

**United States  
Department of  
Agriculture**

**Forest  
Service**

**February 2013**



# **Decision Notice and Finding of No Significant Impact**

**Minnesota Department of Transportation (MnDOT)**

**Allied Radio Matrix for Emergency Response (ARMER)**

**Superior National Forest  
Duluth, Minnesota**

**Responsible Official**

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## Introduction

The Minnesota Department of Transportation (MnDOT) Allied Radio Matrix for Emergency Response (ARMER) Project Decision Notice documents my decision to implement Alternative 2 from the MnDOT ARMER Environmental Assessment (EA). The EA analyzed the effects of approving a Special-Use Authorization to allow the Minnesota Department of Public Safety and Transportation to install, operate, and maintain four communication facilities, including radio towers, to increase the public safety communication network known as the ARMER project. Two of the facilities are new, (Pine Mountain and Forest Center) and two of the facilities replace existing communication radio towers (Fernberg and Meander Lake).

An interdisciplinary team (IDT) of resource specialists prepared the EA. Information sources included public scoping, field review, environmental studies, personal information, and the Superior National Forest Land and Resource Management Plan (Forest Plan).

The EA, in accordance with the National Environmental Policy Act (NEPA), discloses the environmental effects of allowing the special use authorization for the four communication site locations, and the alternatives to those actions. The EA is available at USDA Forest Service, Supervisor's Office, 8901 Grand Avenue Place, Duluth, MN 55808. The EA is also available on the Forest Service web page at <http://www.fs.usda.gov/goto/superior/projects>.

## Decision

I have decided to implement Alternative 2 as disclosed in the EA. As stated in Section 1.3 of the EA, the proposal is to: approve a special-use authorization allowing MnDOT to install, operate, and maintain four communication facilities, including radio towers, for the ARMER project. Alternative 2 allows a Special-Use Authorization to be issued in accordance with the design and restrictions as outlined in the following:

### Pine Mountain

- The location of the site is approximately in the Northwest  $\frac{1}{4}$  of the Southeast  $\frac{1}{4}$  of Section 33, Township 63 North, Range 1 East, 4<sup>th</sup> Principal Meridian (Lat. 47°53'42.60"N, Long. 90°19'37.50"W). This location was adjusted to be approximately 180 feet southeast of the site originally identified by MnDOT. This eliminates any possible impact to historic remains of the former US Forest Service fire lookout.
- Identify this location as a new communication site management area by preparing and authorizing a Communication Site Plan.
- Improve an unclassified road, off of Forest Road 154 (Pine Mountain Road), for adequate access to the site. This access will be reconstructed and improved in accordance with the Forest Service "Special Uses Road Construction Stipulation Requirements" (see Appendix A). The road will be a dual purpose road during the winter, allowing snowmobile use. Plowing is not authorized without written permission from the Forest Service. The extent of additional road improvements will be determined by the MnDOT's access needs. Access road construction at this location may include:
  - Clearing and tree/brush removal
  - Improving the existing road bed by placing approximately 1-foot of pit run granular fill material
  - Placing additional fill<sup>1</sup>, if required, in some locations along the route

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<sup>1</sup> The term "fill" in this document refers to ruts and puddles. Filling of wetlands is not proposed in this project.

- Installing culverts as required to maintain drainage
- Placing crushed aggregate surfacing as desired by user
- Buried electrical power lines may be installed adjacent to and following existing or improved access road rights-of-way. The closest power company operating in the area is Qwest at approximately three miles from the site. If installed, these power lines will be included on the existing Quest special-use permit as an amendment. Details and exact route of new, buried power lines will be defined in the amendment to the existing special-use permit prior to installation.
- Construct a 3-legged, self-sustaining steel radio tower that is dull grey galvanized in color to minimize visual impacts.
- The height of the tower will be 180 feet. The tower will contain no FCC markings, lights, or strobes.
- A concrete shelter measuring 12' x 30' x 10' will be located near the tower to house the communication equipment and a 15-34kV (kilovolt) back-up generator. The shelter is to be covered with brown stone aggregate finish to minimize visual impacts.
- Next to the shelter, a 1,000 gallon LP tank measuring 10' x 4' will be installed for fueling the generator.
- The entire site is to be contained in a 50' x 60' area.
- The site will be surrounded by a 7-foot link fence and an additional 3 strands of barbed wire extending 1 foot above the fence. The fence includes a 4 foot pedestrian gate and a 16 foot drive-through gate.
- The ground surface of the fenced area will be covered with a 4-ounce polyester filter fabric to retard growth of weeds yet porous enough allowing water to pass through to the soil. Class 5 landscape rock will cover the entire area within the communication site.
- Vertical wind turbines and solar panels may be installed on the tower as a secondary power source for recharging the battery and added to the Special-Use Authorization as an ancillary use for the communication site.

### **Forest Center**

- The location of the site is approximately in the Northeast ¼ of the Northwest ¼ of Section 20, Township 61 North, Range 8 West, 4<sup>th</sup> Principal Meridian (Lat. 47°45' 19.92"N, Long. 91°22' 28.81"W).
- Identify this location as a new communication site management area by preparing and authorizing a Communication Site Plan.
- Improve an existing timber access road, off of Forest Road 377(Tomahawk Road), for adequate access to the site. At a minimum, the road improvements will be completed in accordance with the Forest Service "Special Uses Road Construction Stipulation Requirements" (see Appendix A). It is likely that improvements beyond the minimum will need to be completed to provide access to the tower and facilities during construction and post-construction. Access road construction at this location may include:
  - Clearing and tree/brush removal
  - Improving the existing road bed by placing approximately 1-foot of pit run granular fill material
  - Placing additional fill may be required in some locations along the route
  - Installing culverts as required to maintain drainage
  - Placing crushed aggregate surfacing as desired by user
- Buried electrical power lines may be installed adjacent to and following existing or improved access road rights-of-way. The closest power company operating in the area is Cooperative Light and Power at approximately six miles from the site. If desired, the additional power

lines will be included on the existing Cooperative Light and Power special-use permit as an amendment. Details and exact route of new buried power lines will be defined in the amendment to the existing special-use permit prior to installation.

