

National Park Service
U.S. Department of the Interior



Denali National Park and Preserve, Alaska

Upgrade Headquarters Utility Infrastructure Environmental Assessment

May 2013



UPGRADE HEADQUARTERS UTILITY INFRASTRUCTURE
Environmental Assessment
May 2013

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PURPOSE AND NEED

PURPOSE OF AND NEED FOR ACTION

The National Park Service (NPS) is proposing to upgrade the utility systems in the headquarters area of Denali National Park and Preserve (see Figure 1 Location Map). This area includes the 11.91 acre Mount McKinley National Park Headquarters Historic District (headquarters historic district), which is a cultural landscape comprised of 14 historic buildings constructed between 1925 and 1941 and a proposed extension to the district that would add 9 additional contributing buildings, two contributing roads and expand the period of significance to 1961. The existing utilidor system consists of underground concrete and corrugated metal pipe structures that connect multiple utilities to the administrative facilities and permanent housing units in the headquarters area. The utilidors house steam, condensate, water, sewer, and electrical/communication (i.e., power, telephone, data, fire alarm, and satellite) lines.

This environmental assessment (EA) analyzes the environmental and operational impacts of two alternatives, the no action alternative and the NPS preferred alternative to upgrade the utility system. The EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9).

The purpose of the project is to replace and upgrade the utility systems in order to provide reliable utility service for the headquarters facilities; protect the health and safety of park staff in performing operations and maintenance; increase the utility infrastructure energy efficiency; and reduce the park's energy consumption and operating costs.

The need for the project is based a number of deficiencies and the deteriorated condition of the utilities. The steam, sewer, and water lines have not been replaced since the utilidor went into service in 1963 and are well past their serviceable life. Due to the age of the utility lines, the park is experiencing failures of these critical utility systems. These failures reduce efficiency of the utility systems, cause continued damage to the infrastructure and buildings serviced by the utilidor, expose employees to health and safety hazards, and impact the ability to adequately respond to fires in the headquarters area.

The central steam plant is inefficient and is not cost effective to operate. Generally, a central steam plant can supply a large development of medium to large buildings in a consolidated area far better than individual heating systems. As distribution becomes spread out and building demands become smaller, the economy of scale is lost in the central plant and efficiency is lost in the distribution system. Inefficiencies in the headquarters system lead to increased fuel consumption and emissions since the buildings are small and spread out.

The steam lines have started to rust and leak from the corrosive effects of the steam. The insulation system on the steam and condensate piping is in poor condition due to wear and age. It is estimated that there is between a 25 percent and 50 percent reduction in energy efficiency because of the leaks in the steam system. The steam traps have started to fail, and isolation valves are becoming inoperable due to corrosion. Combined, this condition creates the need for more maintenance and repair, and reduces the ability to isolate a section of the

system for maintenance and repair. A failure of the steam system during the winter months would result in the steam, condensate, sewer and water systems freezing.

The existing sewer lines are made of asbestos cement and the pipe is disintegrating at manhole penetrations. Approximately once a year a failure of a section of the sewer line occurs, forcing emergency repairs. The repairs to sewer lines can only occur when the steam lines can be turned off. Repairs to the sewer lines are commonly delayed until spring when the steam system is shut down. During the delay the failure or leak can discharge into the utilidor exposing the park and staff to raw sewage.

The existing water supply lines in the utilidor are of inadequate size to provide the necessary pressure and volume needed to operate a fire suppression system. The current configuration of the water distribution system also includes long, dead-end lines that create a lack of water circulation within the distribution system and is inadequate for fire suppression requirements. The park must rely on the local fire departments, which are 15 -20 miles away with an approximate response time of 45 minutes. In addition some of the piping still has its original asbestos insulation that is a safety hazard.

The existing telephone and data lines are distributed through the headquarters area using the utilidors as duct banks in combination with sections of direct bury cabling. These electrical and communication systems do not service all of the facilities and do not meet employee needs for communication and information technology.

The utilidor is also undersized for the utilities and safe maintenance access (Figure 2). It is comprised of a series of 3-foot 10-inches high by 3-foot wide horizontal concrete tunnels that vary from 5 to 15 feet deep. There are vertical entrances, or manholes, at each sewer line intersection. Maintenance of piping between manholes, and in some locations within manholes, is very difficult due to lack of space for personnel. Under the Occupational Safety and Health Administration's confined space regulations the horizontal sections of the utilidor cannot be accessed when the steam heat system is operational because steam and condensate piping present burn hazards to personnel and there is no escape route. When the steam heat system is not operational the confined space entry is still dangerous because of the tight quarters and the need to maneuver up and over or between pipes and conduits in order to evacuate someone. In addition poorly sealed sewer access points allow sewer gases to fill the utilidor at any time.

The ground in the headquarters area emits radon gas, which enters into the utilidors and manholes, also posing a health and safety issue. Currently, the utilidors and buildings have radon gas mitigation systems in place. Ventilation of the utilidor is used to circulate fresh air and provide a negative pressure to prevent utilidor air from migrating into the buildings. Energy loss in the utilidors is very high due to the combination of continuous ventilation for radon gas, poor insulation on the piping, and no insulation around the utilidor.



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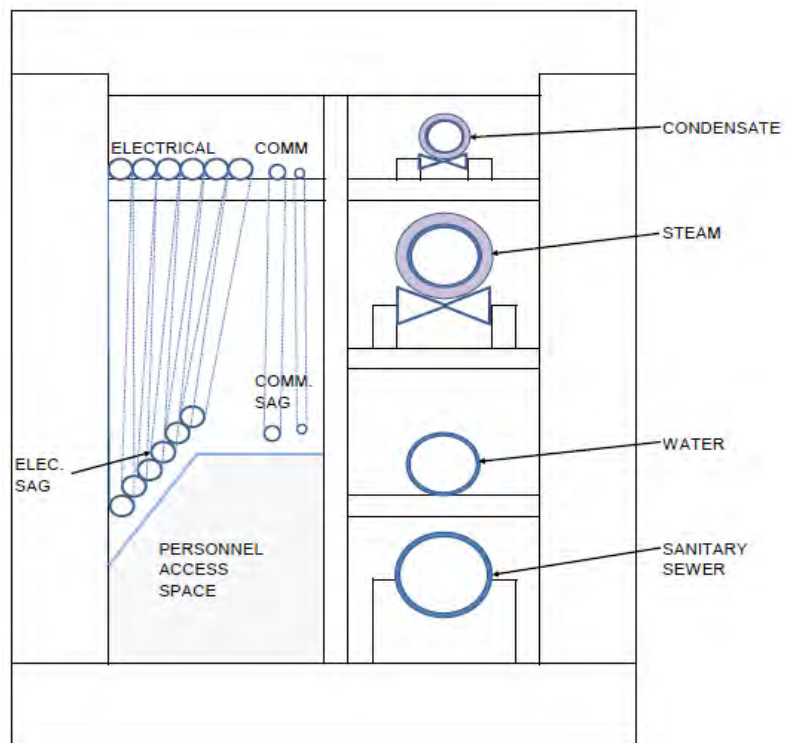


Figure 2: Concrete Utilidor Section

BACKGROUND

History of the Utilidor System

Utilities for the headquarters area were originally installed in a concrete utilidor system between 1960 and 1963. The utilidor is a reinforced concrete box tunnel, approximately 3,500 feet in length, 3-foot 10-inches high by 3-foot wide interior space with access manholes at junctions and alignment changes. The utilidor originated at the central heating plant and was extended to each building that was connected to piped utilities. It originally contained only sewer, water, steam, and condensate return pipes stacked along one wall of the tunnel. The utilidor system was expanded significantly in 1980. The utilidor extensions were constructed of 24-inch to 48-inch corrugated metal pipes instead of concrete. However, the culvert pipe utilidors provide much less space than the concrete utilidors.

The utilities in the culverts include water, sewer, and either steam and condensate or glycol piping. The water distribution system consists of a 6-inch-diameter main and 1-inch diameter service lines to most buildings. The water lines have been in service since 1963. Fire hydrants are located along the utilidor system to provide exterior fire water coverage for the campus. The wastewater system consists of 6-inch diameter mains and 4-inch diameter service lines to each building and has also been in service since 1963. Wastewater is piped to a septic tank and leach field located on the south side of the headquarters area. The wastewater line from the boiler house to the septic tank is a direct buried 8-inch-diameter wood stave pipe. The septic system is relatively shallow and does not have cover insulation, so the system includes glycol lines in the trench with the sewer line and interior of the septic tank for freeze protection.

Over time, many modifications have been made to the utility and heating systems. The utilidors have been used for raceway for electrical power distribution and for communication system distribution. The addition of the electrical distribution and communication system cabling has further restricted the maintenance space in the utilidors, which was already limited due to the small interior dimensions. Many buildings have been converted from central plant heating to individual propane or diesel fired boilers or furnaces, and the steam and condensate disconnected. Others have a combination of heat, with a boiler installed in combination with connection to the distributed heat. Water and sewer connections to some newer buildings have used arctic pipe instead of extending the utilidor.

Park Purpose and Significance

Denali National Park and Preserve's Purpose has been redefined over time. Its purpose in 1917, as stated in the federal legislation which officially established "Mt. McKinley National Park" (as it was originally known), was to be an area that would be "set apart as a public park for the benefit and enjoyment of the people. . . said park shall be, and is hereby established as a game refuge" (NPS 2010a).

The 1980 Congressional legislation known as the Alaska National Interest Lands Conservation Act (ANILCA) enlarged the park and changed its name to Denali National Park and Preserve.

Denali's significance exists in numerous attributes and on several levels. Denali is internationally significant, recognized as a "biosphere reserve" by the United Nations because it offers important potential for ecosystems research in a subarctic environment. It is also significant for its extremely large area (more than 6 million acres), all of which is protected, allowing research opportunities for the study of natural systems in largely undisturbed, wilderness settings. Within this huge expanse lay mountains, some of the longest glaciers on the continent, wildlife and plant life, exceptional air quality and scenery, cultural resources, good access, and remarkable mountaineering and wilderness recreation opportunities.

Laws, Regulations, and Policies

ANILCA added approximately 2,426,000 acres of public land to Mt. McKinley National Park and approximately 1,333,000 acres of public land as Denali National Preserve and re-designated the entirety Denali National Park and Preserve. ANILCA directs the NPS to preserve the natural and cultural resources in the park and preserve for the benefit, use, education, and inspiration of present and future generations.

The 1966 National Historic Preservation Act (NHPA), as amended, provides direction to federal agencies for protection of historic resources. Section 106 of the act requires consideration of adverse impacts to historic resources during the course of any federal undertaking. Section 110 provides for an affirmative role of federal agencies in identifying, preserving, and utilizing the historic properties that are in agency ownership.

The NPS Organic Act and the General Authorities Act prohibit impairment of park resources and values. The 2006 NPS Management Policies uses the terms "resources and values" to mean the full spectrum of tangible and intangible attributes for which the park is established and managed, including the Organic Act's fundamental purpose and any additional purposes as stated in the park's establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the NPS is to ensure that park resources and values would continue to exist in a condition that would allow the American people to have present and future opportunities for enjoyment of them.

Relationship of Proposal to Other Planning Projects

The 1997 *Entrance Area and Road Corridor Development Concept Plan and Environmental Impact Statement* (DCP/EIS) describes a variety of actions to provide front country visitor facilities and services designed to meet a wide range of visitor needs and interests to be implemented over 15-20 years. For the headquarters area, the plan called for infrastructure upgrades and rehabilitation, some construction of new administrative and residential facilities, and increased interpretive opportunities in the Headquarters Historic District. Specific projects identified in that plan included the following:

- 1) Expansion of utility systems in the headquarters area to serve additional buildings such as the new office building and the comfort station in the kennels area.
- 2) Upgrading of headquarters utility systems including electrical and water.

This EA is a project-specific analysis tiered to the approved 1997 DCP/EIS. Tiering refers to a process of multiple levels of planning, from broad plans to site-specific plans. The specific plans implement the broad directions and general concepts identified in prior plans. This EA is an implementation plan for the DCP/EIS.

The 2007 *Headquarters Area Plan Environmental Assessment* provides further detailed guidance and an integrated plan for the developments in the headquarters area of the park to complete implementation of components of the 1997 DCP/EIS. The plan addresses vehicle circulation, pedestrian circulation, office and residential space, landscaping and lighting, parking, and visitor opportunities in the headquarters area. This plan also notes that when and if all buildings in the headquarters area are converted to individual propane-fueled furnaces, the steam plant which provides heat through the underground utilidor to warm many of the buildings would become obsolete, although the utilidor would still be necessary for holding water pipes and other utility infrastructure.

NPS finalized the *Cultural Landscape Report for Park Headquarters, Denali Park and Preserve* in 2008. The *Cultural Landscape Report* discussed the history and existing conditions of the headquarters area and provided landscape treatment recommendations to inform the implementation of the *Headquarters Area Plan*. At the time of completion, the park had 38 separate construction projects associated with the headquarters area for the coming years. If completed without the coordination of landscape preservation concepts, these projects could result in undesirable incremental changes for the historic character of the landscape, and potentially threaten the integrity of the national register district. While focusing on the historic district, the *Cultural Landscape Report* also provides guidance on compatible contemporary features and types of development that are appropriate in the 30-acre headquarters area just outside the district, including the proposed district increase. Treatment recommendations include improvements to circulation and parking, building and structure location and the development of a palette of small-scale features appropriate to the historic character of the headquarters historic district. The elimination of parking and through-traffic from the center of the historic district is the most fundamental element in the wider program of proposed rehabilitation measures. Any project implemented under this EA would need to be consistent with the *Cultural Landscape Report*.

The park and NPS regional office are currently working on an extension to the Mount McKinley National Park Headquarters Historic District. The extension would include much of the remaining housing within the headquarters area. It would add 9 additional contributing buildings and two contributing roads to the district and expand the period of significance to 1961. This document treats the proposed district extension as if it were eligible for listing National Register of Historic Places.

SCOPING

A public scoping comment period for the project occurred from October 26, 2011 through November 30, 2011. The public scoping period was announced through a press release and was posted on the NPS Planning, Environment, and Public Comment (PEPC) website at <http://parkplanning.nps.gov/dena>. During the public scoping comment period, NPS received one comment from an individual who expressed concern about the project

affecting the park's air quality monitoring station that is located in close proximity to the Rock Creek reservoir building. If alternative heat sources are selected, they should not produce any emissions at the site.

IMPACT TOPICS

Impact topics are the resources or values of concern that could be affected by the range of alternatives. Specific impact topics were developed to ensure that alternatives were compared on the basis of the most relevant topics. The following impact topics were identified on the basis of federal laws and regulations, NPS *Management Policies 2006* and Director's Order 12-*Conservation Planning, Environmental Impact Analysis, and Decision Making*, and from internal scoping. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

Impact Topics Retained for Further Analysis

Soils: Rehabilitating the utility systems involves ground disturbing activities.

Vegetation and Wildlife: Rehabilitating the utility systems involves ground disturbing activities that could result in displacement of vegetation and wildlife. Invasive species could colonize the bare soils exposed during the construction process and prevent native vegetation from re-colonizing at appropriate rates.

Cultural Resources: The headquarters historic district and the proposed district extension include archeological resources, historic buildings and a cultural landscape related to the development of the park that are listed or eligible for listing in the national register.

Visitor Use and Experience: There are no visitor use facilities in the project area but the public does visit the nearby dog kennels. During construction, traffic flow and vehicle access to the headquarters area could be temporarily restricted. Traffic may be periodically subjected to alternating, one-way flow. Construction would also introduce visual, audible, and atmospheric intrusions into the headquarters' setting, which could reduce the quality of the visitor experience at the kennels during the construction period.

Park Operations and Safety: Implementation of the action alternative would result in the upgrade of the park's infrastructure utilities, which would affect the reliability of service, the health and safety of park personnel and visitors, and the sustainability of park operations through the use of energy efficiently. Construction related disruptions in service may result in alterations to normal park operations.

Impact Topics Dismissed from Further Analysis

Geologic Resources: There are no important geologic resources in the project area.

Air Quality: Construction activities, including equipment operation and the hauling of material, could result in temporarily increased vehicle exhaust and emissions, as well as inhalable particulate matter. If necessary, construction dust associated with exposed soils would be controlled with the application of water or other approved dust palliatives. In

addition, any hydrocarbons, NO₂, SO₂ emissions, as well as airborne particulates created by fugitive dust plumes, would be rapidly dissipated because the location of the park and prevailing winds allows for good air circulation. Overall, there could be a local, short-term, negligible degradation of local air quality during construction activities; however, no measurable effects outside of the immediate construction site would be anticipated. Any construction-related, adverse effects to air quality would be temporary, lasting only as long as construction, and the park's overall air quality would be unaffected.

Public comment received during scoping indicated that the park has been monitoring air quality at a station in close proximity to the Rock Creek reservoir building (AQMS building) since 1980. The Rock Creek reservoir building is currently heated via a propylene glycol line which runs up the hill from the main headquarters area. The air quality monitoring shelter also utilizes propylene glycol as one of its heat sources. This project would not add additional heating sources in this area, although it would run new water and electric/communication lines to the building. The nearest buildings to this area are buildings 111 and 22. Building 111 is already heated year-round via propane. Building 22 is partially heated through propane and partially heated through steam. It would be converted entirely to propane heat. The switch in heating methods is not expected to noticeably skew data from the collection point since the building already runs on propane during much of the year.

Water Resources: To minimize erosion and potential runoff affecting Rock Creek, Best Management Practices (BMPs) such as silt fences would be implemented during construction and disturbed areas would be revegetated and recontoured following construction. No measurable impacts on water quality are anticipated from the proposed actions.

Wetlands: Construction in the vicinity of wetlands would be confined to the road prism. No excavation, stockpile of excavated material, or other construction activities would occur in wetlands. BMPs such as silt fences to control erosion and sediment transport would be used to prevent indirect impacts to adjacent wetlands.

Floodplains: The project area does not lie within a floodplain.

Threatened, Endangered, and Candidate Species and Species of Special Concern: The headquarters area does not provide critical habitat for listed species, nor are there known populations of listed species in the project area.

