

Sundance to Pinal South 230kV Transmission Project Open House

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Sundance to Pinal South 230kV Transmission Project

Project Need and Regional Information



Sundance to Pinal South 230kV Transmission Project

Key Electrical Terms

Circuit – term used to define an electrical path (Ex: 230kV circuit)

Conductor – another name for the wire that carries the electricity. Each conductor may actually be a bundle of several wires necessary for a complete 230kV circuit

Kilovolt (kV) – 1,000 volts 230kV = 230,000 volts

Monopole – a type of structure that supports electrical lines consisting of a single steel pole

Megawatt (MW) – one million watts. Referenced as a unit of measure for the output capacity of a power plant. Typically 1 MW can power up to 250 average US homes

Right-of-Way – the land rights that APS must acquire to safely construct, operate, and maintain a power line

Span – the distance between two supporting structures

Substation – an electrical facility that serves as a point of interconnection for transmission and/or distribution lines where power is transformed for regional transport across the electric grid

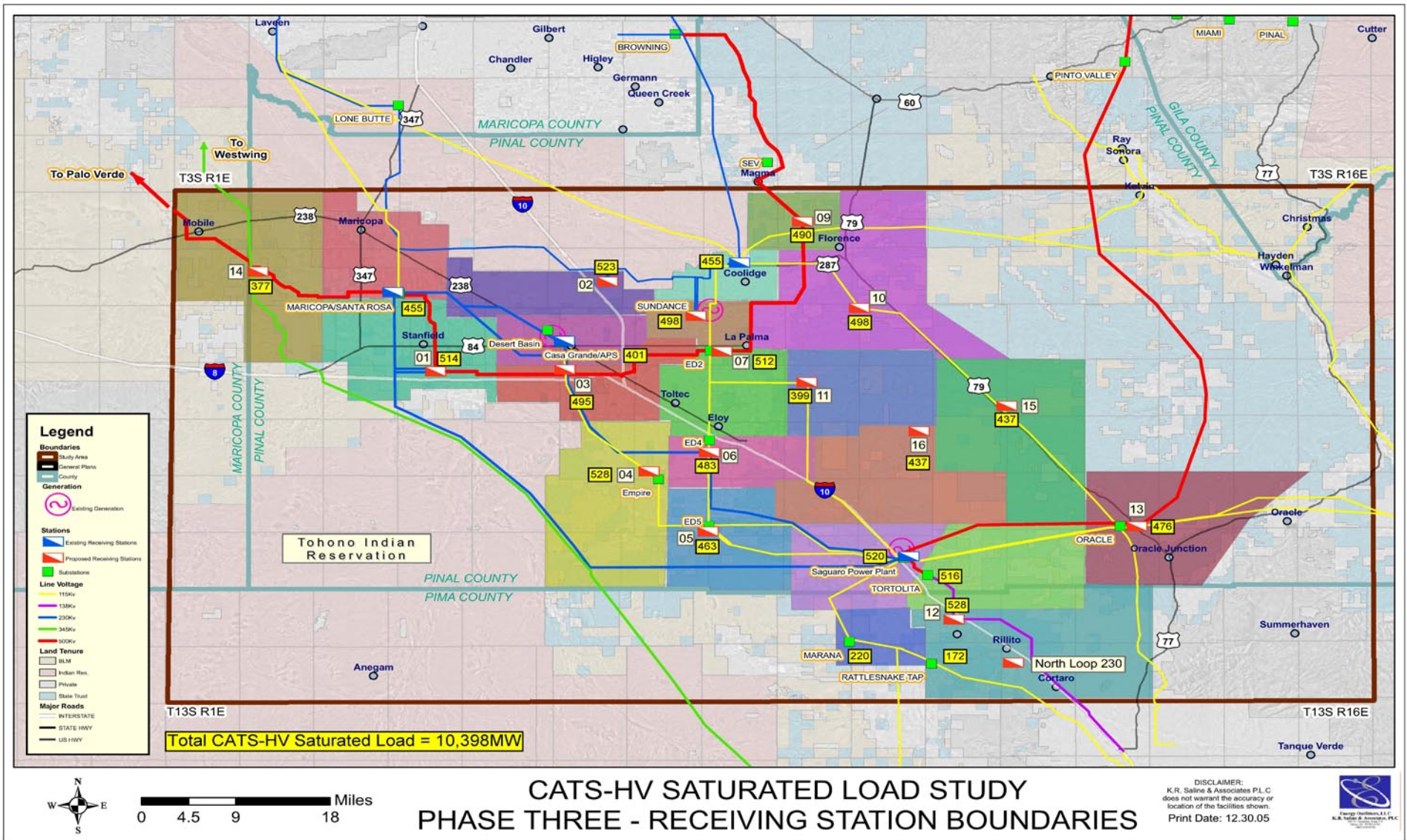


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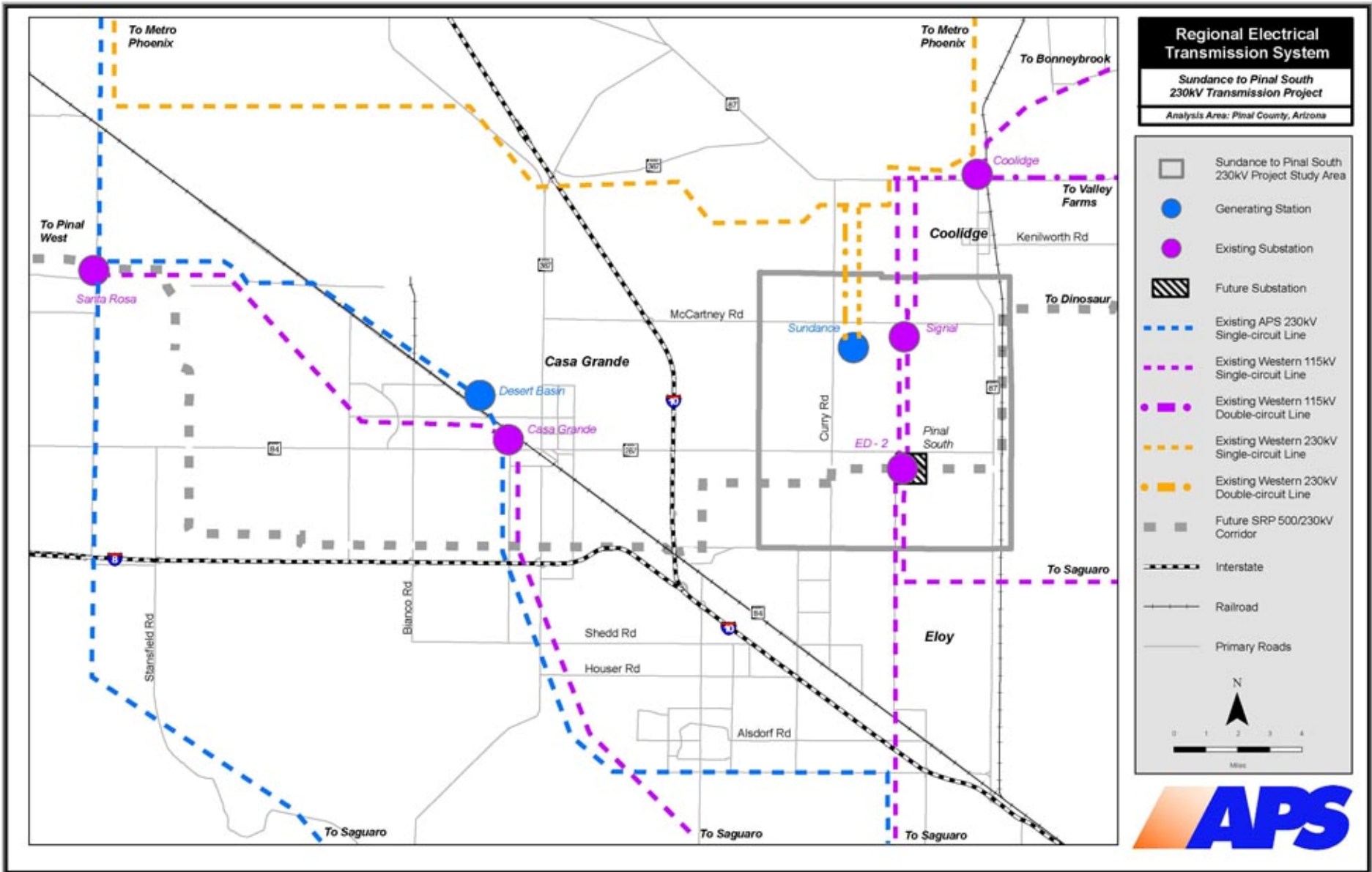
- **Project Need**