- Construct a 3-legged, self-sustaining steel radio tower, dull grey galvanized in color to minimize visual impacts.
- The height of the tower will be 180 feet. The tower will contain no FCC markings, lights, or strobes.
- A concrete shelter measuring 12' x 30' x 10' will be located near the tower to house the communication equipment and a 15-34kV back-up generator. The shelter will be covered with brown stone aggregate finish to minimize visual impacts.
- Next to the shelter a 1,000 gallon LP tank measuring 10' x 4' will be installed for fueling the generator.
- The entire site will be contained in a 50' x 60' area.
- The site will be surrounded by a 7-foot link fence and an additional 3 strands of barbed wire extending 1 foot above the fence. The fence includes a 4 foot pedestrian gate and a 16 foot drive-through gate.
- The ground surface of the fenced area will be covered with a 4-ounce polyester filter fabric to retard growth of weeds yet porous enough allowing water to pass through to soil. Class 5 landscape rock will cover the entire area within the communication site.
- Vertical wind turbines and solar panels may be installed on the tower as a secondary power source for recharging the battery and added to the Special-Use Authorization as an ancillary use for the communication site.

### **Fernberg**

- This site is located at the Southeast ¼ of the Southeast ¼ of Section 8, Township 63 North, Range 9 West, 4<sup>th</sup> Principal Meridian (Lat. 47°56'49.10"N, Long. 91°29'42.10"W).
- Remove the existing guy-wire tower at the site with written permission from the current tower owner (Lake County), retain the existing concrete footings.
- Construct a 3-legged, self-sustaining steel radio tower, dull grey galvanized in color to minimize visual impacts.
- The height of the tower will be 200 feet. The tower will contain a dual mode lighting system at the top in accordance with FCC requirements. This lighting system consists of a medium intensity white strobe light for daytime illumination and a red flashing beacon for nighttime illumination.
- A concrete shelter measuring 12' x 30' x 10' will be located near the tower to house the communication equipment and a 15-34kV back-up generator. The shelter will be covered with brown stone aggregate finish to minimize visual impacts.
- Next to the shelter a 1,000 gallon LP tank measuring 10' x 4' will be installed for fueling the generator.
- The entire tower site will be contained in a 50' x 60' area.
- The site will be surrounded by a 7-foot link fence and an additional 3 strands of barbed wire extending 1 foot above the fence. The fence includes a 4 foot pedestrian gate and a 16 foot drive-through gate.
- The ground surface of the fenced area will be covered with a 4-ounce polyester filter fabric to retard growth of weeds yet porous enough to allow water to pass through to soil. Class 5 landscape rock will cover the entire area within the communication site.

- The ground surface of the fenced area will be covered with a 4-ounce polyester filter fabric to retard growth of weeds yet porous enough to allow water to pass through to the soil. Class 5 landscape rock will cover the entire area within the communication site.
- The existing Communication Site Plan will be modified, once the site is constructed, to include all facilities on the site.

### **Meander Lake**

- This site is located at the Northwest ¼ of the Northeast ¼ of Section 17, Township 65 North, Range 14 West, 4<sup>th</sup> Principal Meridian (Lat. 48°07'12.6"N, Long. 92°9'33.0"W).
- Remove the existing 60 foot tower at the site, retain the existing concrete footings.
- Identify this location as a new communication site management area by preparing and authorizing a Communication Site Plan once the site is constructed.
- Reconstruct an existing overgrown road (unclassified road U6977) to allow access. At a minimum, the road improvements will be completed in accordance with the Forest Service "Special Uses Road Construction Stipulation Requirements" (see Appendix A). It is likely that improvements beyond the minimum will need to be completed to provide access to the tower and facilities during construction and post-construction. The unclassified road U6977 had previously been identified to be decommissioned. This MnDOT ARMER decision will supersede the previous Forest Travel Management Decision Notice/FONSI for this road, providing access to the communication site and facilities. Sections of the road are steep and the extent of additional road improvements will be determined by the MnDOT's access needs. Access road construction at this location may include:
  - Clearing and tree/brush removal
  - Improving the existing road bed by placing approximately 1-foot of pit run granular fill material
  - Placing additional fill may be required in some locations
  - Installation of culverts as required to maintain drainage
  - Placement of crushed aggregate surfacing as desired by user.
- Buried electrical power lines may be installed adjacent to and following existing or improved access road rights-of-way. The closest power company operating in the area is Lake Country Power at approximately 16 miles from the site. If desired, this additional power line will be included on the existing Lake Country Power special-use permit as an amendment. Details and exact route of new buried power lines will be defined in the amendment to the existing special-use permit prior to installation.
- Construct a 3-legged, self-sustaining steel radio tower, dull grey galvanized in color to minimize visual impacts.
- The height of the tower will be 180 feet. The tower will contain no FCC markings, lights, or strobes.
- A concrete shelter measuring 12' x 30' x 10' will be located near the tower to house the communication equipment. The shelter will be covered with brown stone aggregate finish to minimize visual impacts.
- The entire site will be contained in a 50' x 60' area.
- The site will be surrounded by a 7-foot link fence and an additional 3 strands of barbed wire extending 1 foot above the fence. The fence includes a 4 foot pedestrian gate and a 16 foot drive-through gate.
- The ground surface of the fenced area will be covered with a 4-ounce polyester filter fabric to retard growth of weeds yet porous enough allowing water to pass through to soil. Class 5 landscape rock will cover the entire area within the communication site.

- The ground surface of the fenced area will be covered with a 4-ounce polyester filter fabric to retard growth of weeds yet porous enough to allow water to pass through to the soil. Class 5 landscape rock will cover the entire area within the communication site.
- A shelter, measuring 12' x 12' x 10' and covered with brown stone aggregate finish may be installed near C.S.A.H. 116 (Echo Trail) and set back into the woods to minimize visual impacts. The shelter will contain a 15-34kV back-up generator. The 1,000 gallon LP tank measuring 10' x 4' to fuel the generator will be located next to this shelter and painted in a camouflage pattern to minimize visual impacts. This will allow the LP tank to be easily filled on a regular basis. Electrical power lines will be buried underground from the generator to the radio tower. The generator will assist in recharging batteries only when solar, wind, and electrical service power is unavailable due to weather or other conditions.

### **Implementation Requirements**

Relevant Forest Plan standards and guidelines will be followed during all project activities. In addition, all design features described in this Decision Notice and the mitigation measures described in Appendix A will be followed. The special use authorization and resulting operations will be monitored by Superior National Forest staff on an annual basis or as needed.

### **Rationale for the Decision**

In making my decision, I considered the environmental effects of each alternative and how well each alternative would meet the Project's Purpose and Need (see EA, Section 1.3). I have had discussions with the resource specialists about the effects this project would have on the natural and social resources we manage. I have carefully reviewed the project record, including the comments submitted on the scoping report and the environmental assessment. I spoke with Lake County commissioners and with representatives of MnDOT. I considered all of the issues, competing interests and values of the public, and the interactions between various resources and interests. My decision involves a balance of interests and values involving resources of the Forest, the public, MnDOT, local Counties, and the federal government.

