



## **ENGINEERING STATEMENT**

This Engineering Statement and the attached figures have been prepared on behalf of the State of Wisconsin Educational Communications Board ("WECB"), applicant for a new non-commercial educational FM broadcast station at Superior, Wisconsin, by B. Benjamin Evans of Evans Associates, Consulting Communications Engineers in Thiensville, Wisconsin. This engineering exhibit supports WECB's application for construction permit to build a new NCE-FM facility to operate on Channel 203A (88.5 MHz) at Superior, Wisconsin.

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### **PRELIMINARY**

Evans Associates has been retained to prepare the engineering portion of an application by WECB for authority to construct a Class A non-commercial FM broadcast station at Superior, Wisconsin. The new station will be an addition to the existing WECB non-commercial FM broadcast state network.

### **PROPOSED FACILITIES**

It is proposed herein to install the transmitting antenna on an existing 35-foot tower in the Duluth, Minnesota antenna farm. All type-accepted equipment will be installed throughout the RF chain to deliver the required amount of power to the antenna.

The antenna proposed is a single-bay dipole, which will be mounted at 35 feet AGL (10.7 meters), or 1279 feet AMSL (389.9 meters). The antenna HAAT will be 87 meters. The antenna will be of vertical polarization so as to reduce the possibility of interference to TV Channel 6 station KBJR-TV in Superior, whose antenna is on a tower adjacent to the proposed FM site. The ERP will be 1.0 KW. A sketch depicting the proposed tower is attached as Figure 1.



New NCE-FM, Superior, WI - Page 2

The facility proposed herein will serve a land area of 710 square kilometers, containing a 1990 U.S. Census population of 126,714 persons, with a predicted 1 mV/m signal or better.

## **ALLOCATIONS**

The stations that are pertinent to the proposed new Superior NCE-FM station on an allocation basis are shown in Figure 4, attached. As seen in this figure, the proposed Superior facility will not cause prohibited contour overlap with any other FM facility, in accordance with §73.509 of the FCC Rules.\* The proposed facility, although within 320 kilometers of the Canadian border, will not affect any present Canadian FM assignments.

## **TV CHANNEL 6 CONSIDERATIONS**

WECB has obtained the consent of KBJR-TV, Channel 6 in Superior, to operate the facilities proposed herein, in lieu of the technical requirements of §73.525 of the FCC Rules. Attached as Figure 5 is the consent letter from the President and General Manager of KBJR-TV. No other TV Channel 6 stations are affected by this proposal.

## **INTERMODULATION INTERFERENCE**

The proposed site is in an existing antenna farm where there presently are several FM and TV broadcast transmitting facilities operating. No intermodulation interference between the proposed FM station and any other station in the area is expected. Expectations notwithstanding, the applicant accepts full responsibility for the resolution of any objectionable interference caused by the proposed FM station to facilities either existing or authorized, or to non-mobile radio receivers in use prior to grant of the instant application.

## **BLANKETING INTERFERENCE**

Blanketing interference to nearby consumer electronics devices is not expected to be a problem; however, should blanketing interference become evident, the applicant will resolve all known complaints of such interference in accordance with §73.318 of the FCC Rules.

\*Please note the proposed facility at Superior is mutually exclusive with two other proposed facilities. See Figure 4 for further description of both facilities.

## ENVIRONMENTAL CONSIDERATIONS

Since the proposed antenna-supporting structure already exists and is in an established antenna farm, the physical and visual impact of the proposed facility will be insignificant. Thus, §1.1307(a) of the FCC Rules does not apply to this proposal.

The calculated RF power density two meters above ground beneath the proposed antenna, in combination with the other adjacent facilities, would exceed  $0.2 \text{ mW/cm}^2$ , the MPE level for "uncontrolled environments." WECB will measure the actual exposure levels at the site upon completion of construction using industry-standard RFR survey equipment in order to establish compliance with FCC guidelines. These measurements will be submitted along with the FCC 302 application for license. Any areas found to exceed FCC guidelines as a result of the proposed new FM station will be fenced off to prevent access by persons having no knowledge or control over their RFR exposure.

If maintenance personnel are required to work on or near the tower, the FM station transmitter power will be lowered to a level in accordance with FCC guidelines, or the transmitter will be turned off for that period of time in which the RF exposure might exceed FCC guidelines.

Therefore, in view of the above, this proposal is not deemed to be a major environmental action.

