ENGINEERING EXHIBIT

Application to Modify an LPTV Station Construction Permit

prepared for

Nelson TV, Inc.
W29EI-D La Salle, Illinois
Facility ID 187839
Ch. 29 (Digital) 1.0 kW (MAX-DA)

Table of Contents

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Section III - Engineering (Digital)

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:
   29
2. Translator Input Channel No. :
3. Primary station proposed to be rebroadcast:

Facility Identifier	Call Sign	City	State	Channel

4. Antenna Location Coordinates: (NAD 27)
   Latitude:
   Degrees 41 Minutes 42 Seconds 18.9 (•) North ( ) South

   Longitude:
   Degrees 89 Minutes 4 Seconds 46.7 (•) West ( ) East
5. Antenna Structure Registration Number: 1008488
   ☐ Not Applicable [Exhibit 11] ☐ Notification filed with FAA
6. Antenna Location Site Elevation Above Mean Sea Level: 301.8 meters
7. Overall Tower Height Above Ground Level: 91 meters
8. Height of Radiation Center Above Ground Level: 80 meters
9. Maximum Effective Radiated Power (ERP): 1 kW
10. Transmitter Output Power: 0.1 kW
11. a.Transmitting Antenna:
    Before selecting Directional "Off-the-Shelf", refer to "Search for Antenna Information" under CDBS Public Access (http://licensing.fcc.gov/prod/cdbs/pubacc/prod/cdbs_pa.htm). Make sure that the Standard Pattern is marked Yes and that the relative field values shown match your values. Enter the Manufacturer (Make) and Model exactly as displayed in the Antenna Search.
    ( ) Nondirectional ( ) Directional Off-the Shelf (•) Directional composite

    Manufacturer ERI Model AL12W-29-PL

    b. Electrical Beam Tilt: 1.25 degrees ☐ Not Applicable

    c. Mechanical Beam Tilt: degrees toward azimuth degrees True ☑ Not Applicable

    d. Directional Antenna Relative Field Values: ☐ N/A (Nondirectional or Off-the-Shelf)

    Rotation (Degrees): 180 ☐ No Rotation

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0	1	10	0.985	20	0.951	30	0.925	40	0.929	50	0.959
60	0.99	70	0.997	80	0.975	90	0.922	100	0.845	110	0.758
120	0.68	130	0.605	140	0.51	150	0.397	160	0.302	170	0.253
180	0.241	190	0.253	200	0.302	210	0.397	220	0.51	230	0.605
240	0.68	250	0.758	260	0.845	270	0.922	280	0.975	290	0.997
300	0.99	310	0.959	320	0.929	330	0.925	340	0.951	350	0.985

Additional Azimuths

	e. Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt? If Yes, attach an Exhibit (see instructions for details).	○ Yes ◉ No [Exhibit 12]

Relative Field Polar Plot

	NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.	
12.	**Out-of-channel Emission Mask:** ○ Simple ◉ Stringent ○ Full Service	
CERTIFICATION		
13.	**Interference** : The proposed facility complies with all of the following applicable rule sections. 47.C.F.R Sections 74.709, 74.793(e), 74.793(f), 74.793(g), 74.793(h), 74.794(b) and 73.1030.	◉ Yes ○ No See Explanation in [Exhibit 13]
14.	**Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine RF compliance, an **Exhibit is required.** By checking "Yes" above, 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.	◉ Yes ○ No See Explanation in [Exhibit 14]
15.	**Channels 52-59.** If the proposed channel is within channels 52-59, the applicant certifies compliance with the following requirements, as applicable: ☐ The applicant is applying for a digital companion channel for which no suitable channel from channel 2-51 is available. ☐ Pursuant to Section 74.786(d), the applicant has notified, within 30 days of filing this application, all commercial wireless licenses of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees.	
16.	**Channels 60-69.** If the proposed channel is within channels 60-69, the applicant certifies compliance with the following requirements, as applicable: ☐ Pursuant to Section 74.786(e), the applicant has notified, within 30 days of filing this application , all commercial wireless licenses of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees. ☐ Pursuant to Section 74.786(e), the applicant proposing operation on channel 63, 64, 68 and 69 ("public safety channels") has secured a coordinated spectrum use agreements(s) with 700 MHz public safety regional planning committee(s) and state administrator(s) of the region(s) and state(s) within which the antenna site of the digital LPTV or TV translator station is proposed to locate, and those adjoining regions and states with boundaries within 75 miles of the proposed station location. ☐ Pursuant to Section 74.786(e), the applicant for a channel adjacent to channel 63, 64, 68 or 69 has notified, within 30 days of filing this application, the 700 MHz public safety regional planning committee(s) and state	