My rationale for approving this special-use authorization involves several factors:

1. My decision is limited to approving the special use authorization for location and construction of ARMER towers on National Forest System lands within the Superior National Forest. This decision meets the Purpose and Need as stated by MnDOT, the proponent and special use applicant of the project. Minnesota Department of Transportation has communicated to the Forest Service that Alternative 2, in conjunction with other existing towers in the system, would meet their needs for installing, operating, and maintaining radio communication sites to be used for the 800 MHz ARMER project as directed by Minnesota State Statue 174.70. The proponent also acknowledges the cooperation and collaboration efforts with Cook, Lake, and St. Louis Counties as well as the State Radio Board in implementing the ARMER project as directed by Minnesota State Statue 403.36 Subd. 1.e. The towers being incorporated for this system are shown on Map 6 *All FCC Towers* of the EA.
2. My decision meets Forest Plan Objectives for special uses and communication sites, including O-SU-1 "Outside of the BWCAW, generally provide for utility transmission corridors and communication sites. Emphasize the use of common corridors and multiple use sites when granting appropriate right-of-ways." and O-SU-2 "Attempt to meet

demand for special use activities when consistent with the Forest Plan direction and when the proposed use cannot be accommodated on non-NFS land.” (Forest Plan p. 2-52) Further, during the project development phase, multiple sites were relocated or denied based on reducing impacts to resources, and the availability of non-NFS land (see EA Section 2.3). Several sites are co-located with existing uses and equipment (e.g. Fernberg tower). Thus, my decision meets the intent of these Forest Plan Objectives. I also reviewed Forest Plan direction for the BWCAW. The Forest Plan directs us to manage for the degree of challenge and risk in the wilderness, and to help visitors improve and rely on primitive skills. The Forest Plan does not require us to manage for cell phone coverage in a designated wilderness area.

3. The Pine Mountain site location is located on a parcel of land identified as potential part of a land exchange with Cook County. The County has agreed to accept the new tower as an encumbrance upon the land.
4. The existing Fernberg tower is showing age and would benefit from being replaced. It currently does not meet standard grounding requirements accepted by the industry.
5. The Fernberg tower will be a dull grey color and will be less visible than the orange and white alternating bands of the existing tower (Alternative 1). Although a medium intensity white strobe light will be illuminated during the day, it is designed to reflect upward towards aircraft and should not be visible at ground level. At night, illumination will remain the same as the existing tower with a red beacon (see EA Section 2.4 and Table 1).
6. I recognize that Lake County, MN would prefer a higher tower at the Fernberg site. Lake County asked MnDOT to request a 330’ tower at this site. Lake County felt that having a higher tower, consistent with the height of some of the other towers constructed throughout the state, would provide better radio coverage within the Boundary Waters Canoe Area Wilderness (BWCAW). That request was considered but dismissed prior to acceptance of the special use application as MnDOT felt there were other alternatives to meet the Purpose and Need. In lieu of a 330 foot tall tower Lake County feels strongly that Alternative 2 better meets their needs than Alternative 3.
7. My decision balances Lake County’s desire to maximize radio coverage in the wilderness with the desire to minimize adverse impacts to wilderness character and visual impacts overall. While the difference in coverage is minimal between Alternatives 2 and 3, differences in visual impacts are also minimal. Visual impacts, in and out of the wilderness, are increased by the construction of two new towers. They are also reduced in some aspects by reconstructing the two existing towers without guy-wires and by making them a dull grey color as opposed to the current white and orange striping. The special use authorization will allow a tower height at the Fernberg site that requires lighting, however the current tower has night lighting, so visual impacts due to lighting will remain the same as the existing condition.

## **Other Alternatives Considered**

### **Alternative 1, No Action**

Under this alternative, the Forest Service would not issue a Special-Use Authorization to construct new radio towers/facilities at Pine Mountain or Forest Center. The radio towers/facilities at Fernberg and Meander Lake would not be replaced or modified. Radio communication, particularly ARMER, would remain the same as it is currently, lacking in certain areas near and within the BWCAW. This does not meet the purpose and need.

### **Alternative 3, Alternative to Proposed Action at Fernberg**

Under this Alternative, the Forest Service would approve a Special-Use Authorization to replace, construct, operate, and maintain radio towers/facilities at the four sites. Specific actions at Pine Mountain, Forest Center, and Meander Lake communication site locations are the same as outlined in the Decision. The Fernberg site would also be the same as noted in the Decision but the tower height would have been decreased to 180 feet tall. This height does not require FCC markings, lights, or strobes to be placed on the tower. The lack of required daytime and nighttime lighting system would reduce the visual impact to a greater degree than Alternative 2. Minnesota Department of Transportation, the proponent and special use applicant, has determined that there is little difference in radio coverage between the 200' tower and the 180' tower. However, it is important to Lake County, the current owner of the existing tower, to construct a 200' tower instead of a 180' tower in order to maximize radio coverage in the BWCAW.

### **Alternatives Considered But Not Carried Forward**

Section 2.3 of the EA addressed many alternatives that were considered but not carried further. The reasons for not carrying these alternatives forward for detailed analysis are contained in Section 2.3 of the EA. These included:

- Consider other site locations
- Limit radio operations on the proposed towers to public agencies in support of the MnDOT ARMER radio system only and not allow leasing of tower space to private or for profit corporations
- Increase radio/telephone operations on the proposed towers to include commercial communication equipment
- Limit the height necessary to serve the intended purpose of the MnDOT ARMER system
- Consider designing the towers with tubular style framework instead of lattice style framework
- Consider installing gates or barricades to access roads to prevent unapproved vehicular use
- Minimize bird strikes
- Consider allowing the MnDOT ARMER system to “piggy-back” on existing Forest Service radio system
- Consider co-locating some MnDOT ARMER systems on existing towers such as those along the Gunflint Trail
- Minimize visual impact with color scheme
- Consider designing the towers to resemble native trees in the area
- Consider a 199 foot tall tower instead of 200 foot tower in an effort to remain below the height necessary for FCC lighting regulations

### **Public Involvement**

Public scoping comments were solicited via legal notice the Duluth News Tribune on May 15, 2012. The project scoping proposal was also mailed to 25 adjacent landowners and the Forest-wide mailing list consisting of all individuals who have expressed interest in project proposals on the Forest. The project was listed in the third and fourth quarters of the 2012 Superior Quarterly. Internal scoping was conducted by assembling an interdisciplinary team of Forest Service employees in February of 2012 to identify issues related to the special-use authorization.

