

***COMPREHENSIVE TECHNICAL EXHIBIT
APPLICATION FOR CONSTRUCTION PERMIT***

PROPOSED NEW NCE FM STATION
OGALLALA, NEBRASKA
90.5 MHz / CHANNEL 213A

VSS CATHOLIC COMMUNICATIONS, INC.

NOVEMBER 2021

APPLICATION FOR CONSTRUCTION PERMIT

The following engineering statement and attached exhibits have been prepared for **VSS Catholic Communications, Inc.** ("VSS"), applicant for a new non-commercial educational FM station to serve Ogallala, Nebraska, and are in support of their application for construction permit for that facility.

The proposed facility would operate on FM channel 213 as a class A facility. It is proposed that the facility operate with a maximum effective radiated power of 2.5 kW vertical polarization only at a center of radiation of 1155.2 meters above mean sea level, 76.2 meters above ground level, utilizing a non-directional antenna. Vertical polarization is being proposed in order to provide protection to channel six television station KWNB-TV at Hayes Center, Nebraska.¹ The proposed antenna elevation above mean seal level corresponds to a center of radiation of 145.1 meters above average terrain based on an eight-radial sample of the Commission's 30-meter terrain database. This database is used throughout this application for the generation of contours depicted in the technical exhibit.

The proposed technical parameters comply with the provisions of Section 73.515 of the Commission's Rules. Exhibit E-1 illustrates the predicted 60 dBu service contour for the proposed technical parameters. As this map demonstrates, the entire community of license, Ogallala, Nebraska is located within the predicted 60 dBu service contour.

¹ The Facility ID for KWNB-TV at Hayes Center, Nebraska is 21162.

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The proposed new facility would comply with the provisions of Section 73.1125 of the Commission's Rules. Residents of the region, including those within the community of license, Ogallala, Nebraska, will be provided with toll-free telephone access to the main studio.

The proposed technical parameters for the new facility under this application comply with the interference protection requirements of Sections 73.207, 73.509, and 73.525 of the Commission's Rules. Sections 73.213 and 73.215 are not applicable.

Exhibit E-2 is a tabular interference/contour overlap study pursuant to Section 73.509 for the proposed technical parameters. This tabular study is graphically depicted in the contour map in Exhibit E-3. As the tabulation and map demonstrate, there is substantial clearance between the relevant contours. KFJS at North Platte, Nebraska is the only station within the search ring that was identified for the tabulation and contour map.

The proposed technical parameters comply with the intermediate frequency spacing provisions of Section 73.207 of the Commission's Rules. Exhibit E-4 is a single channel spacing study for the proposed facility. This study demonstrates that there are no spacing conflicts to proposed or authorized facilities on FM channels 266 or 267. This spacing study also demonstrates that the proposed site location is within the affected distance under Section 73.525 of the Commission's Rules to television channel six broadcast facility KWNB-TV at Hayes Center, Nebraska.

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In order to provide protection to KWNB-TV, and meet the population limits under Section 73.525, the applicant has opted for the use of vertical polarization, as was previously stated. The maximum non-directional vertically polarized effective radiated power is 2.46 kW. Using this value, and the inequality in Section 73.525(e)(4)(ii) of the Commission's Rules, it is sufficient to demonstrate that if a horizontal only ERP of 0.0615 kW is predicted to cause interference to fewer than 3,000 persons, then the proposed technical parameters comply with the limits under Section 73.525. The inequality is as follows, with the appropriate substitutions:

$$P \leq \left[H + \left(\frac{V}{A} \right) \right]$$
$$P \leq \left[0 + \left(\frac{2.46}{40} \right) \right]$$
$$P \leq 0.0615$$

In this inequality, the variable "H" is set to zero as vertical polarization only is selected. The variable "V" is the vertical only ERP, and "A" set to 40 is appropriate in this instance. The variable "A" is to be set at a value of 40 if the interference area lies entirely outside the limits of a city of 50,000 persons or more 10 if it does not.² A value of 0.0615 is utilized for "P", which is the horizontal only ERP.

² Under the 2010 Census, only the top three most populous cities in Nebraska have a population in excess of 50,000 residents. These three cities are Omaha, Bellevue, and Lincoln. The first two are located in the Omaha metropolitan area, with Lincoln forming the core of a separate metropolitan area. The closer area to the predicted interference region is the Lincoln metropolitan area, the center of which is located approximately 450 kilometers from the proposed site location. It can be reasonably inferred that the selection of a value of 40 for "A" is appropriate.

