

## **ENGINEERING EXHIBIT**

### **Application for Construction Permit**

prepared for

#### **Bluestone License Holdings Inc.**

KTXS-DT Sweetwater, TX

Facility ID 308

Ch. 20 530 kW 402 m

*Bluestone License Holdings Inc.* (“*Bluestone*”) is the licensee of television station KTXS-TV, digital Channel 20 and analog Channel 12, Sweetwater, TX. *Bluestone* is licensed to operate the KTXS-DT digital Channel 20 facility at 26.44 kW effective radiated power (“ERP”) and an antenna height above average terrain (“HAAT”) of 351 meters (file number BLCDT-20060817ACW).

*Bluestone* herein proposes a minor modification of the KTXS-DT facility to achieve replication to a practical extent with a side-mount antenna. The underlying 1998 allotment for KTXS-DT specifies 560.8 kW ERP at 427 meters antenna HAAT (the current top-mount analog Ch. 12 antenna location). The instant proposal specifies an ERP of 530 kW at 402 meters antenna HAAT, with a directional antenna chosen to fill out the replication antenna pattern assigned to KTXS-DT.<sup>1</sup>

As proposed herein, KTXS-DT will achieve an interference-free service population of 235,855 persons for the remainder of the transition (2000 census). This is 97.4 percent of the 242,224 population of the 1998 reference analog Channel 12 facility and 95.4 percent of the 1998 digital Channel 20 allotment’s population of 247,308 (with 2000 census data).<sup>2</sup> Due to other facilities obtaining authorization for maximized facilities under the 2% / 10% de minimis interference limits during the transition, the digital Channel 20 KTXS-DT allotment’s service

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<sup>1</sup> The KTXS-DT Appendix B post-transition digital allotment specifies the same replication parameters (561 kW / 427 m) as the 1998 allotment. *Bluestone* intends to utilize a top-mount antenna system for post-transition digital operation, and will seek further modification of the KTXS-DT facility at the appropriate time.

<sup>2</sup> Table II of 1998 Station NTSC and DTV Replication Information, December 21, 2004, DA 04-3922.

population fell to 242,356 persons<sup>3</sup>, and the proposed facility would achieve a 97.3 percent match of that population.

The proposed antenna system is a Dielectric model TFU-24DSB-H(C) and will be side-mounted on the existing KTXS-TV antenna supporting structure, having FCC Antenna Structure Registration number 1052057. No change to the overall structure height will result from this proposal. The proposed directional antenna's horizontal plane pattern is depicted in **Figure 1**. **Figures 2** and **2A** provide the theoretical vertical plane (elevation) pattern<sup>4</sup>.

A map is supplied as **Figure 3**, which depicts the standard predicted coverage contours. This map includes the boundaries of Sweetwater, KTXS-DT's principal community. As demonstrated thereon, the proposed facility complies with §73.625(a)(1), as the entire principal community will be encompassed by the 48 dBμ contour.

The map attached as **Figure 4** supplies a comparison of the 41 dBμ digital service contour corresponding to the proposed KTXS-DT facility (530 kW / 402 m) and the 1998 allotment parameters (560.8 kW / 427 m). No extension in contour location beyond that of the allotment will result, in compliance with the Commission's August 3, 2004 "freeze" concerning expansion in service area.<sup>5</sup>

The proposal does not strictly meet the "checklist" criteria for application processing without an interference analysis, as the proposed ERP/HAAT combination does exceed the allotment values along a few azimuths (despite the lack of contour extension). A detailed interference study per OET Bulletin 69<sup>6</sup> shows that the proposal complies with the Commission's 2% / 10% *de minimis*

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<sup>3</sup> Table I of 1998 Station NTSC and DTV Replication Information, December 21, 2004, DA 04-3922.

<sup>4</sup> These patterns are supplied in terms of relative field. In recent years, FCC Staff have not required pattern data in dBk format however such patterns are available upon request.

<sup>5</sup> Public Notice "Freeze on the Filing of Certain TV and DTV Requests for Allotment or Service Area Changes," DA 04-2446, released August 3, 2004.

<sup>6</sup> FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). The implementation of OET-69 for this study followed the guidelines of OET-69 as specified therein. A standard cell size of 2 km was employed. Comparisons of various results

interference limits for operation during the transition. The results of the interference study, summarized in **Table 1**, indicate that any new interference does not exceed the *de minimis* limit. Protection requirements towards authorized Class A stations are satisfied. Thus, this proposal complies with the provisions of §73.623(c)(2) of the Commission's rules.

