



# Warm LC at Copper Mountain Overview & Status

Ca Logan Ridge \* (cold)

Ca Cu Mountain \* (warm)

150

145

135 a,b,c,d

Ca Logan Ridge \*

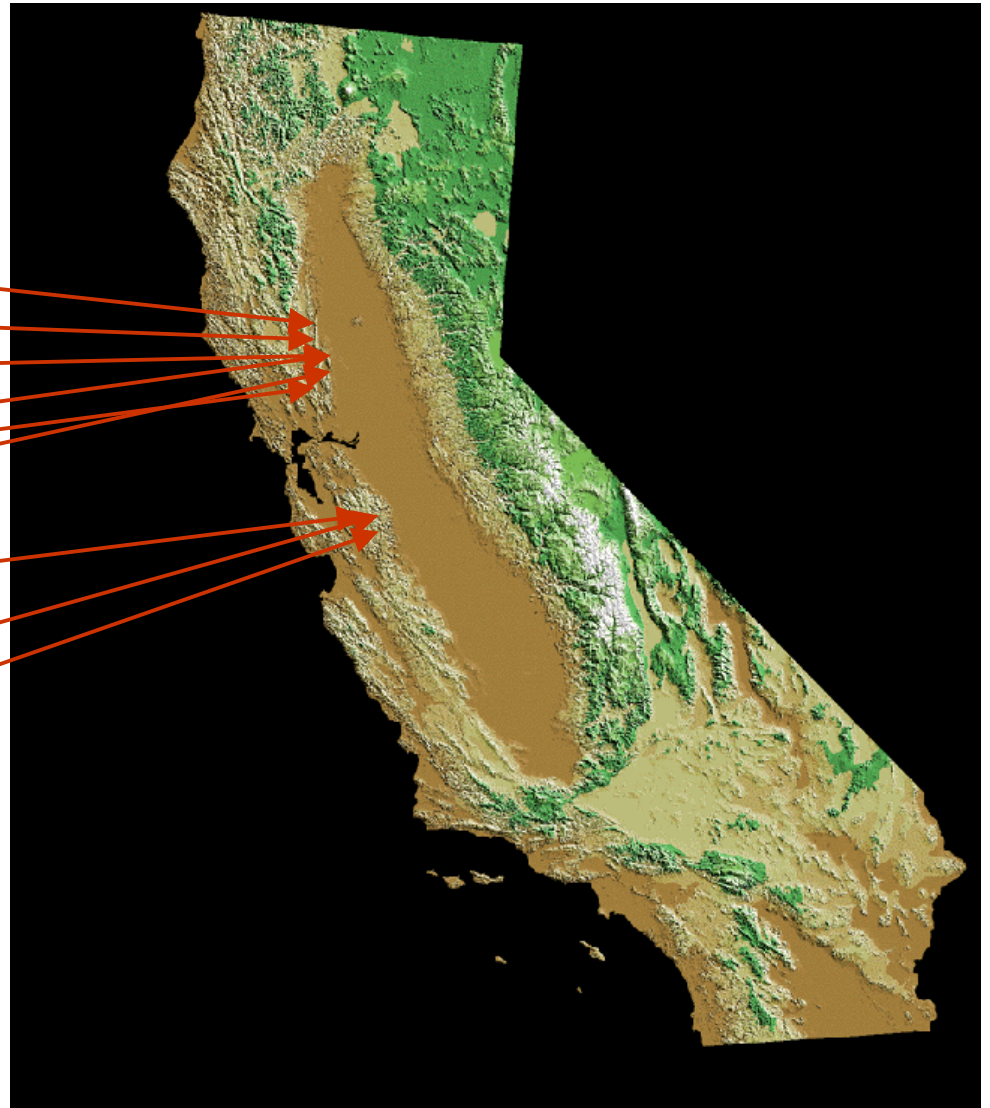
127

120

90N

Ca Cu Mountain \*

90S



SOME LC CALIFORNIA SITES INVESTIGATED SINCE 1996

# WARM LC at CA COPPER MOUNTAIN

## 1.0 Tev, SLED-II, 2 IR's, Remote Injectors

LLNL DOE Laboratory & Test Site to North (1 LC away)

SLAC & LBNL DOE Laboratories to West (2 LC's away)

Native CA Sandstone Rock, Competent, w/ High Bore Advance Rates

Low Noise Site, Confirmed at the Least Quiet Location

On No Active Faults, Slip Rates are Confirmed, Stability is LC Adequate

Parallel 500 & 230 kv Power Transmission Corridor for Electricity > 2 GW

Parallel California Aqueduct System for Cooling, 20C Supply, Full Return

High & Dry Tunnel Elevation well Above Ground Water Table

Elevation Adequate for Pumped Water Storage & Quiet Gravity Feed

Fast Parallel Interstate 5 Vehicle Access, 75 mph

Parallel Southern Pacific Railway for Bulk Material and Transportainers

US Navy Auxiliary Air Field for Lay Down, Storage & Logistics

Local High Volume Gravel & Cement Plant for Short Haul Cement

Hospital, Schools, Shopping, etc. in Patterson, Population ~ 13,000

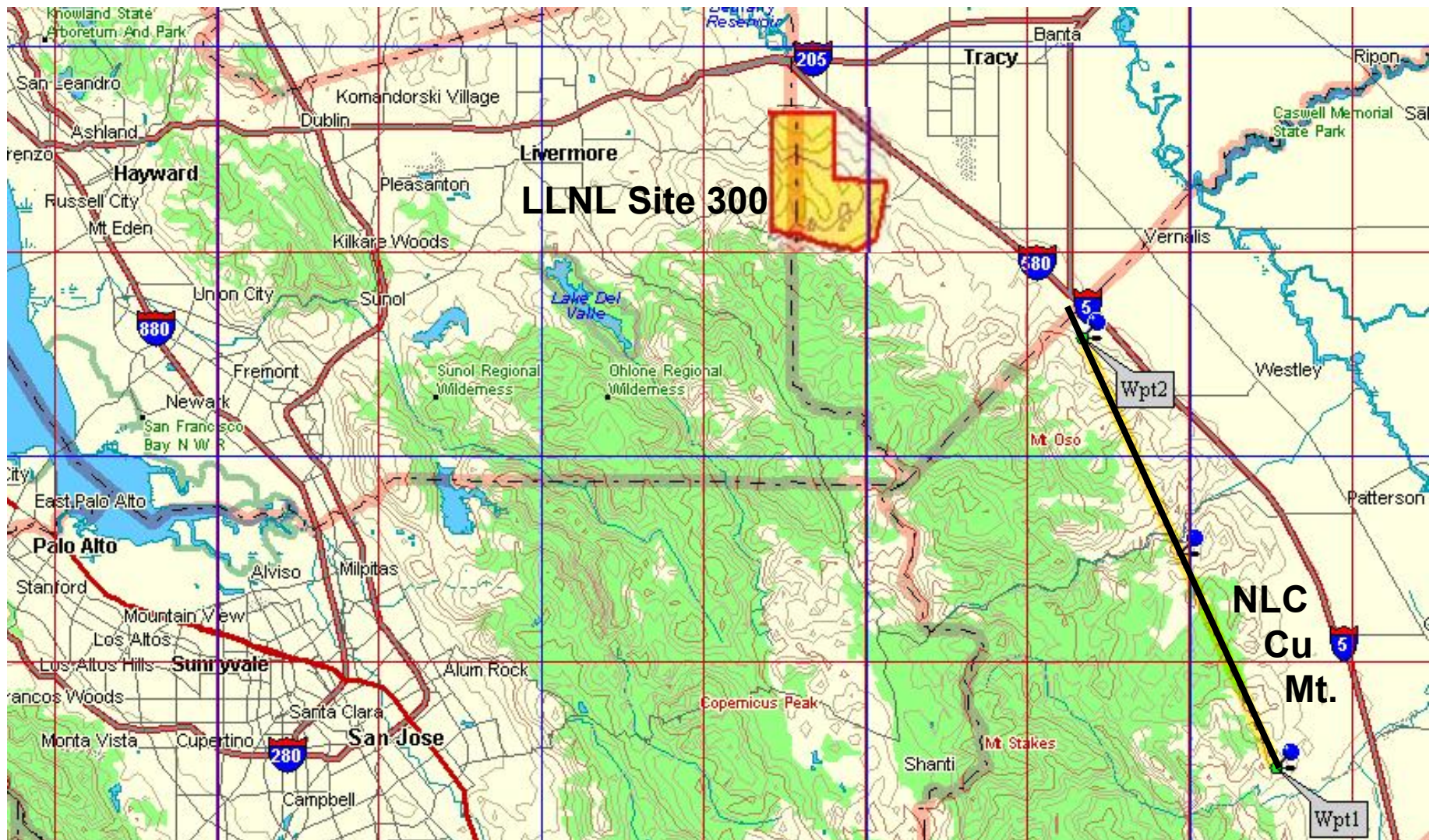
Land use = Cattle Ranching w/ Low population, Low development

Inexpensive Land for Sale, Local Country Club-Vineyard-Golf Course

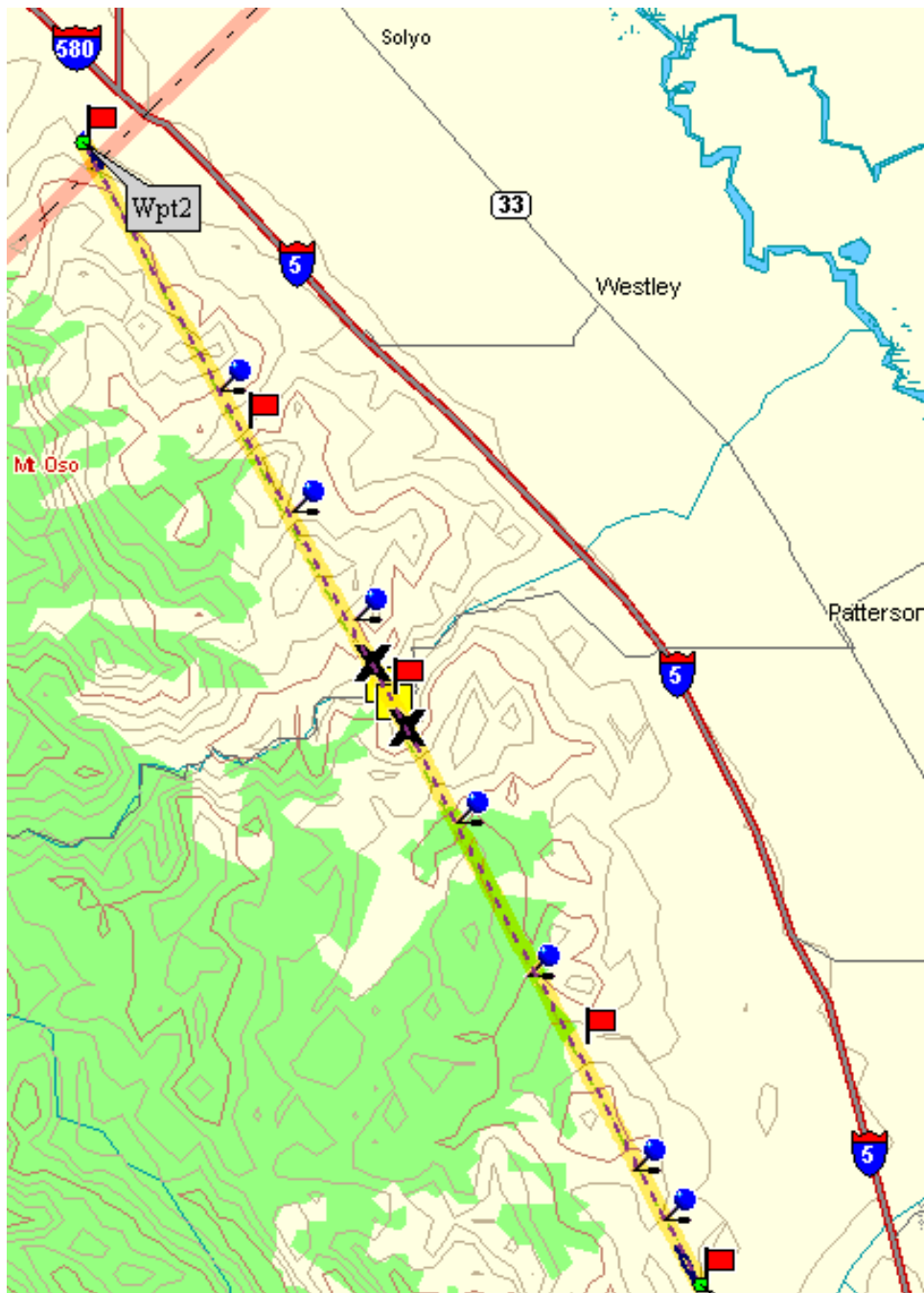
90 minutes drive (or less) from SLAC, LLBL, LLNL, UC, Stanford