- Increase local capacity, which will improve the reliability and continuity of service for the electrical load in the area
- Allow APS to schedule the full output capability of the Sundance facility, currently estimated at 420 megawatts during peak summer conditions
- Economically provide a new 230kV path for existing and potential future generation at the Sundance facility





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A Little Bit About Sundance

- Plant began Service in Summer of 2002
- Acquired by APS in Spring of 2005
- Natural gas-fueled “peaking plant”
 - 10 quick-start turbines
 - capable of producing approximately 450 MW
- APS owns approximately 300 acres around the Sundance facility (current plant operations occupy about 45 acres)



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Project Description and Design Considerations



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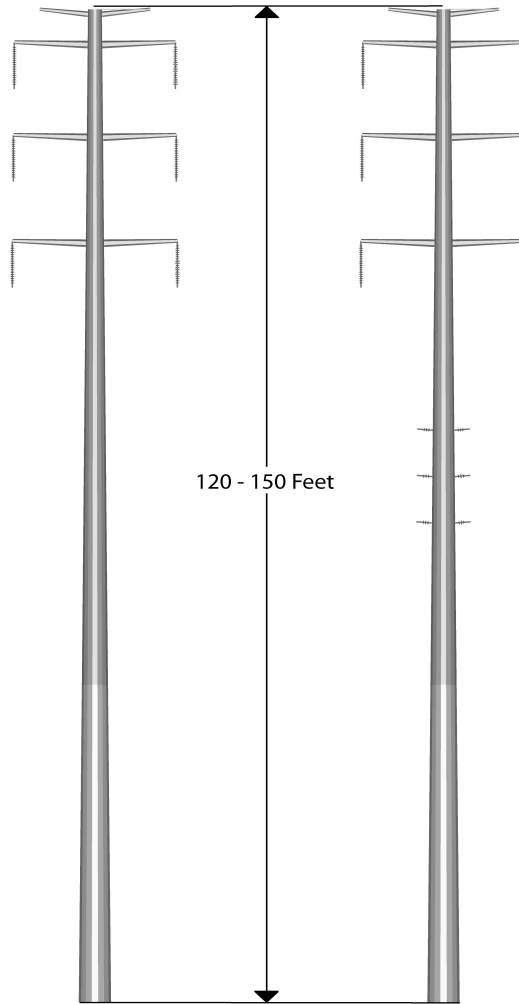
- **Project Description**

- Double-circuit 230kV transmission line
- Tie-in at Sundance and interconnection facilities at Pinal South
- Steel monopole structures
- Average structure height of 120 to 150 feet
- 100 to 130 feet of right-of-way
- Transmission line in-service, Summer 2011
 - *Right-of-way acquisition, followed by design, and then construction, would initiate after receipt of the CEC*



Conceptual 230kV Structure

**Double Circuit 230kV
Transmission Structure
with no Underbuild**



**Double Circuit 230kV
Transmission Structure
with 69kV Underbuild**



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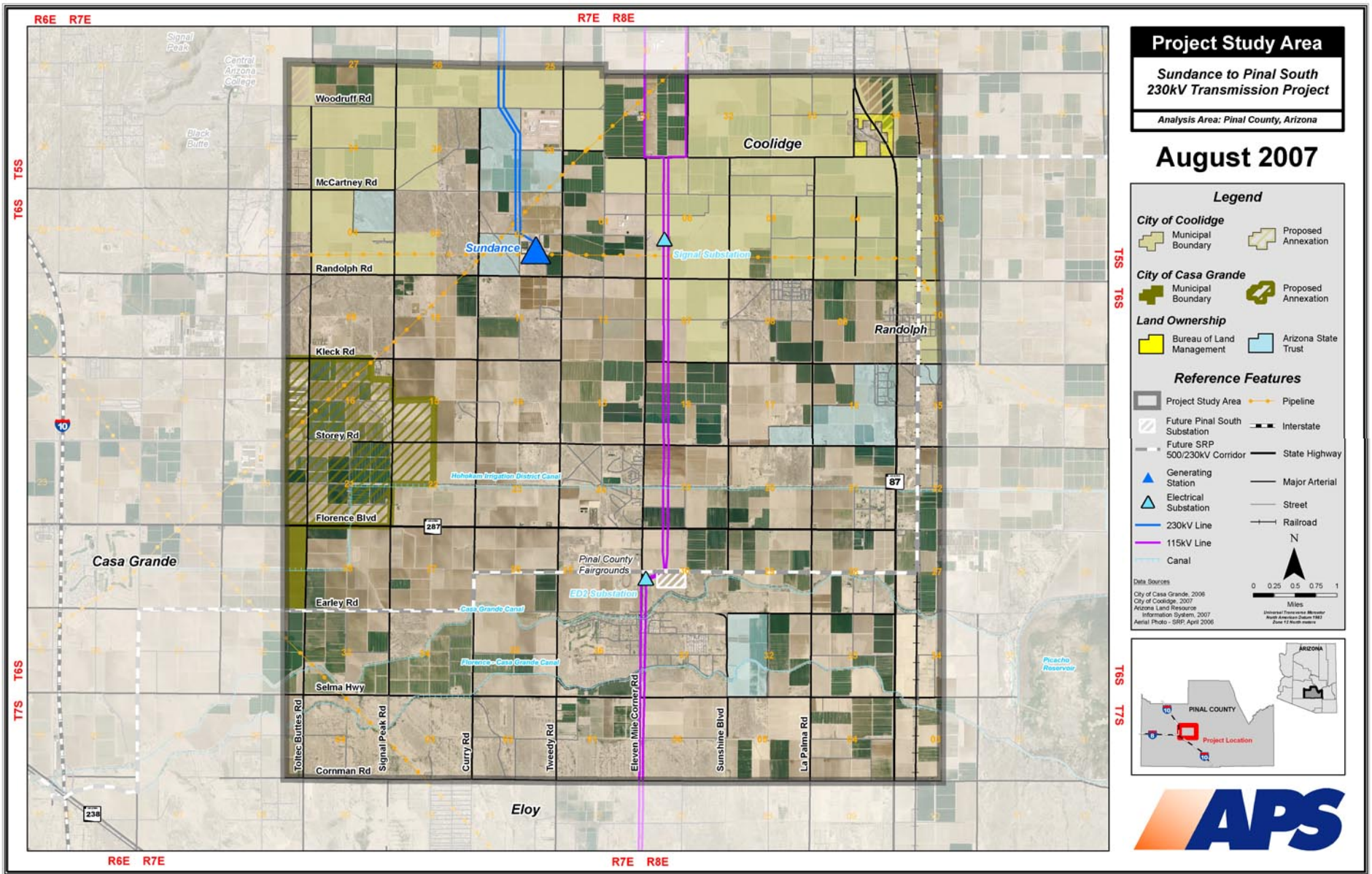


