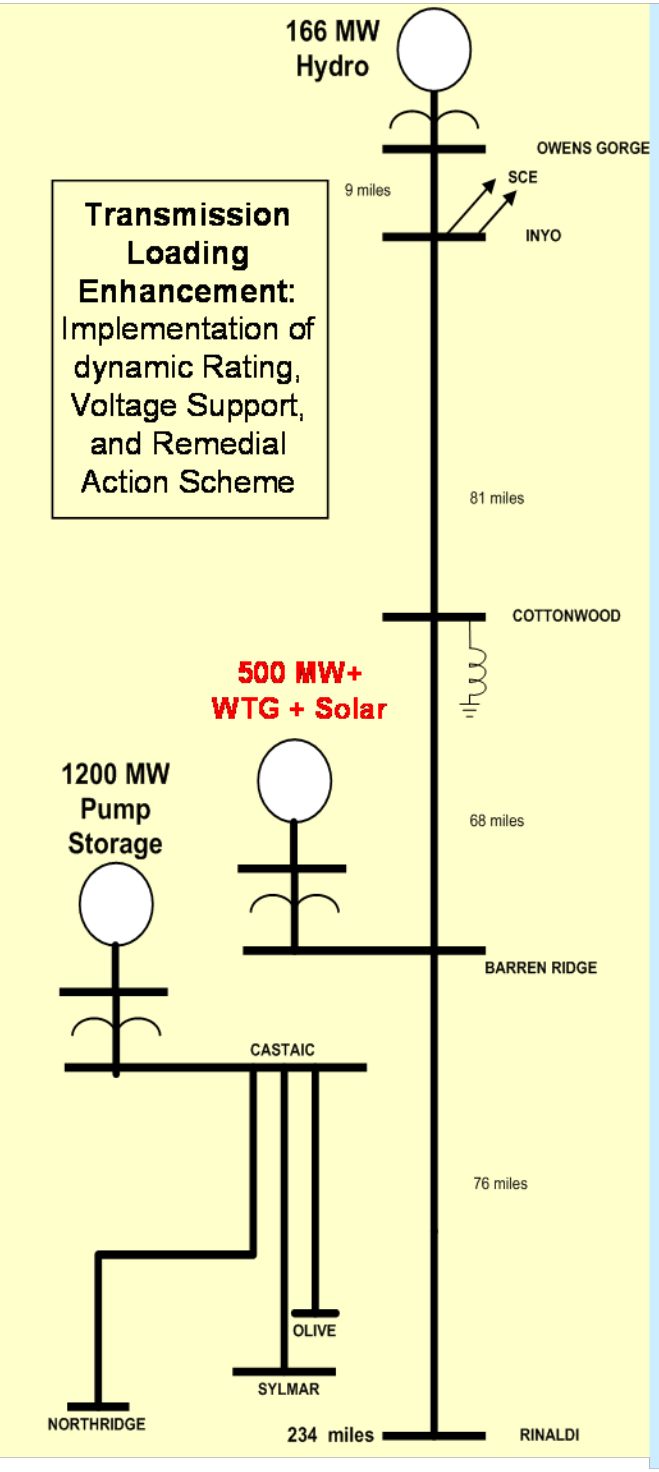


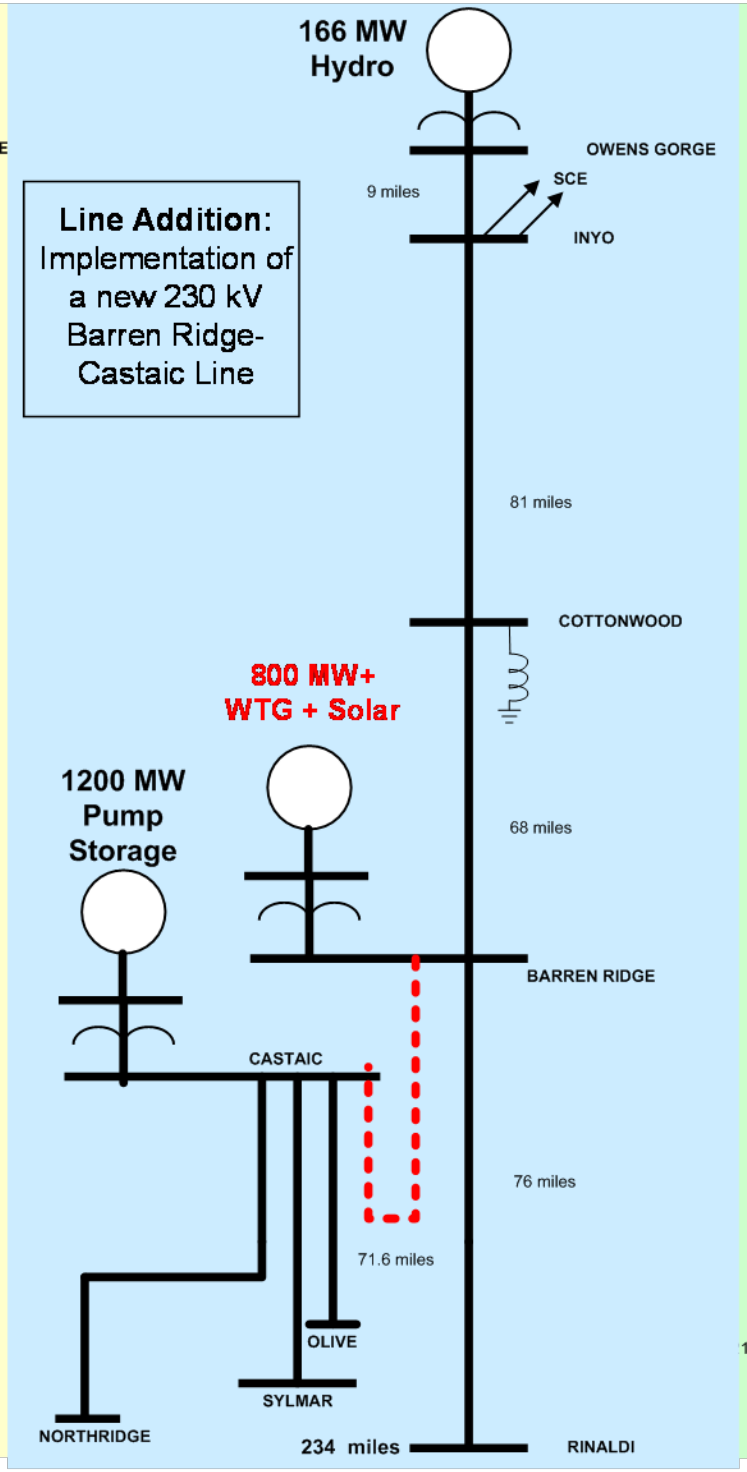
Pine Tree Project Development

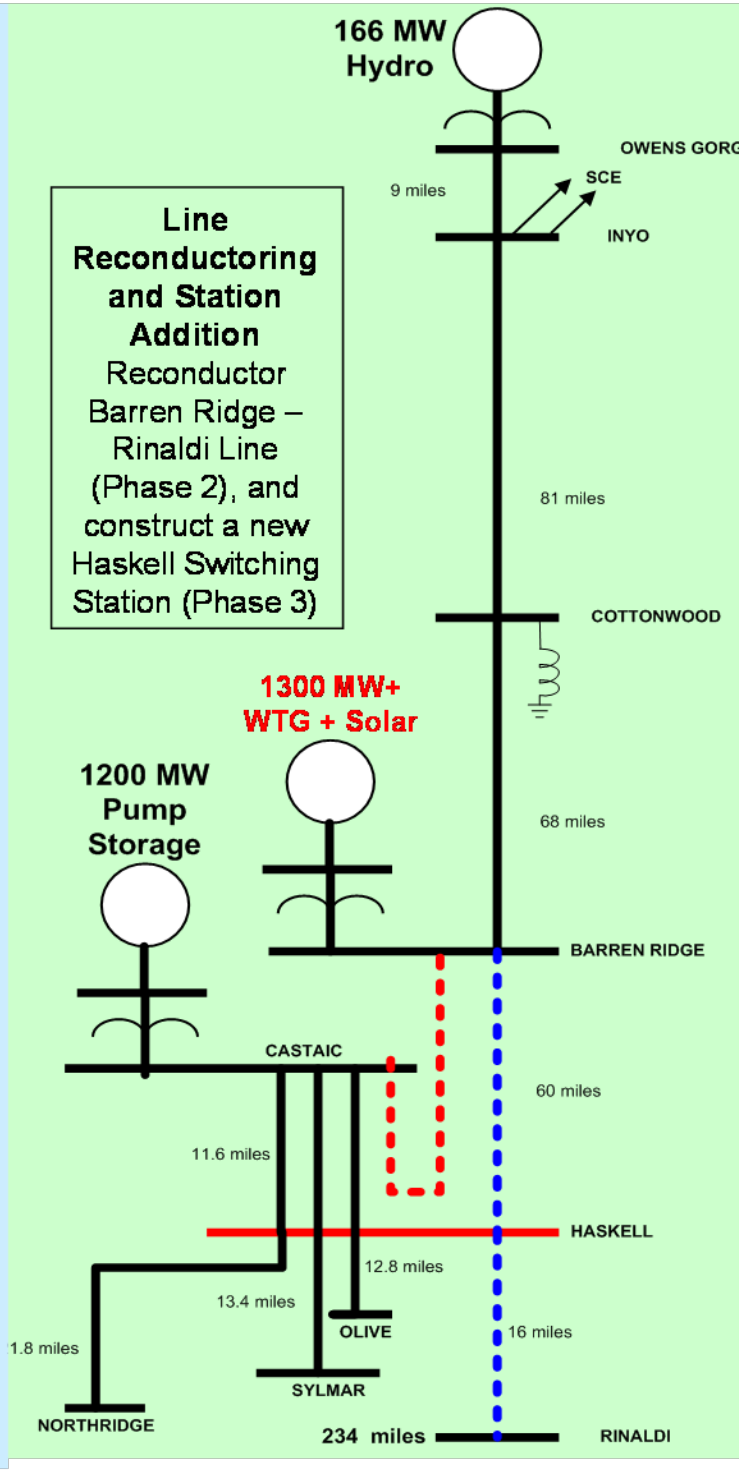




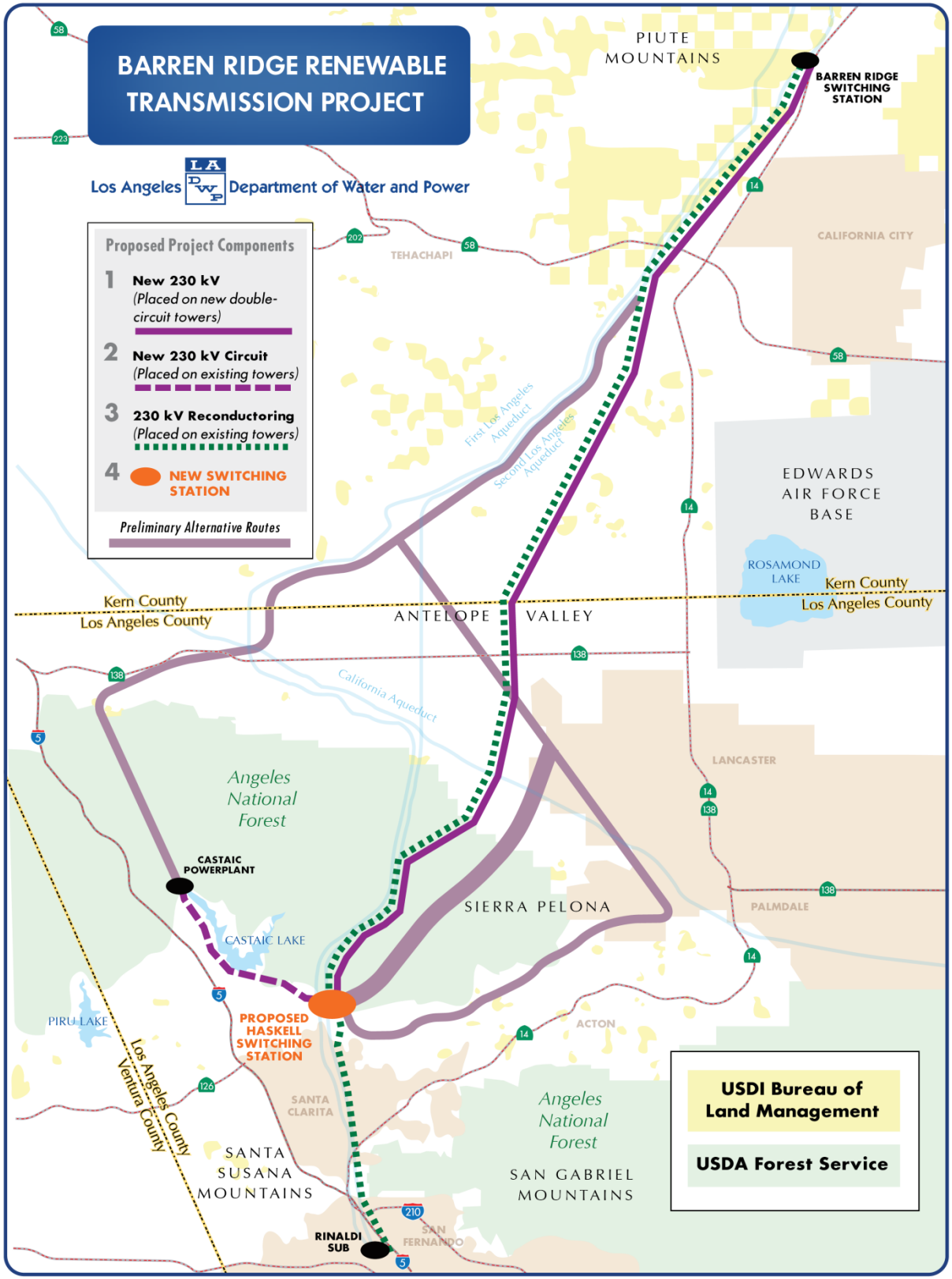
