



9205 NCAR TAP RECONSTRUCTION PROJECT

PLAN OF DEVELOPMENT

PUBLIC SERVICE COMPANY OF COLORADO

May 2019

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ACRONYMS AND ABBREVIATIONS

APLIC	Avian Power Line Interaction Committee
BA	Biological Assessment
BMP	Best Management Practice
CDPHE	Colorado Department of Public Health & Environment
CPW	Colorado Parks and Wildlife
dBA	“A-weighted” decibel scale
ELDO-BHYD Line	Eldorado – Boulder Hydro 115 kV overhead electric transmission line
ESA	Endangered Species Act
kV	kilovolt
NCAR	National Center for Atmospheric Research
NEPA	National Environmental Policy Act of 1969
NESC	National Electric Safety Code
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NSF	National Science Foundation
OSMP	Open Space and Mountain Parks
POD	Plan of Development
PSCo	Public Service Company of Colorado
ROW	right-of-way
SHPO	State Historical Preservation Office
SWMP	Stormwater Management Plan
UCAR	University Corporation for Atmospheric Research
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

1.0 PROJECT OVERVIEW

1.1 Purpose and Need

Public Service Company of Colorado (PSCo), a Colorado Company doing business as Xcel Energy, is a U.S. investor owned electricity and natural gas company with regulated operations in eight Western Midwestern states. Xcel Energy provides a comprehensive portfolio of energy-related products and services to 3.4 million electric customers and 1.9 million natural gas customers through four wholly-owned utility subsidiaries.

PSCo is proposing the 9205 NCAR Tap Reconstruction Project (Project) in 2019. The Project is located within the City of Boulder, in Boulder County, Colorado, connecting to the Eldorado – Boulder Hydro 115 kilovolt (kV) overhead electric transmission line (ELDO-BHYD Line).

The ELDO-BHYD Line is located southwest of the City of Boulder, between Boulder Canyon Drive on the north and Eldorado Springs Drive on the south, see **Figure 1**. The National Center for Atmospheric Research (NCAR) Tap Line is a 115 kV double circuit overhead line that “taps”, or connects to, the ELDO-BHYD Line near the mouth of Bear Canyon and extends approximately one-mile easterly to PSCo’s NCAR Substation.

The NCAR Tap Line is approximately 1 mile long and located within a 75-foot-wide easement. The majority of the ROW is on property owned by the National Science Foundation (NSF) and managed by the University Corporation for Atmospheric Research (UCAR). The westerly portion of the Project is on property owned by the City of Boulder and managed by its Open Space and Mountain Parks (OSMP) department.

The purpose of this Project is to provide ongoing transmission system maintenance and improvements. The existing transmission line has been in use since the mid-1960s and the structures have been identified by PSCo as being in a structural condition that warrants their replacement and/or do not meet current federal code for ground clearance. Their replacement would ensure that PSCo maintains this section of transmission line to the safest and most structurally sound standards.

The need of this Project is to ensure PSCo meets its commitment to provide the safest and most reliable electric service to the greater community. Completion of the project would provide PSCo the ability to continue meeting the current and future electric demands of the local residential, business, and governmental interests, among others.

Completion of the Project is an important part of PSCo’s ongoing efforts to maintain a robust transmission line system to the Boulder area, including the National Center for Atmospheric Research. The new structures bring this section of transmission line up to current federal standards for ground clearance and structural integrity. Both PSCo and the City of Boulder have spent considerable time and money repairing and replacing their infrastructure in the area over the last three years. The City performed major work on NCAR-Bear Canyon and Mesa Trails to

repair damage caused by the 2013 floods. PSCo has replaced nearly four miles of its transmission line that connect to the Project and is currently replacing a large section of distribution line that exits the NCAR Substation and is located on federal lands. Once the Project is complete, the area can return to its open space serenity and the community can take comfort that its electric reliability continues to be maintained.

1.2 Purpose of the Plan of Development

This Plan of Development (POD) is intended to provide an overview of the project with transmission line reconstruction specifications, descriptions of the procedures to be employed, purpose for those procedures, and locations of the project components.

This POD also addresses requirements and policies of the agencies with jurisdiction of resources impacted by this project including the U.S. Fish and Wildlife Service (USFWS), State Historic Preservation Officer (SHPO), and NSF. This document will assist in educating key personnel and contractors regarding the appropriate implementation of environmental compliance measures. A key objective of the POD is to place an emphasis on the avoidance of sensitive resources. In situations where sensitive resources may be impacted by the Project, the use of Best Management Practices (BMPs) will be implemented to minimize potential impacts.

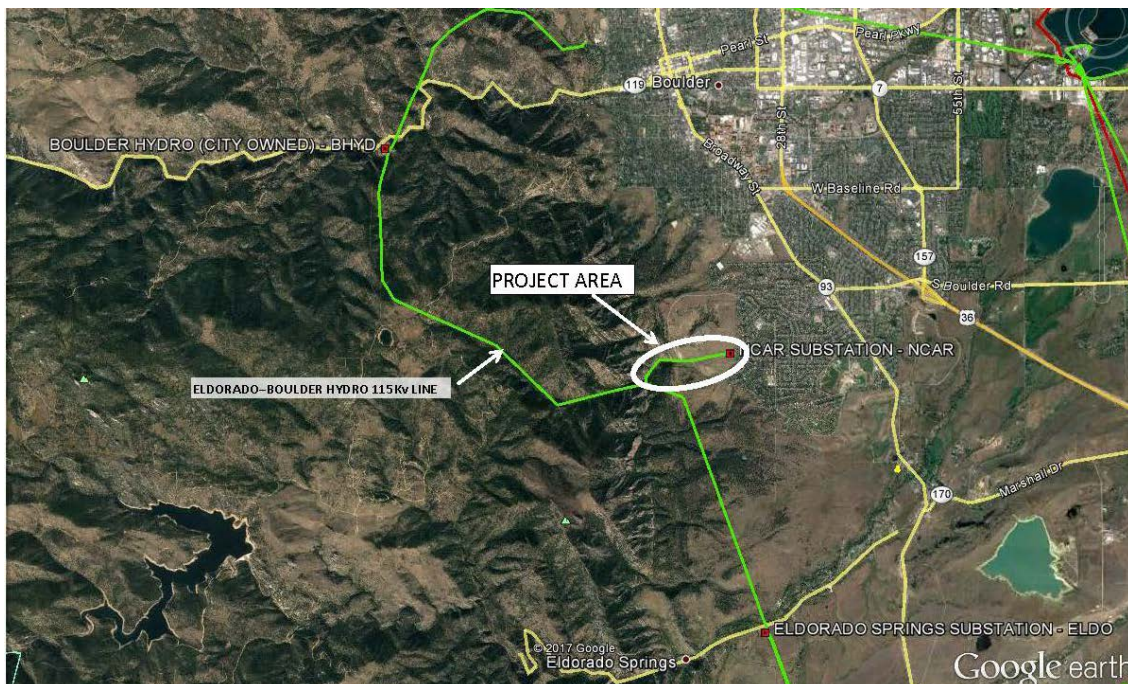


Figure 1. Project Location

1.3 Communication Protocol

Effective communication between the agencies and stakeholders engaged in this project is a critical component to the success of the project. Project pre-construction activities will include the development of a communication protocol/plan between the Project Proponent (PSCo or contractor) and NSF and the City of Boulder, which will outline the appropriate method of reporting and updating project information between the participating parties.

An Organization Chart illustrating responsibilities and Key Contacts List for the project will be created and maintained by PSCo during the construction of the project. This contacts list will include the name, agency, office phone number, cell phone number, and email address of those individuals working on the project, and this list (and Organization Chart) will be updated, as required, on a periodic basis.

1.4 Emergency Contact Numbers

In the event of any emergencies or unforeseen events, PSCo will contact the following entities to make notifications, as appropriate:

Medical, Fire or Police Emergencies: 9-1-1

Incidents on NSF land: City of Boulder Police Department Non-Emergency: 303-441-3333

For non-emergency incidents, a contact list will be developed with the appropriate agency contacts with phone numbers and email addresses including: PSCo, City of Boulder Open Space and Mountain Parks Department, City of Boulder Police Department, National Science Foundation, National Center for Atmospheric Research, University Corporation for Atmospheric Research, and construction contractor.

2.0 PROJECT DESCRIPTION

The Project is located along the larger Eldorado – Boulder Hydro 115 kV overhead electric transmission line (ELDO-BHYD Line) in Boulder County, Colorado.

The ELDO-BHYD Line is located southwest of the City of Boulder between Boulder Canyon Drive on the north and Eldorado Springs Drive on the south, **see Figure 1**. The NCAR Tap Line is a double circuit overhead line that “taps”, or connects to, the ELDO-BHYD Line near the mouth of Bear Canyon and extends approximately one-mile easterly to PSCo’s NCAR Substation. The Project consists of reconstructing the entire NCAR Tap Line. This includes replacing all eleven (11) existing two-pole transmission structures with two new sets of single pole structures. Nearly all of the Project is located within the limits of the City of Boulder, with a small portion of the existing trail access located in Boulder County. The majority of the Project is on lands owned and managed by the United States of America and represented by the NSF. The westerly portion of the Project is on property owned by the City and managed by its Open Space and Mountain Parks Department, see the Site Map included as **Appendix A**.

2.1 Location

The Project is located in Section 12, Township 1 South, Range 71 West and Section 7, Township 1 South, Range 70 West in Boulder County. Photographs of the structures are included as **Appendix B**.

2.1 Project Summary

The Project involves replacing the existing 115 kV double circuit overhead line, consisting of two-pole structures, with two new 115 kV single circuit lines along the same alignment. The new poles would be located in the same general location as the existing structures. The new lines must meet current clearance standards required by the North American Electric Reliability Corporation, which is subject to oversight by the Federal Energy Regulatory Commission. To achieve these clearance standards, the new poles would have a vertical configuration (all conductors on one side), which requires taller poles.

The new poles would be steel construction with a weathered steel exterior treatment. This provides the necessary rust prevention to assure long term structural integrity, while minimizing the visibility of the line in the mountainous setting. The new conductor would be non-specular to reduce reflection. The type, height, location and foundation types of each existing and new structure are shown in **Table 1**.

Table 1. Existing and New Structures

Structure ID Existing/New	Existing Structure Details	Replacement Structure Details	Replacement Structure Location (Facing Substation)	Foundation Type
2/1370 and 1391	Two 65-foot tall guyed single wood poles	85 and 75-foot tall guyed single steel poles	Back 9.5 feet/ Ahead 21 feet	Both Direct Embed
3/1371 and 1390	60-foot tall two- pole wood structure	67.25 and 65.25-foot tall single steel poles	Back 9 feet/ Back 9 feet	Both Direct Embed
4/1372 and 1389	Two 75-foot tall guyed single wood poles	85 and 95-foot tall guyed single steel poles	Back 9 feet/ Back 9 feet	Both Direct Embed
5/1373 and 1388	50-foot tall two- pole wood structure	98.25 and 98.25-foot tall single steel poles	Back 41.5 feet/ Back 11 feet	Both Direct Embed
6/1374 and 1387	50-foot tall two- pole wood structure	95.25 and 100.25-foot tall single steel poles	Back 137 feet/ Back 138 feet	Both Direct Embed
7/1375 and 1386	Two 75-foot tall guyed single wood poles	95.25 and 100.25-foot tall single steel poles	Ahead 13.5 feet/ Ahead 12 feet	Both Concrete
8/1376 and 1385	50-foot tall two- pole wood structure	75.25 and 80.25-foot tall single steel poles	Back 7 feet/ Back 7 feet	Both Direct Embed
9/1377 and 1384	55-foot tall two- pole wood structure	80.25 and 80.25-foot tall single steel poles	Back 42 feet/ Back 42 feet	Both Direct Embed
9A/1378 and 1383	Two 65-foot tall single steel poles	80.25 and 75.25-foot tall single steel poles	Back 14 feet/ Back 14 feet	Both Direct Embed

Structure ID Existing/New	Existing Structure Details	Replacement Structure Details	Replacement Structure Location (Facing Substation)	Foundation Type
10/1379 and 1382	50-foot tall two-pole wood structure	70.25 and 70.25-foot tall single steel poles	Ahead 3 feet/ Ahead 3 feet	Both Direct Embed
11/1380 and 1381	55-foot tall two-pole wood structure	80 and 80-foot tall single steel poles	Back 19 feet/ Back 19 feet	Both Concrete

Note: Existing structure IDs are the same for poles on the north and south circuits. New structure IDs will be unique for each pole.