administrator(s) of the region and state containing the proposed digital LPTV or TV translator antenna site and regions and states whose geographic boundaries lie within 50 miles of the proposed LPTV or TV translator antenna site.

PREPARERS CERTIFICATION ON PAGE 3 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 MICHAEL D. RHODES, P.E.	Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature	Date 12/5/2013	
Mailing Address CAVELL, MERTZ & ASSOCIATES, INC. 7732 DONEGAN DR.		
City MANASSAS	State or Country (if foreign address) VA	Zip Code 20109 -
Telephone Number (include area code) 7033929090	E-Mail Address (if available) MIKE.RHODES@CAVELLMERTZ.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).

Exhibits

Exhibit 13
Description: EXHIBIT 13 - COMPREHENSIVE ENGINEERING EXHIBIT

SEE ENGINEERING EXHIBIT ATTACHED AS A PDF FILE

Attachment 13

Exhibit 14
Description: SEE EXHIBIT 13

SEE EXHIBIT 13 - STATEMENT A

Attachment 14

Exhibit 13 - Statement A

COMPREHENSIVE ENGINEERING STATEMENT

prepared for

Nelson TV, Inc.

W29EI-D La Salle, Illinois

Facility ID 187839

Ch. 29 (Digital) 1.0 kW (MAX-DA)

Nelson TV, Inc. ("Nelson") is the permittee of low power television station W29EI-D, Channel 29, La Salle, Illinois, Facility ID 187839 (BNPDTL-20100721DRE). *Nelson* herein proposes to modify the existing construction permit to specify a different location and directional antenna pattern.

Nature of the Proposal

The proposed antenna system for the digital W29EI-D is a directional unit (ERI Model number AL12W-29-PL) which will be side-mounted on an existing tower structure with the Antenna Structure Registration Number 1008488. No change in structure overall height is necessary to carry out this proposal. Since no change to the structure's overall height is proposed, no change is anticipated to the structure marking/lighting requirements set forth in the aeronautical study.

The proposed digital facility will operate on Channel 29 using a "stringent" out of channel emission mask, a maximum effective radiated power of 1.0 kW, and an antenna height of 381.8 meters AMSL. **Exhibit 13 - Figure 1** depicts the coverage contours of the authorized and proposed (digital 51 dBµ) facilities. As demonstrated on the provided map, the service area overlap shown demonstrates compliance with §74.787(b)(2). The proposed site is located 10.4 km (6.5 miles) from the currently authorized site and thus complies with the Rules for a minor change application.

This facility is subject to the conditions described in the FCC's "*Commencement of Rural, First-Come, First-Served Digital Licensing*" Public Notice (DA 09-1487) released June 25, 2009. The proposed site is 121.2 km from Chicago and 126 km from Davenport, the two closest cities listed in the Public Notice, therefore the proposed site meets the 121 minimum distance spacing restrictions.

Allocation Considerations

The instant proposal complies with the Commission's interference protection requirements toward all DTV, television translator, LPTV, and Class A stations. A detailed interference study was conducted in accordance with the terrain dependent Longley-Rice point-to-point propagation model, per the Commission's Office of Engineering and Technology Bulletin No. 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69").[1] The interference study examined the change in interference as experienced by nearby pertinent stations that would result from the proposed facility.

The interference study results, summarized in **Exhibit 13 - Table I**, show that any new interference does not exceed the Commission's interference limits (0.5 percent to full service and Class A stations, and 2.0 percent to secondary stations). Accordingly, the instant proposal complies with §74.793 regarding interference protection to analog and digital television, low power television, television translator, and Class A television facilities.