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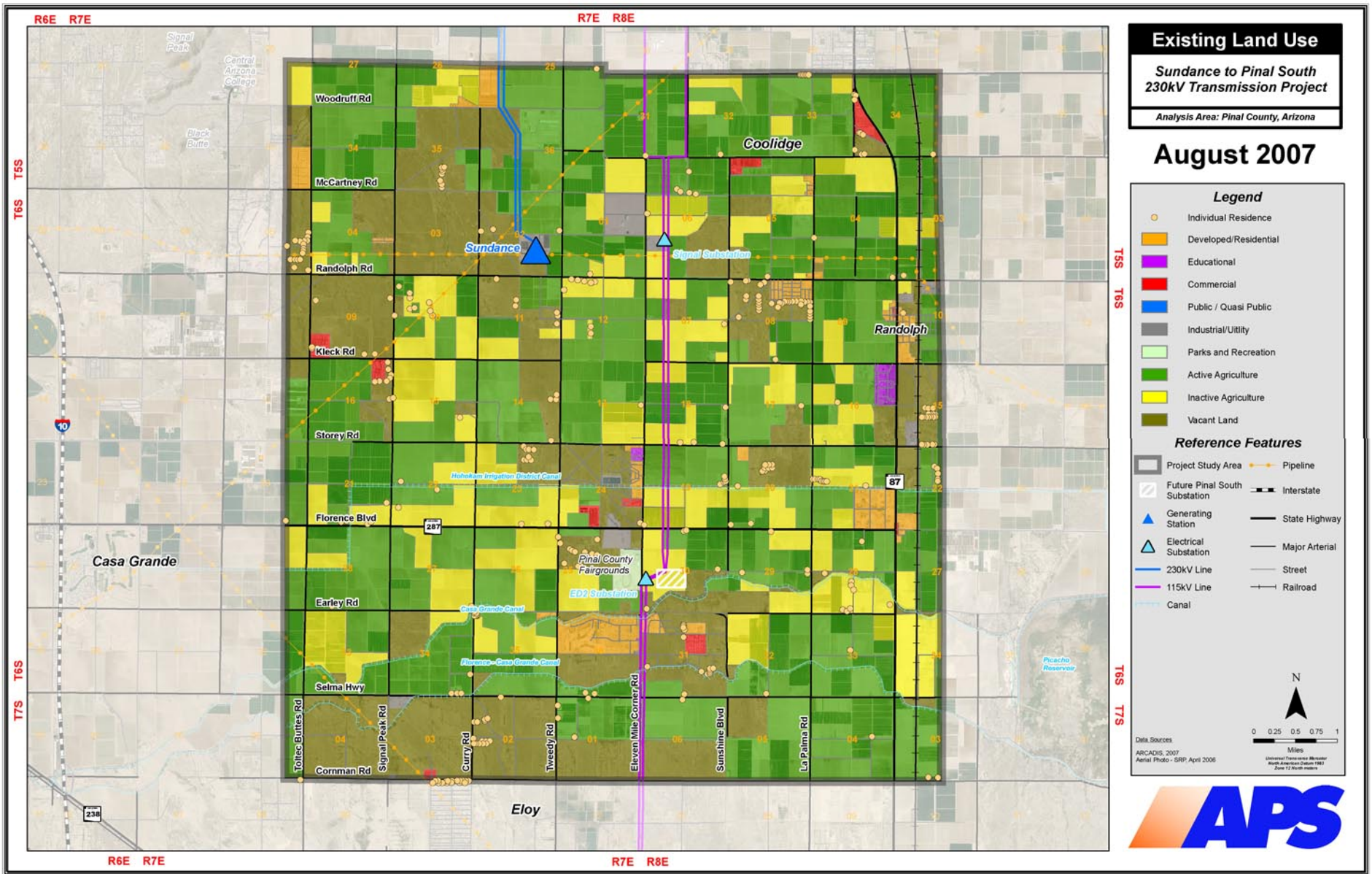
Study Area and Resource Data Collected



