

ENGINEERING REPORT  
RE APPLICATION FOR CONSTRUCTION PERMIT  
FOR A NEW DTV STATION  
**KTNL-DT, SITKA, ALASKA**  
CHANNEL 2 1.0 KW MAX. ERP -212 METERS HAAT

AUGUST 2001

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### Introduction

This engineering report has been prepared on behalf of Green TV Corp ("Green"), licensee of TV station KTNL(TV), Sitka, Alaska, in support of its application for construction permit for a new digital television (DTV) station. At present, KTNL(TV) operates on analog TV Channel 13 (210-216 MHz) with 0.200 kW effective radiated power (ERP) and -257 meters antenna height above average terrain (HAAT). The current analog Channel 13 operation of KTNL(TV) is with a directional TV antenna. Station KTNL(TV) has been allotted Channel 2 (54-60 MHz) for its digital TV operation with 1.0 kW maximum ERP and 33 meters HAAT. It is proposed to operate KTNL-DT on Channel 2 with maximum ERP of 1.0 kW at -212 meters HAAT to comply with the Commission's specified reference ERP and HAAT.

### Antenna Site

It is proposed to mount the Channel 2 DTV antenna on the existing tower structure atop the Cathedral Arms apartment building. Collocated at this site is FM translator station K211BG, Sitka, Alaska. The overall height of the tower structure would remain unchanged.

The KTNL(TV) antenna site is located north at 239 Lincoln Street, Sitka, Alaska. The geographic coordinates (NAD-27) of the existing tower are as follows.

North Latitude: 57° 03' 01"

West Longitude: 135° 20' 04"

The map showing the site is being provided as Exhibit E-2 with this application.

The following data shows the pertinent information concerning the proposed DTV operation.

Antenna and Elevation Data\*

Antenna: Non-Directional

Beam Tilt None

Elevation of the site above mean sea level: 12.2 meters

Elevation of the top of supporting structure:  
above grounding including DTV antenna 39.6 meters

Elevation of the top of supporting structure:  
above mean sea level including DTV antenna 51.8 meters

Height of DTV antenna radiation center:  
meters above ground 37.6 meters

Height of DTV antenna radiation center:  
above mean sea level 49.8 meters

Height of DTV antenna radiation center:  
above average terrain -212 meters

\* to the nearest meter.

### Permissible Maximum & Reference ERP

The allotted maximum permissible ERP for KTNL-DT operation is 1.0 kW at 33 meters HAAT. Station KTNL-DT is proposing to operate with a maximum ERP of 1.0 kW and 212 meters HAAT using a non-directional TV antenna. Consequently, the proposal would not exceed the Commission's allotted reference ERP/HAAT.

### Topographic Data

The average elevation data of the eight cardinal radials from 3.2 to 16.1 kilometers is based on the 3-second terrain data from the Institute for Telecommunication Sciences and USGS topographic maps.

### Contour Data

Utilizing the formula in Section 73.625(b)(2) for the effective heights shown on the attached tabulation, the depression angle  $A_h$ , for each azimuth has been calculated. The maximum radiation value has been used to calculate ERP where the vertical radiation pattern at these angles is greater than 90% of the maximum.

In MM Docket No. 00-83, the Commission has mandated that VHF DTV stations provide 35 dBu signal level over its principal community.

The distances along each radial to the limits of F(50,90) 28 dBu and 35 dBu contours were determined from reference to the propagation data for Channels 2-6, as published by the Commission in Figure 9a, Section 73.699 of its rules.

The distances along the eight cardinal radials to the predicted F(50,90) 28 dBu and 35 dBu contours, the average elevations, and the effective antenna heights are included on the attached tabulation (Table I). The predicted 28 dBu and 35 dBu contours determined from these distances is shown on the attached map (Exhibit E-3).

#### Principal Community Coverage

Sitka Borough and Sitka City are one in the same and encompass an area of 12,560 square kilometers. This area primarily consists of a relatively small urban area (40 sq. km.) And a large rural area (12,520 sq. km) The total population of the Sitka Borough is 8,588 people based on the 1990 US Census data. The listed urban and rural population figures are 7,804 and 784 people respectively.

The proposed 28 dbu contour serves approximately 30%(3,772 sq. Km.) of the area but, 98.7% (8,475 people) of the total population and 100% of the urban population. The proposed 36 dbu contour serves approximately 22%(2,786 sq. Km.) of the area but, also serves 98.7% (8,475 people) of the total population and 100% of the urban population. It is believed the KTNL-DT proposal is in substantial compliance with the coverage requirements of Section 73.685(a) of the FCC Rules due to the vastness of the Sitka Borough coupled with the level of service provided by both the 28 and 35 dBu contours.

