

**MINOR CHANGE APPLICATION**  
**IDAHO BROADCASTING CONSORTIUM, INC.**  
**KSXZ (FM) RADIO STATION**  
**CH 294C1 - 106.7 MHZ - 13.0 KW**  
**PINESDALE, MONTANA**  
**September 2002**

**EXHIBIT A**

**Compliance with §73.315(a)**  
**Using Supplemental City Grade Analysis**

The proposed tower site for KSXZ is located 56.0 kilometers north-northeast of the community of Pinesdale, Montana. From the proposed KSXZ facility, the predicted 3.16 mV/m contour, using the Commission's standard method of predicting city grade coverage as outlined in §73.313, does not encompass the community of Pinesdale. However, in this particular case, we find a supplemental method of depicting city grade coverage, as noted in §73.313(e) of the Commission's rules, is appropriate. We have analyzed the terrain in 2.0° increments from 198° to 202° to determine the terrain variations on each of these radials. §73.313 of the rules notes that the Commission's propagation curves are based on a 50 meter terrain variation ( $\Delta H$ ). Using the 30 second terrain database, on the three pertinent radials toward the community of Pinesdale, from the site out to 16.0 kilometers, the individual radial  $\Delta H$  values exceed 500 meters (see Exhibit A2). The delta H is significantly above the typical value due to the location of the KSXZ site, which is elevated above the valley in which Pinesdale is located. At approximately 10.0 kilometers out from the site, the elevation drops off dramatically. As such, As such, the terrain along the pertinent radials varies significantly from the 50 meter variation used in the Commission's field strength curves.<sup>3</sup>

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3) The variation in the delta H is sufficient to demonstrate that the terrain varies widely, based on the staff's policy of variation in an August 8, 2002, letter to Mark Lipp, Esq. Since the delta H is significantly above the 100 meter level, terrain varies widely.

The proposed KSXZ antenna system is to be located outside of Missoula, Montana, at geographic coordinates North Latitude 46° 48' 09" and West Longitude 113° 58' 19". The community of Pinesdale, Montana, is located on bearings between 198° and 202° true from the proposed KSXZ site. Running individual radials, in 2° increments, from the KSXZ site through the community, we have determined the location of the city grade contour based on the standard utilization of the Commission's 50/50 curves (see Exhibit A1). We have alternatively determined the location of the 70 dBu coverage, using the Diffcomb<sup>4</sup> program, which is a variation of the irregular terrain model, taking into consideration diffraction loss over knife edge and rounded obstacle obstructions. Further, reductions of calculation signal strength are also made to account for foliage and buildings (Clutter Loss).<sup>5</sup> This model is a more representative prediction of field strength than the standard methodology under certain terrain conditions.

On the pertinent bearings toward the community of Pinesdale, we have tabulated the distance to the city grade contour using both the FCC method and supplemental method to demonstrate the differences to the contour and find that the supplemental depiction distances are in excess of 10% higher than the distances using the Commission's standard methodology (see Exhibit A2). Based on the Staff's policy, we find that the terrain on these pertinent radials varies widely from the 3.0 to 16.0 kilometer average (as detailed above) and the differences to the contour distances, as determined by the supplemental method, exceed the standard method by more than 10%. Therefore, pursuant to §73.313(e), a supplemental method of depicting the city

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4) Diffcomb Model PTP-V7B.

5) To insure coverage of the proposed community, the Diffcomb model was set at 39.0 kilometers as the point of interest (the distance to the present FCC F50/50 60 dBu contour).

grade coverage is acceptable. It is noted that at no point does the supplemental city grade distance extend beyond the predicted 60 dBu (50/50) protected contour.<sup>6</sup>

Using the supplemental method calculations, we find that the city grade contour in the direction of Pinesdale, Montana, in 2° increments between 198° and 202°, extends at least 62.0 kilometers out from the site, on the pertinent radials, extending well beyond the community of Pinesdale. As visually demonstrated on Exhibit A3, the predicted 70 dBu signal, as calculated using the Diffcomb model, shows Pinesdale, Montana, within the predicted city grade contour. There are no terrain obstructions in the path between the proposed transmitter site and the community. Attached as Exhibit A4 is the terrain profile of the 200° radials.<sup>7</sup>