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The maps in Exhibits E-5 and E-6 depict the predicted interference region for the outstanding construction permit for KWNB-TV.³ Exhibit E-5 illustrates the contours along with the interference polygon, while for easier illustration, Exhibit E-6 hides the interference contours from the proposed facility in order to see the interference polygon more easily. In the determination of the interference polygon, the adjustment for television antenna receiving directivity was not employed per Section 73.525. By the 2010 Census, the population within the interference region is 539 persons, which complies with the upper limit permissible of 3,000 persons.

Exhibit E-7 analyzes the situation for the KWNB-TV license. In this case, the proposed 69.5 dBu F(50,10) interfering contour does not intersect the 47 dBu F(50,50) contour of KWNB-TV. As a result, no interference is predicted to occur to the KWNB-TV within the 47 dBu F(50,50) service contour when vertical only polarization is utilized by the proposed VSS technical parameters.

The proposed facility would comply with relevant international agreements. Exhibit E-8 illustrates the proposed site location, as well as a 320-kilometer radius centered on the site. As this map demonstrates, the proposed site is located well in excess of this distance from either the Canadian or Mexican border.

The map in Exhibit E-9 illustrates the proposed 60 dBu service contour along with other NCE 60 dBu service contours in the region. All contours depicted, save the proposed contour, are for license technical parameters. Each of the stations depicted operates on a channel below. The

³ The outstanding construction permit for KWNB-TV is assigned LMS File No. 0000035798.

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proposed 60 dBu service contour has a resident population of 7,573 persons within an area of 2,224 square kilometers, which excludes water areas of water.

The region of new first local NCE service created by the proposed facility covers an area of 66.3 square kilometers with a resident population of 249 persons. The area of new second local service has a resident population of 7,324 persons. The aggregate of the first and second local service areas has a resident population of 7,573 persons, or 100 percent of the 60 dBu service contour.

VSS is the licensee of several other facilities within the State of Nebraska. The 70 dBu service contour resulting from the proposed technical parameters does not overlap the 70 dBu contour of any of the other VSS facilities. Additionally, there is no overlap between the contour from the proposed technical parameters, and any other facility in which the principals of VSS have an attributable interest.

VSS has obtained reasonable site assurance for use of the proposed site. The proposed site is owned by Sterling Tower Properties, LLC. The agent for Sterling is Mr. Kent Sager, whose telephone number is (308) 631-9176. Mr. Sager has provided VSS with reasonable assurance that the site is available for their use, and that a mutually beneficial lease or license agreement will be negotiated following a grant of a construction permit.

The proposed facility would not constitute a significant environmental impact, and is exempt from environmental processing. The proposed facility would utilize a tower that is registered with

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the Commission. The addition of the antenna to this structure would not increase its existing environmental impact.

Additionally, the proposed facility would not constitute a radiofrequency radiation exposure hazard to persons in the vicinity of the structure. It is proposed that an Electronics Research, Inc. ("ERI") model P300/350 vertically polarized antenna be utilized. This antenna qualifies as a type-1 antenna under *FM Model*, and utilizes three bays spaced one wavelength apart. That utility calculates a power density of $17.6 \mu\text{W}/\text{cm}^2$ at a distance of 15 meters from the tower base. VSS certifies that it will coordinate with all other users of the site to ensure that workers and other persons are not exposed to levels of radiofrequency radiation in excess of the Commission's safety standards. Coordination activities will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation.

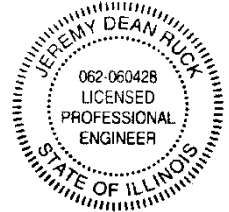
The proposed facility would not be located in proximity to the Grand Island, Nebraska FCC installation, and complies with the radiation limits toward that facility. Additionally, the facility is not located within the Table Mountain Receiving Zone, or the West Virginia Quiet Zone.

