

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877

ENGINEERING EXHIBIT EE:

**MORTENSON BROADCASTING CO. OF TEXAS, INC.
AM BROADCAST STATION
KTNO, 1440 KHZ, UNIVERSITY PARK, TEXAS**

LICENSED: 0.35 KW-N/15 KW-D DA-2 U
PROPOSED: 0.35 KW-N/50 KW-D DA-2 U

3 June 2005

FCC FACILITY ID NUMBER 34562

**ENGINEERING EXHIBIT
IN SUPPORT OF
AN APPLICATION FOR CONSTRUCTION PERMIT TO:
INCREASE DAYTIME OPERATING POWER
OF AN EXISTING CLASS B AM BROADCAST STATION**



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DECLARATION

I, Alan E. Gearing, declare and state that I am a graduate electrical engineer with a Bachelor of Science degree in Electrical Engineering from SUNY University at Buffalo, that I am a registered professional engineer in the District of Columbia (since 1979), and that I have provided engineering services in the area of telecommunications since 1973. My qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission. I am a senior engineer with the firm of Mullaney Engineering, Inc., consulting radio telecommunications engineers with offices in Gaithersburg, Maryland.

The firm of Mullaney Engineering, Inc., has been retained by MORTENSON BROADCASTING CO. OF TEXAS, INC. to prepare the instant engineering exhibit in support of *an Application for Construction Permit to increase daytime operating power* for existing Class B AM broadcast station KTNO, UNIVERSITY PARK, TEXAS (FCC FACILITY ID NUMBER 34562).

All facts contained herein are true of my own knowledge except those stated to be on information and belief, and as to those facts, I believe them to be true. I declare under penalty of perjury that the foregoing is true and correct.



Alan E. Gearing, P.E.
District of Columbia Number 7406

Executed on the 3rd day of June 2005

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NARRATIVE STATEMENT:

I. GENERAL:

This engineering statement and the instant engineering exhibit of which it is part have been prepared on behalf of MORTENSON BROADCASTING CO. OF TEXAS, INC. (hereinafter "Mortenson"), licensee of AM broadcast Station KTNO - currently licensed to serve University Park, Texas [FCC FACILITY ID NUMBER 34562]. KTNO is a Class B station currently authorized to operate on the frequency of 1440 kHz with daytime power of 15 kilowatts and nighttime power of 0.35 kilowatts. A directional antenna consisting of a total of five towers is employed. Four towers are used for each pattern (day & night), with three towers common to both patterns.

By means of instant application Mortenson **proposes to increase KTNO's daytime operating power to 25 kW. The existing directional antenna array will be employed, with modified parameters. No changes are proposed in the licensed KTNO nighttime operation.** The changes specified herein constitute a **minor change**¹ relative to KNTNO's existing licensed operation [See BL-20040827ACM] and **do not** result in any prohibited contour overlap or cause prohibited interference with respect to any other known prior filed application or existing station.

¹ As defined in §73.3571 of the FCC Rules as revised by the *First Report & Order* in MM Docket No. 98-93; adopted March 23, 1999; released March 30, 1999

The KTNO facilities proposed herein will be built to comply with the *FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*. Furthermore, since no new tower construction is involved, the instant proposal is believed to be **categorically excluded from environmental processing - including Section 106 review** - pursuant to the provisions of §1.1306 of the Commission's Rules. A more detailed discussion of environmental factors is included under the heading Environmental Considerations below.

Information requested by exhibits in response to questions on Section III-A of FCC Form 301 [September 2004 edition] is incorporated in the following paragraphs, figures, and tables.

II. ENGINEERING DISCUSSION:

A. KTNO Transmitter/Antenna Location:

Will employ the same transmitter/antenna site as authorized in BMP-20030331ALX. The site is located on the north side of Bruton Road in the City of Dallas, approximately 450 meters ($\approx 1500'$) east of the intersection with 2nd Avenue and US Highway 175. The geographic coordinates (NAD 27) of the center of the KTNO antenna array are:

Latitude: 32° 45' 01.8"
Longitude: 96° 43' 22.0"

Since this is an existing site, a map and aerial photograph of the site are not being submitted herein.

There are no known radio stations within the general vicinity of the site. Table 1 is a list of places, airfields, other broadcast stations, and towers within ten kilometers of the proposed KTNO site. The table shows that there are three AM

stations located within 3.2 kilometers of the proposed site. The KTNO entry is for the authorized CP which will be superseded by the instant proposal. KGGR is a nondirectional station, so the pertinent distance is 0.8 km. With a separation of 3.2 km, no adverse interaction is expected between the proposed KTNO operation and KGGR.