# WARM LC COPPER MOUNTAIN LOCATION



1.0 Tev, SLED-II, Hi-Lo Energy IR Halls, Remote Injectors



## NLC CA Copper Mt. Site Z- Axis Surface Projection



IP Switch



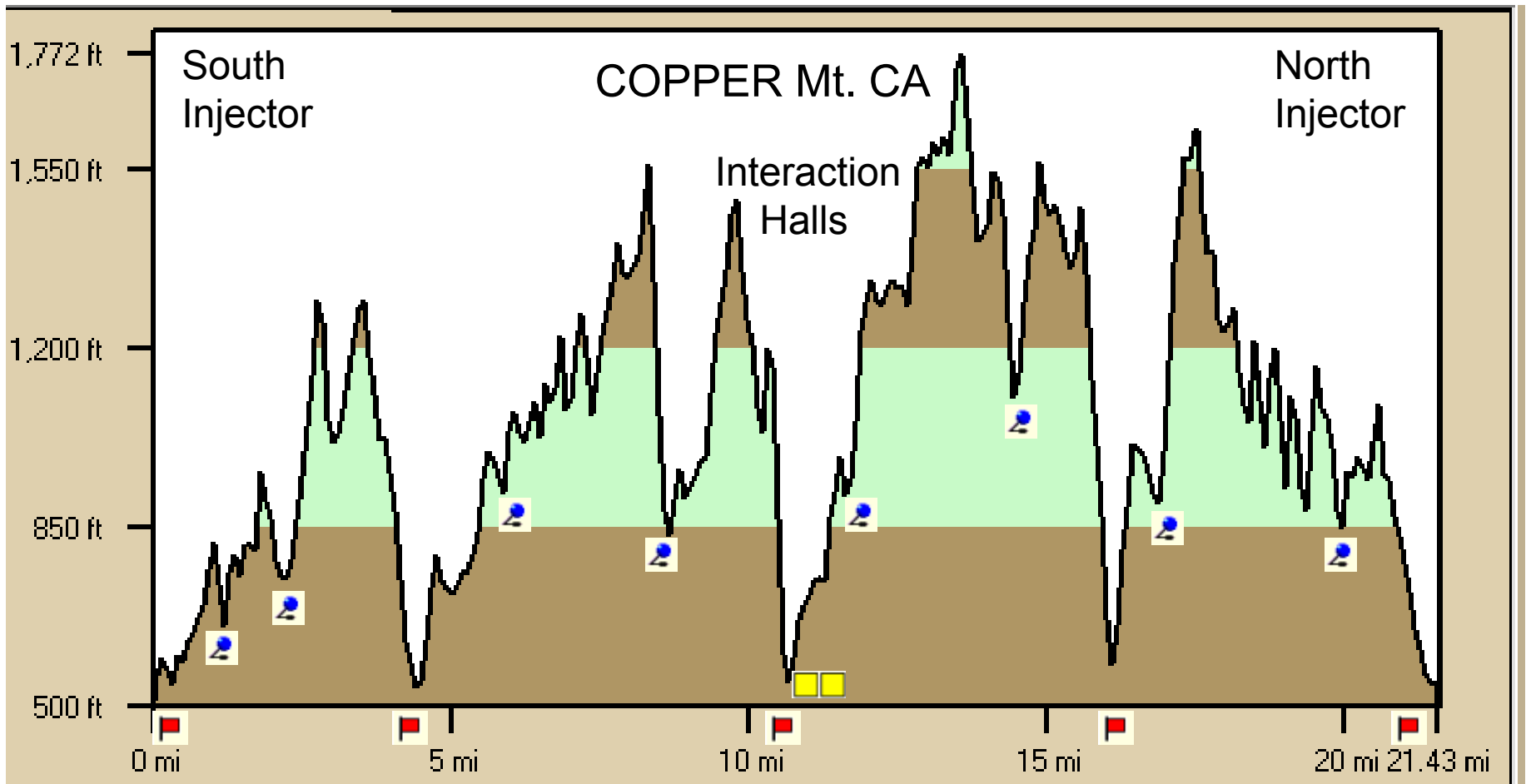
Utilities



Access & Utilities



IP



eL = 540' 653' 748' 536' 916' 834' 577' 913' 1106' 580' 894' 846' 509'

Section View West  
NLC Beam Z-Axis eL ~480'



