



**Kino to DeMoss-Petrie 138 Kilovolt (kV)
Transmission Line Project**

CWG Meeting #3

February 12, 2020
6:00-8:00 p.m.



Welcome & Introductions

Kino to DeMoss-Petrie Transmission Line Project

Agenda



- TEP's Line Siting Process
- Project Updates (data gathering, geospatial analysis, project studies)
- Summary of the Underground Cost Analysis Report
- Overview of Underground District formation
- EMF Q&A Session
- Transmission Lines and Effects on Property Values
- Preliminary Geospatial Analysis – Residential Use, Sensitive Receptors, and Historic Properties
- Developing Preliminary Routes – Initial Feedback Session
- Project Next Steps
- CWG Meeting #4
- UA North Substation Update

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TEP's Line Siting Process

- Identify the need for the Project.
- Identify the Preliminary Study Area.
- Prepare Public Notification Plan/Identify stakeholders.
- Collect baseline data/conduct internal analysis.
- Conduct first round of outreach.
- Identify preliminary links.
- Conduct second round of outreach.
- Identify & analyze opportunities and constraints.
- Conduct follow on Stakeholder & Community Working Group meetings.
- Develop multiple proposed routes.
- Conduct follow on public/stakeholder outreach.
- Conduct impact assessment/engineering & constructability assessment/route comparison.
- Identify alternative routes to carry forward in ACC application for a CEC.
- Prepare and file ACC application.



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Project Updates



- Collected other utility location information
- Collected future City/County road project information
- Collected future land development information
- Continue to receive comments, conduct research, and prepare comment responses
- Presented and refined DRAFT preliminary links with the CWG at Meeting #2
- Continued to conduct stakeholder meetings with other utilities, City & County officials, and others
- Revised the DRAFT Preliminary Links and maps based on feedback
- Conducted preliminary Geospatial Analysis
- Conducted 138kV Underground Cost Analysis study

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Project Updates



Since the last Stakeholder/CWG/Public Meeting:

- Received and answered 48 questions from CWG
- Received 152 public comments, responded to 60% + and continue to review/respond
 - Common Themes:
 - When the public can review potential routes
 - Health effects electromagnetic fields (EMF)
 - Costs associated with underground transmission lines
 - Potential effects on private property values
 - TEP's current renewables goals

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138kV Underground Study

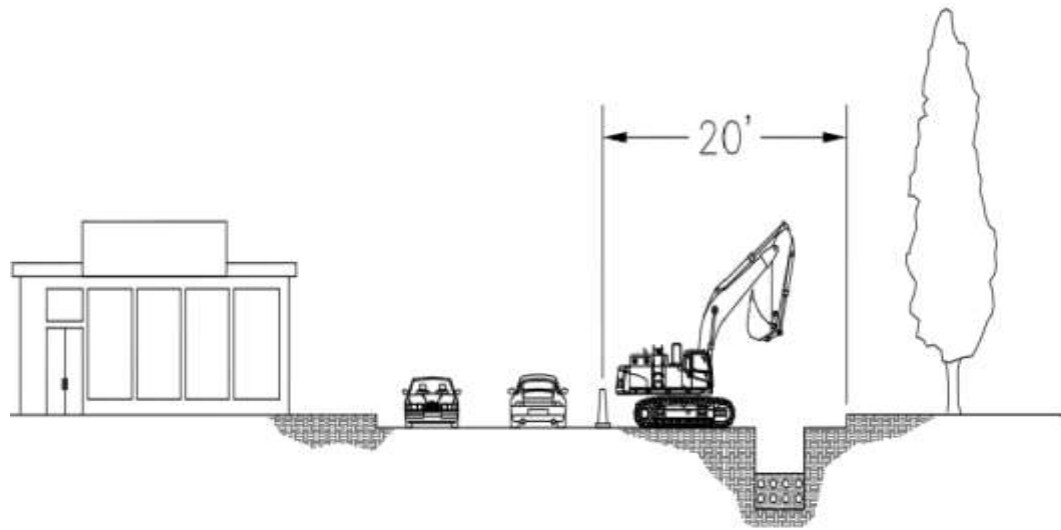


Study Overview:

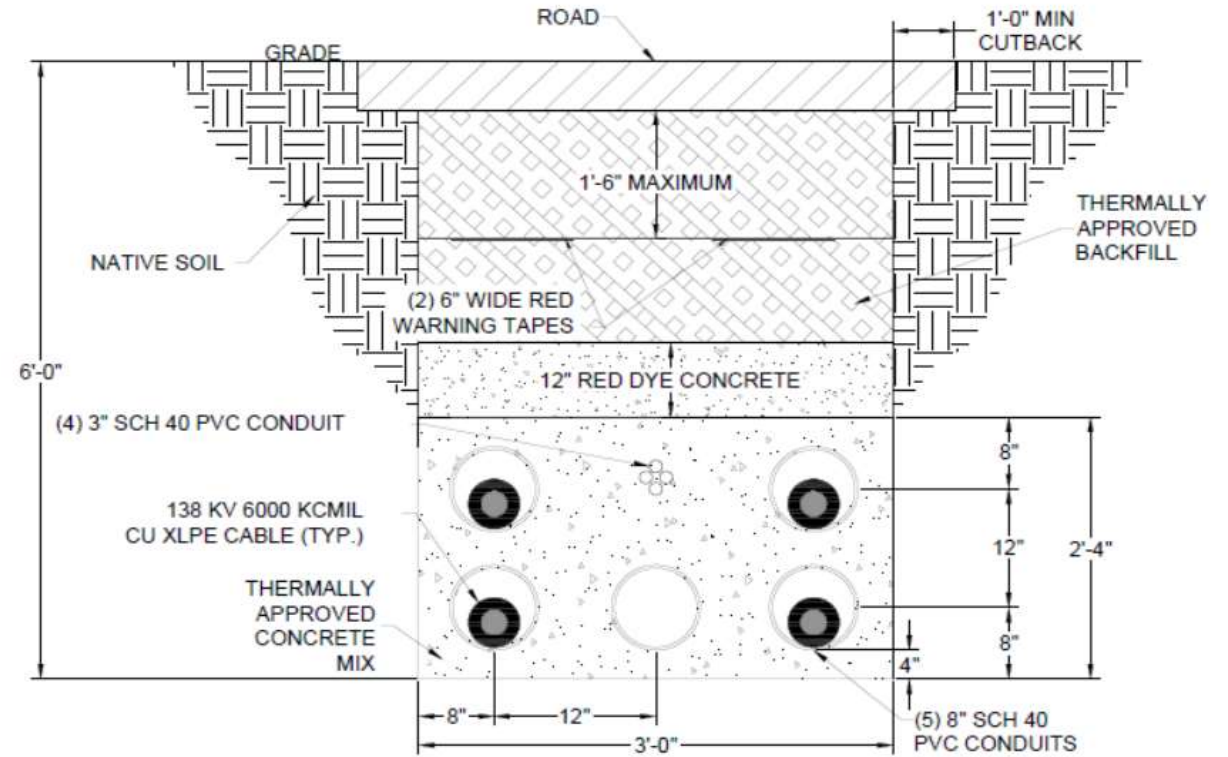
- 1.5 mile underground vs. 1.5 mile overhead
- Assumed urban environment
- Assumed open trench construction
- Assumed jack-and-bore method for major road crossings (3 assumed)
- Conflicts with most existing utilities *NOT* considered (assumed 12 sewer crossings for study)
- EMF not considered as part of this study (requires actual design)
- Underground cable used in study assumed to be equivalent to overhead conductor (overall capacity of lines)

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138kV Underground Study



Typical Work Space



Typical Trench x-section

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Typical HV Electric Vault
Placement