Natural Soundscape: Construction associated with implementation of the action alternative, e.g. the hauling of material or the operation of construction equipment, could result in dissonant sounds but such sounds would be temporary and end with the cessation of construction activities. Any adverse impacts to the surrounding natural ambient soundscape and/or opportunity for visitors to experience natural sound environments would be temporary of negligible to minor intensity.

Natural Lightscapes: Construction would occur during daylight hours and no new lighting would be installed.

Socioeconomic Environment: Implementation of the action alternative could provide a minor beneficial impact to the local economy, e.g. an increase in employment opportunities for the construction workforce and a modest increase in revenues for local businesses and government generated from construction activities and workers. Any increase, however, would be temporary, lasting only as long as construction.

Environmental Justice:

- The alternatives would not result in any identified effects that would be specific to any minority or low-income community.
- Any impacts to the socioeconomic environment due to implementation of the alternatives would be negligible to minor and beneficial but temporary.

Subsistence: Subsistence activities are not allowed in the project area, so this impact topic does not apply. An ANILCA §810 evaluation is included in Appendix A.

POTENTIAL PERMITS AND APPROVALS NEEDED TO IMPLEMENT PROJECT

Below is a list of potential federal, state, or local permits, licenses, or other consultation requirements:

Table 1: Potential Permits and Agency Approvals

Type of Permit	Authorizing Agency	Responsible Party
NHPA Section 106 Consultation	State Historic Preservation Office	National Park Service
Asbestos Certified Workers	Occupational Safety and Health Administration	National Park Service and Building Contractor
Asbestos Certified Landfill for Disposal	Alaska Department of Environmental Conservation	National Park Service and Building Contractor
General Construction National Pollutant Discharge Elimination System Stormwater Permit	Alaska Department of Environmental Conservation	National Park Service
Utility Company Permits (Water, Sewer, Electricity, Fiber Optics)	Utility companies providing service to Denali National Park and Preserve	National Park Service

ALTERNATIVES

INTRODUCTION

This chapter describes Alternative A, the no action alternative and Alternative B, the NPS preferred alternative. This chapter also describes those alternatives that were discussed but eliminated from further consideration and identifies the environmentally preferable alternative. Table 2 summarizes the components and attributes of both alternatives. Table 3 summarizes the impacts of each alternative.

The design process for this project led to the development of one action alternative, which is analyzed in this environmental assessment, and several alternatives that were dismissed from consideration. A Value Analysis process was used by an interdisciplinary team to develop a range of alternatives to address the shortcomings of the existing utility system. A variety of options for heating systems, water and sewer utility systems, and power and communication systems were analyzed to identify advantages and drawbacks. Through this evaluation process, three central heat distribution alternatives were eliminated from further consideration. The remaining alternatives that carried forward the utilidor distribution system concept were further evaluated and an additional direct burial alternative was identified. Following an analysis of these alternatives, the utilidor distribution system alternatives were also dismissed.

ALTERNATIVE A: NO ACTION

This alternative represents a continuation of the existing situation and provides a baseline for evaluating the changes and impacts of the action alternative. Under this alternative the existing utilidor distribution system would be retained (Figure 3). The concrete and corrugated metal pipe utilidors contain water, sewer, steam, condensate, and electrical/communication lines (Figure 2). The existing direct bury water lines from the water storage tank and to the kennels and the direct bury sewer line to the septic tank would also remain as part of the utility system. The centralized heating system would continue to provide full or partial steam heat to ten of the headquarters area buildings.

The park would continue to maintain the existing utility infrastructure and perform scheduled and emergency repairs. Approximately once a year a section of the sewer line fails, forcing emergency repairs. The repairs to sewer lines can only occur when the steam lines can be turned off and the steam system cannot be turned off during the extreme cold of the winter months. Small repairs to the lines are typically delayed until spring. A catastrophic failure of the system would require immediate repairs no matter what the season. Major repairs would likely require excavation to remove the utilidor lid. Typically, there has been one steam system failure per year that requires the system be isolated or shut down with a repair time estimated at 2-4 hours per failure. There have been numerous failures of fittings, traps, and valves on the condensate (return) lines. The water system has been averaging about two failures per year.

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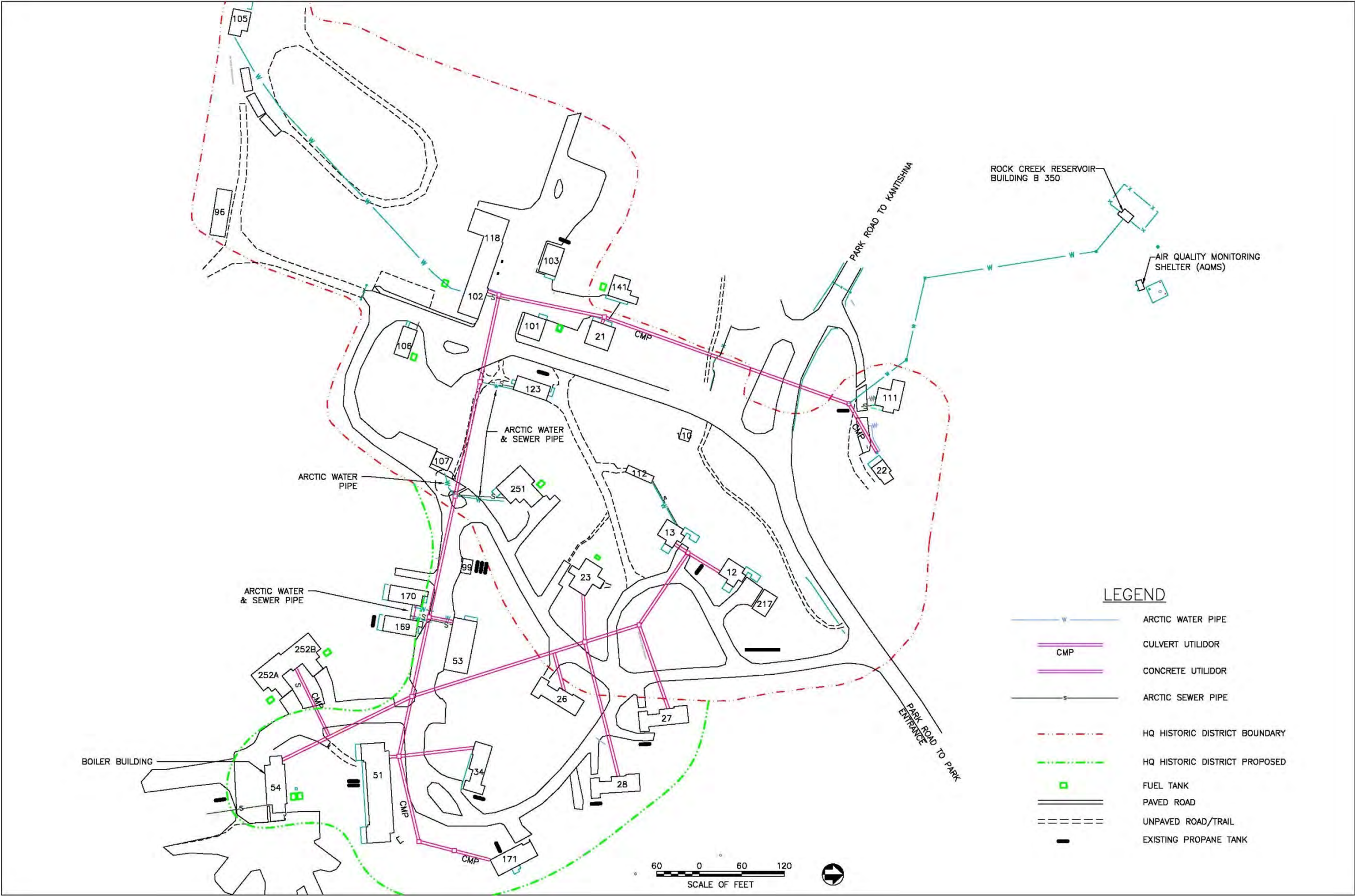


Figure 3: Alternative A Existing Utility Distribution System

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ALTERNATIVE B: UPGRADE HEADQUARTERS UTILITY INFRASTRUCTURE (PREFERRED ALTERNATIVE)

This alternative includes the direct burial of new water, sewer, propane, and electric/communication lines and new propane tanks. The sewer and water lines would consist of arctic insulated pipe with a glycol heat trace system to prevent freezing. Lines would primarily follow the same alignment as the existing utilidors or existing roads, with the sewer and water lines placed in a parallel alignment (see Figure 4). The water and sewer lines would meet the minimum requirement of 10 feet of horizontal separation. The electrical and communication lines would be placed in conduit and direct buried in a shallow trench above or near the utilidor or in the road (see Figure 6). Propane alignments would follow new routes, although new buried propane tanks would be placed near existing tank farms, where possible (see Figure 5).

A trench box would be used to minimize the width of excavation necessary to install the new sewer and water lines. The multiple typical trench sections shown in Figure 7 depict the dimensions of the trenches and the associated construction limits, including adequate space for construction equipment access and placement of excavated spoil piles. Trenches would be between 7 and 13 feet deep for water and sewer pipes and approximately 2.5 to 5 feet deep for communications lines, electric lines, and propane lines and approximately 8 to 10 feet deep for propane tanks, which would be buried two feet below surface.

New sewer mains, service lines, and manholes would be constructed. Approximately 4,100 linear feet of sewer pipe would be direct buried including 8-inch and 6-inch collection mains and 4-inch service lines from the individual buildings. The upgraded sewer system would connect to the existing septic tank and leach field.

Approximately 5,250 linear feet of water pipe ranging from a 10-inch transmission main to 2-inch water service lines to the individual buildings would be direct buried. The existing 6-inch transmission main from the water storage tank down to the developed area near building 111 would be abandoned in place and replaced with a 10-inch arctic pipe. This alignment would be within the corridor previously cleared for the existing transmission main. The existing water line to building 105 at the sled dog kennels, which traverses through a wetland would also be abandoned in place and replaced with approximately 640 linear feet of direct buried 6-inch pipe located along the existing access road to the building.

Approximately 4000 linear feet of new electric/communication lines (e.g., fiber optic data, telephone, cable television, and fire alarm) would be installed, primarily above and generally following the alignment of the existing utilidor or within the roads. Placement of these lines in a separate trench rather than in a common trench with either the water or sewer lines would require additional excavation, however it would allow any future repair to the water or sewer lines to occur without disturbing the electric/communication lines.

Buildings 21, 23, 51, 54, 102/118 and 107 in the headquarters area that currently have winter heat supplied by the steam plant through the utilidor would be converted to individual furnaces fueled by propane. Buildings 169 and 170 would have supplemental steam heat removed and remain on fuel oil. Buildings 12 and 13 would have supplemental steam heat

removed and remain on propane. Existing above ground fuel oil tanks in five locations would be removed and new buried propane tanks would be added to the system. Up to ten fuel and propane tanks may eventually be removed as additional buildings are hooked up to the system at a later date. Boulders would also be placed around the new propane tanks locations where needed. Propane lines from the tanks to the buildings would be direct buried to the buildings as shown on Figure 5.

New utility lines would enter the buildings either underground or above ground in the same location or close to the same location as existing utility lines (see Figure 8). The existing utilidor, which was determined not to be eligible for listing in the National Register of Historic Places, would be abandoned in place. Utilidor connections into the buildings would be removed and the foundation and utilidor end sealed with concrete to prevent radon gas from entering the buildings. Sections of the utilidor would be removed in the few locations where new utility lines must pass through the utilidor. In all locations where portions of the utilidor are removed, all asbestos or other hazardous material would be removed and transported to an approved facility for disposal.

The existing Headquarters building parking area would be removed and revegetated except for a pedestrian pathway between buildings, as described in the Headquarters EA (NPS 2007) and the *Cultural Landscape Report* (NPS 2008). The accessible wooden ramps to buildings 21, 101 and 103 would also be removed and the entrance regarded to eliminate the step up into the buildings. The asphalt roads within the headquarters historic district in which utilities would be buried would be chip sealed to provide a surface treatment that would be more consistent with the historic rustic character of the landscape (see Figure 9). Impacted roads within the proposed district increase area would be resurfaced with asphalt in keeping with the later period of significance. Existing bollards that provide safety barriers to utility structures within the developed area would be replaced with boulders to also be more consistent with the historic rustic character of the landscape in accordance with the recommendations of the *Cultural Landscape Report* (NPS 2008).

Buildings 141 and 99 may be demolished and removed as part of this project pending sufficient project funding. The removal of these buildings was identified in the 2007 Headquarters Area Plan. Separate NEPA and Section 106 compliance was completed for the demolition and removal of building 141 in 2011 and thus is not reevaluated as part of this alternative but is included as a cumulative action (see “Environmental Consequences” section).

The steam plant would be decommissioned. All steam piping and equipment would be removed, and a propane heating system would be installed. The park would determine the future use for this building. The 2007 *Headquarters Area Plan* called for the renovation of the steam plant building to accommodate office, workspace, storage and a meeting/training room. Separate NEPA and NHPA compliance would be undertaken prior to the building being rehabilitated.

There would be two staging areas for construction. The primary staging area would be located in the overflow parking lot at the Riley Creek campground. The other staging area would be located in the parking area south of the steam plant (building 54).

Clearing of approximately 100-200 trees would be necessary for this project. Criteria for tree removal include removal of all trees that would be directly impacted, removal of trees that may have 25% or more of their root systems injured due to construction. Trees showing disease or bug infestation or that pose risk to buildings or people may also be removed if they are within the construction limits. A preliminary recommendation for trees that would be cut can be found in Appendix B, although final selection would be made in the field based on the final design and the criteria outlined above.

The total area of impact would be approximately 3.5 acres.

Construction is expected to be completed over two six-month construction seasons from approximately mid-April through mid-October in 2014 and 2015, with tree clearing likely taking place in August through October of 2013, pending funding availability. Utility outages during construction would be planned for in advance with at least 48-hours notice. The contractor would be responsible for providing service in the event of extended outages.

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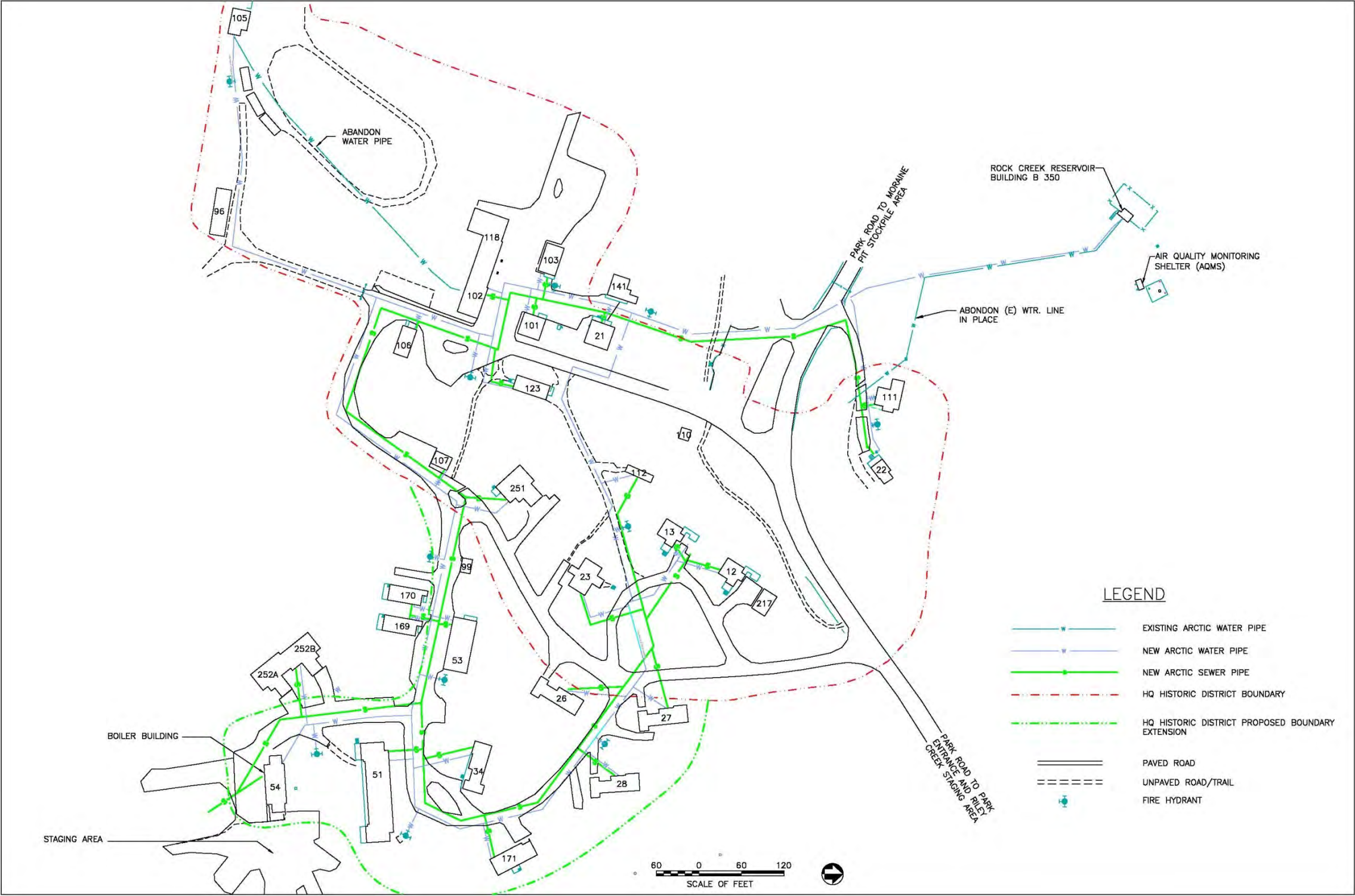