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The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature
License Expires November 30, 2021

Jeremy D. Ruck, PE
November 7, 2021

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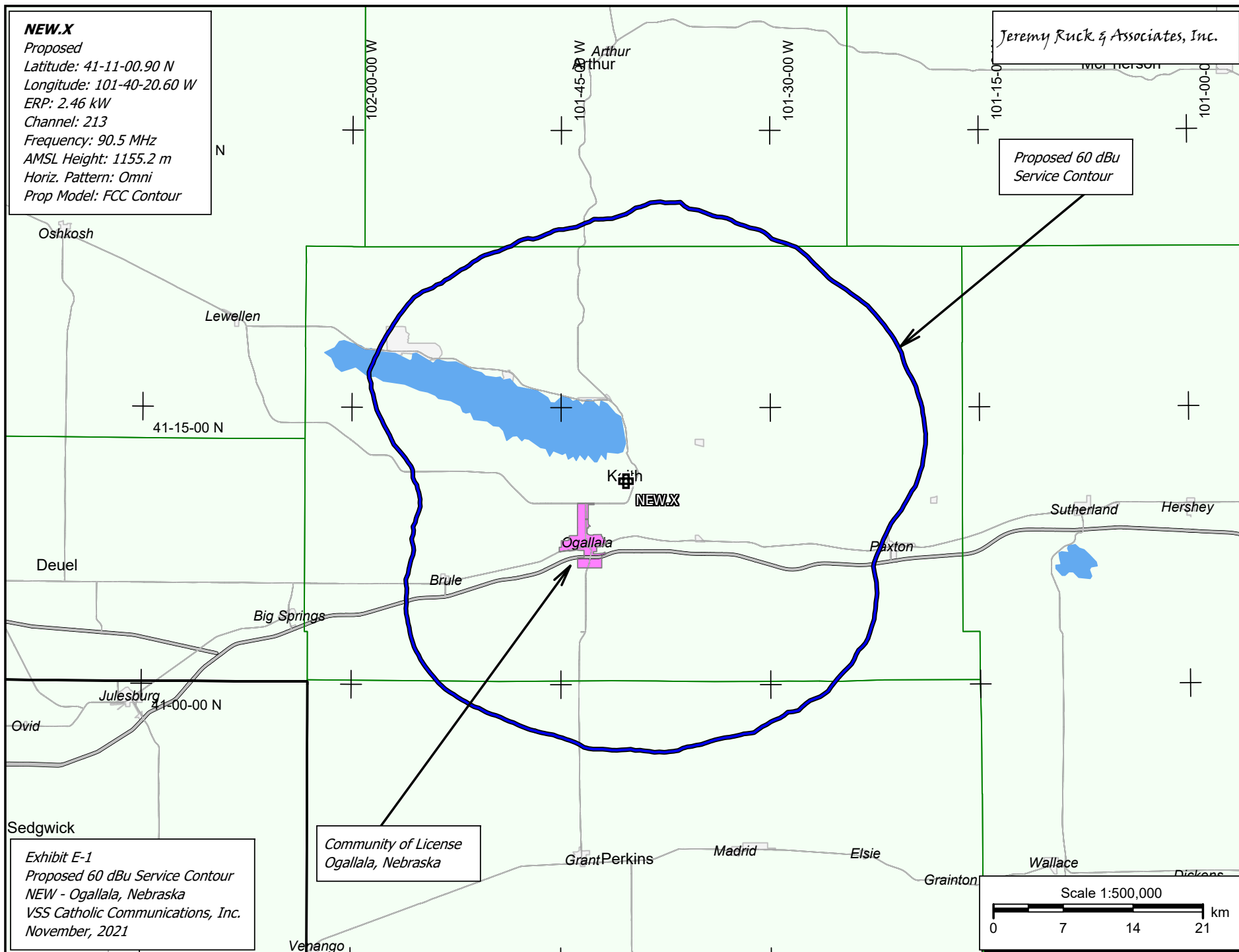
11.7.2021

NEW.X

Proposed
Latitude: 41-11-00.90 N
Longitude: 101-40-20.60 W
ERP: 2.46 kW
Channel: 213
Frequency: 90.5 MHz
AMSL Height: 1155.2 m
Horiz. Pattern: Omni
Prop Model: FCC Contour

Jeremy Ruck & Associates, Inc.