The remaining AM station of concern is KRVA, 1600 kHz, Cockrell Hill, TX. The KRVA site is located 1.6 km (\approx 1 mile) to the southeast of the KTNO site proposed herein. KRVA employs a 5 kW, two tower directional array during daytime hours and a 930 watt, four tower array nighttime. The tightest suppression for both the KRVA daytime and nighttime patterns is around 80-90 mV/m @ km. Given the relative frequencies, powers and directional patterns involved, it is anticipated that with appropriate filtering installed as necessary these two stations will be able to successfully coexist without any significant adverse interaction. Mortenson will cooperate fully with the licensee of KRVA to install whatever filtering and detuning networks are found to be required.

A computerized analysis of the population contained within the proposed daytime blanketing area indicates that there are 2,798 persons living within the proposed 1000 mV/m contour and 2,034,243 persons living within the proposed 25 mV/m contour. The population within the proposed daytime 1000 mV/m contour is approximately 0.1% of that within the proposed daytime 25 mV/m contour, well below the 1.0% criteria specified in §73.24(g). Mortenson will fully comply with the provisions of §73.88 concerning responding to reports of blanketing interference.

B. Proposed Directional Antenna System:

Mortenson proposes to employ the five element directional antenna array for authorized in BMP-20030331ALX. The proposed daytime and nighttime KTNO directional patterns will each employ four of the towers, with three towers common to both. Each array element will be a base-insulated, uniform cross-section, guyed, steel tower. The towers will be of unequal heights. Figure 3 is a vertical plan sketch of a typical tower. Height information for each individual tower is also provided on Figure 3. The Federal Aviation Administration (FAA) is being notified of the proposed tower construction concurrently with the instant application. Upon receipt of an FAA determination of "no hazard", the towers will be registered with the Commission. *NOTE: Since tower #3 of the day pattern is approximately 17 meters ($\approx 56'$) shorter than the other four towers and since it is located near the center of the array and surrounded by the other taller towers, this tower is not proposed to obstruction marked or lighted, unless the FAA or FCC directs otherwise.*

A plat of the proposed site showing relative tower locations and the proposed ground system layout is included herein as Figure 4.

Figures 5-A through 5-C furnish salient information regarding the proposed daytime directional antenna system. Similarly, Figures 8-A through 8-D provide data for the proposed nighttime directional antenna system. A computer program utilizing the theoretical formulae modified in accordance with the Commission's Rules has been used to determine the final values of fields, RMS, RSS, etc. (General design formulae and sample calculations are not being provided herein but will be made available upon request by the Commission.) Theoretical RMS values are 1000 mV/m for the proposed KTNO 9.0 kW daytime pattern and 189.8 mV/m for the proposed KTNO 0.35 kW nighttime pattern. These values equate

to 333 mV/m/kW @ km daytime and 321 mV/m/kW @ km nighttime, meeting the minimum efficiency requirement of 282 mV/m/kW @ km specified in §73.189.

C. Principal Community Coverage:

Figure 6-B, herein, is a map showing the location of the existing, authorized, and proposed KTNO daytime 5.0 mV/m contours, while Figures 6-C and 6-D depict the 2.0 mV/m and 0.5 mV/m contours, respectively. From the map of Figure 6-B it is clearly evident that the principal community to be served (UNIVERSITY PARK, TEXAS) is well within the proposed daytime 5 mV/m contour.

Figure 9-B, herein, is a map showing the location of the existing, authorized, and proposed KTNO 50% RSS night limit contours. From the map it is clearly evident that the principal community to be served (UNIVERSITY PARK, TEXAS) is completely within the proposed nighttime 9.96 mV/m 50% RSS contour.

D. Daytime Allocation Study:

Table 2 is a tabulation of stations pertinent to the operation of Station KTNO on 1440 kHz from the site proposed herein. Figures 7-A through 7-C are appropriately scaled maps showing applicable allocation contours for KTNO and the more critical stations from Table 1. Figure 7-A shows the co-channel allocation situation. Because of the large area covered, this map is not a full-scale reproduction of the FCC's Figure M-3 ground conductivity map. If requested by the Commission, a showing using a full-scale M-3 map will be provided. Figure 7-B shows the first adjacent channel allocation situation and Figure 7-C shows the second adjacent channel allocation situation. In order to show in more detail the relative locations (**and the absence of any overlap**) of the proposed KTNO and KTFW 5 mV/m contours, Figure 7-C does not employ the FCC's Figure M-3 map. A showing using a full-scale M-3 map will be

provided upon request. There are no third adjacent channel stations close enough to warrant mapping.

These maps show that there is **no** prohibited contour overlap between the proposed KTNO operation and any other station. The **existing** normally prohibited contour overlap between KTNO and several other stations has been either **reduced** or completely **eliminated** by the instant proposal.