3.0 ADDITIONAL PROJECT COMPONENTS

3.1 Easements

The NCAR Tap Line is located within a perpetual 75-foot wide easement, see **Appendix C**. This easement grants PSCo the right for:

“the construction, reconstruction, operation and maintenance of conductors and conduits for the transmission and distribution of electricity, whether said lines may now or may hereafter serve the property herein described or other property , together with the necessary poles, towers, cables, wires, guys, supports, and other fixtures and devices, used and useful in the operation of electric transmission and distribution lines...”

“Together with the right of ingress and egress over said premises and to remove objects or structures therefrom; and also to survey, construct, reconstruct, maintain, operate, control and use said lines and facilities...”

Condition 4 of the easement across NSF lands requires PSCo to “supervise the facilities to be constructed on the right-of-way granted hereby and cause them to be inspected at reasonable intervals, and shall immediately repair any defects found therein...”

PSCo holds an easement for the NCAR- Bear Canyon Trail, see **Appendix C**. The easement gives PSCo legal authority to use the existing NCAR-Bear Canyon Trail for routine and emergency access to its facilities. All Project work conducted within the easement is consistent with the rights granted in the easements and required by the easement conditions.

PSCo is recommending that the easement be amended and restated to center it over the reconstructed line.

3.2 Down Guys and Anchors

Down guys and anchors are used to support certain structures, as shown in the picture of Structure 4 in **Appendix B**. Down guys are wires that extend from the top of the poles to anchors that are installed in the ground. Currently, four structures have down guys and anchors. The down guys and anchors for existing structure 7 extend outside of the easement. The replacement structures for Structure 7 will not require down guys and anchors, which will rectify the out-of-easement situation. However, the down guys for replacement structures for existing Structures 2 and 4 will extend outside of the easement. This is due to the taller poles required for ground clearance and the additional spacing needed between the north and south lines.

PSCo recommends addressing the inclusion of these anchors in an amended and restated easement.

3.3 Construction Access

Movement of personnel, material, equipment and poles would utilize a combination of existing trails, new temporary full access routes, limited access routes, and helicopters, **see Figure 2**. The NCAR-Bear Canyon Trail and portions of the Mesa and Bear Canyon Trails are constructed to accommodate vehicular traffic and have historically been used by PSCo for maintenance of the NCAR Tap and ELDO-BHYD lines.

The temporary full access routes located within the easement would be graded 10 feet wide, where necessary, and used for all construction activities. Following construction of the Project, this section would be revegetated but not re-contoured to accommodate future line maintenance activities. The temporary full access routes not located within the easement have been routed to minimize the need for grading, thus the need to extend the access to existing Structure 10 extending north of the easement. Following construction, these routes outside of the easement would re-contoured and revegetated.

The limited access routes would be used by personnel for pedestrian access to certain structures. Helicopters would be used primarily for the placement of new poles at locations that cannot accommodate new temporary full access.

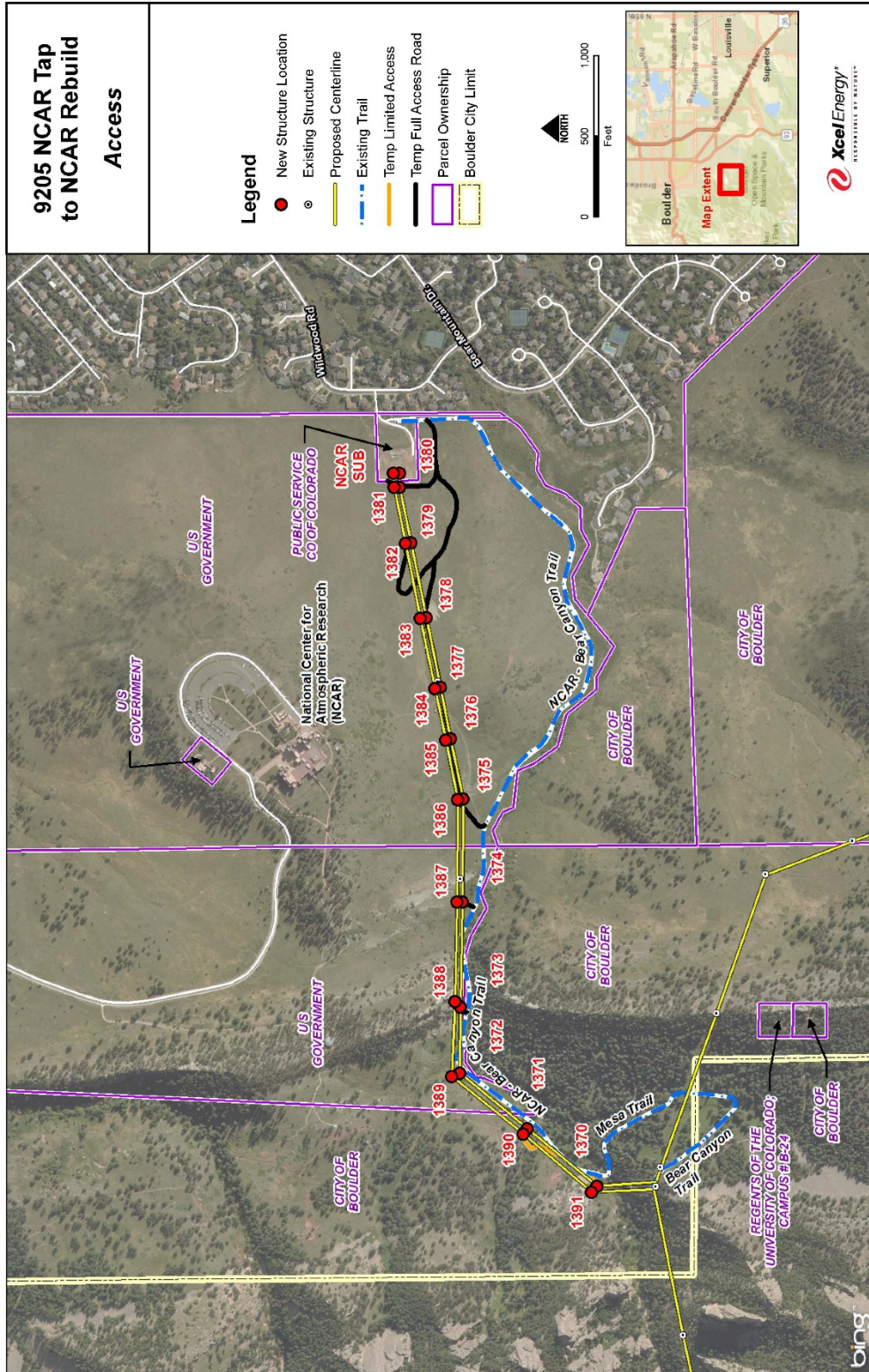


Figure 2. Construction Access

3.4 Temporary Construction Staging Areas

The Project would utilize up to five staging areas, **see Figure 3**. PSCo has analyzed impacts associated with each staging area but likely will not use all five areas. These staging areas would be used for the following purposes:

- Staging Area A (approx. 0.71 acres): This is located on PSCo property on the east side of the NCAR Substation. It would be used for parking for employees and contractors.
- Staging Area B (approx. 2.58 acres): This area would be used for staging of material and equipment.
- Staging Area C (approx. 3.26 acres): This area would be an alternate site for storage and staging of material and equipment. Because this staging area is closest to residences, it would not be used by helicopters.
- Staging Area D (approx. 0.22 acres): This area would be used as an alternative area for storage, framing and helicopter picking of pole sections.
- Staging Area E (approx. 0.68 acres): This area would be used for storage, framing and helicopter picking of pole sections. PSCo would also use this area for staging, framing and helicopter picking of pole sections and concrete truck staging and concrete bucket picking for PSCo's Line Capacity project located in Bear Canyon. The Line Capacity work began in 2018 and will take approximately four weeks to complete in 2019.
- Staging Area F (approx. 0.64 acres): This area would be used for staging, framing and helicopter picking of pole sections and for helicopter landing.

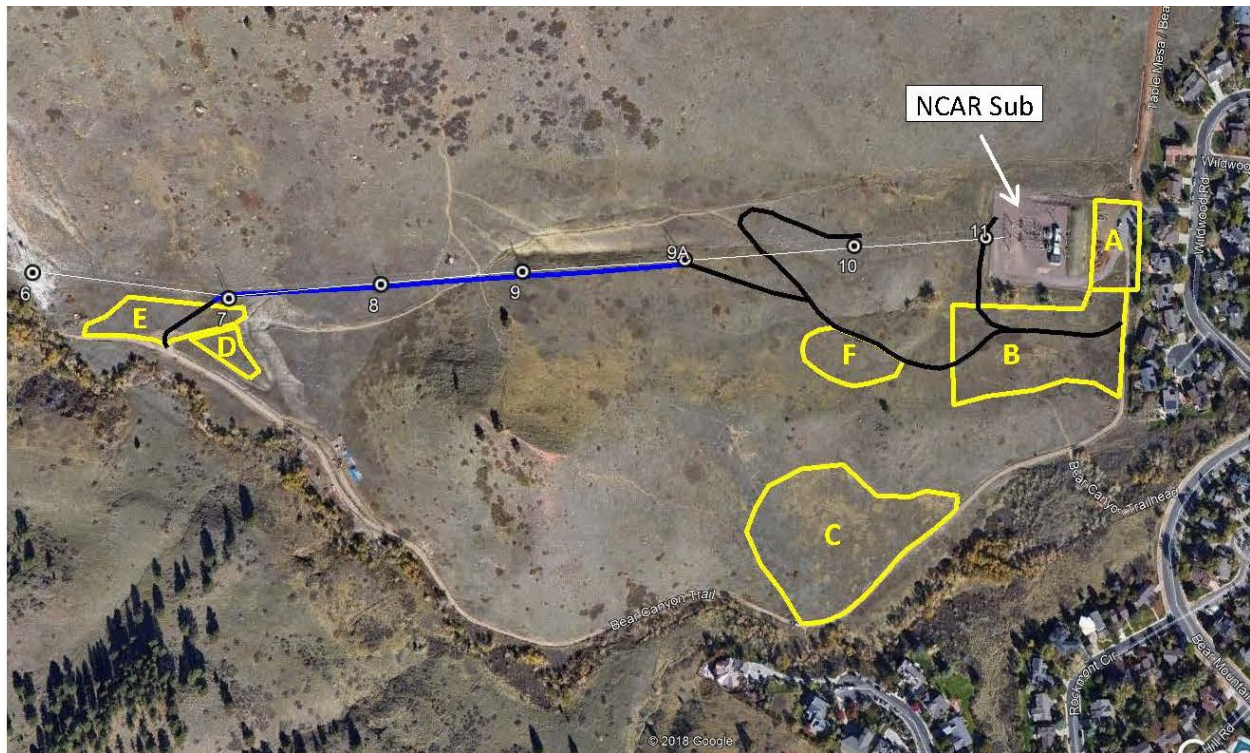


Figure 3. Construction Staging Areas

3.5 Construction Equipment

PSCo and its contractors anticipate using the following equipment during construction:

- Cranes (3)
- Digger truck and/or low drill
- Pickup trucks (several)
- Bucket trucks (2)
- Road tractor trailers (2)
- Puller
- Tensioner
- Wire trucks (2)
- Side-by-side all-terrain vehicles (2)
- Back hoe
- Tool trailer
- Caterpillar
- Man lift
- Model UH-1 Huey helicopter (or similar)
- Model UH-60 Blackhawk helicopter (or similar).