Regarding impact to post-transition operations, OET Bulletin 69 interference analysis shows that the proposal would not cause any additional interference to any other nearby Appendix B facility, as summarized in **Table 2**. For initial post-transition operation, the proposed KTXS-DT facility would achieve an interference-free service population of 235,926 persons. This is 97.0 percent of the KTXS-DT post-transition Appendix B population of 243,313, and is therefore within the 5 percent population tolerance proposed in MB Docket 07-91 for initial operations.<sup>7</sup>

The nearest FCC monitoring station is 591 km distant at Kingsville, TX. This exceeds by a large margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The site is also located outside the areas specified in §73.1030(a)(1) and §73.1030(b). Thus, notification of the instant proposal to the National Radio Astronomy Observatory at Green Bank, West Virginia, or the Table Mountain Radio Receiving Zone in Boulder County, Colorado is not required. There are no AM stations within 3.2 kilometers of the site, based on information contained within the Commission's database. The site location is beyond the border areas requiring international coordination.

### **Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposed transmitting antenna will be side-mounted on an existing antenna support structure. The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. No change in structure height is proposed, thus no change in current structure marking and lighting

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of this computer program (run on a Sun Sparc processor) to the Commission's implementation of OET-69 show excellent correlation.

<sup>7</sup>*Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, Notice of Proposed Rulemaking, FCC 07-70, released May 18, 2007.

requirements is anticipated. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the Commission's OET Bulletin Number 65. Based on OET-65 equation (10), and considering 15 percent antenna relative field in downward elevations (pattern data shows less than 15 percent relative field at angles 10 to 90 degrees below the antenna), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is  $5.0 \mu\text{W}/\text{cm}^2$ , which is 1.5 percent of the general population/uncontrolled maximum permitted exposure limit. This is well below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

## **Certification**

The undersigned hereby certifies that the foregoing statement and associated attachments were prepared by him or under his direction, and that they are true and correct to the best of his knowledge and belief.

Joseph M. Davis, P.E.  
November 26, 2007

**Chesapeake RF Consultants, LLC**  
11993 Kahns Road  
Manassas, VA 20112  
703-650-9600

### List of Attachments

Figure 1	Antenna Horizontal Plane Pattern
Figure 2, 2A	Antenna Vertical Plane (Elevation) Pattern
Figure 3	Proposed Coverage Contours
Figure 4	Coverage Contour Comparison
Table 1	Transition Interference Analysis Results Summary
Table 2	Post-Transition Interference Analysis Summary
Form 301	Saved Version of Engineering Sections from FCC Form at Time of Upload

*This material was entered November 26, 2007 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.*



Exhibit No.