International Coordination

The proposed transmitter site is located 492 km from the U.S.-Canadian border, which is greater than the 100 km required coordination distance specified for digital low power television stations in the Letter of Understanding[2] and is greater than the 400 km distance required for full-service facilities. Thus, it is believed that international coordination will not be necessary for the instant proposal.

[1] The implementation of OET-69 for this study (*tv_process*) followed the guidelines of OET-69 as specified therein. **A cell size of 1 km was employed.** Comparisons of various results of this computer program (run on a Sun processor) to the Commission's implementation of OET-69 show excellent correlation.

[2] The Letter of Understanding Between the Federal Communications Commission of the United States of America and Industry Canada Related to the Use of the 54-72 MHz, 76-88 MHz, 174-216 MHz and 470-806 MHz Bands for the Digital Television Broadcasting Service Along the Common Border, September 29, 2000, paragraph 12.

Other Allocation Considerations

The nearest FCC monitoring station is at Allegan, MI, at a distance of 277 km from the proposed site. This exceeds by a great margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The proposed 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 broadcast stations located within 3.2 km (2 miles) of the proposed site, according to information extracted from the Commission's engineering database.

Environmental Considerations

The instant proposal is not believed to have a significant environmental impact as defined under §1.1306 of the Commission's Rules. Consequently, preparation of an Environmental Assessment is not required. *Nelson* herein proposes to construct the proposed facility on an existing tower structure with the Antenna Structure Registration Number 1008488.

The use of existing tower structure 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 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.

Human Exposure to Radiofrequency Electromagnetic Field

The proposed operation was evaluated for human exposure to radiofrequency electromagnetic field using the procedures outlined in the Commission's OET Bulletin 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with the limits specified in §1.1310 if it satisfies the exposure criteria set forth in OET 65.

Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

The W29EI-D Channel 29 antenna center of radiation will be 80 meters above ground level. An effective radiated power of 1.0 kilowatts, horizontally polarized, will be employed utilizing an ERI model AL12W-29-PL directional antenna. A "worst-case" relative field value of 20 percent (from 10° to 90° below the horizontal) is assumed for purposes of the calculation. The "uncontrolled/general population" limit specified in §1.1310 for Channel 29 (center frequency 563 MHz) is 375.3 $\mu W/cm^2$.

OET 65's formula for television transmitting antennas is based on the NTSC transmission standards, where the average power is normally much less than the peak power. For the DTV facility in the instant proposal, the peak-to-average ratio is different than the NTSC ratio. The DTV ERP figure herein refers to the average power level. The formula used for calculating DTV signal density in this analysis is essentially the same as equation (10) in OET 65.

$$\mathbf{S = (33.4098)\ (F^2)\ (ERP)\ /\ D^2}$$

Where:

S	=	power density in microwatts/cm^2
ERP	=	total (average) ERP in Watts
F	=	relative field factor
D	=	distance in meters

Using this formula and the above assumptions, the proposed facility would contribute a power density of 0.22 $\mu W/cm^2$ at two meters above ground level near the antenna support structure, or 0.10 percent of the general population/uncontrolled limit.

§1.1307(b)(3) states that facilities are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent of the exposure limit. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of any other facilities near this site may be considered independently from this proposal.

Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

Safety of Tower Workers and the General Public

As demonstrated herein, excessive levels of RF energy attributable to the proposal will not be caused at publicly accessible areas at ground level or near the base of the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower access will be restricted and controlled through the use of a gated and locked fence. Additionally, appropriate RF exposure warning signs will be posted.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure would not occur in areas at ground level or at the base of the top mounted tower structure. A site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed on the tower or in areas where high RF levels may be present. Such protective measures may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines would otherwise be exceeded. On-site RF exposure measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with all pertinent stations.

Conclusion

Based on the preceding, it is believed that the instant proposal complies with all Commission Rules and policies.