3.6 Helicopter Use

A helicopter would be utilized for limited purposes where vehicular access is not feasible. The helicopter use associated with the Project would be for work performed on the new westerly structures 1370-1374 and 1387-1391. A total of 120 trips are anticipated. The average trips per day would vary, depending on the type of construction being performed. At its maximum during excavation and conductor stringing and clipping activities, ten (10) flights per day or more may be needed. The helicopter flight time will vary based on numerous factors, with an estimated average flight time of 10 to 15 minutes per round-trip. There will also be long stretches when no helicopter use is needed.

In addition, PSCo would have approximately 160 helicopter trips to complete its Line Capacity Project located in Bear Canyon. This work consists of the placement of five new structures and transferring the existing conductor. All excavation work associated with this project was completed in 2018. The average helicopter use for the Line Capacity Project would be approximately eight (8) trips per day. This use would be consistent throughout the approximate four-week schedule.

3.6.1 Flight Path

All of the construction activities, the landing area and both pickpoints would be located within or in close proximity to the transmission line ROW. Because of this, once the helicopter arrives on site, the flight path would only need to generally follow the transmission line back and forth. This also includes refueling, which would likely occur at the Rocky Mountain Fire District heliport located on Eldorado Springs Drive about 2.5 miles south of the Project. The helicopter would follow the transmission line from the Project area to the tap location, then south along the ELDO-BHYD line to Eldorado Springs Drive and then easterly to the heliport. Any changes to this flight path would occur following consultation with the City of Boulder and NCAR.

3.6.2 Trail Crossings

Each trail to be crossed by the helicopter with suspended loads would have two flaggers. The flaggers would temporarily block the trail use 500 feet in each direction while being crossed.

3.7 Construction Sequence

The NCAR Substation is energized by both circuits of the existing line. This provides redundancy in the event one of the circuits is taken out of service for any reason. To complete the Project, at least one of the circuits must remain energized at all times to serve the substation. To accomplish this feat, the Project would be completed in three phases:

Phase 1 - The first phase involves installing the one of the new lines immediately north of the existing double circuit line. The new line would be offset from the existing northerly conductors by an average of approximately 13 feet. Prior to construction, all new structures would be staked

in the field. The existing northerly circuit would then be de-energized to allow safe construction of the new north line. The following construction activities would then be performed in this general order:

- Excavate new transmission line pole holes
- Install the foundations/culverts for the new poles
- Set the base sections of the poles
- Repeat this process for all of the new poles for the north line (Structures 1381-1391)
- Once the bases are in place, install the pole tops either by crane or helicopter.
- String and clip the new conductor onto the new poles. This requires some minor grading at structures 1375 through 1386 to accommodate a 50-foot x 50-foot level surface at each structure location for excavation equipment, cranes, and bucket trucks.
- Energize the new line.

Phase 2 – Once the new north line is reenergized, the southerly existing circuit would also be de-energized and then the following construction activities would be performed:

- Remove the existing conductor for both existing circuits.
- Access each old structure and cut the wood poles at ground level.
- Cut the wood poles into manageable sections
- Haul the poles to the staging area and eventually off the Project area.

Phase 3 – Once the existing structures are removed, the new southerly line would be installed in approximately the same alignment as the existing southerly pole line. The following construction activities would be performed:

- Excavate new transmission line pole holes
- Install the foundation for the new pole
- Set the initial section of pole
- Repeat this process for all of the new poles for the south line (Structures 1370-1380)
- Once the bases are in place, the pole tops would be installed either by crane or helicopter.
- String and clip the new conductor onto the new poles.
- Energize the new line.

3.8 Construction Schedule

Construction of Phase 1 would begin in early June 2019, if possible, and progress from east to west. This would allow the structures outside of known raptor nest buffers to begin prior to the end of the raptor nesting season that occurs around July 31st. Phase 1 would be completed by November 15, 2019. The disturbed areas would then be stabilized for the winter months.

Phases 2 and 3 would begin in early June 2020, if possible, and progress from east to west. This would allow the structures outside of known raptor nest buffers to begin prior to the end of the raptor nesting season that occurs around July 31st. The entire Project would be completed by November 15, 2020.

Work activities would typically be performed between 7:00 am and 7:00 pm, including many weekends.

PSCo will work with NCAR and UCAR, when possible, to schedule helicopter activities around outdoor events located at the NCAR facility.

3.9 Excavation

Direct embed pole holes would be hand dug or with the use of a vehicle mounted drill rig, depending on the access type. The hand digging option involves the use of a small track-mounted backhoe, compressor and culverts or other conventional methods as needed to excavate the pole hole. The culverts would be positioned vertically and the excavated material backfilled around the culvert. The culverts would be covered until time to install the new structures. The remaining spoils would be spread onsite, where approved by the NSF or removed off site.

For the poles that have concrete foundations, the holes for these foundations would be excavated by a vehicle-mounted drill rig. Anchor bolt cages would then be placed in the hole and then filled with concrete. The remaining spoils would be spread onsite where approved by the NSF, in consultation with NCAR/UCAR, or removed off site.

3.10 Soil Borings

The majority of structures are bolted to poured concrete caisson foundations. The design of these foundations to date are based on very conservative geotechnical properties which leads to the largest foundation and construction impact. With site-specific information, obtained by performing two representative geotechnical borings and collecting samples at appropriate depths, these foundation structures may be reduced in size, primarily in depth of foundation. This reduces the foundation construction duration, excavation spoils export, and foundation material import. The proposal is to use a track-mounted rotary drill that utilizes water (no other additives) to lubricate the boring and facilitate sample collection. The water tank will be mounted on the drill rig. The boring diameter would be 8 inches or less depending on boring method - boring through soil or rock. This geotechnical investigation should be expedited and performed immediately to update project foundation design and material procurement. One bore location is proposed near the pair of structures 1380 and 1381. The second bore is proposed near the pair of structures 1386 and 1375. Access for this work will not require grading and will have minimal surface access impact. In the event of saturated soils, the boring work will be postponed or the contractor will utilize mats to prevent rutting greater than 4 inches. The bore rig will be supported by a pickup. No safety escorts are anticipated for this work. Access to the 1386 and 1375 structure pair will require temporary closure of the Bear Canyon Trail for ingress and

egress of the boring equipment. Access to the 1380 and 1381 structure pair will circle around the south side of the NCAR Substation. The work at each bore location is expected to be completed in one day.

4.0 ALTERNATIVES CONSIDERED

PSCo reviewed three alternatives to the Project as follows:

No Action Alternative: This alternative would leave the existing conditions in place. Not addressing the clearance conditions would leave the transmission line out of compliance with North American Electric Reliability Corporation Standards and vulnerable to emergency outages. This alternative would also not address the structural integrity of the structures and risk them being vulnerable to structural failure.

Overhead Line Relocation: This alternative would replace all or portions of the existing Project alignment with a new alignment from the NCAR Tap site to the NCAR Substation.

Moving the alignment for the westerly Project structures that are located in the canyon would be problematic. The ground to the north is a steep hill that would be difficult to access, while relocating to the south would put the line in the Bear Canyon Creek floodplain and/or require new creek channel crossings.

Relocation of the easterly Project structures would push the line over a prominent small hill and potentially in close proximity to the Bear Canyon Creek floodplain. Although a southerly realignment could benefit from being closer to the existing NCAR-Bear Canyon Trail, which is PSCo's historic and legal access to its transmission lines, it would be a much longer line to traverse around the prominent small hill. This would require a substantial addition of angle structures that would be larger in diameter or require the use of down guys for support. Relocation to the north would place the alignment at the bottom of the slope below the NCAR facility. This would increase the length of the line and add new angle structures. Trees located within the new alignment would be removed to provide the necessary clearance. Additionally, new easements would need to be secured.

Line Burial Alternative: This Project alternative would replace the existing overhead line with a new buried line. Burying the line would require the excavation of a large trench, placement of a concrete duct bank with several conduits that would disturb a corridor up to 100 feet wide. Pulling vaults would be required approximately every one half mile and large flat areas around each vault would be required for staging pulling equipment. The cost of burying a line in ideal conditions would typically cost 10 times that of overhead construction. In the case of this Project, the cost would be substantially more. The steep mountainous terrain and rocky conditions make this alternative technically impossible.

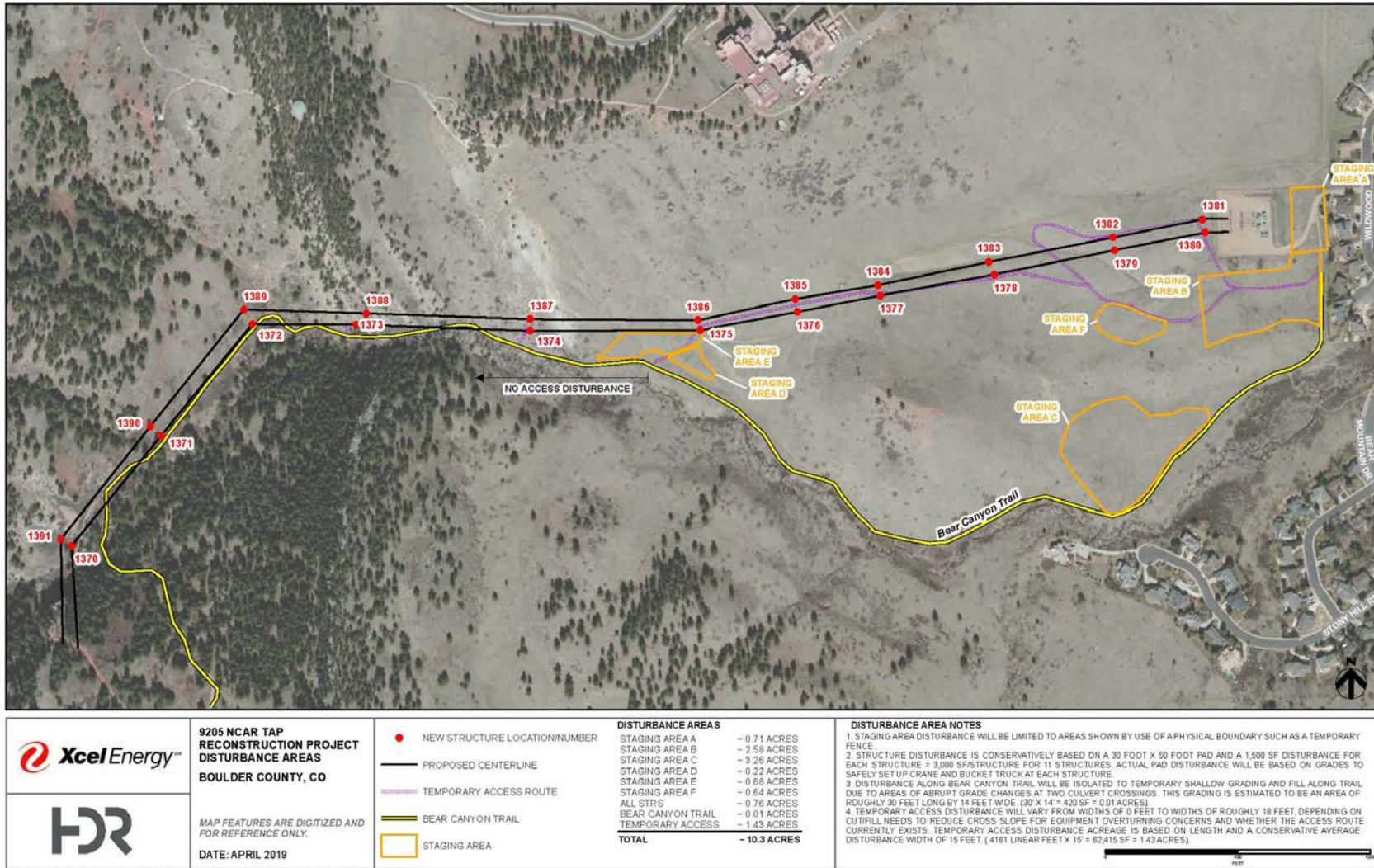


Figure 4. Construction Disturbance Areas

5.0 ENVIRONMENTAL CONSIDERATIONS

This section describes each relevant environmental resource, as well as the proposed mitigation measures are also included for each environmental issue, as appropriate, to reduce potential impacts.