During the scoping period, comments were received from the public including individuals, organizations, and local government agencies. See section 1.7 of the EA for specifics from Public Scoping and Section 2.3 of the EA for Alternatives Considered but Not Carried Forward. The visual impact associated with towers was a common theme.

Consultation letters were sent to the Boise Forte, Fond du Lac, and Grand Portage Bands of the Lake Superior Chippewa. No consultation was requested. No comments were received from the Bands.

I reviewed the comments on the EA (see Appendix B of the Decision Notice as Response to Comments). I realize that some people are concerned about visual impacts to the BWCAW. I believe it is allowed for within the Forest Plan to provide for actions outside the wilderness such as the communication towers that may have some impact on the wilderness, yet meet other management purposes such as increased public safety from the ARMER system. However, I also strove to minimize adverse impacts to wilderness character while meeting the Purpose and Need of the project. This was completed by rejecting several tower locations initially proposed that might have greater impacts (see EA Section 2.3), and finally through the selection of Alternative 2. I believe this strikes an appropriate balance between meeting the needs of the project proponent and responding to comments on the project while minimizing adverse impacts.

I also heard from a commenter expressing concerns that the height of the towers in the proposed action and Alternative 3 is inadequate to provide coverage envisioned in the ARMER system network. During the development of the project proposal, the proponent (Minnesota Department of Transportation) expressed that the proposed action and Alternative 3 would be adequate for their needs for the ARMER system.

### **Finding of No Significant Impact**

After considering the environmental effects described in the EA, I have determined that these actions will not have a significant effect on the quality of the human environment considering the context and intensity of impacts (40 CFR 1508.27). Thus, an environmental impact statement will not be prepared. I base my finding on the following:

**Context** - The geographical setting of the proposal is the immediate area. It does not have implications that warrant extending the analysis beyond the Superior National Forest. The physical and biological effects are disclosed in Chapter 3 of the EA and are analyzed at appropriate scales, such as the specific site locations where towers would be constructed, and across the Superior National Forest as based on each resource. The effects of the Project are limited to those described in the EA and other documents incorporated by reference. All actions are consistent with the Forest Plan, and all environmental effects are within the range of effects disclosed in the 2004 Forest Plan FEIS.

The EA shows that Alternative 2 will not have significant effects on the resources, either in the short-term or long-term.

**Intensity** - The severity of the impact will not be significant based on the following:

**1. Impacts may be both beneficial and adverse. A significant effect may exist even if, on balance, effects are believed to be beneficial.**

Both beneficial and adverse effects have been taken into consideration when making this determination of significance. Beneficial effects have not, however, been used to offset or compensate for potential adverse effects. A special-use authorization for radio facilities and towers will not result in significant adverse effects to the character of the areas or quality of air, water, soils, visual resources, or wildlife habitat (see EA, Chapter 3). Only several acres of land across the Forest will be committed to the footprint of the towers. Authorizing such a use for the ARMER system will be beneficial to public safety and will not create potential conflicts with other management actions.

**2. The degree of effects on public health or safety.**

The selected action will allow the State of Minnesota to install or replace radio towers at various locations. These towers will house radio equipment to potentially increase public health and safety. When implemented by the proponent, the ARMER system will provide emergency response personnel the means and ability to share information via voice and/or data systems on demand in real time.

**3. 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.**

There will be no significant effects on unique features in the area, such as historical or cultural resources, prime forest lands, wild and scenic rivers, scientific resources, or ecologically critical areas. Mitigation measures are required as outlined in Appendix A Mitigation Measures. These measures and the design of the project help avoid and minimize any possible impact to the environment during construction.

- **Park Lands and Prime Farm Lands** – There are no park lands or prime farm lands within the lands that would be used to construct and operate the towers.
- **Wetlands** – There are no wetlands affected by this project. The tower footprints are not located in wetlands.
- **Wild and Scenic Rivers** – The project area is not located within an Eligible Wild, Scenic, or Recreational River Management Area.
- **Ecologically Critical Areas** – The project area is not within a Unique Biological Areas, candidate Research Natural Areas, or Research Natural Areas or other ecologically critical areas. The project area was surveyed for heritage resources, threatened, endangered, and sensitive species. No resources needing additional protection or management were located.
- **Boundary Waters Canoe Area Wilderness** – The four towers are located between one-half and six miles from the BWCAW boundary. Section 3.1 of the EA discloses effects of the project on the BWCAW. This decision will affect the BWCAW in specific locations as identified in Table 2, Section 3.1.5 Environmental Consequences Direct and Indirect Effect of the EA. This decision adversely affects wilderness character because three additional towers will now be visible from various locations within the BWCAW during the day. Pine Mountain and Forest Center are new towers and the increased height of Meander tower result in these towers being visible from specific locations. These three towers will be limited to 180 feet high and contain no day or nighttime illumination. The towers will be dull grey in color, which makes them less visible. The effects of these towers on wilderness have been reduced to the extent they can yet still meet the Purpose and Need of the project. The replacement tower at Fernberg will have a slightly reduced visual impact as compared to the

existing tower. The replacement tower will be 20 feet lower, dull grey in color instead of orange and white alternating bands, reducing the daytime visual impact. The replacement tower will have a medium intensity white light during the day, however the light will be directed upwards and not expected to be noticeable from the ground level. The nighttime red beacon that is currently visible on the existing tower will also be on the replacement tower. Therefore, while this replacement tower may be less visible than the existing tower during the day, it retains the nighttime illumination resulting in the effects being nearly the same as the current condition. I considered all of these changes to be a limited increase in adverse cumulative effects for the reasons discussed above and due to the lack of lights on the new towers and on the Meander replacement tower. I note that the Wilderness Act expressly provides that it shall not “be deemed to be in interference with” other federal laws such as the “Multiple-Use Sustained Yield Act of June 12, 1960.” 16 U.S.C. § 1133(a)(1). The special-use authorizations for these towers, which are located outside the wilderness, are one of the allowed uses in the Forest Plan. My decision complies with the Wilderness Act of 1964 (P. L. 88-577) and the Boundary Waters Canoe Area Wilderness Act of 1978 (P. L. 95-495).

**4. The degree of controversy over environmental effects.**

Although there is controversy among some people over the potential for significant effects and potential effects from visual impacts, there is not significant scientific controversy over the information used to disclose environmental effects in the EA. The visual impact study conducted by MnDOT adequately portrays the visibility of towers in the BWCAW. Another visual impact study was submitted by Friends of the BWCAW; however this study was not applicable to this project since it did not evaluate the specific heights and locations of the towers proposed.

