

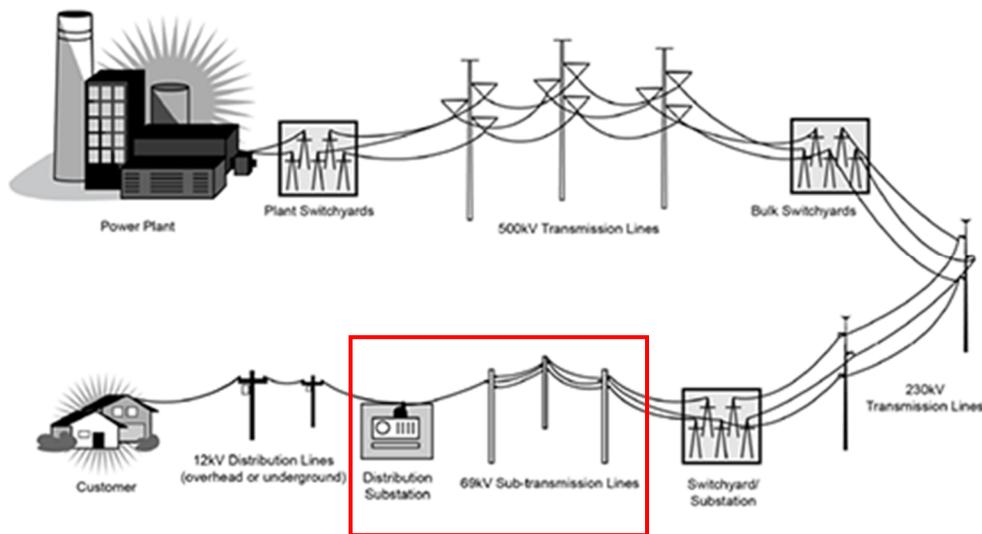
North Peoria 69kV Power Line Siting

Frequently Asked Questions

Arizona Public Service Company (APS) is developing a plan to build new energy facilities to better serve the growing population in the northern region of Peoria. The information below is in response to some of the frequently asked questions specific to the North Peoria 69kV Line Siting effort (Project).

- How does electricity get to my house from where it's made?

In today's world, electricity is manufactured in many different ways, from large-scale remote power plants all the way to local small-scale renewable energy sources. However, the bulk of electricity, no matter where it is generated, travels over long distances through a system of transmission and distribution lines that carry the electricity to where it is needed, and substations that convert the voltage to an amount usable by a specific customer. This diagram gives an approximation of the path that electricity takes between where it is manufactured and a typical customer. This Project primarily consists of the 69kV sub-transmission segment – as outlined in red below.



- What areas will this Project serve?

The Project is intended to serve both existing and planned development within the north Peoria region.

Specifically, Substation W03 will serve the existing north Peoria community by providing an additional power source and increasing reliability of the system. It will also serve planned development to the north of the Central Arizona Project canal.

Similarly, Substation W04 will serve the existing north Peoria community, as well as new developments planned north and south of the Central Arizona Project canal.

Substation W05 is intended to serve future development north of the Central Arizona Project canal.

- When will these lines and substations be built?

The first Project phase (Substation W03 with 69kV connections to/from the existing Raceway to Calderwood 69kV line) has an identified need to be in-service by 2021.

Additional phases are to be constructed as needed, depending upon the rate of future planned development, with an estimated need 5 to 10 or more years from now.

- Why doesn't APS place all electric power lines underground?

Placing transmission and sub-transmission voltage power lines underground is significantly more expensive than placing power lines overhead. Actual cost differences depend on various elements, including terrain, project length, environmental concerns, labor and material differences, etc. In particular, an overhead line that spans trenches, washes, or other difficult terrain, may not be compatible for running underground, and would require added time and expense for additional labor and material. Depending on the voltage and the location of the power line and considering the inability to be cooled by the ambient (surrounding) air as in an overhead configuration, underground power lines may require special technology to keep the wires cool. Underground 69kV lines require the cable conduits to be encased in a special concrete slurry, which allows for greater heat dissipation while adding a layer of protection from accidental excavation.

Buried power lines may also extend power outages, as it may take additional time to locate a specific power issue, access the fault and repair it. Additionally, underground systems can be prone to flooding in certain conditions.

Typically, lower voltage 12kV(distribution) lines are buried with new developments, as the additional cost to place the lines underground is passed onto homebuyers or business owners by the developer through impact fees. The bulk of the 12kV distribution lines found in the Project study area, specifically those within the City of Peoria boundaries, are located underground.

The cost of installing 69kV power lines overhead can vary greatly depending on a number of factors and typically range from \$500,000 to \$800,000 per mile. The cost of installing a mile of power line underground can be approximately up to 10 times or more, depending on terrain, geology, or other factors.

While APS will financially contribute the amount that would be necessary to install the lines overhead, the difference in cost between an overhead line and underground line would be borne by the community, developer, or any other organization requesting the underground option. Of interest to community members or others requesting an underground option is an existing state law, Arizona Revised Statute 48-620 (<https://www.azleg.gov/ars/48/00620.htm>), which may provide a mechanism to fund the additional costs through the formation of an underground improvement district. Use of ARS 48-620 or any other agreement would need to be in place and approved prior to APS beginning the engineering of the underground facility and procurement of materials and must meet APS's scheduled need for the line.