5.1 Soils

The project could impact up to approximately 10.3 acres during construction. Impacts on soils during construction could result from soil compaction, disturbance, and erosion. After proposed project construction and reclamation activities are completed, negligible, direct, long-term soil loss would occur. Construction disturbance areas are indicated on **Figure 4**.

5.2 Water Resources

Construction for the proposed structure replacement will utilize existing grading improvements as much as practicable. Additional construction grading will have minimal localized stormwater drainage pattern impacts. Although drainage patterns will be impacted around the proposed pad and access cut/fill areas, the overall parcel drainage patterns and area drainage basins will not change. After construction, temporary grading impacts outside the power line easement will be restored to the pre-construction grades. Construction access and pad grading within the power line easement will remain. All graded areas will be covered with on-site topsoil at the end of construction and revegetated. The post-construction minor localized grading will have a negligible impact on the local basin drainage water quality and flow quantity since the vegetation will be restored, there are no large global grading changes, and there are no new conveyance swales nor detention areas.

In addition to site grading, the proposed project area will require multiple staging areas for material drop-off, storage, and helicopter use. Although these areas will experience construction surface disturbance due to construction activities, there will be no grading modifications. Upon completion of construction, the staging areas will have vegetation restored. Since there is no change in staging area grading post-construction, there will be no long-term impact to water quality or surface flow quantity.

Short-term water quality and flow quantity impacts may occur until construction is completed and the site is revegetated. Structural (e.g., silt fence, sediment control logs, rock checks, erosion control blankets) and nonstructural (e.g., preserving natural vegetation, preventative maintenance, training, inspections, and spill response procedures) construction stormwater BMPs would be implemented to minimize erosion and sediment transport.

Construction stormwater permitting is managed by the Colorado Department of Public Health & Environment (CDPHE), which has established a Stormwater Construction Permit that requires the development and implementation of a project-specific Stormwater Management Plan (SWMP) to reduce and prevent pollutants in storm water runoff from entering waterbodies for

any activity disturbing at least 1 acre of land. The SWMP, through the use of structural and non-structural BMPs, would establish erosion and sedimentation controls, hazardous material management, and any necessary reclamation or monitoring events (CDPHE 2019). In addition, the City of Boulder will require a City Grading Permit, which is a local jurisdiction SWMP-type permit. Both permits allow and require regular inspection for BMP implementation, maintenance function in regards to minimizing erosion and sediment transport off-site, as well as revegetation before closing either permit.

A spill or leak of fuel or other construction-related products could indirectly impact water quality. Therefore, construction equipment would be maintained according to the manufacturer's specifications and fuels and other potentially hazardous materials would be contained and stored appropriately. Construction personnel would follow appropriate BMPs to protect against potential petroleum or hazardous material spills. Good housekeeping, maintenance of equipment, and containment of fuels and other potentially hazardous materials would be conducted to minimize the potential for a release of these fluids into groundwater. Therefore, no significant impacts on groundwater from spills or leaks would be expected.

5.3 Air Quality and Climate Change

The project is located within Boulder County, Colorado. The County has been designated by the USEPA as nonattainment for ozone (USEPA 2019). The eastern half of the project is within the area designated by the USEPA as maintenance for carbon monoxide. USEPA has developed *de minimis* levels, that is, the minimum threshold for which a conformity determination must be performed, for various criteria pollutants. For ozone, the *de minimis* level ranges from 10 to 50 tons per year. For carbon monoxide in maintenance areas, the *de minimis* level is 100 tons per year (USEPA 2017). The emissions from the project are anticipated to be well below those thresholds, and therefore no conformity determination, reporting, or permitting requirements are anticipated.

Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. Construction activities will also generate particulate emissions as fugitive dust from ground-disturbing activities; however, the emissions from the project are anticipated to be well below regulatory thresholds; therefore, no reporting or permitting requirements are anticipated.

To limit the emission of fugitive particulate matter, construction activities would incorporate BMPs such as control of vehicle access and flow routes, vehicle speed restrictions, covering of piles, and reestablishing ground cover. The small scale, temporary increase in greenhouse gas emissions associated with the proposed project would not have a measurable effect on climate and, therefore, would be anticipated to be negligible.

To reduce exhaust emissions from construction equipment, PSCO will minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time depends on the sequence of construction activities and when and where vehicles are needed or staged.

Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times that limit their availability for use following startup. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The Project would apply a “common-sense” approach to vehicle use, such that idling would be reduced as much as practicable.

In addition, PSCo will discuss with construction contractor the practicality of using natural gas- or electric-powered vehicles and equipment.

5.4 Biological Resources

5.4.1 Vegetation

Vegetation in the project area includes riparian, grassland meadow, and Douglas-fir (*Pseudotsuga menziesii*) forested habitat. The western end of the project area near the entrance to the canyon, the dominant tree species include Douglas fir and Rocky mountain juniper (*Juniperus scopulorum*) with a shrub cover consisting mainly of skunkbrush sumac (*Rhus trilobata*) and sumac (*Rhus* spp.). The eastern end of the project area consists of typical prairie species, such as western wheatgrass (*Pascopyrum smithii*), buffalograss (*Buchloe dactyloides*), blue grama (*Chondrosum gracile*), fringed sage (*Artemisia frigida*), prickly pear (*Opuntia macrorhiza*), broom snakeweed (*Gutierrezia sarothrea*), yucca (*Yucca glauca*), and curlycup gumweed (*Grindelia squarrosa*).

Bear Canyon Creek flows adjacent to the project area and is dominated by plains cottonwood (*Populus deltoides*), peachleaf willow (*Salix amygaloides*), sandbar willow (*Salix exigua*), reed canarygrass (*Phalaroides arundinacea*), wood’s rose (*Rosa woodsii*), golden currant (*Ribes aureum*), snowberry (*Symphoricarpos occidentalis*), American plum (*Prunus americana*), and chokecherry (*Prunus virginiana*).

Clearing of a minor amount of vegetation and compaction of soil as a result of installing new poles would result in approximately 0.01 acre of impacts to vegetation. Temporary construction impacts to vegetation would occur in proposed staging areas. Disturbed areas will be reseeded with a City of Boulder- and NSF-approved seed mix. Short-term, negligible impacts are expected during construction activities; however, no significant, long-term impacts on vegetation resources would be expected.

5.4.2 Wildlife

Terrestrial mammal species that may occur within the project area include mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), cottontail rabbit

(*Sylvilagus audubonii*), and striped skunk (*Mephitis mephitis*). Large carnivores, such as mountain lion (*Felis concolor*), and black bear (*Ursus americanus*), are also found in the Boulder foothills. There are several rodent species that are likely to occur in the project area, including fox squirrel (*Sciurus niger*), various mice and voles, woodrats (*Neotoma* spp.), and common porcupine (*Erethizon dorsatum*).

Colorado Parks and Wildlife (CPW) identifies the entire project area as black bear, mountain lion, and mule deer overall range (CPW 2018). The project area is also designated by CPW as mule deer concentration area, resident population area, and summer and severe winter range. Elk overall range is designated west and south of the project area along the Boulder foothills (CPW 2018).

Direct impacts to wildlife would include temporary disturbance to vegetation within the staging areas and adjacent to poles. Project construction activities could temporarily displace mammals from the active construction areas because of increased noise and human activity during construction. Helicopters used for the placement of poles could temporarily startle wildlife in the vicinity of the helicopter flight path. Short term and infrequent overflights such as for the five month construction period are not likely to result in long-term harmful effects.

If the proposed project resulted in an increase of non-native or noxious weeds in the project area, this could indirectly impact available browse for mule deer and elk in the project area and adjacent areas. However, PSCo will control noxious weeds, as described in section 6.0, by cleaning all heavy equipment and mobilizing equipment by power-washing before entering the project area. In addition, all disturbed areas will be revegetated using NSF- and City of Boulder-approved seed mix, and the seeded areas will be protected and cared for and watered when needed. Supplemental applications of seed, mulch, and fertilizer will be repaired or applied, and watered as many times as needed until seed mix is established.

5.4.3 Migratory Birds

The potential exists for breeding birds protected by the Migratory Bird Treaty Act to occur within the project area. In order to avoid impacts to potential nesting birds within the project area, all vegetation removal shall be conducted outside of the nesting season for migratory birds (April 1 to August 31). A survey of the project area for nesting migratory birds will be completed prior to any vegetation removal during the nesting season. If active nests are located, PSCo will work with the City of Boulder OSMP department to determine appropriate buffers around active nests. The survey and buffer requirements for migratory bird nests do not apply if the vegetation removal or work on structures is conducted outside of the April 1 to August 31 migratory bird nest season.

A variety of raptor species are known to occur and likely nest in the project area or adjacent Bear Creek Canyon. The most common species include American kestrel (*Falco sparverius*), great-horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsonii*), and turkey vulture (*Cathartes aura*).

OSMP institutes seasonal closures to protect cliff-nesting raptors in the Bear Creek Canyon and adjacent cliffs. Areas designated as raptor nesting habitat are closed to all activity from February 1 through August 15. No construction activities may occur within a 0.50-mile buffer around cliff nesting raptors until after August 15. To ensure that raptors would not be disturbed, PSCo will begin construction on the east end of the project area near the NCAR substation and plan to begin activities that overlap with the raptor nesting buffer after August 15 unless nests are determined by OSMP to be inactive or fledging has occurred. PSCo will coordinate with OSMP to determine nest status in July. If nests are determined to be inactive PSCo will discuss with OSMP the possibility of starting construction early in areas where there are no active nest buffers.

Clearing of a minor amount of vegetation around the poles would slightly reduce habitat availability for migratory birds in the project area. Construction activities could result in displacement of birds from habitat near active construction areas. Helicopter overflights may cause birds to flush from perches or nests but is not expected to result in long-term harmful effects. The helicopter overflights will occur in August when most migratory birds are done nesting.

The rebuilt transmission line would be constructed in accordance with recommendations and standards outlined in the Avian Power Line Interaction Committee's (APLIC's) *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* and *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*. The new line would not pose an electrocution risk to birds.

The rebuilt transmission line would be marked as appropriate to prevent avian collision incidents, if recommended by CPW. By incorporating this protection measure and the proposed seasonal restrictions outlined in Colorado Parks and Wildlife's Raptor Buffer Guidelines, the potential impacts to both resident and migratory birds from the project would be minimized.

5.4.4 *Special Status Species*

Under Section 7 of the Endangered Species Act, a Biological Assessment (BA) has been prepared for the proposed project, for review by the USFWS, to analyze the potential effects to protected species. Federally listed and proposed species considered in the BA include 12 species identified in the USFWS Information for Planning and Consultation (IPaC) list of Endangered, Threatened, Candidate, and Proposed Species for the project area (USFWS 2019). Based on habitat requirements and discussions with City of Boulder biologists, the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is the only federally listed species with potential to occur in the project area. No designated critical habitat for any federally listed species is present within the action area. Impacts to the Preble's meadow jumping mouse are discussed in the BA.