Date  
Call Letters  
Location  
Customer  
Antenna Type

09 Nov 2007

Channel 20

**Figure 1**  
**Antenna Horizontal**  
**Plane Pattern**

**AZIMUTH PATTERN**

Gain  
Calculated / Measured

**1.70 (2.30 dB)**  
**Calculated**

Frequency  
Drawing #

**509 MHz**  
**DSB-H**

True North

0

Relative  
Field

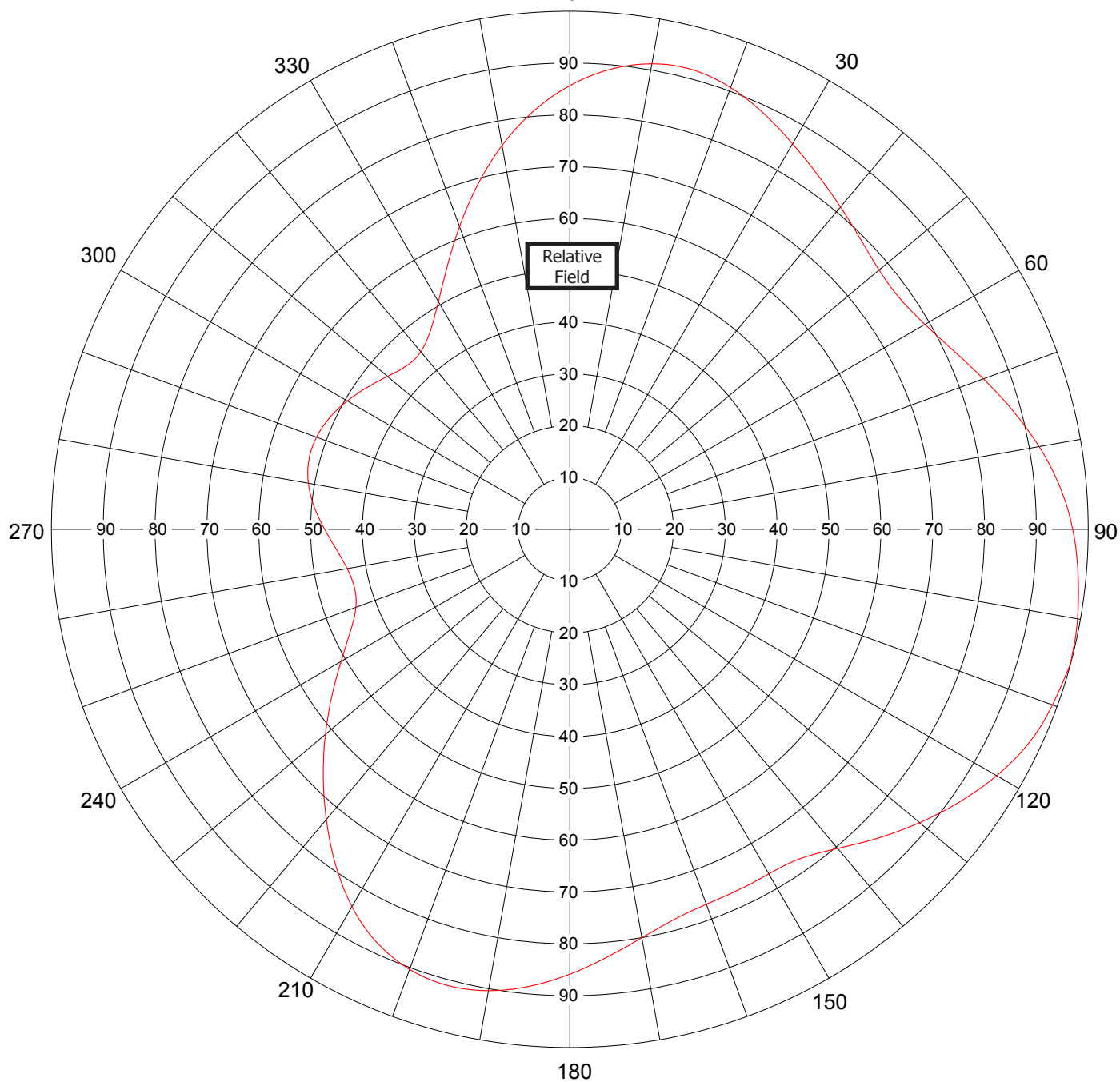




Exhibit No.

Date  
Call Letters  
Location  
Customer  
Antenna Type

08 Nov 2007

Channel 20

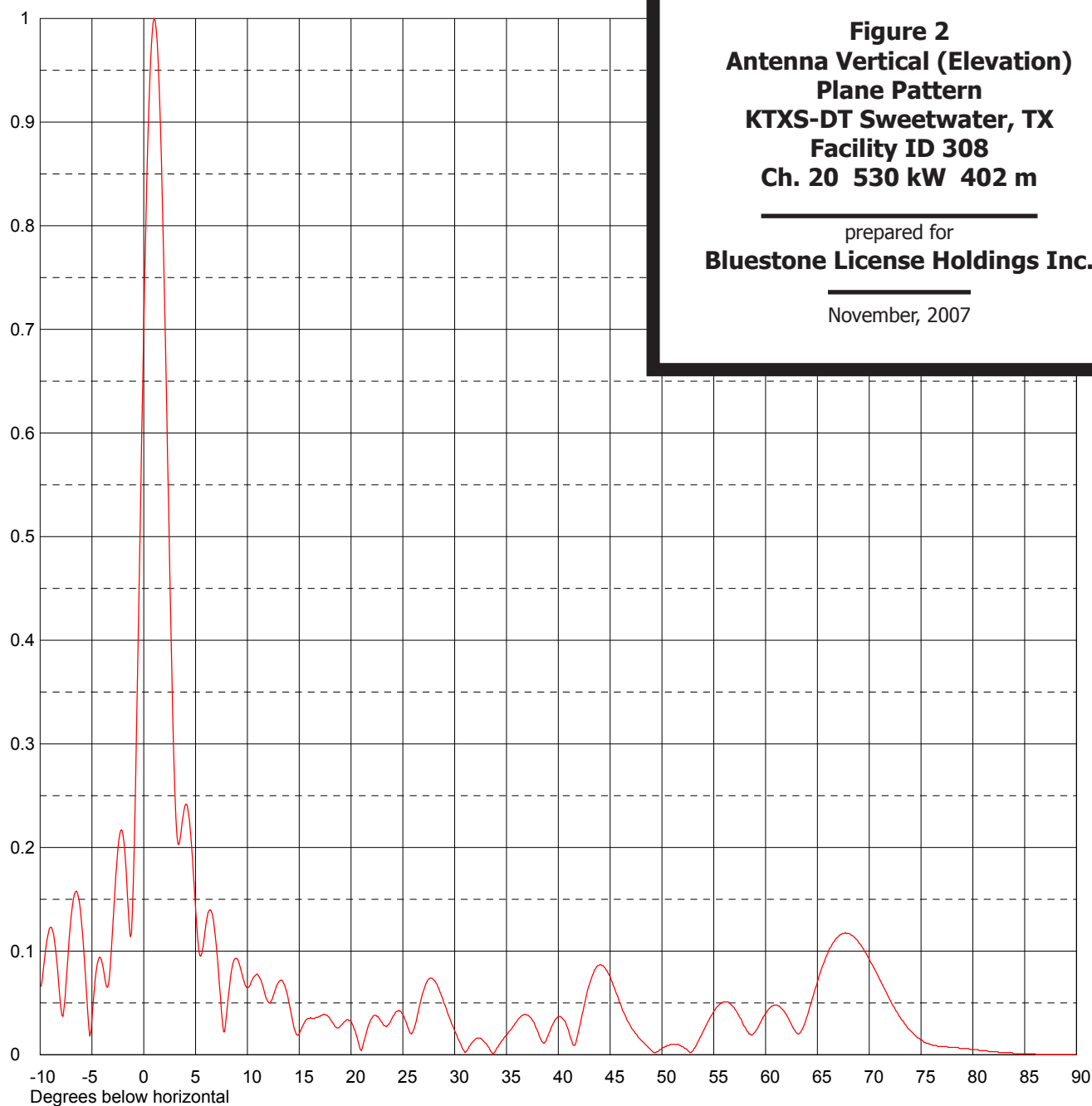
TFU-24DSB-H (C)