Proposed 60 dBu
Service Contour



Community of License
Ogallala, Nebraska

Exhibit E-1
Proposed 60 dBu Service Contour
NEW - Ogallala, Nebraska
VSS Catholic Communications, Inc.
November, 2021

Scale 1:500,000
0 7 14 21 km

Jeremy Ruck & Associates, Inc.
Consulting Engineers

Exhibit E-2 - Tabular Contour Overlap Study

NEW - Ogallala, Nebraska

REFERENCE CH# 213A - 90.5 MHz, Pwr= 2.46 kw, HAAT= 145.5 M, COR= 1155.2 M
41 11 00.90 N. Average Protected F(50-50)= 27.25 km
101 40 20.60 W. Omni-directional

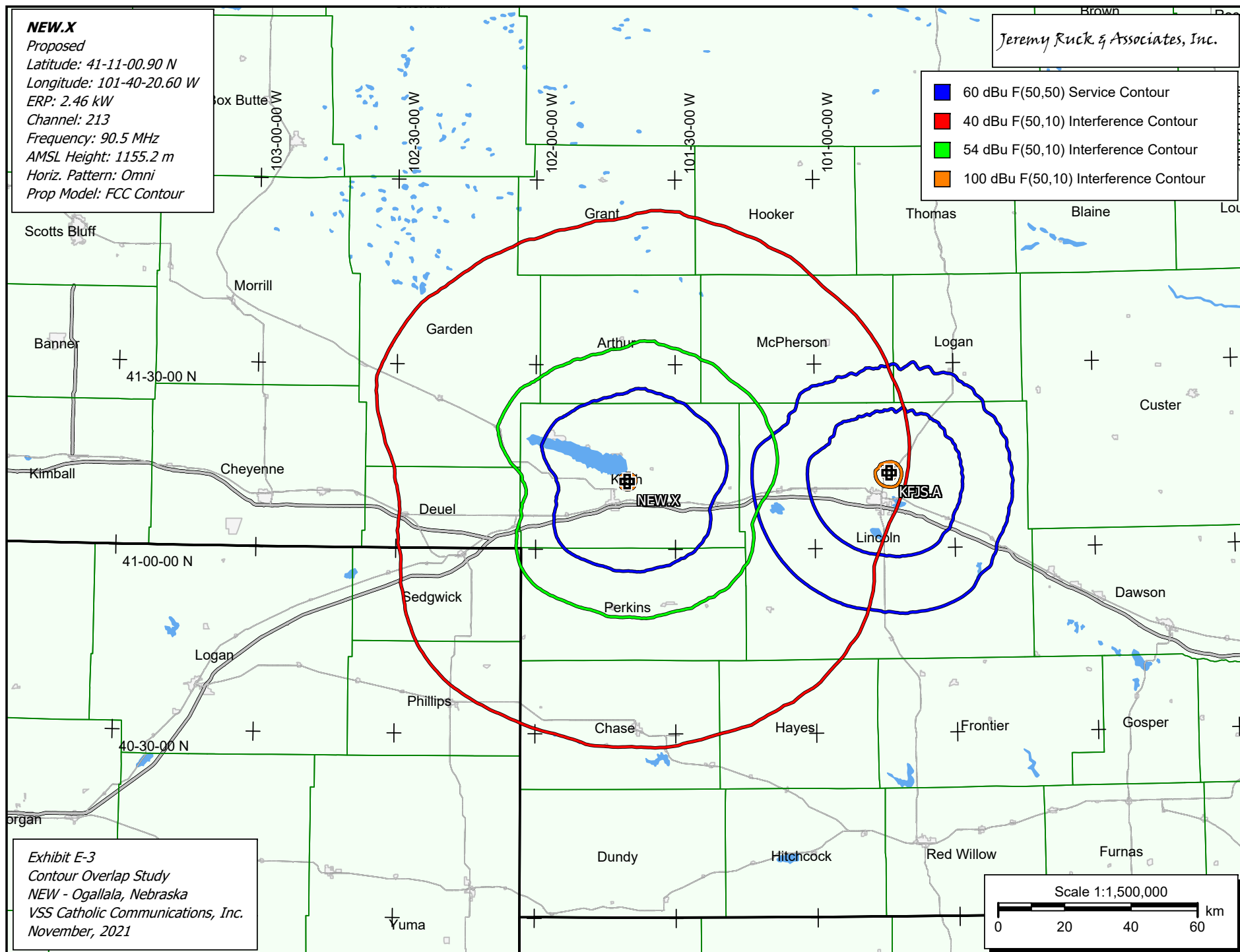
DISPLAY DATES
DATA 11-05-21
SEARCH 11-07-21