A sample calculation was made, based on the 200° radial, between the site and the community, to verify the location of the city grade, using a free space signal formula:  $106.9 + \text{power in dBk} - 20 \log (\text{distance in kilometers to point of interest})$ . Based on the proposed KSXZ facility, the distance to the 70 dBu contour was calculated using the Diffcomb program and found to extend 62.0 kilometers. Based on the proposed facility, the 70 dBu contour, corrected to allow for a 5.0 dB clutter loss (the 75 dBu contour), is being sought.

$$106.9 + 11.14 \text{ dBk} - 20 \log 62 = 82.19$$

**Attenuation due to diffracted signal over terrain - 7.19 dB**

**Clutter Loss -5.0**

**Signal at point of interests 70.0 dBu**

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- 6) If the Diffcomb contour extended beyond the predicted 60 dBu contour, it was truncated at that distance.
- 7) The terrain profiles of the 198° and 202° radials have been reviewed and are similar to that of the 200° radial. These terrain profiles are not included herein, but are available for submission on request.

Therefore, based on the supplemental depiction, we find the community of Pinesdale to be within the city grade contour of the proposed KSXZ facility in compliance with the Commission's rules.

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**EXHIBIT A2**

**Tabulation of City Grade Contours**  
**in Arc Towards Pinesdale, Montana**

<u>Radial</u> <u>(Bearing)</u>	<u>Delta H<sup>8</sup></u>	<u>Location of 70 dBu</u>		<u>% of Chg</u>	<u>Method</u> <u>Used</u>
		<u>FCC Method (F)</u>	<u>Diffcomb(D)</u>		
0°	307.9 m	52.7 km	29.0 km	- 44.9	D
45°	334.7 m	52.9 km	20.0 km	- 62.2	D
90°	618.4 m	40.9 km	8.4 km	- 79.4	D
135°	444.5 m	32.1 km	15.0 km	- 53.3	D
180°	347.3 m	41.7 km	34.0 km	- 18.5	D
225°	415.6 m	52.3 km	26.0 km	- 50.3	D
270°	614.1m	49.5 km	18.4 km	- 62.8	D
315°	470.3 m	56.6 km	77.0 km	+ 36.0	D
198°	517.3 m	49.8 km	69.0 km	+ 38.6	D
200°	535.0 m	50.8 km	62.0 km	+ 22.0	D
202°	540.3 m	51.4 km	62.0 km	+ 20.6	D

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8) Delta H calculated based on 3-16 kilometer sector out from the site, on respective radial.

**Graham Brock, Inc. - Broadcast Technical Consultants**

**KSXZ Proposed**  
Latitude: 46-48-09 N  
Longitude: 113-58-19 W  
ERP: 13.00 kW  
Channel: 294C1  
AMSL Height: 1912.0 m