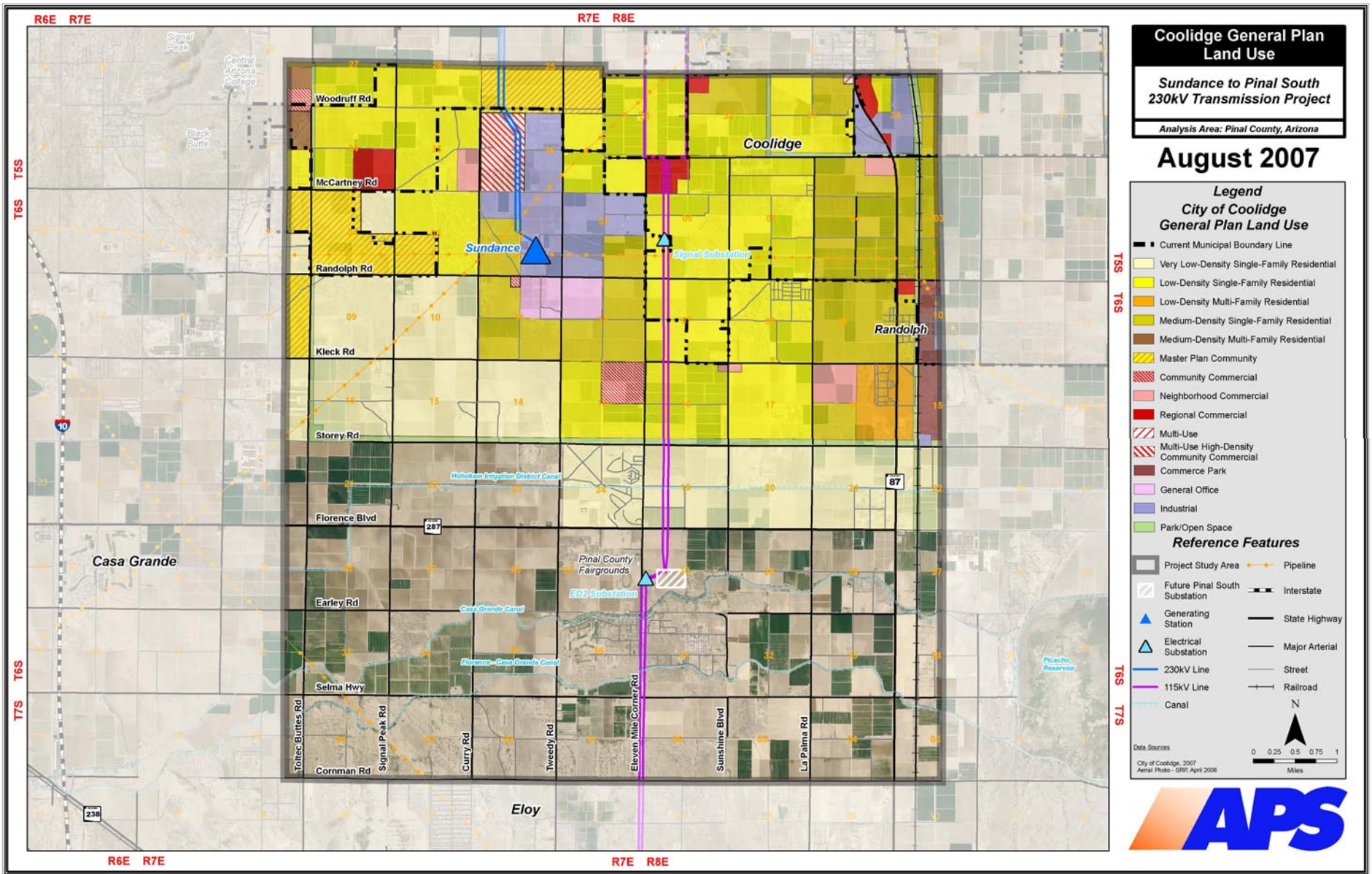
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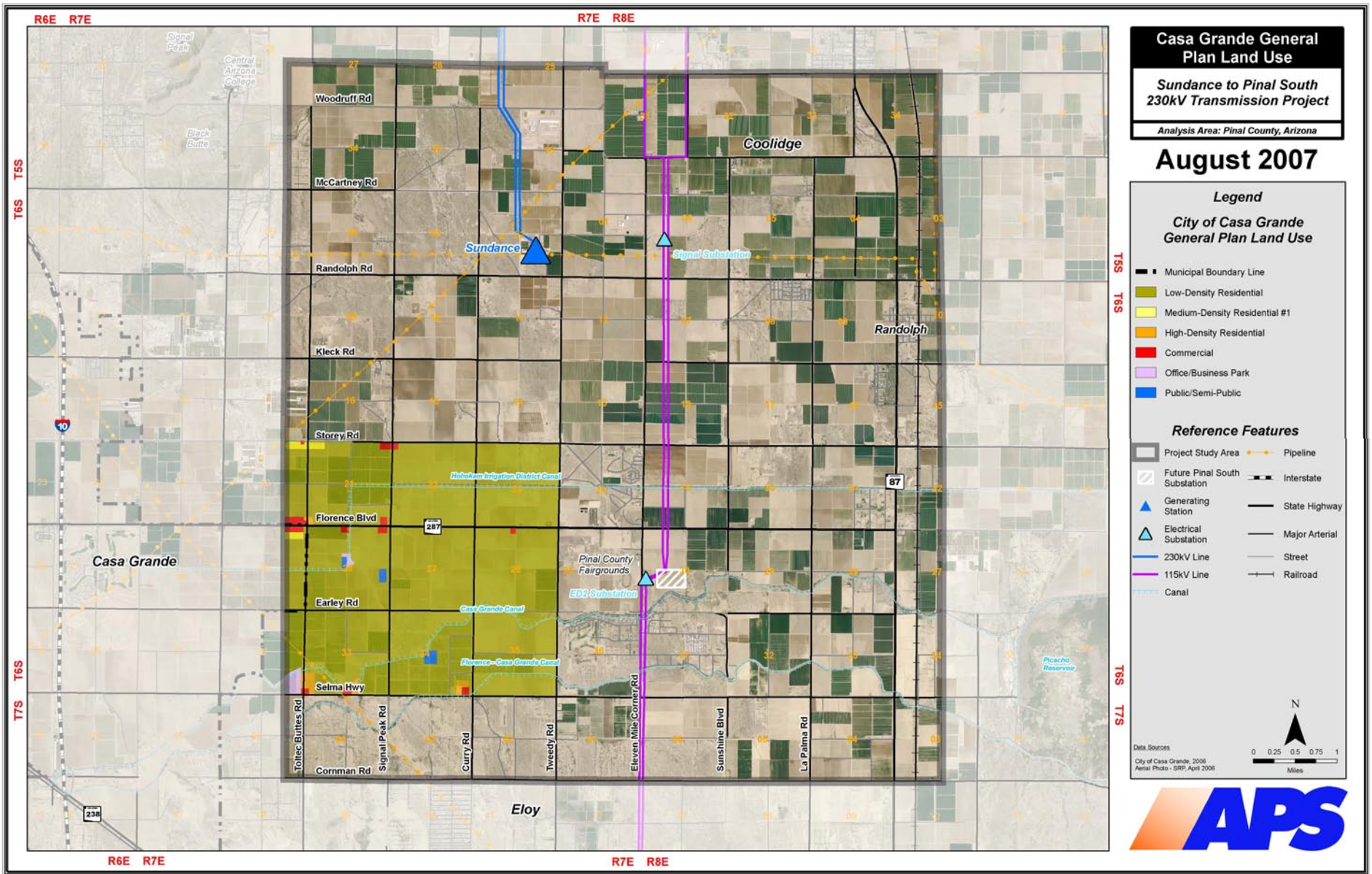
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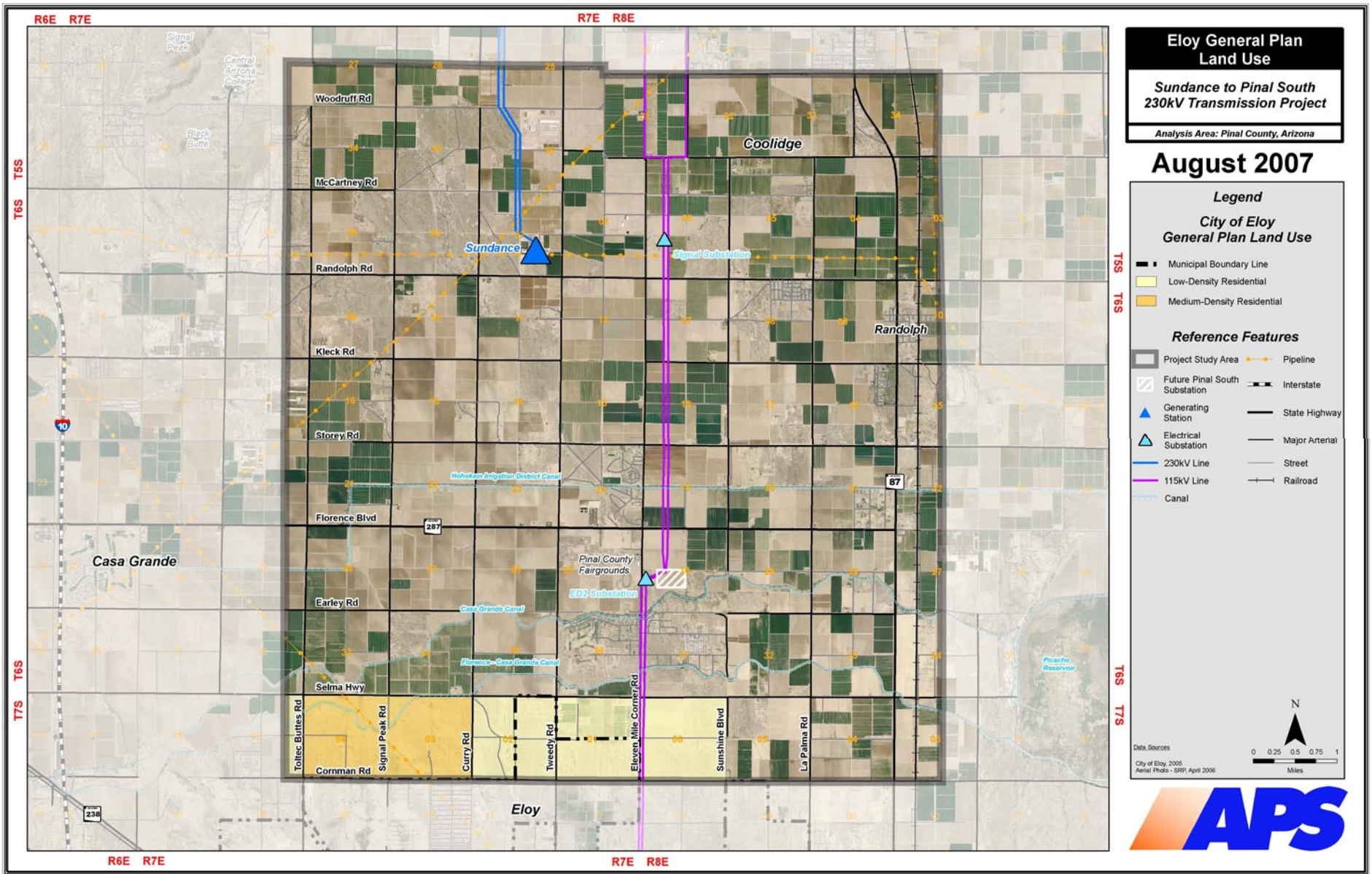
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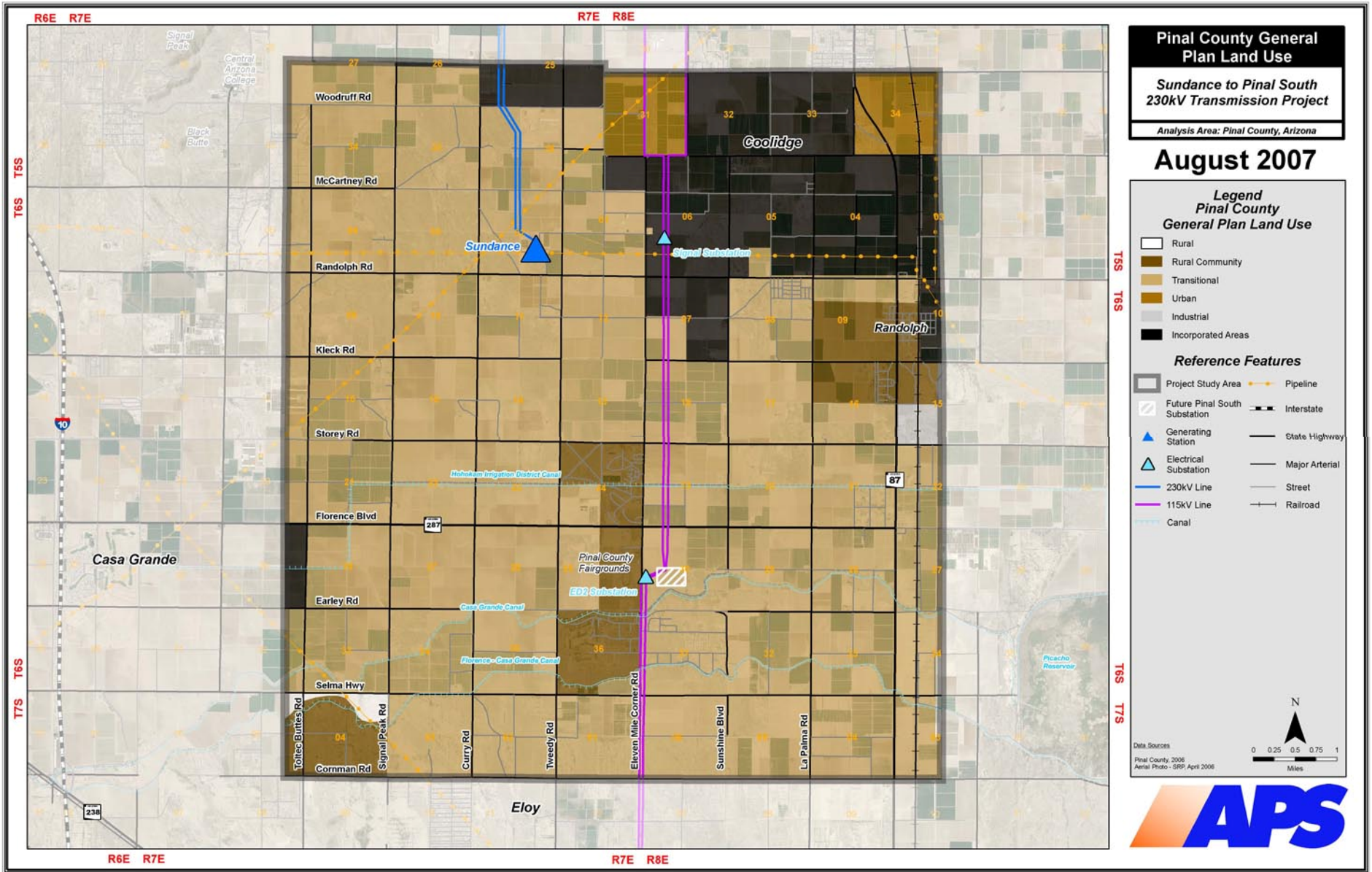
