

National Telecommunications and Information Administration
Broadband Technology Opportunities Program
Finding of No Significant Impact
Keystone Initiative for Network Based Education and Research (KINBER)
Pennsylvania Research and Education Network (PennREN) Project

Summary

The Keystone Initiative for Network Based Education and Research (KINBER) applied to the Broadband Technology Opportunities Program (BTOP) for a grant to provide affordable, enhanced broadband services to Pre-K through 12 schools, higher education systems, health care networks, libraries, state and local governments, and workforce/economic development entities across Pennsylvania. This Proposed Action will reach every region of the Commonwealth, and is called the Pennsylvania Research and Education Network (PennREN) Project.

The National Telecommunications and Information Administration (NTIA) awarded a grant for the Project to KINBER, through BTOP, as part of the American Recovery and Reinvestment Act (ARRA). The funding must be obligated and the Project completed within three years. This timeline is driven by the laws and regulations governing the use of this ARRA grant funding.

BTOP supports the deployment of broadband infrastructure in unserved and underserved areas of the United States and its Territories. As a condition of receiving BTOP grant funding, recipients must comply with all relevant Federal legislation, including the National Environmental Policy Act (NEPA) of 1969. Specifically, NEPA limits the types of actions that the grantee can initiate prior to completing required environmental reviews. Some actions may be categorically excluded from further NEPA analyses based on the specific types and scope of work to be conducted (74 *FR* 32876 and 74 *FR* 33204). For projects that are not categorically excluded from further environmental review, the grant recipient must prepare an EA that meets the requirements of NEPA. After a sufficiency review, NTIA may adopt the EA, use it as the basis for finding that the Project will not have a significant impact on the environment, and issue a finding of no significant impact (FONSI). Following such a finding, the BTOP grant recipient may then begin activities identified in the EA as the preferred alternative, in accordance with any special protocols or identified environmental protection measures.

An EA for this Project was completed by KINBER in August 2010. NTIA reviewed the EA, determined it is sufficient, and adopted it as part of the development of this FONSI.

The Project includes:

- Installing 48-count fiber optic cable infrastructure in a three-ring configuration to create a network with 1,696 route miles, covering a service area of approximately 4,082 square miles;
- Installing approximately 1,540 miles of new aerial fiber infrastructure on existing utility poles (98% of the network infrastructure);
- Installing approximately 18 miles of new fiber within existing underground or on-structure conduit systems (less than 2% of the network infrastructure);

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- Installing Ethernet switch and optical transport equipment to connect 13 network-operated nodes at community anchor institutions around the Commonwealth; and
- Repairing or replacing existing conduit, as needed, to facilitate installation of network fiber.

Based on a review of the analysis in the EA, NTIA has determined that the Project, if implemented in accordance with the preferred alternative and incorporating mitigations and protective measures outlined in the EA, will not result in any significant environmental impacts. Therefore, the preparation of an EIS is not required. The basis for this determination is described in this FONSI.

Additional information and copies of the EA and FONSI are available to all interested persons and the public through the BTOP website (www2.ntia.doc.gov/) and the following contact:

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Purpose and Need

The purpose of the Project is to construct and manage a statewide fiber optic network accessible to a host of educational, research, health care, and economic development partners seeking to aggregate services for their members and subscribers at affordable cost. By aggregating the service needs of the partners, the sponsor will have the ability to negotiate rates lower than those now available. The PennREN network will provide in excess of 4,082 square miles of network connectivity and access to an estimated 5,159,780 individuals in 2,047,442 households and 204,193 businesses within the 10 mile radius of the targeted community anchor institutions. At least 75 % of the planned Project service area falls within rural areas that are unserved or underserved. No more than 50% of the households in the planned service area have access to facilities-based, terrestrial broadband service at greater than the minimum broadband transmission speed. Of the network's 13 core nodes, 4 will be located within underserved areas. Most of the planned node sites were chosen because of their strong presence in the potential service area and their willingness to permit all-hours access by non-employee staff.

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Project Description

The PennREN Project will develop an advanced 48-count middle mile fiber network between key locations throughout Pennsylvania. The network will encompass approximately 1,696 route miles and will be constructed in a three-ring configuration – one in the west, one in the east, and a small metropolitan ring in State College. Approximately 1,558 miles of new fiber optic infrastructure will be installed.

