



National Park Service
U.S. Department of the Interior
Carlsbad Caverns National Park
Carlsbad, New Mexico

Finding of No Significant Impact

Reconstruction of Mesa Top Waterline

Background

In compliance with NEPA, the National Park Service (NPS) prepared an Environmental Assessment (EA) to examine various alternatives and environmental impacts associated with the proposal to replace an above-ground, primary waterline at Carlsbad Caverns National Park. This existing pipeline was severely damaged by natural events. The waterline was subjected to extreme below-freezing temperatures, followed by a wildfire that damaged much of the insulation and support blocks.

The proposed project is needed in order to restore a permanent reliable source of water to the park, free from the ravages of nature. The park receives approximately 400,000 visitors annually and requires a constant source of potable water. Any disruption to the water system operations could impact the visitors and employees health and safety, as well as their enjoyment of the natural and cultural resources of the park.

Selected Action

Alternative D, Complete Replacement With a New Buried Pipeline, is the Preferred Alternative and the NPS's selected action because it best meets the purpose and need for the project, as well as the project objectives to 1) restore a permanent reliable source of water to the park for many years of service to the public and park employees, 2) design the project such that the pipeline is not damaged by natural events such as wildfires and below-freezing temperatures, which occur periodically at the park, 3) restore the disturbed natural resources and cultural landscape to a more natural state, and 4) minimize impacts to cave/karst resources.

Under Alternative D, the existing pipeline will be replaced with a new, buried pipeline. The pipeline will be constructed and buried along the existing pipeline location, within the same corridor and footprint. Mitigation measures will be taken to avoid impacts to cave/karst resources. A ground-penetrating radar (GPR) survey will be conducted prior to any excavation work. The GPR survey will detect any voids that might be located along the project route. The construction specifications will entail a 50-foot work corridor width (including footprint of vehicles and equipment traversing) and a trench 24 inches deep and 12 inches wide. The pipe will be 6-inch-diameter roll pipe or equivalent. The trenching work will be accomplished by a rock-saw, which creates relatively less noise than a jackhammer operation.

In this scenario, a heavy rock saw will be used to excavate a trench approximately 12 inches wide by 24 inches deep, over the entire 6,930 foot length of the pipeline. The rock saw trenching operation will take place in a narrow corridor, as compared to the other methods, such as demolition hammer and track hoe. With a rock saw, the spoil pile is placed right next to the trench in a windrow. The material excavated by the rock saw is pulverized, making it suitable for bedding and backfill operations. This precludes additional resource impacts caused by

hauling in borrow material for backfilling. Upon completion of the work, the existing above-ground pipeline will be demolished and removed.

Mitigation Measures

Mitigating measures were developed for the Preferred Alternative in order to minimize the degree and/or severity of adverse resource impacts of the alternative on park resources and they will be implemented during construction under any of the alternatives, as applicable:

- Construction zones will be identified and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. The fencing will define the construction zone and confine activity to the minimum area required for construction.
- Prior to entering the park project site, construction vehicles and equipment will be inspected for imbedded exotic plants/parts, including plant seeds. Vehicles and equipment not passing the inspection shall be properly cleaned at an off-park site using high pressure spray wash equipment. Special attention will be paid to the underside and tires where mud may have accumulated. No further inspections are needed if the vehicles and/or equipment remain within the park boundaries during the entire construction period.
- Sources of fill material will be inspected by park staff to ensure that they are free of exotic plants and/or plant parts.
- A ground-penetrating radar (GPR) survey will be conducted prior to any excavation (trenching) work. The ground-penetrating radar survey will detect any voids that might be located along the project route.
- In the event a void is encountered during the construction of the pipeline, work will cease immediately and the contractor will notify the park's Cave Specialist to allow further examination of the void. After examining the void, the Cave Specialist will provide further instructions to the Contracting Officer and Project Leader on how to best mitigate the impacts.
- All areas disturbed during construction will be re-contoured following construction. Some revegetation will occur naturally, but some native plant seed will be placed in the larger disturbed areas. Disturbed areas will be surveyed for exotic plants for several years after construction is completed; any exotic plants will be removed immediately.
- Standard measures such as silt fences, vertical mulch, and/or sandbags will be used to minimize the potential for soil erosion.
- Dust will be controlled by water tenders, who will work alongside the trenching machine.
- To reduce noise and exhaust emissions, construction equipment will not be permitted to idle for long periods of time.
- Some petrochemicals from construction equipment could seep into the soil. To minimize this possibility, equipment will be checked frequently to identify and repair any leaks.
- Vegetation impacts and potential compaction and erosion of bare soils will be minimized by conserving topsoil in windrows. The use of conserved topsoil will help preserve micro-organisms and seeds of native plants. The topsoil will be re-spread in as near the

original location as possible, and supplemented with scarification, mulching, seeding, and/or planting with species native to the immediate area. This will reduce construction scars and erosion.

- All protection measures, including those to protect workers, park employees, and natural and cultural resources, will be clearly stated in the construction specifications. Workers will be instructed to not conduct activities beyond the construction zone, as defined by the construction zone fencing.
- Construction will take advantage of previously disturbed areas (e.g. existing pipeline route) wherever possible. Soils within the project construction limits will be compacted and trampled by the construction equipment and workers. Soils will be susceptible to erosion until revegetation takes place. In an effort to avoid introduction of exotic plant species, no hay bales will be used for erosion control. Hay often contains seed of undesirable or harmful alien plant species. Therefore, on a case-by-case basis, the following materials may be used for any erosion control dams that may be necessary: rice straw, straws determined by the NPS to be weed-free (e.g., Coors barley straw or Arizona winter wheat straw), cereal grain straw that has been fumigated to kill weed seed, and wood excelsior bales. Standard erosion control measures such as silt fences and/or sandbags will also be used to minimize any potential soil erosion.
- Revegetation plantings will use only native plant seed. Any plant materials salvaged from the project site, such as yuccas and shrubs, will be stored at the park's materials quarry, watered, and replanted after construction is completed. Objectives of the revegetation efforts will be to reconstruct the natural spacing, abundance, and diversity of native plant species.
- Should construction unearth previously undiscovered archeological resources, work will be stopped in the area of any discovery, and the park will consult with the State Historic Preservation Officer and/or Tribal Historic Preservation Officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) will be followed.
- Cultural Resources: Protective Measures Stipulations: 1) Project area has been inventoried and is to be monitored by an archeologist at least once during and once after the pipeline removal and trench excavation. The area of the lithic scatter near the project will be monitored during all construction operations within fifty feet of the lithic scatter. 2) Avoidance of all known and field-identified Cultural Resources against destruction, obliteration, removal or damage, in accordance with the requirements of the National Historic Preservation Act of 1966 (36 CFR 800.3). If previously unknown archeological resources are discovered during implementation of a project, all work in the immediate vicinity of the discovery will be halted and the procedures of 36 CFR Part 800.13(c) will be followed. In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during project implementation, the regulations implementing the Native American Graves Protection and Repatriation Act (NAGPRA; 43CFR Part 10) will be followed. 4) Equipment yards will be within existing paved lots or in previously disturbed areas such as pullouts. 5) Should equipment move accidentally

outside the approved corridor or approved staging areas, the contractor will report the incident, and a Cultural Resource Specialist will conduct a damage assessment and devise remediation. 6) Cultural resource site location information will be kept confidential. All access to information regarding the location of cultural resources will be restricted to those employees on a need-to-know basis.