Utility Shaft

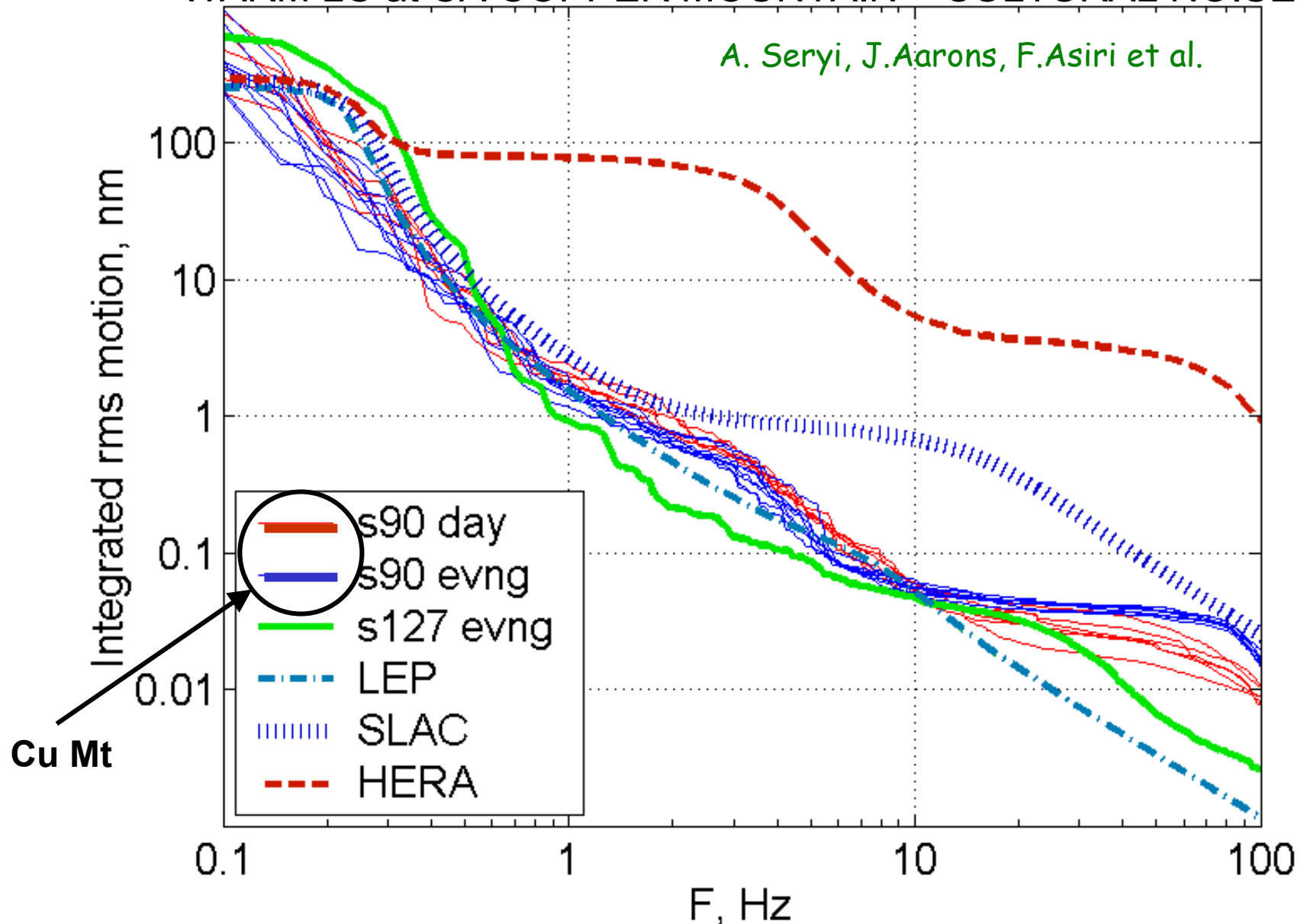
Tunnel Access Ramp & Utility Shaft

Interaction Hall

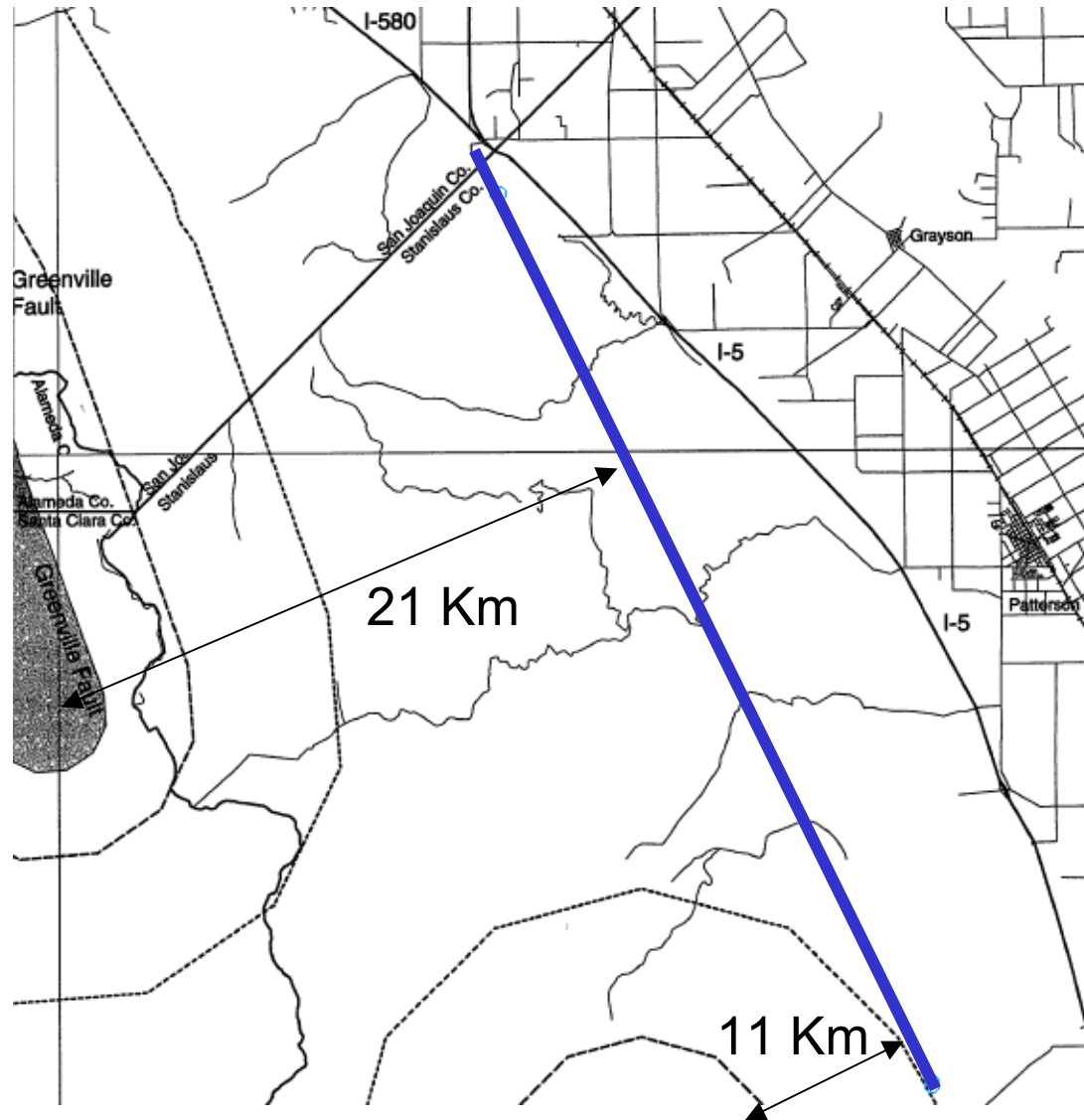


# WARM LC at CA COPPER MOUNTAIN – CULTURAL NOISE

*A. Seryi, J.Aarons, F.Asiri et al.*



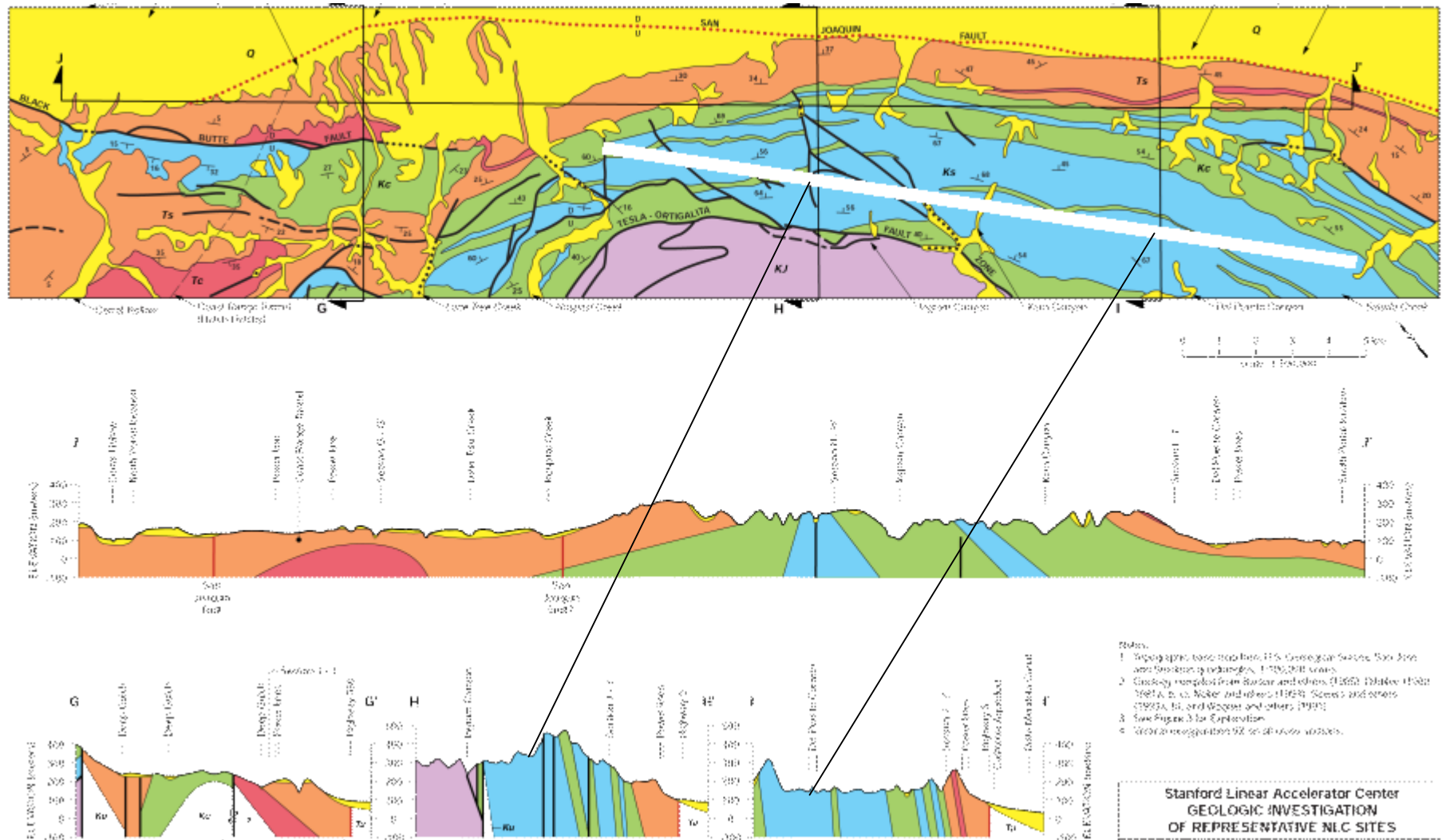
# WARM LC CA COPPER MOUNTAIN – REMOTE ACTIVE FAULT ZONES