The BA concluded that based on the avoidance of riparian habitat, the low potential for Preble's in the direct impact area around the poles and staging areas, and the adherence to BMPs, the

project *may affect, but is not likely to adversely affect, the Preble's meadow jumping mouse*. The proposed project will have no effect upon designated Preble's critical habitat.

5.5 Heritage Resources and Human Environment

5.5.1 Cultural Resources

PSCo retained HDR to conduct a Class III cultural resource survey for the Project. Much of the project area is covered by surveys conducted by City of Boulder OSMP in 2016. HDR requested a file search and literature review from the Colorado Office of Archaeology and Historic Preservation in November 2018 and January 2019. The file searches identified six previous surveys and 21 cultural resources within 0.25 mile of the Area of Potential Effects. The previous surveys were conducted between 1992 and 2016. Five of the 21 resources are within the Area of Potential Effects: 5BL3925.1, 5BL3924.2, 5BL13400, 5BL13401, and 5BL13402. The sites are Bear Canyon Road, Mesa Trail, an unnamed historical site, a historical fence line, and the Xcel NCAR substation and transmission line. HDR resurveyed and reevaluated all previously identified cultural resources within the Area of Potential Effects during the original and supplemental survey.

Two newly recorded linear segments were recorded and three previously recorded sites were reevaluated during the original and supplemental surveys. Site 5BL3924.5 is a newly recorded segment of the Mesa Trail that is officially eligible for inclusion in the National Register of Historic Places (NRHP) as a whole and the current segment is recommended as supporting the eligibility of the entire linear site. Site 5BL3925.1 is a previously recorded segment of the Bear Canyon Road that is officially eligible for inclusion in the NRHP and the segment is recommended as supporting the eligibility of the entire linear site. Site 5BL13400 is a small previously recorded historical site recommended eligible for inclusion in the NRHP under Criterion D. Site 5BL13401 is a previously recorded historical fence line that was recommended not eligible for inclusion in the NRHP. A segment of the site, 5BL13401.1, was recorded during the original survey and the entire site was recorded during the supplemental survey. Site 5BL13402 is the previously recorded PSCo/Xcel NCAR substation, transmission line and access road that was recommended not eligible for inclusion in the NRHP.

The project will directly impact site 5BL13402. Feature 3 (the transmission line) is slated for a complete rebuild as part of this project. The site is recommended not eligible for inclusion in the NRHP and no further work is recommended. Effects to 5BL3924.5 and 5BL13400 will consist of temporary audio and visual impacts during construction activities, so these potential historic properties will not be adversely affected. Site 5BL13400 is within the supplemental survey for the new staging areas. It is recommended that the site is avoided. Site 5BL13400 and segment 5BL13401.1 is recommended not eligible for inclusion in the NRHP and no further work is recommended. Site 5BL3925.1 will be used as an access road for the project, but is already used by maintenance and emergency vehicles and use during this project is not considered an adverse effect.

Pending concurrence by the Office of Archaeology and Historic Preservation with the site eligibility recommendations, a determination of “no historic properties adversely affected” is recommended for the project pursuant to 36 CFR 800.5(b) of the National Historic Preservation Act, and no further work is recommended.

NSF has initiated consultation with the Office of Archaeology and Historic Preservation.

5.5.2 *Visual Resources*

The visual impacts of the Project would be minimal. The new poles would be steel construction with a weathered steel exterior treatment. This provides the necessary rust prevention to assure long term structural integrity, while minimizing any increase of the line visibility not already experienced by the public and surrounding residents. The new conductor would be non-specular to reduce reflection. In general, the new poles would be taller than the existing poles, as shown in Table 2, but would be similar in appearance to the existing poles. The type, height, location and foundation types of each existing and new structures are shown on **Table 1. Appendix B** contains photos of the existing viewshed, taken from seven viewpoints, as shown on **Map B-1**.

5.5.3 *Noise*

Existing background noise levels in the project area range from 35 to 67 A-weighted decibels (dBA). Sensitive noise receptors along the proposed transmission line rebuild areas primarily include private single family residences.

The short-term increase in ambient noise levels from construction and rebuild of the proposed transmission lines would not cause significant adverse effects on the surrounding populations. The noise from construction equipment would be localized, short-term, and intermittent during machinery operations. Heavy construction equipment would be used periodically during construction; therefore noise levels from the equipment would fluctuate throughout the day.

Noise impacts associated with the Project will consist primarily of construction equipment and helicopter use. PSCo will work with the City of Boulder to provide the community notification of the Project, including the helicopter use and hours of operation. This notification will be in the form of Next Door, mailings and trail signs. All notifications would include PSCo contact information for questions or concerns.

PSCo anticipates using UH-1 Huey and UH-60 Blackhawk helicopters for construction; however, the model of helicopter may change depending on availability. Most trips would be made by the Huey, which produces less noise than the Blackhawk. The Blackhawk model would be used for trips carrying heavier loads. The noise associated with these helicopters will likely be noticeable to recreational users of nearby trails (see section 5.6.2 regarding trail closures for safety during helicopter crossings of trails) and to residents to the east and south of the Project area. More information on helicopter use is presented in section 3.5. See nearby residences on

Figure 5, which depicts a one-half mile radius around the transmission line easement and staging areas.

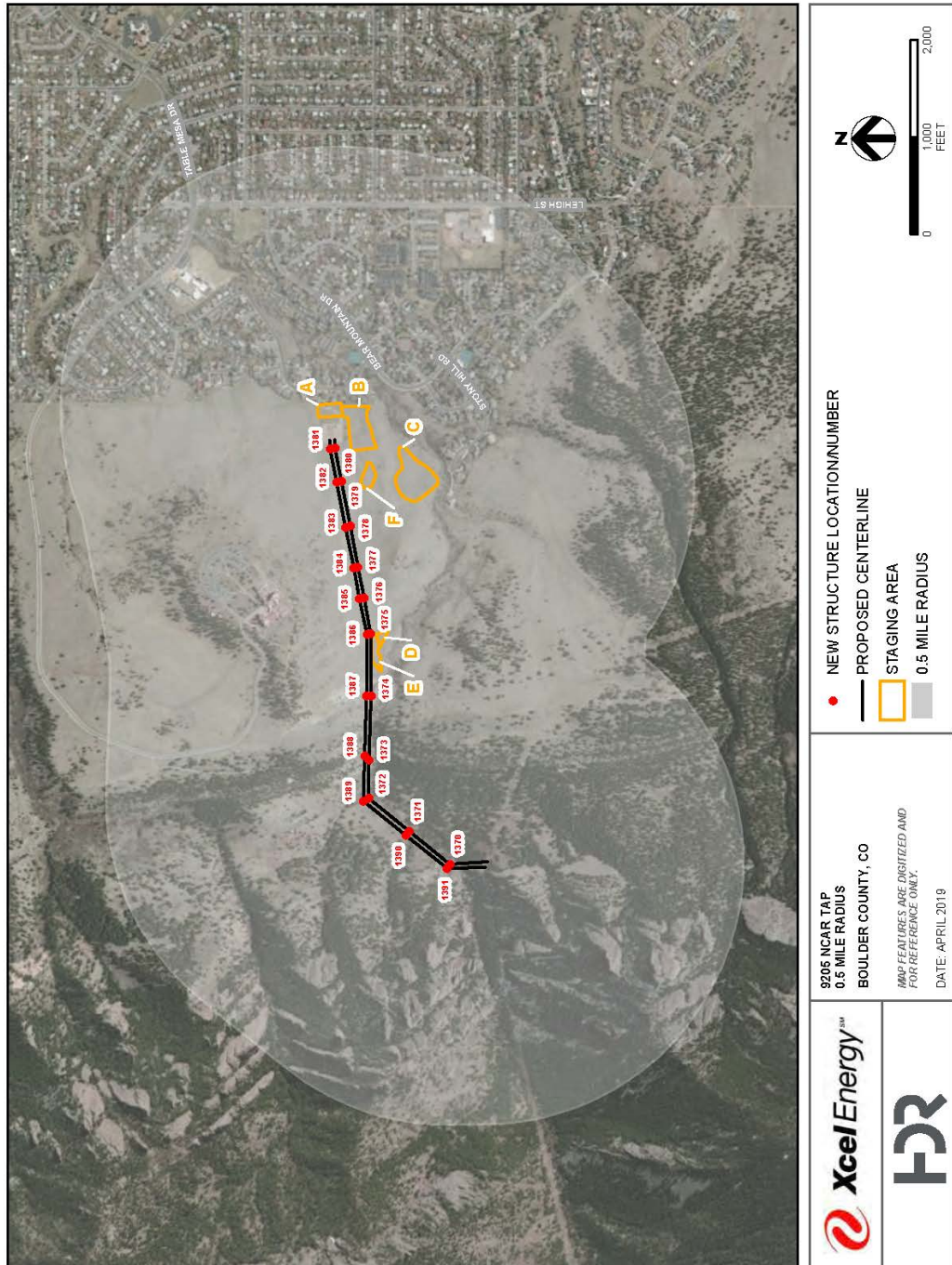


Figure 5. Project with 0.5-mile Radius

PSCo will work with NCAR and UCAR, when possible, to schedule helicopter activities around outdoor events located at the NCAR facility.

Humans are typically more sensitive to increased noise levels during nighttime hours. Helicopter flights and project construction would occur only during daylight hours. However, temporary noise increases would occur during Project construction. To minimize residential noise, PSCo would attempt to utilize the lightest helicopter appropriate for the activity. In addition, PSCo has configured the Project so that the staging areas closest to residences would not be used for helicopter picking.

5.6 Land Resources

5.6.1 Land Use

The project is located within Boulder County, on land owned by NSF and the City of Boulder. The land is maintained as open space, with a number of trails that are managed by the City of Boulder OSMP department for recreational uses. Residential areas are found to the east and south of the Project area. Land ownership in the project area is illustrated on the Site Plan in **Appendix A**.

PSCo will notify landowners within one-half mile of project activities (see **Figure 5**). Within 0.5 miles of the Project are about 972 single-family residences, 37 multi-family residences, Bear Creek Elementary School, Mesa Elementary School, and the NCAR Mesa Laboratory and Visitor Center facility. NCAR is managed by the nonprofit UCAR on behalf of NSF and the UCAR university community. The NCAR Mesa facilities include the flagship Mesa Lab and the Fleischmann Building. The Mesa Lab Visitor Center is open to the public 363 days a year and offers free exhibits about weather and climate, guided and self-guided tours, a gallery featuring local artists, and an outdoor weather trail (UCAR 2019).

5.6.2 Recreation

Several trails maintained by the City of Boulder are located in and around the Project construction area. These trails consist of the NCAR-Table Mesa\Bear, NCAR-Bear Canyon Connector, NCAR-Bear Canyon, Bear Canyon and Mesa. PSCo would work with the City to keep these trails open as much as possible throughout the Project construction. The exception to this is the NCAR-Bear Canyon Connector Trail, which would likely need to be closed during the construction activities. Flaggers and signage will be employed during the construction activities to assure public safety during closures. The NCAR-Table Mesa\Bear Trail should remain open with minimal closures. The NCAR-Bear Canyon, Bear Canyon and Mesa Trails would require intermittent closures during the day to allow passage of construction vehicles, crossing of trails with helicopter suspended loads, and construction activities. All trails, with some exceptions, would be open in the evenings and weekends. Trails closures will be reflected on the City of Boulder's website and discussed in the preconstruction public outreach efforts. Any changes to

these closures would be relayed to the City and NCAR as soon as possible and appropriate public outreach will be determined.