- Driving and parking of construction equipment will be limited to the 50-foot pipeline corridor, areas already disturbed (e.g. existing parking lots), or pull-outs assigned for staging of materials and equipment.
- Before and after photo documentation will be completed within or adjacent to the project area and added to the park's permanent records. This record will help evaluate cumulative impacts in the future.
- Vehicle traffic on the Scenic Loop Road will be allowed as much as possible during the construction period. Construction delays will normally be limited to 30 minutes. There may be some periods when the nature of the construction work may require temporary road closures. All efforts will be made to reduce these closures as much as possible and to alert park staff as soon as possible, if delays longer than normal are expected. Visitors will be informed of construction activities and associated delays. Traffic will be managed to ensure timely access to the park.
- Contractors will coordinate with park staff to reduce disruption to normal park activities. Equipment will not be stored along the roadway overnight, without prior approval of the Contracting Officer. Construction workers and supervisors will be required to attend mandatory park resource orientation sessions to learn about the special sensitivity of park values, regulations, and appropriate litter and trash control measures.
- The National Park Service will ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors will also be instructed on procedures to follow, in case previously unknown archeological resources are uncovered during construction. Equipment traffic will be kept outside known archeological site(s). Material staging areas will also avoid known archeological resources.
- Construction workers and supervisors will be informed about threatened and endangered species. Construction will cease if a species is discovered in the project area. Park Biology staff will evaluate the situation and advise the Contracting Officer.
- Construction will cease when wind is 20 mph or greater, in order to reduce impacts to air quality.
- Monitoring: A biological monitor will accompany the construction crew when they are working in areas with the listed plants present. Follow-up monitoring of the plants' condition, including being inundated with dust, will be carried out by biologists after the project.
- If the project is conducted in the off-season for breeding birds, then most impacts to wildlife will be avoided. If not, professional biologists using a nest search protocol will

determine if there are nesting bird species in the area, and disturbance near those nests will be avoided.

- If the project is conducted outside of winter, a qualified biologist will be on site throughout the project to monitor the open trench and remove trapped wildlife. If the project is conducted during winter, a qualified biologist will be on site before and during the work to mitigate damage by relocating hibernating animals. Monitoring of the trench for wildlife will occur on a daily basis during project work.
- If possible, conduct the activity outside the local nesting season, so there are no active nests of birds that may be inadvertently damaged or destroyed by the project actions, and thus no need to conduct surveys for active nests.
- Minimize the loss, destruction, or degradation of migratory bird habitat during the local nesting season, if activities must occur during that time frame. Within the Southwest Region, although most species nest between early April and mid-August, some nesting activity may occur during all months of the year, depending on location. In desert regions, for example, nesting may begin in January and continue into November. Some eagles, owls, and finches may nest in mid-winter.
- If a proposed project or action might take migratory birds through disturbance or alteration of nesting habitat, and work cannot occur outside the local nesting season, the National Park Service (NPS) should provide the USFWS with an explanation for why work has to occur during the migratory bird nesting season. In these cases, the NPS should also demonstrate that all efforts to complete the work outside the migratory bird nesting season were attempted, and that the reason that work needs to be completed during the nesting season was beyond the Project Leader's control.
- To determine if migratory birds are nesting on-site and therefore potentially at risk by the activity, Park Biologists should conduct initial general surveys of the project area during the best biological time frame for detecting the presence of the locally nesting birds (to locate potential territories that may be in harm's way), followed by nest searches in the project area shortly before the disturbance will occur (ideally within a week of the start of construction, due to the speed with which nests may be built).
- Except for the nests of large species, bird nests are well hidden and very difficult to find, and nest searches can be time-intensive. Surveyors must be experienced in locating nests, as doing so successfully often relies on the ability to interpret subtle behavioral cues by the adult birds. The Project Leader should also be aware that results of migratory bird surveys are subject to spatial and temporal variability and should be conducted at the most appropriate times of day and season for detection of territories and ultimately nests.
- If no migratory birds are found nesting in the proposed project or action areas immediately prior to the time when construction and associated activities are to occur, then the project activity may proceed as planned.

- If protected species of birds are present and nesting in the proposed project or action area when project activities are slated to occur, the Park Biologist should contact the USFWS Ecological Services Field Office and the USFWS Regional Division of Migratory Birds for guidance on appropriate next steps for minimizing risk of violating the Migratory Birds Treaty Act (MBTA).

Alternatives Considered

Five alternatives were evaluated in the Environmental Assessment (EA), including the No Action Alternative and four action alternatives. Please refer to the Environmental Assessment for complete descriptions of the alternatives. Under Alternative A, No Action, there would be no change to the existing above-ground pipeline. The NPS would respond to service outages as needed. Under Alternative B, repairs would be made to the existing above-ground pipeline to restore it to its pre-existing condition. Under Alternative C, the existing 40-year old pipeline would be replaced with a new, in-kind, above-ground pipeline. Under Alternative D, the existing pipeline will be replaced with a new, buried pipeline. Alternative D is the Preferred Alternative, as described in the previous section. Under Alternative E, there would be a pressure-regulated pump system that would connect directly to the park's existing water distribution line connection point, using an additional waterline that would be buried adjacent to an existing buried pipeline up the escarpment. The existing Mesa Top above-ground waterline and storage tank would then be removed.

Environmentally Preferable Alternative

According to the Council on Environmental Quality (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. The Environmentally Preferable Alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one Environmentally Preferable Alternative."

Alternative D (burying the Mesa Top waterline) is the Environmentally Preferable Alternative for several reasons: 1) This alternative enhances cultural resources by removing the existing above-ground pipeline from the historic landscape; 2) While there will be some new ground disturbance that will affect previously undisturbed elements of the biological and physical environment, burying the pipeline will reduce the impacts to visual resources and the viewshed; 3) the design life of the new buried pipeline will be 50-75 years. The risk of loss from this alternative is low. Maintenance costs (including time, equipment and materials) will be reduced as a result.

By contrast, Alternative A (No Action) is not the Environmentally Preferable Alternative because although there will be no construction or ground disturbing activities that will affect previously undisturbed elements of the biological and physical environment, 1) the existing pipeline is considered an eyesore which detracts from the visual resources of the area, 2) there is an ever-present danger of the pipeline freezing or being subjected to wildfire which will impact the visitor's health and safety, and 3) the pipeline may suffer leakage due to natural events, which may impact cave/karst resources and waste precious water.

For similar reasons, Alternative B (to repair the existing pipeline) and Alternative C (to replace the damaged existing pipeline with similar, in-kind above-ground pipeline) are not Environmentally-Preferable Alternatives.

Alternative E (the constant pressure pump system) is not environmentally preferable, because of the tremendous amount of electricity that will be needed to maintain adequate water pressure. Over time, pump replacement will be necessitated and will be expensive in terms of maintenance, staff time, and replacement parts/supplies. Also, this alternative includes removal of the storage tank, which provides back-up water supply in case of fire emergency or if the pump system were to go down.

Why the Selected Action Will Not Have a Significant Effect on the Human Environment

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria:

Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

Implementation of the Preferred Alternative will result in some adverse impacts; however, the overall benefit of the project, particularly to park operations, visitor use and experience, and cultural resources outweighs these negative effects. The effects are summarized as follows. Park operations will be beneficially impacted over the long-term, as pipeline maintenance costs (including time, equipment, and materials) will be reduced. The design life of the new buried pipeline will be 50-75 years. The risk of loss from this alternative is low. Maintenance costs (including time, equipment and materials) will be reduced as a result.

The waterline will be better protected from future natural events, including wildfire and below-freezing temperatures.

Cultural resources will be beneficially impacted by removing the existing above-ground pipeline, which is located adjacent to the Carlsbad Caverns Historic District and the historic landscape. The existing above-ground pipeline is considered a visual intrusion. Native American concerns will be ameliorated, as the visual resources of the landscape are returned to a more natural state. The Preferred Alternative will have a short-term, minor adverse impact on Visitor Use and Experience due to noise and dust from construction. Burying the pipeline will improve the views from the Visitor Center. Long-term moderate beneficial impacts will be realized once the construction is completed. The waterline will be placed in operation, and a continuous source of water will be available to the visiting public and will be protected from natural events such as fire or freezing temperatures. Geology and Soil resources will realize moderate adverse impacts for the short-term during construction. Mitigation measures such as re-contouring the soil and re-seeding the site after the construction, will reduce the impacts to natural (vegetation) resources. Ground-penetrating radar surveys will detect the presence of cave/karst features before construction work begins, and if voids are found, additional mitigation measures will be implemented.

The overall benefit of implementing the Preferred Alternative is that park operation costs will be significantly reduced over time, and visual intrusions from the existing pipeline will be removed,

which will beneficially impact the adjacent historic landscape. Native American concerns for the natural and cultural resource significance of the site will be lessened.