ACCEPTABLE 1.5 mm ANNUAL SLIP RATE  
2 FAULTS, 21 Km & 11 Km DISTANT

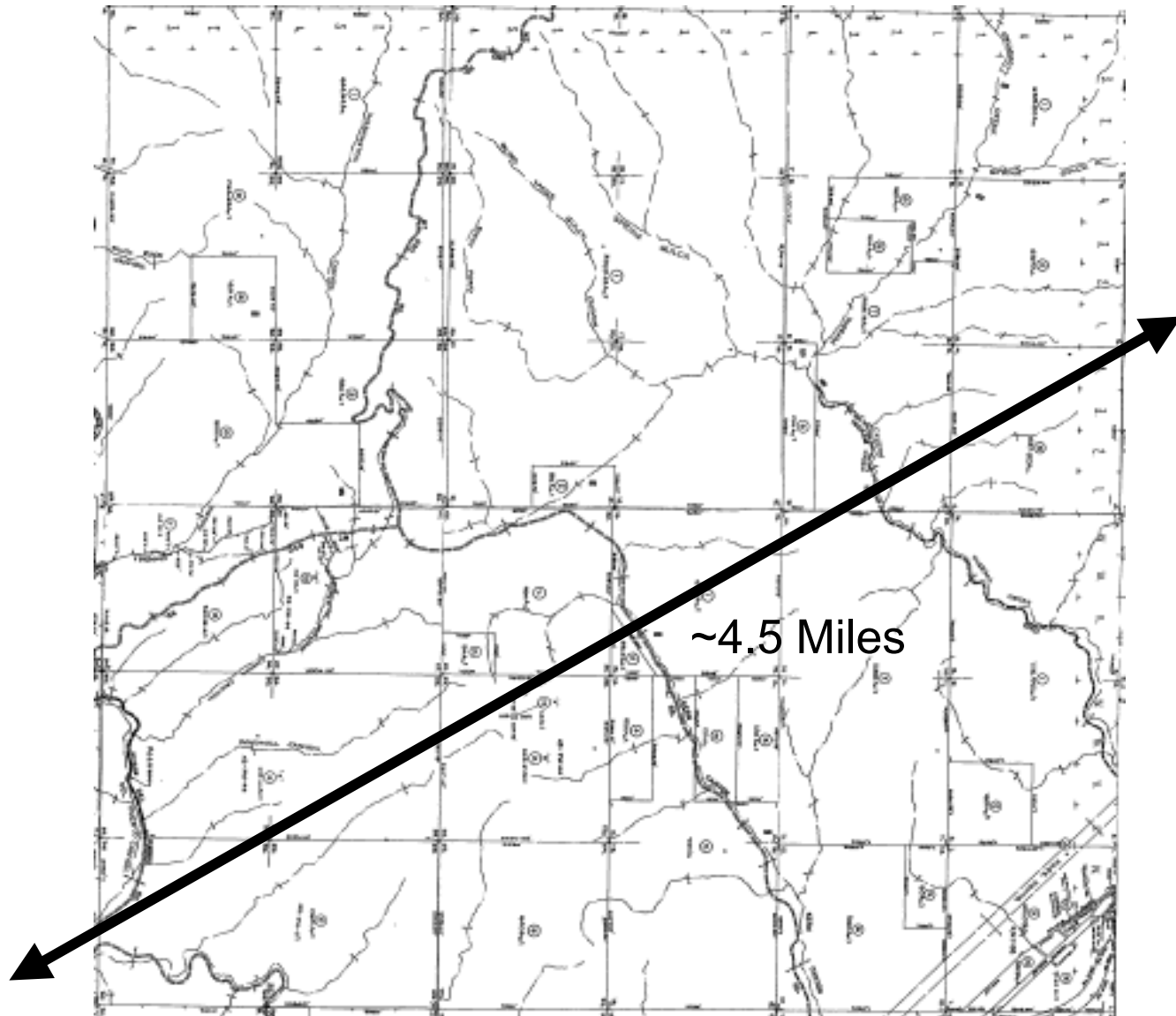


# WARM LC at CA COPPER MOUNTAIN – GEOLOGY



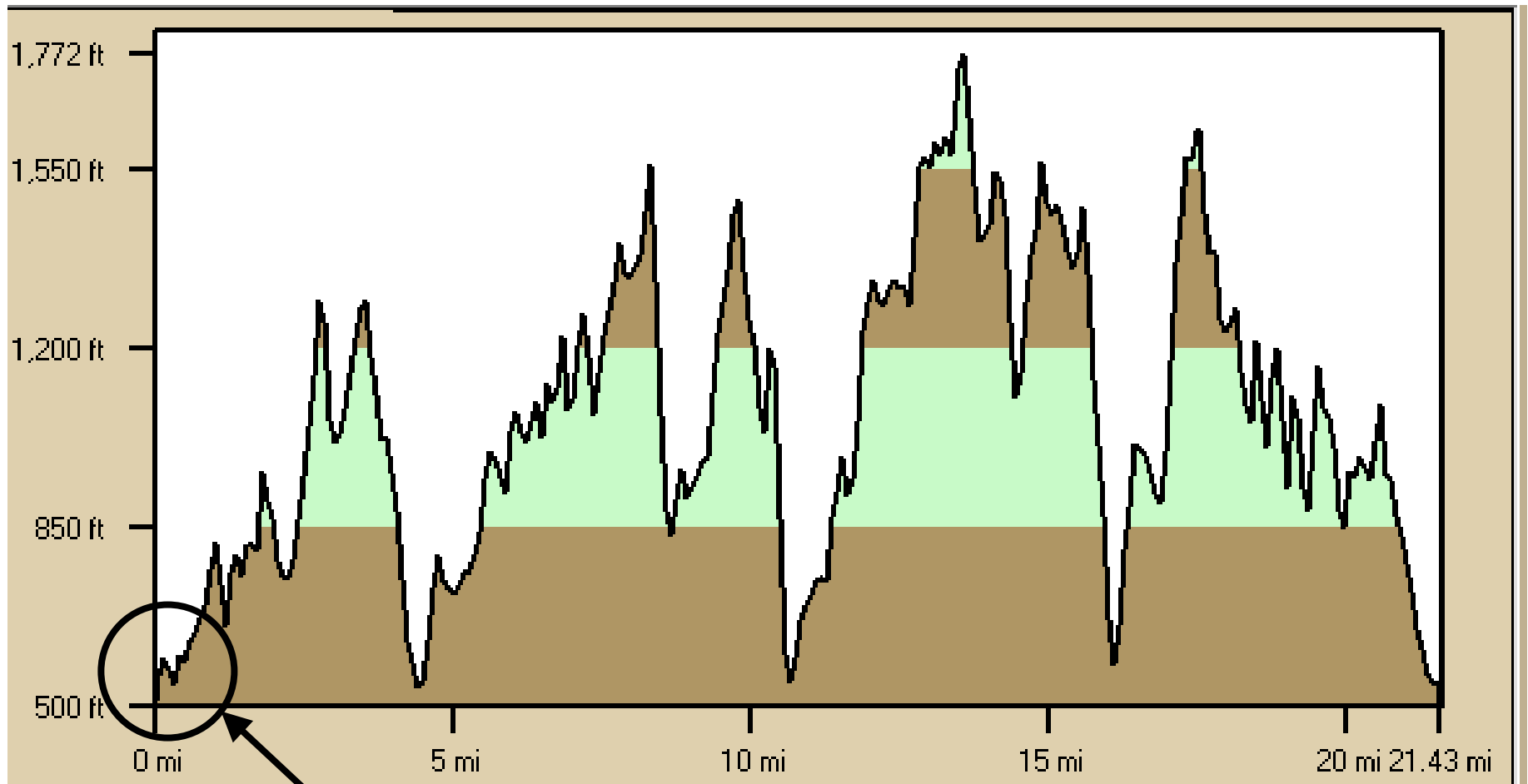
## NATIVE CALIFORNIA SANDSTONES

# WARM LC at CA COPPER MTN – PLOT PLANS & PROPERTY RIGHTS



Approximately 30 Alignment + 60 Access Parcels

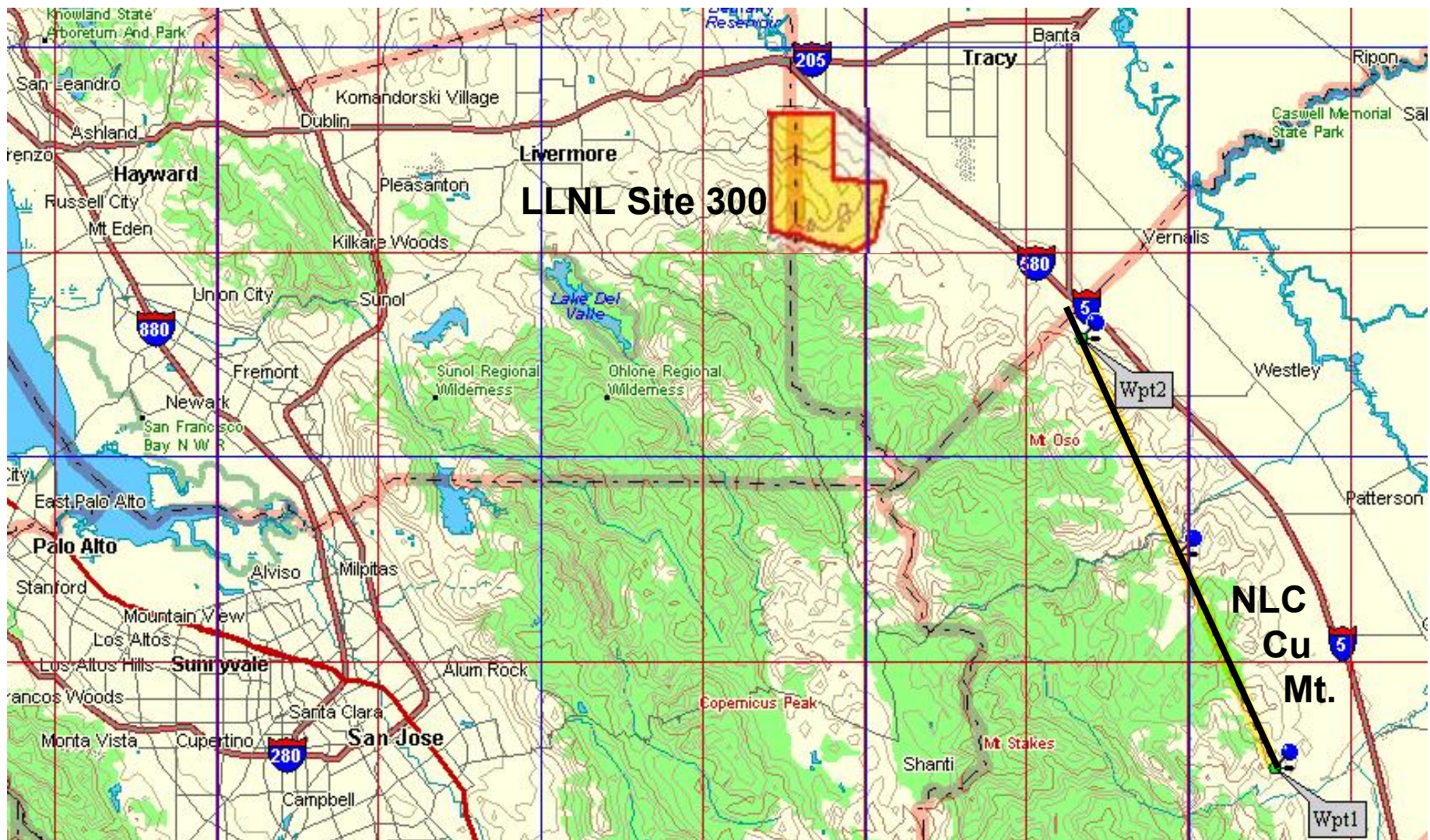
## WARM LC at CA COPPER MOUNTAIN



SOUTH INJECTOR TOUR



# WARM LC at CA COPPER MOUNTAIN



1.0 Tev, SLED-II, Hi-Lo Energy IR Halls, Remote Injectors

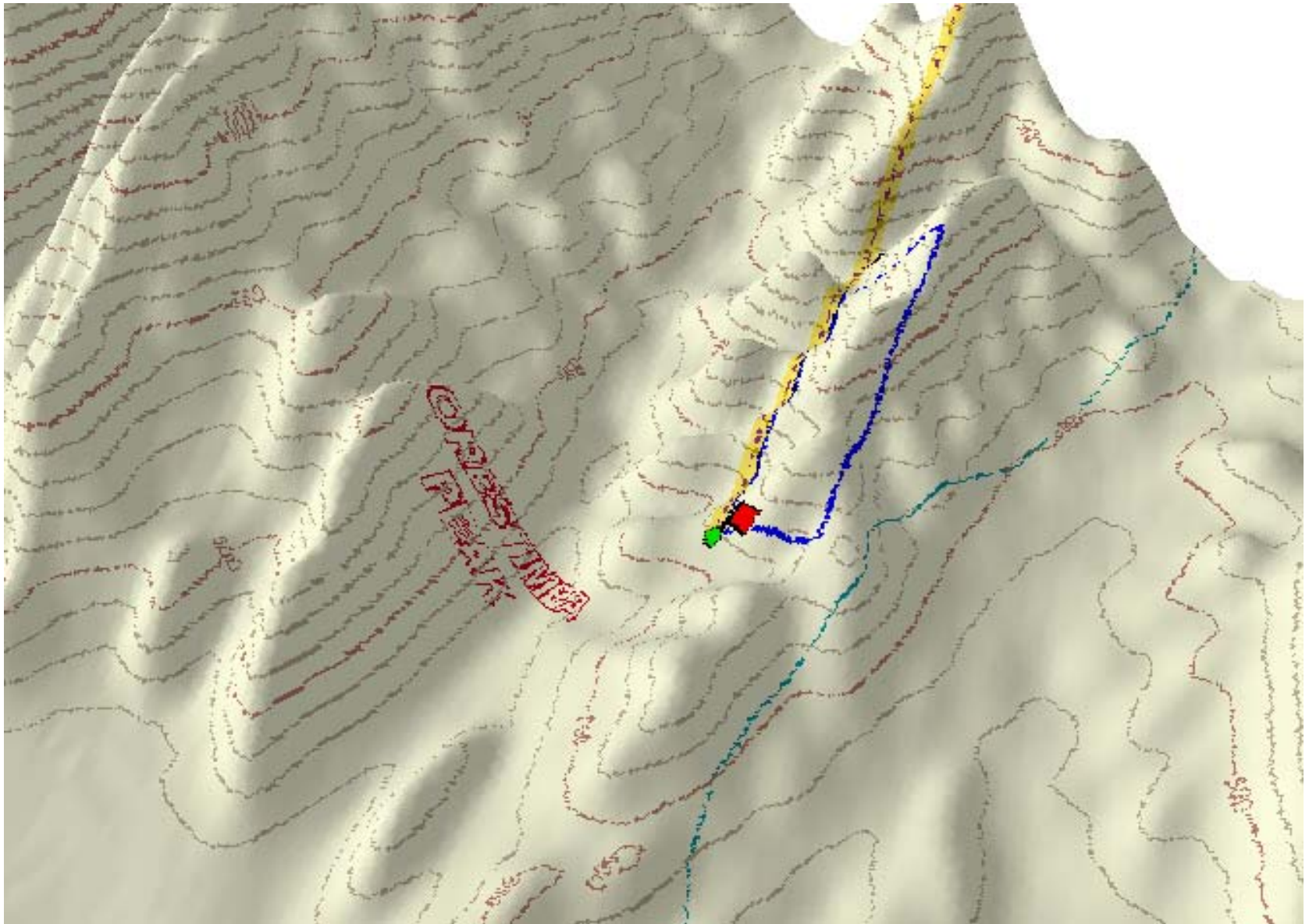
WARM LC at CA COPPER MOUNTAIN - SOUTH INJECTOR



OSO CREEK DIVIDE VIEW NORTH

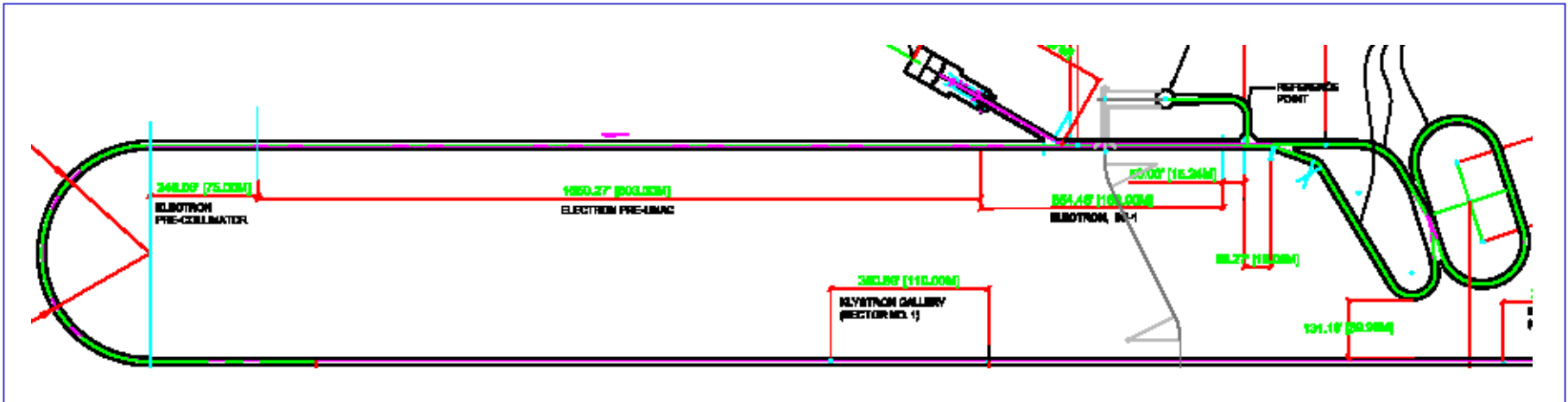
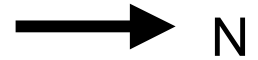