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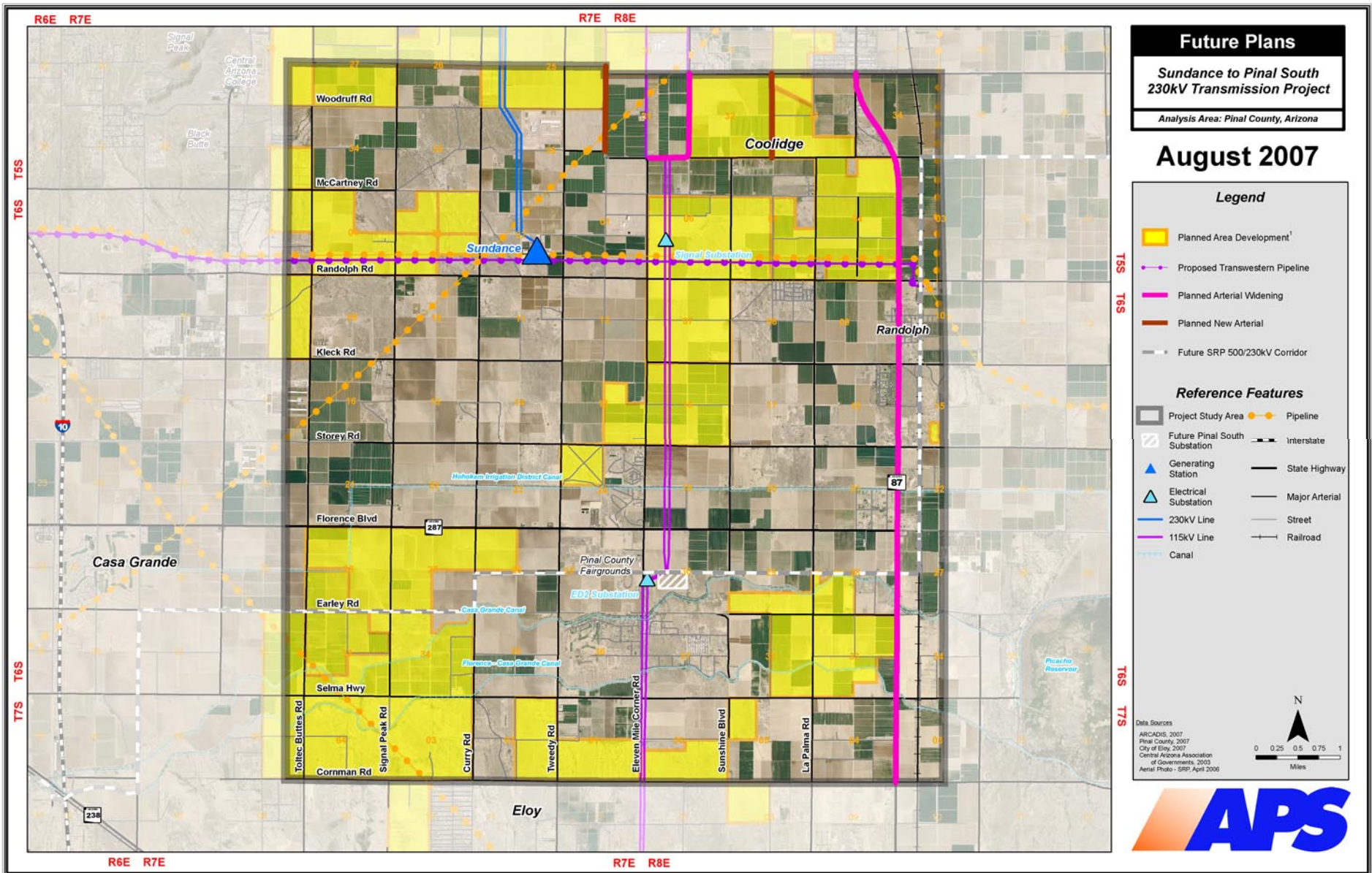
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¹ Planned Area Developments displayed on this map include all areas that have held zoning hearings as of August 1, 2007