Figure 4: Alternative B (Preferred Alternative) Water and Sewer Lines

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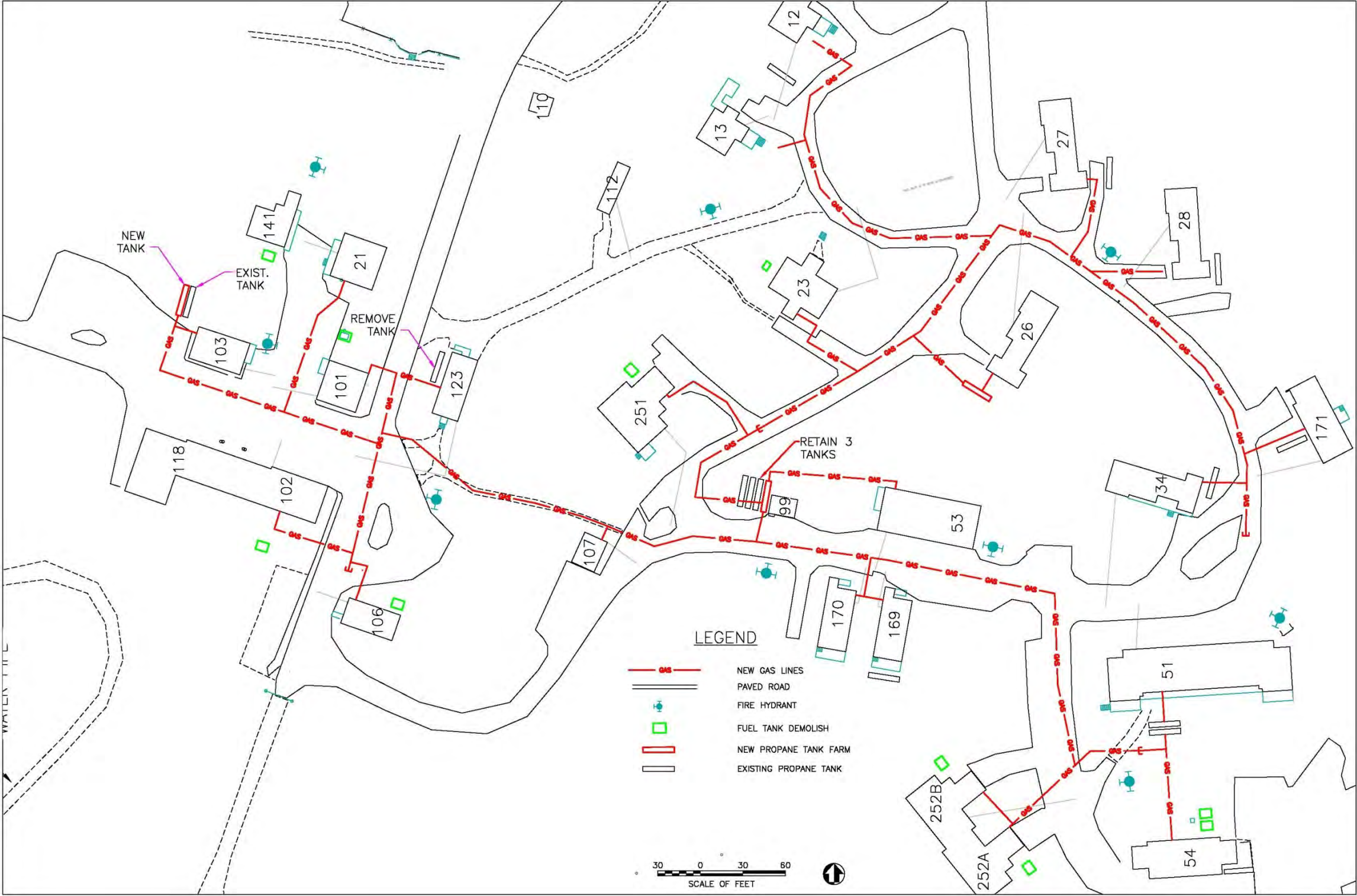


Figure 5: Alternative B (Preferred Alternative) Propane Lines

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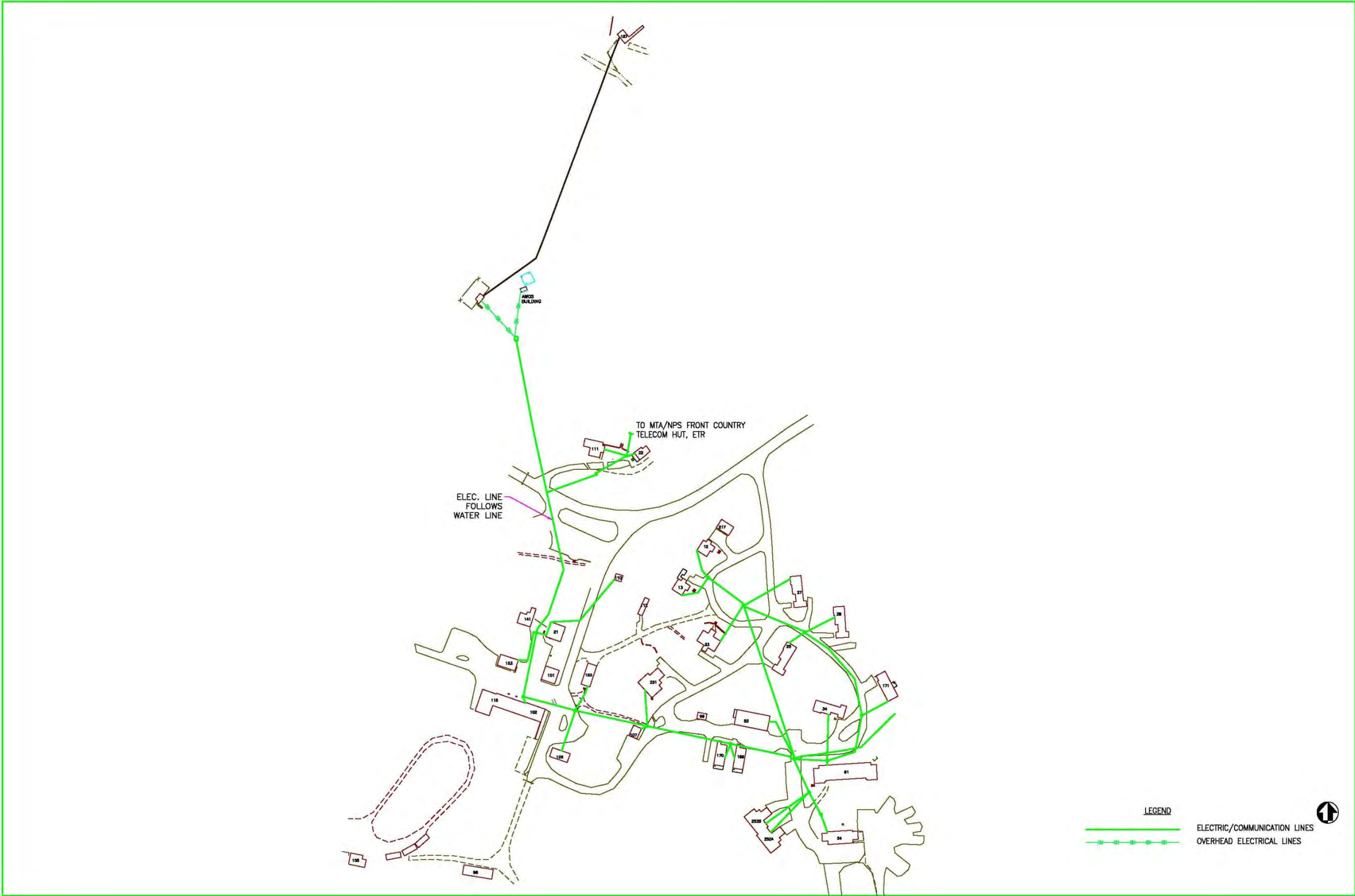


Figure 6: Alternative B (Preferred Alternative) Electric and Communication Lines

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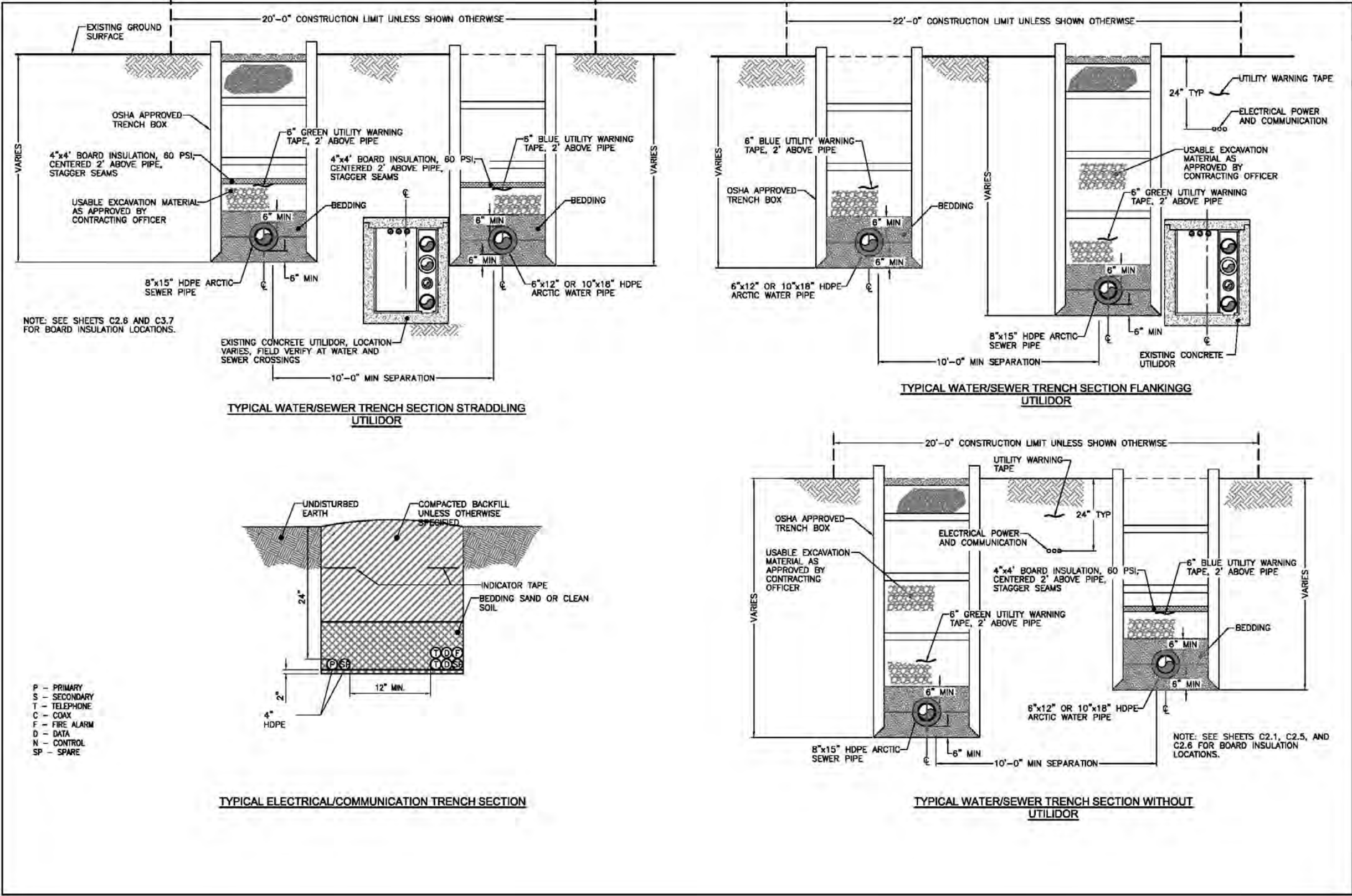


Figure 7: Alternative B (Preferred Alternative) Utilities Trench Cross Sections

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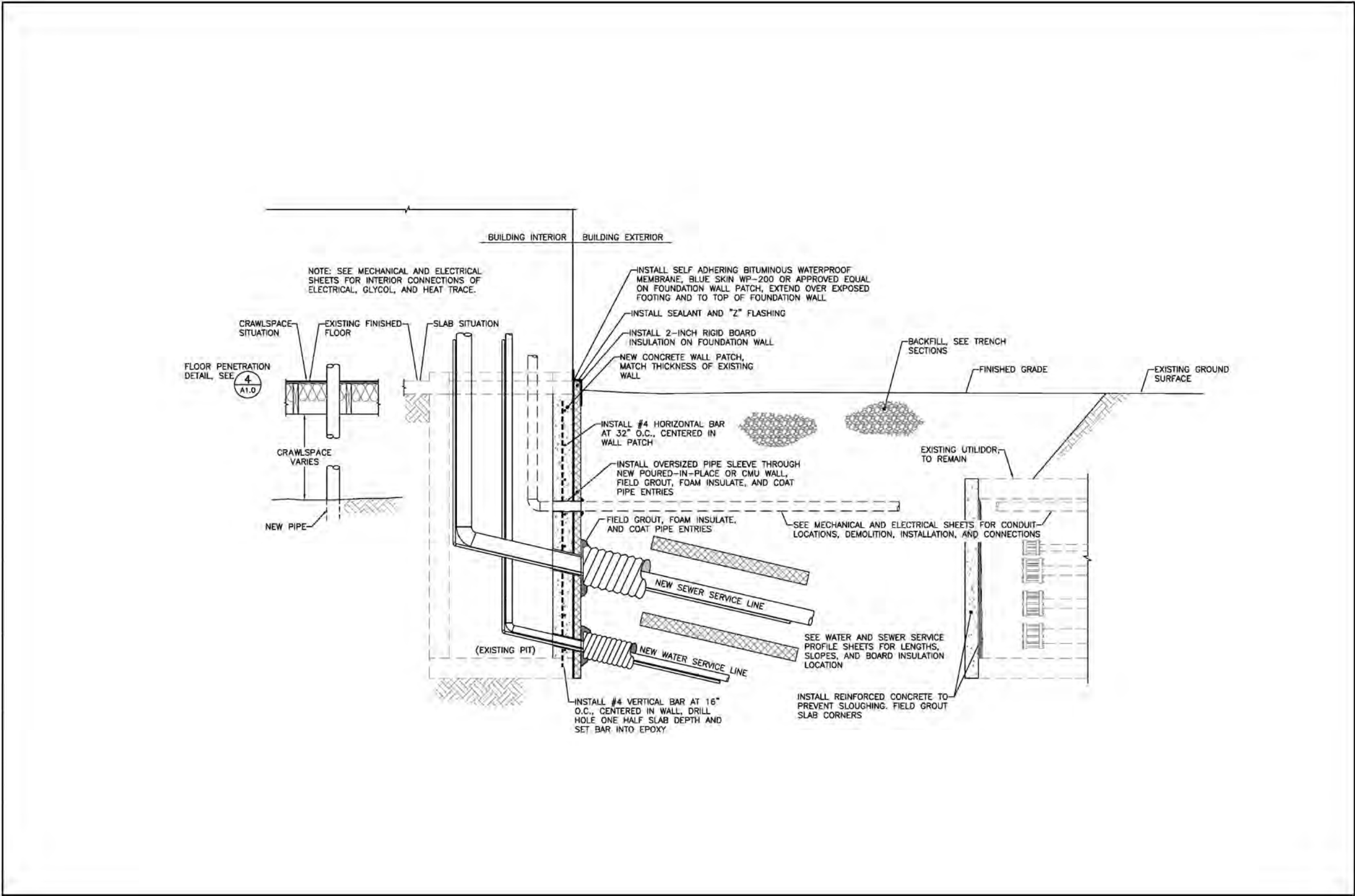


Figure 8: Alternative B (Preferred Alternative) Typical Utilities Penetrations into Buildings

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DENALI PAVEMENT REMOVAL PLAN

1"= 50'



DENALI HQ FINAL LANDSCAPE PLAN

1"= 50'

Figure 9: Alternative B (Preferred Alternative) Pavement to be Replaced with Chip Seal in Administrative Area

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MITIGATION MEASURES

Mitigation measures are specific actions that when implemented avoid, minimize, or eliminate adverse impacts to natural and cultural resources and protect visitors and staff. The following mitigation measures would be implemented under the preferred alternative and are assumed in the analysis of impacts.

Soils

The areas of disturbance would be kept to a minimum. For example, construction materials and equipment would be stored in previously disturbed areas. Excavated material and topsoil would be stockpiled on site and reused as needed. Any imported material would come from NPS approved sources. BMPs, such as silt fencing, would be used to prevent and control soil erosion and disturbed ground would be restored to the original grade following construction. Upon completion of the construction project, disturbed soils would be reseeded with native species to prevent erosion.

All debris would be removed from the park for legal and proper disposal. All asbestos containing material and other hazardous waste would be transported to an approved facility for disposal, such as the Anchorage Regional Landfill.

Wetlands

Since the existing water line that leads to the kennels would be abandoned in place, there would be no trenching through the wetland in that area. Excavation would be performed within the kennels access road so as to not disturb adjacent wetlands. Construction equipment staging and soils stockpile areas would be located in areas of previously disturbed ground. Silt fences and other BMPs would be used to prevent soil erosion or stormwater runoff to adjacent wetlands. Conditions of the NPDES Stormwater Permit for construction activities would be followed.

Vegetation and Wildlife

Construction areas would be defined by construction tape, snow fencing, or some similar material prior to any construction activity to confine activity to the minimum area required for construction. All construction materials would be stored in previously disturbed areas. Disturbed sites in the project area would be reseeded with native species. BMPs would be implemented to prevent colonization by invasive plants such as obtaining gravel and fill material (if any is required) from weed-free certified sources and pressure washing construction equipment and vehicles before entering the park.

Under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703), it is illegal to “take” migratory birds, their eggs, feathers, or nests. “Take” includes by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof. The MBTA does not distinguish between intentional and unintentional actions of this nature. In order to avoid impacts to nesting birds, vegetation clearing would occur outside the nesting season, March 1 to August 1. If it should be necessary to remove vegetation during the nesting season, breeding bird surveys would be

conducted by a park biologist and all active nests would be flagged for avoidance and protected.

The NPS contractors would follow the established guidelines for the park's bear-human conflict management plan. The plan requires the use of bear-proof containers for food and refuse and sets up guidelines for temporary closures.

