

MEMORANDUM FOR:	Matthew M. Kuzemchak, NWS NEPA Coordinator
FROM:	Jessica Schultz, Radar Program Manager, National Weather Service
SUBJECT:	Finding of No Significant Impact for Lowering the Minimum Scan Angle of the KMUX Weather Service Radar - Model 1988 Doppler (WSR-88D) serving the San Francisco Bay, CA 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 9/25/2017// _____ 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 KMUX Weather Service Radar - Model 1988 Doppler (WSR-88D) serving the San Francisco Bay Area, CA

LOCATION: Mount Umunhum, Santa Clara County, California

SUMMARY:

The National Weather Service (NWS) owns and operates the existing Weather Service Radar, Model 1988 Doppler (WSR-88D) serving the San Francisco Bay, CA, area. The radio call letters of the radar are KMUX and the radar is near the crest of Mt. Umunhum, about 14 miles southwest of the city of San Jose, Santa Clara County, CA. The KMUX WSR-88D was commissioned in 1996 and is one of 155 WSR-88Ds in the nationwide network.

The KMUX 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 portions of Northern California. The KMUX 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 KMUX 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 KMUX 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 KMUX 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 Program Manager, National Weather Service, 1200 Westheimer Drive, Norman, OK 73069, Tel. (405)573-8808, email: 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 environment. 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 October 30, 2017.

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

Sincerely

Matthew M. Kuzemchak
NWS NEPA Coordinator

Enclosure

1 **FINDING OF NO SIGNIFICANT IMPACT (FONSI)**
2 **LOWERING THE MINIMUM SCAN ANGLE OF THE WEATHER**
3 **SERVICE RADAR-MODEL 1988, DOPPLER (WSR-88D) SERVING**
4 **SAN FRANCISCO BAY AREA, CA**

5 **ENVIRONMENTAL ASSESSMENT SUMMARY**

6 **Purpose and Need**

7 NWS is part of the National Oceanic and Atmospheric Administration (NOAA) of the U.S.
8 Department of Commerce. NWS operates a nationwide network of Doppler weather radars,
9 which collect data on atmospheric conditions, and include precipitation type and intensity, wind
10 speed and direction, and storms, from near ground level to above 10,000 ft in elevation above the
11 ground. NWS staff uses these data to prepare daily forecasts and issue severe weather watches
12 and warnings, and to further NWS's mission to protect and enhance life and property and the
13 nation's economy. Operating this radar at lower scan angles would increase the area of radar
14 coverage, providing additional data on atmospheric conditions to NWS forecasters and other
15 data users. The change in area covered at 2,000 ft above site level (ASL) and 10,000 ft ASL
16 would increase by 329% and 90%, respectively.

17 **Description of Proposed Action**

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

31 **Alternatives Considered**

32
33 NWS evaluated the benefits and potential impacts of lowering the minimum scan angle of the
34 KMUX WSR-88D to each angle between +0.4 and -0.2 deg in 0.1 degree increments. That
35 analysis found that a minimum scan angle of -0.2 deg would result in improvement of radar
36 coverage while not causing significant environmental impacts. Operating the KMUX WSR-88D

37 at center of beam minimum scan angles between +0.4 and -0.1 deg (i.e. between +0.1 and -0.2
38 deg) would also improve radar coverage but not as much as the proposed action. Based on this
39 information, NWS selected a minimum scan angle of -0.2 deg as the proposed action analyzed in
40 this EA.

41
42 The no action alternative consists of continued operation of the KMUX WSR-88D at the existing
43 minimum scan angle of +0.5 dg. The improvements in radar coverage would not be achieved
44 and the project objectives would not be met. The proposed action would result in increased
45 radiofrequency (RF) exposure at certain portions of the atmosphere while the no-action
46 alternative would not change RF exposure levels from existing levels. Under both the proposed
47 action and the no action alternative, RF exposure during WSR-88D operations would conform to
48 safety standards established by ANSI/IEEE, OSHA, and FCC.