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Route Identification and Screening



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Siting Criteria / Opportunities

Primary

Designated Utility Corridors

Existing Transmission Lines and Rights-of-Way

Existing Canals

Existing Railroads

**Existing Roads / Highways
(County Road Level or Greater)**

Existing Pipelines

**Future Approved Utilities
(Transmission Lines, etc.)**

**Developed Section Lines / Major Property Lines /
County Dedicated Roads**

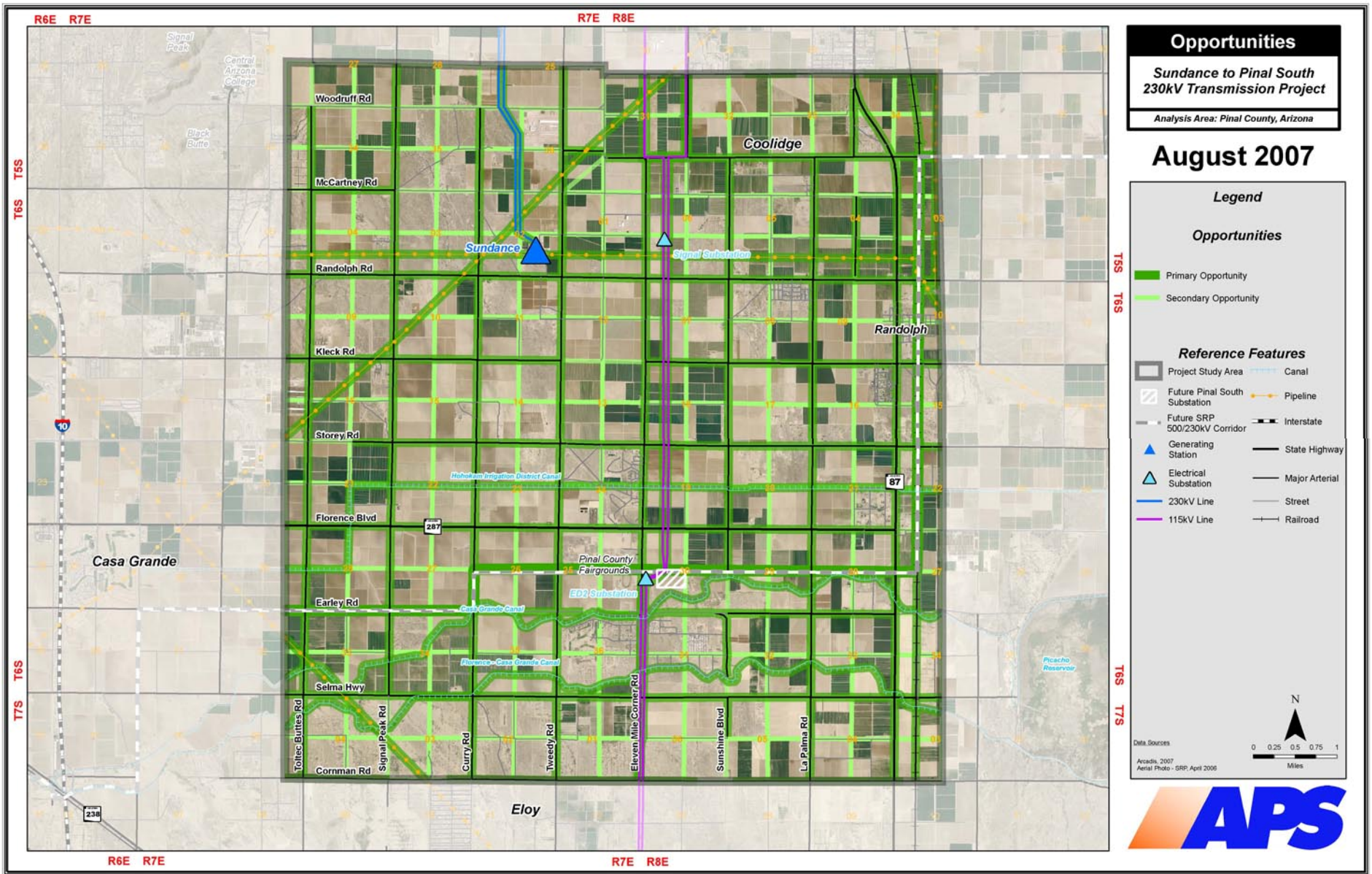
Secondary

Existing Small Canals and Drainage Features

Undeveloped Section and Half-Section Lines



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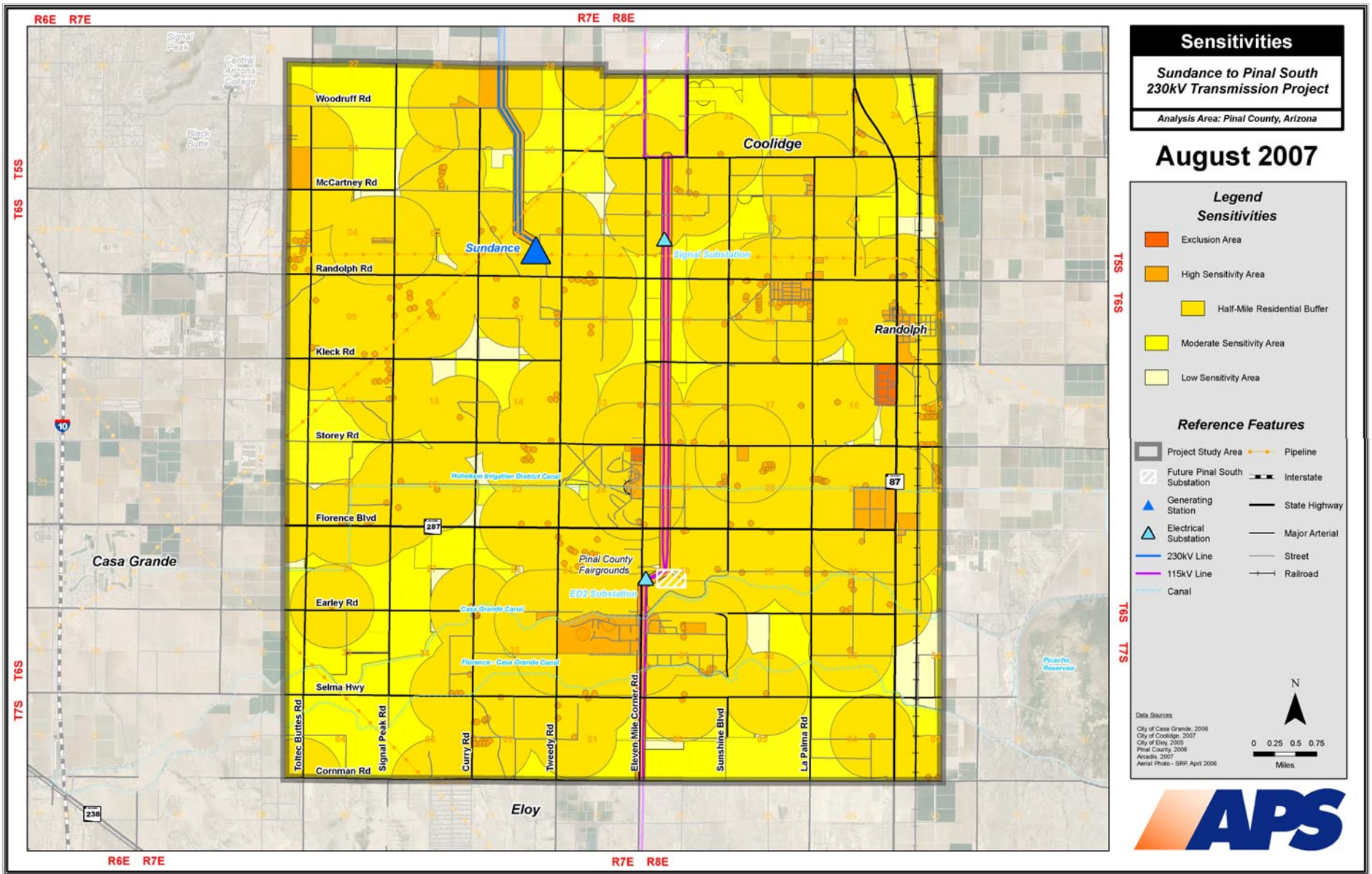
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Areas of Sensitivity / Constraints

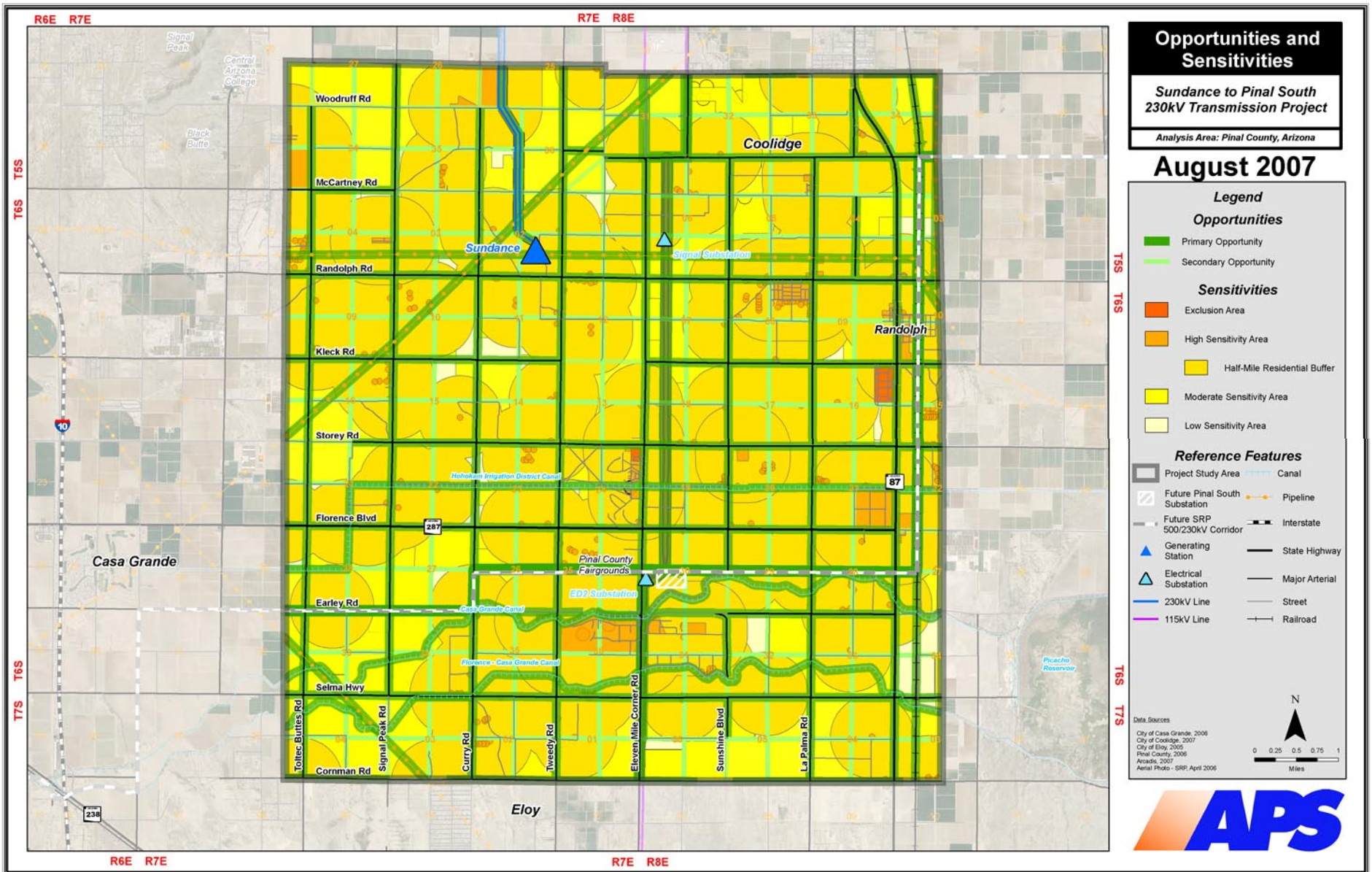
Exclusion	Exclusion
	High
	Medium
	Low
	Educational Facilities
	Existing Residences and Residential Developments (half-mile buffer)
	Regional Parks and Recreation Facilities
	*Constrained Transmission Line Corridors
	Agricultural Areas (Active)
	Biological Sensitive Areas
	Commercial Land Uses
	Public/Quasi-Public Land Uses
	Planned Area Developments
	General Plan Land Uses
	Industrial and Utility Land Uses
	Vacant Land or Inactive Agricultural Areas