This approach to reduce impacts to recreational resources while maintaining public safety was reviewed and approved by Bethany Collins, Real Estate Supervisor for the City of Boulder, via email on April 26, 2019.

5.6.3 Transportation and Access

The transmission line would be accessed by driving along the existing ROW and where necessary from existing public or private roads. No new roads would be built. Some access points would require additional grading so construction equipment can drive into the project area. New culverts would be installed at certain access points and along the transmission line so construction equipment can drive to the ROW. These improvements would reduce ground damage during construction. Non-paved roads would not be accessed during wet conditions, except in emergency situations. Any rutting or other damage to access roads would be repaired; ruts would be filled in and revegetated as necessary.

Transmission line materials (poles, wire) and construction equipment would be brought in using semi-trailer trucks along the major US and state highways. Materials would be delivered and stored along the ROW where accessible by semi-truck. In locations where semi-trucks cannot drive along the ROW, the materials would be delivered to the staging areas.

The main state and local roads already experience a relatively high volume of trucks; negligible and short-term impacts are expected to the capacity and conditions of these roads resulting from trips generated by material supply trucks.

Traffic from construction crews is not expected to limit the overall capacity or safety of the road network, Users of the local roads may notice the presence of additional vehicles on the rural roads even though capacity is not diminished.

A helicopter/aviation safety plan would be the responsibility of the helicopter company and would be submitted to NSF prior to flights.

Once construction is complete, the transmission lines typically would be patrolled twice a year, and accessed as needed by a single crew for long-term maintenance of the transmission lines. Impacts to traffic and road condition on existing roads would be negligible.

Consequently, short- and long-term adverse effects to transportation infrastructure and safety conditions would be negligible. During operation and maintenance of the Project, PSCo would implement seasonal and wet weather restrictions to the extent practical to reduce negative impacts to roads and access routes.

6.0 STABILIZATION AND RESTORATION

Following completion of construction in 2020, disturbed areas outside of the transmission line easement would be re-contoured, and all disturbed areas both inside and outside of the easement would be reseeded with a NSF approved seed mixture. PSCo will restore affected areas, including trails, in collaboration with NCAR/UCAR and City of Boulder OSMP staff.

Design features and BMPs that would be applied during the proposed project construction are described in **Table 2**. During construction, work crews would carry spill cleanup kits, and in times of burn bans or wildfire concerns, each crew would have a fire suppression kit.

Construction stormwater plans and measures that meet local, state, and federal guidelines and intent would be developed and implemented during construction and revegetation activities.

Table 2. Design Features and Best Management Practices

Proposed Project Phase	Affected Resources	Applicant-Committed Measures and BMPs
Pre-Disturbance/Planning	General	A construction monitoring plan will be developed to monitor the implementation of BMPs during construction.
Pre-Disturbance/Planning	General	All on-site crews will be trained about the importance of staying on defined access routes and within the ROW.
Pre-Disturbance/Planning	General	Low impact boundary fence will be installed to delineate construction limits in coordination with City of Boulder OSMP staff.
Construction	General	Grading and clearing activities will be phased, minimized, and disturbances will be temporarily or permanently stabilized as soon as practicable.
Construction	General	Vehicle speed restrictions will be enforced to reduce potential for accidents and dust creation. Dust suppression of haul routes by watering will be utilized as appropriate and as coordinated with City of Boulder OSMP staff.
Construction	Soils, Water	Temporary soil erosion control measures for disturbed land area and soil stockpiles would be implemented before construction commences and during construction as appropriate. After the cessation of construction, up-gradient BMPs will be removed, the site will be reseeded, depending on season, and mulched and down-gradient BMPs will remain on-site. The down-gradient temporary BMPs will remain in place until the site has revegetated.
Construction	Soils	Construction will not occur when the soil is too wet to adequately support construction equipment, if such equipment creates ruts in excess of 4 inches deep. Construction crews may utilize drive-over mats to address rutting and soil compression concerns. Excavated topsoil will be segregated from subgrade soil and replaced as the final lift to establish finish grade mimicking the pre-construction topsoil depth. Excess soils not backfilled into the foundation excavation will be removed from the project area for proper off-site disposal.

Proposed Project Phase	Affected Resources	Applicant-Committed Measures and BMPs
Construction	Air Quality	To limit the emission of fugitive particulate matter, BMPs will be employed as appropriate, including controlling vehicle access and flow routes, covering piles, reestablishing ground cover, and applying water.
Construction	Air Quality	To further minimize the less-than-significant construction exhaust emissions, PSCO will minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time depends on the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times that limit their availability for use following startup. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The Project would apply a “common-sense” approach to vehicle use, such that idling would be reduced as much as practicable.
Construction	Biological Resources	<p>Non-native or noxious weeds will be controlled by:</p> <ul style="list-style-type: none"> • All heavy equipment and mobilizing equipment will be cleaned by power-washing before entering each project if: <ol style="list-style-type: none"> a) Equipment is covered with mud, plants, or other foreign materials and/or b) Previous operation site was infested with invasive plant species. • All disturbed areas will be revegetated using NSF- and City of Boulder-approved seed mix. • Seeded areas will be protected and cared for and watered when needed. Supplemental applications of seed, mulch, and fertilizer will be repaired or applied, and watered as many times as needed until seed mix is established.
Construction	Biological Resources	To minimize impacts to migratory birds, construction will occur outside the typical breeding season for migratory birds. Although the provisions of the Migratory Bird Treaty Act apply year-round, most nesting activity occurs between April 1 and August 31. If proposed activities must occur during the nesting season, or at any other time that may result in the “take” of migratory birds, a qualified biologist will conduct pre-construction field surveys of the affected habitats or structures, during the nesting season, to verify the presence or absence of nesting migratory birds. If active nests are located, an appropriate buffer will be provided around active nests in consultation with the OSMP wildlife biologist. If active nests are inadvertently located during construction activities, an appropriate buffer will be provided around active nests in consultation with OSMP.

Proposed Project Phase	Affected Resources	Applicant-Committed Measures and BMPs
Construction	Biological Resources	Construction will begin in early June 2019 and progress from east to west. This would allow work on structures outside of known raptor nest buffers to begin prior to the end of the raptor nesting season which is August 15th. No work will occur within the 0.50 mile OSMP cliff nesting raptor buffers until after August 15th unless nests are determined by OSMP to be inactive or fledging has occurred. PSCo will coordinate with OSMP to determine nest status in July. If nests are determined to be inactive PSCo will discuss starting construction early with OSMP in areas where there are no active nest buffers.
Construction	Biological Resources	The seasonal restrictions recommended by Colorado Parks and Wildlife (CPW) and outlined in CPW's Raptor Buffer Guidelines will be followed.
Construction	Biological Resources	<p>Seasonal restrictions and/or best management practices to minimize impacts on Preble's Meadow Jumping Mouse will include</p> <ul style="list-style-type: none"> • In the unlikely event that a Preble's mouse is encountered (dead, injured, or hibernating) during construction activities, the Colorado Field Office of the USFWS will be contacted immediately at 303-236-4773. • During the Preble's active season (May 1 through November 1) limit work to daylight hours to avoid disrupting the Preble's nocturnal activities. • Vegetation beyond the construction limits will not be disturbed. Vegetation adjacent to pole installation areas will be preserved where possible. • Barriers in work areas will be constructed and maintained to prevent sediment, petroleum products, chemicals, and other liquids and solids from entering waters of the United States.
Construction	Biological Resources	The transmission lines will be constructed in accordance with recommendations and standards outlined in the Avian Power Line Interaction Committee's <i>Suggested Practices for Avian Protection On Power Lines: The State of the Art in 2006</i> and <i>Reducing Avian Collisions with Power Lines: The State of the Art in 2012</i> .
Construction	Cultural Resources	If any inadvertent discoveries are located during construction, the State SHPO cultural resources staff will be notified in accordance with applicable guidance and law.
Construction	Visual Resources	To reduce visual effects, the exterior of the new steel poles will be treated with a weathered steel exterior treatment that provides the necessary rust prevention while minimizing increase of the line visibility to the public and surrounding residents. In addition, the new conductor will be non-specular to reduce reflection.
Construction	Noise	PSCo will not use staging areas closest to residences to reduce impacts of helicopter noise.
Construction	Noise	Proper and properly maintained safety equipment, including mufflers, dampeners, covers, and vibration isolators, will be used.
Construction	Noise, Recreation	PSCo will work with NCAR and UCAR, when possible, to schedule helicopter activities around outdoor events located at the NCAR facility.

Proposed Project Phase	Affected Resources	Applicant-Committed Measures and BMPs
Maintenance	Soils, Biological Resources	All BMPs will be inspected and maintained on site as required and as needed until vegetation is established to the required density.

7.0 OPERATION AND MAINTENANCE

The transmission lines would be patrolled on regular basis (typically about twice a year) by a PSCo employee or contractor in a pickup truck or on foot, depending on access. The inspector would observe the line and each structure to identify and correct any damage or mark it for future repair. Most access would be along the transmission line ROW, but access may be across public or private land to minimize disturbance.

The transmission line would generally be inspected during daylight hours. All inspectors would carry spill cleanup kits and fire suppression tools in their vehicles while inspecting the lines. Vegetation would be managed to maintain reliable line operations. Vegetation management following construction would be consistent with current practices in terms of both duration and intensity. Trees are the primary vegetation that would require regular clearing, as they can create mechanical (tree falling on line or structure) or electrical (tree falling on line or close to line creating a short to the earth) outages. Once each year, the line would be visually inspected for line and structure integrity as well as vegetation encroachment. Trees that are seen as a hazard would be scheduled for pruning or removal.

No new permanent jobs would be lost or gained as a result of the project. The projected life span, consisting of the new conductors, insulators, shield wires, and pole structures, would be 50 years.

8.0 REFERENCES

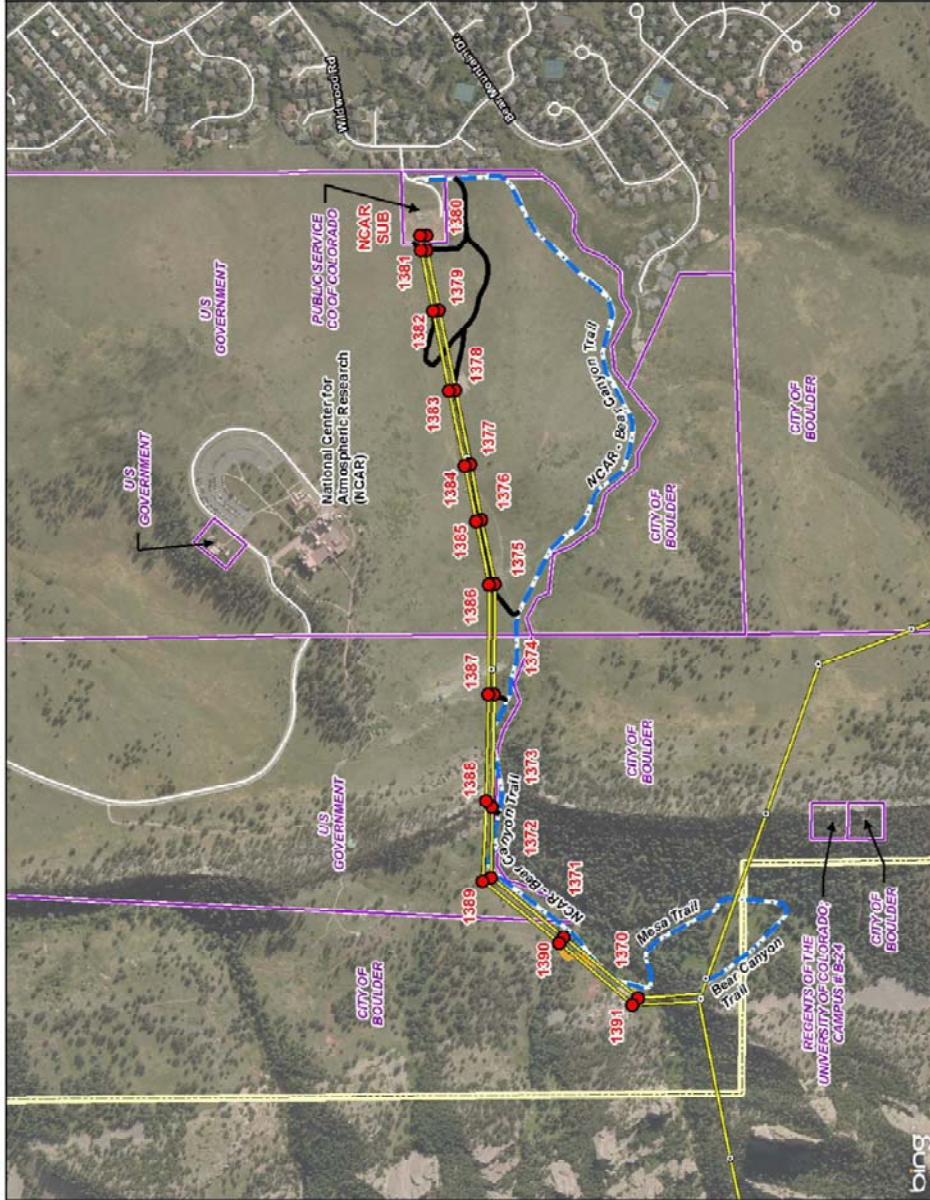
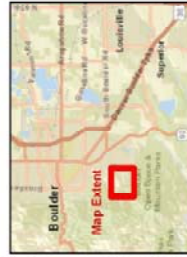
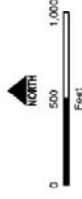
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Appendix A
Site Plan