Barren Ridge Renewable Transmission Development Scope





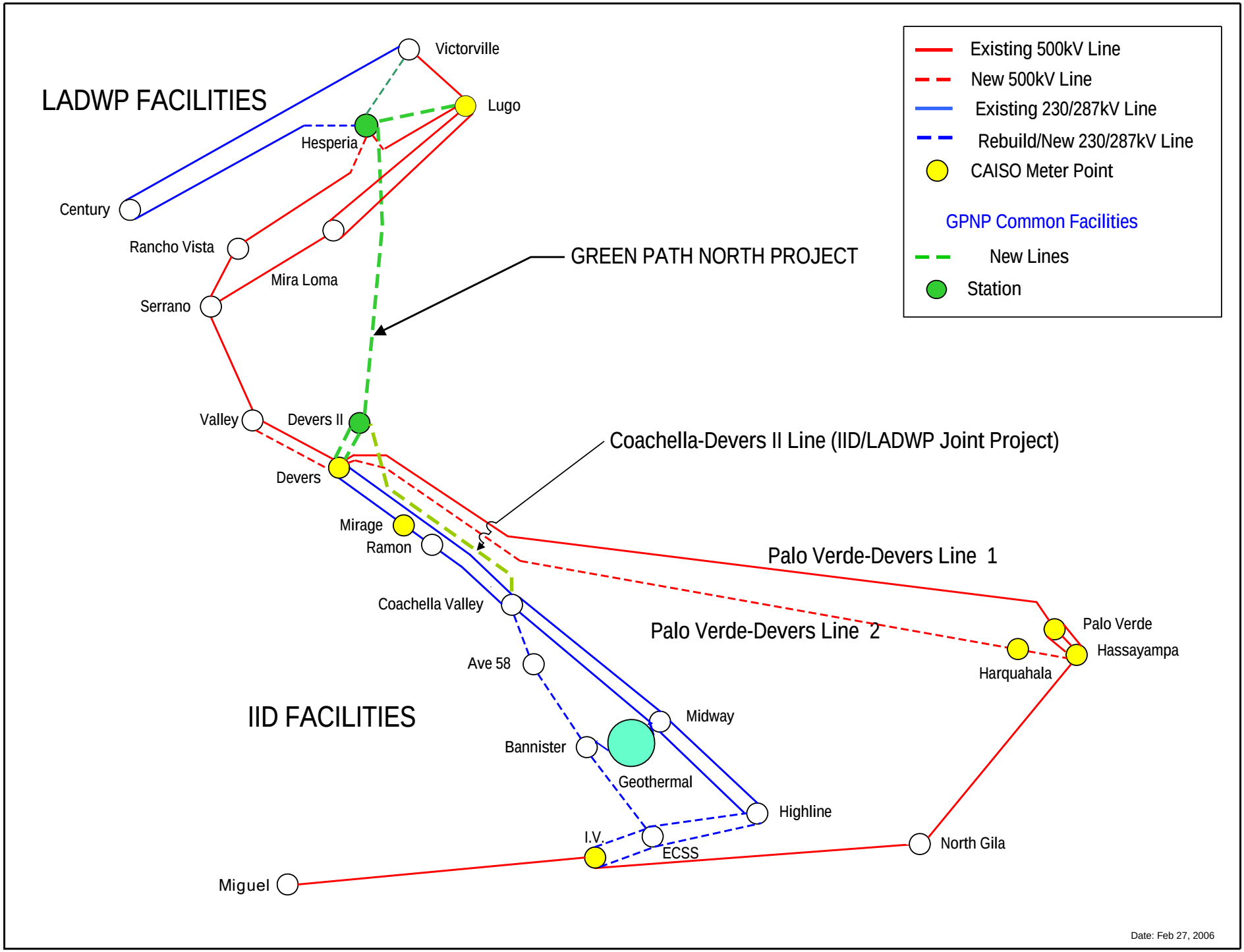


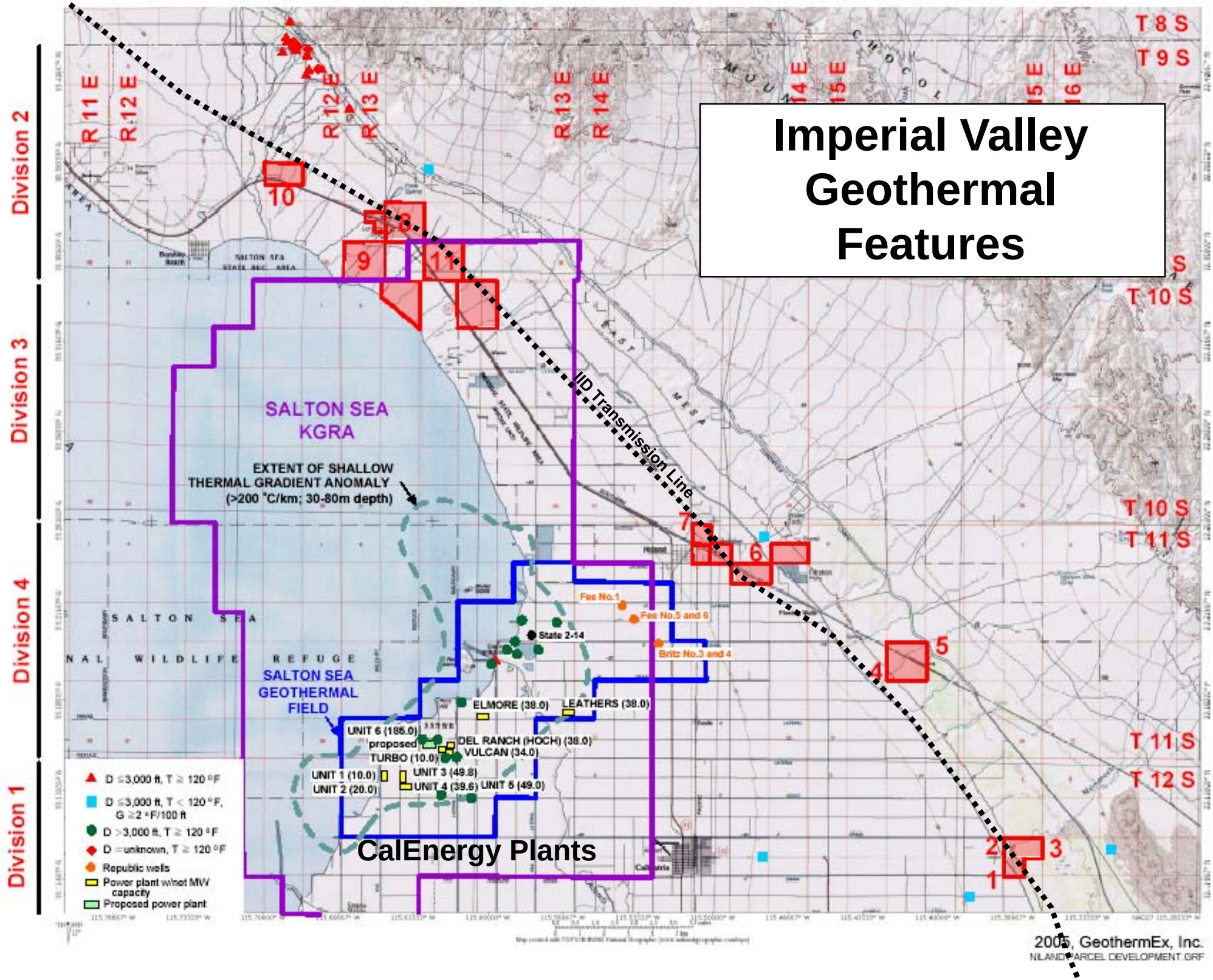
Line Routing Options



Green Path North Transmission Project