49 **Environmental Consequences**

50 NWS prepared an Environmental Assessment (EA) analyzing the potential environmental
51 consequences of the implementing the proposed action in compliance with the President's
52 Council on Environmental Quality (CEQ) National Environmental Policy Act implementing
53 regulations (40 Code of Federal Regulations Parts 1500 – 1508) and NOAA Administrative
54 Order (NOA) 216-6, *Environmental Review Procedures for Implementing the National*
55 *Environmental Policy Act*.

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

- 59
- 60 • Land Use and Coastal Zone Management
 - 61 • Geology, Soils, and Seismic Hazards
 - 62 • Drainage and Water Quality
 - 63 • Transportation
 - 64 • Air Quality
 - 65 • Flood Hazards
 - 66 • Wetlands
 - 67 • Biological Resources / Protected Species
 - 68 • Cultural and Historic Resources
 - 69 • Environmental Justice Socioeconomic Impacts
 - 70 • Farmlands
 - 71 • Energy Consumption
 - 72 • Visual Quality/ Light Emissions
 - 73 • Solid and Hazardous Waste
 - 74 • Wild and Scenic Rivers

75

76 The lower minimum scan angle would not result in the KMUX WSR-88D main beam impinging
77 on the ground in the vicinity of the WSR-88D site. The proposed action would slightly increase
78 radiofrequency (RF) exposure levels in the vicinity of the KMUX WSR-88D. During normal
79 operation of the radar with rotating antenna, RF exposure would comply with the national safety
80 standards developed by the Institute of Electrical and Electronic Engineers (IEEE) and the
81 adopted by the American National Standards Institute (ANSI). RF emissions during normal
82 operation would also comply with Federal Communications Commission and Occupational
83 Safety and Health Administration safety standards for RF exposure of the general public and
84 workers. RF exposure at the former Almaden AF Station and all ground-level activities in the
85 vicinity of the WSR-88D would comply with all safety standards.

86

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

92 **Public and Agency review of the Draft EA**

93 NWS distributed the Notice of Availability for the Draft EA to interested members of the public
94 and government agencies for review and comment. In addition, NWS posted the NOA and an
95 electronic copy of the Draft EA to the publicly accessible web sites maintained by the Radar
96 Operations Center and the San Francisco Bay area Weather Forecast Office. Comments on the
97 Draft EA were accepted by NWS during a 30-day comment period ending on August 27, 2017.
98 No comments on the Draft EA were received by NWS during the review period.

99 .

100

FINDING OF NO SIGNIFICANT IMPACT

101

102 The CEQ Regulations state that the determination of significance using an analysis of effects
103 requires examination of both context and intensity, and lists ten criteria for intensity (40 CFR
104 1508.27). In addition, NAO 216-6A, Section 6.01(b) 1 – 11, provides eleven criteria, the same
105 ten as the CEQ Regulations and one additional for determining whether the impacts of a
106 proposed action are significant. Each criterion is discussed below with respect to the proposed
107 action and considered individually as well as in combination with the others.

108

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

111

112 No. The EA report analyzes the potential for implementation of the proposed action to cause
113 environmental consequences based on established standards and criteria. The proposed action
114 would not result construction or ground disturbance. The only environmental consequence would

115 be a slight increase in RF power density in a small portion of the atmosphere. WSR-88D RF
116 emissions would continue to comply with national and international safety standards for human
117 exposure.