Cultural Resources

Construction would primarily occur on previously disturbed areas in order to minimize the amount of newly disturbed ground. Project excavations would be monitored by qualified cultural resource staff when appropriate. If during construction, previously unknown archaeological resources were discovered, all work in the immediate vicinity of the discovery would be suspended until the resources could be identified and documented and, if the resources cannot be preserved *in situ*, an appropriate mitigation strategy would be developed in consultation with the State Historic Preservation Officer (SHPO) in accordance with NHPA and its implementing regulations (36 CFR 800.13).

New construction would use materials and design elements that are compatible with the character of the buildings in the historic district.

Contractors would be obligated to protect buildings from inadvertent harm when using heavy equipment to excavate pipes and utilidor runs to historic buildings.

Modifications to landscape features would follow the recommendations of the *Cultural Landscape Report* (NPS 2008).

Any above ground appurtenances associated with the utility systems would be painted a flat, non-reflective color, and selective plantings of native vegetation would be put in as visual buffers. If appurtenances are located on buildings, they would be painted to match the building.

Should changes to the route of the utility lines or their connections to the buildings be necessary, they would first be approved by qualified cultural resource staff.

The Native American Graves Protection and Repatriation Act (NAGPRA) requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the Superintendent, as well as the appropriate Native American group(s) and SHPO.

Park Operations, Safety and Visitor Experience

In order to minimize inconvenience to residents, workers and visitors, the utilities would not be disconnected during the construction period until "new" utilities are in place and ready for operation. Contractors would be required to provide a traffic plan in advance of construction, provide flaggers or other traffic control measures if their operations would impede normal visitor traffic flow, and provide flaggers and information on safe passage to residents and employees in the headquarters area as roads are dug up. Disruption of existing

utility service would be minimized. . The contractor would be responsible for providing service in the event of extended outages.

Loud construction work within 400-500 feet of the kennels, such as but not limited to trenching, filling or other mechanical work with the potential to produce noises that would be audible to visitors watching sled dog demonstrations would cease during dog demos (10-10:40 am, 2-2:40 pm, 4-4:40 pm) or occur during the off season/off hours.

Air Quality

Contractors would be required to have properly operating emissions reduction equipment on all vehicles, including personal vehicles that come on-site, in order to minimize air emissions. Equipment not in use would be turned off. Construction dust would be controlled as needed via use of water sprinkling or other appropriate measures.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative “that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources.

Alternative A, the no action alternative is the environmentally preferable alternative because it would have the least environmental impact. Although the existing system is not energy efficient and would continue to pose health and safety hazards, there would be no new construction and associated ground disturbing activities. By contrast, Alternative B would result in approximately 3.5 acres of ground disturbance that would impact vegetation, soils, and wildlife habitat.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

The following discussion presents an overview of alternatives that were considered and dismissed from further consideration, and the reasons why they were removed from consideration. These alternatives were ones that continued use of a centralized heating system or a utilidor distribution system.

Retain Centralized Heating System

Three alternatives that would retain the centralized steam heating system and the utilidor heat distribution system were initially considered. These included an alternative that pulled out and replaced the current piping “in kind” within the existing utilidor; an alternative that relocated the water and sewer lines to direct-buried arctic pipe outside the existing utilidor; and an alternative that replaced all existing utilities within a new and larger utilidor. Although replacement of existing aged piping systems would improve the overall reliability of the utility systems, the use of a centralized steam plant and utilidors is an extremely inefficient mechanism for distributing heat to the buildings in the headquarters area and requires substantially more in operating costs and maintenance than would conversion to a propane heating system. In addition the steam heat poses a risk to worker safety within the confined utilidor corridors. Consequently, these alternatives did not sufficiently meet the

project purposes to address safety concerns and increase the utility infrastructure energy efficiency. Therefore, alternatives that would retain the inefficient centralized energy heating system were dismissed from further consideration.

Retain Utilidor Distribution System

Three design alternatives that discontinued use of the central steam heating system and proposed the expansion, rehabilitation, or replacement of the utilidor in combination with the direct burial of some of the utilities outside of the utilidor were also considered, but ultimately dismissed. These alternatives would reduce but not eliminate health and safety concerns associated with confined space, radon gas emissions, and potential exposure of staff to raw sewage and sewer gases within the utilidor. Major repairs of utilidor lines would also have larger disturbance footprints because the utilidor covers would need to be removed. Direct bury lines are more reliable because major repairs or upgrades to a single utility line has little or no impact on the other utilities. Space constraints associated with continued use of utilidors would preclude water or sewer pipe that is more than six-inches in diameter, whereas with the direct bury alternative all of the utility systems can be designed to meet the existing and foreseeable future requirements.

Additionally, upon further evaluation of these alternatives, it was concluded that the practicality of maintaining a utilidor distribution system would be compromised once the distribution of heat from a central heating plant was discontinued and utilidors would not be required for heat distribution. When originally constructed in between 1960 and 1963, the utilidor provided a conduit for steam pipes that provided heat to buildings and radiant heat that prevented freezing of the water and sewer lines. With the availability of current arctic insulated pipe and heat trace technology to protect buried pipes from freezing and the conversion from the central steam heating system to remote propane heating systems, there is no longer an overriding functional need for a utilidor structure. Given this as well as the other noted shortcomings associated with a utilidor distribution system, the alternatives to continue use of a utilidor system were dismissed from further consideration.

Table 2: Summary of Alternatives

	Alternative A - No Action	Alternative B - Upgrade Headquarters Utility Infrastructure (Preferred Alternative)
Description	No new construction. Existing utilities would remain in place and existing emergency and other maintenance would continue.	Direct bury new water, sewer and electric/communication lines. Abandon in place utilidor/lines. Steam plant decommissioned and heat source replaced by individual furnaces fueled by propane. Install new buried propane tanks and service lines to service buildings currently heated by steam.
Attributes	No planned ground disturbance or new development. Major repairs could require excavation to remove the utilidor lid.	Provides reliable, more efficient and updated utilities to employees and residents in headquarters area. Eliminates health and safety concerns associated with confined space, radon gas emissions, steam heat, and sewage leaks.
Area of disturbance	None	Approximately 3.5 acres disturbed.
Construction costs	Not applicable.	\$12,306,000
Recurring annual costs	\$319,844	\$208,225
Lifecycle costs	Not applicable	\$1,069,675 annually

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Table 3: Impacts Summary

	Alternative A - No Action	Alternative B - Upgrade Headquarters Utility Infrastructure (Preferred Alternative)
Soils	Emergency and regular maintenance may result in localized temporary minor adverse effects on soils.	Minor, temporary adverse impacts to approximately 3.5 acres of soils as a result of ground disturbance associated with construction activities.
Vegetation and Wildlife	Emergency and regular maintenance may result in temporary minor adverse impacts to vegetation and wildlife during utility repair work.	Moderate, adverse impacts due to the temporary disturbance or long-term loss of vegetation and minor adverse impacts to wildlife habitat on approximately 3.5 acres.
Cultural Resources	Implementation of Alternative A would have negligible, local, long term, indirect adverse impacts to cultural resources primarily due to increased risk to the buildings from fire and/or water or sewer main breaks.	Alternative B would have long term, local, direct moderate beneficial impacts to cultural resources due to the implementation of selected actions called for in the Cultural Landscape Report as well as minimization of risk to buildings due to utility failures and fire.
Visitor Use and Enjoyment	There would be no effect on visitor use and experience to the headquarters area under the Alternative A because visitors do not use indoor facilities in the area with the exception of a single restroom and most visitors come during summer months when the effects of broken utilities are less likely to be noticed.	The Alternative B would have short term negligible adverse impact on visitor enjoyment during the construction seasons, followed by long term, local, minor beneficial impact on visitor use and enjoyment due to the improvement of the cultural landscape.
Park Operations and Safety	Alternative A would have long and short term, local, moderate adverse impacts on park operations and safety due to the employee hours needed to maintain the aging systems, the effects of more frequent system shut downs and the potential threats to human and resource safety due to lack of adequate fire suppression protection.	Alternative B would have moderate, short term, local adverse impacts during construction. These would be tempered by the long term, local and regional minor beneficial impacts to park operations and safety that would be expected from the implementation of this alternative.

AFFECTED ENVIRONMENT

PROJECT AREA

Denali National Park and Preserve encompasses 9,419 square miles in central Alaska, with the main entrance along the George Parks Highway approximately 240 miles north of Anchorage and 12 miles south of Healy. The project area lies near mile post (MP) 3.0 of the 92-mile long Park Road. The project would take place in the 11.91 acre headquarters historic district which, with a proposed boundary increase, contains all of the permanent employee housing, two historic roads, the park administrative facilities and the dog kennels (Figure 4). There are a total of 42 buildings in this area, 21 of which have historic significance.

SOILS

Soils within or adjacent to the project area vary according to parent material, topography and vegetation coverage, and generally consist of three types. Sandy and silty soils underlay forested areas, and support moss and lichen groundcover. Wetland soils consist mostly of poorly-drained silts and glacial moraine materials, and typically possess a subsurface accumulation of organic matter and peat layers, with permafrost occasionally at depths less than 3 feet (NPS 1997). Permafrost has not been studied in the project area but can be continuous at higher elevations north of the Alaska Range.

VEGETATION AND WILDLIFE

The park as a whole is comprised of a mosaic of tundra, forest, shrubland and open meadow. The project area, located at an elevation of approximately 2,000 ft, lies within the northern boreal forest biome (taiga). The taiga immediately surrounding headquarters consists mostly of mixed needle leaf/deciduous forest of white and black spruce (*Picea glauca* and *P. mariana*) mixed with paper birch (*Betula papyrifera*) and some aspen (*Populus tremuloides*). White spruce occupy areas of well-drained soil, while black spruce are usually found in areas with poor drainage underlain by shallow permafrost. Common tall shrubs in this spruce-paper birch forest include alder (*Alnus crispa*), dwarf birch (*B. glandulosa*), and willows (including *Salix bebbiana*, *S. arbusculoides*, *S. glauca*, and *S. planifolia* spp. *pulchra*). The understory includes, prickly rose (*Rosa acicularis*), shrubby cinquefoil (*Potentilla fruticosa*), Labrador tea (*Ledum groenlandicum*, *L. palustre*), bog blueberry (*Vaccinium uliginosum*), and high-bush cranberry (*Viburnum edule*). Ground cover typically consists of lichens mosses including thin feather mosses (*Hylocomium* spp.) (Viereck et al. 1992, NPS 1997, NPS 2005a).

The resident bird species common to the project area include spruce grouse (*Dendragapus canadensis*), willow ptarmigan (*Lagopus lagopus*), common raven (*Corvus corax*), black-billed magpie (*Pica pica*), boreal chickadees (*Poecile hudsonica*), common redpolls (*Carduelis flammea*), and three-toed woodpeckers (*Picoides tridactylus*). The great-horned owl (*Bubo virginianus*) and boreal owls (*Aegolius funereus*) are the most common resident owl species in Denali, while great gray owls (*Strix nebulosa*), and the northern hawk owls (*Surnia ulula*) occur at very low densities (NPS 2005b).

The numerous migratory species found in the project area include ruby-crowned kinglets (*Regulus calendula*), sparrows (American tree sparrow [*Spizella arborea*], savannah

sparrow [*Passerculus sandwichensis*], fox sparrow [*Passerella iliaca*], white-crowned sparrow [*Zonotrichia leucophrys*], warblers (yellow-rumped warbler [*Dendroica coronata*] and orange-crowned warbler [*Vermivora celata*], Wilson's warbler [*Wilsonia pusilla*]), violet green swallow (*Tachycineta thalassina*), dark-eyed junco (*Junco hyemalis*), American robin (*Turdus migratorius*), and several species of thrush (*Catharus* spp.) (NPS 2005b). Other common migrants include northern harrier (*Circus cyaneus*), mew gull (*Larus canus*), and golden eagle (*Aquila chrysaetos*). Wetland-nesting shorebirds include lesser yellowlegs (*Tringa flavipes*), common snipe (*Gallinago gallinago*), solitary sandpiper (*T. solitaria*), and wandering tattler (*Heteroscelus incanus*) (NPS 2005b).

Large mammal species such as moose (*Alces alces*), caribou (*Rangifer tarandus*), Dall sheep (*Ovis dalli*), brown bear (*Ursus arctos*), black bear (*Ursus americanus*), and gray wolf (*Canis lupus*) are found to the west of the project area, and are frequently seen along the park road or in the surrounding hillsides and mountains. Moose would likely browse in the wetlands and black and brown bears might forage in the upland forested areas around the headquarters area. Wolves are generally found wherever prey species, such as moose, are present, and therefore may also be found in the area.

Smaller mammals present within the project area include red fox (*Vulpes vulpes*), snowshoe hare (*Lepus americanus*), ermine (*Mustela erminea*), and red squirrel (*Tamiasciurus hudsonicus*) (NPS 2005a). Red fox are common and very visible along the Park Road, whereas snowshoe hares and red squirrels are commonly found in forested areas. Other small mammal species that are likely to be found in the headquarters area include shrews (*Sorex* spp.), lynx (*Lynx Canadensis*), several species of voles, and lemmings.

CULTURAL RESOURCES

Several cultural resources surveys have been conducted in the project area. No prehistoric sites are known to exist in the area. However, there are several properties eligible for or listed in the National Register of Historic Places within the project area. These include the headquarters historic district, a proposed district increase that contains eligible properties, and the Park Road. These historic properties are further discussed below.

The headquarters historic district was listed in the national register in 1987. The nomination emphasizes the significance of the early park's buildings, reminiscent of an early Alaskan frontier settlement laid out in a grid (NPS 2008). Initially designed by the park's first superintendent, Harry Karstens, it was later expanded upon by other NPS designers including Thomas Vint, the first NPS landscape architect. The landscape was documented in the *Cultural Landscape Inventory* (Curran 2004) and the *Cultural Landscape Report* (NPS 2008), which provided treatment recommendations for the headquarters historic district. The district is significant based in part on its architecture and setting. Therefore, important characteristics and features that contribute to the historic landscape need to be carefully considered, including spatial organization, land use, vegetation, circulation, buildings and structures, small-scale features, cluster arrangement, and views.

The 11.91-acre headquarters historic district encompasses 18 buildings and a network of narrow connecting roads. In keeping with the NPS philosophy of rustic architecture, the physical features of the majority of buildings in the district reflect a conscious attempt to

harmonize with their natural surroundings through the use of building materials and techniques indigenous to interior Alaska and through sensitive siting. Horizontal log (or log veneer), vertical log plank; board and batten, and clapboard siding are used predominantly on exterior walls. Logs or rough sawn lumber, characteristically exposed under the eaves or at the ends of gable roofs, serve to emphasize the rustic qualities of buildings. The contributing buildings in the district were erected between 1926 and 1941. Fourteen buildings maintain significant exterior integrity and contribute to the ambience of the district. Several buildings are considered noncontributing buildings due to their recent construction; loss of physical integrity; and/or their non-rustic architectural features, including buildings 118 (Resource Management), 123 (Administration), 217 (Garage), 96, the restrooms, and 251 (residence) (NPS 1987).

The historic buildings in the district are used for both administrative and residential purposes. The park kennels building hosts a program interpreting the history and current use of sled dog patrols in the park. The boundaries of the historic district are depicted on Figure 10.

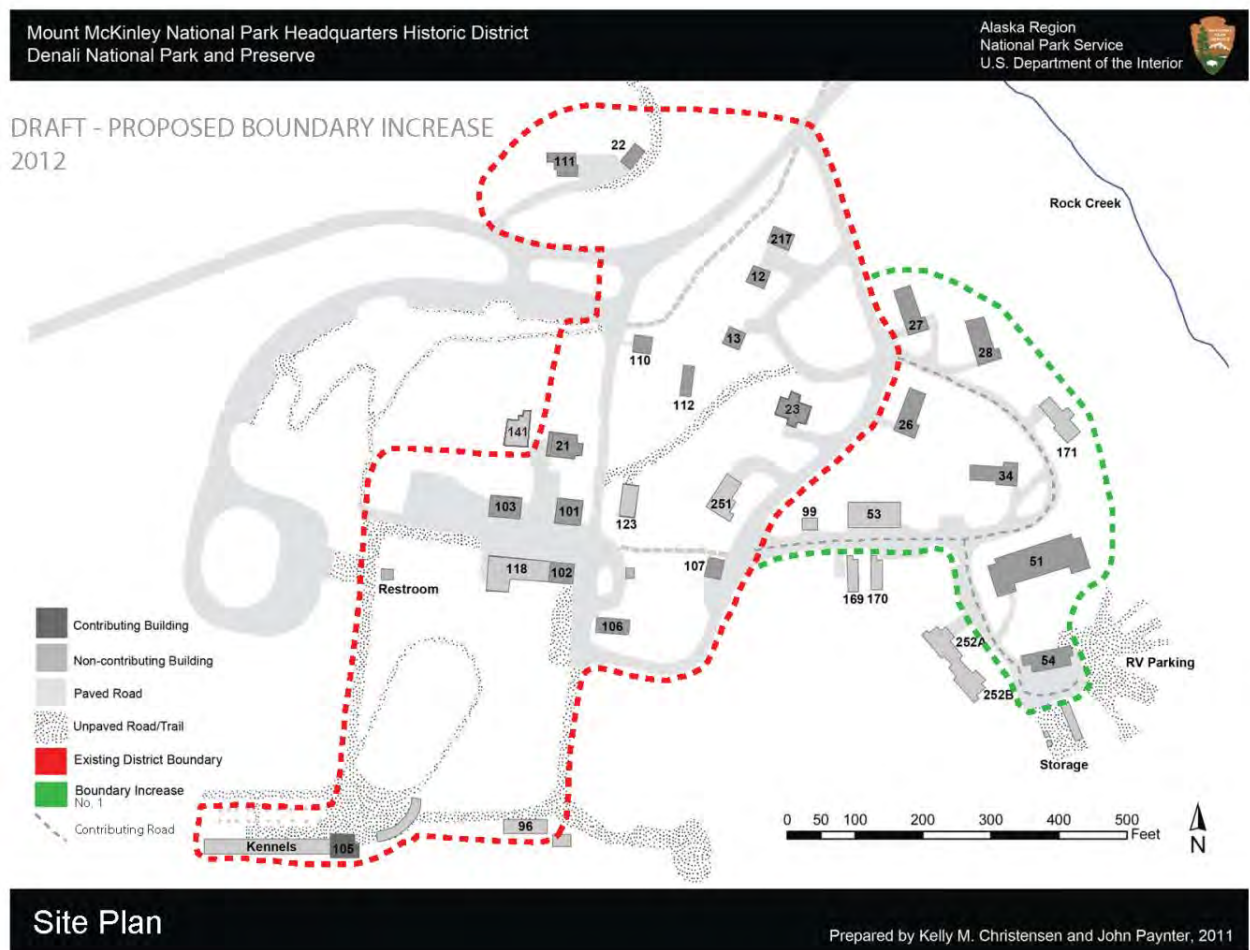


Figure 10: Boundaries of Existing Historic District and Proposed District Expansion

The district is historically significant since it illustrates the presence and early growth of the NPS in the State of Alaska. The NPS was established for the stated purpose of conserving areas of outstanding national beauty and wildlife and for providing outdoor recreational opportunities to the American public. The Civilian Conservation Corps (CCC), a Depression-era program whose life extended from 1933 to 1942, contributed greatly to the expansion and development of the headquarters historic district in the late 1930s. Throughout the nation and locally at Mount McKinley National Park, the CCC facilitated and enhanced the efforts of the NPS. The headquarters historic district represents the two historical themes of conservation and recreation (NPS 1987).

