

JAMES B. HATFIELD, PE  
BENJAMIN F. DAWSON III, PE  
THOMAS M. ECKELS, PE  
STEPHEN S. LOCKWOOD, PE  
DAVID J. PINION, PE

PAUL W. LEONARD, PE  
ERIK C. SWANSON, EIT  
THOMAS S. GORTON, PE

HATFIELD & DAWSON  
CONSULTING ELECTRICAL ENGINEERS  
9500 GREENWOOD AVE. N.  
SEATTLE, WASHINGTON 98103

TELEPHONE  
(206) 783-9151  
FACSIMILE  
(206) 789-9834  
E-MAIL  
hatdaw@hatdaw.com

MAURY L. HATFIELD, PE  
CONSULTANT  
BOX 1326  
ALICE SPRINGS, NT 5950  
AUSTRALIA

**Engineering Statement  
Displacement Application for K69BE  
For Operation on Channel 17-  
July 2006**

This Engineering Statement has been prepared on behalf of Kittitas County Television Improvement District #1, licensee of TV translator station K69BE at Ellensburg, Washington. This material has been prepared in connection with a displacement application for operation on Channel 17-.

**I. Allocation 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 facilities with which contour overlap exists. This study was performed using the SunDTV program from V-Soft Communications and a 1 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

The results of this study indicate that the proposed Ellensburg Ch. 17 facility is predicted to cause zero additional interference to any of the listed stations.

Based on the foregoing allocation and interference study, it is believed that the proposed Ellensburg Ch. 17 facility can operate without risk of interference to other stations.

Summary Study

1990 Census data selected  
TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 07-17-2006 Time: 11:53:32

Record Selected for Analysis

ELLEN17 USERRECORD-01 ELLENSBURG WA US  
Channel 17 ERP 1.1 kW HAAT 521. m RCAMSL 00993 m  
Latitude 046-53-15 Longitude 0120-26-29  
Status APP Zone 2 Border Offset -  
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 320.  
Last update Cutoff date Docket  
Comments  
Applicant

Cell Size for Service Analysis 1.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Not full service station

Facility meets maximum power limit

Azimuth (Deg)	ERP (kW)	HAAT (m)	74.0 dBu F(50,50) (km)
0.0	0.020	498.0	5.1
45.0	0.000	419.6	1.0
90.0	0.000	259.5	1.0
135.0	0.000	354.4	1.0
180.0	0.000	455.8	1.0
225.0	0.000	287.1	1.0
270.0	0.194	260.8	8.5
315.0	1.056	520.8	19.1

Contour Overlap Evaluation from LPTV Station to Full Service TV & DTV

Station inside contour of station  
KNDO 16 YAKIMA WA BPCDT 19991027ACH

Contour Overlap Evaluation from LPTV to Full Service TV & DTV Complete

Contour Overlap Evaluation from LPTV Station to LPTV Stations

No Spacing violations or contour overlap from LPTV station

Contour Overlap Evaluation from LPTV to LPTV Stations Complete

Contour Overlap to Proposed Station

Contour Overlap Evaluation to Proposed Station Complete

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quite zone

Proposed facility OK toward Table Mountian

Proposed facility is within the Canadian coordination distance  
Distance to border = 234.8km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

\*\*\*\*\*

Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
17	ELLEN17	ELLENSBURG WA	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
16	KNDO	YAKIMA WA	39.7	CP	BPCDT	-19991027ACH

%%%

Study of this proposal found the following interference problem(s):

NONE.

## II. NIER 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.

$$S(\mu\text{W}/\text{cm}^2) = \frac{[(0.4) \text{ VERP} + \text{AERP}] \times 1.64 \times 2.56 \times 100 \times F^2}{4 \times B \times (\text{Distance})^2}$$

Where: VERP = total peak visual ERP in Watts  
AERP = aural ERP in Watts  
F = relative field factor in the downward direction  
Distance = distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground level (10 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 45° and 90° below the horizontal. The calculations in this report assume a worst case relative field value of 0.2 at these angles, based on review of the manufacturer's vertical plane pattern for the Kathrein K72314 panel antenna proposed in this application. This relative field value yields a worst case average adjusted effective radiated power of 22 Watts at depression angles between 45° and 90° below the horizontal. Assuming this worst-case effective radiated 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 is calculated to be 7.4  $\mu\text{W}/\text{cm}^2$ , which is 2.3%

of  $326 \mu\text{W}/\text{cm}^2$  (the FCC standard for uncontrolled environments at the Channel 17 visual carrier frequency).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 1000 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 et seq and no further analysis of non-ionizing radiation at this site is required in this application.

Public access to the transmitter site is restricted. 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 radiation in excess of FCC guidelines.

July 17, 2006

Erik C. Swanson

Hatfield & Dawson Consulting Engineers