The degree to which the proposed action affects public health or safety

The Preferred Alternative will have an overall beneficial effect on public health and safety, particularly for the park's visitors and employees that will regularly use the water distribution system. The new waterline will minimize the amount of repair work and consequent water shortages. Health and safety issues associated with the lack of a dependable water supply will be greatly improved, and the water supply will be protected from wildfire and below-freezing temperatures. Fire management operations, including the protection of park structures, will be improved, due to a more secure and dependable water supply.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas

The unique characteristics of the geographic area include the proximity of the proposed waterline to the adjacent historic district and cultural landscape. There are no other park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas that will be affected.

The degree to which the effects on the quality of the human environment are likely to be highly controversial

Throughout the Environmental Assessment process, the purpose and need for the proposed pipeline construction was not highly controversial and was generally supported. There were only five responses to the Environmental Assessment from interested parties during the 30-day review period. Three of the responders provided substantive comments. Substantive comments for this EA centered on three topics: mitigation of impacts to wildlife that may fall into the trench during construction, a request for consultation should any human remains or artifacts unearthed during this project be determined to fall under the Native American Graves Protection and Repatriation Act (NAGPRA) guidelines, and suggested revisions to various parts of the Environmental Assessment.

The degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks

The Environmental Assessment/analysis process, including the application of mitigation measures, has identified effects that may involve impacts to cave/karst features. Mitigation measures such as the use of ground-penetrating radar will reduce the unknown risk of encountering voids, and consequently reduce potential impacts to cave/karst features.

The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration

The Preferred Alternative is not expected to set a precedent for future actions with significant effects, nor does it represent a decision in principle about a future consideration.

Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

Cumulative effects were analyzed in the EA, and no significant cumulative impacts were identified. While there has been some development within the Park as described in the EA, there has also been some restoration of natural and cultural resources over the years. Examples include: removal of the Bat Draw parking lot and consequent revegetation to native plant species and removal of the Mission 66 six-plex buildings and consequent revegetation. The Preferred Alternative for this project (burying the pipeline) will remove an above-ground intrusion to the cultural resources (historic district and cultural landscape). Revegetation treatments and other mitigation measures will gradually restore this site to a more natural landscape and thereby improve the cultural significance of the site as well.

The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

The entire Area of Potential Effect (APE) was surveyed August 27, 2012. The project is situated within proximity of the Carlsbad Caverns Historic District and the water line will be visible from the historic district. Mitigation measures included in the Preferred Alternative include burying the pipeline and allowing native plants to revegetate and cover the pipeline to reduce the visual impact. As a result, NPS has determined that this project will result in a finding of No Adverse Effect on the historic property of the Carlsbad Caverns Historic District. The NMSHPO agreed with this finding in a letter dated September 5, 2013 (NMSHPO Log No. 97499).

The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

The NPS consulted with the New Mexico Department of Game and Fish via regular mail dated August 9, 2013, and received a response on September 6, 2013, which indicated that the gray banded kingsnake is a state-endangered reptile and is known to exist within Carlsbad Caverns National Park. The Department recommends that a biologist monitor open trenches and remove trapped wildlife on a daily basis. The Department also recommends that the construction activities occur during cool winter months. National Park Service mitigation measures will be taken to ensure that no endangered or threatened species will be impacted during implementation of this project.

Early consultation on federally listed species was conducted with the U.S. Fish and Wildlife Service on April 23, 2013. A survey of the Federally Threatened Lee's pincushion (*Coryphantha sneedii* var. *leeii*), was conducted along the route of the proposed Mesa Top Waterline project. The survey was conducted during the period December 12, 2013 to December 26, 2013 by Carlsbad Caverns National Park staff, including the Supervisory Biologist and three additional team members. The area of the survey is calculated by multiplying the entire 1,630-foot length of the proposed pipeline by the width of the construction corridor, which is 25 feet wide along each side of the existing line, with an over-survey of 5 additional feet. Approximately 2.25 acres were examined for the cacti. There were no Threatened or

Endangered cacti detected during the survey. A determination of "no effect" was made by the National Park Service.

Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The action will not violate any federal, state, or local environmental protection laws.


Public Involvement and Native American Consultation

The Environmental Assessment (EA) was made available for public review and comment during a 30-day period ending September 8, 2013. To notify the public of this review period, a letter was mailed to stakeholders, Native American tribes, interested parties, and newspapers. Copies of the document were made available to certain agencies, interested parties, and to the tribes who requested a copy during the scoping period, and they were posted on the NPS Public Environment and Public Comment (PEPC) website at <http://parkplanning.nps.gov/>. Six comments were received during this review period. One comment was a letter from the New Mexico Historic Preservation Office (NMSHPO) which concurred with the determination of No Effect. Another letter was from the New Mexico Department of Game and Fish, who offered mitigation suggestions for preventing wildlife from falling into the trench during construction. The San Carlos Apache Tribe concurred with the project and the findings. The Ysleta del Sur Pueblo requested that they be consulted should any human remains or artifacts unearthed during this project be determined to fall under the Native American Graves Protection and Repatriation Act (NAGPRA) guidelines. The other two comments were from individuals. One of these expressed support for the project, and the other submitted substantive comments suggesting changes to various parts of the EA. Responses to these comments have been prepared and incorporated into the Finding of No Significant Impact (FONSI) document. The comments are addressed in the Response to Comments and Errata Sheets section of this FONSI.

Conclusion

As described above, the Preferred Alternative does not constitute an action meeting the criteria that normally require preparation of an Environmental Impact Statement (EIS). The Preferred Alternative will not have a significant effect on the human environment. Environmental impacts that could occur are limited in context and intensity, with generally adverse and beneficial impacts that are mostly localized, short- to long-term, and negligible to moderate. There are no unmitigated adverse effects on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, the NPS has determined that an EIS is not required for this project.

Approved: 
Sue E. Masica, Regional Director
Intermountain Region
National Park Service

Date: 2/21/14

Errata Sheets
Mesa Top Pipeline Reconstruction
Carlsbad Caverns National Park

According to NPS policy, substantive comments are those that 1) question the accuracy of the information in the Environmental Assessment, 2) question the adequacy of the environmental analysis, 3) present reasonable alternatives that were not presented in the EA, or 4) cause changes or revisions in the proposal.

Some substantive comments may result in changes to the text of the EA, in which case, they are addressed in the Text Changes section of the Errata Sheets. Other substantive comments may require a more thorough explanatory response and are addressed in the Response to Comments section. The NPS responds to all substantive comments in either or both of these sections.

As stated previously in this document, a total of five individuals, groups, and agencies submitted comments during the public review period of the EA. Three of the responders provided substantive comments. Substantive comments for this EA centered on three topics: mitigation of impacts to wildlife that may fall into the trench during construction, a request for consultation should any human remains or artifacts unearthed during this project be determined to fall under the Native American Graves Protection and Repatriation Act (NAGPRA) guidelines, and suggested revisions to various parts of the Environmental Assessment. In some cases, these comments resulted in changes to the text of the EA and are also explained more thoroughly in the Response to Comments section.

COMMENTS AND NPS RESPONSES

Comment No.1 – Open trenches created for pipelines and communication lines can act as a pitfall trap, trapping small mammals, amphibians and reptiles, and can also cause injury to large mammals. We recommend that regardless of which alternative is implemented, construction activities occur during the cooler months to reduce unnecessary wildlife mortality. We also recommend that regardless of the timing of the construction, a biologist monitor open trenches and remove trapped wildlife on a daily basis. Implementing construction activities for concurrent trenching, pipe-laying and backfilling will minimize the impacts of open trenches and reduce the potential for wildlife mortality.

NPS Response – The NPS has mitigation measures for both winter and summer construction. A mitigation measure listed on page 28 (bullet #3) of the Environmental Assessment provides the recommended mitigation prescribed by New Mexico Department of Game and Fish (NMDGF). The NPS will add text to the EA stating that monitoring of the trench for trapped wildlife will occur on a daily basis.

Comment No. 2 – Installing this line underground represents an investment in sustainable practices because the line will be protected from elements such as weather, fire, and vandalism. The line needs to be replaced, and burying the line will remove an unsightly obstruction from the viewshed of the area. When infrastructure can be hidden from view without impacting natural resources in the long term it should be installed in such a manner. I am sure that thousands of visitors will appreciate the park's dedication to preserving the natural appearance for future generations.