## ATTACHED FIGURES

Affidavit

FCC Form 340, Section V-B

Figure 1 - - - - Vertical Plan Sketch of Antenna Structure

Figure 2 - - - - Topographic Map Showing Proposed Site

Figure 3 - - - - Map Showing Proposed  $1.0 \text{ mV/m}$  Service Contour

Figure 4 - - - - Allocation Study - Channel 203A

Figure 5 - - - - Consent Letter from KBJR-TV, Channel 6, Superior, WI

## AFFIDAVIT

COUNTY OF OZAUKEE

SS:

STATE OF WISCONSIN }

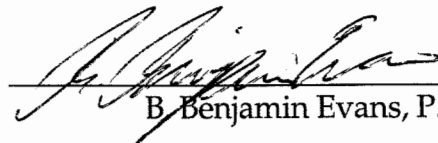
**B. BENJAMIN EVANS**, being duly sworn upon oath deposes and says:

That his qualifications are a matter of record with the Federal Communications Commission;

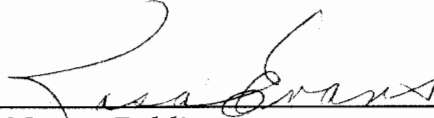
That he is a Consulting TeleCommunications Engineer, a Registered Professional Engineer in the State of Wisconsin, and a partner in the firm of Evans Associates;

That this firm has been retained by the State of Wisconsin Educational Communications Board to prepare this engineering exhibit;

That he has either prepared or directly supervised the preparation of all technical information contained in this engineering statement, and that the facts stated in this engineering statement are true to the best of his knowledge, except statements that are herein stated to be based on information or belief, and as to such statements he believes them to be true.

  
B. Benjamin Evans, P.E.

Subscribed and sworn to before me this 1st day of December, 1997.

  
Notary Public

My Commission expires

Sept 24, 2000

### NOTICE

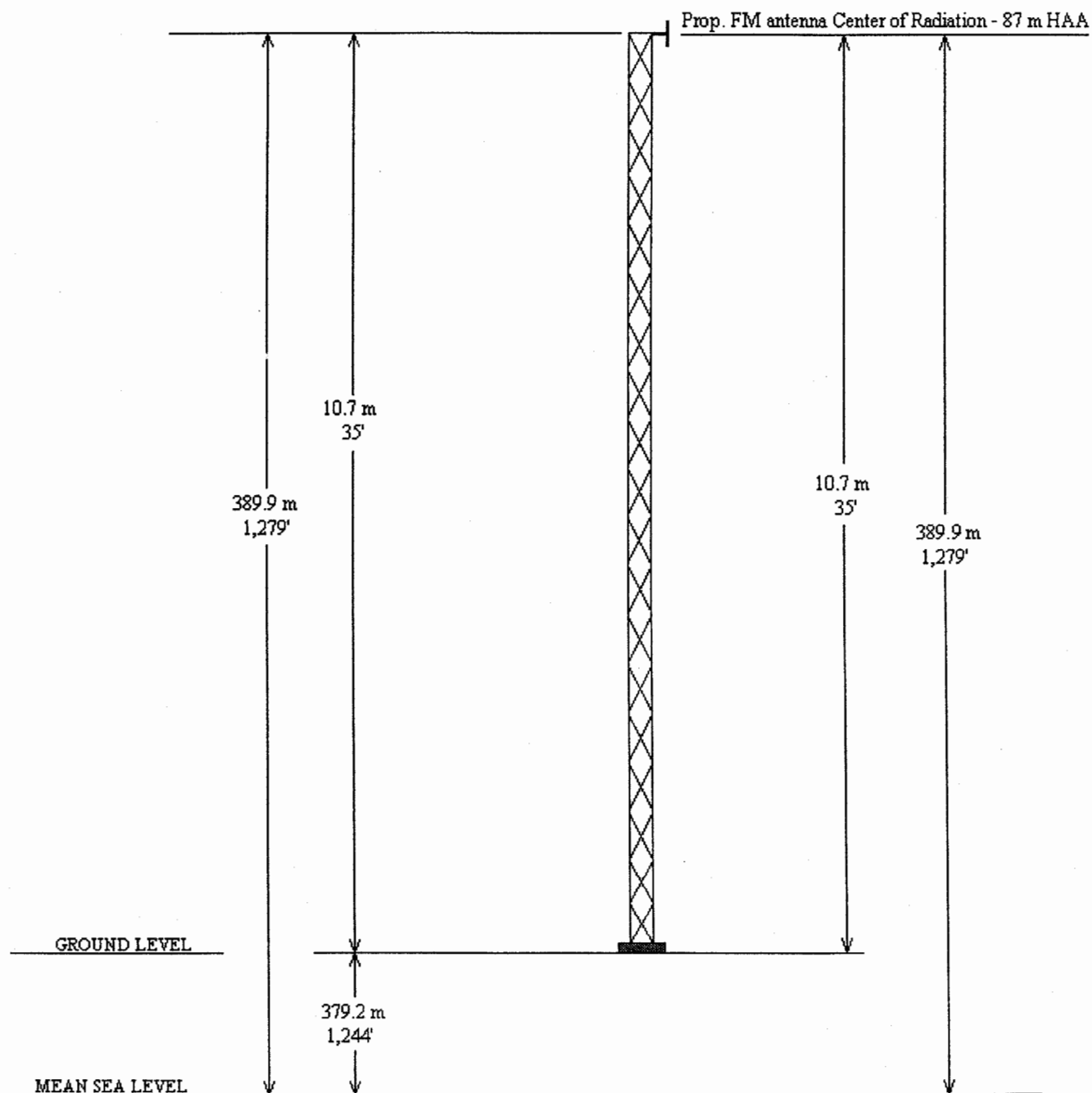
This exhibit and the work it is based on represents our best interpretation of existing information, technical data, FCC Rules and policies, and policies and rules of other agencies. However, these data, rules and policies and their interpretation by the FCC or other agencies are constantly changing. Therefore, we do not warrant this work to be acceptable to the FCC or other agency, that any undertaking based on it will be successful, or that further submittals, administrative actions or litigation will not be required by others in support of this proposal or future undertaking. In the event of errors, our liability is strictly limited to replacement of this document with a corrected one. Liability for consequential damages is specifically disclaimed. Favorable action on this application by the FCC, FAA or other federal and state agencies is not guaranteed.