118

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

120

121 No. The lower minimum scan angle would not result in the KMUX WSR-88D main beam
122 impinging on the ground in the vicinity of the WSR-88D site. The proposed action would
123 slightly increase RF exposure levels in the vicinity of the KMUX WSR-88D. During normal
124 operation of the radar with rotating antenna, RF exposure would comply with the national safety
125 standards developed by the Institute of Electrical and Electronic Engineers (IEEE) and the
126 adopted by the American National Standards Institute (ANSI). RF emissions during normal
127 operation would also comply with Federal Communications Commission and Occupational
128 Safety and Health Administration safety standards for RF exposure of the general public and
129 workers. NWS may infrequently operate the WSR-88D with a stationary antenna for testing
130 purposes. Operation with a stationary antenna would also not result in RF exposure levels
131 exceeding RF exposure standards for the general public or workers. This is true for the nearby
132 former Almaden Air Force Station, where RF exposure would comply with all safety standards.

133

134 RF emissions from the WSR-88D would also comply with RF exposure standards for
135 implantable medical devices established by the FCC and the Association for Advancement of
136 Medical Instrumentation and would not interfere with operation of those devices.

137 *3. Can the proposed action reasonably be expected to result in significant impacts to unique*
138 *characteristics of the geographic area, such as proximity to historic or cultural resources, park*
139 *lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?*

140

141 No. No places listed or eligible for listing on the National Register of Historic Places or are
142 present within the proposed actions APE. No effects on historic or cultural resources would
143 result. The KMUX WSR-88D is not in proximity to prime farmlands, wetlands or wild and
144 scenic rivers and those resources would not be affected. The project area is not within and/or
145 does not contain critical habitat or other ecologically critical areas. The proposed action would
146 not adversely affect or restrict outdoor recreation opportunities in the vicinity of the WSR-88D.

147

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

150

151 No. The proposed action would not result in construction or ground disturbance and would
152 comply with safety standards for human exposure to RF emission.

153

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

156

157 No. The proposed action would not increase the radar's power output, but would spread
158 those emissions over a larger portion of the atmosphere. RF power densities at the newly covered
159 area would be the same as at existing covered portions of the atmosphere. The EA contains
160 detailed calculations of RF exposure levels and compares projected exposure levels to safety
161 standards for RF exposure of the general public and workers, potentially RF sensitive activities
162 (e.g. fuel handling, use or transport of electro-explosive devices), and active implantable medical
163 devices. The proposed action would comply with all safety standards for human exposure to FR
164 emissions. The WSR-88D main beam would also not result in new direct illumination of
165 astronomical observatories by the WSR-88D main beam. There is very little potential for
166 unknown or uncertain impacts to result.

167
168 *6. Can the proposed action reasonably be expected to establish a precedent for future actions*
169 *with significant effects or represent a decision in principle about a future consideration?*
170

171 No. The proposed action is limited to lowering the minimum scan angle of the existing
172 WSR-88D serving the San Francisco Bay area and the EA analysis is specific to that radar. If the
173 NWS were to consider lowering the minimum scan angle of another WSR-88D in the nationwide
174 network, they will perform a site specific analysis of potential effects for that radar in
175 compliance with NEPA and NAO 216-6A. No precedents would result for future actions with
176 significant effects or a decision in principle about a future consideration.

177
178 *7. Is the proposed action related to other actions that when considered together will have*
179 *individually insignificant but cumulatively significant impacts?*

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

185
186 *8. Can the proposed action reasonably be expected to adversely affect districts, sites, highways,*
187 *structures, or objects listed in or eligible for listing in the National Register of Historic Places or*
188 *may cause loss or destruction of significant scientific, cultural, or historical resources?*
189

190 No. The KMUX WSS-88D is located on the crest of a rural mountain top in the Santa Cruz
191 Mountains. The Area of Potential Effect (APE) for the proposed action is the air space within
192 1,300 ft of the WSR-88D, where worst-case RF exposure within the stationary main beam could
193 potentially exceed human safety standards. No historic places listed on the National Register are
194 located within the proposed action's APE.

195
196 *9. Can the proposed action reasonably be expected to have a significant impact on endangered*
197 *or threatened species, or their critical habitat as defined under the Endangered Species Act of*
198 *1973?*