## WARM LC at CA COPPER MOUNTAIN



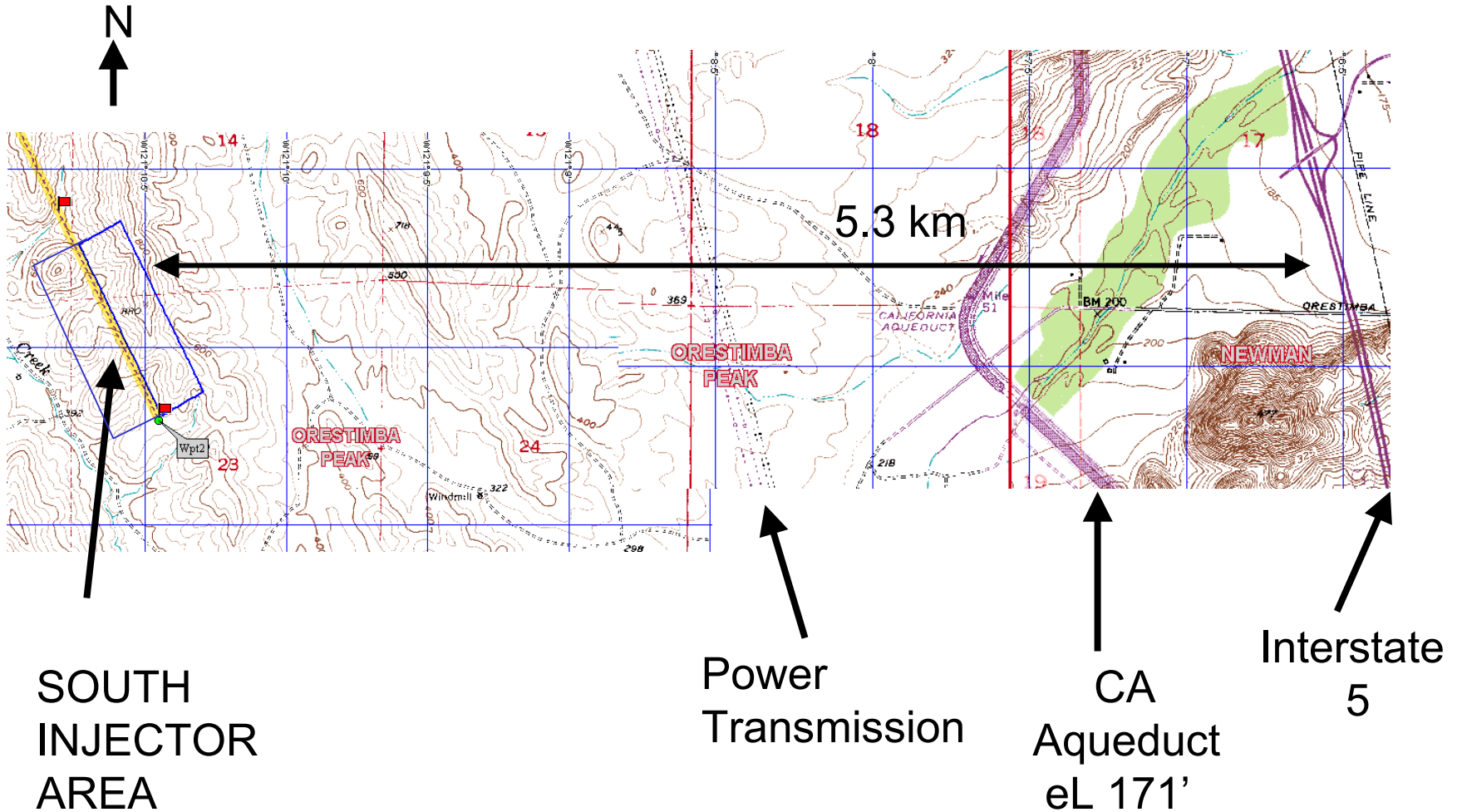
SOUTH INJECTOR VIEW NORTH

# WARM LC at CA COPPER MOUNTAIN



SOUTH ELECTRON INJECTOR

# WARM LC at CA COPPER MT. - SOUTH INJECTOR



SOUTH INJECTOR AREA FEATURES

## WARM LC at CA COPPER MOUNTAIN



AQUADUCT - 2 & 3 Km DISTANT @ N. & S. INJECTORS



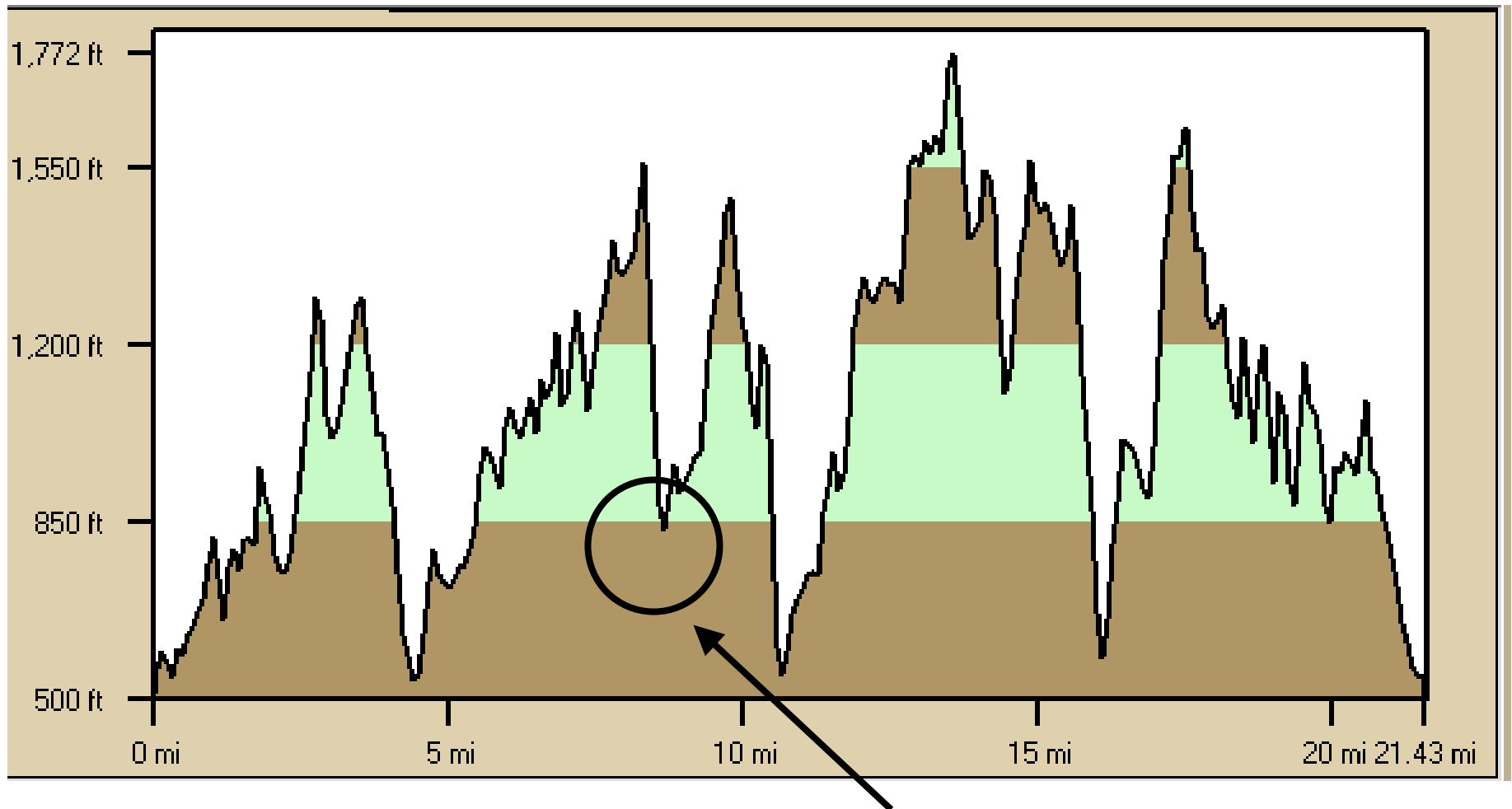
## WARM LC at CA COPPER MOUNTAIN - SOUTH INJECTOR AREA



POWER TRANSMISSION CORRIDOR VIEW NORTH – 8 CIRCUITS



## WARM LC at CA COPPER MOUNTAIN



UTILITY SHAFT TOUR

## WARM LC at CA COPPER MOUNTAIN



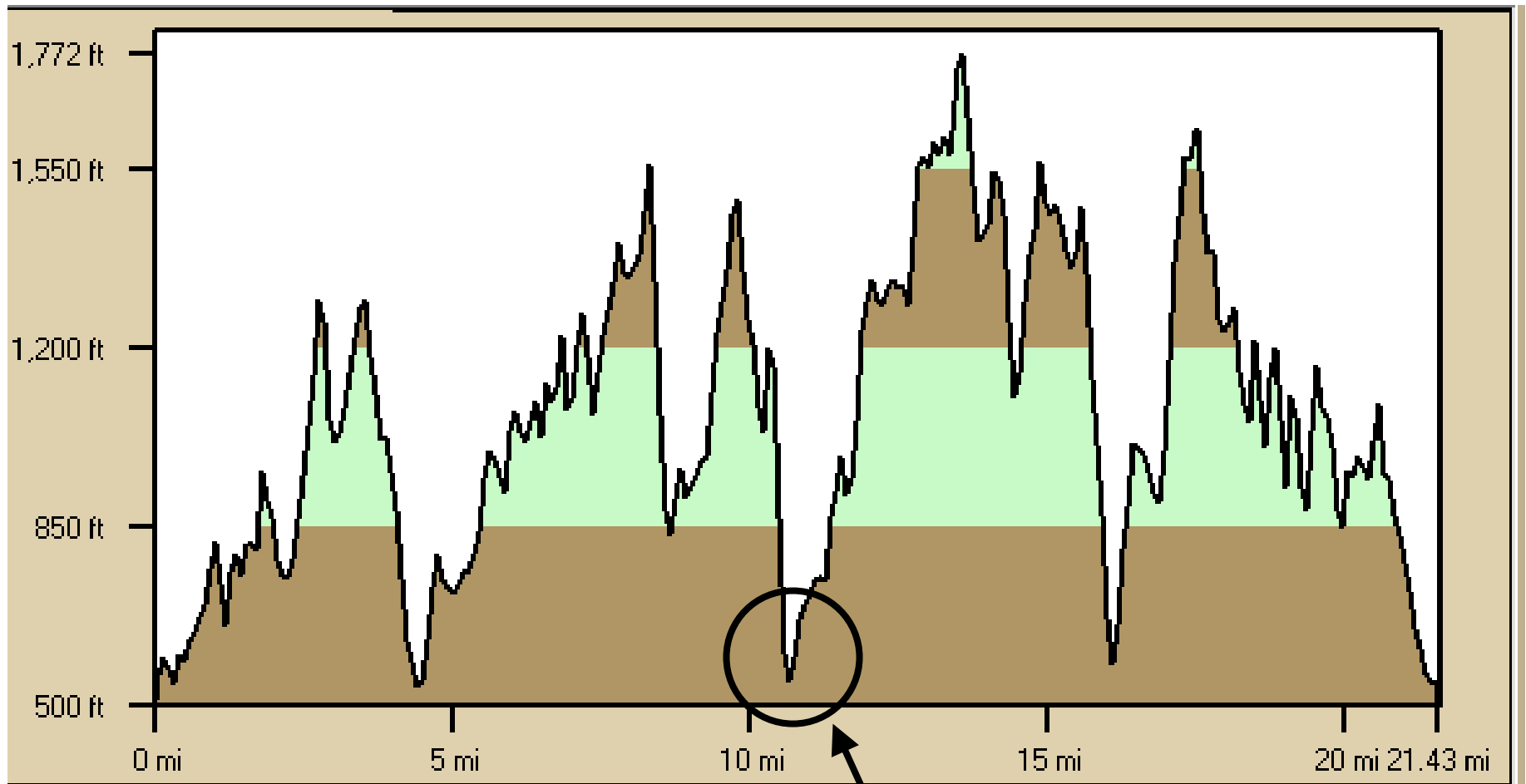
DIABLO GRANDE UTILITY SHAFT AREA

## WARM LC at CA COPPER MOUNTAIN



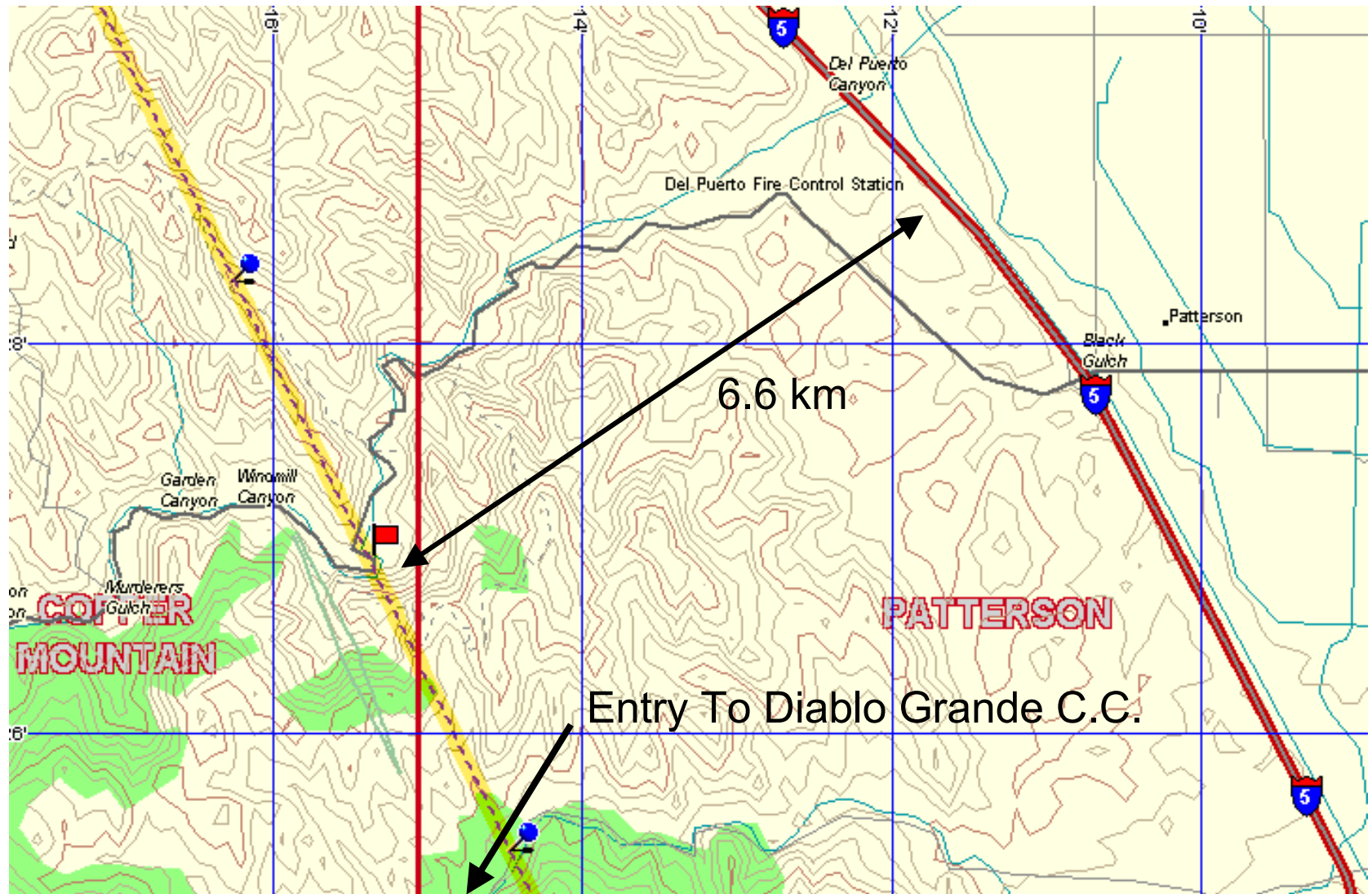
DIABLO GRANDE COUNTRY CLUB, GOLF COURSE & VINEYARDS