*A “constrained transmission line corridor” is an area with existing transmission lines where the addition of a new line (or lines) could negatively impact system reliability

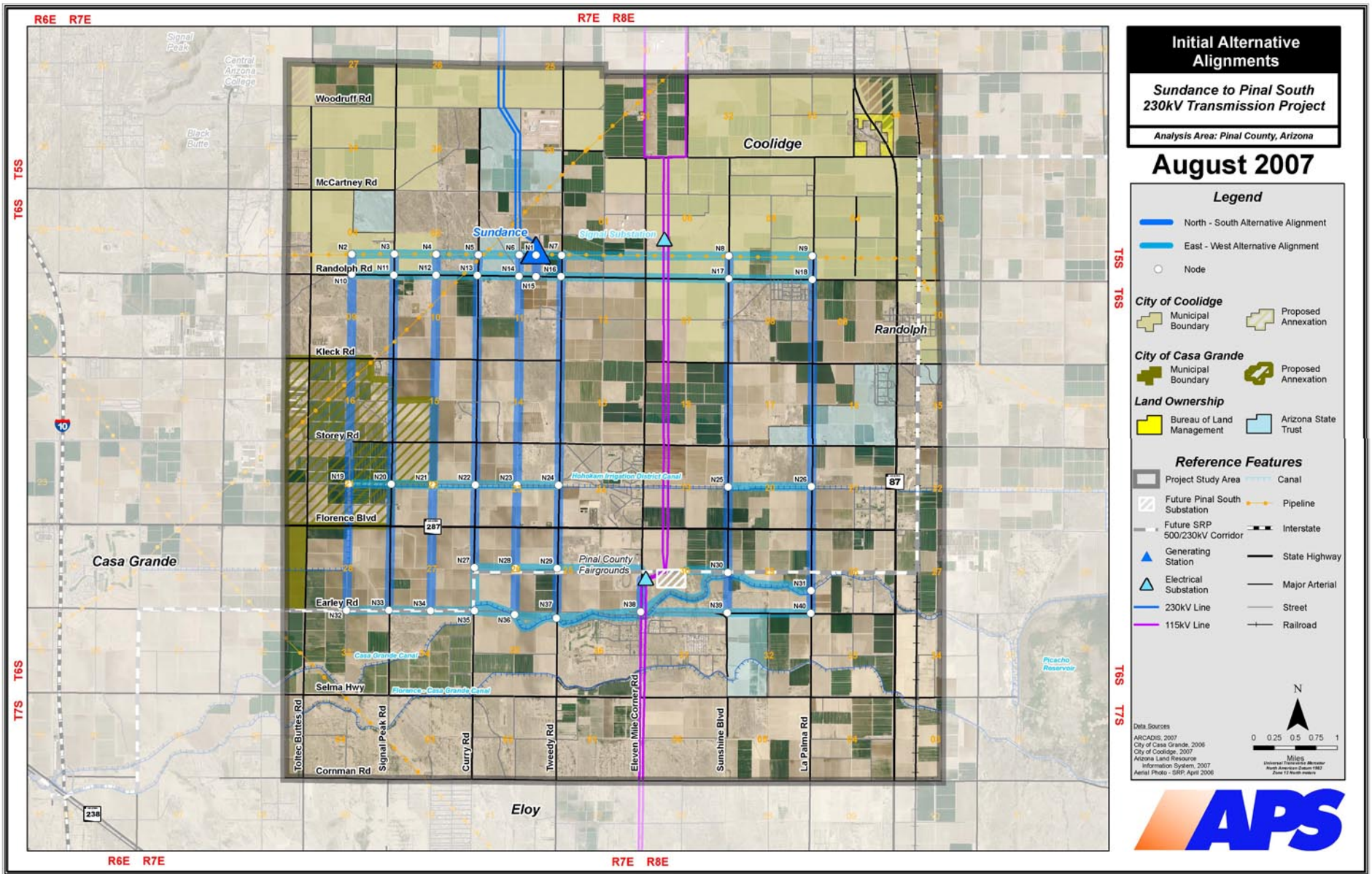




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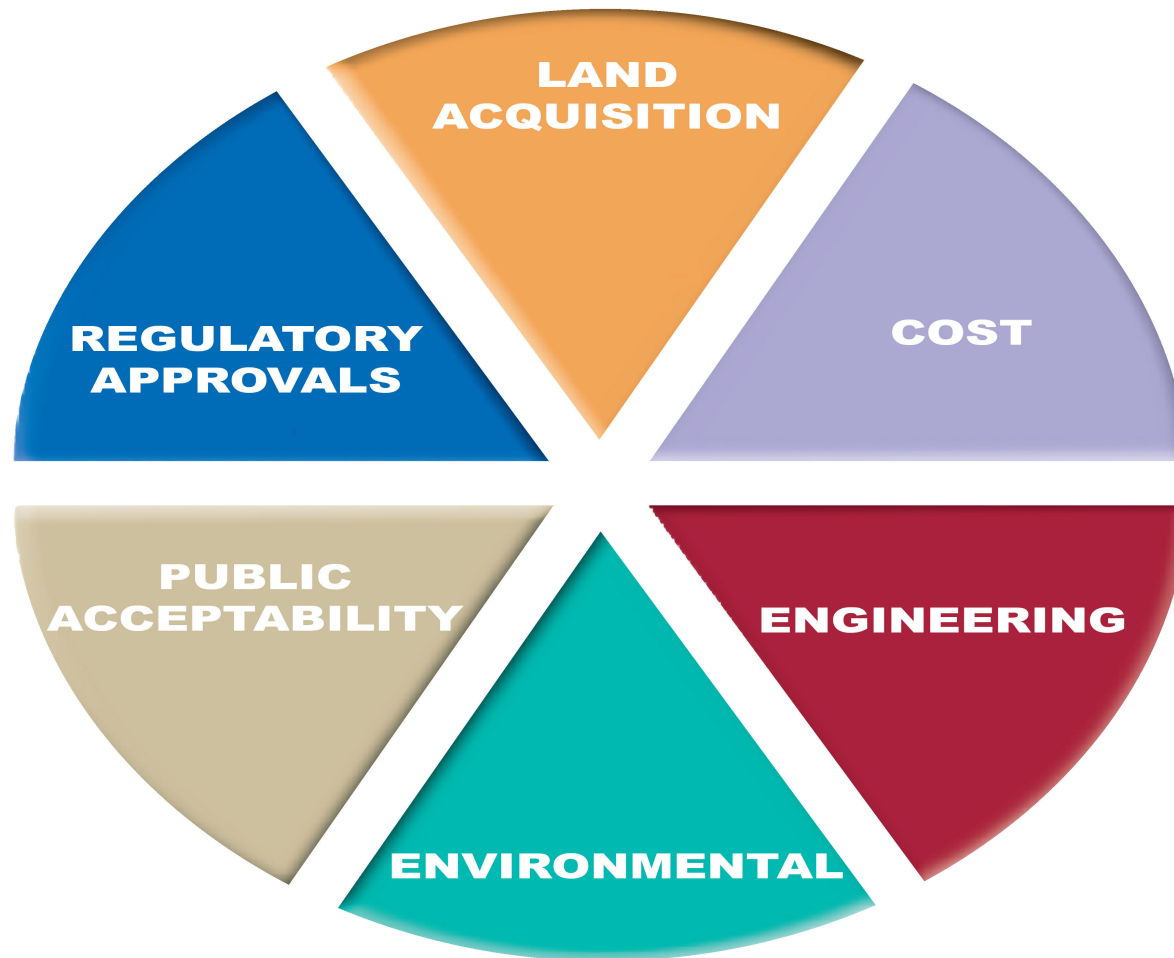