Approximately 98% of the new fiber (1,540 miles) will be installed aurally on existing utility poles within existing rights-of-way (ROW). Any replacement of utility poles due to deterioration or to accommodate new fiber will be conducted by the pole owner/operator when KINBER applies for permission to affix new fiber to existing infrastructure. When replacing a pole, standard practice is to auger a new hole as close to the existing pole as is practical, place the new replacement pole, transfer existing infrastructure to the new pole, and remove the existing pole (most commonly by cutting it above the surface and leaving the buried segment in place).

Less than 2% of the new fiber (approximately 18 miles) will be pulled through existing underground conduit systems or existing conduit affixed to structures. Bridges along the planned fiber backbone route will be crossed by pulling fiber through existing conduits affixed to those bridges. To transition between aerial and conduit installations, aerial fiber will be run down the nearest pole and routed into the conduit. Circumstances can arise in which the existing underground conduit must be repaired or replaced to accommodate fiber installation (e.g., when existing conduit has been crushed). Accordingly, before attempting to pull new fiber through existing conduit, the ducts will be “proofed” by attempting to push a rod through from one manhole or hand hole to the next, or from a pole to a nearby manhole or hand hole. If blocked, and depending on the extent of the blockage, potential alternative routes will be evaluated. If alternate routes are unavailable, the duct will be repaired or replaced. Duct repair typically involves digging down to the damaged section of the duct bank and installing a new section of duct using a split duct remedy. When burying replacement conduit, a trench measuring three feet deep and one foot wide will be excavated to accommodate the new infrastructure. In either case, the trench will be backfilled with the removed soil, or a combination of soil and crusher rock.

Throughout the Commonwealth, 13 core nodes will be connected to the new fiber network; each node will host an Ethernet switch and optical transport equipment. These network core nodes will be located at the University of Scranton, Lehigh University, Penn State Hershey, Indiana University of Pennsylvania, Allegheny Center Mall, Slippery Rock University, Penn State/Behrend, Clarion University, Penn State Dubois, Bucknell University, and three collocation facilities. The core nodes will be supplemented by over 50 independently owned and operated local nodes. PennREN-controlled equipment will not be installed at the local nodes.

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Alternatives

The EA includes an analysis of the alternatives for implementing the proposed Project to meet the purpose and need. NTIA also requires that an EA include a discussion of the no action alternative. The following summarizes the alternatives analyzed in the EA.

Preferred Alternative – Primarily Aerial Fiber Construction in a Three-Ring Configuration (described above in Project Description). This alternative involves construction of the PennREN network in a three-ring configuration using primarily new aerial fiber. For a small portion of the planned route, new fiber will be run through existing underground or on-structure conduit. Aerial installation will use existing utility poles within existing ROWs. In addition, 13 core nodes will be connected to the new network with Ethernet switches and optical transport equipment.

No Action Alternative. No action was also considered. Under the no action alternative, fiber installation would not occur, and the identified community anchor institutions would not be provided with the specified node equipment. As a result, the statewide broadband service enhancements anticipated to result from implementation of this Project would not be realized. According to KINBER, an infrastructure Project of this nature will not be undertaken in the absence of federal funding. The EA examined this alternative as the baseline for evaluating impacts related to other alternatives being considered.

Alternatives Considered But Not Carried Forward. During the Project planning stage, KINBER evaluated several alternatives for Project implementation. These alternatives focused on changes in network scale, configuration, and technology.

Although less extensive networks are conceivable, the resulting service area would be reduced. Therefore, the network would be limited in its ability to support the underlying need for improved access. All feasible configuration options included a crossing in the State College area. Virtually any network configuration, including the preferred alternative, would encounter the same potential need to cross bridges, work on sensitive road shoulders, and/or install new underground conduit. Alternate networks with fewer rings would provide less protection against a single fiber cut or the loss of a single node. The specific institutions of higher education serving as core node sites were chosen because of their strong presence in the potential service areas and their willingness to permit all-hours access by non-employee staff. Alternate networks with fewer nodes, or with different nodes, would be less effective at providing broader access.