E. Nighttime Allocation Study:

RSS calculations on 1440 kHz and each first adjacent channel (1430 kHz & 1450 kHz) have been carried out by means of a computer program which accesses the FCC's AM station database. Table 4 is a detailed tabulation showing the results of this study toward critical non-Class A stations (there are no pertinent Class A stations on 1440 kHz or either first adjacent channel). The tabulation shows that the proposed KTNO nighttime operation either **would not** enter the 25% RSS night limit of any other co-channel or first adjacent channel station or **would reduce** the contribution to the 25% RSS night limit in instances where the licensed KTNO operation enters the 25% RSS calculation. The licensed KTNO operation does not enter any 50% RSS calculation so the 10% reduction requirement specified in footnote 1 to §73.182(q) does not apply.

“Clipping” studies were performed with respect to the following stations:

- KELG, 1440 kHz, Manor, TX - 9.74 mV/m 50% RSS N.L.
- KEYS, 1440 kHz, Corpus Christi, TX - 7.13 mV/m 50% RSS N.L.
- KITA, 1440 kHz, Little Rock, AR - 17.4 mV/m 50% RSS N.L.
- KMAJ, 1440 kHz, Topeka, KS - 7.23 mV/m 50% RSS N.L.
- KMLB, 1440 kHz, Monroe, LA - 4.97 mV/m 50% RSS N.L.
- KPUR, 1440 kHz, Amarillo, TX - 5.54 mV/m 50% RSS N.L.

Maps showing the protected contours and clipping points for these stations are not being submitted herein, but will be supplied upon request. Detailed night limit calculations at the clipping points are included in Table 4.

F. Conductivities and Unattenuated Field Strengths:

The FCC Conductivity Map, Figure M-3, was used to establish the effective conductivities for all stations in the absence of measurement data. Field strength measurements have been employed for both the licensed and proposed KTNO operations as well as KPUR and KNET

Field strength measurements to establish actual conductivity values for the proposed KTNO operation were taken on AM station KSKY operating from its formerly licensed location just 2.6 km (1.6 miles) from the site proposed for use by station KTNO. In compliance with the Commission's policy of permitting measured conductivity values to be used within 2 miles of the site that was actually measured these data have been applied to the proposed KTNO site. The results of these field strength measurements on KSKY are submitted as Appendices A-C herein. Appendices D-H provide the measurement results on stations KPUR and KNET. Field strength measurements for the licensed KTNO operation were taken from the station's FCC files - see BL-10961.

Where applicable, the equivalent distance method was used to establish the distances to contours.

The FCC's AM station database has been used to obtain parameters of all stations considered in the allocation studies except for the proposed KTNO operation which is specified herein.

As the latest version of FCC Form 301 [March 2001] no longer specifically refers to a tabulation of supporting data employed in generating groundwave contour locations depicted in coverage and allocation showings, such data are not being submitted herein, but will be supplied to the Commission upon request. However, Table 3 herein does provide a summary of the measured conductivity values employed.

G. Environmental Considerations:

The applicant believes its proposal will not significantly affect the environment for the following reasons.

The proposal does not meet any of the criteria specified in Section 1.1307 of the FCC Rules. More specifically, the proposed facilities are not known to fall within any of the categories enumerated in Sections 1.1307(a)(1)-(7) and will not involve the use of high intensity white lights. Furthermore, operation of the proposed facility will not involve the exposure of workers or the general public to levels of radio frequency electromagnetic fields exceeding guidelines adopted by the Federal Communications Commission. [The current FCC guidelines are based upon criteria contained in the National Council of Radiation Protection and Measurements (NCRP) Report No.86 (1986) and ANSI/IEEE C95.1-1992.]

With regard to the last item, each tower will be surrounded by a gated fence, at least seven feet tall. The fence will not be less than two meters from any point on the tower or feed line. This is the "worst case" distance from Section 1 of Supplement A to OET Bulletin No. 65 (Edition 97-01) assuming: 9.0 kW, 1440 kHz, AM station with antenna towers of approximately 0.25 wavelength to 0.35 wavelength in height. The fence gates will be kept locked and appropriate warning signs posted on each face of the fences. Procedures will be adopted to protect workers requiring access to the tower inside the fenced area, including

reduction of power or cessation of operation, to comply with germane exposure guidelines.

III. SUMMARY:

Mortenson proposes to modify the changes it has proposed to make in the operation of AM broadcast station KTNO, currently licensed to serve Denton, Texas. The instant application is an amendment to the pending application [See BMP-20030331ALX] to modify a construction permit which authorized KTNO to duplex its operation with sister station KGGR. The technical modifications proposed herein constitute a **minor change** relative to the pending proposal and **do not** result in any prohibited contour overlap or cause prohibited interference with respect to any other known application or existing station.

Based upon the technical specifications contained in available station facility databases and engineering analysis carried out during the design of the directional antenna systems proposed herein, the undersigned believes that the proposed operation: 1) would not result in prohibited contour overlap; 2) would not create or receive prohibited interference; 3) would not have any significant impact on the environment; and 4) is fully in compliance with all Commission's rules and applicable international agreements.



Alan E. Gearing, P.E.