9205 NCAR Tap to NCAR Rebuild Access

Legend

- New Structure Location
- Existing Structure
- Proposed Centerline
- - - Existing Trail
- Temp Limited Access
- Temp Full Access Road
- Parcel Ownership
- Boulder City Limit



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Appendix B

Existing Structure and Viewshed Photos

Appendix B

Part 1: Existing Structure Photos

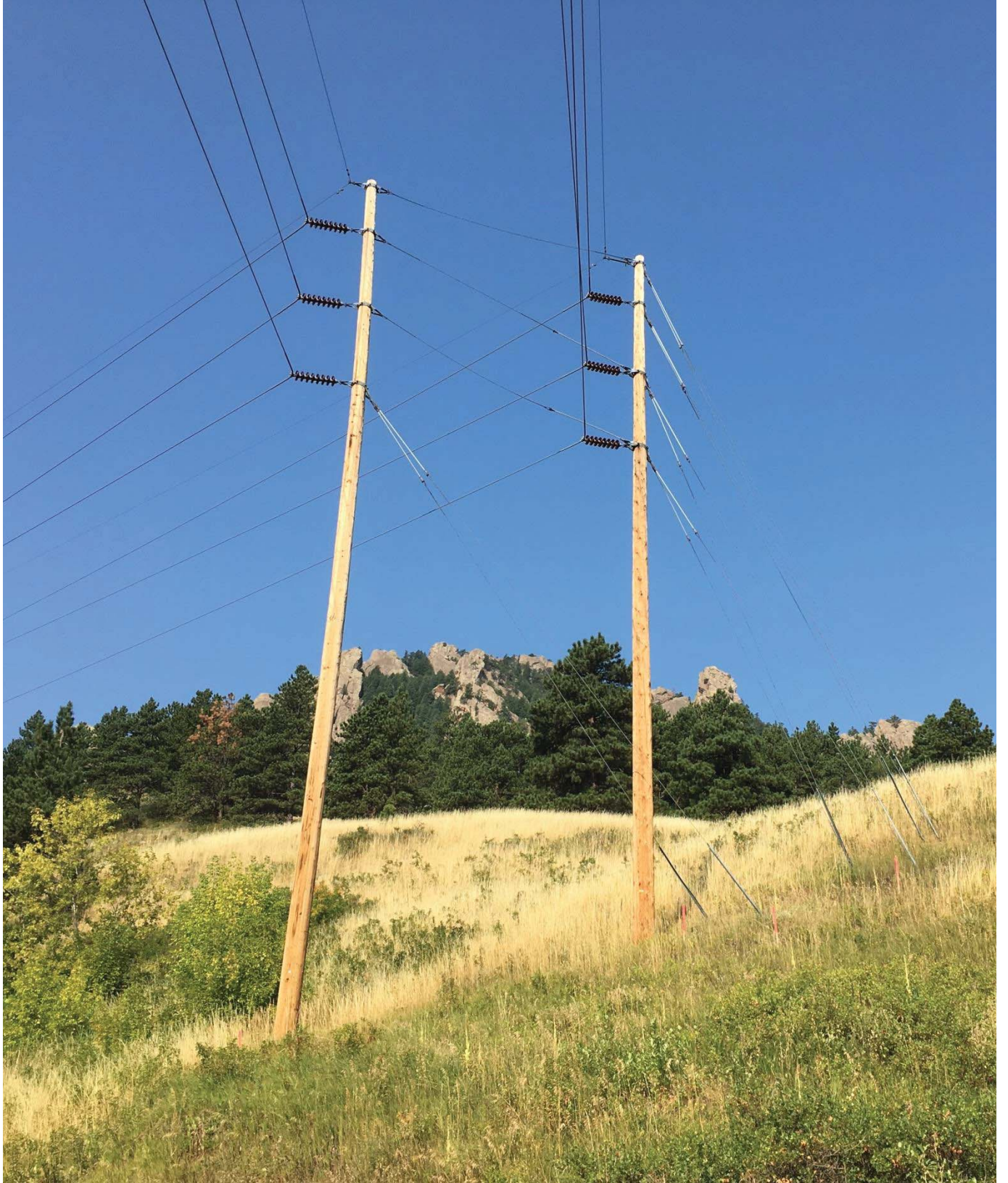
APPENDIX B



Structure 2



Structure 3



Structure 4



Structure 5



Structure 6



Structure 7



Structure 8



Structure 9



Structure 9A



Structure 10



Structure 11

Appendix B

Part 2: Viewshed Photos



Viewshed Index Map



Viewpoint POD 1



Viewpoint POD 2



Viewpoint POD 3



Viewpoint POD 4



Viewpoint POD 5



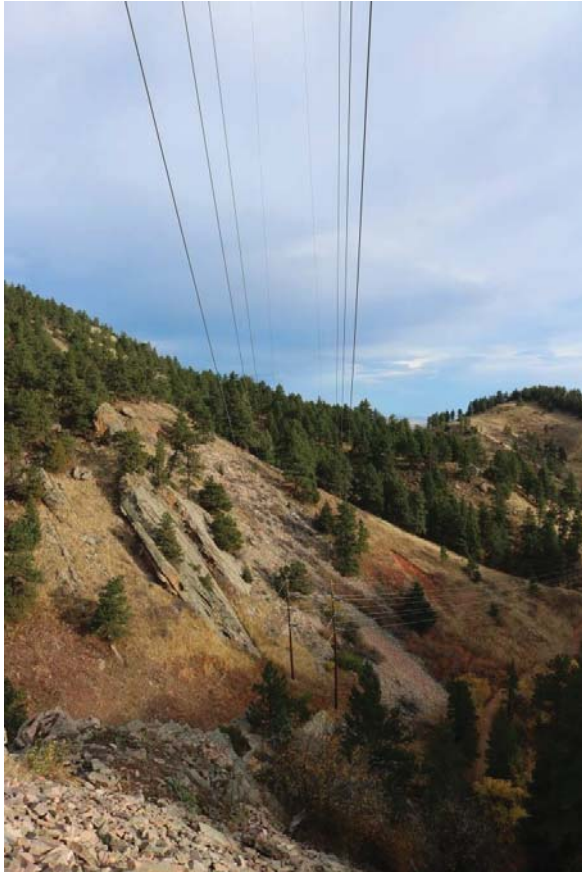
Viewpoint POD 6



Viewpoint POD 7



Viewpoint POD 8



Viewpoint POD 9

Appendix C
Easements

APPENDIX C

FLM 521

Recorded DEC - 8 1964

Assignment No.

772393

3-1

EASEMENT AGREEMENT

69203

THIS EASEMENT AGREEMENT, pursuant to the National Science Foundation Act of 1950 (42 U.S.C. 1861 et seq.), and effective 26 October 1964, is entered into by the UNITED STATES OF AMERICA (hereinafter called the Government) represented by the NATIONAL SCIENCE FOUNDATION (hereinafter called the Foundation) and the PUBLIC SERVICE COMPANY OF COLORADO, hereinafter called the Grantee:

W I T N E S S E T H:

WHEREAS, the Grantee desires to construct, operate, and maintain electric transmission and distribution lines across the lands of the government as described below; and

WHEREAS, the granting of such right by the Government, and the exercise thereof by the Grantee under the terms and conditions herein provided, will not be incompatible with the purposes for which said lands are being administered;

NOW THEREFORE, in consideration of the mutual covenants hereinafter contained, and in further consideration of the sum of Two Thousand Eight Hundred Fifty and no/100 Dollars (\$2,850.00) and other good and valuable consideration payable in advance to the Foundation by the Grantee, the parties hereto agree as follows:

The Foundation does hereby convey to the Grantee, its successors, and assigns forever an easement for the construction, reconstruction, operation and maintenance of conductors and conduits for the transmission and distribution of electricity, whether said lines may now or may hereafter serve the property herein described or other property, together with the necessary poles, towers, cables, wires, guys, supports, and other fixtures and devices, used or useful in the operation of electric transmission and distribution lines, through, on, over, and across the following described lands, to wit:

A right-of-way 75 feet in width, 37 1/2 feet on either side of a center line situate in the (SE 1/4 of Section 12, Township 1 South, Range 71 West,) and the (N 1/2 SW 1/4 and NW 1/4 SE 1/4 of Section 7, Township 1 South, Range 70 West,) all in the 6th P.M., County of Boulder, State of Colorado, the center line of which right-of-way is more particularly described as follows:

Beginning at a point on the south boundary line of the property of the grantors, whence the S 1/4 corner of said Section 12 bears S 42° 40' 14" W. 756.78 feet; thence N 1° 47' 21" W 77.49 feet to a point; thence N 39° 54' 59" E. 1119.62 feet to a point; thence S 88° 46' 21" E. 1684.08 feet to a point; thence N 78° 36' 19" E. 2010.57 feet to a point; thence N 88° 46' 39" E. 14.84 feet more or less to a point, whence the center of said Section 7 bears N 1° 12' 30" W. 125 feet; thence N 14° 08' W. 721.10 feet.

Also a right-of-way 10 feet wide, 5 feet on each side of a center line situate in the (S 1/2 SW 1/4 of Section 6,) the (NW 1/4, and the W 1/2 W 1/2 NE 1/4, and W 1/2 W 1/2 SE 1/4 of Section 7,) all in Township 1 South, Range 70 West, 6th P.M., County of Boulder, State of Colorado, the center line of which right-of-way is more particularly described as follows:

Commencing at the Northwest corner of said Section 7; thence S 0° 25' 26" E. 5 feet to the true point of beginning; thence S 89° 40' 36" E. 1345 feet; thence N 2° 22' W. 1315.57 feet; thence S 2° 22' E. 1315.57 feet; thence S 89° 40' 36" E. 776.47 feet; thence N 88° 57' 25" E. 600.11 feet; thence S 88° 57' 25" W. 5 feet; thence S 0° 4' 35" W. 4068.42 feet more or less to the south boundary line of National Center for Atmospheric Research property.