A wireless network alternative could provide the means for data transmission and communication, but would not provide sufficient capacity or speed necessary to meet objectives of the Project. Furthermore, a wireless network would result in a much larger area of ground disturbance, especially within the rural areas of Pennsylvania. Wireless infrastructure is

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generally located on hilltops, hillsides, or in areas where lines-of-sight allow for wireless communication. Potential locations for wireless infrastructure would require disturbing the natural environment by clearing and grubbing for access roads and site improvements. The planned fiber optic network capitalizes on areas where the environment has been previously disturbed to establish transportation ROWs.

Based on these findings, alternative scales, configurations, and technologies were eliminated from further consideration for the Project.

Findings and Conclusions

The EA analyzes existing conditions and environmental consequences of the preferred alternative and the no action alternative. Eleven major resource areas were analyzed, including Noise, Air Quality, Geology and Soils, Water Resources, Biological Resources, Historic and Cultural Resources, Aesthetic and Visual Resources, Land Use, Infrastructure, Socioeconomic Resources, and Human Health and Safety. Cumulative impacts of each alternative were also evaluated..

The EA supports a determination that implementation of the Project is not likely to result in any significant environmental impacts and does not involve any unusual risks or impacts to sensitive areas..

Noise

Implementation of the Project and operation of the network is unlikely to contribute any significant noise to the ambient noise level in developed environments. Construction noise associated with fiber installation activities will be similar to existing noise in urban environments, temporary, and of short duration in any one location as construction moves along the Project route. Installation noise in rural environments along the Project route will also be temporary, and is not anticipated to exceed ambient noise levels associated with traffic on rural roads. Moreover, operation of the network to transmit data would not result in new permanent sources of noise in the Project area. Thus, the Project is not expected to have significant adverse impacts on noise. There would be no construction associated with the no action alternative. Accordingly, the no action alternative would have no impact on noise.

Air Quality

No new permanent sources of air emissions will be created during installation of fiber optic cable within existing conduit or on existing utility poles. Because heavy equipment will be used for fiber cable installation, short-term impacts on air quality both from exhaust emissions and ground disturbance may occur. However, these impacts are expected to be minor and limited in duration. Any contribution to the emission of greenhouse gasses will be minor and insignificant. Ongoing operation of the fiber optic network to transmit data will have no impact on air quality. Thus, the Project is not expected to have significant adverse impacts on air quality in the Project

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area. There would be no construction associated with the no action alternative. Thus, the no action alternative would have no impacts on air quality.

Geology and Soils

Previously undisturbed native soil profiles will only be impacted if existing utility poles or conduit require replacement. In such cases, the new pole or conduit will be placed immediately adjacent to, or as near as possible to, the existing infrastructure. Additional cut and fill activities will be limited. In most cases, if existing conduit does not allow for fiber installation, the fiber will be re-routed aerially. Infrastructure replacement may result in incidental erosion or sediment discharge to wetlands or waters and result in minor but insignificant impacts to soils and geology.. Appropriate best management practices (BMPs) will be used to prevent soil erosion and sedimentation for any pole or conduit replacements that are necessary. Disturbed soils will be restored to their pre-construction state. The Project will not irreversibly convert farmland to nonagricultural use. No ground disturbance would occur under the no action alternative. Accordingly, the no action alternative would have no impact on geology and soils.

Water Resources

A total of 56 segments encompassing 3.76 miles of the new fiber network will cross National Wetlands Inventory (NWI) wetlands or waterways on pole lines. In addition, six segments encompassing 1.3 miles of the route will cross NWI wetlands or waterways via existing conduit on bridges or associated structures. No underground conduit will be used for these crossings. Potential adverse impacts may also result from any repair or replacement of poles or on-structure conduit that may be needed in these segments. These impacts may include disturbance of wetland soils and associated wetland vegetation during excavation or trenching, potential alteration of drainage patterns or localized changes to the water table depth as a consequence of trenching and backfill with permeable fill, or alteration of surface drainage patterns should local topography not be restored.

To mitigate potential adverse impacts on water resources, Project protocols require KINBER to notify the US Fish and Wildlife Service (USFWS) and the US Army Corps of Engineers (USACE) if it appears that any wetlands or floodplains will need to be trenched. The protocol also specifies that all further consultation with either agency, including any recommended delineations or other studies, will be undertaken and completed in advance of any disturbance. Finally, the protocol requires a qualified wetland scientist to perform a wetlands delineation survey of the area to be affected prior to any anticipated excavation or trenching. After completion of excavation or trenching activities, the surface of any disturbed areas will be restored to the pre-construction elevation and replanted with native species appropriate to the area. Because extensive infrastructure repair or replacement is not anticipated under the preferred alternative, and because protective measures will be implemented prior to and during any ground disturbing activities, the Project is not expected to have significant impacts on water resources.