CH CITY	CALL	TYPE STATE	ANT STATE	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
06 2C Hayes Center	KWNB-TV	CP	_HN NE	138.8 319.2	82.25 0000035798	40 37 32.01 101 01 47.01	45.000 221	18.0 1160	83.8	101.7R	-19.5M
6 -- Hayes Center	KWNB-TV-A	CHA	_Y NE	138.7 319.2	82.25 DTVBL21162	40 37 32.02 101 01 46.57	11.900 221	18.0 1160	70.3	88.3R	-6.0M
06 2C Hayes Center	KWNB-TV	LI	_HN NE	138.8 319.2	82.25 BLCDT-20090604ABL	40 37 32.01 101 01 47.01	11.900 221	18.0 1160	70.3	88.3R	-6.0M
211C3 North Platte	KFJS	APP	_CN NE	88.1 268.7	78.59 0000161799	41 12 13.00 100 44 00.00	13.200 128	4.2 1022	41.3 Vss Catholic Communication	44.9	34.8
211A North Platte	KFJS	LIC	_CN NE	88.1 268.7	78.60 BLED20120723ADN	41 12 13.00 100 43 59.50	1.350 128	2.0 1022	24.6 Vss Catholic Communication	47.1	51.4

Terrain database is FCC 30 meter , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
Contour distances are on direct line to and from reference station. Reference zone= - Zone 2, Co to 3rd adjacent.
All separation margins (if shown) include rounding.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
« = Station meets FCC minimum distance spacing for its class.

NEW.X*Proposed**Latitude: 41-11-00.90 N**Longitude: 101-40-20.60 W**ERP: 2.46 kW**Channel: 213**Frequency: 90.5 MHz**AMSL Height: 1155.2 m**Horiz. Pattern: Omni**Prop Model: FCC Contour**Jeremy Ruck & Associates, Inc.*

- 60 dBu F(50,50) Service Contour
- 40 dBu F(50,10) Interference Contour
- 54 dBu F(50,10) Interference Contour
- 100 dBu F(50,10) Interference Contour

*Exhibit E-3**Contour Overlap Study**NEW - Ogallala, Nebraska**VSS Catholic Communications, Inc.**November, 2021*

Scale 1:1,500,000

0 20 40 60 km

Jeremy Ruck & Associates, Inc.
Consulting Engineers

Exhibit E-4 - Single Channel Spacing Study

NEW - Ogallala, Nebraska

REFERENCE CH# 213A - 90.5 MHz, Pwr= 2.46 kw, HAAT= 145.5 M, COR= 1155.2 M
41 11 00.90 N. Average Protected F(50-50)= 27.25 km
101 40 20.60 W. Omni-directional

DISPLAY DATES
DATA 11-05-21
SEARCH 11-07-21

CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
06 2C Hayes	KWNB-TV Center	CP NE	_HN	138.8 319.2	82.25 0000035798	40 37 32.01 101 01 47.01	45.000 221	18.0 1160	83.8	101.7R	-19.5M
6 -- Hayes	KWNB-TV-A Center	CHA NE	_Y	138.7 319.2	82.25 DTVBL21162	40 37 32.02 101 01 46.57	11.900 221	18.0 1160	70.3	88.3R	-6.0M
06 2C Hayes	KWNB-TV Center	LI NE	_HN	138.8 319.2	82.25 BLCDT-20090604ABL	40 37 32.01 101 01 47.01	11.900 221	18.0 1160	70.3	88.3R	-6.0M
211C3 North Platte	KFJS	APP NE	_CN	88.1 268.7	78.59 0000161799	41 12 13.00 100 44 00.00	13.200 128	4.2 1022	41.3 Vss Catholic Communication	44.9	34.8
211A North Platte	KFJS	LIC NE	_CN	88.1 268.7	78.60 BLED20120723ADN	41 12 13.00 100 43 59.50	1.350 128	2.0 1022	24.6 Vss Catholic Communication	47.1	51.4

Terrain database is FCC 30 meter , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
Contour distances are on direct line to and from reference station. Reference zone= - Zone 2, Co to 3rd adjacent.
All separation margins (if shown) include rounding.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
« = Station meets FCC minimum distance spacing for its class.