Typical HV Electric Vault
Backfill



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138kV Underground Study



Jack-and-Bore
Sending/receiving pit

Jack-and-Bore
Sending/receiving pit



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138kV Underground Study



Study Summary:

- TEP assumes \$1 million/mile for overhead 138 kV construction
 - \$1.5 million /1.5miles
- \$16.4 million/1.5 miles estimated for cost of 138 kV underground in urban environment
- Outage time can be extreme
- Maintenance can be more costly
- 138 kV underground construction vs 138 kV overhead construction
 - **Approximately 11x greater**

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Underground District Formation



Who pays the cost to for underground installation:

- Cost difference is borne by the community, developer, or organization requesting an underground option.
- A.R.S. Section 48-620 provides a mechanism to fund the additional cost through formation of an underground improvement district.
- Use of Section 48-620 or any other funding mechanism will have to be in place and approved before TEP begins the engineering of the underground facilities and procurement of materials.

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Electromagnetic Fields (EMF)



Questions?

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Property Values



- Impacts cannot easily be measured and may vary based on multiple factors.
- About half of the studies examining the impact of transmission lines on property values find no statistically significant or systematic impacts on property values.
- Impacts typically diminish as distance from the line increases.
- Impacts attributable to line proximity are temporary and typically decrease over time.

Sources: Utility versus Proximity, 2015, International Right of Way Association magazine

Power Lines and Property Values Revisited, 2007, the Appraisal Journal

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Preliminary Geospatial Analysis



Geospatial Analysis:

- Applies statistical analysis to data which has a geographical or geospatial aspect.
- Employs software capable of geospatial representation and processing, and applies analytical methods to geographic datasets, including the use of geographic information systems (GIS) and geomatics.

Project Specific Considerations Studied to Date:

- Residential Use
- Sensitive Receptors
- Historic Properties

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Preliminary Geospatial Analysis – Weighted Sum Analysis



GIS Layer	Buffer (feet)	Link Ranking
Sensitive Lands	n/a	2
Conservation Lands	n/a	1
TEP Transmission	200	3
TEP Distribution	100	2
Transmission Other	200	2
Roads	100	3
Interstates	200	1
Rail	600	0
Airports	200	0
Contributing Properties w/in Historic Districts	300	1
Parks	n/a	2
Residential Use	n/a	2
Vacant Land	n/a	3
Sensitive Receptors	300	1

- Table depicts surface layers and their corresponding ranking
- 0-3 ranking based on suitability and constraints
- Links buffered to 500', default value is 3
- More preferred sections are in green, less preferred are in yellow or orange

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Preliminary Geospatial Analysis



Map Interpretation:

Kino-UA North-DeMoss Petrie 138kV Transmission Line Spatial Analysis Residential Use



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Preliminary Geospatial Analysis



Residential Use Maps – Study Area and Entire System

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Preliminary Geospatial Analysis



Sensitive Receptors Map

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Preliminary Geospatial Analysis



Contributing Historic Properties Map

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Preliminary Geospatial Analysis



Composite Analysis Map

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Developing Preliminary Routes



Thoughts on routing?

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Next Steps

- Continue to incorporate public, CWG, & stakeholder comments/data
- Obtain additional data from stakeholders
- Continue to research/study as needed
- Identify preliminary routes based on Geospatial Analysis
- Conduct Public Meeting # 2 – March 17 & 18
- Conduct CWG Meeting # 4 – Late April

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CWG Meeting #4



- When – Late April
- Where – Quincie Douglas Community Center
- Topics – Review Preliminary Routes

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UA North Substation Update



- Status – Developing visual simulations and application package
- Upcoming Public Meeting for Special Exception Land Use Permit (SELUP) with City of Tucson–Fall 2020
 - Filing SELUP Application Fall 2020
 - Expected Zoning Examiner Hearing in Spring 2021