EXHIBIT 23
Community Coverage Showing
Alternate Propagation Study

Longley/Rice Community Coverage
of Newberry, MI for

WNBY-FM.C – Newberry, MI
Channel 230C2 – 93.9 MHz

Exhibit 23 Discussion

This firm has been retained to prepare an engineering report demonstrating compliance with §73.315 regarding the proposed community coverage for WNBY-FM, Newberry, MI. WNBY-FM proposes operation on Channel 230C2, 93.9 MHz with 50 kW ERP at 135 meters AGL. A NDA antenna will be employed. Alternate propagation methodology (Longley/Rice) has been employed pursuant to §73.313(e).

The proposed transmitter site for WNBY-FM will be the existing WIHC(FM) tower bearing Antenna Structure Registration number 1060955 and NAD 27 coordinates 46° 26' 58" NL; 85° 06' 04" WL. These coordinates and proposed WNBY-FM operation parameters results in minimal 70 dBu f(50:50) coverage of Newberry using standard FCC propagation methods. However, pursuant to §73.313(e), 100% of the community of Newberry does lie within the 70 dBu city grade contour of WNBY-FM when analyzed under the Longley/Rice Propagation methodology.

FCC Rules requires several specific stipulations prior to accepting Longley-Rice as an alternate propagation method for coverage issues. In this case, supplemental Longley/Rice methodology is warranted based on observed anomalous terrain and use of the Delta (Δ) h as the sole determinate. For use as a sole determinate, Delta (Δ) h along the path from the transmitter to the community must "depart widely" from an average Delta (Δ) h of 50 by less than 20 or more than 100. In addition, the terrain path must extend from a distance of 10.0 km to the community, but not to exceed 50.0 km. For the proposed WNBY-FM operation, a Delta (Δ) h no higher than 14.2 was observed over the entire 249.7°T to 253.1°T arc of coverage toward Newberry. The distances along this bearings range from 32.67 km to 34.12 km.

In addition, showings must be made demonstrating distance to the 70 dBu contour as predicted by the supplemental method is at least 10% larger than the distance predicted by the standard contour prediction method. Distance to the 70 dBu contour as predicted by the supplemental method has been calculated to be no less than 11.7% larger than the distance to the standard contour prediction method over the entire community coverage arc.

Use of the supplemental Longley-Rice methodology may also be warranted based on documented calculations showing the extended HAAT (3 km to community limit) for each radial over the community arc varies by more than 30% from the HAAT obtained by using the standard method (3 km to 16 km) for each radial. For the proposed WNBY-FM operation, the extended HAAT varies by no less than 50.1% for any radial over the community arc. Alternately, the average HAAT of 135 meters as taken off of this Form 301-FM application results in a variance of no less than 63.7% when compared against any extended HAAT radial over the community arc.

Attached as *Exhibit 23A* is a V-Soft®, Probe III™ map demonstrating compliance with the above mentioned criteria. All relevant distances and contours as well as operating parameters employed have been noted. Longley/Rice and standard predicted methodology as described by the computer software manufacturer has been included in *Exhibit 23B*. It is believed sufficient showing has been presented meriting a grant of the proposed WNBY-FM with regard to community coverage, however additional showings will be provided upon FCC request.

WNBY-FM.P
Proposed Operation
Latitude: 46-26-58 N
Longitude: 085-06-04 W
ERP: 50.00 kW
HAAT: 135.18 m
Channel: 230
Frequency: 93.9 MHz
AMSL Height: 368.0 m
Horiz. Pattern: Directional
Vert. Pattern: No

Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0010
Dielec Const: 4.0
Refractivity: 311.0
Receiver Ht AG: 9.1 m
Receiver Gain: 0 dB
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

Terrain
178   315 m

**Exhibit 23A
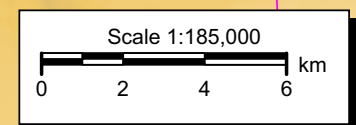Longley/Rice
Community Coverage
Contour Study**

WNBY-FM.P

FCC 70 dBu f(50:50)

Longley/Rice 70 dBu

253.1°
252.5°
251.5°
250.5° 249.7°
Newberry

| Azimuth | Distance to City Limit | Delta H | Distance to 70 dBu FCC Contour (km) | Distance to 70 dBu Longly-Rice (km) | Percent Difference | Individual Radial HAAT 3 km - City Limit | 3 km -16 km | % Diff From | Average FCC HAAT | % Diff From |
(degrees)	(km)	(m)			70 dBu dist	Extended (meters)	FCC (meters)	Ind HAAT	(meters)	AVG HAAT
249.7	32.67	10.90	32.5	36.3	11.7%	221.01	147.2	50.1%	135.0	63.7%
250.0	33.18	11.00	32.5	36.3	11.7%	221.21	147.1	50.4%	135.0	63.9%
250.5	34.02	14.20	32.5	38.3	17.8%	221.52	147.0	50.7%	135.0	64.1%
251.0	34.12	13.00	32.5	40.2	23.7%	221.34	146.9	50.7%	135.0	64.0%
251.5	34.01	13.92	32.5	44.1	35.7%	221.06	146.8	50.6%	135.0	63.7%
252.0	33.91	12.87	32.5	48.0	47.7%	220.83	146.7	50.5%	135.0	63.6%
252.5	33.81	10.89	32.4	46.0	42.0%	220.83	146.6	50.6%	135.0	63.6%
253.0	33.71	9.22	32.4	44.1	36.1%	221.04	146.4	51.0%	135.0	63.7%
253.1	33.69	8.75	32.4	44.5	37.3%	221.07	146.6	50.8%	135.0	63.8%

