

MEMORANDUM FOR:	Matthew M. Kuzemchak, NWS NEPA Coordinator
FROM:	Jessica Schultz, Radar Focal Point, National Weather Service
SUBJECT:	Finding of No Significant Impact for Lowering the Minimum Scan Angle of the KRGX Weather Surveillance Radar - Model 1988 Doppler (WSR-88D) serving the Reno, NV, area – DECISION MEMORANDUM

Based on the subject environmental assessment, I have determined that no significant environmental impacts will result from the proposed action. I request your concurrence in this determination by signing below. Please return the memorandum for our files.

1. I concur \_\_\_//signed 8/15/18//\_\_\_\_\_ Date

2. I do not concur \_\_\_\_\_ Date

Attachment

## MEMORANDUM

**TO:** All Interested Government Agencies and Public Groups

Under the National Environmental Policy Act, an environmental review has been performed on the following action.

**TITLE:** Lowering the Minimum Scan Angle of the KRGX Weather Surveillance Radar - Model 1988 Doppler (WSR-88D) serving the Reno, NV, area

**LOCATION:** Virginia Peak, Washoe County, NV

**SUMMARY:**

The National Weather Service (NWS) owns and operates the existing Weather Surveillance Radar, Model 1988 Doppler (WSR-88D) serving the Reno, NV, area. . The radio call letters of the radar are KRGX and the radar is located at the crest of Virginia Peak, a remote mountain located about 24 miles northeast of downtown, Reno, NV. The KRGX WSR-88D was commissioned in June 1995 and is one of 159 WSR-88Ds in the nationwide network.

The KRGX WSR-88D antenna transmits a narrow focused main beam with a width of 1 degree. In normal operation, the WSR-88D antenna rotates horizontally to cover all directions (i.e. azimuths). The radar antenna also varies the scan angle at which it points with respect to the horizon. The scan angle is measured along the axis of the main beam and can be changed in 0.1 deg increments. Currently, the KRGX radar operates at a minimum of scan angle of +0.5 degrees (deg) above the horizon. NWS proposes to reduce the minimum scan angle of the KRGX WSR-88D from the current minimum of +0.5 deg to -0.2 deg (the proposed action). Lowering the minimum scan angle would provide enhanced coverage of the lower portions of the atmosphere. No construction activities or physical modification of the KRGX WSR-88D would be required to implement the proposed action; the only change would be to the radar's operating software.

**RESPONSIBLE OFFICIAL:** Jessica Schultz, Radar Focal Point, National Weather Service, 1200 Westheimer Drive, Norman, OK 73069, Tel. (405)573-8808, email: [Jessica.a.schultz@noaa.gov](mailto:Jessica.a.schultz@noaa.gov)

The environmental review process led us to conclude that this action will not have a significant effect on the human environmental. A copy of the finding of no significant impact, including the supporting environmental assessment is enclosed for your information. Please submit any comments to the responsible official named above by **September 17, 2018**.

Also, please send one copy of your comments to me in 1325 East-West Highway, Room 3353, Silver Spring, MD 20910.

Sincerely

Matthew M. Kuzemchak  
NWS NEPA Coordinator

Enclosure

**FINDING OF NO SIGNIFICANT IMPACT (FONSI)**  
**LOWERING THE MINIMUM SCAN ANGLE OF THE WEATHER**  
**SURVEILLANCE RADAR-MODEL 1988, DOPPLER (WSR-88D)**  
**SERVING THE RENO, NV, AREA**

**ENVIRONMENTAL ASSESSMENT (EA) SUMMARY**

**Purpose and Need**

NWS is part of the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce. NWS operates a nationwide network of 159 Doppler weather radars, which collect data on atmospheric conditions, and include precipitation type and intensity, wind speed and direction, and storms, from near ground level to above 10,000 ft in elevation above the ground. NWS staff uses these data to prepare daily forecasts and issue severe weather watches and warnings, and to further NWS's mission to protect and enhance life and property and the nation's economy. The WSR-88D serving the Reno, NV, area has radio call letters KRGX and is located at Virginia Peak, a remote mountain crest about 24 miles northeast of downtown Reno, NV. Operating this radar at lower scan angles would increase the area of radar coverage, providing additional data on atmospheric conditions to NWS forecasters and other data users. The area covered at 2,000 ft above site level (ASL) would increase by 291%.