### Environmental Statement

Since the proposed DTV antenna will be installed at the existing KTNL-TV site, it is believed the environmental concerns listed in Section 1.1307(a) of the Commission's rules are not pertinent; therefore, those issues have not been addressed.

An evaluation has been made to determine compliance with the Commission's specified standards for human exposure to RF fields as set forth in the OET Bulletin No. 65 dated August 1997. For a maximum effective radiated power of 1.0 kW and a radiation center of 38 meters above ground level, and approximately 9 meters above the building rooftop, the proposed DTV operation would have a maximum of 1.0 and 27.3 microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ) RF field at 2 meters above the ground at the base of the building and rooftop respectively. These computations assume an antenna field factor of 0.2 in the downward direction. The Commission's guidelines for the Channel 2 TV operation are 1,000  $\mu\text{W}/\text{cm}^2$  for the occupational/controlled and 200  $\mu\text{W}/\text{cm}^2$  for the general population/uncontrolled environment.

However, since the existing KTNL analog TV and the existing K211BG(FM) are located on the same building site, a combined RF field level at the DTV site has been also determined. The attached Table II lists the RF field contribution made by each operation. The Table II indicates the combined value would be less than the Commission's MPE guidelines.

Therefore, members of the public and personnel working around the proposed KTNL-DT, Channel 2 DTV facility would not be exposed to RF fields exceeding the Commission's guidelines.

With respect to work performed on the supporting tower structure, station KTNL(TV), in coordination with the other station, will establish procedure to ensure that workers are not exposed to RF fields above the Commission's guidelines, by reducing or turning off the power, as appropriate. In addition access to the roof is locked and controlled by the building management.

For the reasons stated above, it is believed this proposal complies with Section 1.1307(a) and (b) of the Commission's Rules; therefore, under Section 1.1306, it is categorically excluded from the environmental processing.

TABLE I  
COMPUTED COVERAGE DATA  
FOR THE PROPOSED DTV OPERATION OF  
KTNL-DT, SITKA, ALASKA  
AUGUST 2001

<u>Radial</u> <u>Bearing</u> N ° E, T	<u>Average*</u> <u>Elevation</u> <u>of Radial</u> <u>3.2 to 16 km</u> meters	<u>Height of R/C</u> <u>Above Average</u> <u>Elevation of Radial</u> <u>3.2 to 16.1 km</u> meters	<u>ERP</u> kW	<u>Distance to</u> <u>F(50,90)</u> <u>28 dBu Contour</u> km	<u>Distance to</u> <u>F(50,90)</u> <u>35 dBu Contour</u> km
0	323	-273	1	44.8	35.2
45	560	-510	1	44.8	35.2
90	517	-467	1	44.8	35.2
135	323	-273	1	44.8	35.2
180	110	-60	1	44.8	35.2
225**	0	50	1	52.8	42.7
270	0	50	1	52.8	42.7
315	3	47	1	51.7	42.0

Channel 2 (54-60 MHz)  
Center of Radiation 50 meters AMSL  
Antenna Height Above Average Terrain -212 meters  
Max. Effective Radiated Power 1.0 kW (0 dBk)

(NAD-27)

North Latitude: 57° 03' 01"  
West Longitude: 135° 20' 04"

\*Based on USGS topographic data and 3-second terrain data from ITS, rounded to nearest meter.  
\*\*Radial extending entirely over water and not included in average.



TABLE II  
RF FIELD ANALYSIS  
KTNL-DT, SITKA, ALASKA  
AUGUST 2001

<u>Station</u>	<u>Channel</u>	Max. <u>ERP</u> kW	<u>Antenna</u>		Calculated <u>RF Field</u> μW/cm	<u>MPE</u> μW/cm <sup>1</sup>	% of <u>MPE</u>
			C/R <u>A.G.</u> meters	Relative <u>Field</u>			
KTNL-DT	2 (54-60 MHz)	1	38	0.2	1.00	200	<0.1
KTNL(TV)	13 (210-216 MHz)	0.200	38	0.2	0.43	200	<0.1
K211BG(FM)	211D (90.1 MHz)	0.055H	35	0.5	0.50	200	<0.1
					Combined		1.0