# WARM LC at CA COPPER MOUNTAIN



INTERACTION REGION TOUR

## WARM LC at CA COPPER MT – INTERACTION REGION



## INTERACTION REGION AREA FEATURES



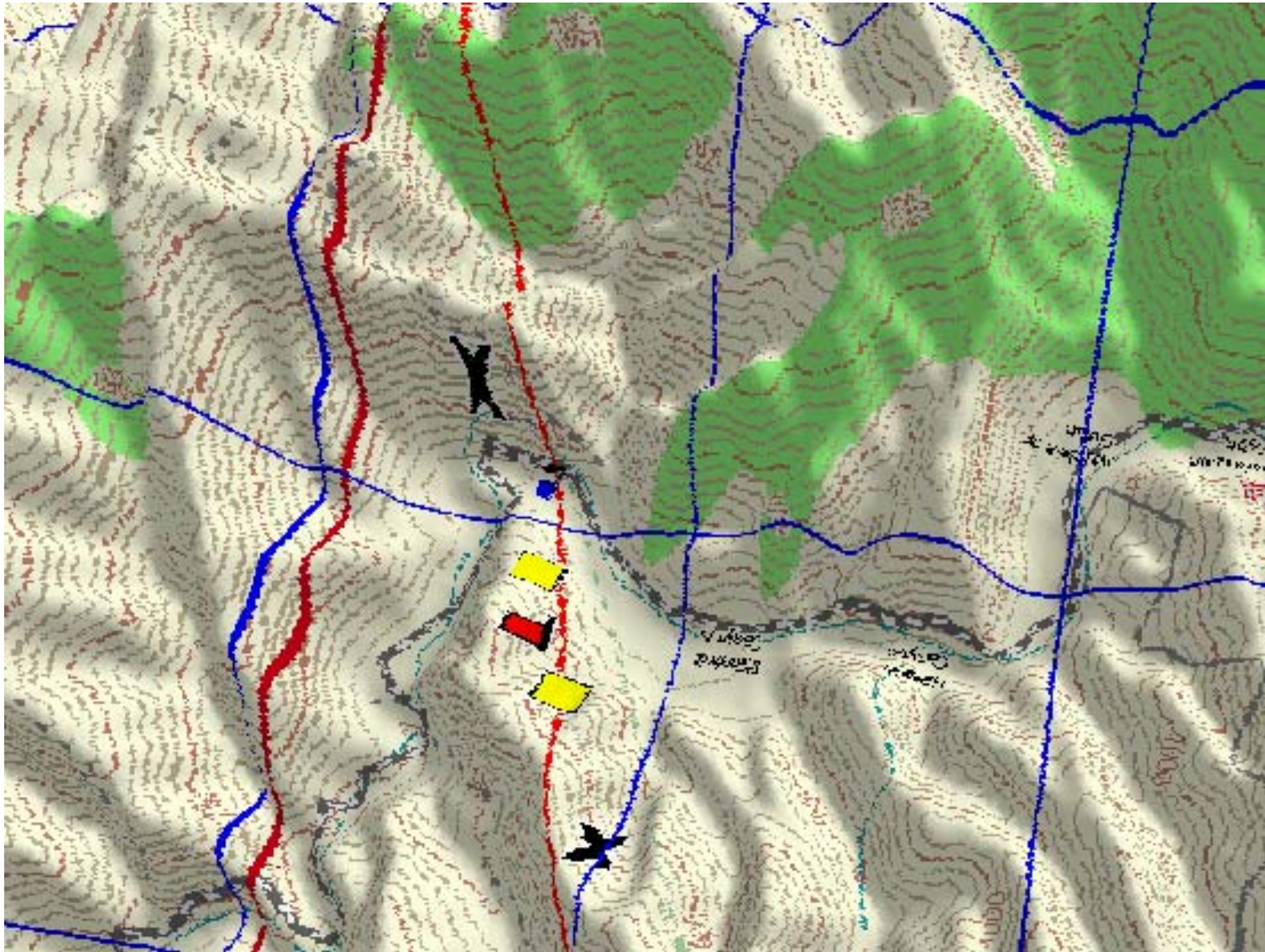
## WARM LC at CA COPPER MOUNTAIN



INTERACTION HALL RIDGE - VIEW EAST

# WARM LC at CA COPPER MOUNTAIN – INTERACTION HALLS

S  
↑



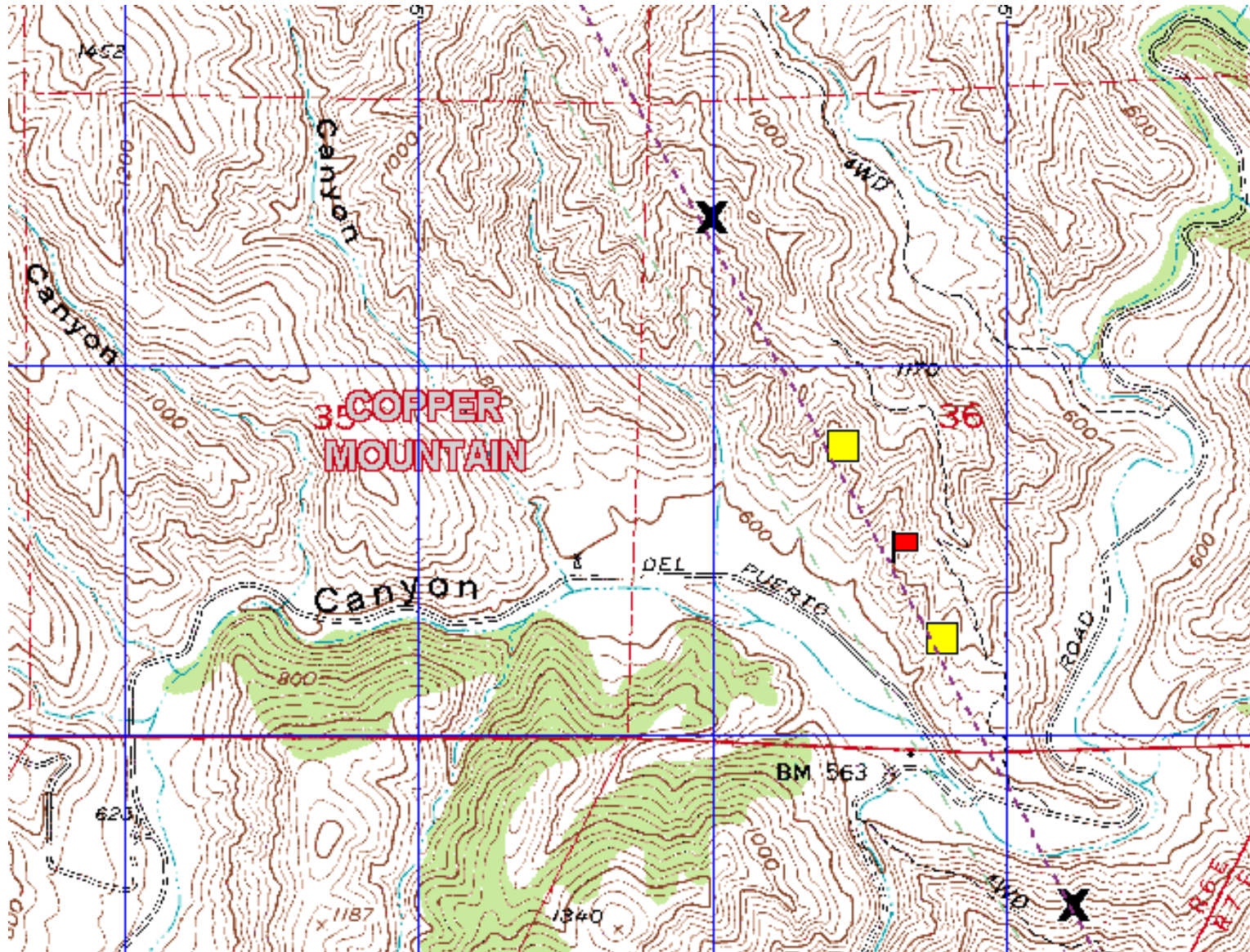
 ACCESS

 INTERACTION HALL

 IP SWITCH



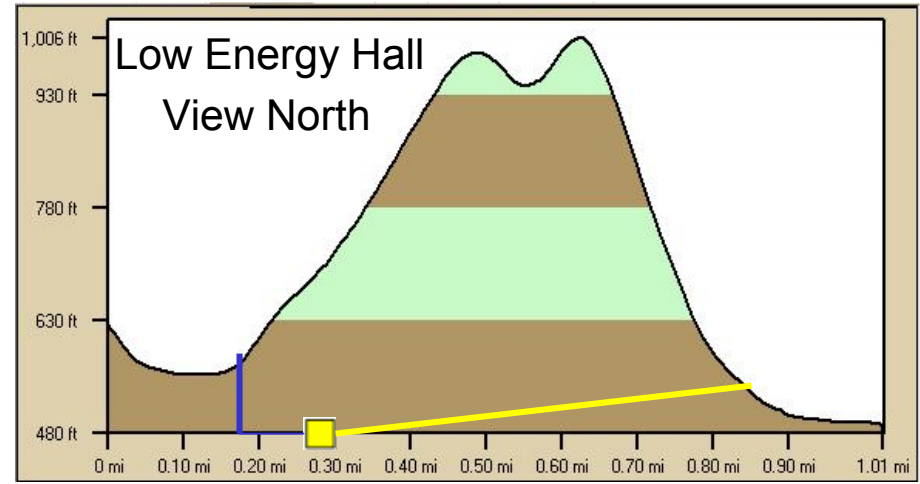
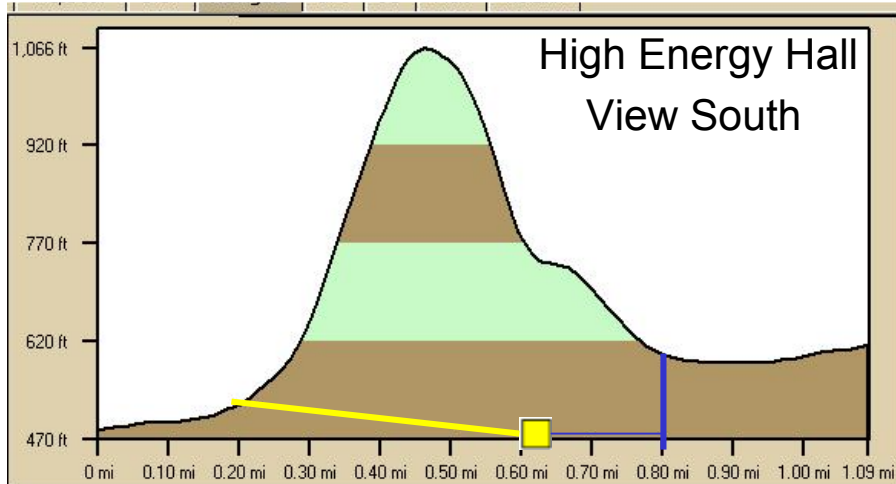
N  
↑