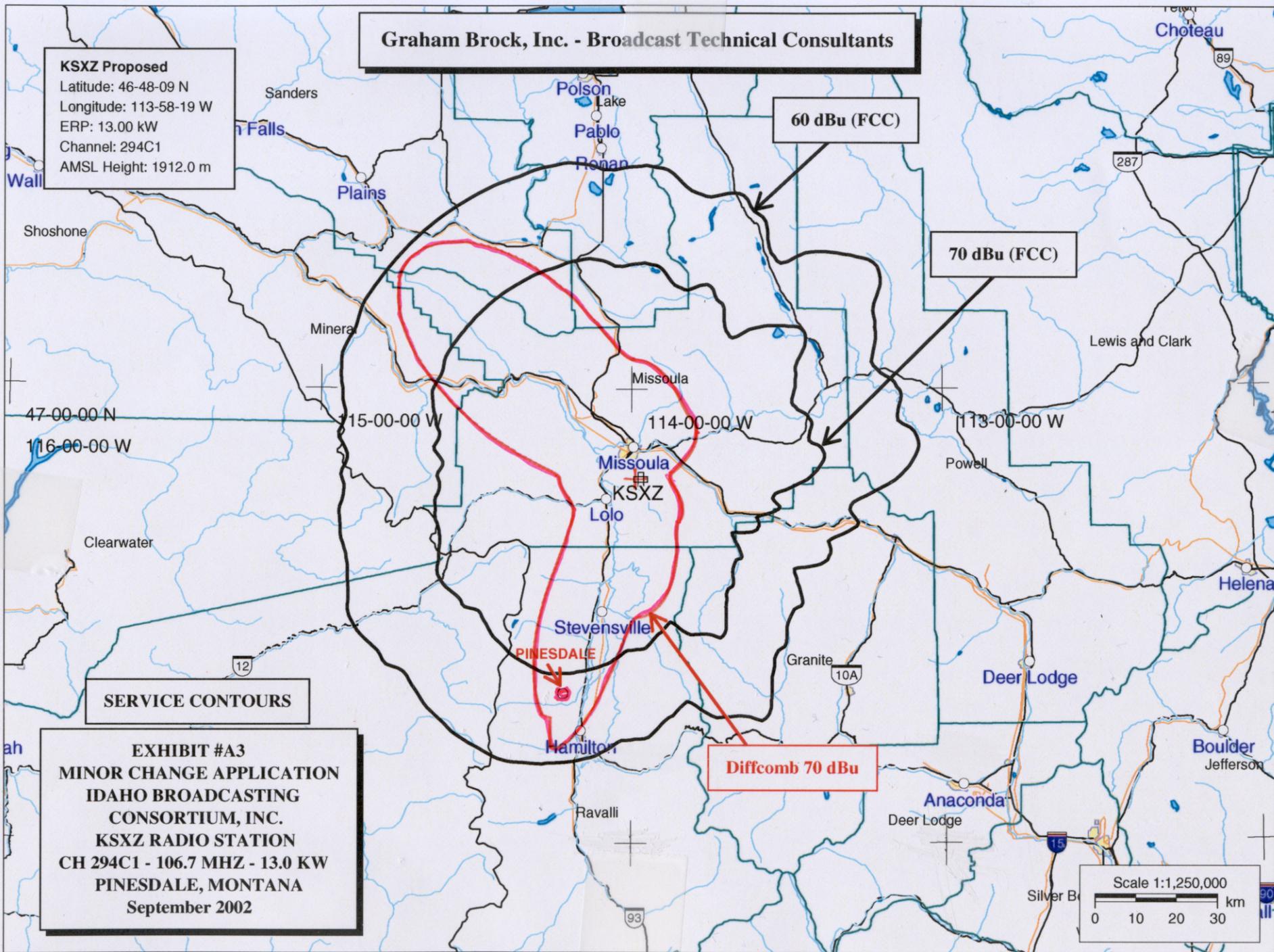
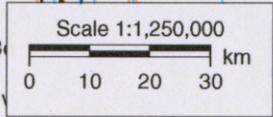
**60 dBu (FCC)**

**70 dBu (FCC)**

**Diffcomb 70 dBu**

**SERVICE CONTOURS**

**EXHIBIT #A3**  
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KSXZ: 46-48-09 113-58-19  
 Frequency: 106.7 MHz  
 Number of Obstacles: 0  
 K factor: 1.333

Azimuth: 200.00 degs.  
 Ant. Elev.: 1912.0 m AMSL  
 Obstacle Loss: .0 dB  
 Fresnel Zone: .60

Receiver Distance: 61.0 km  
 Rec. Elev.: 1803.5 m AMSL  
 Total Path Loss: 108.7 dB  
 30 Second Database