NPS Response -The statement indicates support for the Preferred Alternative (Alt.D).

Comment No. 3 – While we do not have any comments on the Environmental Assessment/Assessment of Effect and believe that this project will not adversely affect traditional, religious or culturally significant sites of our Pueblo and have no opposition to it; we would like to request consultation should any human remains or artifacts unearthed during this project be determined to fall under the Native American Graves Protection and Repatriation Act (NAGPRA) guidelines.

NPS Response – The Protective Measures Stipulations listed on page 26 (bullet #4) of the Environmental Assessment provides the recommended mitigation prescribed by the Ysleta del Sur Pueblo.

Comment No. 4 – The Tribal Consultation Response Letter indicates No Interest/No Further Consultation and the Tribe concurs with EA findings and offers a thank you. The letter indicates that there is not a likelihood of eligible properties of religious and cultural significance to the San Carlos Apache Tribe in the proposed project area.

NPS Response – No further NPS action is required.

Comment No. 5 - Figures and Drawings: As far as I can tell, there are no drawings or maps showing the location of the park, the project area, or any of the features described in the text.

NPS Response – A map of the project site was included with the Mesa Top Waterline Environmental Assessment (EA). Supplemental maps were posted to the NPS website on 8/22/13. The supplemental maps will be included as an appendix to the EA.

Comment No. 6 - Not all of the references in the bibliography are cited in the text and there are many places in the text that need additional citation and reference. In several places, there are extensive, unattributed quotations without any citations.

NPS Response – Changes to citations and additional citations are provided in the Citations section of the FONSI. A few additional sources have been added to the References list.

Comment No. 7 - Page 14-15 Paleontological resources – All of the rock in the park, including the backreef, contain paleontological resources (fossil animals, algae, etc.). So while there may not be any major adverse impacts to these resources given the scope of the project and extent of the rock units, you cannot say there are no known paleontological resources.

NPS Response – The burial of the waterline will damage the part of the bedrock (reef) being dug into, but the impact of the burial of the pipeline on the reef as a whole will be negligible.

Comment No. 8 - Page 15 – Weather and climate are not the same thing. This topic is meant to consider the effects of the project on long-term sustainability and impacts (such as emissions) to climate change, not the effects of climate change on the project.

NPS Response – The NPS concurs with the first sentence. The following changes will be made to the text on page 15 of the EA, in the paragraph on Climate Change and Sustainability: Delete the second sentence and replace it with “Impacts to climate change from this project will be negligible, since this project will have only a short-term impact during the period of construction.”

Comment No. 9 - Page 16 – Actions common to all alternatives. The discussion of actions that have already taken place do not belong here, but are more appropriate to the cumulative impacts section. This is not an action that will be undertaken as a result of the proposed project.

NPS Response – The reviewer may have mistaken the descriptive sentences under Fig.1 to be under Actions Common to All Alternatives. Only two (bulleted) items are listed under the Actions Common to All Alternatives section, page 16. No changes needed.

Comment No. 10 - Alternatives section – All of the other alternatives include a cost, but not Alternative C. The term "in-kind replacement" is incorrect in this context (and is misused throughout the document); if everything was being replaced in-kind, that will include re-installing asbestos insulation.

NPS Response – The cost for Alternative C as shown on page 31 of the Environmental Assessment (EA) is \$677,000. The correct amount is \$678,000. Cost figures will be added to the EA, page 20, Alternative C heading. The term “in-kind replacement,” where used throughout the EA, will be prefaced with the words “asbestos-free.”

Comment No. 11 - Page 22 – The summary states that this alternative eliminates the possibility of water line freezing without any evidence to support that a long spell of cold weather will not penetrate to 24 inches. You can safely use the term "mitigates" but I don't think you have the data to support "eliminates."

Mitigations – There is no mention of cleaning of construction vehicles to mitigate the introduction of invasive species into the park.

NPS Response – The NPS will change text (bullet) on page 23 of the EA to indicate that the Preferred Alternative “greatly reduces” the possibility of the waterline freezing. It is extremely unlikely that the buried pipeline will freeze.

The NPS will insert an additional mitigation measure on page 25 after bullet #3, which states that construction vehicles will be inspected and cleaned prior to entering the park, in order to mitigate the introduction of invasive species into the park.

Comment No. 12 - Page 29 – You cannot guarantee that there will be no repairs needed for 50 years, so cannot make this claim and cannot state there will be zero maintenance costs.

The document also implies that the above-ground pipeline is in the Carlsbad Caverns Historic District and is a non-contributing element. This is not accurate and does not reflect the beneficial impacts of burying the line.

NPS Response –Although the exact number of repair-free years cannot be guaranteed, the buried pipeline will be exposed to fewer natural events (fire and floods) than an above-ground pipeline. The NPS will insert the following text on page 29, Environmentally Preferable Alternative (Alternative D), second paragraph item 3: “While there is no guarantee of zero-maintenance for the Preferred Alternative, the design life of the new buried pipeline will be 50-75 years. The risk of loss from this alternative is low. Maintenance costs (including time, equipment and materials) will be reduced as a result. As an example of longevity, a 70 year-old buried, abandoned pipeline within the park was placed back into service in 2011 to provide water to the park for many months, when the above-ground section of another waterline froze and ruptured.”

The NPS concurs that the existing above-ground pipeline is not within the Carlsbad Caverns Historic District. Text changes will be made to page 12 Cultural Resources section to indicate that: “The project is located nearby, but not within, the historic district. Burying the pipeline enhances this adjacent historic district and cultural landscape by removing the existing above-ground pipeline from the viewshed, as seen from nearby portions of the Carlsbad Caverns Historic District and Cultural Landscape.”

Comment No. 13 - Page 30 – The document states that under Alternative A, ruptured lines will result in months of continuous park closure. Interim temporary patches could be put in place and park operations resumed in much less time than this. The threat of extended park closures is exaggerated and seems like an intentional attempt to overstate the disadvantage of the alternative rather than a true assessment of the comparative advantages/disadvantages of the option.

NPS Response – The NPS will amend the text on page 30, Alternative A to indicate that “Ruptured lines could result in some park closure. Interim temporary patches could be put in place and park operations could be resumed in several days or more, depending on the severity of damage.”

It is difficult to predict just how long the park will be closed or have operations curtailed (partially open). The realities of undertaking major repair projects include doing damage assessments, obtaining funding approvals, and lead times for engineering, contract administration, mobilization, and material delivery. These have a huge effect on project timelines. The waterline failure that the park experienced in 2011 took nearly two years to get through the above process. Fortunately, when the transmission pipeline failed, the main water storage reservoir was nearly full. This allowed the park to continue normal operations with the assistance of water conservation measures. In addition, another 70 year-old water pipeline had been abandoned-in-place. Luckily, that line was still intact and the park was able to successfully return it to service until the new water distribution line was constructed. Due to these fortunate circumstances, major disruptions to park operations were averted when that pipeline failed.

Such will not be the case in the event of a total failure of the water distribution line. Delivery of water throughout the distribution system will cease immediately. Interim measures to avoid extended park closure might include:

1. Having residents carry water from temporary storage tanks for basic household necessities.
2. Constructing a temporary water distribution pipeline on the surface.
3. Installing vault toilets (including handicapped accessible ones) for use by visitors at the Visitor Center.

The above-listed interim measures will be expensive to sustain and inconvenient for everyone. Concession operations will also be impacted. Fire protection/suppression systems will be rendered inoperative until a new or temporary water distribution pipeline is installed.

Comment No. 14 - Page 33 – The comparison tables present very subjective analyses of reliability without ever defining them in the document. The way these terms are presented implies a level of thorough analysis that is not supported by the information presented in the rest of the document.

By the way the term is defined, you cannot restore a cultural resource to its "natural" state. You can remove a non-contributing element from the landscape, but you are not doing anything to restore a specific structure or feature.

NPS Response – Longevity is difficult to quantify and subjective when viewed across a range of risk exposures. For each alternative, the NPS cites the benefits, drawbacks, and risk exposures.

In Alternatives A, B, and C, the waterline remains an intrusive adverse visual element, as seen from the nearby historic district and cultural landscape. In Alternatives D and E, the intrusive and adverse impact of the above-ground pipeline is removed.