All but four (building 21, 22, 23, 110) of the contributing buildings in the district have been rehabilitated since the completion of the 1997 *Entrance Area and Road Corridor DCP*. Several still require some interior work.

In addition to the buildings within the historic district, there are four residential homes just outside the district designed by NPS architect Cecil Doty that were constructed during the post- World War II, pre-Mission 66 period when the federal government was reinvesting in parks. The 1-story ranch style homes are significant for three reasons. First, they are emblematic of the revitalization and modernization of the national parks following World War II. Second, they were designed by Cecil Doty who was one of the most influential post-World War II architects in the National Park Service and whose work defined the Mission 66 style, particularly for visitor centers. Finally, the houses represent the transition between the rustic and modern style of national park architecture and contain elements of both. NPS cultural resources staff are presently preparing a nomination that would add these houses to the national register as part of a headquarters historic district boundary increase. All of the houses have had some modifications since original construction, and two have been completely remodeled and no longer have their original floor plans (NPS 2007b). These are being considered as part of a district increase (NPS 2012).

Additional resources being considered as part of the boundary increase include a six-plex apartment building (51), which has been determined eligible for listing in the national register, the Boiler House (54), the Boiler House Spur Road and the Residential Loop Road. Staff are also re-examining the eligibility of a three-car garage (217/124) within the existing district boundaries. The garage was built in 1957 and was outside of the original period of significance. The proposed boundary increase would extend the period of significance for the district to include 1950-1961, the years of post-World War II and Mission 66 development (NPS 2012a). For the purposes of this EA, it is assumed that the resources under consideration for the potential historic district extension are eligible for listing in the national register. The utilidor will not be added to the historic district. On June 14, 2012 the SHPO concurred with the park finding that it was not eligible for listing.

On August 3, 2009, the Alaska State Historic Preservation Officer concurred with the NPS determination that the 92-mile long Denali Park Road is eligible for listing in the national register with a period of significance from 1922 to the present. This includes the original period of construction and use from 1922-1938, the Mission 66 period from 1955-1966, during which the road acquired its present appearance, and 1972 when the park adopted a shuttle bus system. The road is an evolving feature that has maintained significant continuity of original location, setting, feeling, association, and design, and under the Mission 66 era,

integrity associated with design, materials and workmanship. Since regular road maintenance and modest improvements continues to be in keeping with preserving the unique road character and providing a rustic park experience, the period of significance extends to the present. The road contains important character-defining features that are of the modern historic time-period, including the later part of the Mission 66 era and the period beginning in 1972 when the park initiated the shuttle bus and special permitted traffic policy. Therefore, Criteria Consideration G is appropriate for aspects of integrity that are less than 50 years old. NPS staff are currently preparing to formally list the Park Road in the national register.

The park museum collection is also stored in the headquarters area. The collection consists of over 369,000 objects including archeological objects systematically recovered from within the park's boundaries and associated field records; biological voucher specimens that document natural resource management research conducted within the park and associated field records; objects related to Athabascan Indians; objects related to the Murie expeditions and studies; mining tools and equipment related to the Kantishna mining district.

VISITOR USE AND ENJOYMENT

Approximately 400,000 people visited the park in 2011, primarily between mid-May and mid- September (NPS 2011a). The primary visitor activity at Denali is a shuttle or tour bus ride along the Denali Park Road, which stretches from the Parks Highway for 90 miles into the park interior, ending at Kantishna. Annually, almost 250,000 visitors embarked upon a shuttle bus trip or tour beyond the Savage River checkpoint for travel into the park interior (NPS 2011a). The remaining visitors stay in the frontcountry and explore this area of the park via the Savage River Shuttle bus, tour bus, private car, bicycle, or on foot. In 2011, approximately 35,000 visitors were also recorded on the south side of the Alaska Range at the Talkeetna Ranger Station and on concession-operated scenic air tours that land on park glaciers. All types of visitation to the park of are expected to continue to increase over the next 10-15 years.

Within the project area, most visitor use occurs at the sled dog kennels. The only working sled dog kennel in the NPS is found at Denali, and rangers provide 30-45 minute demonstration programs at the historic kennels building three times a day during peak season. It is the most popular interpretive program at the park, hosting approximately 50,000 visitors annually. Almost all visitors to the sled dog demonstrations ride a designated concession bus to the program which boards at the Denali Visitor Center approximately ½ hour before the presentation. Up to 6 buses may carry passengers to a single sled dog demonstration. The buses drive past the main headquarters driveway to the service road junction, turn, and drive down the service road to unload prior to the demonstration. The buses remain parked while visitors are at the demonstration, and then travel back up the service road to depart. Visitors also walk to demonstrations along the Roadside and Rock Creek Trails or use the Savage River Shuttle. Although it is discouraged, a few visitors drive private vehicles, park in the limited visitor parking at the headquarters visitor parking lot, and walk a short trail to the kennels.

Few visitors tour the rest of the headquarters historic district. Although a few walk through on their way between the visitor parking lot and the kennels, there are currently no

interpretive exhibits, brochures, or other information to identify or explain the significance of the district, although there is interpretive signage by the flagpole that changes seasonally.

The Rock Creek and Roadside Trails are also used by visitors to take a hike and who do not necessarily attend a sled dog demonstration, but who may end up in the headquarters area. The Savage River Shuttle and sled dog demonstration buses also allow visitors to walk one direction between the visitor center and headquarters and take a bus the other direction.

During winter, Park Road is closed just west of the visitor parking lot and the driveway that provides access to residences #111 and #22. Visitors leave cars in this parking lot while on day or overnight ski, snowshoe, or dog mushing trips that start along the park road corridor. The Spring Trail near the kennels is also available for starting trips, and is the principal route used by visitors after road plowing begins in March. Dog mushers are allowed to unload vehicles on the service road by the starting point of the trail. Tie-off posts are provided.

PARK OPERATIONS AND SAFETY

In addition to the staff and their offices, the headquarters area hosts several other functions including the park resource and interpretive libraries, the park's museum collection, central files, the computer network and phone hubs, and both temporary and permanent storage. There are a total of 24 housing units in the headquarters area, occupied primarily by permanent employees. Some are used for transient or temporary housing. There are over 30 full-time residents, including several children. A playground is located to the east of the six-plex apartment building (51). In the basement of building 51 is the "Permanent Rec Hall," which has been used as a gathering place, exercise room, and entertainment area for residents in permanent housing but is also used as a conference room for administrative purposes.

Along the road running east of the kennels building are a variety of storage buildings, including a long shed used for sheltering a variety of equipment and materials. One of these buildings is inside the historic district boundary. At the end of the road are three conex containers being utilized for storage by law enforcement/emergency medical services, resource management, and fire management. This is also the location of a compost pile used to dispose of waste from the park's sled dogs. The park's National Weather Service weather station is also located here. This historically significant station has been in continuous operation at its current site since 1925 and has recorded one of the lengthiest sets of weather data for the state of Alaska.

The main headquarters road, running south from the park road past building 110 and a cluster of administrative buildings (buildings 141, 21, 103, 101, 118 and 102), served as the primary entry point to the headquarters area historically and continues to serve as the primary entry point for administrative traffic today (See Figure 10 for orientation to the roads and buildings discussed in this paragraph). Most residential traffic enters on the road to the northeast of the main headquarters road and heads past building 27. The new kennels access road to the north and west of the headquarters area primarily serves the parking area west of the Cache (building 103) and to the kennels. Sled dog demonstration buses also enter the headquarters area along this road. In winter when the park road is closed at the headquarters gate, some winter maintenance continues out to mile 7 of the road to minimize

ice build-up on the road surface, during which time road equipment also uses the service road.

Employee parking is generally around the administrative buildings where the employees work, with some more remote parking along the traffic island in the residential area near the Superintendent's house (building 23). Residential parking is generally at the residences, with six-plex apartments having designated parking spaces along the surrounding roadways. The gravel pad to the east of the steam plant (building 54) was expanded to provide space specifically for storage of employee recreational vehicles in 2001 (NPS 2001). An existing environmental assessment provides for the deepening of parking spaces to the west of and across the street from building 51 to accommodate longer vehicles (NPS 2001).

There are several areas critical as snow dumps to store snow removed from headquarters roads.

The park currently has around 100 permanent employees, the majority of whom work in the headquarters area facilities year-round. In addition, over 100 seasonal employees work out of these facilities during the summer months.

The park utilities are housed in a concrete utilidor. The utilidor carries steam pipes for heating in addition to water, condensate and sewer pipes, electric and communication lines (telephone and data). The utilidor was built between 1960 and 1963 to replace an outdated utilidor system. It measures 3-foot 10-inches feet high by 3 foot wide and is filled with pipes, and lines, including asbestos concrete sewer pipes. Park personnel cannot work in the utilidor during the winter heating season without first turning off the heat to all buildings heated with steam heat, which runs the risk of freezing water and sewer lines and increasing potential problems. Additionally, they must navigate cramped conditions in order to repair any breaks or leaks in utilities, which are becoming more common as the sewer system is beginning to corrode. Radon gas ventilation systems have been installed in the utilidor, but there is still potential for the gas to seep into homes and offices via the connections between the utilidor and the buildings.

Three different heating systems are maintained: a liquid fuel system with scattered tanks each serving one to several buildings, a similar propane tank system and a steam heat system which serves ten buildings via a steam plant (building 54). The park is slowly converting liquid fuel systems to propane. The steam heat is conveyed through the utilidor during the winter months. During shoulder seasons and summer months, the buildings are heated via undersized boilers.

The fire suppression systems are currently inadequate and not code compliant. As a result, the park relies on fire response from local fire departments with an average 45-minute response time.

The Purpose and Need for Action section in Chapter 1 provides more details on the health and safety hazards associated with the utilidor.

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter provides an evaluation of the potential effects or impacts of each of the alternatives on the resources described in the impact topics presented in Chapter 1, Purpose and Need for Action.

METHODOLOGY

The impact topics analyzed in this chapter include soils, vegetation and wildlife, cultural resources, visitor use and enjoyment, and park operations and safety. Direct, indirect, and cumulative effects are analyzed for each impact topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. The effects to the subject resources are analyzed on the basis of type (adverse or beneficial), context, duration, and intensity of the impacts. Summary impact levels (characterized as negligible, minor, moderate, or major) are given for each impact topic in the analyses. Definitions of impact terms are provided below. Table 4 presents a summary of impact level thresholds.

Overall, the NPS based the following impact analyses and conclusions on review of existing literature and Denali National Park and Preserve studies, information provided by experts within the NPS, professional judgments and park staff insights, and previous projects in the area.

Direct versus Indirect Impacts:

Direct – Effects are impacts caused by the alternative(s) at the same time and in the same location as the action.

Indirect – Effects are impacts caused by the alternative(s) that occur later in time or farther in distance than the action, but still reasonably foreseeable. An indirect impact could occur because of a change to another resource or impact topic.

Intensity of Impact:

Low – A change in resource condition is perceptible, but does not measurably alter the resource function in the park ecosystem, cultural context, or park operations.

Medium – A change in a resource condition is measurable or observable and an alteration is detectable to the resource function in the park ecosystem, cultural context, or park operations.

High – A change in a resource condition is measurable or observable and an alteration to the resource function in the park ecosystem, cultural context, or park operations is clearly and consistently observable.

Duration of Impact:

Temporary – Impacts would last only a single visitor season or for the duration of the discreet activity, such as weather station installation or maintenance.

Long-term – Impacts would extend for several years up to the life of the facility.

Permanent – Impacts are a permanent change to the resource that would last beyond the life of the facility even if the actions causing the impacts were to cease.

Context:

Common – The affected resource is widespread and is not identified in enabling legislation as important to the park, nor is it rare within or outside the park. The portion of the affected resource does not fill a unique role within the park or its region of the park.

Important – The affected resource is identified by enabling legislation or is rare either within or outside the park. The portion of the affected resource does not fill a unique role within the park or its region of the park.

Unique – The affected resource is identified by enabling legislation and the portion of the affected resource uniquely fills a role within the park and its region of the park.

Table 4: Summary of Impact Levels

Negligible	Minor	Moderate	Major
Effects would generally be low intensity, temporary, & would not affect unique resources.	Effects would tend to be low intensity & short duration, but common resources may sustain medium intensity & long-term effects.	Common resources would be affected by higher intensity & longer term impacts while important & unique resources are affected by medium to low intensity & shorter-term to temporary impacts, respectively.	Effects are generally medium to high intensity, long-term to permanent & affect important or unique resources.

Cumulative Impacts

CEQ regulations (40 CFR 1508.7) require the assessment of cumulative impacts in the decision making process for Federal projects. A cumulative impact is an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (Federal or non-Federal), organization, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Cumulative impacts are considered for all alternatives and are presented at the end of each impact topic discussion analysis. To determine potential cumulative impacts, projects in the vicinity of the proposed project site were identified. Potential projects identified as cumulative actions included any planning or development activity that was currently being implemented or that would be implemented in the reasonably foreseeable future.

In the past, cumulative impacts on resources in the area have been dominated by the development of administrative facilities and visitor services along the park road. The entrance area is the area along the park road from the intersection with the George Parks Highway to the park headquarters.

There are several relevant past actions and projects that have been completed in the vicinity of the project as well as ongoing actions, facilities, and services in the project vicinity and park entrance area. The developed entrance area, the headquarters area, the paved road, and its associated developments through the Savage River Bridge near MP 14.0, make up the nearby area of development and disturbance examined in this cumulative impacts section. In this area about 80 acres of park land has been developed. Ongoing actions in the area include upgrades and rehabilitation to existing facilities, road, trails, and campgrounds to support current visitor use.

Implementation of the DCP/EIS is continuing with general programming for all facilities and the design of several development components. Facilities and services in the park entrance area currently include:

- Visitor Center Complex, completed in 2005 with a bookstore/gift shop and cafeteria/deli
- Murie Science and Learning Center Complex
- Wilderness Access Center
- Riley Creek Campground
- Railroad Depot
- Post Office
- Airstrip
- A network of hiking trails that connects the Nenana Canyon to the entrance area and the entrance area to the C-Camp/Headquarters Area
- C-Camp facilities including employee housing, parking, common facilities, maintenance area, Emergency Services Building,
- Sled dog kennels including the recently realigned dog kennel road and public parking at park headquarters
- Riley Creek Mercantile, with camper convenience services such as a general store and showers
- Support facilities for the concessionaire (including a housing area) and NPS interpretive programs
- A bus barn to support bus maintenance activities
- Park headquarters

Reasonably foreseeable future actions are those actions that are likely or reasonably certain to occur. Typically, they are based on documents such as existing plans, permit applications, or announcements. Significant planned actions in this area that were either identified in the DCP/EIS or elsewhere include construction of a wastewater pipeline from C-Camp to the headquarters leachfield and expansion of the leachfield; road improvements at mile 4.0 and 4.5 of the Denali Park Road; and replacement of Rock Creek bridge. Several upgrades to existing facilities are also planned but would not increase the existing footprint of development in the area.

In 2007 an environmental assessment to implement elements of the DCP/EIS within the headquarters area was released to the public. This master plan includes numerous building and facilities, circulation and parking, and utilities and infrastructure projects that are considered as part of the cumulative impact analysis. Some projects identified in the

Headquarters Area Plan would be implemented by part of the proposed project. Projects specifically analyzed in the EA as part of the alternative include:

- Removal of pavement between buildings 21, 141, 101 and 103 and replacement with a walking path;
- Resurfacing of roads in compliance with the cultural landscape report; and
- The conversion of buildings from central steam-heating to propane-heated with individual furnaces.

Actions analyzed in the Headquarters Area Plan that are treated as cumulative actions because they have or will undergo separate compliance include:

- Removal of buildings 99 and 141.

Other future and ongoing projects in the entrance area that were not specifically addressed in the DCP/EIS include cyclically removing brush from beneath the overhead power line; repairing roads and trails; continuing remediation of contaminated soils and groundwater at various locations; and periodic resurfacing of Denali Park Road in the entrance area, and implementation of the *Cultural Landscape Report*.

IMPACTS OF ALTERNATIVE A: NO ACTION

Soils

The existing utilidor system would remain in use and no additional impacts to soils from new construction would occur under this alternative. Continued deterioration of the system could lead to utility failures that would require ground excavation to remove the lid from sections of the utilidor to complete repairs. Localized areas of soils above the utilidor would be disturbed by excavation up to a depth of six feet during those repairs. However, the soils surrounding the current utilidor system were previously disturbed when the system was installed. Excavated soil material would be retained and then placed back on top the utilidor and the disturbed area reseeded after repairs were completed to reduce the potential for temporary erosion and soil loss during repair work.