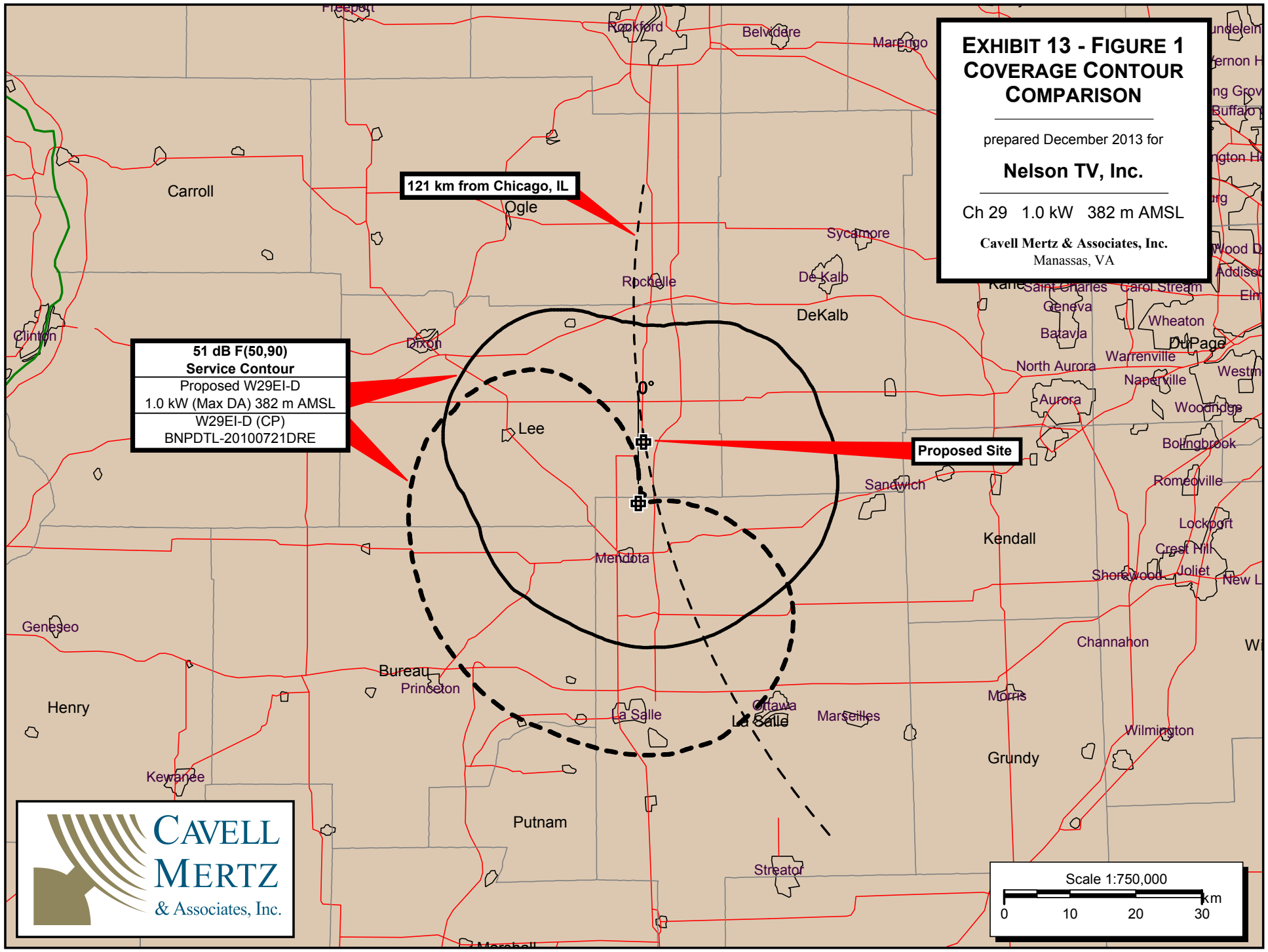
EXHIBIT 13 - FIGURE 1
COVERAGE CONTOUR COMPARISON
prepared December 2013 for
Nelson TV, Inc.
Ch 29 1.0 kW 382 m AMSL
Cavell Mertz & Associates, Inc.
Manassas, VA
121 km from Chicago, IL
51 dB F(50,90) Service Contour
Proposed W29EI-D
1.0 kW (Max DA) 382 m AMSL
W29EI-D (CP)
BNPDTL-20100721DRE
Proposed Site
0°
Carroll
Ogle
Lee
DeKalb
Kendall
Grundy
La Salle
Bureau
Henry
Putnam
Rockford
Belvidere
Rochelle
Sycamore
De Kalb
Dixon
Clinton
Geneseo
Princeton
Ottawa
Marseilles
Streator
Sandwich
Aurora
Naperville
Wheaton
DuPage
Joliet
Channahon
Morris
Wilmington
Scale 1:750,000
0 10 20 30 km
CAVELL MERTZ & Associates, Inc.