Comment No. 15 - Page 40 – The description of the climate and vegetation is not tied directly to this project. A more thorough discussion that includes the number of total and consecutive days below freezing would be more appropriate.

NPS Response – Vegetation text is tied directly to this project. Text will be added to page 40 under the Climate section: "In February 2011, there were three consecutive days when the temperature at Carlsbad Caverns National Park did not rise above 20 degrees Fahrenheit."

Comment No. 16 - The description of the geology and cave and karst resources also seem disconnected from the project. Since there is no other discussion with regards to hydrology, this section needs to be strengthened to show the link between the surface and subsurface in the project area. The impacts are not just from accidentally unroofing a cave during construction, but in causing collapse of the pipeline into unknown shallow voids, treated water from the waterline leaking through the fractures above the cave and entering the karst below, and from inadvertently disrupting the natural flow of water into the system by concentrating infiltration along the waterline trench. While these impacts may still be minor, they should be both disclosed and fully analyzed.

NPS Response –The following text will be added to the EA, page 41 of the Cave/Karst Resources Section: A report to Carlsbad Caverns National Park by Larry Martin, Hydrogeologist with the Aquatic Systems Branch of the NPS Water Resources Division, states

“There would be virtually no potential hydrologic impact from burial of the waterline in a shallow trench. There is no reason to expect that excavating and backfilling a shallow trench will capture surface flow or provide an avenue for increased infiltration to the underlying bedrock. A low-permeability siltstone layer at the contact between the surficial Tansill Formation and the underlying Yates Formation impedes downward movement of groundwater, causing most groundwater to flow horizontally to discharge at outcrops in adjacent canyons.”

Comment No. 17 - Cumulative Impacts (starting on page 49) – Projects done more than 50 years ago are not relevant to this project. There are additional, more recent project that should have been included such as the VC rehabilitation, the parking lot repairs, the Bat Cave Draw parking lot removal, the road resurfacing, and the elevator repairs. These projects have resulted in almost 10 years of continuous construction activity at the park and have disrupted park operations, visitor experience (including socioeconomics that were inappropriately eliminated from analysis), soundscapes, air quality, and wildlife. This section should be completely re-done to account for these projects. Overall, the entire concept of cumulative impacts is not addressed at all.

NPS Response – The NPS believes that projects done more than 50 years ago can be relevant to this project, such as the 1940’s waterline up the escarpment. The NPS has re-examined and addressed the cumulative impacts of the additional projects on each of the resource topics. The impacts from past projects vary considerably from impact topic to impact topic. Some have had beneficial impacts and some have had adverse impacts. Text will be added to page 50 of the EA to show additional projects that have taken place in the developed area of the park.

Comment No. 18 - Analysis of Impacts (starting on page 51) – Because the cumulative impacts and resource topics were not appropriately considered, these analyses should be re-done. Universally, the impact analysis of the cumulative impacts only considers the proposed project alternatives and does not include the past and foreseeable future impacts of even the incomplete list of projects that was presented on page 49.

NPS Response – Additional projects are listed. The NPS has re-examined and addressed the cumulative impacts of the additional projects on each of the resource topics.

Comment No. 19 - The analysis of cultural resources impacts is incorrect. The continued existence of an above-ground water line as a non-contributing element that is visible from the Historic District represents a steady-state impact not a feature that causes future degradation of the landscape as is stated in the analysis.

NPS Response – The existence of an above-ground pipeline that is visible from portions of the Carlsbad Caverns Historic District and Cultural Landscape represents a present and continued future visual adverse impact upon the historic district and cultural landscape.

Comment No. 20 – The NPS policy requires some discussion and analysis of impairment to park resources. This EA does not contain any mention of impairment or an analysis of impairment caused by any of the alternatives.

NPS Response – A Non-Impairment Finding analysis is contained within the Finding of No Significant Impact (FONSI) document.

TEXT CHANGES

1. Page 9, Introduction and Background section, last paragraph. Change “several thousand” to “several hundred thousand.”
2. Page 12, Cultural Resources section. The following revision will be made: “The project is located nearby, but not within, the Carlsbad Caverns Historic District. Burying the pipeline enhances the adjacent historic district and cultural landscape by removing the existing above-ground pipeline from the viewshed as seen from nearby portions of the Carlsbad Caverns Historic District and Cultural Landscape.”
3. Page 14, Paleontological Resources section, first sentence. Change “Policies” to “Policies.”
4. Page 14, Paleontological Resources paragraph. Delete the last two sentences. Add the following: “The project site is within the backreef unit of the Permian reef that composes the Guadalupe Mountains. This reef is a significant paleontological resource that represents one of the most well-preserved Permian age fossil reefs in the world and includes fossilized remains of invertebrates that are representative of the Permian time period (e.g., algae, sponges, foraminifera, brachiopods, trilobites, ammonites, etc.) While this project will impact the one foot wide and two feet deep part of the reef that is trenched for the waterline, the impacts will be negligible to the reef as a whole. Therefore, this impact topic has been dismissed from further analysis.”
5. Page 15, Climate Change and Sustainability paragraph. Delete the second sentence and replace it with “Impacts to climate change from this project will be negligible, since this project will have only a short-term impact during the period of construction.”
6. Page 18, Second sentence. Change to: “The Park will close temporarily until water can be restored.”
7. Page 20, Alternative C. The cost figure (\$1,678,000) will be added to the Alternative C heading. The term “in-kind replacement,” where used throughout the EA, will be prefaced with the words “asbestos-free.”
8. Page 21, Alternative D. Change heading amount from \$900,000 to \$937,000.
9. Page 23, Alternative D. The NPS will insert text to the first bullet on page 23 of the EA to indicate that Alternative D “greatly reduces the potential for the waterline freezing.” Also add: “It is extremely unlikely that the buried pipeline will freeze.”

10. Page 23, Alternative E. Change heading amount from \$1,900,000 to \$2,250,000.
11. Page 25, Mitigation Measures section. The NPS will insert an additional mitigation measure, bullet #2, which states that "Prior to entering the park project site, construction vehicles and equipment will be inspected for imbedded exotic plants/parts, including plant seeds. Vehicles and equipment not passing the inspection shall be properly cleaned at an off-park site using high pressure spray wash equipment. Special attention will be paid to the underside and tires where mud may have accumulated. No further inspections are needed if the vehicles and/or equipment remain within the park boundaries during the entire construction period."
12. Page 28, Mitigation Measures section. The NPS will add text to bullet #3 on that page to indicate that: "Monitoring of the trench for trapped wildlife will occur on a daily basis."
13. Page 29, Environmentally Preferable Alternative, Alternative D section, the next to last sentence on the page, item 3. Insert the following text: "While there is no guarantee of zero-maintenance for the Preferred Alternative, the design life of the new buried pipeline will be 50-75 years. The risk of loss from this alternative is low. Maintenance costs (including time, equipment and materials) will be reduced as a result. As an example, a 70 year-old buried, abandoned pipeline within the park was placed back into service to provide water to the park temporarily, when the above-ground section of another waterline froze and ruptured."
14. Page 30, Summaries/Costs Comparison, Alternative A, last sentence of second paragraph. Change to: "Ruptured lines could result in some park closure. Interim temporary patches could be put in place, and park operations could be resumed in several days or more, depending on the severity of damage."
15. Page 31, Alternative C. Revise the grand total figure to: \$1,678,000.
16. Page 33, Table 1, Objective 1, Alternative A, second paragraph. Delete the sentence that begins with "The reliability..." Also delete the sentence that begins with "The longevity..." Insert the following text: "The risk of loss to the pipeline in its current state is High."
17. Page 33, Table 1, Objective 1, Alternative B, second paragraph. Delete the sentence that begins with "The reliability..." Also delete the sentence that begins with "The longevity..." Insert the following text: "The risk of loss from this alternative is Moderate. The design life of this alternative is less than 20 years."
18. Page 33, Table 1, Objective 1, Alternative C, third paragraph. Delete the sentence that begins with "The reliability..." Also delete the sentence that begins with "The longevity..." Insert the following text: "The risk of loss from this alternative is Moderate. The design life of this alternative is 50-75 years."