 CENTER POINT    INTERACTION HALL    IP SWITCH

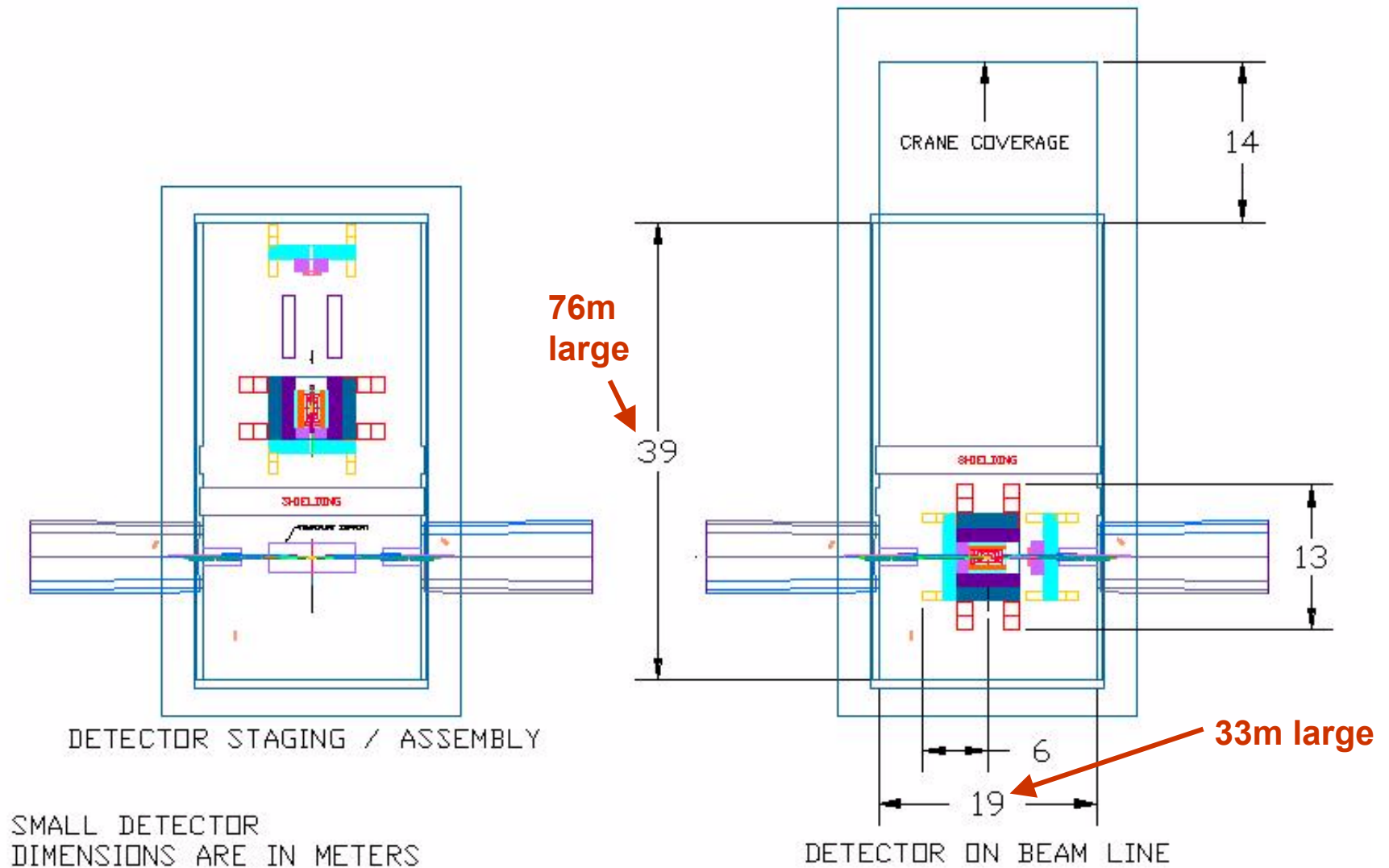


# WARM LC at CA COPPER MOUNTAIN – IP UTILITY & ACCESS



- Interaction Hall
- Vehicular Access Ramp
- Utility & Elevator Shaft

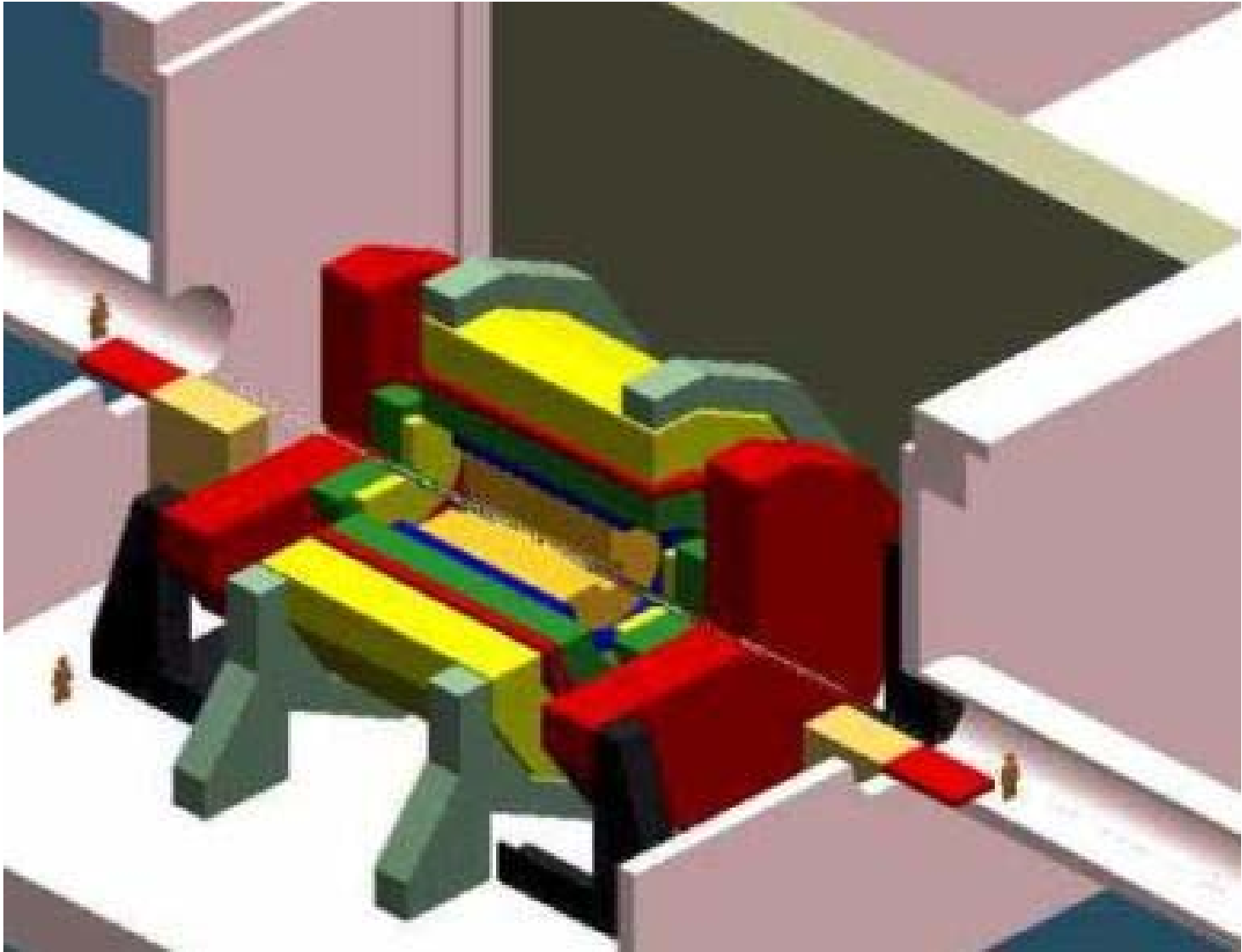
# WARM LC at CA COPPER MOUNTAIN



INTERACTION REGION (older small detector shown)