**Description of Proposed Action**

The KRGX WSR-88D is an S-band Doppler, dual polarized weather radar, which NWS uses to collect meteorological data to support weather forecasts and severe weather warnings for Northwestern Nevada and Northeastern California. The KRGX WSR-88D antenna transmits a narrow focused main beam with a width of 1 degree. In normal operation, the WSR-88D antenna rotates horizontally to cover all directions (i.e. azimuths). The radar antenna also varies the scan angle at which it points with respect to the horizon. The scan angle is measured along the axis of the main beam and can be changed in 0.1 deg increments. Currently, the KRGX radar operates at a minimum scan angle (at the center of the beam) of +0.5 degrees (deg) above the horizon. NWS proposes to reduce the minimum scan angle of the KRGX WSR-88D from the current minimum of +0.5 deg to -0.2 deg (the proposed action). Lowering the minimum scan angle would provide enhanced coverage of the lower portions of the atmosphere. No construction activities or physical modification of the KRGX WSR-88D would be required to implement the proposed action; the only change would be to the radar's operating software.

**Alternatives Considered**

NWS evaluated the benefits and potential impacts of lowering the minimum scan angle of the KRGX WSR-88D to each angle between +0.4 and -0.2 deg in 0.1 degree increments. That analysis found that a minimum scan angle of -0.2 deg would result in improvement of radar

coverage while not causing significant environmental impacts. Based on this information, NWS selected a minimum scan angle of -0.2 deg as the proposed action.

The no action alternative consists of continued operation of the KRGX WSR-88D at the existing minimum scan angle of +0.5 dg. The improvements in radar coverage would not be achieved and the project objectives would not be met. The proposed action would result in increased RF exposure at certain portions of the atmosphere while the no-action alternative would not change RF exposure levels from existing levels. Several communications towers in proximity to the KRGX WSR-88D would be directly illuminated by the WSR-88D main beam under both the proposed action and the no-action alternative. During normal operation of the KRGX WSR-88D with a rotating antenna) radiofrequency (RF) exposure at all of these structures would conform to safety levels for the general public and workers established by American National Standards Institute / Institute of Electrical and Electronics Engineers (ANSI/IEEE), Occupational Health and Safety Administration (OSHA), and Federal Communications Commission (FCC).

### **Environmental Consequences**

NWS prepared an Environmental Assessment (EA) analyzing the potential environmental consequences of the implementing the proposed action in compliance with the President's Council on Environmental Quality (CEQ) National Environmental Policy Act implementing regulations (40 Code of Federal Regulations Parts 1500 – 1508) and NOAA Administrative Order (NOA) 216-6A: *Compliance with the National Environmental Policy Act , Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990 Protection of Wetlands.* (April 22, 2016).

Lowering the minimum scan angle of the KRGX WSR-88D would not require physical changes to the radar, vegetation removal, or ground disturbance. The proposed action would not result in significant effects in the following subject areas:

- Land Use and Coastal Zone Management
- Geology, Soils, and Seismic Hazards
- Drainage and Water Quality
- Transportation
- Air Quality
- Flood Hazards
- Wetlands
- Biological Resources / Protected Species
- Cultural and Historic Resources
- Environmental Justice Socioeconomic Impacts
- Farmlands
- Energy Consumption
- Visual Quality/ Light Emissions
- Solid and Hazardous Waste
- Wild and Scenic Rivers.