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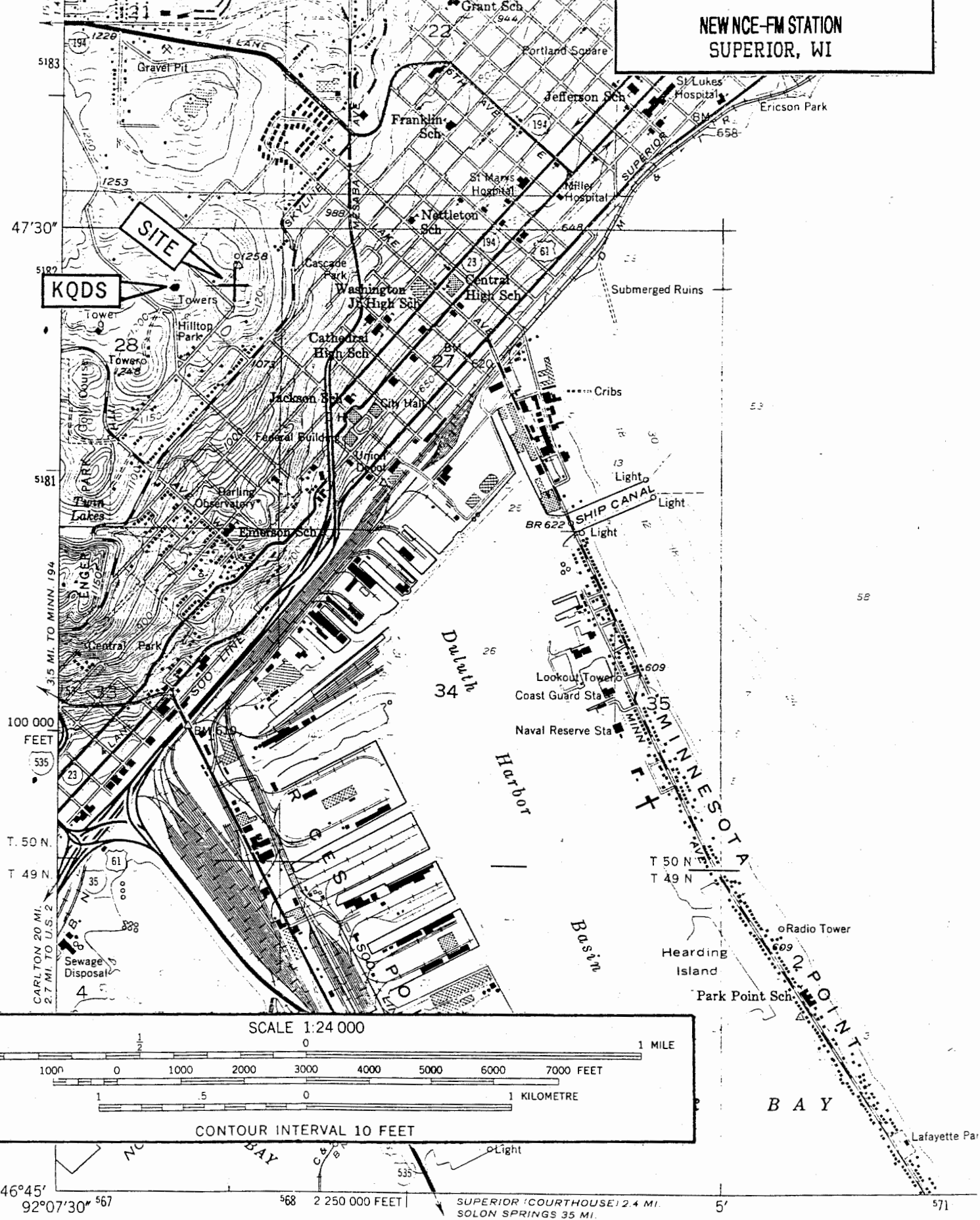
Drawing Not to Scale - Not  
to be used for Construction.