NEW.X

Proposed
Latitude: 41-11-00.90 N
Longitude: 101-40-20.60 W
ERP: 0.0615 kW
Channel: 213
Frequency: 90.5 MHz
AMSL Height: 1155.2 m
Horiz. Pattern: Omni
Prop Model: FCC Contour

KWNB-TV.C

0000035798
Latitude: 40-37-32 N
Longitude: 101-01-47 W
ERP: 45.00 kW
Channel: 6
Frequency: 85.0 MHz
AMSL Height: 1160.0 m
Horiz. Pattern: Omni
Prop Model: FCC Contour

Jeremy Ruck & Associates, Inc.

KWNB-TV CP / Proposed VSS Contours

- 47 dBu F(50,50) / 69.5 dBu F(50,10)
- 48 dBu F(50,50) / 69.3 dBu F(50,10)
- 49 dBu F(50,50) / 69.0 dBu F(50,10)
- 50 dBu F(50,50) / 68.8 dBu F(50,10)
- 51 dBu F(50,50)

Interference
Polygon

Keith

NEW.X

Ogallala

Exhibit E-5

Television Channel Six Interference Study
NEW - Ogallala, Nebraska
VSS Catholic Communications, Inc.
November, 2021

Scale 1:100,000



NEW.X

Proposed
Latitude: 41-11-00.90 N
Longitude: 101-40-20.60 W
ERP: 0.0615 kW
Channel: 213
Frequency: 90.5 MHz
AMSL Height: 1155.2 m
Horiz. Pattern: Omni
Prop Model: FCC Contour

KWNB-TV.C

0000035798
Latitude: 40-37-32 N
Longitude: 101-01-47 W
ERP: 45.00 kW
Channel: 6
Frequency: 85.0 MHz
AMSL Height: 1160.0 m
Horiz. Pattern: Omni
Prop Model: FCC Contour

Jeremy Ruck & Associates, Inc.

KWNB-TV CP / Proposed VSS Contours

- 47 dBu F(50,50) / 69.5 dBu F(50,10)
- 48 dBu F(50,50) / 69.3 dBu F(50,10)
- 49 dBu F(50,50) / 69.0 dBu F(50,10)
- 50 dBu F(50,50) / 68.8 dBu F(50,10)
- 51 dBu F(50,50)

Interference
Polygon

Keith

NEW.X

Ogallala

Exhibit E-6
Television Channel Six Interference Study
NEW - Ogallala, Nebraska
VSS Catholic Communications, Inc.
November, 2021

Scale 1:100,000



NEW.X

Proposed
Latitude: 41-11-00.90 N
Longitude: 101-40-20.60 W
ERP: 0.0615 kW
Channel: 213
Frequency: 90.5 MHz
AMSL Height: 1155.2 m
Horiz. Pattern: Omni
Prop Model: FCC Contour

KWNB-TV

BLCDT-20090604ABL
Latitude: 40-37-32 N
Longitude: 101-01-47 W
ERP: 11.90 kW
Channel: 6
Frequency: 85.0 MHz
AMSL Height: 1160.0 m
Horiz. Pattern: Omni
Prop Model: FCC Contour

Jeremy Ruck & Associates, Inc.

Proposed 69.5 dBu
F(50,10) Contour

KWNB-TV Licensed 47 dBu
F(50,50) Contour

Keith
NEW.X

Ogallala

Brule

Exhibit E-7
Television Channel Six Interference Study
NEW - Ogallala, Nebraska
VSS Catholic Communications, Inc.
November, 2021

Scale 1:200,000



NEW.X

Proposed

Latitude: 41-11-00.90 N

Longitude: 101-40-20.60 W

ERP: 2.46 kW

Channel: 213

Frequency: 90.5 MHz

AMSL Height: 1155.2 m

Horiz. Pattern: Omni

Prop Model: FCC Contour

Jeremy Ruck & Associates, Inc.

*Proposed Site Location
320-kilometer Radius*

NEW.X

Exhibit E-8

International Agreement Compliance

NEW - Ogallala, Nebraska

VSS Catholic Communications, Inc.

November, 2021

Scale 1:8,000,000

0 110 220 330 km

NEW.X

Proposed

Latitude: 41-11-00.90 N

Longitude: 101-40-20.60 W

ERP: 2.46 kW

Channel: 213

Frequency: 90.5 MHz

AMSL Height: 1155.2 m

Horiz. Pattern: Omni

Prop Model: FCC Contour

Jeremy Ruck & Associates, Inc.