At a scan angle of -0.2 deg, the closest terrain that would be within the WSR-88D main beam is Pah Rah Mountain, located 2.95 miles ft north-northwest of the WSR-88D. Pah Rah Mountain is farther from the WSR-88D than the applicable setback distances listed and no hazards to persons or potentially sensitive activities would result. Eight communications towers are located near the WSR-88D and four towers (i.e. Towers 1, 2, 4, and 5) are tall enough to be directly illuminated by the WSR-88D main beam when operating at the proposed minimum scan angle of -0.2 deg. Towers 3, 6, 7, and 8 are below the WSR-88D main beam under current operations and would continue to be below the main beam at a minimum scan angle of -0.2 deg. During normal operation of the radar with rotating antenna, RF exposure at Tower 1, (the closest tower) would comply with the safety standards developed by the Institute of Electrical and Electronic Engineers (IEEE) and the adopted by the American National Standards Institute (ANSI). Federal Communications Commission (FCC) safety levels for the general public and workers would also be met at Tower 1. RF exposure levels at Towers 2 through 8, which are farther from the WSR-88D, would be less and also comply with ANSI/IEEE and FCC safety standards during normal operation of the WSR-88D with a rotating antenna.

During infrequent stationary antenna operation, RF exposure levels would exceed ANSI/IEEE and FCC safety levels for exposure of the general public and workers at the upper portions of Towers 1 and 2, which would be within the WSR-88D main beam; RF exposure levels at the upper portions of Towers 4 and 5 would comply with ANSI/IEEE safety levels for occupational exposure but exceed ANSI/IEEE and FCC safety levels for the general public and FCC occupational exposure safety levels. It is very unlikely that the general public would be present at the upper portions of Towers 1, 2, 4, or 5. Workers could access the towers on rare occasions. Mitigation Measure 1 would prevent RF exposure hazards to workers or the general public if present on any of these towers.

**MITIGATION MEASURE 1:** During infrequent stationary antenna operation, the WSR-88D antenna would not be directed at nearby Towers 1, 2, 4, or 5. The azimuths to be avoided are 10 to 14 (Tower 1), 329 to 333 (tower 2), 24 to 28 (Tower 4), and 18 to 22 (Tower 5).

Because the KRGX WSR-88D operates in a frequency band dedicated to government relocation services and the main beam would not impinge on the ground surface in the radar vicinity, the proposed action would have low potential to cause radio interference with television, radio, cellular telephone, personal communications devices (PCDs), electro-explosive devices, fuel handling, active implantable medical devices, or astronomical observatories.

## **Public and Agency Review of the Draft EA**

The NWS distributed the Draft EA to interested members of the public and government agencies for review and comment. Comments on the Draft EA were accepted by NWS during a 39-day comment period ending on July 27, 2018. No comments were received on the Draft EA.

## **FINDING OF NO SIGNIFICANT IMPACT**

The CEQ Regulations state that the determination of significance using an analysis of effects requires examination of both context and intensity, and lists ten criteria for intensity (40 CFR 1508.27). In addition, NAO 216-6A, Section 6.01(b) 1 – 11, provides eleven criteria, the same ten as the CEQ Regulations and one additional for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to the proposed action and considered individually as well as in combination with the others.

*1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?*

No. The EA report analyzes the potential for implementation of the proposed action to cause environmental consequences based on established standards and criteria. The proposed action would not require construction or vegetation removal and would not result in ground disturbance. The only environmental consequence would be a slight increase in RF power density in a small portion of the atmosphere. During normal operations, WSR-88D RF emissions would comply with national and international safety standards for human exposure. During infrequent stationary antenna operation, NWS would implement Mitigation Measure 1. This measure would ensure that RF levels at elevated structures in the vicinity of the WSR-88D would conform to safety standards for human exposure.

*2. Can the proposed action be expected to significantly affect public health or safety?*

No. The lower minimum scan angle would not result in the KRGX WSR-88D main beam impinging on the ground within 2.95 miles of the WSR-88D site. The proposed action would slightly increase RF exposure levels in the vicinity of the KRGX WSR-88D. As described in the answer to question 1 above, RF emissions from the WSR-88D during normal operation with a rotating antenna operating at a minimum scan angle of -0.2 deg would conform to ANSI/IEEE, FCC, and OSHA safety standards at all ground locations and structures in the vicinity of the WSR-88D. RF emissions from the WSR-88D would also comply with RF exposure standards for implantable medical devices established by the FCC and the Association for Advancement of Medical Instrumentation and would not interfere with operation of those devices. During infrequent stationary antenna operation, RF levels could exceed safety standards for exposure of the general public and workers. Implementation of Mitigation Measure 1 would eliminate that hazard.