**5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.**

The scoping and EA revealed no unknown effects on the human environment that are highly uncertain or that involve unique or unknown risks. Multiple communication towers exist on the landscape and have been in operation, and the effects of the ARMER towers are not anticipated to be substantially different. The visual impact study for the ARMER towers did not identify any unique or unknown risks; the effects were adequately described.

**6. 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.**

This action does not set precedence for future decisions, including other special-use authorizations. The purpose and need for this project is only for MnDOT ARMER system (see EA, Chapter 1, Purpose and Need). Future decisions will consider all relevant scientific and site-specific information available at that time.

**7. 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.**

Each of the resource sections in Chapter 3 of the EA addressed potential cumulative effects. This action does not represent potential significant cumulative impacts when considered in combination with other past or reasonably foreseeable actions, including previous and planned radio towers.

It is noted in the EA (Section 3.1.4) that existing radio towers within 7 miles of the BWCAW may possibly be seen somewhere within the BWCAW. I recognize that the new towers constructed under special use authorization in my decision create additional areas of the BWCAW that may experience visual impact from a tower. However, the visual impacts of this project are minimized by limiting the height of the towers to 180 feet for the new towers and the replaced tower at Meander. The replacement tower at Fernberg will have the same nighttime illumination as the existing tower. I also recognize that communication towers and other human-made sights may occasionally be visible in areas near the BWCAW boundary. The cumulative impacts are not significant.

**8. 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.**

There will be no effects to heritage resources (EA section 3.4). The Pine Mountain site was moved from its original staked location to avoid any possible conflicts with the footing of the previous fire lookout tower. The direction in the Programmatic Agreement between the Superior National Forest and the State Historic Preservation Office was followed for this project.

**9. 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 (ESA).**

Determination of the impacts on listed rare plants and animals from this action are provided in the biological evaluation and the biological assessment and summarized in Section 3.3 of the EA. We submitted the biological assessment to US Fish and Wildlife Service for their concurrence with the Agency finding that the project may affect but is not likely to adversely affect Canada lynx and that the project is not likely to adversely modify critical habitat for Canada lynx. The US Fish and Wildlife Service concurs with the Agency finding based on the analysis in the BA and the project's compliance with provisions set forth in the Forest Plan.

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

This action does not violate any federal, state or local laws, or requirements for protecting the environment, including NFMA and associated regulations that provide for amendments of Forest Plans. See Findings Required by Other Laws and Regulations section of this Decision Notice.

**Findings Required By Other Laws and Regulations**

The decision meets the requirements of all applicable laws, regulations and executive orders. Special-Uses are authorized under the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2755 as amended; 43 U.S.C. 1701, 1715, 1716, 1717).

**National Forest Management Act (NFMA)**

As required by the NFMA and the 2012 Planning Rule, my decision complies with the requirements of the 2004 Forest Plan. My decision helps meet Forest Plan Objectives for special use management (see Rationale for the Decision).

**The Wilderness Act and 1978 BWCA Act**

See the Finding of No Significant Impact, item #3. My decision complies with the Wilderness Act of 1964 (P. L. 88-577) and the Boundary Waters Canoe Area Wilderness Act of 1978 (P. L. 95-495).

**National Historic Preservation Act**

There will be no effects to heritage resources (EA section 3.4). The Pine Mountain site was moved from its original staked location to avoid any possible conflicts with the footing of the previous fire lookout tower. The direction in the Programmatic Agreement between the Superior National Forest and the State Historic Preservation Office was followed for this project. My decision complies with the National Historic Preservation Act.

**Executive Orders on Floodplains (EO 11988) and Wetlands (11990)**

This project shall be confined to areas that are not identified as wetlands or floodplains. My decision complies with EO 11988 and 11990.

**Environmental Justice (EO 12898)**

All special-uses must be conducted in a discrimination-free atmosphere. The Special-Use Authorization contains such a clause that if breached, will nullify the authorization. The site locations are not located in an area that would cause disproportionately high and adverse human health or environmental effects on minority population or on low-income populations in accordance with Executive Order 12898 of February 11, 1994, Environmental Justice.

**Clean Air Act**

The project itself would not result in emissions affecting the visibility in the Class I Airshed of the BWCAW. My decision is in compliance with Clean Air Act provisions for Forest Service management, including Class I Airshed management.

**Administrative Review and Contacts**

This decision is subject to appeal pursuant to Title 36 CFR 215. An appeal may be filed by those who submitted comments on the project during the 30-day comment period on the environmental assessment. The appeal must be filed within 45 days of the date that the notification of this decision is published in the Duluth News Tribune, the official newspaper of record, published in Duluth, Minnesota. However, when the 45-day filing period would end on a Saturday, Sunday, or Federal holiday, then filing time is extended to the end of the next Federal working day. The publication date of the legal notice is the exclusive means for calculating the time to file an appeal. The Notice of Appeal must be sent to:

Regional Forester, Kathleen Atkinson  
Eastern Region  
USDA Forest Service  
626 East Wisconsin Avenue  
Milwaukee, WI 53202

Facsimile Number: 414-944-3963

Office Hours: 7:30 AM to 4:00 PM Central Standard Time, Monday-Friday

## MnDOT ARMER Special-Use Authorization

Electronic address for email appeals: [appeals-eastern-regional-office@fs.fed.us](mailto:appeals-eastern-regional-office@fs.fed.us), subject: ARMER Project Notice of Appeal, Superior National Forest. Acceptable electronic file formats include: txt, html, pdf, or any file format viewable from MS Office applications. In cases where no identifiable name is attached to an electronic message, a verification of identity will be required. A scanned signature is one way to provide verification.

Appeals must meet the content requirements of 36 CFR 215.14 and will only be accepted from those who have expressed interest during the formal, 30-day comment period. It is the responsibility of those who appeal a Decision to provide the Deciding Officer sufficient narrative evidence and argument to show why this Decision should be changed or reversed. At a minimum, the written Notice of Appeal must:

- State that the document is a Notice of Appeal filed pursuant to 36 CFR part 215;
- List the name, address, and, if possible, a telephone number of appellant;
- Identify the decision document by title and subject, date of the decision, and name and title of the Responsible Official;
- Identify the specific changes(s) in the decision that the appellant seeks or portion of the decision to which the appellant objects;
- State how the Responsible Official's decision fails to consider comments previously provided, either before or during the comment period specified in 36 CFR 215 and, if applicable, how the appellant believes the decision violates law, regulation, or policy.

Those who are legal instrument holders, such as permittees, can also appeal under 36 CFR 251 Subpart C and must meet the requirements of 36 CFR 251.90. Legal instrument holders must stipulate which appeal regulation they are appealing under. They cannot appeal under both.