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Because no construction or ground disturbing activities would be conducted, the no action alternative would result in no impact to water resources.

Biological Resources

The Project fiber route will traverse a number of Pennsylvania environments and has the potential to impact a variety of biological resources.

The Department of Conservation and Natural Resources (DCNR) has identified seven areas along the Project route within which vulnerable plant species of concern are known or suspected to occupy the road shoulder. These plants may be adversely impacted during construction. Network construction within the seven areas will include aerial installation and pulling fiber through four segments of conduit. In accordance with DCNR requirements, fiber installation work in these areas will be done from the roadway itself; the road shoulder will not be used in any way. Installation within these areas will incorporate a lane closure to allow equipment and personnel to work from the road surface. If lane closure is not possible and work cannot proceed from the roadway itself, the construction crew (1-2 people) will walk to the pole avoiding vegetation and climb the poles to complete aerial installation. Based on KINBER's agreement to implement these conservation and avoidance measures, DCNR has determined that no impact is likely with regard to vulnerable plant species along the Project route. In the event that poles need to be replaced, or if excavation or trenching is needed to repair or replace conduit within the seven identified areas, KINBER will conduct additional consultation with DCNR.

In a letter dated April 23, 2010, the USFWS indicated that a portion of the planned Project is within the known range of the bog turtle (*Clemmys muhlenbergii*), a species that is federally listed as threatened. According to the USFWS, aerial stringing of fiber and use of existing conduits to create the PennREN network is not likely to adversely affect this species. However, further consultation with USFWS will be necessary if wetlands must be trenched in the counties of Monroe, Carbon, Northampton, Lehigh, Bucks, Montgomery, Berks, Schuylkill, Chester, Lancaster, Lebanon, York, Adams, and Cumberland.

In a letter dated June 9, 2010, the Pennsylvania Game Commission (PGC) indicated that peregrine falcons (*Falco peregrines*) currently nest on two bridges that will be crossed to create the PennREN network. These bridges are the East Rochester Bridge that crosses the Ohio River in Beaver County, and the Veterans Memorial Bridge, that crosses the Susquehanna River in Lancaster County. In accordance with PGC requests, all work on these bridges will be scheduled to avoid the falcon nesting period between March 15th and June 30th. According to the PGC, the remainder of the Project as presented is not likely to impact any other threatened, endangered, or species of special concern under their jurisdiction. Nevertheless, site-specific plans will be provided to the PGC for review, comment, and final clearance prior to implementing any Project activity other than aerial placement on existing poles, in existing ROWs, or within existing underground conduit.

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According to a letter dated May 27, 2010, the Pennsylvania Fish and Boat Commission (PFBC), Division of Environmental Services Natural Diversity Section (NDS) does not anticipate that Project activity will have any significant adverse impacts on species of special concern, or on any rare or protected species under the PFBC jurisdiction. Nevertheless, should Project implementation require earth disturbance, KINBER will initiate additional contact with NDS.

The analyses and correspondence provided in the EA indicate that the Project will have no significant impact on biological resources if implemented as detailed in the preferred alternative and in accordance with stipulated mitigation and protective measures. The no action alternative would involve no construction and, therefore, would have no impact on biological resources.

Historic and Cultural Resources

According to a May 10, 2010, letter from the Pennsylvania Bureau for Historic Preservation (BHP), the Project route runs through and near historic resources eligible for and listed in the National Register of Historic Places. However, BHP found that installation of the fiber optic cables on existing aerial lines and in existing buried conduit will have no adverse effect on historic resources. BHP also indicated that further consultation will be necessary if the final Project design indicates that network installation will require new ground disturbance. This notification and consultation requirement has been incorporated into the Project protocol.