**ELEVATION PATTERN**

RMS Gain at Main Lobe  
RMS Gain at Horizontal  
Calculated / Measured

**24.0 (13.80 dB)**  
**11.9 (10.76 dB)**  
**Calculated**

Beam Tilt **1.00 Degrees**  
Frequency **509.00 MHz**  
Drawing # **24B240100-90**



**Figure 2**  
**Antenna Vertical (Elevation)**  
**Plane Pattern**  
**KTXS-DT Sweetwater, TX**  
**Facility ID 308**  
**Ch. 20 530 kW 402 m**

prepared for  
**Bluestone License Holdings Inc.**

November, 2007

Remarks:



Exhibit No.

Date

08 Nov 2007

Call Letters

Channel 20

Location

Customer

Antenna Type

TFU-24DSB-H (C)

**ELEVATION PATTERN**

RMS Gain at Main Lobe

**24.0 (13.80 dB)**

Beam Tilt

**1.00 Degrees**

RMS Gain at Horizontal

**11.9 (10.76 dB)**

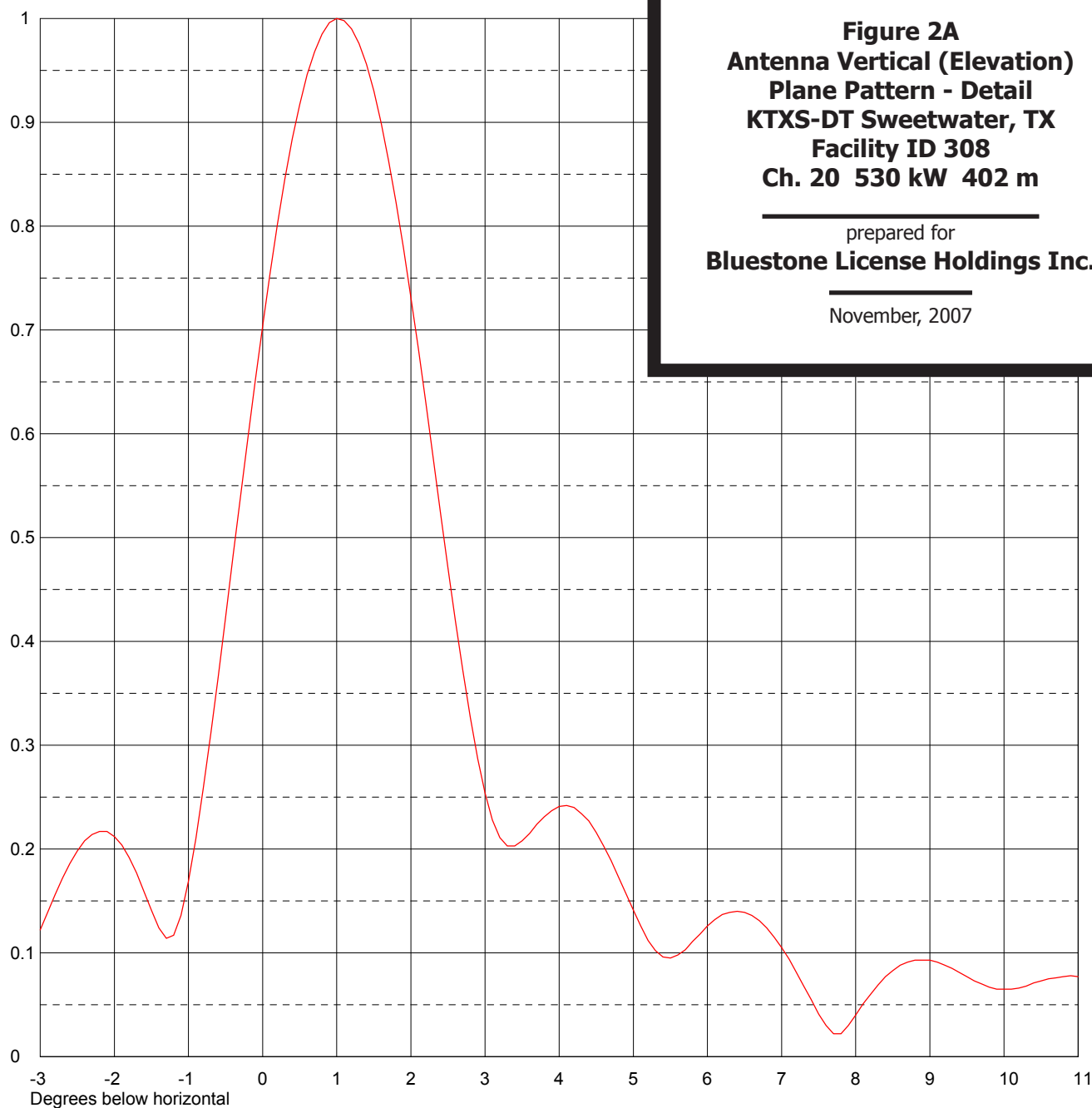
Frequency

**509.00 MHz**

Calculated / Measured

**Calculated**

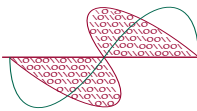
Drawing #

**24B240100**

**Figure 2A**  
**Antenna Vertical (Elevation)**  
**Plane Pattern - Detail**  
**KTXS-DT Sweetwater, TX**  
**Facility ID 308**  
**Ch. 20 530 kW 402 m**  
prepared for  
**Bluestone License Holdings Inc.**  
November, 2007

Remarks:



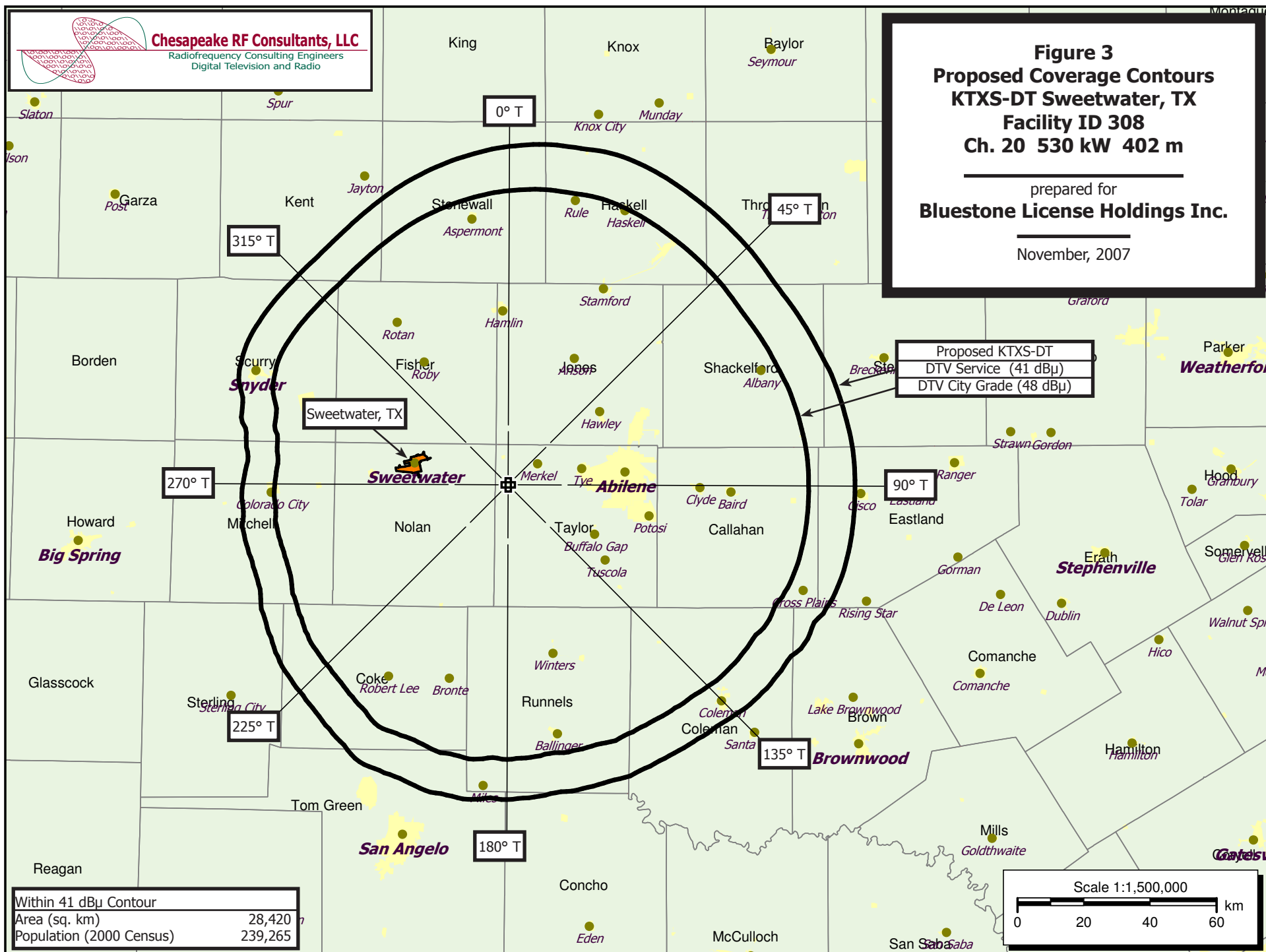


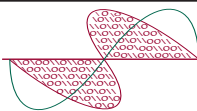
**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 3**  
**Proposed Coverage Contours**  
**KTXS-DT Sweetwater, TX**  
**Facility ID 308**  
**Ch. 20 530 kW 402 m**

prepared for  
**Bluestone License Holdings Inc.**

November, 2007





**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 4**  
**Coverage Contour Comparison**  
**KTXS-DT Sweetwater, TX**  
**Facility ID 308**  
**Ch. 20 530 kW 402 m**

prepared for  
**Bluestone License Holdings Inc.**

November, 2007

41 dBu Contours  
Proposed KTXS-DT 480 kW 402 m  
1998 DTV Allotment 560.8 kW 427 m