19. Page 33, Table 1, Objective 1, Alternative D, second paragraph. Delete the sentence that begins with “The reliability...” Also delete the sentence that begins with “The longevity...” Insert the following text: “The risk of loss from this alternative is Low. The design life of this alternative is 50-75 years.”
20. Page 33, Table 1, Objective 1, Alternative E, second paragraph. Delete the sentence that begins with “The reliability...” Also delete the sentence that begins with “The longevity...” Insert the following text: “The risk of loss from this alternative is Low. The design life of this alternative is 50-75 years.”
21. Page 34, Table 1, Alternative D, Objective 4. Change the word “high” to “negligible to moderate.” Add: “Much of this impact can be mitigated with ground-penetrating radar and avoidance.”
22. Page 34, Table 1, Alternative E, Objective 4. Delete the existing text and replace it with: “The trench will be located alongside an existing trench, so impacts to cave/karst resources will be negligible to minor.”
23. Page 35, Table 2, Alternative E, Visitor Use and Experience section. In the next to the last sentence of the second paragraph, delete the following: “and maintenance requirements will be reduced, as the pumps could be inspected on a regular schedule at the pump house.”
24. Page 35, Alternative D table, Visitor Use and Experience section. Delete the last sentence which begins with “The longevity...” Insert the following: “The designed life of this alternative is 50-75 years. The risk of loss from this alternative is Low.”
25. Page 39, Table 2, Alternatives B, C, D, and E, Air Quality section. Delete each sentence that begins with “Long-term impacts.” On Alternative E, Air Quality section, add: “Air quality will return to what it was prior to construction.”
26. Page 40, Climate section. Add the following text: “In February 2011, there were three consecutive days when the temperature at Carlsbad Caverns National Park did not rise above 20 degrees Fahrenheit.”
27. Page 41, Cave/Karst Resources section. Add the following text: “A January 25, 2013 report to Carlsbad Caverns National Park by Larry Martin, Hydrogeologist with the Aquatics Branch of the NPS Water Resources Division, states: ‘There will be virtually no potential hydrologic impact from burial of the water line in a shallow trench. There is no reason to expect that excavating and backfilling a shallow trench will capture surface flow or provide an avenue for increased infiltration to the underlying bedrock. A low-permeability siltstone layer at the contact between the surficial Tansill Formation and the

underlying Yates Formation impedes downward movement of groundwater, causing most groundwater to flow horizontally to discharge at outcrops in adjacent canyons.”

28. Page 50, at the end of the Cumulative Impacts section, add: “ The following additional projects were reviewed for their cumulative impacts: VC rehabilitation (2005-2006), Entrance Road Repairs and Visitor Center Parking lot Repairs(2006-2007), the Bat Cave Draw parking lot removal (2006), CAVE sewer line project (2007-2008) the Road Resurfacing (2013), and the Elevator Repairs (2011-2013).”
29. Page 52, Impacts of Alternative C. In the first sentence, insert the word “impact” after the word “adverse.”
30. Page 52-53 Visitor Use. Delete existing Cumulative Effects paragraph of Alternatives A, B, and C, and add to Cumulative Effects paragraph. “The effects of the projects listed in the Cumulative Impact Scenario would be minor and beneficial.”
31. Page 53, Visitor Use. Delete existing Cumulative Effects paragraph of Alternative D and replace with “The effects of the projects listed in the Cumulative Impact Scenario would be minor and beneficial.”
32. Page 53, Visitor Use. Delete existing Cumulative Effects paragraph of Alternative E and replace with “The effects of the projects listed in the Cumulative Impact Scenario would be minor and beneficial.”
33. Page 53, Impacts of Alternative E. In third sentence of the second paragraph, place a period after the word “restored,” and delete the rest of the sentence.
34. Page 53, Impacts of Alternative D. In the last sentence of the first paragraph at top of page, delete the sentence with the words “The longevity...” and insert the following sentence, “The design life of this alternative is 50-75 years. The risk of loss from this alternative is low.”
35. Page 54, Geology and Soils. Delete existing Cumulative Effects paragraph, Alternatives A, B and C and replace with “Each of the previous waterline projects that have occurred in the developed area have had an adverse impact on geology and soils. Other projects that have had an adverse impact are: the telephone communication line trench, the 2013 Up Escarpment Buried Waterline, and the sewer line removal. Cumulative effects would be minor to moderate adverse.”
36. Page 54, Geology and Soils. Alternative D. Replace Cumulative Effects existing text with Each of the previous waterline projects that have occurred in the developed area have had an adverse impact on geology and soils. Other projects that have had an adverse impact are: the telephone communication line trench, the 2013 Up Escarpment Buried Waterline, and the sewer line removal. Previous effects of these projects would be minor to moderate adverse. The impact of the current project would be moderate and adverse as additional pipeline and trenching is constructed across the top of the escarpment. Cumulative effects of the current and past projects on geology and soils is moderate and adverse.

37. Page 54, Geology and Soils. Alternative E. Replace Cumulative Effects existing text with: "Each of the previous waterline projects that have occurred in the developed area have had an adverse impact on geology and soils. Other projects that have had an adverse impact are: the telephone communication line trench, the 2013 Up the Escarpment Waterline, and the sewer line removal. Previous effects of these projects would be minor to moderate adverse. The impact of the current project would be moderate and adverse as additional pipeline and trenching is constructed across the top of the escarpment. Cumulative impacts of the current and past projects on geology and soils is moderate and adverse."
38. Page 56, Cave and Karst. Alternatives A, B, and C. Replace Cumulative Effects existing text with: "One project that may have had an adverse impact on cave/karst resources is the Up the Escarpment Buried Waterline (1935). Cumulative impacts from Alternatives A, B, and C would be minor and adverse."
39. Page 56, Cave and Karst. Alternative D. Replace Cumulative Effects existing text with: "One project that may have had an adverse impact on cave/karst resources is the Up the Escarpment Buried Waterline (1935). The effect of the current project would be negligible to moderate, and adverse, depending on whether a void is encountered. The cumulative impacts would be negligible to moderate and adverse."
40. Page 56, Impacts of Alternative D section. The following changes are made to the text. In the first sentence, after the word "short-term," insert the words: "negligible, minor, or." In the second paragraph, in the first sentence, after the word "excavation" insert the following words: "and if no treated water leaks into the subsurface." In the same paragraph, second sentence, after the word "impact," add the following: "and little or no water leaks into the subsurface." In the same paragraph, last sentence after the word "impact," add the following: "and moderate amounts of treated water leak into the subsurface." In the same sentence, change the word "significant" to "moderate."
41. Page 57, Cave and Karst. Alternative E. Replace Cumulative Effects existing text with: "One project that may have had an adverse impact on cave/karst resources are the Up the Escarpment Buried Waterline (1935). The effect of the current project would be negligible to moderate, and adverse, depending on whether or not a void is encountered. The cumulative impacts would be negligible to moderate and adverse."
42. Page 58-60, Threatened and Endangered Species. Alternatives A, B, C, and D. At the end of each alternative, before the Cumulative Effects section, add the following: "A recent survey for T&E species conducted December 12 through December 26, 2013 determined that no T&E plant and animal species were found along the waterline project corridor. Under this alternative there would be no impacts to T&E plants."
43. Page 58-60, Threatened and Endangered Species. Cumulative Effects section for Alternatives A, B, C, and D. Replace the text with: "The impacts from early waterline projects on T&E species are unknown. A survey was conducted December 12 through December 26, 2013 and determined that there were no T&E plant and animal species found along the project corridor. Implementation of Alternatives A, B, C, and D could have a negligible cumulative impact on Threatened and Endangered animal species."