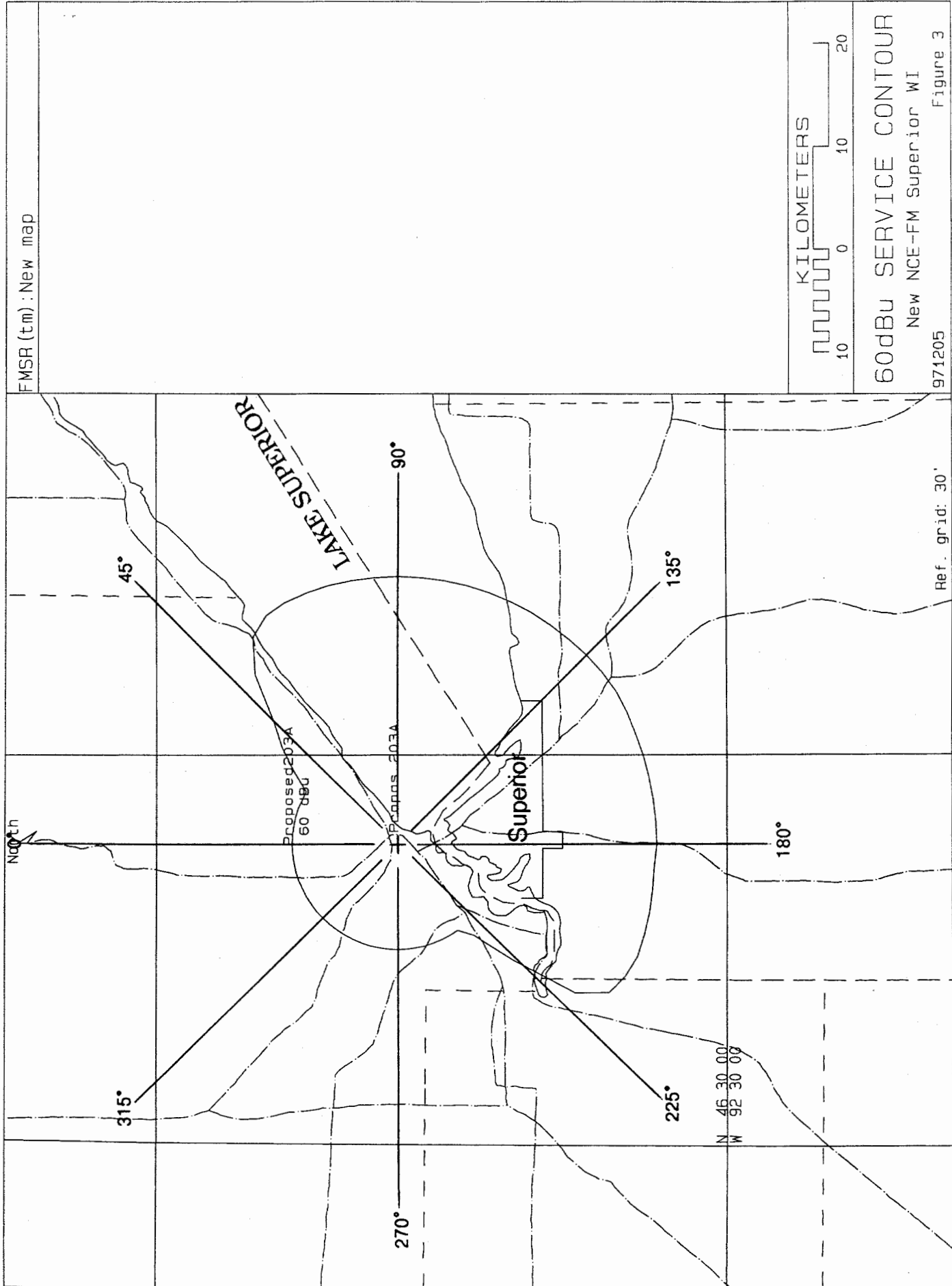


VERTICAL PLAN SKETCH OF ANTENNA STRUCTURE

New NCE-FM Station - Channel 203  
Superior, Wisconsin  
Wisconsin Educational Communications Board

FIGURE 2  
TOPOGRAPHIC MAP SHOWING  
PROPOSED SITE  
NEW NCE-FM STATION  
SUPERIOR, WI





60dBu SERVICE CONTOUR

New NCE-FM Superior WI

Figure 3

971205

Evans Associates  
210 S. Main Street  
Thiensville, WI 53092  
FM FREQUENCY ALLOCATION STUDY

Channel: 203A ( 88.5 MHz) 1 KW ERP  
 Coordinates: 46 - 47 - 21 92 - 6 - 51 207 M HAAT  
 Job Title: WECB - SUPERIOR WI Φ indicates 73.215 Facility  
Cl.A Spacing: 73.207

CALL	Φ CITY	CH/CL-ZN	HERP	VERP	-kw	LATITUDE	BEAR-to	DIST-km	REQ
STATUS	ST-CTRY	FCC#	(m)-HAAT	MAXHAT	HAMSL	LONGITUDE	-from-°T	CLEAR-km	-km
WHWC	Menomonie	202C	100.	100.	DA BT	45 2 47	174.2°	194.7	166.0
LIC	WI US	BLED960829KA	319	356	625	91 51 42	354.3°	+28.7	
•State of Wisconsin-Educational Comm						•DA: ODDODD960829IA00°			
NEW	Wentworth	203C2		8.		46 32 4	172.9°	28.5\*	
AP@	WI US	BPED971009MB	129	220	429	92 4 5	352.9°		
•American Family Association									
KCRBFM	Bemidji	203C1	95.	95.		47 42 3	300.4°	206.3	201.0
LIC	MN US	BLED940711KA	297	311	717	94 29 15	118.6°	+5.3	
•Minnesota Public Radio, Inc.									
NEW	Esko	204A		0.45		46 42 22	244.0°	21.1\*	
APP	MN US	BPED970331MA	29	139	372	92 21 44	63.9°		