Scale 1:1,500,000  
0 20 40 60 km

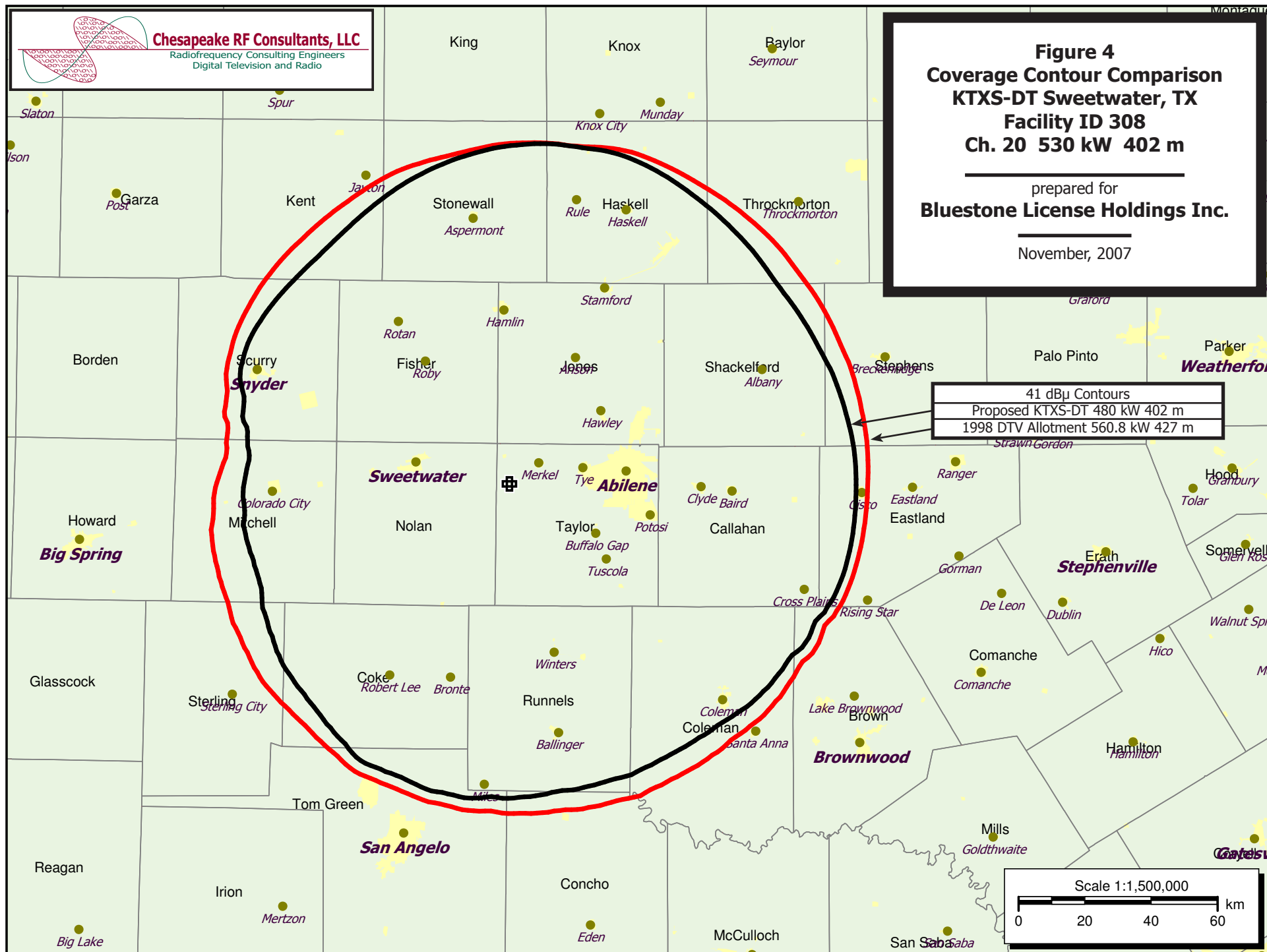


Table 1

**Transition Period  
Interference Analysis Results Summary**

prepared for

**Bluestone License Holdings Inc.**

KTXS-DT Sweetwater, TX



Ch.	Call	City/State	Dist (km)	Status	Application Ref. No.	-----Population (1990 Census)-----		
						Baseline	New Interference	Total Interference
17	KPCB	SNYDER TX	84.6	LIC	BLCT-19970409KE	---	none	n/a
19	KIDY-DT	SAN ANGELO TX	99.4	PLN	DTVPLN-DTVP0375	140,177	-469 (-0.33%)	n/a
20	KVIH-DT	CLOVIS NM	354.9	CP	BPCDT-19991029ACF	---	none	n/a
20	KVIH-DT	CLOVIS NM	354.9	PLN	DTVPLN-DTVP0412	---	none	n/a
20	KLRN-DT	SAN ANTONIO TX	381.6	PLN	DTVPLN-DTVP0418	1,512,960	0 (0.00%)	n/a
20	KXII-DT	SHERMAN TX	356.3	PLN	DTVPLN-DTVP0419	684,636	-857 (-0.13%)	n/a
20	KWBU-DT	WACO TX	287.6	LIC	BLEDT-20060622AAS	201,413	-11 (0.01%)	n/a
20	KWBU-DT	WACO TX	294.9	PLN	DTVPLN-DTVP0421	---	none	n/a
21	960726KI	SAN ANGELO TX	99.4	APP	BPET-19960726KI	101,529	0 (0.00%)	n/a

(interference decreases to KIDY-DT, KXII-DT, and KWBU-DT)

Table 2

**Post-Transition  
Interference Analysis Results Summary**

prepared for

**Bluestone License Holdings Inc.**

KTXS-DT Sweetwater, TX

Ch	Call Sign	State/City Facility ID	Power (kW) HAAT (m)	Latitude Longitude	Dist (km) Bear (°T)	Baseline Population (2000 Census)	New Interference Population	Percent
19	KIDY	TX SAN ANGELO 58560	1000 277	31 35 21 100 31 0	99.2 203.0	132,640	-54	-0.04%
20	KWBU-TV	TX WACO 6673	700 319	31 19 17 97 20 40	288.1 114.2	---	none	n/a
20	KVIH-TV	NM CLOVIS 40450	598 204	34 11 34 103 16 44	355.3 304.7	679,623	-35	-0.01%

**SECTION III-D - DTV ENGINEERING DATA**

**Complete Questions 1-5 of the Certification Checklist and provide all data and information for the proposed facility, as requested in Technical Specifications, Items 1-13.**

**Certification Checklist:** A correct answer of "Yes" to all of the questions below will ensure an expeditious grant of a construction permit. However, if the proposed facility is located within the Canadian or Mexican borders, coordination of the proposal under the appropriate treaties may be required prior to grant of the application. An answer of "No" will require additional evaluation of the applicable information in this form before a construction permit can be granted.

1. The proposed DTV facility complies with 47 C.F.R. Section 73.622 in the following respects:	