- Proposed 60 dBu Service Contour
- 60 dBu Service Contour of Other NCE Stations Considered
- Area of First Local NCE Service
- Area of Second Local NCE Service
- Area of Third or Greater Local NCE Service (None)

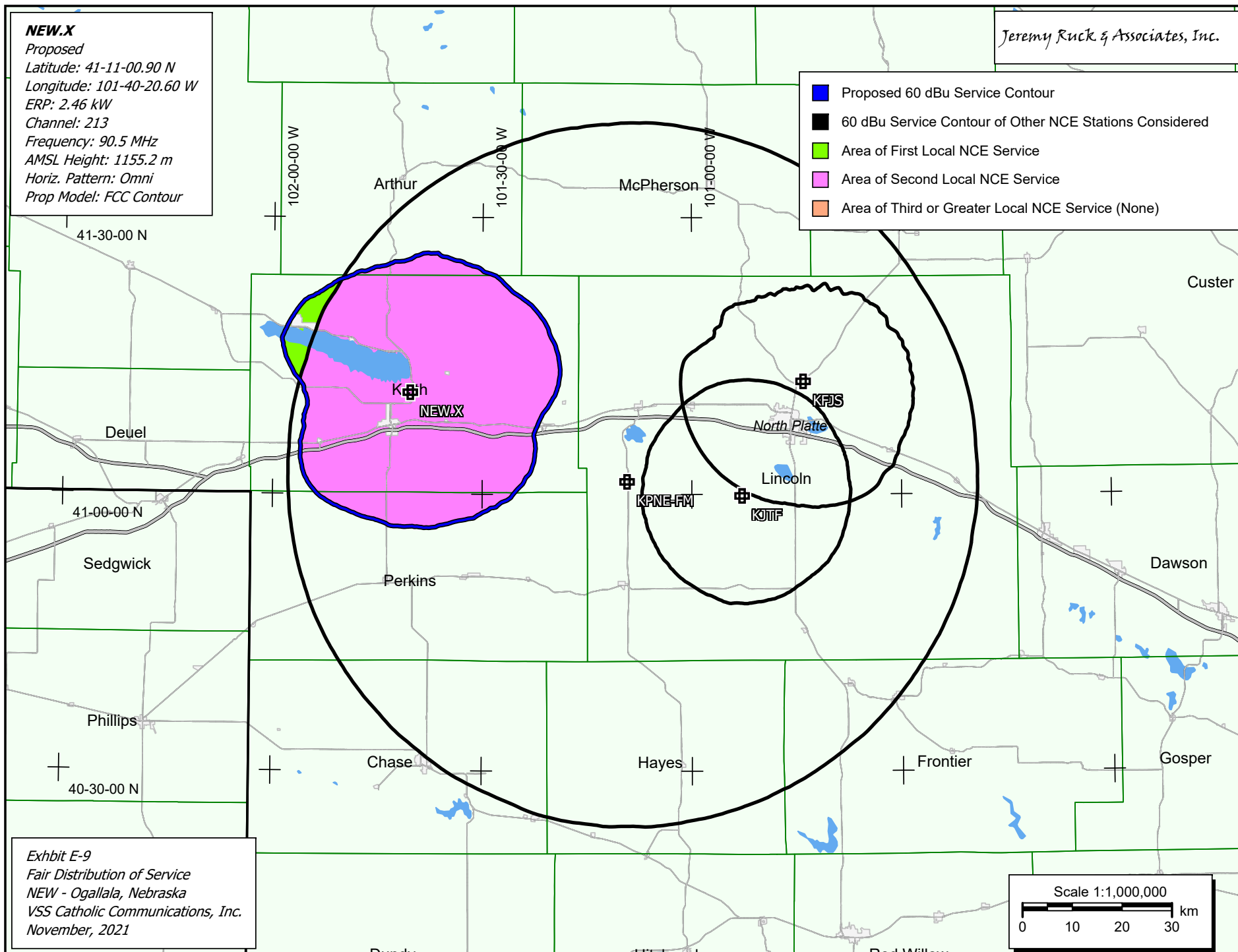


Exhibit E-9

Fair Distribution of Service

NEW - Ogallala, Nebraska

VSS Catholic Communications, Inc.

November, 2021