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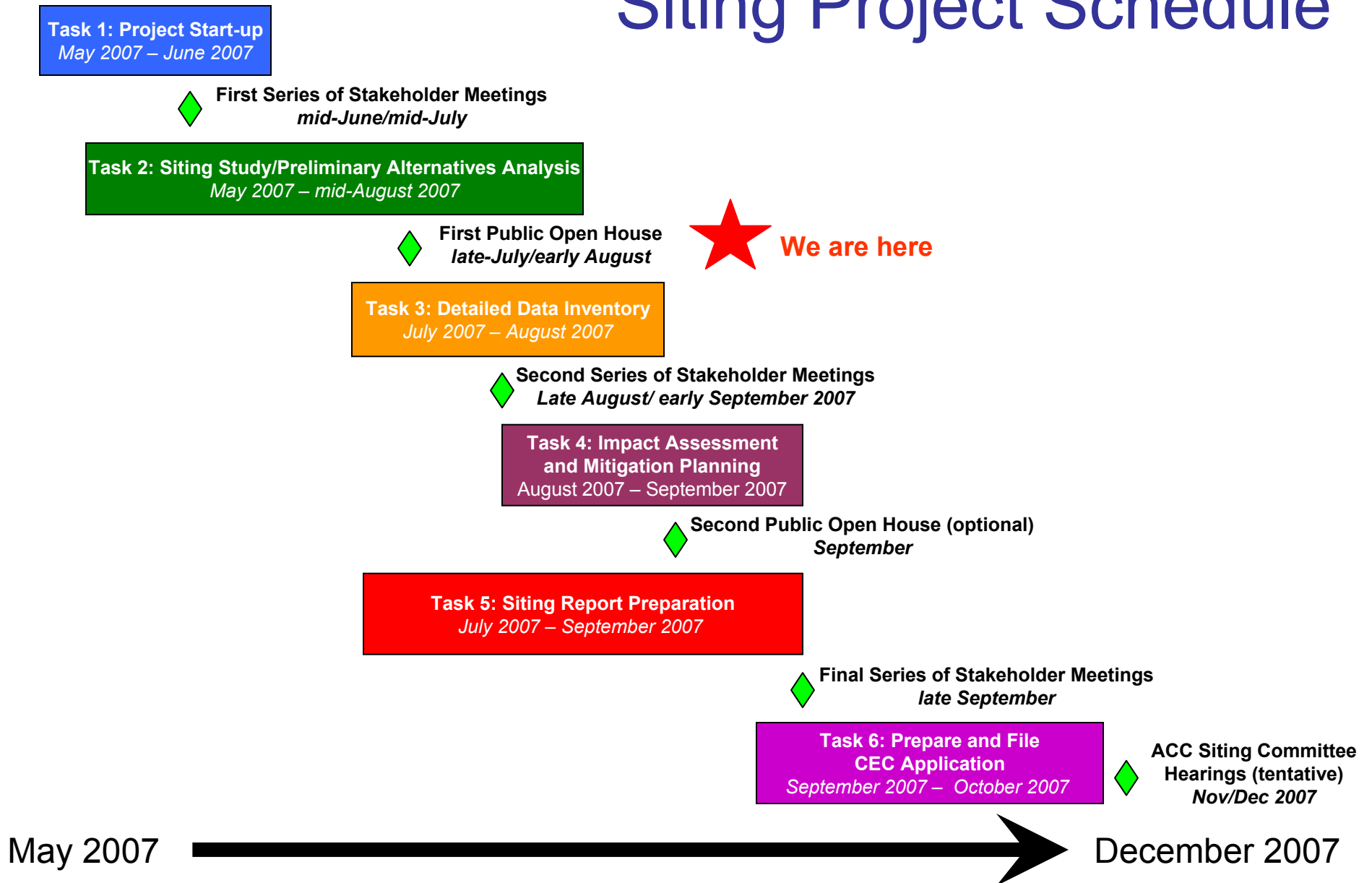
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Transmission Line Siting Considerations



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Siting Project Schedule



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Technical Considerations



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EMF

(Electric and Magnetic Fields)

- APS recognizes the public concern for EMF and have included EMF considerations in the design of this project
- Typical magnetic field calculations for this project **(based on expected 2011 flows)***

Inside the Right-of-Way	< 5 (mG)
– 50 feet from the structure	3.5 (mG)
– 100 feet from the structure	< 2 (mG)

**Magnetic field calculations may vary based on the ultimate line configuration and the amount of electric load carried by the lines*
- Additional information and research
 - World Health Organization (<http://www.who.int/en/>)
 - National Institute of Environmental Health Sciences (<http://www.niehs.nih.gov/>)



EMF

(Electric and Magnetic Fields)

- EMF's are produced by ALL devices which use, carry, or produce electricity
- EMF strength drops off dramatically as distance from the source increases
- Research on EMF began in the 1970's and continues today
- To date, no Federal or Arizona State standards have been established for EMF levels or exposure
- APS continues to monitor U.S. and international studies regarding EMF and offers free in-home measurements of EMF levels to all APS customers



Electric Fields

- Electrostatic induction can occur with insulated objects near the transmission line. This can result in nuisance shocks to individuals touching a grounded object under or near the line
- IEEE standard for electric field values (max):
 - Outside of the Right-of-Way 5.0 kV/m
 - Inside of the Right-of-Way 10.0 kV/m
- Calculated values for this project:
 - Outside of the Right-of-Way < 0.5 kV/m
 - Inside of the Right-of-Way < 1.1 kV/m



Communications

- Transmission lines have been known to cause interference with radio and TV transmissions
- Calculated radio noise levels (at 100 feet from conductor):
25.1 dB(A) fair weather (try to keep below 40 dB(A))
- Based on interference studies, no interference is expected with digital, satellite, or cable television



Corona

- Corona is defined as the breakdown of air into charged electrical particles. The amount of corona for a transmission line is a function of several things including:
 - Engineering Design
 - Voltage
 - Phase spacing and geometry
 - Weather conditions
- Effects of Corona are:
 - Audible Noise
 - Radio and TV interference



Audible Noise

- Created by Corona discharge along the line and the frequency and voltage level of the line
- Transmission line noise can be described as humming or crackling
- Noise Levels (at 100 feet from the structure) for this project are expected to be:
 - Fair Weather 11 dB(A)
 - Wet Weather 23 dB(A)
 - Ldn (Weighted Avg.) 17 dB(A)
- Suggested Levels (100 feet from the structure):
 - EPRI studies re: customer complaints 52.5 dB(A)
 - EPA recommended Ldn level 55.0 dB(A)
- Other common levels
 - Busy Traffic 70 dB(A)
 - Moderate Rain 50 db(A)

Noise levels on this project are expected to be less than the suggested levels



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Opportunities for Public Information and Comment

- Fill out and return a comment form tonight!
- Electronic comment forms and project updates available on the Project Web site: **siting.aps.com** (see Sundance to Pinal South 230kV under “Current Projects”)
- Greg Bernosky, APS Project Manager can be reached at 1-866-472-4484 (Select option 2)
- Future project newsletter(s) will have updated information and opportunities for comment
- Arizona Power Plant and Transmission Line Siting Committee



Hearings

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Interactive GIS



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