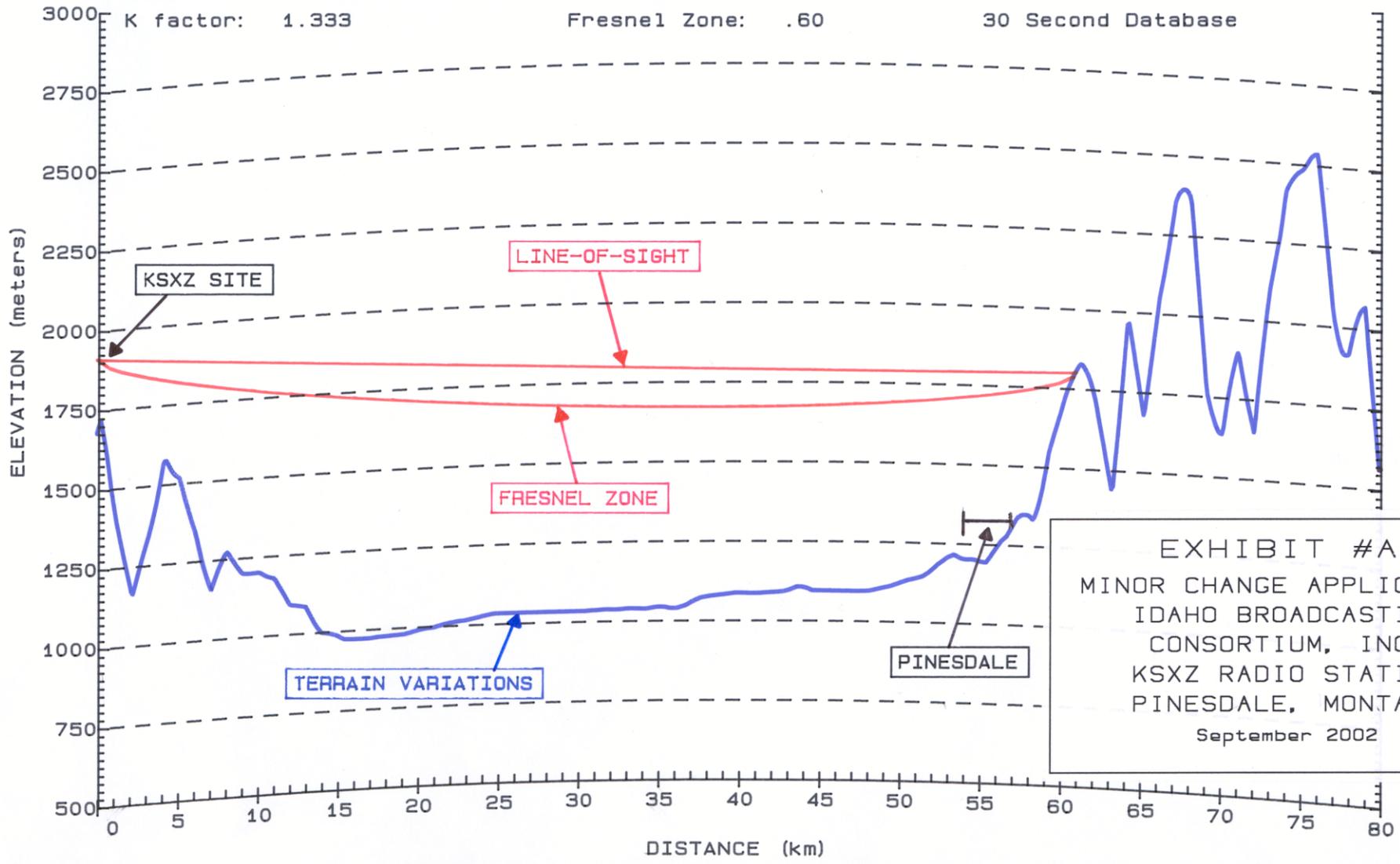


EXHIBIT #A4  
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KSXZ MINOR CHANGE APPL.

EXH. #A4

Sept. 2002

**GRAHAM BROCK, INC.**  
 BROADCAST TECHNICAL CONSULTANTS