(a) It will operate on the DTV channel for this station as established in 47 C.F.R. Section 73.622.	<input checked="" type="radio"/> Yes <input type="radio"/> No
(b) It will operate from a transmitting antenna located within 5.0 km (3.1 miles) of the DTV reference site for this location as established in 47 C.F.R. Section 73.622.	<input checked="" type="radio"/> Yes <input type="radio"/> No
(c) It will operate with an effective radiated power (ERP) and antenna height above average terrain (HAAT) that do not exceed the DTV reference ERP and HAAT for this station as established in 47 C.F.R. Section 73.622.	<input type="radio"/> Yes <input checked="" type="radio"/> No
2. The proposed facility will not have a significant environmental impact, including exposure of workers or the general public to levels of RF radiation exceeding the applicable health and safety guidelines, and therefore will not come within 47 C.F.R. Section 1.1307. Applicant must <b>submit the Exhibit</b> called for in Item 13.	<input checked="" type="radio"/> Yes <input type="radio"/> No
3. Pursuant to 47 C.F.R. Section 73.625, the DTV coverage contour of the proposed facility will encompass the allotted principal community.	<input checked="" type="radio"/> Yes <input type="radio"/> No
4. The requirements of 47 C.F.R. Section 73.1030 regarding notification to radio astronomy installations, radio receiving installations and FCC monitoring stations have either been satisfied or are not applicable.	<input checked="" type="radio"/> Yes <input type="radio"/> No
5. The antenna structure to be used by this facility has been registered by the Commission and will not require registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely effect safety in air navigation and this structure qualifies for later registration under the Commission's phased registration plan, OR the proposed installation on this structure does not require notification to the FAA pursuant to 47 C.F.R. Section 17.7.	<input checked="" type="radio"/> Yes <input type="radio"/> No