Exhibit 13 - Table I

INTERFERENCE STUDY RESULTS

prepared for

Nelson TV, Inc.

W29EI-D La Salle, IL

Facility Id: 187839

Ch. 29 1 kW 382 m

Channel	Affected Station	City, State	File Number	Calculated Baseline (2000 Census)	Interference Population without Proposal (2000 Census)	Interference Population with Proposal (2000 Census)	New Interference Population	New Interference Percentage
22	WRJK-LP	Arlington Heights, IL	BLTT-19991020AAO			--- No Interference ---		
25	WMKB-LP	Rochelle, IL	BLTTL-20070813AFM			--- No Interference ---		
28	WYZZ-TV	Bloomington, IL	BLCDT-20060609ABE	1,014,270	3,462	3,513	51	0.005 %
28	WCHU-LD	Chicago, IL	BDISDTL-20111005AIQ			--- No Interference ---		
28	WTMJ-TV	Milwaukee, WI	BLCDT-20001218ACR			--- No Interference ---		
29	KGAN	Cedar Rapids, IA	BPCDT-20130919AAL			--- No Interference ---		
29	K29EA	Des Moines, IA	BLTTL-20011217ADD			--- No Interference ---		
29	WMAQ-TV	Chicago, IL	BLCDT-20010531ACY	9,507,948	27,484	74,222	46,738	0.492 %
29	W29CI-D	Salem, IL	BSTA-20070117AFL			--- No Interference ---		
29	W29CI-D	Salem, IL	BLDTA-20120913AAP			--- No Interference ---		
29	WTTK	Kokomo, IN	BLCDT-20090930ABD			--- No Interference ---		
29	WUHQ-LD	Grand Rapids, MI	BLDTL-20111121AAI			--- No Interference ---		
29	WOMS-CD	Muskegon, MI	BLDTA-20110812ACT			--- No Interference ---		
29	K29JH-D	St Charles, MN	BNPDTL-20090825BXT			--- No Interference ---		
29	W29EL-D	Lima, OH	BNPDTL-20100609AFJ			--- No Interference ---		
29	W29DQ-D	Eau Claire, WI	BNPDTL-20090825AYN			--- No Interference ---		
29	WPVS-LP	Milwaukee, WI	BLTTL-20080221AAP			--- No Interference ---		
29	WPVS-LP	Milwaukee, WI	BSTA-20130416AAO			--- No Interference ---		
29	W29EH-D	Wausau, WI	BNPDTL-20100202AAL			--- No Interference ---		
30	WCRD-LP	Carthage, IL	BDCCDTL-20061030AMS			--- No Interference ---		
30	WDCI-LD	Chicago, IL	BLDTL-20120131AAW			--- No Interference ---		
30	WMBD-TV	Peoria, IL	BLCDT-20061019ADD			--- No Interference ---		
30	WLPD-LP	Plano, IL	BLTTL-19900514IR			--- No Interference ---		
30	W30DI-D	Wolcott, IN	BNPDTL-20100112AEB			--- No Interference ---		
30	WPVS-LP	Sheboygan, WI	BMPDTL-20130205ACP			--- No Interference ---		
33	WFBN-LP	Rockford, IL	BLTTL-19890616II			--- No Interference ---		