Tribal Historic Preservation Officers (THPOs) with interest in the geographic area to be affected by the Project were notified via the Federal Communications Commission's (FCC) Tower Construction Notification System (TCNS). A total of six replies from tribal entities have been received through TCNS as of September 22, 2010. According to the responses, no further Project-specific consultations are required by the Wyandotte Nation, the Eastern Shawnee Tribe of Oklahoma, and the Native Villages of Gakona and Kwinhagak. The Keweenaw Bay Indian Community (KBIC) THPO indicated that they have no documentation on the presence of cultural or sacred properties within the proposed Project area. Nevertheless, it is the KBIC THPO's belief that many cultural sites within historic homelands have not yet been identified or documented. In the event that archaeological remains or artifacts are identified during construction, field activity will be halted and appropriate Tribes will be notified immediately. The KBIC THPO also requested follow-up contact if the scope of work changes in any way. The Shawnee Tribe indicated that they are interested in consulting on all tower projects within their geographic areas. The preferred alternative for this Project does not include construction of new tower infrastructure. Nevertheless, additional consultation will be conducted to satisfy Shawnee Tribe requirements pertaining to protection of historic and cultural resources.

Based on all available information, the Project is not expected to have significant adverse impacts on historic and cultural resources. Because no construction or ground disturbance would be conducted, the no action alternative would not impact historic and cultural resources.

Aesthetic and Visual Resources

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Installation of fiber optic network, and operation of that network to transmit data, will have no impact on aesthetic and visual resources. The Project will add a single cable line to existing utility poles along existing transportation ROWs. However, adverse impacts associated with viewing one additional cable on already existing utility poles is expected to be small. Moreover, the new infrastructure will blend into the current environment, even on rural road corridors. Therefore, the Project is not expected to have significant adverse impacts on aesthetic and visual resources. Similarly, because no new infrastructure would be installed, the no action alternative would not impact aesthetic and visual resources.

Land Use

The Project area is characterized by a variety of different land uses, including rural areas with farmland and forests, suburban and medium-density communities, and large urban centers that are built-out with existing development. The Project will occur within existing transportation ROWs, and impacts on existing land use will be minimal. Existing transportation corridors may experience temporary disturbance during fiber line installation, but long-term adverse land use impacts are not anticipated as a result of this Project. Because no changes would be made within the Project area, the no action alternative will not result in adverse impacts to land use.

Infrastructure

The Project area is largely supported by existing infrastructure systems. Existing transportation ROWs provide ready access to utility poles on which much of the fiber optic cable will be hung. Existing underground conduit, largely found in more urbanized areas, will also be used to route the new PennREN network fiber optic cable. Construction of new Project infrastructure will occur during normal construction seasons (i.e., early spring through fall). The existing roadway infrastructure is adequate for supporting the equipment/vehicles required for construction. The majority of the Project will take place outside the path of traffic, but lane closures will be necessary in areas where sensitive biological resources are located. Construction of fiber infrastructure near or within existing roadways will be conducted in accordance with the Federal Highway Administration's *Manual on Uniform Traffic Control Devices*. PennDOT's supplement (Publication 212) to the Federal Highway Administration's *Manual on Uniform Traffic Control Devices* will also be utilized. PennDOT's new *Work Zone Safety Law and Work Zone Traffic Control Guidelines* (Publication 213) will be followed for protecting public health and safety while maintaining traffic flow. In all cases, traffic will be managed on site using appropriate work zone traffic control procedures (e.g., signing, channeling devices, lane shifts and tapers). Potential adverse impacts on the traveling public, or on the movement of goods and services, are expected to be minor in nature and will likely consist only of short term delays. When necessary, flagging operations will be utilized to direct traffic around a work zone.

No significant adverse impacts are anticipated with regard to existing infrastructure systems. Because no infrastructure changes would be implemented, the no action alternative would not adversely impact existing infrastructure.

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Socioeconomic Resources

The Project will provide improved communication capabilities throughout the Commonwealth. A total of 7.8% of Pennsylvania families are classified as being below the poverty level, with the greatest concentrations located in Fayette and Green Counties in southwest Pennsylvania, and within the City of Philadelphia. Minority populations appear to be concentrated within or near urban areas of the Commonwealth, with greater concentrations in Monroe, Northampton, Lehigh, Berks, Delaware, Philadelphia, Dauphin, Huntingdon, and Allegheny counties. Minority and low income populations throughout Pennsylvania will be served by the PennREN network. No adverse socioeconomic circumstances are anticipated as a result of Project implementation. Potential positive effects of the Project on socioeconomic resources are described below in the Human Health and Safety analysis. The no action alternative would not provide enhanced broadband accessibility to currently unserved and underserved populations in the Project area.