- I live in an established neighborhood. Why are new power lines needed in my area?

There are multiple reasons why new power lines are needed in the Project study area.

One reason is due to nearby growth and additional power needs. Currently, the Vistancia area is powered by a single 12kV (radial) source which is distributed from APS's Calderwood substation near the east end of the community. This distribution line serves the entire Vistancia area and is expected to reach its capacity by 2022. In order to meet the demands of the future growth, APS is required to bring additional sources of electricity to these growth areas, including substations interconnected by their associated 69kV power lines. Doing so will bolster the already existing system to accommodate current and anticipated nearby growth, and to add to the reliability of the system.

Another reason is that as technology plays a larger part in our lives, our customers are using more electricity than ever before, even in established areas.

- What is the difference between transmission lines and distribution lines?

Transmission lines deliver electricity over long distances from power plants to substations at a high voltage. These voltages range from 115-500kV. They bring electricity from the power source to the regional service area. Multiple transmission lines, including 230kV and 500kV, are currently located within the Project study area.

Sub-transmission lines carry voltages reduced from the major transmission line system, typically 69kV, to regional distribution substations.

Distribution lines are low voltage lines that bring electricity from substations to your home. These carry voltages of 12kV. The lines are smaller and cover shorter distances. The bulk of the 12kV distribution lines found in the of the Project study area, specifically those within the City of Peoria boundaries, are located underground.

Arizona State Law requires utilities to obtain approval from the Arizona Corporation Commission (ACC) prior to the construction of new electrical transmission facilities greater than 115kV. Siting for lower voltage electrical facilities, i.e., 69kV or distribution facilities, do not require approval by the ACC; however in most cases APS follows a public process to determine where 69kV lines will be located, as is the case for this Project.

- What types of transmission and sub-transmission lines currently exist within the study area?

There are multiple transmission and sub-transmission lines owned and operated by various power companies that currently exist within the study area. These are generally located along the Loop 303 and Highway 74, and vary in voltage, height, and structure type as depicted in the diagram below.

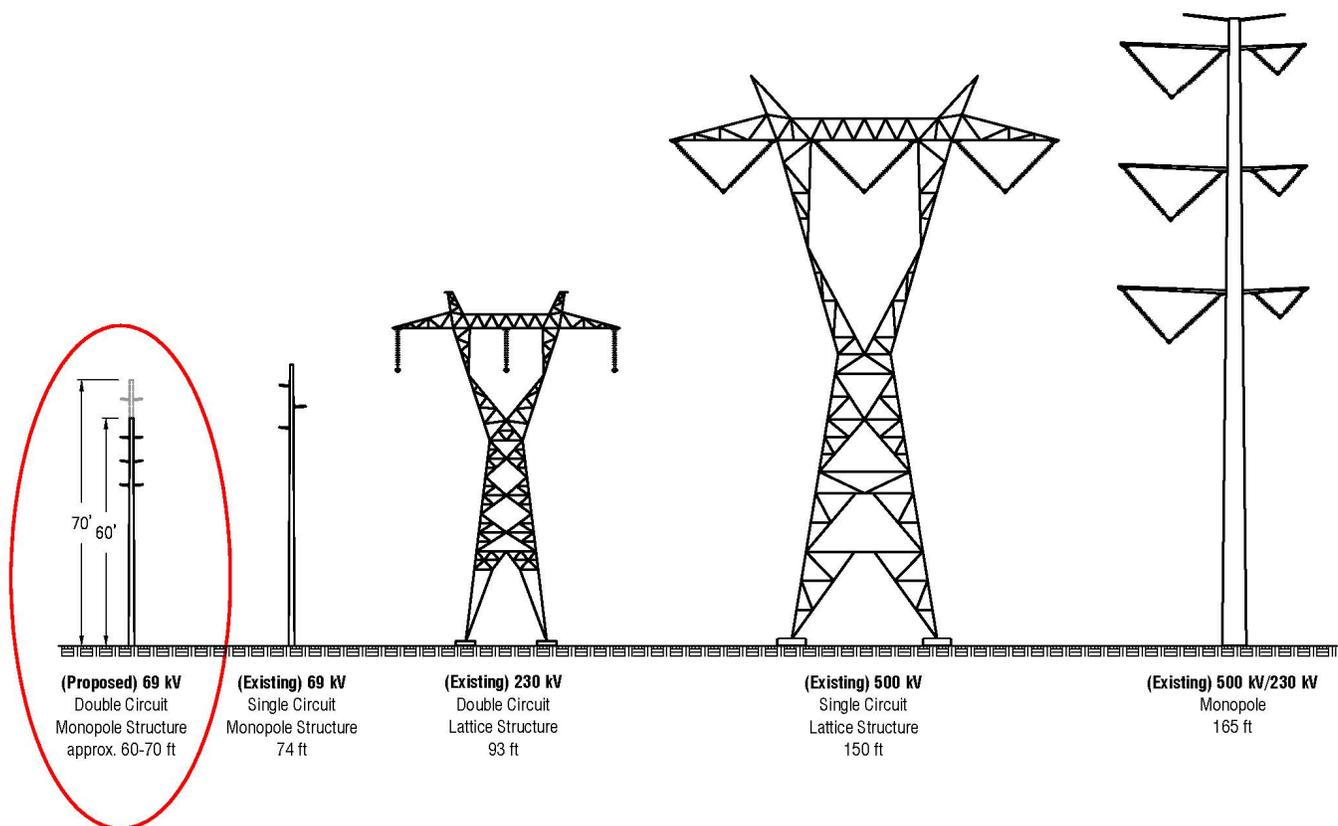
The largest typical structures in the APS transmission network are 500kV structures. There are two types of 500kV structures in the study area: the lattice structure, and the monopole structure. Within the study area, these can range in height from 150-165 feet tall.

