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Engineering Statement
Displacement of K48MA-D
Channel 36 at Rainier, OR
March 2018

This Engineering Statement has been prepared on behalf of Rural Oregon Wireles Television, Inc. ("ROWT"), licensee of digital TV translator station K48MA-D at Rainier, Oregon. This material has been prepared in connection with a displacement application.

I. Background

The translator currently operates on a channel above Channel 36, which will be the highest channel remaining for terrestrial television broadcasting per the results of the 2017 spectrum auction. Accordingly, ROWT is filing this displacement application during the Commission's Special Displacement Window, which is scheduled for April 10 to May 15, 2018.

II. Interference Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any authorized or pending proposed facilities. This study was performed using the Commission's TVStudy software.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations. Based on the foregoing interference study, it is believed that the proposed facility can operate without risk of objectionable interference to other stations.

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Study created: 2018.03.29 14:59:24

Study build station data: LMS TV 2018-03-28 (108)

    Proposal: K48MA-D D36 LD LIC RAINIER, OR
 File number: RAIN36
 Facility ID: 130928
Station data: User record
   Record ID: 540
     Country: U.S.

Build options:
Protect pre-transition records not on baseline channel

Stations potentially affected by proposal:

IX   Call     Chan      Svc Status  City, State              File Number         Distance
No   KORK-CD  D35       DC  LIC     PORTLAND, OR             BLANK0000001496      71.6 km
No   K35CR-D  D35       LD  LIC     TILLAMOOK, ETC., OR      BLDTL20130220AAR    126.6
No   K35LQ-D  D35       LD  CP      CENTERVILLE, WA          BNPDTL20100513ADW   159.2
No   K35HU-D  D35       LD  LIC     GRAYS RIVER, WA          BLDTT20111031AEM     63.0
No   KDHW-CD  D35       DC  LIC     YAKIMA, WA               BLDTA20100902AED    184.0
No   K36LI-D  D36       LD  CP      ASTORIA, OR              BNPDTL20100324ACB    93.3
No   K36BX-D  D36       LD  LIC     COOS BAY, OR             BLDTL20100402ACG    324.0
No   K50CT-D  D36       LD  APP     COTTAGE GROVE, OR        BLANK0000029358     265.5
No   K36FG-D  D36       LD  LIC     HOOD RIVER, ETC., OR     BLDTT20091125AAU    108.9
No   K36DP-D  D36       LD  LIC     PENDLETON, OR            BLDTT20120621ABZ    295.6
Yes  KKEI-CD  D36       DC  CP      PORTLAND, OR             BLANK0000027188      71.6
No   K36GU-D  D36       LD  LIC     ROCKAWAY BEACH, OR       BLDTT20110808ACE     96.1
No   KTCW     D36       DT  CP      ROSEBURG, OR             BLANK0000034586     331.1
No   K36JZ-D  D36       LD  LIC     ROSEBURG, OR             BLDTL20140221ACK    331.6
No   KJWY-LD  D36       LD  LIC     SALEM, OR                BLDTL20130730ALY    133.6
No   K36EW-D  D36       DC  LIC     COLLEGE PLACE, WA        BLDTA20090401AWP    345.9
No   K44EN-D  D36       LD  APP     METHOW, WA               BLANK0000030029     300.7
No   KBWU-LD  D36       LD  LIC     RICHLAND, ETC.,, WA      BLDTL20080701AEM    286.7
Yes  KZJO     D36       DT  CP      SEATTLE, WA              BLANK0000025375     166.7
No   KSKN     D36       DT  LIC     SPOKANE, WA              BLANK0000001266     450.8
Yes  KEVE-LD  D36       LD  LIC     VANCOUVER, WA            BLDTL20101028ABP     71.9
No   K36KY-D  D36       LD  LIC     WENATCHEE, WA            BLANK0000010595     237.0
No   KWYT-LP  D36       LD  APP     YAKIMA, WA               BLANK0000029321     185.5

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

      Channel: D36
         Mask: Stringent
     Latitude:  46  9 45.40 N (NAD83)
    Longitude: 122 51  9.40 W
  Height AMSL: 399.0 m
         HAAT: 0.0 m
     Peak ERP: 0.500 kW
      Antenna: SCA-1X1KBBU (ID 20717) 240.0 deg
  Elev Pattrn: Generic

50.9 dBu contour:
Azimuth      ERP       HAAT    Distance
  0.0 deg  0.001 kW   173.8 m    7.7 km
 45.0       0.003      59.1      5.7
 90.0       0.000     165.6      4.5
135.0       0.001     105.9      5.8
180.0       0.036     299.5     23.3
225.0       0.414     317.4     36.7
270.0       0.245     376.4     35.7
315.0       0.004     323.6     13.8

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m   Computed HAAT: 228 m

Proposal 25.86 dBu contour does not cross Canadian border
Distance to Canadian border: 235.0 km
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Distance to Mexican border: 1577.1 km

Conditions at FCC monitoring station: Ferndale WA
Bearing: 4.0 degrees    Distance: 311.2 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 108.8 degrees    Distance: 1571.0 km


Study cell size: 1.00 km
Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%


---- Below is IX received by proposal RAIN36 ----

Proposal receives 3.79% interference from scenario 1
No IX check failures found.
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III. Technical Facility

Continued operation is proposed at the current transmitter site on Mount Brynion, using a Kathrein broadband antenna (1X1KBBU), with an ERP of 500 watts.

IV. RF Exposure Study

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (13 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.200 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein 1-level broadband

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antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 20 watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density from the proposed facility is calculated to be 4.0 µW/cm² , which is 1.0% of 401.3 µW/cm² (the FCC maximum for uncontrolled environments at the Channel 36 frequency).

Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken. The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

March 29, 2018
Erik C. Swanson, P.E.