Human Health and Safety

Although numerous hazardous waste sites have been identified in the Project area, the presence of such sites will not adversely impact human health and safety. To protect human health and ensure the safety of pedestrians and motorists in the area, installation of fiber optic cable near or within existing roadways will be completed in accordance with the Federal Highway Administration's *Manual on Uniform Traffic Control Devices*. Pennsylvania Department of Transportation's (PennDOT) supplement (Publication 212) to the Federal Highway Administration's *Manual on Uniform Traffic Control Devices* will also be utilized, along with PennDOT's new *Work Zone Safety Law and Work Zone Traffic Control Guidelines* (Publication 213). Contractors will also follow the United States Department of Labor, Occupational Health and Safety Administration regulations in 29 CFR Part 1926 to ensure worker safety.

Numerous Project-related benefits have been identified with regard to socioeconomic and human health and safety. The Project will create a statewide fiber optic network that is accessible to a host of educational, research, health care, and economic development partners at affordable cost. The Project will also provide broadband Internet access to an estimated 5,159,780 individuals in 2,047,442 households and 204,193 businesses within the 10 mile radius of the targeted community anchor institutions. The PennREN network will serve as a catalyst for stabilization and future growth in several important segments of the economy of the Commonwealth, including higher education, health care, and workforce development. Finally, Project improvements will allow public safety agencies to access broadband service, and will help employers remain competitive through modernization at a reasonable cost.

By implementing appropriate protective measures in Project work areas, construction of the preferred alternative will have no adverse impacts on human health and safety. Operation of the network will have significant long-term beneficial impacts on government entities, businesses, schools, and residents in the targeted service area. The no action alternative would have no

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adverse impacts on human health and safety, but the anticipated positive impacts would not be realized.

Cumulative Impacts

The PennREN network will include nearly 1,700 miles of fiber infrastructure. Most of this new fiber will be located within existing ROWs where it will coincide with existing road and utility infrastructure. Minor cumulative impacts to infrastructure will involve adding cable to existing utility poles, which can accommodate a finite number of cables and associated equipment. Therefore, there may be less available space for potential future cables and lines on existing poles. Routine maintenance and repair activities are occasionally required for the continued operation of these existing utility lines and roadways. Numerous smaller scale surface treatment and road maintenance projects are typically conducted throughout the state, including some within the Project area. KINBER will work with state, county, and local highway departments to coordinate scheduling details so as to avoid conflicts. As development increases, there is likelihood of road improvement projects, as well as utility line replacements and transmission line upgrades.

There is a substantial positive cumulative impact of the Project on socioeconomic resources, as well as upon human health and safety resources. The PennREN network is intended to serve as a catalyst for stabilization and future growth in several important segments of the economy of the Commonwealth. The Project will enable projects and initiatives throughout the Commonwealth in the areas of education, research, health care, public safety, homeland security, broadband communications deployment, and economic development. The Project will also provide broadband access to numerous underserved and unserved communities, which will provide global economic development opportunities, provide increased education opportunities, and improve public safety through reliable and high speed communication.

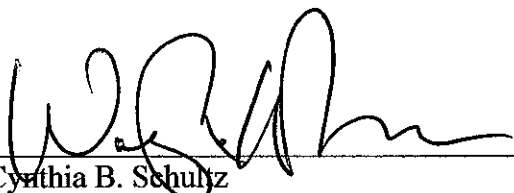
No cumulative impacts are anticipated with respect to other resource areas considered in the EA, or with regard to the no action alternative.

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Decision

Based on the above analysis, NTIA concludes that constructing and operating the Project as defined by the preferred alternative, and in accordance with identified protocols and environmental protection measures, will not require additional mitigation. A separate mitigation plan is not required for the Project. The analyses indicate that the Proposed Action is not a major Federal action that will significantly affect the quality of the human environment. NTIA has determined that preparation of an EIS is not required.

Issued:



Cynthia B. Schultz
Director of Compliance and Audits
Broadband Technology Opportunities Program

9/28/10

Date