Cumulative Impacts

Past and present actions that include development and use of the headquarters area, park entrance area and Park Road have resulted in the loss of soils within the development footprints and localized disturbance to soils, such as compaction and exposure of soils to erosion from vehicle or foot traffic and general park operations. Channelization of storm runoff from impervious paved areas and compacted surfaces would also continue to contribute to localized erosion of soils. The total estimated area of disturbance in these development areas and road corridor is approximately 80 acres.

Reasonably foreseeable future projects include construction of the C-Camp wastewater pipeline, expansion of the headquarters leachfield, and the replacement of the Rock Creek bridge that would result in localized disturbance to soil resources in construction areas. Rehabilitation of the Park Road at milepost 4.5 would also result in temporary disturbance to soils during placement of rip rap along approximately 1000 linear feet of road backslope and adding topsoil to that riprap and an additional 1,000 linear feet of riprap that was placed

in 2008. The old roadbed at milepost 4.0 would be landscaped as part of that project or a future project. Other future and ongoing projects such as cyclic brush removal and road and trail repair would also contribute to soil disturbance, generally within previously disturbed areas within the developed areas and road corridor.

The past, present, and reasonably foreseeable future projects would have long-term moderate adverse effects on soil resources. Alternative A may contribute temporary minor impacts should sections of the utilidor lid be excavated during utility repair work. The overall cumulative impacts to soil resources from Alternative A in combination with the other cumulative actions would be long-term, moderate, and adverse.

Conclusion

Alternative A could potentially have temporary minor adverse effects on soil resources should future utility repair work require excavation along sections of the utilidor.

Vegetation and Wildlife

No disturbance to vegetation and wildlife habitat would occur due to new construction. There would be the possibility of occasional ground disturbance and localized vegetation removal due to future repairs that involve excavation and removal of utilidor lids. This may include root damage or removal of some spruce, aspen, or cottonwood trees along the existing utilidor alignment. Disturbed areas would be reseeded with native species following repair work. Existing disturbance or displacement of wildlife from human activity in the headquarters developed area would continue. Noise and disturbance created during repair work would not likely result in a measurable change in wildlife use.

Cumulative Impacts

Past and present actions that include development and use of the headquarters area, park entrance area and park road have resulted in the loss or alteration of vegetative communities and wildlife habitat on approximately 80 acres. Reasonably foreseeable future and ongoing projects that would also impact vegetation and wildlife include construction of the C-Camp wastewater pipeline, expansion of the headquarters leachfield, replacement of Rock Creek bridge, rehabilitation of the park road at milepost 4.5, and other continuing actions such as cyclic brush removal and road and trail repair.

These projects have or would result in the removal, trampling, or placement of fill on vegetation and the potential introduction of nonnative invasive species that could serve as source populations for nonnative plants that may disperse into nearby native plant communities. In addition to the impacts to wildlife habitat caused by the loss or alteration of native vegetation, these projects would affect the behavior, distributions, and movements of some wildlife, such as dispersion of wildlife away from construction activity with reoccupation anticipated following construction, the loss of some less mobile species because of construction or operational activities, and reduction in habitat quality for adjacent areas because of noise and human activity during construction. BMPs and mitigation measures would be implemented as part of the projects to reduce the extent of potential impacts.

The past, present, and reasonably foreseeable future projects would have long-term moderate adverse effects on vegetation and wildlife resources. Alternative A may contribute temporary minor impacts due to utility repair activities. Overall, Alternative A in combination with the other cumulative actions would result in long-term moderate adverse cumulative impacts on vegetation and wildlife.

Conclusion

Alternative A could result in temporary minor adverse impacts to vegetation and wildlife during utility repair work.

Cultural Resources

Cultural resources within the headquarters historic district, proposed district increase or resources eligible for listing in the national register would not be directly impacted by Alternative A because there would be no ground disturbance, tree cutting, or work on historic buildings. Under this alternative, routine maintenance and the repair of leaks or broken utilities would continue and would not be expected to impact cultural resources, although some damage may occur if leaks or lack of heat caused pipes to burst in the buildings. Additionally, the above-ground fuel tanks would remain, detracting somewhat from the cultural landscape, although mitigation has successfully reduced their impact through paint and screening vegetation. Inadequate fire protection and continued reliance on fire responders from 45 minutes away would leave historic buildings at increased risk of damage should a fire occur.

Cumulative Effects

Since the headquarters historic district was added to the national register in 1987, NPS activities have both enhanced and detracted from the character of the district. Historic building rehabilitation since completion of the 1997 DCP/EIS has emphasized the reconstruction of the historic exterior appearance of the buildings, such as the garage facade on the eastern portion of the Resources building (102) and the loading dock and doorway reconfiguration on the interpretive building (101). However, new non-contributing buildings have been added to the district including the SST serving kennels visitors in 2005 and one residence (251) in 1994. Formal and informal parking has expanded along road edges. The effects of the implementation of the *Cultural Landscape Report* (NPS 2008) and the 2007 *Headquarters Master Plan* is expected to reverse some of the cumulative impacts and move non-contributing, but essential landscape elements, such as parking, to more peripheral areas. Overall it is expected to have moderate beneficial impacts in improving the overall cultural landscape of the headquarters historic district and the proposed district increase.

The cumulative effects of past, present, and foreseeable future actions on cultural resources have been mixed, but with an overall moderate, long term, beneficial impact. Alternative A would contribute a long term, negligible adverse portion, which when combined with the other cumulative effects would result in overall long term moderate beneficial impacts.

Conclusion

Implementation of Alternative A would have negligible, local, long term, indirect adverse impacts to cultural resources primarily due to increased risk to the buildings from fire and/or water or sewer main breaks.

Visitor Use and Experience

Under the no action alternative, utilities outages and repairs would continue to occur, but would have no effect on visitor use and enjoyment of the headquarters area. Visitors to the headquarters area primarily visit the kennels for sled dog demonstrations and arrive via bus or private car. Some visitors also hike the Roadside and Rock Creek Trails. They may use restrooms located by the bus drop off, but there are no other buildings that are open to the public, although there is interpretive signage by the flagpole at the entrance to the headquarters road that changes seasonally. Since, most visitation and demonstrations occur during the summer months, visitors are unlikely to feel the effects of utilities outages.

Cumulative Effects

Making the headquarters historic district more visitor-friendly is part of the larger effort articulated in the 1997 DCP/EIS and the *Headquarters Management Plan* to enhance visitor opportunities in the entrance area of the park. Combined with the extensive new visitor facilities centered on the Denali Visitor Center and improvements planned or underway in the Savage River area, the NPS has provided long-term, substantial improvements in the opportunities for visitors to use, recreate in, and learn about Denali. Although localized in the Denali entrance area, because virtually all of the park visitors pass through the entrance area the significance of the improvements can be considered park-wide. Other actions, such as the replacement of the Rock Creek Bridge would provide temporary minor adverse impacts to visitors due to potential traffic congestion and visible construction, but long term minor beneficial impacts due to stabilized road and bridge surfaces along the Park Road.

Past, present and reasonably foreseeable future impacts on visitor use and experience have been long term and moderate to major beneficial. Because there would be no effect from the implementation of Alternative A, the cumulative impact on visitor use and enjoyment when combined with the Alternative A would be beneficial and moderate to major.

Conclusion

There would be no effect on visitor use and experience to the headquarters area under the Alternative A because visitors do not use indoor facilities in the area with the exception of a single restroom and most visitors come during summer months when the effects of broken utilities are less likely to be noticed.

Park Operations and Safety

There would be no changes to park operations or safety conditions under this alternative. Failed or leaking utilities would continue to be fixed on an as-needed basis, with repairs averaging once a year for the steam heat, twice per year for the water system, and numerous small repairs to the condensate and sewer systems, becoming more frequent as the systems continue to age. Heating within the headquarters area would continue to use a mix of steam and liquid fuel systems, although individual buildings may be converted to propane systems as budgets allow, and safety hazards, including asbestos piping, and cramped working conditions would continue to hamper any needed repair efforts. In the event of a leak in any one of the faulty utilities in the headquarters area during the winter months, staff would have to choose between turning off the heat to the ten steam-heated buildings for up to 4 hours (or more for a complicated repair) to fix the systems or allowing leaks and potential health threats to exist until the steam heating system shuts off in the spring. Either choice could

negatively affect the systems and human health and safety, although systems with potentially catastrophic failures or safety implications would be fixed as soon as possible, whatever the season.

Under the Alternative A the current inadequate water pressure and supply to fire suppression and hydrant systems would continue, putting buildings and employees at risk. Additionally, the unacceptable levels of radon gas in the utilidor would continue to seep into the administrative buildings and employee housing units, although current ventilation systems would mitigate the threat. Finally, a significant amount of steam heat would continue to be lost within the inefficient utilidor system.

Cumulative Effects

Implementation of the 1997 DCP/EIS has generally improved park management and operations, which has been particularly important for addressing the increased complexity of visitor facilities and services and the increasing number of visitors over time. In the headquarters area, the rehabilitation of historic buildings into modern, functional offices has increased office capacity without adding new buildings. The construction of the Building and Utilities building in C-Camp and expansion of the Auto Shop also provided new office space to accommodate growing staff and responsibilities. Changes such as the conversion from fuel oil to propane for heating reduce operational complexity, and improvements such as the forthcoming repair of the mile 4 and 4.5 section of the Park Road remove maintenance burdens. These improvements and efficiencies help to offset the impact of increasing complexity and scale of park operations. With the short-term exception of construction-related delays some long-term parking adjustments for staff, construction of the new Rock Creek crossing and implementation of the *Headquarters Master Plan* would also result in greater safety and efficiency in operations.

Past present and reasonably foreseeable actions would add a long-term moderate to major beneficial effects on park operations and safety. Alternative A would add a moderate, local adverse impact to the whole, resulting in combined moderate long-term beneficial cumulative impacts on park operations and safety.

Conclusion

Alternative A would have long and short term, local, moderate adverse impacts on park operations and safety due to the employee hours needed to maintain the aging systems, the effects of more frequent system shut downs and the potential threats to human and resource safety due to lack of adequate fire suppression protection.

IMPACTS OF ALTERNATIVE B - UPGRADE HEADQUARTERS UTILITIES INFRASTRUCTURE (PREFERRED ALTERNATIVE)

Soils

Construction of new utilities would include activities such as ground clearing, grading, excavation, and filling that would disturb approximately 3.5 acres of soils within the headquarters developed area. Most construction would occur within areas previously disturbed by roads, buildings, and utilities. Some previously undisturbed soils may be impacted by compaction from heavy equipment, soil removal, or soil erosion that would compact and destroy the structure and function of the organic soil horizon and mineral soils.

Excavated soil material would be displaced and exposed during construction and would be subject to erosion until stabilized or reseeded. Erosion control BMPs would control runoff and reduce the potential for erosion and soil loss during construction. Topsoil would be removed and stockpiled separately then placed back on top after the work is completed and the disturbed areas would be reseeded following construction. A stormwater control plan would further identify measures to control runoff and reduce the potential for erosion and soil loss.

Removal of building 99 and the pavement between buildings 21, 141, 101 and 103 and the restoration of soils and vegetation in these areas would result in localized beneficial effects.

Cumulative Impacts

As described for the no-action alternative, past and present projects have resulted in the loss of soils within the development footprints and localized disturbance to soils, such as compaction, exposure of soils, and erosion from vehicle or foot traffic, general park operations, and channelization of storm runoff. The total estimated area of disturbance in these development areas and road corridor is approximately 80 acres. Additional disturbance and loss of soil resources would occur from the reasonably foreseeable future projects and continuing park operations like road repair.

The overall cumulative impacts to soil resources from Alternative B in combination with past, present, and reasonably foreseeable future actions would be long-term, moderate, and adverse. The 3.5 acres of soil disturbance from Alternative B would be a relatively small contribution to the overall cumulative impacts.

Conclusion

Overall Alternative B would impact approximately 3.5 acres of primarily previously disturbed soils and would result in local, temporary, minor, adverse impacts to soils from ground disturbance associated with construction activities.

Vegetation and Wildlife

Construction of the new utilities would result in the disturbance to the approximate 3.5 acres that constitute the project area, most of which are currently unvegetated due to previous disturbance and current use, such as roads. Vegetation would be removed for

construction of some segments of the utility lines and propane tank burial. Approximately 100 trees within the trenching footprint most of which are 6-inch to 12-inch in diameter would be removed. Two or more 18 to 24-inch in diameter trees would also be removed for safety reasons. Most of these trees are spruce and aspens and a few are cottonwood, birch, and willows. These species are common within the park. Approximately 40 other trees adjacent to the trenches are likely to have roots severed or damaged by the trenching operations and may be removed. Although disturbed areas would be reseeded, loss of trees would be a long-term impact.

The new waterline on the steep slope to the existing water tank would be located within a corridor previously cleared during construction of the existing waterline to the tank. An additional number of smaller second growth trees that have become established along the waterline corridor up to the water tank would also be removed to construct the new waterline.

Construction activities would be confined to the smallest area necessary to complete the work, and disturbed areas would be reseeded with native vegetation following construction. Infestation and spread of invasive exotic plants is possible. These species frequently invade disturbed ground where they are easily established and out compete native species if left unchecked. Reseeding with native species and implementation of weed-control BMPs would minimize the potential for weed establishment and long-term impacts.

Construction would primarily occur within previously disturbed areas, some of which provide no wildlife habitat (e.g., roads), have marginal habitat value (e.g., mowed lawns), or are generally avoided by most large wildlife such as moose or grizzly bears due to existing development and human activity. No sensitive or rare habitats would be affected. Birds and small mammals would likely alter their usual movements through the area when construction is occurring or be displaced by the loss of trees and other vegetation; however, there is abundant undeveloped habitat available on surrounding lands and park-wide. Consequently, effects on wildlife could include localized changes in the abundance or distribution of individuals in the headquarters developed area, but would not affect the viability of local populations.

Mitigation measures developed for minimizing impacts on soils and vegetation such as reseeded areas with native species, pressure washing of construction equipment, etc., as described in chapter 2 would also aid in minimizing impacts on the quality of wildlife habitat. The construction contractor would be required to adhere to the park's bear-human conflict management plan to avoid attracting bears and other wildlife into the construction zone. To avoid displacement or mortality of breeding birds or the destruction or abandonment of active nests, vegetation removal would be conducted outside the avian nesting season March 1 through August 1. If it should be necessary to remove additional vegetation during the nesting season, breeding bird surveys would be conducted by a park biologist to confirm if nests were present. Any occupied nests discovered would be protected at all times.

Some local beneficial effect to vegetation and wildlife habitat would occur as the result of Alternative B. As part of this project, less than an acre would be revegetated following the removal of building 99 and the pavement between buildings 21, 141, 101 and 103.

Cumulative Impacts

As described for Alternative A, past and present projects have resulted in the loss or alteration of vegetative communities and wildlife habitat on approximately 80 acres. Additional disturbance and loss of resources would occur from the reasonably foreseeable future projects and continuing park operations like road repair.

These projects have or would result in the removal, trampling, or placement of fill on vegetation and the potential introduction of nonnative invasive species that could serve as source populations for nonnative plants that may disperse into nearby native plant communities. In addition to the impacts to wildlife habitat caused by the loss or alteration of native vegetation, these projects would affect the behavior, distributions, and movements of some wildlife, such as dispersion of wildlife away from construction activity with reoccupation anticipated following construction, the loss of some less mobile species because of construction or operational activities, and reduction in habitat quality for adjacent areas because of noise and human activity during construction. BMPs and mitigation measures would be implemented as part of the projects to reduce the extent of potential impacts.

The overall cumulative impacts to vegetation and wildlife resources from Alternative B in combination with the past, present, and reasonably foreseeable future actions would be long-term, moderate, and adverse. The 3.5 acres of disturbance and loss of and vegetation and displacement of wildlife from Alternative B would be a relatively small contribution to the overall cumulative impacts.

Conclusion

Overall, Alternative B would result in local, moderate, adverse impacts to vegetation and local minor adverse impacts to wildlife due to the temporary disturbance or long-term loss of vegetation and wildlife habitat on approximately 3.5 acres.

Cultural Resources

The preferred alternative would disable the existing utilities after installing new utilities throughout the headquarters historic district and the potentially eligible district increase. The installation would follow the existing roads and utilidor path to a great extent, with new spurs constructed to the administrative buildings and homes. This routing would minimize new ground disturbance. Additionally, although some trash scatters or outbuilding foundations may be encountered, significant archeological resources are not expected because a trash disposal area was established over the ravine at the southern terminus of the Headquarters Road, outside of the current project area when the district was first occupied (NPS 2008). Archeological testing within the headquarters historic district has not located any significant cultural deposits (NPS 1983; 2009b; 2010b; 2011b; 2012b). Because of these factors, the excavation is not expected to disturb significant archeological resources. Additionally, periodic monitoring during construction would ensure that any potentially unknown resources would be investigated prior to installation of utilities and utilities could be rerouted if significant resources were discovered.

There would be some impacts to historic buildings and structures. Because the new utilities are going into the roads, a portion of the Park Road, Residential Loop Road and Boiler

House Spur Road would be torn up. These roads have previously been repaved and expanded (NPS 2012a). After the work was over, they would be replaced in kind or replaced with chip seal within the boundaries of the headquarters historic district in keeping with the rustic nature of the historic district. Paving with chip seal should improve the appearance of the roads in the district. Removing pavement between buildings 141, 21, 101 and 103 and replacing a portion of it with a chip seal path would meet one of the *Cultural Landscape Report* (NPS 2008) recommendations for this area. Additionally, regrading walks so that they are flush with the stoops at building 21, 101, and 103 would also improve the cultural landscape by removing non-contributing ramp structures.

Most new utilities would enter the buildings below grade and using existing foundation penetrations wherever possible to minimize effects to historic fabric. For utilities entering the building in new locations, most penetrations would be below grade and not be visible. If utilities must be connected above ground, crews would attempt to reuse existing building penetrations where it is possible to do so. Roof top vents would also be reused in most cases. Since fewer than four and in many cases no new penetrations would be expected for each building and most, if not all, would be below ground, the new penetrations would not directly or indirectly affect any of the characteristics that qualify the headquarters historic district, proposed district increase, or individual buildings for inclusion in the national register in a manner that would diminish the integrity of their location, design, setting, materials, workmanship, feeling, or association. The project would also provide a permanent underground data connection to building 110, which would allow the existing overhead wires to be disconnected, improving the cultural landscape.