Green Path North Transmission Project One-Line Diagram




Imperial Valley Geothermal Features
Division 2
Division 3
Division 4
Division 1
R 11 E
R 12 E
R 13 E
R 14 E
T 8 S
T 9 S
T 10 S
T 11 S
T 12 S
SALTON SEA KGRA
EXTENT OF SHALLOW THERMAL GRADIENT ANOMALY (>200 °C/km; 30-80m depth)
SALTON SEA GEOTHERMAL FIELD
IID Transmission Line
Fee No.1
Fee No.5 and 6
Britz No.3 and 4
State 2-14
ELMORE (38.0)
LEATHERS (38.0)
UNIT 6 (185.0)
proposed
TURBO (10.0)
DEL RANCH (HOCH) (38.0)
VULCAN (34.0)
UNIT 1 (10.0)
UNIT 2 (20.0)
UNIT 3 (49.8)
UNIT 4 (39.6)
UNIT 5 (49.0)
CalEnergy Plants
D ≤3,000 ft, T ≥ 120 °F
D ≤3,000 ft, T < 120 °F, G ≥2 °F/100 ft
D >3,000 ft, T ≥ 120 °F
D = unknown, T ≥ 120 °F
Republic wells
Power plant w/net MW capacity
Proposed power plant
2005, GeothermEx, Inc.
NILAND PARCEL DEVELOPMENT.GRF

Thank You!

Q & A