Another typical transmission structure that is within the study area is the 230kV lattice structure. Within the study area, these are constructed at a height of approximately 90-95 feet tall.

The existing 69kV monopole structures within the study area are constructed at a height of approximately 70-75 feet tall.

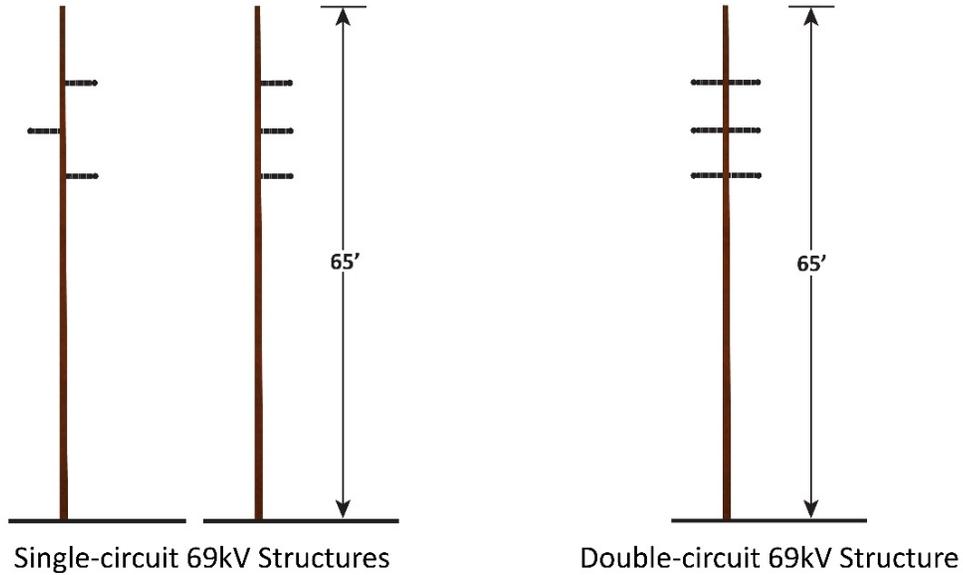
The proposed APS 69kV line is depicted and circled in this diagram as a comparison to these existing power structures.

Depiction of proposed typical 69kV double circuit monopole in comparison to existing transmission structures near the Vistancia community



- What do typical sub-transmission structures look like?

Sub-transmission line structures vary in size and design based on a variety of factors such as the voltage capacity of the line, how many circuits will be carried by the structure, and other engineering considerations such as terrain. The structures proposed in this Project will carry a 69kV line with a proposed typical height of 65 feet +/-, as illustrated in the diagram below.



The photographs below are examples of typical structures in the APS system.



69kV Double-Circuit Monopole



69kV Double-Circuit Monopole with 12kV Underbuild

- What is a substation and why is it necessary?

Electric transmission lines connect to substations. Substations perform multiple purposes: stepping electricity levels up or down, transferring power from the transmission system to a distribution system, collecting power from generation facilities, or functioning as a switching station for rerouting electricity on the grid.

For this Project, the purpose of the proposed substations is to step electricity levels down from the regional 69kV sub-transmission network to the local 12kV distribution system that serves residences in the north Peoria area.

- How many houses does a substation serve?

A 69/12kV substation typically serves approximately 9,000 residential homes, depending on the terrain and distances from the substation which the distribution lines extend.

- How big is a substation, what does it look like?

A 69/12kV substation requires approximately 3-5 acres. APS works with local communities to design substations that blend in with the surrounding area as much as possible. Below are examples of existing APS 69/12kV substations.



A) 69/12kV Substation: aerial view



A) 69/12kV Substation: street view



B) 69/12kV Substation: aerial view



B) 69/12kV Substation: street view

- I have seen a map that is not on the APS Siting webpage, is this an official APS map?

Official maps for this project are distributed by APS through the mail with accompanying newsletters, and can also be found on APS's North Peoria 69kV Power Line Siting webpage at <https://www.aps.com/en/ourcompany/generationtransmission/transmissionfacilitiesiting/Pages/current-siting-projects.aspx>. Any other map found to be distributed among the public is not substantiated by APS, and may not reflect actual proposed substation site locations and power line routes.