### Implementation Date

As per 36 CFR 215.9, if no appeal is received, implementation of this decision may occur on, but not before, the 5th business day following the close of the appeal-filing period (215.15). When an appeal is filed, implementation may occur on, but not before the 15th business day following the date of appeal disposition (36 CFR 215.2). If the decision is not subject to appeal as per 36 CFR 215.12(e)(1), the action may be implemented immediately after publication [36 CFR 215.9(c)(1)].



**Brenda Halter**  
**Forest Supervisor**



**Date**

The U.S. Department of Agriculture Forest Service prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status (not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination write: USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Ave, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA Forest Service is an equal opportunity provider and employer.

## Mitigation Measures for MnDOT ARMER

### Appendix A

- Locate Pine Mountain site a distance of approximately 180 feet southeast of the site staked by MnDOT. This eliminates any possible historic impact to remains of the former US Forest Service fire lookout. Possible heritage site will be flagged to identify furthest edge.
- Construct a 3-legged, self-sustaining steel radio tower without guywires on all proposed towers. This mitigates possible bird strikes from the wires.
- Remove the existing guy-wire tower at the Fernberg site. This mitigates possible bird strikes from the wires.
- Have the color of the tower structures a dull grey galvanized. This mitigates daytime visual impacts.
- The height of towers located at Pine Mountain, Forest Center, and Meander Lake will be 180 feet and contain no FCC markings, lights, or strobes. This mitigates nighttime visual impacts.
- A concrete shelter shall house the communication equipment and a 15-34kV (kilovolt) back-up generator. The shelter is to be covered with brown stone aggregate finish. This is to mitigate visual impacts and noise from the generator.
- A 1,000 gallon LP tank shall be painted earth tone colors. This is to mitigate visual impacts.
- The ground surface of the tower site will be covered with a 4-ounce polyester filter fabric to retard growth of weeds yet porous enough to allow water to pass to soil. Landscape rock of class 5 will cover the entire area within the communication site. This mitigates non-native vegetation.
- Vertical wind turbines and solar panels may be installed upon the tower as an ancillary use for recharging battery power.
- Road construction and reconstruction shall abide by the “Special Uses Road Construction Stipulation Requirements” which stipulates the following:
  - This stipulation is hereby made by and between the party named as permittee on the special use authorization for a road, to which this stipulation is attached, hereinafter referred to as “Holder,” and the United States Department of Agriculture, Forest Service, hereinafter referred to as “Forest Service.”
  - Whereas, the Holder, has been issued a special-use authorization of the use and occupancy of the National Forest System land for the use and maintenance of a road, and such authorization requires that all construction conform with approved plans, specifications, and stipulations approved by the Forest Service.
  - Now, therefore, the Holder, by acceptance of and by signature of the special use authorization to which this stipulation is attached, hereby authorizes the construction to proceed in accordance with these terms and conditions.

1. The Forest Service may suspend all or any part of the construction/reconstruction activities and/or revoke or terminate the special-use authorization without administrative proceedings upon breach of any of the conditions herein.  
Prior to the suspension, revocations, or termination, the Forest Service shall give the Holder written notice of the grounds for such action and reasonable time to cure any noncompliance. However, the Forest Service may require immediate temporary suspension of all or any part of the activities when the Forest Service determines it is necessary to protect the public health, safety, or the environment. If requested by the Holder, the superior to the officer ordering the suspension, revocations, or termination shall arrange within 10 days of the request for an on-the-ground review of the conditions with the Holder. The superior shall affirm, modify, or cancel the temporary suspension as soon after the review as possible.
2. The Holder shall be responsible for the prevention and control of soil erosion and gullying in the construction area and adjacent areas and shall take such preventative measures as are necessary to repair and revegetate damaged areas and to prevent future damage.
3. The Holder shall protect scenic and esthetic values in the construction area as far as possible.
4. The Holder shall take reasonable precautions to protect all public land survey monuments and accessories, private property corners, and forest boundary markers. In the event that any such land markers or monuments are damaged or destroyed, the Holder shall re-establish or reference the corner in accordance with directions and procedures to be furnished by the Forest Service.
5. The Holder shall maintain a muffler or spark arrester satisfactory to the Forest Service on the exhausts of all trucks and tractors or other internal combustion engines used in connection with this project.
6. During the fire season, as determined by the Forest Service, the Holder shall furnish and maintain in serviceable condition a fire-tool box and fire tools to be used only for suppression of forest fires. The toolbox shall be located at the site and shall contain the tools necessary for fire suppression as agreed upon by the Holder and the Forest Service.
7. The Holder shall equip each gasoline power saw at all times with a spark-arresting muffler, in good working condition and adapted to that machine. During periods of dangerous fire weather, as determined by the Forest service, the holder must transport and keep with each power saw at all times such fire tools and portable extinguishers as specified and to take other precautionary measures as may be required by the Forest Service.
8. The Authorized Officer has determined that at this time no performance bond will be required for this permit; provided, however, that at such time as the Authorized officer Ranger determines that bonding is needed to protect the resources, not to exceed \$1,000.00 within 30 days of notification by certified mail. Failure to post the required bond or cash in lieu of bond within the required 30 days will result in the termination of the authorizing permit.

9. Prior to any road clearing/construction, the USDA Forest Service must assess the timber value, and payment must be made by the permittee.
10. The road design specification shall comply with the following standards:
  - a) All merchantable timber assessed, paid for, and cut must be removed from Government land.
  - b) Clearing and grubbing of brush, non-merchantable timber, stumps, topsoil, and other debris removed from within the cleared right-of-way will be disposed of by scattering it away from the road at least ten feet and/or in J shaped pushouts matted down and covered with grubbed topsoil, ensuring it lies within two to three feet height of the ground. No construction slash shall be deposited in lakes, meadows, streams, or other wetlands.
  - c) Fill depths would be the minimum required to avoid severe rutting or other adverse environmental impacts.
  - d) The running width shall be (12 or 14) feet except for turnouts. Fill and cut slopes should be 2:1 or flatter. Ditches shall be V shaped and one foot deep with 2:1 slopes and shall be installed on slopes where erosion of the roadway is likely.
  - e) Turnouts can be constructed if the permittee desires but they should not exceed 50-foot long full widening at an 8-foot width, with 50-foot transitions.
  - f) Culverts will be located so as to provide proper drainage and of adequate size to carry anticipated water volumes. Live stream crossings require the use of silt fence and riprap at the culvert to prevent the siltation of road material into the stream. The use of an approved seed mix may be required to stabilize the road slopes in these locations.
  - g) Side entrances that intersect Forest Service roads shall have a 35-foot radius and shall intersect at a right angle.
  - h) The Forest Service must approve wetland-crossing designs. A proper road design is necessary to avoid road failure when crossing wetlands. Technical assistance may be required.
  - i) The Forest Service is not liable for road failure due to improper road design or incorrect construction methods.