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Scale 1:185,000
0   2   4   6   km

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Propagation Methodology

FCC Propagation Curves

The FCC curves were created through a combination of the free-space equations and actual measurements, which augmented the equations with real world experience. Initially, the curves were available only as a set of graphs. However, with the advent of computers, the U.S. Federal Communications Commission employed its staff to translate the curves to a set of digitally stored tables, which could be interpolated by machine. With the input of desired signal level, radiated power, and effective antenna height the curves will give the user an accurate estimate of the distance from the antenna where the signal will exist. The curves can also be used to determine signal level at a distance with the input of power, antenna height and distance from the antenna. Proper use of the curves requires that the input variable "antenna height" be calculated to represent the antenna's height above "average terrain". The FCC specifies certain methods for determining this value. When topographic maps are employed, the Commission requires that at least 50 points be taken from 3.16 to 16 kilometers (FM) and then averaged to produce the height above average terrain. The computer implementation of the curves will generally take terrain samples at one/tenth kilometer intervals. The FCC's method is excellent at representing coverage over somewhat smooth or rolling terrain, however the methods tend to break down in places where the terrain is rugged. Since the method simply averages the terrain elevations, inaccuracies are introduced when the terrain varies widely or when it varies significantly at points beyond the method's 16-kilometer cutoff.

Longley-Rice Model

In the mid-sixties, the National Bureau of Standards published Technical Note 101. P. L. Rice, A. G. Longley, A. Norton and A. P. Barsis authored this two-volume propagation treatise in the course of their work at the Institute for telecommunications Sciences and Aeronomy at Boulder, Colorado. The concepts expressed in these documents were incorporated into a series of computer routines that came to be known as the "Longley-Rice Model". This model has recently been employed by the Commission to determine the new DTV allocation scheme. It has now become the standard alternative prediction method. Going well beyond the FCC curves, the Longley-Rice method considers atmospheric absorption including absorption by water vapor and Oxygen, loss due to sky-noise temperature and attenuation caused by rain and clouds. It considers terrain roughness, knife-edge, (with and without ground-reflections), loss due to isolated obstacles, diffraction, forward scatter and long-term power fading. The model and our V-Soft Communications implementation require the following inputs for analysis based on multiple point-to-point paths:

Frequency (20 - 20,000 MHz)

Transmitter antenna parameters:

Transmitter antenna height (above mean sea level - meters.) Transmitter antenna height (above ground - meters.) Transmitter power. Transmitter antenna pattern.

Receiver antenna height (above ground - meters)

System antenna polarization (vertical or horizontal)

System Ground Conductivity (mhoS/m)

- .001 = Poor Ground

- .005 = Average ground

- .020 = Good ground

- 5.000 = Sea water

- .010 = Fresh Water

System dielectric constant (Permitivity)

- 4.0 = Poor ground

- 15.0 = Average ground

- 25.0 = Good ground

- 81.0 = Sea and fresh water

System minimum monthly mean surface refractivity (Adjusted to sea level.)

- 200 to 450 (available from map, 301 N-units is default.)

Climate Code:

- 1 = Equatorial

- 2 = Continental sub-tropical

- 3 = Maritime Subtropical

- 4 = Desert

- 5 = Continental temperate (default for U.S. continent)

- 6 = Maritime temperate

- 7 = Maritime temperate overseas

Probability Factors:

- Qt = (Time variability) The percentage of time the actual path loss is equal or less than the predicted path loss (Standard broadcast coverage = 50%)

🔶 **Ql** = (Location Variability) The percentage of paths (all with similar characteristics) whose actual path loss is less than or equal to the predicted path loss. (Used with area mode only.)

🔶 **Qc** = (Prediction Confidence or "Quality") The percentage of the measured data values the model is based on that are within the predicted path loss. (Standard broadcast = 50%, DTV = 90%.)

V-Soft Communication's implementation of Longley-Rice predicts received signal strength level at some 264,000 points. Our programs Probe and Terrain-3D allow instantaneous manipulation of these points to produce numerous graphic representations of the coverage pattern. The user can choose any of the pre-defined signal level representations or input a user-defined signal level. Costal features, cities, political boundaries and streets to the individual road level are available for plotting.

Okumura Propagation Model

 The basic Okumura propagation model uses the height above average terrain to calculate path loss and does not consider specific terrain obstacles. The Okumura propagation model that Probe uses is the Okumura/Hata/Davidson implementation. Hata developed a set of equations that provide Okumura model predictions for computer use. The Davidson correction factors extend the frequency and base antenna height range.

COST-231 Propagation Model

Probe implements the COST-231/Hata version of the COST-231 propagation model. This model uses the HAAT along each radial to determine the attenuation based the following equation:

Path Loss (dB) = 46.3 + 33.9*log(F) - 13.82*log(H) + [44.9 - 6.55*log(H)]*log(D) + C

where

 F = Frequency (MHz)
 D = Distance between base station and receiver (km)
 H = HAAT in the direction of the receiver (m)
 C = Environmental-correction factor (dB)

The Hata correction for receiver height and frequency is then applied to calculate the final attenuation.

Probe   -   Terrain 3-D