44. Page 60, Threatened and Endangered Species. Alternative E. Replace Cumulative Effects text with: "The impacts from early waterline projects on T&E species are unknown. Cumulative impacts to T&E species from the Alternative E are unknown, but likely would be negligible, given the fact that the buried waterline would be located in disturbed soil adjacent to an existing waterline.
45. Page 61-63, Vegetation and Wildlife. Alternatives A, B, C, D, and E. Replace Cumulative Effects text with: "The impacts from previous waterline and sewerline projects on Vegetation and Wildlife species would be negligible to moderately adverse. The Bat Cave Draw parking lot removal and Visitor Center Rehabilitation project had a minor to moderate beneficial impact on Vegetation and Wildlife. This beneficial impact is restoration of the site to a native plant landscape and habitat for wildlife. Cumulative impacts to Vegetation and Wildlife from the alternatives would be negligible to moderate and adverse." The adverse impacts occur as the development of park projects over the years have slowly encroached upon and impacted the vegetation and wildlife .
46. Page 63, Impacts of Alternative E, Vegetation/Wildlife section. The following changes will be made to the text: Replace the third paragraph of Alternative E with the third paragraph of Alternative D.
47. Page 64, Visual Resources section. In the first sentence under the Minor intensity level definition, change the word "extant" to "extent."
48. Page 64, Visual Resources. Alternatives A, B, C. Replace Cumulative Effects text with: "The impacts from the previous projects on Visual Resources would be negligible to moderately adverse. The Up the Escarpment Waterline (2013) is a moderate adverse impact on visual resources due to the difference in coloration between the project area and the surrounding land. The Bat Cave Draw parking lot removal is a moderate, beneficial impact on visual resources. This is due to the removal of the visual intrusion of the paved parking lot and its replacement with natural landscape. The cumulative impacts to Visual Resources from Alternatives A, B, and C would be negligible to moderate and adverse for the above reasons of visual intrusions and differences in coloration, and changes to natural landscapes.
49. Page 65, Visual Resources. Alternatives D and E. Replace Cumulative Effects text with: "The impacts from previous projects on Visual Resources would have been negligible to moderately adverse. The Up the Escarpment Waterline (2013) is a moderate adverse impact on visual resources due to the difference in coloration between the project area and the surrounding land. The Bat Cave Draw parking lot removal is a moderate, beneficial impact on visual resources. This is due to the removal of the visual intrusion of the paved parking lot and its replacement with natural landscape. The impacts to Visual Resources from Alternatives D and E will be moderate and beneficial due to the removal of the above-ground waterline and reduction of visual intrusion. The cumulative beneficial impacts from Alternative D and E offsets the adverse impacts from earlier projects described above."
50. Page 65, Visual Resources, Alternative E. Delete the words "minor to" in the first sentence.

51. Page 66, Cultural Resources and Landscapes section. In the second paragraph, second sentence, change the word "local" to "locale."
52. Page 67, Impacts of Alternative B section. In the first sentence, change the word "Distric" to "District."
53. Page 67, Cultural Resources. Alternatives A, B, and C. Replace Cumulative Effects text with: "The impacts from previous projects on Cultural Resources would have been negligible to moderately adverse due to visual intrusions to historic landscape. The current above-ground Mesa Top Waterline (1960) has had a moderate adverse effect on Cultural Resources."
54. Page 67, Cultural Resources. Alternatives D and E. Replace Cumulative Effects text with: "The impacts from previous projects on Cultural Resources would have been negligible to moderately adverse. The current above-ground Mesa Top Waterline (1960) has had a moderate adverse effect on Cultural Resources. Alternative D and E would have a moderate beneficial impact on Cultural Resources, as the pipeline would be buried, and native plants would be planted or the disturbed area would be naturally revegetated. This would provide an unscarred landscape as seen from the historic district and cultural landscape. The cumulative beneficial effects of Alternatives D and E would balance the negligible minor to moderate adverse impacts from previous projects."
55. Page 69, Native American Concerns. Alternatives A, B, and C. Replace Cumulative Effects text with: "The impacts from previous projects on Native American Concerns would be negligible to moderately adverse due to visual intrusions to historic landscape and the changes effected on the site. The current above-ground Mesa Top Waterline (1960) has had a moderate adverse effect on Native American Concerns. The cumulative impacts to Native American Concerns from these projects is moderately adverse."
56. Page 70, Native American Concerns. Alternatives D and E. Replace Cumulative Effects text with: "The impacts from previous projects on Native American Concerns is negligible to moderately adverse. The current above-ground Mesa Top Waterline (1960) has had a moderate adverse effect on Native American Concerns. Alternative D and E would have a moderate beneficial impact on Native American Concerns, as the pipeline would be buried, and native plants would be planted or the disturbed plants would be naturally revegetated. The cumulative beneficial impact to Native American Concerns from Alternatives D and E would balance the negligible to moderately adverse impacts from previous projects."
57. Page 71, Park Operations and Fire Management. Alternatives A, B, and C. Replace Cumulative Effects text with: "The impacts from previous projects on Park Operations and Fire Management are minor to moderate and beneficial. This is because park operations and fire management benefit from these developments. These projects include the prior waterline projects, visitor center improvements, and a sewerline project. The cumulative impacts from Alternatives A, B, and C and previous projects is moderate and beneficial to Park Operations and Fire Management."

58. Page 71, Impacts of Alternative A section, at end of second paragraph in this section. Insert the following text: "The existing pipeline, in its present condition, is within 20 years of its designed life."
59. Page 72, Park Operations and Fire Management. Alternative D. Replace Cumulative Effects text with: "The impacts from previous projects on Park Operations and Fire Management is minor to moderate and beneficial. Prior projects include the waterline projects, visitor center improvements, and a sewerline project. Alternative D would have a moderate beneficial impact on Park Operations and Fire Management. Any future park projects requiring water would be able to proceed with this assurance of dependable water. Health and safety, including fire protection, would be maintained at the highest level due to the increased dependability of the waterline. The cumulative impact from Alternative D and previous projects is moderate and beneficial to Park Operations and Fire Management is moderate and beneficial."
60. Page 72, Impacts of Alternative B section, at end of second paragraph from top of page. Insert the following text: "The design life of this alternative is less than 20 years."
61. Page 72, Impacts of Alternative C section, at end of second paragraph. Insert the following text: "The design life of this alternative is 50-75 years."
62. Page 72, Impacts of Alternative D section, the third sentence of the next to last paragraph which starts with "The longevity...." Delete that sentence and insert: "The design life of this alternative is 50-75 years."
63. Page 73, Impacts of Alternative E. Replace "comprised" with "compromised."
64. Page 73, Park Operations and Fire Management, Alternative E. Replace Cumulative Effects text with: "The impacts from previous projects on Park Operations and Fire Management is minor to moderate and beneficial. Prior projects include the waterline projects, visitor center improvements and a sewerline project. Future park proposed projects requiring water would be allowed to proceed with this assurance of dependable water. The cumulative impacts from Alternative E and previous projects to Park Operations is moderate and beneficial, because the waterline would no longer be subject to fires and freezing temperatures. However, for Fire Management, fire protection under Alternative E would be compromised due to the removal of the Mesa Top water tank, which provides a needed back-up supply of water for fire protection. Alternative E would reduce the benefits of previous projects on Fire Management. The cumulative impact of Alternative E and previous projects would be minor to moderate and beneficial."
65. Page 73, Impacts of Alternative E section, at end of third paragraph. Insert the following text: "The design life of this alternative is 50-75 years."
66. Page 74-75, Air Quality, Alternatives A, B, C, D and E. Replace Cumulative Effects text with: "Previous projects, such as the waterline projects and visitor center rehabilitation, would have had an adverse impact on Air Quality during the time of construction. This is because dust, machinery fumes and exhaust would temporarily increase for the period of

the construction. The impacts would not have been long-term, as the Air Quality would have returned to pre-construction levels. There are no long-term cumulative impacts to Air Quality from Alternatives A, B, C, D and E.”

67. Page 75, Air Quality, Impacts of Alternative E. In second sentence after the word “alternative,” add “than for.”
68. Page 75, Soundscape Management, Alternatives A, B, C, D and E. Replace Cumulative Effects text with: “Previous projects, such as the waterline projects and visitor center rehabilitation, would have had an adverse impact on Soundscape during the time of construction. This is because noise levels would temporarily increase during construction. The impacts would not have been long-term, as the sound levels would have returned to pre-construction levels. There are no long-term cumulative impacts to Soundscape from Alternatives A, B, C, D and E.
69. Page 75, Intensity Definitions, Soundscape Management. Under “Minor,” change the word “extant” to “extent.”
70. Page 79, Historic Structures section, the third sentence. Insert the word “visual” after the word “adverse.”