## **Response to Comments**

### **Appendix B**

All comments received on the MnDOT ARMER Environmental Assessment were reviewed by the interdisciplinary team and Forest Supervisor. The comments were consolidated and salient issues, questions and concerns are responded to in this appendix.

#### **1. Mark R. Falk, Cook County Sheriff**

**Comment 1.1:** The ARMER radio towers are vital to providing public safety to the citizens of Cook and Lake Counties and visitors to the Superior National Forest. The Cook County Sherriff's Office fully supports the Special-Use Authorization that has been proposed for the Pine Mountain tower location.

**Response:** We agree that public safety is a concern throughout the Superior National Forest and thank you for your comment.

**Comment 1.2:** I suspect there will be proposals in the near future for towers located near the Boundary Waters Canoe Area Wilderness (BWCAW) in Cook County as we migrate to the ARMER System as mandated by the State Radio Board (SRB).

**Response:** Any and all new Special-Use Authorization proposals will be evaluated on their own merit in accordance with laws and policies of the National Forest.

#### **2. Lolita M. Schnitzius**

**Comment 2.1:** I support the proposed action.

**Response:** Thank you for your comment.

#### **3. Laurel Buchanan, Lake County Board of Commissioner Clerk**

**Comment 3.1:** I am requesting a hard copy of the Draft EA.

**Response:** Thank you for your comment. A copy was mailed October 12, 2012.

#### **4. Leonard Cersine, Town of Moose (Phone Call)**

**Comment 4.1:** I support the proposed action and please send me a hard copy of the Draft EA.

**Response:** Thank you for your comment. A copy was mailed October 25, 2012.

## 5. Dr. Thomas Cliffard, Lake County Commissioner

**Comment 5.1:** We request the Decision Notice be delayed while Lake County and Minnesota Department of Transportation (MnDOT) continue discussions regarding the effectiveness of tower heights and meeting the 95% coverage mandated by the SRB in Lake County. Until these discussions are complete, we feel a decision by the Forest Service is premature.

**Response:** The Forest Service contacted MnDOT, the proponent of the Special-Use Application, on October 25, 2012 to verify their desires and asked if they agreed in delaying the Decision. MnDOT would like to proceed with the Decision. MnDOT further suggested Lake County contact the Department of Public Safety / SRB if there are concerns with the radio coverage of the proposed action. MnDOT communicated the Proposed Action and the Alternative to the Proposed Action would meet the needs of the project. However the Forest supervisor did meet with the County Board Chair to discuss their continued concerns and did delay the decision while the board considered additional comments to the Forest Service.

## 6. Craig Engwall, Minnesota Department of Natural Resources

**Comments 6.1:** We have no further comments.

**Response:** Thank you for your comment.

## Comments received after the Comment Period Ended

## 7. Carey Johnson, Lake County Sherriff

**Comment 7.1:** I am concerned with the change in tower height. When MnDOT originally approached the County about joining the ARMER project, the tower height was 330-foot tall.

**Response:** The EA states, “The original special-use application proposed from the proponent included tower heights up to 330-foot. Through discussions and site visits, MnDOT modified their application by reducing the tower height which is reflected in the Proposed Action of this EA. The lower height reduces the radio coverage, however it still meets MnDOT’s needs while minimizing visual impacts.” (EA 2.3 Alternatives Considered But Not Carried Forward For Further Analysis)

“Based on the data supplied by the proponent, the predicted communication coverage is approximately 8 to 9 miles for a 200 foot tower. According to MnDOT’s report *180 ft. Tower vs. 200 ft. Tower*, the communication coverage for a 200-foot tower is about the same as for the 180-foot tower. Since there is little if any difference in communication

coverage between the two heights, the Fernberg communication site would be a 180 foot tower.” (EA 2.2 Alternative 3, Alternative to Proposed Action at Fernberg)

**Comment 7.2:** There were two studies performed that described the radio coverage of towers. One was *Minnesota Local and Regional Public Safety Interoperable Communications Assessment Project, Radio Systems Needs Assessment and Alternatives Report for Lake County*, written November 23, 2009 by Federal Engineering of Fairfax Virginia. The second was *Lake County Minnesota, ARMER Participation Plan*, written October 2010 by GeoComm of St. Cloud, Minnesota. The studies were based on tower heights of 330-feet. I feel any tower lower than this 330-foot would not provide adequate radio coverage. Copies of the studies are provided to the Forest Service.

**Response:** We thank you for the opportunity to review these reports.

The purpose of the report by Federal Engineering is to identify radio system infrastructure enhancements needed and discuss available alternatives to meet the needs of individual counties. The study compared the County’s existing radio system with the ARMER radio system. When the report identified the County’s existing radio system components (p. 21-30) it also described the existing 220-foot tower at Fernberg (also known as Snowbank and Lake One tower) (p. 33-34). The ARMER System is described in detail under Alternative 3, specifically describing the radio system, predicted radio coverage, equipment requirements, incentives, and cost (p. 109-124). We were unable to locate in this report, any reference to the height of Fernberg, or any other tower being, 330-feet tall.

The purpose of the report by GeoComm is to request from the State, authorization for the County to participate in the ARMER System. We were unable to locate in this report, any reference of Fernberg or any other tower being 330-feet in height.

**Comment 7.3:** By using the location of the towers in the reports provided, I feel limiting the tower height and lowering it from 330-feet will not provide adequate radio coverage. If towers are shorter, more towers would be required to meet the same radio coverage. More towers would be more visually disruptive, add extra expense, and cause additional land impact.

**Response:** The Forest Service contacted MnDOT, the proponent of the Special-Use Application, on October 25, 2012. MnDOT communicated the Proposed Action and the Alternative to the Proposed Action would meet the needs of the project. MnDOT also suggested that Lake County contact the Department of Public Safety / SRB if there are concerns with the radio coverage of the proposed action.

## 8. Kris Wegerson

**Comment 8.1:** The Pine Mountain tower would be placed on a hilltop at 2,190 feet above sea level (ASL), standing at 2,370 feet ASL. This is 69 feet taller than Eagle Mountain (highest

point in Minnesota). The tower would be visible on Ram Lake (EA Table2) and could also be visible on Lower Trout Lake and Abita Lake.