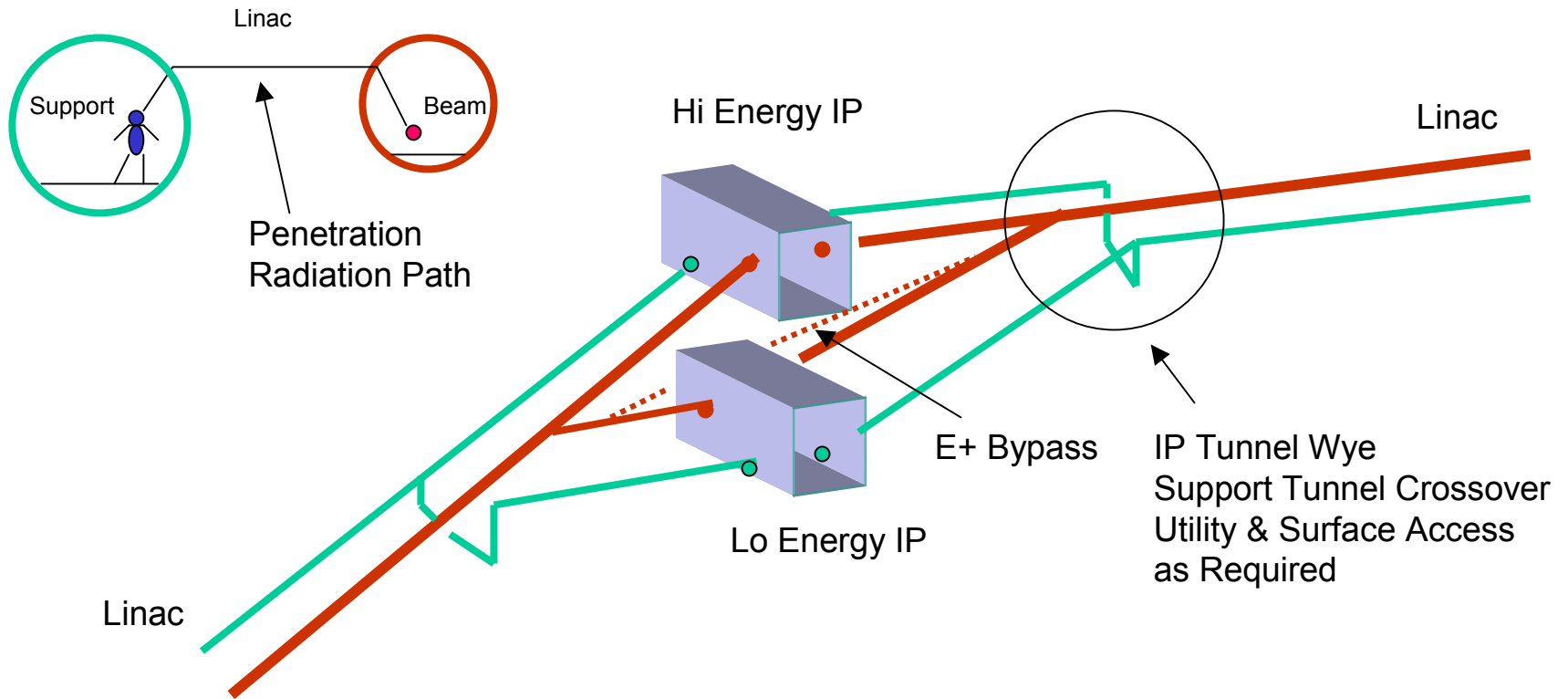


## WARM LC at CA COPPER MOUNTAIN

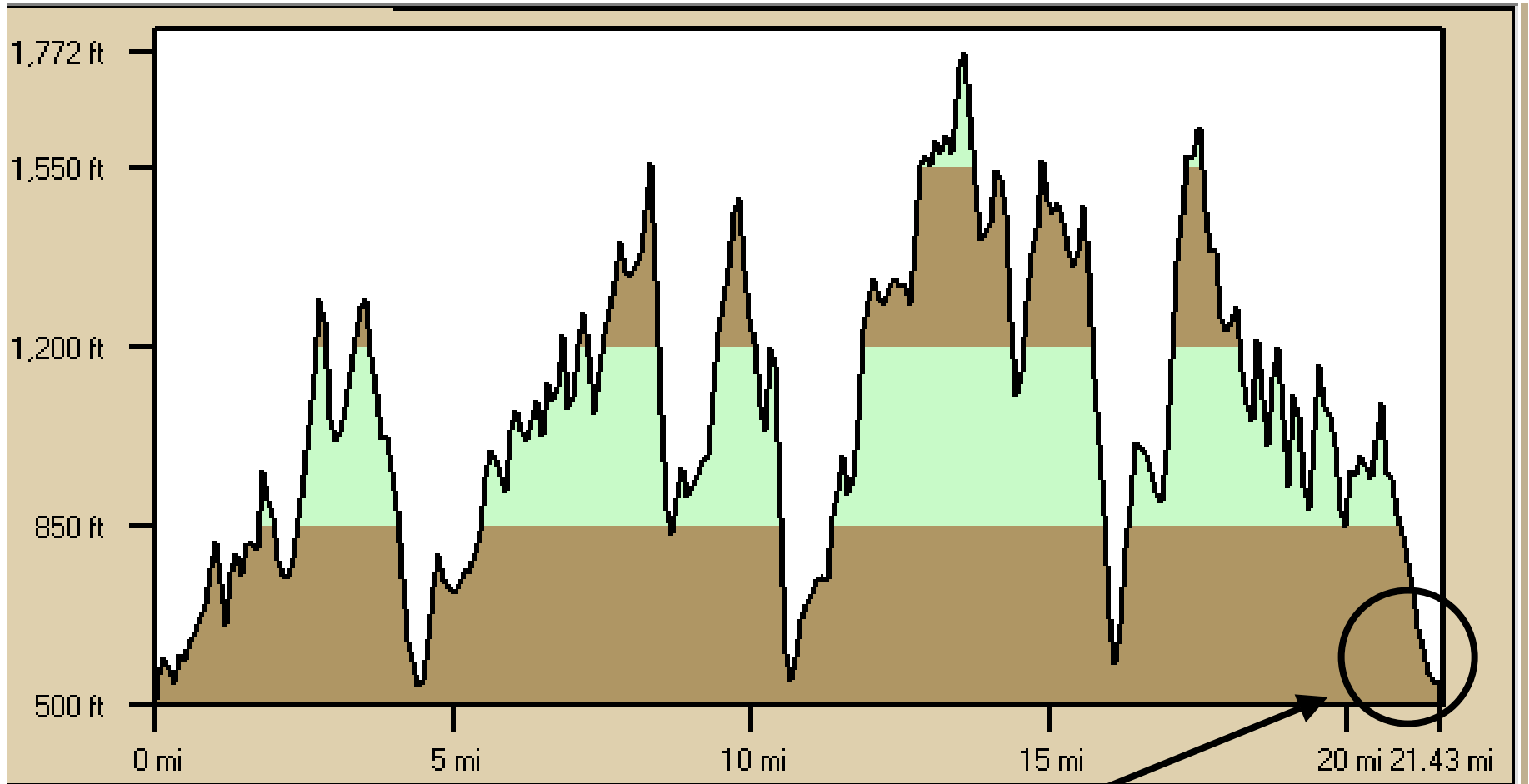


DETECTOR HALL (art view)

# Beam & Support Tunnel IP Approaches



# WARM LC at CA COPPER MOUNTAIN

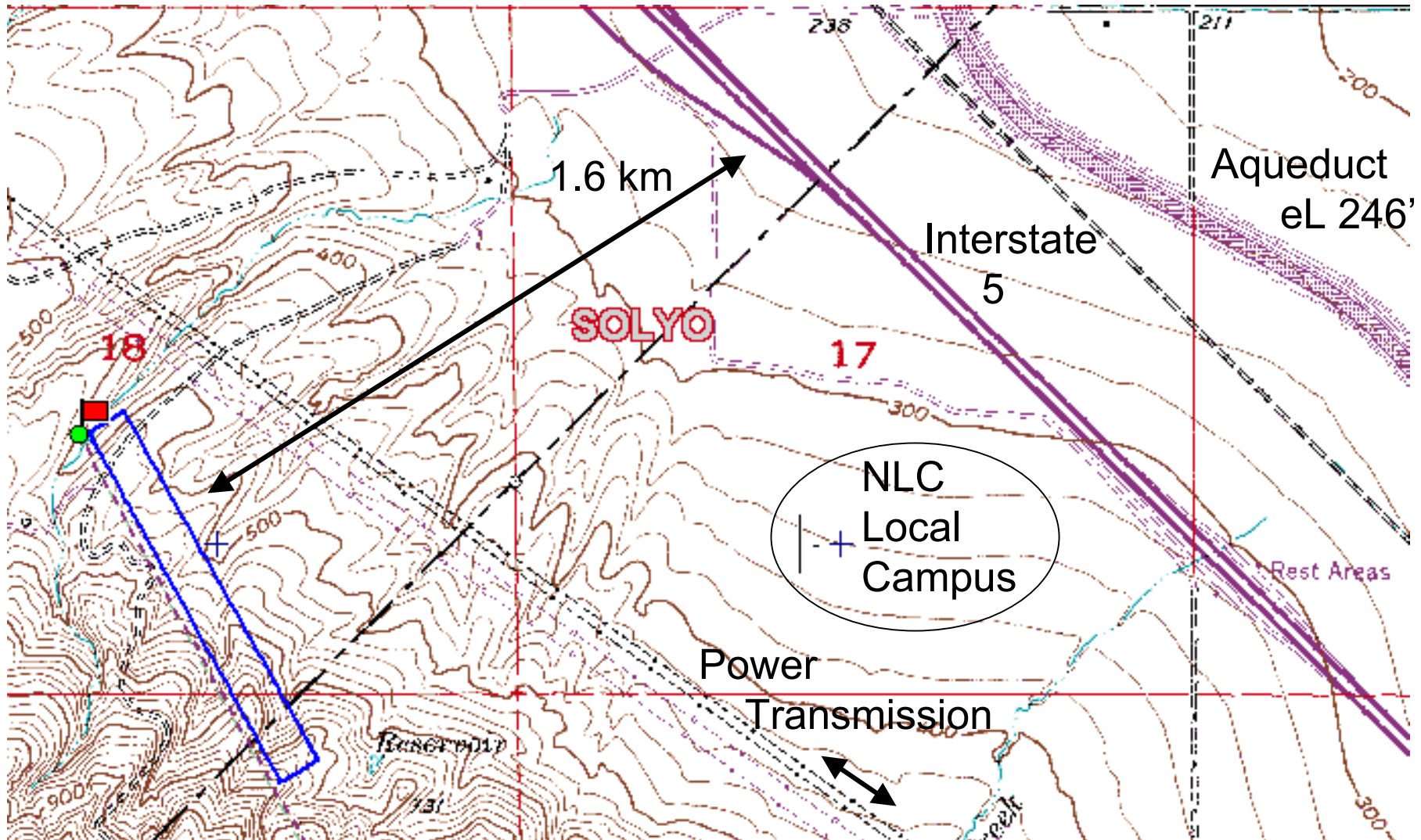


NORTH INJECTOR REGION TOUR

**→ N**



# WARM LC at CA COPPER MOUNTAIN - NORTH INJECTOR



NORTH INJECTOR AREA FEATURES

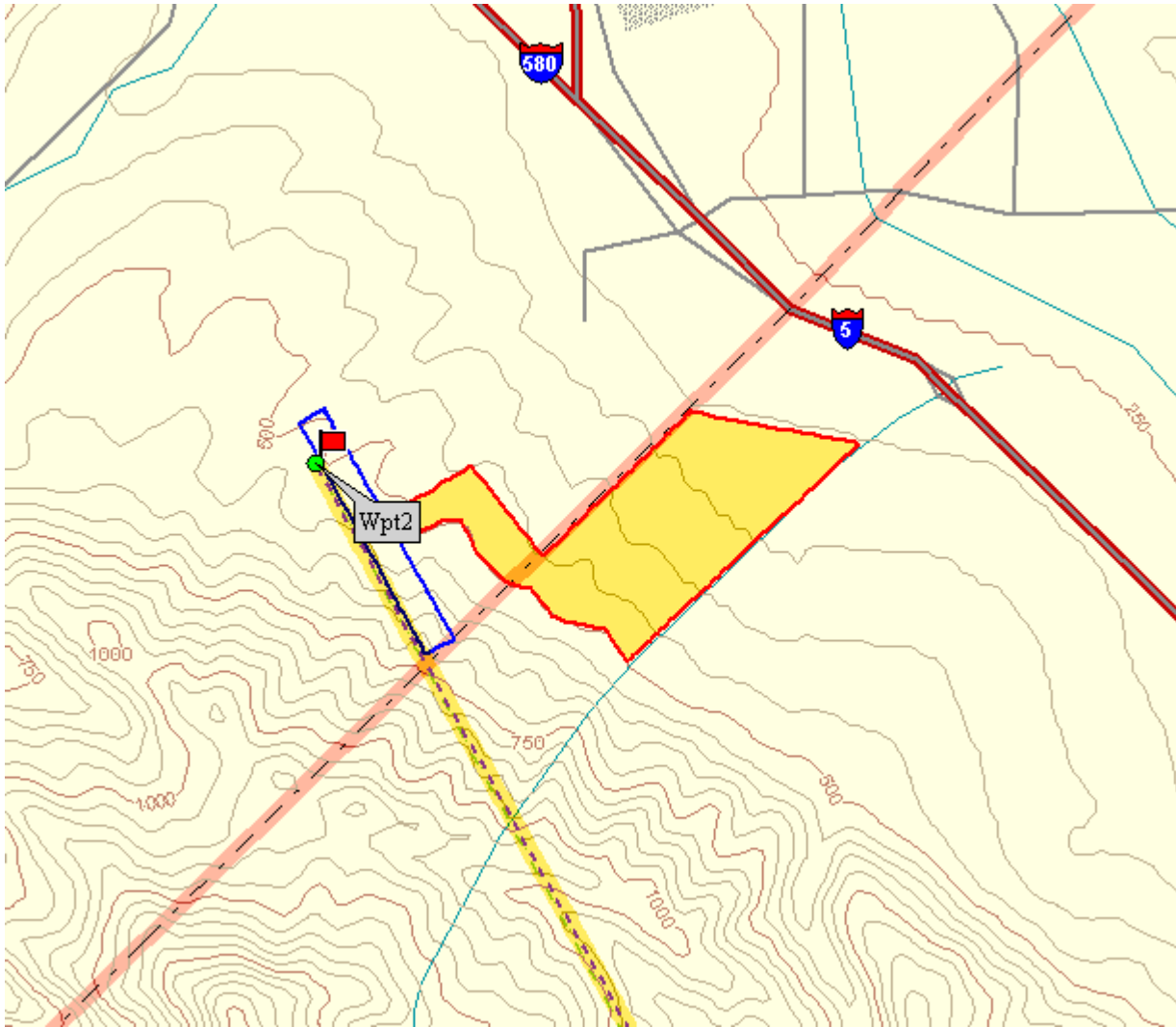


## WARM LC at CA COPPER MOUNTAIN - NORTH INJECTOR AREA



POWER TRANSMISSION CORRIDOR VIEW WEST – 8 CIRCUITS

## WARM LC at CA COPPER MOUNTAIN



WARM LC LOCAL CAMPUS

A topographic map of the LC Campus area. The map features brown contour lines indicating elevation. A yellow-shaded polygon represents the 'LC Campus' area, with the text 'LC Campus' written inside it. A red line, likely a road or boundary, runs diagonally across the map. A blue line, possibly a path or boundary, runs vertically through the center. A green line, likely a stream or boundary, runs diagonally from the top right towards the center. A small red square is located at the bottom center, near the intersection of the blue and red lines.

NORTH INJECTOR VIEW SOUTH

## WARM LC at CA COPPER MOUNTAIN



NORTH INJECTOR RIDGE & LOCAL CAMPUS



### WARM & COLD CALIFORNIA USLCSGTF LC STATUS

#### Warm LC at Copper Mountain CA

Undulator site not yet ground truthed.

Beam delivery e<sup>+</sup> bypass tunnel elevation & wye not yet set.

Drawings completed but are w/o undulator & e<sup>+</sup> bypass.

Design document text completed but now in physicists review-edit.

Cost estimates in whole project WBS not yet reconciled across full WBS.

#### Cold LC at Logan Ridge CA

Not yet ground truthed.

Drawings not yet complete.

Design document text edits not yet complete.

Cost estimates not yet in whole project WBS.





### FY 2004 CONVENTIONAL FACILITIES LC PLANS

#### CALIFORNIA

SLED-II Development Support

2-Pack Development Support

E-166 Undulator Planning, Procurement, & Pre-Assembly & Installation

3-D Layout of Copper Mountain Beam Delivery, Wye-to-Wye

3-D Vibration & Acoustic Tunnel Model Development

TQ (tunnel quieting) Studies for Isolation & Attenuation

Underground Ventilation & Fire Protection Studies

Ground Water & Hydrology Studies

Complete USLCSGTF Documents for CA Cu Mtn & Logan Ridge

#### JAPAN

#### ILLINOIS



# Warm LC at Copper Mountain Overview & Status End