•Lincoln High School									
KBJRTV	SUPERIOR	6TV-2	100			46 47 21	0.0°	0.0\	
LIC	WI US	BLCT2419	308	430	610	92 6 51	0.0°		
•KBJR LICENSE, INC.									

>> \*\*\* CHANNEL SUITABLE FOR ASSIGNMENT WITH SPECIFIED POWER AND HEIGHT \*\*\* <<

\* The instant Superior application is mutually-exclusive with these applications.





November 21, 1997

Mr. Ben Evans  
Evans and Associates  
210 South Main Street  
Thiensville, WI 53092-1905

Dear Mr. Evans,

After reviewing your letter of October 15th KBJR has no objection to the Wisconsin Educational Communications Board's proposed non-commercial FM station here in Duluth. The proposed station's operating frequency of 88.5 Mhz, at an effective radiated power of 1000 watts, co-located at KBJR's transmitter site and at the specified height above ground level, is acceptable.

Naturally KBJR is concerned about potential interference and realize that even when engineering studies indicate there won't be a problem the real world sometimes doesn't cooperate. Therefore your promise to work on resolving all complaints is a key part of KBJR's acceptance of this proposed station.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Robert Wilmers', written over a horizontal line.

Robert Wilmers  
President & General Manager  
KBJR-TV