**Response:** One of the many factors required to determine visual impact is an unobstructed line-of-sight. MnDOT's *Visualization Study* indicated that in the BWCAW, only Ram Lake would have an unobstructed line of site. Abita Lake sits at 2,060 feet ASL, abuts next to a range of hilltops being 2,140-2,182 feet ASL, and the hilltops stand in the line of sight between the lake and Pine Mountain. Bower (not Lower) Trout Lake sits at 1,643 feet ASL, abuts next to Brule Mountain range being 2,226 feet ASL, and the Brule Mountain range stands in the line of sight between the lake and Pine Mountain. Therefore, Abita Lake and Bower Trout Lake do not have an unobstructed line of sight to the proposed tower location. (Lima Mountain Quadrangle map dated 1991)

**Comment 8.2:** Grand Marais/Cook County Airport is 5 miles from Pine Mountain site. The airport already has a communication tower with a white-green beacon which operates from dusk to dawn. The proposed Pine Mountain tower should be collocated on or at the same existing tower owned by the airport.

**Remarks:** Consideration was given to co-locating on existing towers but was not carried forward for analysis. *Consider co-locating some MnDOT ARMER systems on existing towers such as those along the Gunflint Trail.* MnDOT ARMER systems are currently co-located on 8 of the 11 communication management site locations on National Forest System lands, including the Gunflint Trail. These sites are identified in Map 6. To meet the desired coverage needs of the SRB, additional towers are required near the BWCAW. (EA 2.3 Alternatives Considered But Not Carried Forward For Further Analysis)

Additionally, the Forest Service cannot mandate or order the FAA to alter its towers being used for air traffic control.

**Comment 8.3:** Meander Lake and Forest Center would be seen in the BWCAW where the Management Area is designated Primitive Wilderness. "Desired social conditions under Primitive Wilderness MA state the area provides excellent opportunities for isolation and solitude, relatively free from the sights and sounds of humans." (EA, p5) "The Solitude or Primitive and Unconfined Type of Recreation quality is the primary quality that is evaluated for impacts by the project because it directly relates to how the visibility of communication towers from inside the wilderness could affect opportunities for solitude provided by and expected in a wilderness setting." (EA, p18) Since Meander Lake tower would have a significant visual impact on and degrade the wilderness experience in the BWCAW, I believe that a full Environmental Impact Study (EIS) is mandatory.

**Response:** An indicator for solitude opportunities inside the wilderness is remoteness from occupied and modified areas outside the wilderness. A measure for this indicator is the number of sites where the tower is visible within the BWCAW, specifically concerning night sky visibility. For this analysis, the effects from the tower structure itself and the lighting system for Fernberg are evaluated by the view of modern civilization at receptor sites, and the meaning of these effects on the opportunity for

solitude in the BWCAW. The MnDOT *Visualization Study* was used to identify the possible line-of-site observation points at recreation locations within the BWCAW where each proposed communication tower could be viewed during daylight hours. During night hours, only the Fernberg existing and proposed 200-foot tower would be seen due to a nighttime lighting system. When visual impacts across the BWCAW are considered, Alternative 2 would be a minor increase in adverse cumulative effects. This is due to the lack of lights on the new towers, the limited height of the new towers, the familiarity of these features on the landscape, and limited locations where the towers would be seen while in the BWCAW. Under Alternative 3, the cumulative effects would decrease in the BWCAW near the Fernberg site due to the lack of a lighting system when replacing the existing tower.

See the Decision Notice and Finding of No Significant Impact which explains why an EIS is not necessary for this project.

**Comment 8.4:** The area north of Forest Center tower was burned in the Pagami Creek Fire of 2011. Did MnDOT's *Visualization Study* take the loss of trees into account? How many 110-foot white pines remain to provide any viewing screen from the proposed tower?

**Response:** The MnDOT *Visualization Study* has the following statement when describing the visual impact of every proposed tower location: "The observer must have an unobstructed view "Line of Sight" to the object. Of the 1 million lines of site profiles calculated around the Forest Center Tower within 7 miles, 1.81% of these profiles present an unobstructed view of the tower. See attached maps. This calculation does not take into consideration vegetation or tree loss due to logging, forest fires, or other natural forces of nature beyond Mn/DOT's control." Terrain and topography were the main driving forces in determining locations where each tower could be viewed.

While it is possible that greater accuracy in the study could be achieved by accounting for vegetation loss such as from the Pagami Creek fire, "terrain and topography were the main driving forces in determining locations where each tower could be viewed" (not vegetation). Further, future vegetation loss from logging that may or may not be planned in the future and natural disturbance is not reasonably foreseeable or knowable in timing, area and location as noted by MnDOT. Finally, vegetation will grow back and reduce visual impacts, while areas of disturbance are dynamic on the landscape. The MnDOT study reasonably chooses not to include tree loss due to logging, forest fires, or other natural forces. The MnDOT Study is the best available information for estimating the visual impact.

**Comment 8.5:** The visual impact radius for Fernberg and Forest Center towers nearly intersect. This means that either tower would be seen for nearly 14 miles inside the BWCAW.

**Response:** The MnDOT *Visualization Study* indicates, "The distance at which MnDOT's typical communication tower would present an object of 1 arc minute is 7 miles. Beyond this distance vision better than 20/20 or visual aids would be required to perceive the

tower.” The human eye has the ability to only see a distance of 7 miles in one direction at a single time. Because the radius of these towers do not connect or overlap the possibility of viewing towers for 14 consecutive miles is inaccurate.

**Comment 8.6:** According to MnDOT’s report *180 ft. Tower vs. 200 ft. Tower*, there is little difference in radio coverage between these heights. This raises the question, what is the breaking point where adequate coverage would be compromised. Could a tower being 160, 140, or 120 feet tall be used instead of 180-200 foot?

**Response:** Assuming there is no disruption of line-of-sight, no variables from weather, and no atmospheric interference from sun spots, a simple mathematical equation can estimate the radio coverage from different heights.

$\text{SQRT}(2 * \text{Tower Height}) = \text{Radio Horizon}$

Tower at 120 foot = 15.5 Miles

Tower at 180 foot = 19.0 Miles

Tower at 200 foot = 20.0 Miles

Tower at 220 foot = 21.0 Miles

Tower at 330 foot = 25.7 Miles

When operating in the 800MHz band (ARMER frequency), line-of-sight is crucial for reliable radio signal functionality. The distances above are reduced in reality due to geographical terrain, the Earth’s curvature, natural obstruction, and human interference. This same equation was supplied by MnDOT Office of Electronic Communications and the Forest Service Chief Information Office / Information Solutions Organization.

The tower heights for the Proposed Action and Alternative to the Proposed Action were determined to be tall enough to meet the needs of the project and low enough that visual impacts would be limited.