CITATIONS

1. Page 10, Purpose and Need section, last sentence of first paragraph. Add the following date to the citation: October 5, 2011.
2. Page 14, Environmental Justice section, at end of first sentence. Add the following citation: (William J. Clinton. Executive Order 12898, General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994).
3. Page 14, Environmental Justice section, at end of second sentence. Add the following citation: (Environmental Protection Agency, Environmental Justice Guidance, 1998).
4. Page 14, Water Resources section, at end of paragraph. Add the following citation: (Clean Water Act of 1972, 33 USC Section 1251 et seq.).
5. Page 48, Native American Concerns section, first sentence. Change citation to: (Barack Obama. Memorandum, November 5, 2009).
6. Page 48, Native American Concerns section. Second sentence. Change citation to: (Pawnee Nation, Letter from Marshall Glover, President; Pawnee Business Council 2012).
7. Page 68, Native American Concerns section, at end of first sentence. Add the following citation: (William J. Clinton. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, November 6, 2000).
8. Page 68, Native American Concerns section, at end of first paragraph. Change citation to: (Barack Obama. Memorandum, November 5, 2009).
9. Page 76, Impacts of Alternative D section, at end of first paragraph. Add the following citation: (Federal Highway Administration Roadway Construction Noise Model User’s Guide. Final Report, January 2006: FHWA-HEP-05054; DOT-VNTSC-FHWA-0501).

10. Page 78, Native American Concerns section, second sentence. Change citation to:
(Barack Obama. Memorandum, November 5, 2009).

REFERENCES (add to list on page 83 of the Environmental Assessment)

1. Council on Environmental Quality (CEQ) 40 CFR Section 1508.9
2. Council on Environmental Quality (CEQ) 43 CFR Section 46.30
3. National Environmental Policy Act of 1969 (NEPA).
4. National Historic Preservation Act of 1966 (NHPA).
5. Native American Graves Protection and Repatriation Act (NAGPRA), 43 CFR Part 10.
6. Center for Excellence in Hazardous Materials Management. RKI Pipeline Report. 2013.
7. U.S. Fish and Wildlife Service. 2013. Migratory Bird Treaty Act (MBTA) 16 U.S.C. 703-712.
8. Title 50, Code of Federal Regulations, Part 10.
9. Clean Air Act of 1963, as amended.
10. NPS, Directors Orders #47, Soundscape Preservation and Noise Management, December 1, 2000.
11. NPS, Planning, Environment, and Public Comment (PEPC)
website:<http://parkplanning.nps.gov/>.
12. NPS, Supplemental Maps for Mesa Top Waterline Environmental Assessment, 2013.
Appendix.
13. Pawnee Letter of Consultation, 2013. (NPS files).

Appendix – Non-Impairment Finding

The National Park Service's Management Policies, 2006 requires analysis of potential effects to determine whether or not actions will impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid or to minimize, to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, will harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values. An impact to any park resource or value may, but does not necessarily, constitute an impairment. An impact will be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's General Management Plan or other relevant NPS planning documents.

An impact will be less likely to constitute an impairment if it is an unavoidable result of an action necessary to pursue or restore the integrity of park resources or values and it cannot be further mitigated.

The park resources and values that are subject to the no-impairment standard include:

- the park's scenery; natural and historic objects, and wildlife, and the processes and conditions that sustain them; including to the extent present in the park, the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and

- any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The NPS's threshold for considering whether there could be an impairment is based on whether an action will have significant effects.

Impairment findings are not necessary for visitor use and experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, because impairment findings relates back to park resources and values, and these impact areas are not generally considered park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values. After dismissing the above topics, the remaining topics to be evaluated for impairment include Cultural Resources, Cave/Karst Resources, Native American Concerns, Vegetation, Wildlife, Threatened and Endangered Species and Migratory Birds, Visual Resources, Air Quality and Soundscape Management.

Fundamental resources and values for Carlsbad Caverns National Park are identified in the General Management Plan (1996). According to that document, of the impact topics carried forward in this Environmental Assessment (EA), Cultural Resources, Cave/Karst Resources, Native American Concerns, Vegetation, Wildlife, Threatened and Endangered Species and Migratory Birds, Visual Resources, Air Quality, and Soundscape Management are considered necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; are key to the natural or cultural integrity of the park; and/or are identified as a goal in the park's General Management Plan or other relevant NPS planning document.

- **Cultural Resources** - The project will be located near the Carlsbad Caverns Historic District and Cultural Landscape. Impacts to cultural resources from burying the pipeline will be long-term and moderately beneficial, since the visual intrusion of the existing above-ground pipeline is removed from the viewshed. Therefore, there will be no impairment to Cultural Resources.
- **Cave/Karst Resources** - Carlsbad Caverns National Park is located within a subsurface cave/karst system. Mitigation measures such as implementing the use of ground-penetrating radar technology (GPR) will drastically reduce the potential for contacting voids during trenching. Per Larry Martin, Hydrogeologist, in a report dated 1/25/13, there will be virtually no potential hydrologic impact from burial of the waterline in a shallow trench. Therefore, there will be no impairment to Cave/Karst resources.
- **Native American Concerns** - The project will be located within a cultural and natural landscape. Impacts during construction of the pipeline project will have a moderate, adverse affect on the landscape for the short-term, as vegetation is removed and soil is disturbed during construction. Mitigation measures such as revegetation and re-conturing will improve the site. Long-term impacts of the project are considered moderately beneficial impacts, as the naturalness and the viewshed are restored, due to removal of the existing above-ground pipeline. Therefore, there will be no impairment to Native American Concerns.
- **Vegetation and Wildlife** - Vegetation will be adversely impacted for the short-term, as a result of the trenching and pipeline construction activities, including heavy-equipment,

human, and vehicular traffic. Mitigation measures will gradually reduce this footprint through the revegetation and re-contouring of the project site. No impairment is anticipated. Wildlife may be displaced in localized areas as a result of the new construction, including heavy-equipment, humans, and vehicular traffic. Short-term impacts to vegetation and wildlife will vary from negligible to moderate and adverse. Mitigation measures will reduce the impacts to wildlife through monitoring and preventive measures. Long-term impacts will be negligible and adverse. Therefore, there will be no impairment to Vegetation and Wildlife.

- **Threatened and Endangered Species and Migratory Birds** – NPS resource staff inspected the project site for the presence of threatened and endangered (T&E) plant and animal species and migratory birds. No T&E plant or animal species were found. Short-term impacts to T&E animal and migratory birds will be no more than negligible to minor and adverse. Long-term impacts will be no more than negligible adverse. Therefore, there will be no impairment to Threatened and Endangered Species and Migratory Birds.
- **Visual Resources** - Scenic views are one of the assets of many national parks. For the short-term, the viewshed from visitor use facilities will be adversely impacted to a minor to moderate degree during and after construction of the pipeline. After construction and demolition activities, the visual intrusion of the existing above-ground pipeline will be removed. The new (buried) pipeline project will have a beneficial effect (naturalness) on the viewshed over the long-term, as mitigation measures (e.g revegetation and re-contouring) are implemented. Therefore, there will be no impairment to Visual Resources.
- **Air Quality** - Carlsbad Caverns National Park is a mandatory Class I area. For the short-term, impacts will be moderately adverse, due to exhaust fumes and airborne soil particulates generated by the trenching equipment. Removal of vegetation during construction will temporarily allow soil to be blown away during high winds. Mitigation measures will restore vegetation over the long-term. Over the long-term, air quality will return to what it was prior to construction. Therefore, there will be no impairment to Air Quality.
- **Soundscape Management** - For the short-term, there will be moderate, adverse impacts, due to noise from construction activities. Mitigation measures will be employed to protect bats which may be utilizing the area. Work will occur during daylight hours only. Work hours will be allowed only between ½ hour after sunrise to ½ hour before sunset, which will reduce noise impacts to the bats to negligible levels. This is because bats will be inside caves during daylight hours. The soundscape management will return to levels that existed prior to project construction. Therefore, there will be no impairment to Soundscape Management .

Conclusion for Non-Impairment Finding

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and public involvement, it is the Superintendent's professional judgment that there will be no impairment of park resources and values from implementation of the Preferred Alternative.