Finally, historic buildings would benefit from the replacement of old utilities with working utilities, including the replacement of existing, undersized, non-original boilers in the 10 buildings that currently receive steam heat. The buildings would be less likely to be affected by water or sewer main breaks or lack of heat during the winter months that could damage historic fabric, and adequate water supply for fire-fighting would be available.

The alternative would necessitate tree cutting within the district and the potential district increase. Cutting of approximately 140 trees within the district, most 6-12" in diameter, would occur along the paved roads and would include trees that would be directly impacted by the trenching or that may incur root damage due to trenching. Some large (18 to 24-inch diameter trees would also be cut if they posed danger to buildings or people as a result of the trenching. Additional cutting would be necessary along the previous utility cut to building B350 in the northwest portion of the project area. Because the trees that would be cut are already along linear open corridors, it is unlikely that they would have negative impacts on the cultural landscape. The park staff would direct contractors to save important screening trees where possible and park staff would replant screening trees as determined necessary. The *Cultural Landscape Report* calls for selective thinning of the trees to open views near the headquarters entrance and around residences, as well as removing vegetation between the roads and manicured lawns to discourage tree growth along the roads. The preferred alternative would help accomplish these goals as well as prevent damage to buildings if a tree were to topple during a wind storm.

Finally, by removing existing fuel tanks from five locations and burying new propane tanks, replacing bollards with more rustic boulders, and possibly demolishing the non-contributing

building 99, the headquarters historic district cultural landscape would be improved by removing incompatible small-scale features and structures.

Cumulative Effects

Since the headquarters historic district was added to the national register in 1987, NPS activities have both enhanced and detracted from the character of the district. Historic building rehabilitation since completion of the 1997 DCP/EIS has emphasized the reconstruction of the historic exterior appearance of the buildings, such as the garage facade on the eastern portion of the Resources building (102) and the loading dock and doorway reconfiguration on the interpretive building (101). However, new non-contributing buildings have been added to the district including the SST serving kennels visitors in 2005 and one residence (251) in 1994. Formal and informal parking has expanded along road edges. The effects of the implementation of the cultural landscape report and the 2007 *Headquarters Master Plan* is expected to reverse some of the cumulative impacts and move non-contributing, but essential landscape elements, such as parking, to more peripheral areas. Overall it is expected to have moderate beneficial impacts in improving the overall cultural landscape of the headquarters historic district and the proposed district increase.

The cumulative effects of past, present, and foreseeable future actions on cultural resources have been mixed, but with an overall moderate, long term, beneficial impact. Alternative B would contribute additional long term, beneficial impacts, which when combined with the other cumulative effects would result in overall long term moderate beneficial impacts.

Conclusion

Alternative B would have long term, local, direct moderate beneficial impacts to cultural resources due to the implementation of selected actions called for in the *Cultural Landscape Report* as well as minimization of risk to buildings due to utility failures and fire.

Visitor Use and Experience

Alternative B would replace the utilities in the headquarters area and as part of the project would also implement selected actions of the *Cultural Landscape Report*, including removing excess pavement from the headquarters core and replacing it with a walking path; replacing bollards with boulders, paving the roads with a surface more sympathetic to the cultural landscape, and narrowing the headquarters road in locations where it has expanded. Additionally, the above ground tanks will be placed underground. These actions would not implement the entire *Cultural Landscape Report* treatment plan, but would enhance the historic district and make possible the creation of a central pedestrian zone, facilitating expanded front country interpretive opportunities as recommended in park plans.

However, during two construction seasons, visitors would not be able to access the kennels by walking from the Roadside Trail through the headquarters area to connect to the kennel, although they could walk along the road approximately 350 feet and access the kennel down pedestrian paths to the west of the administrative core. Additionally, some sled dog programs could be disrupted by background noise as work continued in the headquarters area. The worst noise would be associated with the water and electric hook up to the kennels themselves. Other construction noise would be 400 to 500 feet away from the demonstrations at a minimum and would have less impact on programs.

During construction there would be increased vehicle trips to the headquarters area related to construction traffic. Traffic flow and vehicle access to the headquarters area could be temporarily restricted. Traffic may be periodically subjected to alternating, one-way flow. All efforts would be made to reduce any delays as much as possible. Flaggers could be used during work hours to control traffic and visitors would be informed of construction activities and associated delays.

Cumulative Effects

Making the headquarters historic district more visitor-friendly is part of the larger effort articulated in the 1997 DCP/EIS and the *Headquarters Management Plan* to enhance visitor opportunities in the entrance area of the park. Combined with the extensive new visitor facilities centered on the Denali Visitor Center and improvements planned or underway in the Savage River area, the NPS has provided long-term, substantial improvements in the opportunities for visitors to use, recreate in, and learn about Denali. Although localized in the Denali entrance area, because virtually all of the park visitors pass through the entrance area the significance of the improvements can be considered park-wide. Other actions, such as the replacement of the Rock Creek Bridge would provide temporary minor adverse impacts to visitors due to potential traffic congestion and visible construction, but long term minor beneficial impacts due to stabilized road and bridge surfaces along the Park Road.

Overall, past, present and reasonably foreseeable projects would have short term minor adverse impacts and long term moderate to major beneficial impacts. Alternative B would add a small beneficial impact to the whole, contributing to an overall long term beneficial moderate to major cumulative impact on visitor use and enjoyment.

Conclusion

The Alternative B would have short term negligible adverse impact on visitor enjoyment during the construction seasons, followed by long term, local, minor beneficial impact on visitor use and enjoyment due to the improvement of the cultural landscape.

Park Operations and Safety

Under Alternative B, the entire utility system would be replaced and repaired and the utilidor would be abandoned in place. The park would expect long term benefits from the repairs, including less time spent fixing leaks or malfunctioning equipment, less time for critical systems to be off line as a result of any repairs that may be needed, no need to schedule repairs around the heating season, and no need to maintain parts to fix two disparate heating systems. Additionally, since the ten buildings currently steam-heated in winter would be converted to propane fuel and connected to buried fuel tanks, if a heating problem did occur, it would likely not affect more than one building at a time and disruptions to other utilities could be fixed without turning off the heat. Similarly, employees would not be exposed to hazardous materials or cramped working conditions during any necessary repairs or routine maintenance. Since the connector tunnels from the utilidor to the buildings would be cut and capped, there would be less chance for radon gas to seep into the residential and administrative buildings. Additionally, adequate water for fire-fighting would be available, minimizing fire-safety issues in the headquarters area, and the cutting of hazard trees would prevent trees from toppling on buildings or people.

During construction, however, the park would need to plan for two seasons worth of work within the administrative and residential complexes during the time when the park is at capacity for both permanent and temporary workers. Crews, machinery and materials would need to be stockpiled and transported to work areas and since the water and sewer lines would be placed within the roads in the headquarters area, vehicular traffic to homes and administrative buildings would often be disrupted. This disruption would be minimized by the implementation of a traffic management plan, but the roads may be excavated multiple times as multiple utility trenches are dug. Additionally, workers could expect periodic outages of water, sewer, electric and communication. They would generally be given 24-hour notice to plan around outages and the contractor would provide back-up utilities for extended outage periods. These outages may mean that employees would need to be temporarily relocated during certain hours or use facilities in other buildings. Despite the temporary disruptions, all utilities would function during the project, allowing work and residential life to continue.

During construction there would be increased vehicle trips to the headquarters area related to construction traffic. Traffic flow and vehicle access to and within the headquarters area would be temporarily restricted. Traffic may be periodically subjected to alternating, one-way flow. All efforts would be made to reduce any delays as much as possible and to alert park staff as soon as possible if delays longer than normal are expected. Flaggers could be used during work hours to control traffic. However, routine park operations and possibly emergency response times would be disrupted.

Cumulative Effects

Implementation of the 1997 DCP/EIS has generally improved park management and operations, which has been particularly important for addressing the increased complexity of visitor facilities and services and the increasing number of visitors over time. In the headquarters area, the rehabilitation of historic buildings into modern, functional offices has increased office capacity without adding new buildings. The construction of the Building and Utilities building in C-Camp and expansion of the Auto Shop also provided new office space to accommodate growing staff and responsibilities. Changes such as the conversion from fuel oil to propane for heating reduce operational complexity, and improvements such as the forthcoming repair of the mile 4 and 4.5 section of the park road remove maintenance burdens. These improvements and efficiencies help to offset the impact of increasing complexity and scale of park operations. With the short-term exception of reduced traffic volume and increased travel time at the new Rock Creek crossing during bridge replacement, this would most likely result in greater safety efficiency in operations as a result of the project.

The impact of past, present and reasonably foreseeable future projects on park operations and safety would be short term, minor adverse and long term moderate beneficial. Alternative B would add a small, but noticeable long term beneficial impact, resulting in moderate long-term beneficial cumulative impacts on park management and operations and safety.

Conclusion

Alternative B would have moderate, short term, local adverse impacts during the construction seasons and possibly during the intervening winter. These would be tempered

by the long term, local and regional minor beneficial impacts to park operations and safety that would be expected from the implementation of this alternative.

CONSULTATION AND COORDINATION

PUBLIC INVOLVEMENT

Public participation was invited for this project in the form of a press release which was published on PEPC on October 26, 2011 for a 30-day comment period. Comments received were incorporated into the analysis for this EA.

A press release announcing the public comment period and availability of this EA was issued by the NPS. The EA is available online at the National Park Service Planning, Environment, and Public Comment (PEPC) website. Go to <http://parkplanning.nps.gov> to access the PEPC site. Public comments on this environmental assessment can also be provided on the PEPC website.

AGENCY CONSULTATION

NPS consulted with the following federal and state officials/agencies during the preparation of this Environmental Assessment:

The NPS has determined that there are no Threatened and Endangered Species expected in the project area; therefore Section 7 consultation with the USFWS is not required.

The Alaska State Historic Preservation Officer was consulted during preparation of this EA and concurred with the NPS determination that the utilidor was not eligible for listing in the national register on June 14, 2012. The SHPO will be provided a 30-day review of the environmental assessment.

Consultation with the SHPO and associated Indian Tribes in accordance with S106 of the NHPA will happen separately but concurrently with the EA review.

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APPENDIX A

SUBSISTENCE - SECTION 810(a) OF ANILCA SUMMARY EVALUATION AND FINDINGS

I. INTRODUCTION

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluation of potential restrictions to subsistence activities that could result from an upgrade for the utility systems in the headquarters area in Denali National Park and Preserve.

II. THE EVALUATION PROCESS

Section 810(a) of ANILCA states:

"In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands . . . the head of the federal agency . . . over such lands . . . shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency –

(1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;

(2) gives notice of, and holds, a hearing in the vicinity of the area involved; and

(3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the National Park System in Alaska. Denali National Park and Preserve was created by ANILCA Section 202(3)(a):

"The park additions and preserve shall be managed for the following purposes, among others: To protect and interpret the entire mountain massif, and additional scenic mountain peaks and formations; and to protect habitat for, and populations of, fish and wildlife, including, but not limited to, brown/grizzly bears, moose, caribou, Dall sheep, wolves, swans and other waterfowl; and to provide continued

opportunities, including reasonable access, for mountain climbing, mountaineering, and other wilderness recreational activities."

ANILCA Section 202(3) also states: "Subsistence uses by local residents shall be permitted in the additions to the park where such uses are traditional in accordance with the provisions in title VIII."

Title I of ANILCA established national parks for the following purposes:

"... to preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing, fishing, and sport hunting, within large arctic and subarctic wildlands and on free-flowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.

"... consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this Act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so."

The potential for significant restriction must be evaluated for the proposed action's effect upon "... subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use..." (Section 810(a))

III. PROPOSED ACTION ON FEDERAL LANDS

Alternatives A and B are described in detail in the environmental assessment. Customary and traditional subsistence use on NPS lands will continue as authorized by federal law under all alternatives. Federal regulations implement a subsistence priority for rural residents of Alaska under Title VIII of ANILCA.

The NPS proposes to upgrade the utility systems in park headquarters by installing new water, sewer, electrical, communications, fire alarm and propane lines and abandoning the utilities now housed in the underground utilidor constructed between 1960 and 1963. Park Headquarters is in the former Mount McKinley National Park wherein subsistence activities are not allowed.

IV. AFFECTED ENVIRONMENT

Subsistence uses within Denali National Park and Preserve are permitted in accordance with Titles II and VIII of ANILCA. Section 202(3)(a) of ANILCA allows local residents to engage in subsistence uses in the ANILCA additions to the park where such uses are traditional in accordance with the provisions in Title VIII. Lands within former Mount McKinley National Park are closed to subsistence uses.

A regional population of approximately 300 eligible local rural residents qualifies for subsistence use of park resources. Resident zone communities for Denali National Park are Cantwell, Minchumina, Nikolai, and Telida. By virtue of their residence, local rural residents of these communities are eligible to pursue subsistence activities in the new park additions. Local rural residents who do not live in the designated resident zone communities, but who have customarily and traditionally engaged in subsistence activities within the park additions, may continue to do so pursuant to a subsistence permit issued by the Park Superintendent.

The NPS realizes that Denali National Park and Preserve may be especially important to certain communities and households in the area for subsistence purposes. The resident zone communities of Minchumina (population 22) and Telida (population 11) use park and preserve lands for trapping and occasional moose hunting along area rivers. Nikolai (population 122) is a growing community and has used park resources in the past. Cantwell (population 147) is the largest resident zone community for Denali National Park and Preserve, and local residents hunt moose and caribou, trap, and harvest firewood and other subsistence resources in the new park area.

The main subsistence species, by edible weight, are moose, caribou, furbearers, and fish. Varieties of subsistence fish include coho, king, pink and sockeye salmon. Burbot, dolly varden, grayling, lake trout, northern pike, rainbow trout and whitefish are also among the variety of fish used by local people. Beaver, coyote, land otter, weasel, lynx, marten, mink, muskrat, red fox, wolf and wolverine are important furbearer resources. Rock and willow ptarmigan, grouse, ducks and geese are important subsistence wildlife resources.

The NPS recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in any given year may vary considerably from previous years because of such factors as weather, migration patterns and natural population cycles. However, the pattern is assumed to be generally applicable to harvests in recent years with variations of reasonable magnitude.

V. SUBSISTENCE USES AND NEEDS EVALUATION

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources that could be impacted.

The evaluation criteria are:

- the potential to reduce important subsistence fish and wildlife populations by (a) reductions in numbers; (b) redistribution of subsistence resources; or (c) habitat losses;
- the effect the action might have on subsistence fishing or hunting access; and
- the potential to increase fishing or hunting competition for subsistence resources.

The potential to reduce populations:

Provisions of ANILCA and Federal and State regulations provide protection for fish and wildlife populations within Denali National Park and Preserve.

Construction of new utility systems in park headquarters would have a long-term minor impact on wildlife habitat and populations. The alternatives would not adversely affect the distribution or migration patterns of subsistence resources. Therefore, no change in the availability of subsistence resources is anticipated as a result of the implementation of this proposed action.

Restriction of Access:

Section 811 of ANILCA addresses “Access” for subsistence as follows: “The Secretary shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on public lands.” Traditional access for Title VIII subsistence uses should not be significantly restricted under the proposed action.

Alternative A (No Action), the status quo, and Alternative B (Proposed Action), are not anticipated to significantly limit or restrict the access to subsistence uses within the ANILCA additions of Denali National Park or Denali National Preserve. Federal and State regulations assure the continued viability of fish and wildlife populations.

Increase in Competition:

Alternative A (No-Action), maintaining the status quo and Alternative B (Proposed Action) are not expected to result in increased competition for fish, wildlife or other resources that would significantly impact subsistence users in Denali National Park and Preserve. Federal and State regulations assure the continued viability of particular fish or wildlife populations

VI. AVAILABILITY OF OTHER LANDS

The preferred alternative is consistent with the mandates of ANILCA, including Title VIII, and the NPS Organic Act.

VII. ALTERNATIVES CONSIDERED

The alternatives considered for this project were limited to the lands along the park road. The alternatives are: A) continue to use the existing utility systems housed in the underground utilidor that connects to most building in park headquarters (No Action) or: B) direct bury all new utility water, sewer, electric, fire alarm, communications, and propane

lines, including mains and service lines, in the park headquarters area. Most lines would be placed under existing roads, parking lots, driveways, or cleared utility corridors. Trench boxes would be used to limit new disturbance.

VIII. FINDINGS

This evaluation concludes that the preferred alternative would not result in a significant restriction of subsistence uses within Denali National Park and Preserve.

APPENDIX B

UTILIDOR TREE RECOMMENDATIONS



Alaska Western Area Fire Management
Utilidor Tree Recommendations

Recommendations:

Remove all trees over 12 inch DBH (Size, Age , Site conditions, etc.)

Trees over 12 inch DBH within the project area, are considered to be mature trees. These trees tend to be less tolerant of root pruning, and due to there proximity to park infrastructure, pose a higher risk if pruned. Pruning Location is also a factor, pruning delineation on the project map shows that then majority of these size trees would be pruned in such a way that they would tend to fall in the direction of a park infrastructure.