*3. Can the proposed action reasonably be expected to result in significant impacts to 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?*

No. The proposed action's area of potential effect (APE) is defined as area within 5,906 ft of the WSR-88D where RF hazards to potentially RF-sensitive activities could result. The closest place listed on the National Register of Historic Places or the state historic registry is the Wadsworth Union Church in Wadsworth, NV, about 13 miles south of the KRGX WSR-88D. No historic places are within the APE and none would be affected by the proposed action.

*.4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?*

No. The proposed action would not result in construction or ground disturbance and would comply with safety standards for human exposure to RF emission. The WSR-88D can cause harmful electromagnetic interference (EMI) with charge-couple devices (CCDs) which electronically record data collected by astronomical telescopes. The potential for harmful EMI would arise if the WSR-88D's main beam would directly impinge on an astronomical observatory during low angle scanning. NWS identified four astronomical observatories within 150 miles of the WSR-88D and analyzed the potential for a lower scan angle to result in the main beam impinging on each observatory. No observatories would be affected at the proposed -0.2.

*5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

No. The proposed action would not increase the radar's power output, but would spread those emissions over a larger portion of the atmosphere. RF power densities at the newly covered area would be the same as at existing covered portions of the atmosphere. The EA contains detailed calculations of RF exposure levels and compares projected exposure levels to safety standards for RF exposure of the general public and workers, potentially RF sensitive activities (e.g. fuel handling, use or transport of electro-explosive devices), and active implantable medical devices. The proposed action would comply with all safety standards. The WSR-88D main beam would also not directly illuminate any astronomical observatories and would not have the potential to affect their operation. There is very little potential for unknown or uncertain impacts to result.

*6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?*

No. The proposed action is limited to lowering the minimum scan angle of the existing KRGX WSR-88D serving the Reno, NV, area, and the EA analysis is specific to that radar. If the NWS were to consider lowering the minimum scan angle of another WSR-88D in the nationwide network, they will perform a site specific analysis of potential effects for that radar in

compliance with NEPA and NAO 216-6A. No precedents would result for future actions with significant effects or a decision in principle about a future consideration.

*7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?*

No. The Final EA report evaluates the potential for the proposed action, in conjunction with past, present, and reasonably foreseeable future actions to cause significant environmental effects. The proposed action is not reliant upon or connected to other actions, nor is it relied upon for the occurrence of other actions. Therefore, the proposed action will not result in a significant cumulative impact to the human environment.

*8. Can the proposed action reasonably be expected to 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?*

No. As discussed in the answers to questions 3 and 4, no historic places occur within the proposed action's APE and no electromagnetic effects impacts would result to astronomical observatories.

*9. Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?*

No. Based on information obtained from the U.S. Fish and Wildlife Service, three listed species occur in the general vicinity of the WSR-88D: North American wolverine, Cui-Cui fish, and Lahontan cutthroat. The proposed action would not adversely affect any of these threatened and endangered species or modify critical habitat.

*10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?*

No. The effect of the proposed action on the human environment has been analyzed relative to applicable Federal, state and local environmental laws or regulations. No regulatory violations or other significant environmental effects are expected to result.

*11. Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?*

No. The proposed action has no potential to cause the transport, release, propagation or spread of non-indigenous species.

## DETERMINATION

After careful and thorough consideration of the Final EA report, the undersigned finds that lowering the minimum scan angle of the KRGX WSR-88D serving the Reno, NV, area from the current +0.5 deg to -0.2 deg is consistent with existing national environmental policies and objectives set forth in sections 101(a) and 101(b) of NEPA and will not significantly affect the quality of the human environment or otherwise result in any condition requiring consultation pursuant to section 102(2) (c) of NEPA.

As described in section 5.03c of NOA 216-6A, a Finding of No Significant Impact is supported and appropriate for lowering the minimum scan angle of the KRGX WSR-88D from the current +0.5 deg to -0.2 deg. as analyzed in the EA report. Preparation of an environmental impact statement for this action is not necessary.

//signed 8/7/18// \_\_\_\_\_  
Jessica Schultz  
Radar Focal Point  
Radar Operations Center  
National Weather Service

\_\_\_\_\_  
Date