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Together with the right of ingress and egress over said premises and to remove objects or structures therefrom; and, also to survey, construct, reconstruct, maintain, operate, control and use said lines and facilities subject to the following terms and conditions:

1. The construction and/or operation and maintenance of said facilities shall be accomplished without cost or expense to the Government and in such manner as not to endanger personnel or property of the Government or others on the said Government land or obstruct travel on any road thereon.
2. The use and occupation of said land incident to the exercise of the privileges hereby granted shall be subject to such rules and regulations regarding ingress, egress, safety, sanitation, and security as the Foundation may from time to time prescribe, subject however to the prior rights of the Grantee described in that instrument granted by the State of Colorado to Grantee and recorded in Book 1262 at Page 435 Boulder County Records.
3. The Grantee recognizes the Foundation's concern for preserving the natural beauty of the area and will use its best efforts to preserve such natural beauty insofar as is reasonably possible.
4. The Grantee shall supervise the facilities to be constructed on the right-of-way granted hereby and cause them to be inspected at reasonable intervals, and shall immediately repair any defects found therein as a result of such inspection, or when requested by the Foundation. Upon completion of the installation of such facilities and the making of any repairs thereto, the premises shall be restored immediately by the Grantee, at the Grantee's own expense, to conditions satisfactory to the Foundation.
5. Any property of the Government damaged or destroyed by the Grantee incident to the use and occupation of the said premises shall be promptly repaired or replaced by the Grantee to the satisfaction of the Foundation, or in lieu of such repair or replacement the Grantee shall, if so required by the Foundation, pay to the Government money in an amount sufficient to compensate for the loss sustained by the Government by reason of damage to or destruction of Government property.
6. The Government reserves to itself the right to construct, use, and maintain across, over, and/or under the right-of-way hereby granted, electric transmission, telephone, telegraph, water, gas, gasoline, oil, and sewer lines, and other facilities, but only in such manner as not to create any unreasonable interference with the use of the right-of-way herein granted.
7. The Government shall not be responsible for any damages to property or injuries to persons which may arise from or be incident to the use and occupation of the said premises by Grantee, or for damages to the property of the Grantee, or for damages to the property or injuries to the person of the Grantee's officers, agents, servants, or employees, or others who may be on said premises at their invitation or the invitation of any one of them, arising from or incidental to governmental activities; and the Grantee shall hold the Government harmless from any and all such claims.
8. The Government shall not be responsible for damages to property or injuries to persons which may arise from or be incidental to the construction, maintenance, and use of said facilities.
9. The Grantee shall furnish through said facilities such services as may be required from time to time for governmental purposes on said land, provided that payment for all such services will be made by the Government at rates which shall be mutually agreeable but which shall never exceed the most favorable rates granted by the Grantee for similar service.
10. That, in the event all or any portion of said land occupied by said facilities shall be needed by the Government, or in the event the existence of said facilities shall be considered detrimental to governmental activities, the Grantee shall, from time to time, upon notice, remove said facilities to such other location or locations on Government land as may be designated by the Foundation, provided, however, that if directed to relocate its facilities the Grantee may, at its option, in lieu of taking such action,

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wholly remove its facilities from lands of the Government as described herein, at which time the right granted herein shall cease but the restoration obligation set forth in Condition No. 12, herof shall remain, and in the event said property shall not be removed or relocated within ninety (90) days after any aforesaid notice, the Government may cause the same to be done at the expense of the Grantee.

11. That this easement may be terminated by the Foundation upon reasonable notice to the Grantee if the Foundation shall determine that the right-of-way hereby granted interferes with the use or disposal of the said land or any part thereof by the Government, or it may be forfeited and annulled by declaration of the Foundation for failure, neglect, or refusal by the Grantee fully and promptly to comply with any and all of the conditions of this agreement, or for nonuse for a period of two years, or for abandonment. No part of any payment made to the Government under this agreement shall be refunded.

12. That upon the expiration, termination, or forfeiture and annulment of this agreement, the Grantee shall, without expense to the Government, and within such reasonable time as the Foundation may indicate, remove said facilities from said land and restore the premises hereby authorized to be used and occupied to a condition satisfactory to the Foundation. In the event the Grantee shall fail, neglect, or refuse to remove the said facilities and so restore the premises, the Government shall have the option either to take over the said facilities as the property of the Government without compensation therefor, or to remove said facilities and perform the restoration work as aforesaid at the expense of the Grantee, and in no event shall the Grantee have any claim for damages against the Government, or its officers or agents, on account of the taking over of said facilities or on account of their removal.

13. That the provisions and conditions of this instrument shall extend to and be binding upon and shall inure to the benefit of the representatives, successors, and assigns of the Grantee.

14. That it is understood that this instrument is effective only insofar as the right of the Government in the said property are concerned; and that the Grantee shall obtain such permission as may be necessary on account of any other existing rights.

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THE UNITED STATES OF AMERICA

NATIONAL SCIENCE FOUNDATION

By John T. Wilson
JOHN T. WILSON
Deputy Director

OCT 2 6 1964
(Date)

GRANTEE:

PUBLIC SERVICE COMPANY OF COLORADO

By L. P. Patten
Vice-President

550-15th Street - Denver, Colorado, 80202
(Business Address)

7/30/64
(Date)

MANAGER OF ENGINEERING
Lawrence M. Robertson
LAWRENCE M. ROBERTSON



[Signature]
Secretary

APPROVED FOR EXECUTION
LEE, BRYANS, KELLY & STANSFIELD
ATTORNEYS
By [Signature] 7/30/64

wp

EASEMENT

Approved:

THIS INSTRUMENT, Made this 26th day of JANUARY 1965 in the year of our Lord one thousand nine hundred and sixty five, between

Byron L. Wells and Joe Rothmeier, grantor S of the Boulder County of Colorado and PUBLIC SERVICE COMPANY OF COLORADO, a corporation duly organized and existing under and by virtue of the laws of the State of Colorado, grantee;

WITNESSETH, That the said grantor S, for and in consideration of the sum of Ten Dollars and other valuable consideration to the said grantor in hand paid by the said grantee, the receipt whereof is hereby confessed and acknowledged, has VE granted, bargained, sold and conveyed and by these presents do grant, bargain, sell, convey and confirm unto Public Service Company of Colorado, its successors and assigns forever, an easement for the construction, reconstruction, operation and maintenance of conductors and conduits for the transmission of electricity, together with the necessary poles, towers, crossarms, cables, wires, guys, supports, and other fixtures and devices, used or useful in the operation of electric transmission lines, through, on, over and across the following described lands, to-wit:

Located in the SW 1/4 of Section 12, T.1S., R.71W., 6th P.M. A right-of-way 75 feet in width 37 1/2 feet on either side of a center line described as follows:

Beginning at a point on the centerline of the Public Service Company of Colorado 115KV Line whence the S corner of said Section 12 bears S. 62° 59' 26" W. 585.90 feet; thence N. 1° 47' 21" W. 290.49 feet more or less to the north boundary line of grantor common with N.C.A.R. property.

Together with the right of ingress and egress over said premises and to remove objects or structures therefrom; and, also to survey, construct, reconstruct, maintain, operate, control and use said lines and facilities.

The grantor S reserve the right to cultivate and use said premises for any purpose consistent with the rights and privileges above granted and which will not interfere with or endanger the grantee's facilities thereon, or the use thereof or of any of the rights herein granted. Such reservation by the grantor shall not include the right to erect or place any structures or objects, including signs, or drill or operate any wells on, upon, above or over the easement herein granted. In case the permanent abandonment of said easement, all right, privilege and interest herein granted shall end, cease and determine.

The work of installing, maintaining and reconstructing its facilities shall be done with care, and all damage to the premises caused thereby shall be paid for or repaired at the expense of the grantee.

The provisions of this easement shall be binding upon and shall inure to the benefit of the heirs, executors, administrators, successors and assigns of the parties hereto.

Signed and delivered this 26th day of JANUARY, A. D. 1965.

In the Presence of

Byron L. Wells (SEAL)
Joe Rothmeier (SEAL)
..... (SEAL)
..... (SEAL)

STATE OF COLORADO,
COUNTY OF Boulder } ss.
The foregoing instrument was acknowledged before me this 26th day of JANUARY 1965, by Byron L. Wells and Joe Rothmeier

Witness my hand and official seal.
My commission expires Oct 17, 1967
Eli G. Smith Notary Public

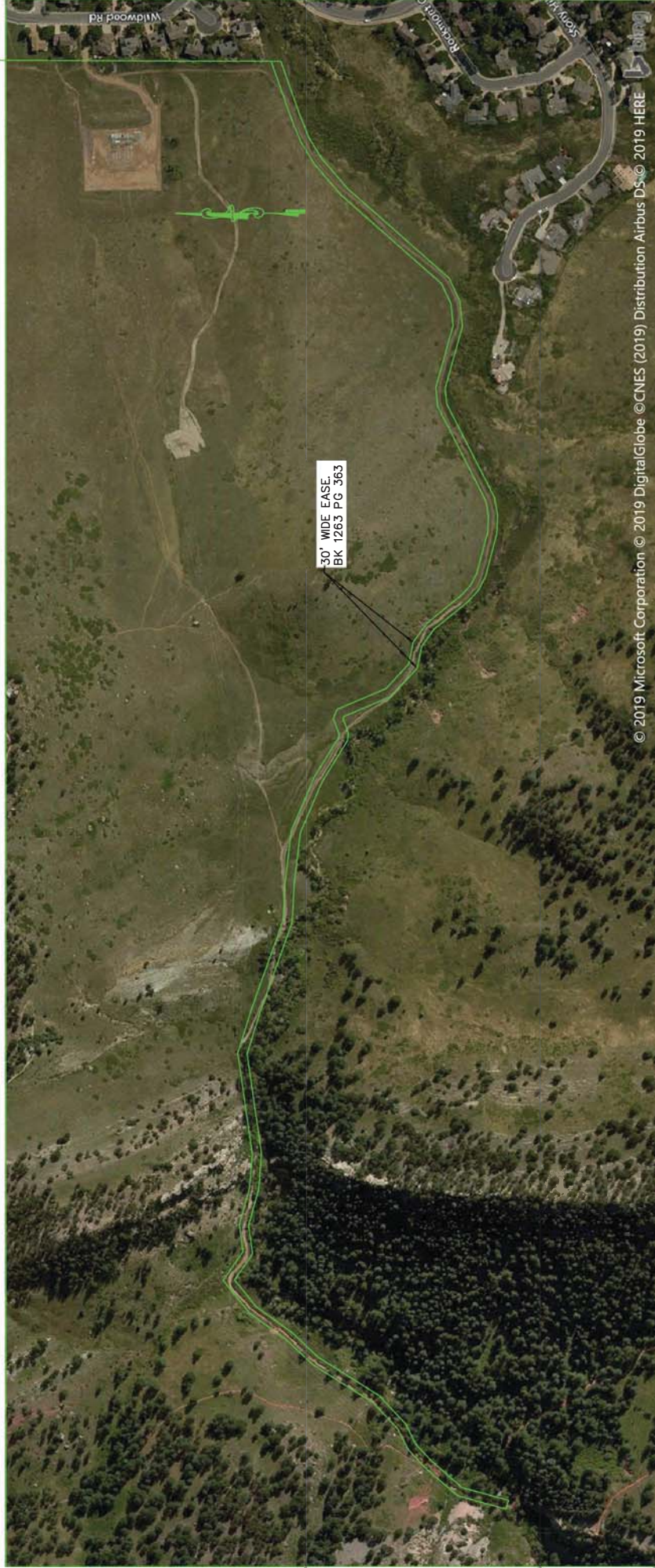
Eli G. Smith

METHOD OF PAYMENT DRAFT # 3545

NAME OF LINE NCAE 115KV TAP

Document No. 71132

Access Easement



background aerial photo dated 2016