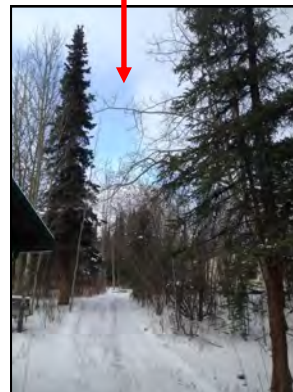
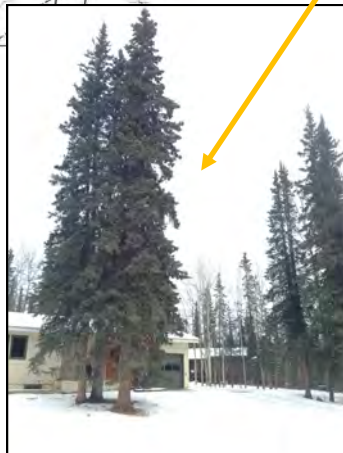
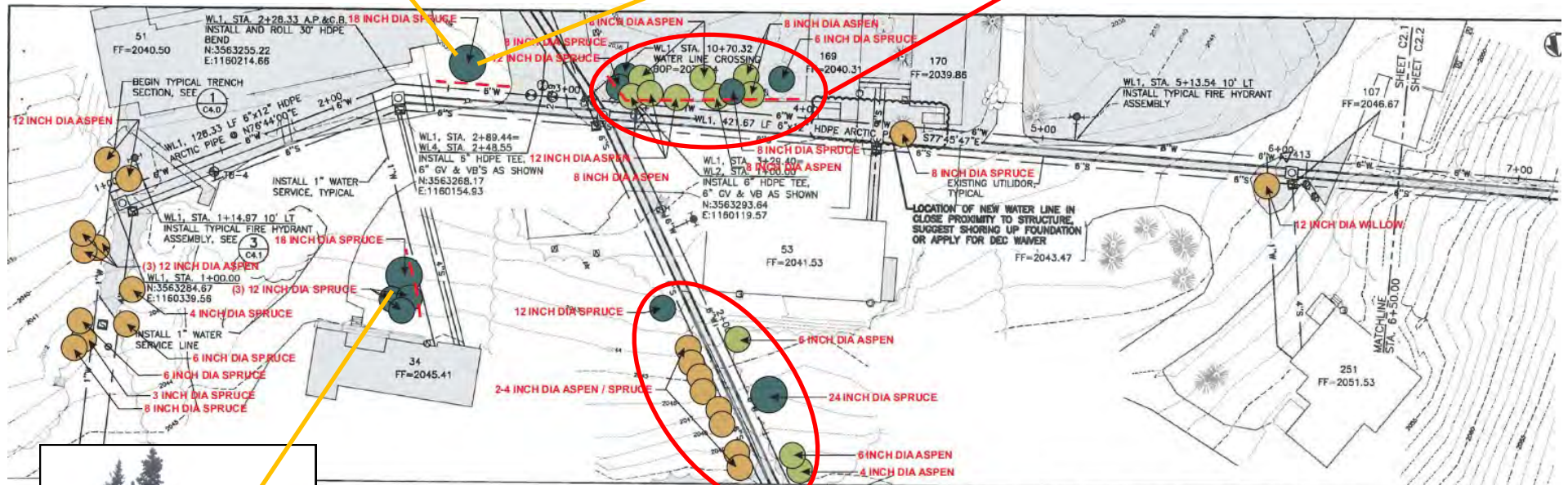
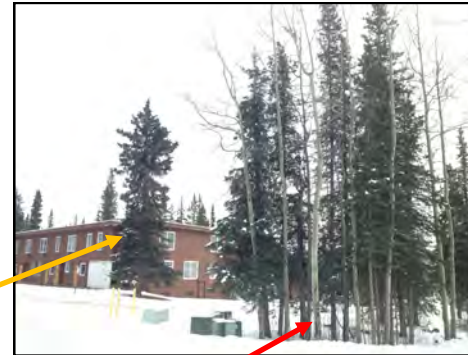
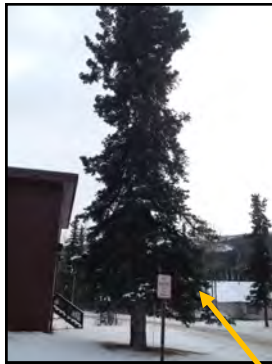
Remove all trees that with more then 25% of there roots removed

Removal of 25% or more of a trees root system can cause fatal injury to a tree, therefor they should just be removed instead of pruned.

Remove any tree that shows defects (bug infestation, disease, etc.)

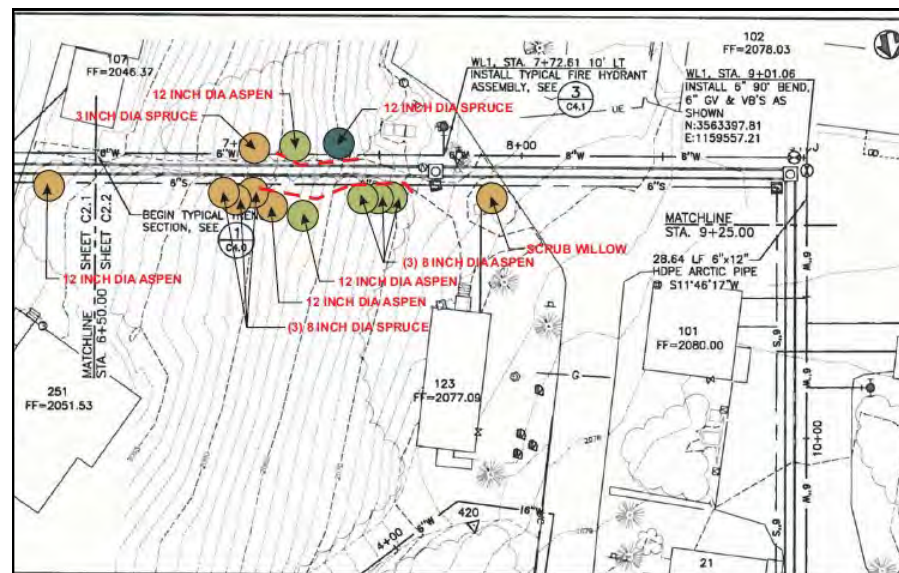
Some trees in the project have preexisting defects, root pruning would likely exacerbate these defects and cause stress on an already weakened tree. Therefor trees with these types of defects should just be removed.





If trees are to be pruned at there roots it is also suggested that it be done by a certified arborist. If the arborist determines that the pruning will cause a tree irreparable harm, then the tree should just be removed.



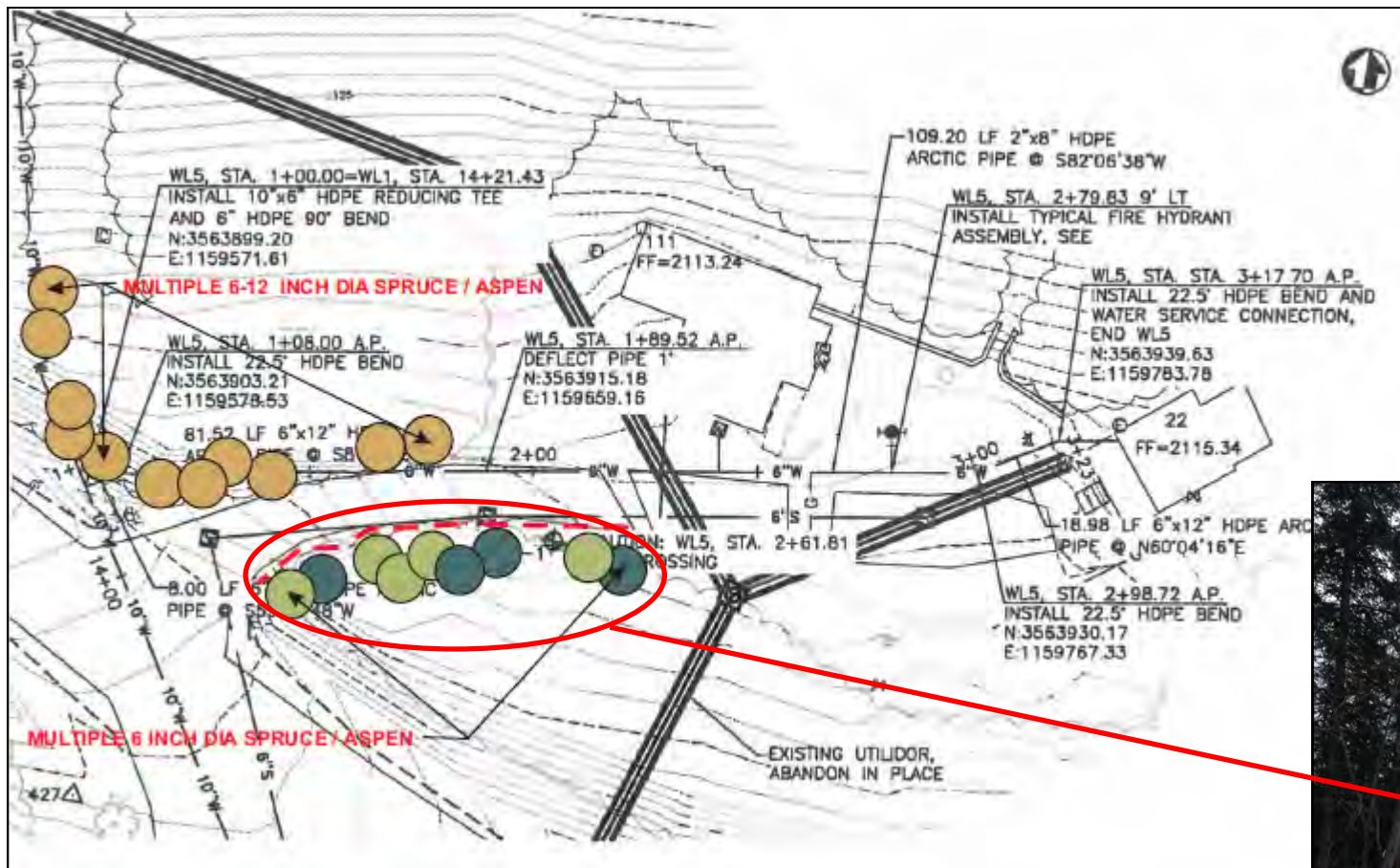
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A photograph of a snowy forest path. A red arrow points to the path, which is flanked by tall evergreen trees and bare deciduous trees in the background.

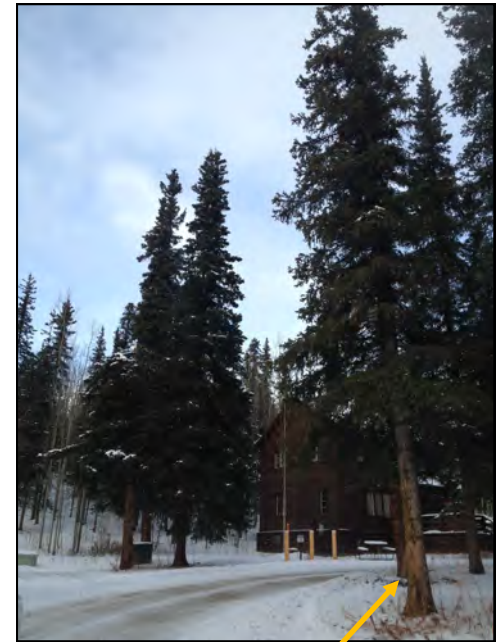
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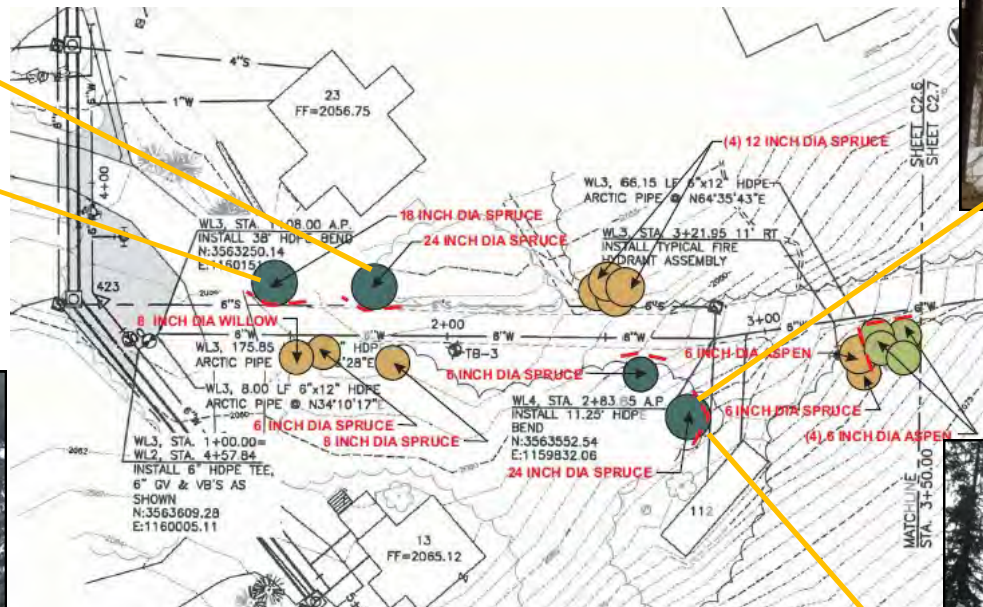
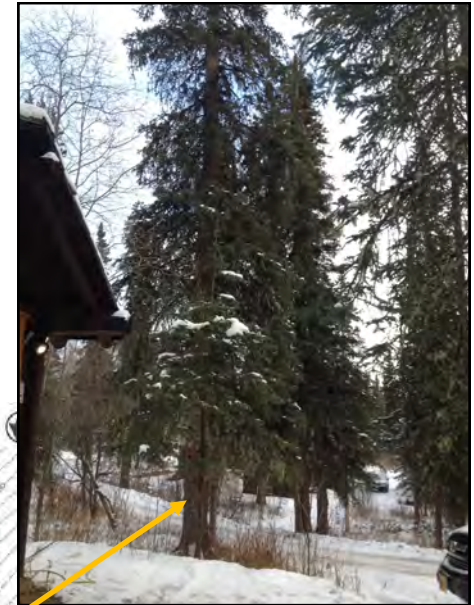
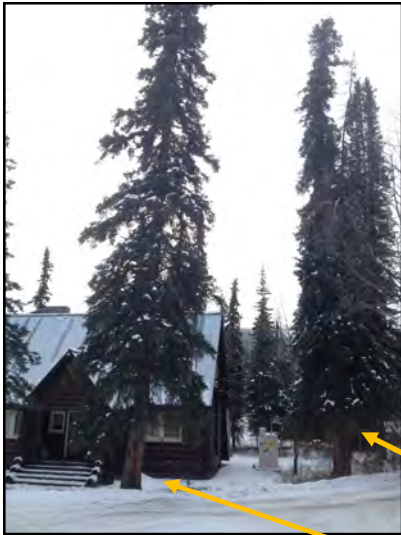




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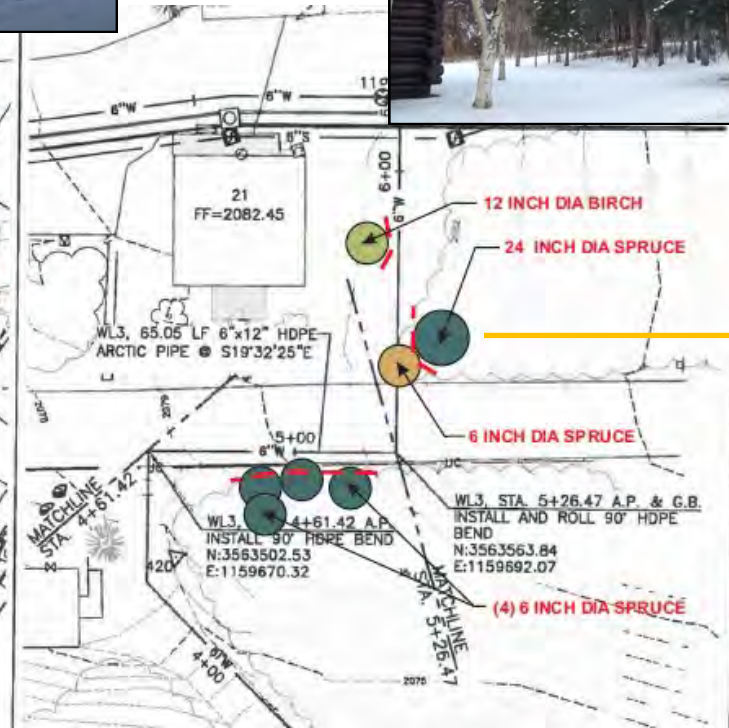
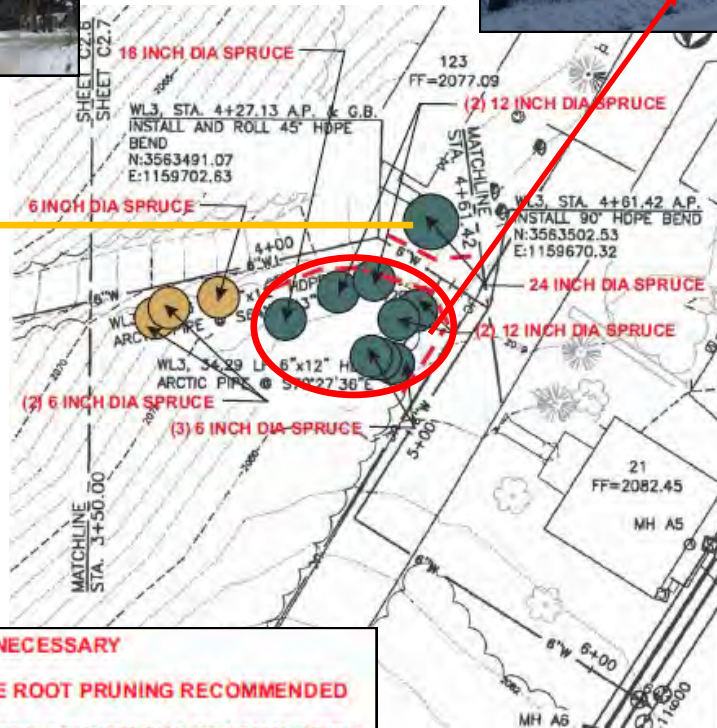
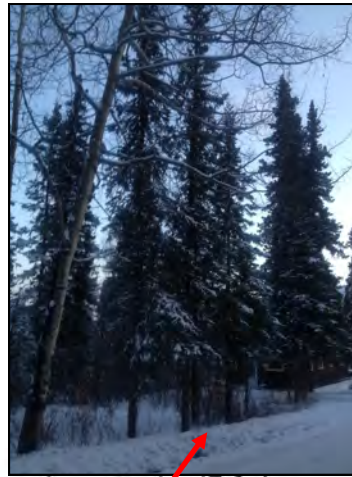




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