**SECTION III-D - DTV Engineering****TECHNICAL SPECIFICATIONS**

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

**TECH BOX**

1.	Channel Number: DTV 20    Analog TV, if any 12
2.	Zone: <input type="radio"/> I <input checked="" type="radio"/> II <input type="radio"/> III
3.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 32 Minutes 24 Seconds 48 <input checked="" type="radio"/> North <input type="radio"/> South  Longitude: Degrees 100 Minutes 6 Seconds 25 <input checked="" type="radio"/> West <input type="radio"/> East
4.	Antenna Structure Registration Number: 1052057 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA
5.	Antenna Location Site Elevation Above Mean Sea Level: 755.9 meters
6.	Overall Tower Height Above Ground Level: 325.8 meters
7.	Height of Radiation Center Above Ground Level: 283.2 meters
8.	Height of Radiation Center Above Average Terrain : 402 meters
9.	Maximum Effective Radiated Power : 530 kW
10.	Antenna Specifications: a. Manufacturer DIE    Model TFU-24DSB-H(C) b. Electrical Beam Tilt:

1 degrees ☐ Not Applicable

c. Mechanical Beam Tilt:

degrees toward azimuth

degrees True ☒ Not Applicable

Attach as an Exhibit all data specified in 47 C.F.R. Section 73.685.

[Exhibit 42]

d. Polarization:

☒ Horizontal ☐ Circular ☐ Elliptical

e. Directional Antenna Relative Field Values: ☐ Not applicable (Nondirectional)

[For a composite directional (not off-the-shelf) antenna, press the following button to fill in the relative field values subform.]

[Relative Field Values]

### 10e. Directional Antenna Relative Field Values

[Fill in this subform for a composite directional (not off-the-shelf) antenna, only.]

e. Directional Antenna Relative Field Values:

Rotation (Degrees): ☒ No Rotation

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0	0.856	10	0.912	20	0.907	30	0.859	40	0.812	50	0.779
60	0.791	70	0.849	80	0.919	90	0.97	100	0.994	110	0.991
120	0.951	130	0.881	140	0.804	150	0.768	160	0.77	170	0.8
180	0.858	190	0.904	200	0.904	210	0.841	220	0.731	230	0.615
240	0.51	250	0.439	260	0.436	270	0.473	280	0.512	290	0.52
300	0.496	310	0.459	320	0.447	330	0.507	340	0.622	350	0.752
Additional Azimuths		15	0.918	105	1	195	0.911	287	0.522		

[Relative Field Polar Plot](#)

If a directional antenna is proposed, the requirements of 47 C.F.R. Sections 73.625(c) must be satisfied. **Exhibit required.**

[Exhibit 43]

11. Does the proposed facility satisfy the interference protection provisions of 47 C.F.R. Section 73.623(a)? (Applicable only if **Certification Checklist** items 1(a), (b), or (c) are answered "No".)

☒ Yes ☐ No

[Exhibit 44]

If No, attach as an Exhibit justification therefore, including a summary of any previously granted waivers.

12. If the proposed facility will not satisfy the coverage requirement of 47 C.F.R. Section 73.625, attach as an Exhibit justification therefore. (Applicable only if **Certification Checklist** item 3 is answered "No".)

[Exhibit 45]

13. **Environmental Protection Act. Submit in an Exhibit** the following:

[Exhibit 46]

If **Certification Checklist** Item 2 is answered "Yes," a brief explanation of why an Environmental Assessment is not required. Also describe in the Exhibit the steps that will be taken to limit RF radiation exposure to the public and to persons authorized access to the tower site.

By checking "Yes" to **Certification Checklist** Item 2, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

If **Certification Checklist** Item 2 is answered "No," an Environmental Assessment as required by 47 C.F.R Section 1.1311.

**PREPARERS CERTIFICATION ON SECTION III MUST BE COMPLETED AND SIGNED.**

**SECTION III - PREPARER'S CERTIFICATION**

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name JOSEPH M. DAVIS, P.E.	Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature	Date 11/26/2007	
Mailing Address CHESAPEAKE RF CONSULTANTS, LLC 11993 KAHNS ROAD		
City MANASSAS	State or Country (if foreign address) VA	Zip Code 20112 -
Telephone Number (include area code) 7036509600	E-Mail Address (if available) JOSEPH.DAVIS@RF-CONSULTANTS.COM	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

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Any specified rotation has already been applied to the plotted pattern.

Field strength values shown on a rotated pattern may differ from the listed values because intermediate azimuths are interpolated between entered azimuths.

