APPLICATION FOR CONSTRUCTION PERMIT
DIGITAL COMPANION CHANNEL

K32GF – RHINELANDER, WISCONSIN
FACILITY ID: 129701

DIGITAL NETWORKS–MIDWEST, LLC

JANUARY 2020

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APPLICATION FOR CONSTRUCTION PERMIT – DIGITAL COMPANION CHANNEL

The following engineering statement and attached exhibits have been prepared for **Digital Networks-Midwest, LLC** ("Midwest"), licensee of low power television station K32GF at Rhinelander, Wisconsin, and are in support of their application for construction permit for a digital companion channel.[1]

The current license for K32GF specifies operation on channel 32 as an analog LPTV facility with a maximum effective radiated power of 7.9 kW at a center of radiation of 601 meters above mean sea level utilizing a non-directional antenna. The proposed digital companion channel facility would operate on channel 18 with a maximum effective radiated power of 1.64 kW at a center of radiation of 586.2 meters above mean sea level utilizing a composite directional antenna. The proposed antenna array is comprised of two Kathrein-Scala PR-TV antennas. One of these antennas is to be oriented at 150 degrees true, with the other oriented at 310 degrees true. Equal power division between the array elements is proposed.

The proposed technical parameters in this application comply with the requirements for a digital companion channel. Exhibits E-1 and E-2 compare the licensed 74 dBu F(50,50) service contour and the proposed 51 dBu F(50,90) service contour. As is depicted, these two contours overlap each other. Additionally, as indicated, the transmitter site for the digital companion channel is located in proximity to the licensed site, as the two are less than 30 miles apart.

Exhibit E-2 is the output from *TVStudy* for the proposed facility. This exhibit demonstrates that there are no outgoing IX check failures to any proposed or existing facility. The proposed

[1] The Facility ID for K32GF at Rhinelander, Wisconsin is 129701.

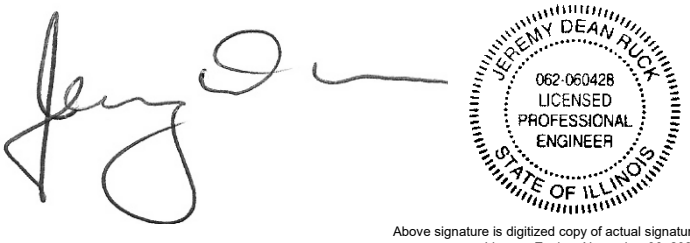
technical parameters therefore comply with the appropriate sections of the Commission's Rules. Midwest has also considered the location of the Commission's Allegan monitoring station in its analyses. The monitoring station is located at a sufficient distance from the proposed facility that compliance with the limits under Section 73.1030(c) of the Commission's Rules will be achieved.

The proposed facility would not constitute a significant environmental impact, and is exempt from environmental processing. The proposed antenna would be mounted to an existing tower that is registered with the Commission. The addition of the antenna to this tower would not increase the already existing environmental impact present from the structure.

In addition, the proposed facility would not result in human exposure at ground level to radiofrequency radiation in excess of the Commission's safety standards. Using the equations in Supplement A of *OET Bulletin 65*, the calculated worst-case power density at ground level assuming a downward radiation relative field of 0.3 is 6.07 $\mu W/cm^2$. This value is below the upper limit of the uncontrolled environment condition. Midwest certifies it will coordinate with all other users of the site to ensure that workers and other personnel are not exposed to levels of radiofrequency radiation in excess of the applicable safety standards. Coordination activities will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation.

The proposed facility complies with the provisions of Section 74.709 of the Commission's Rules. No land mobile protection issues have been identified based on the tables in that section of the rules, or on the output of *TVStudy*. The proposed facility also complies with Sections 74.793(e)-(h) of the Commission's Rules.

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
January 22, 2020

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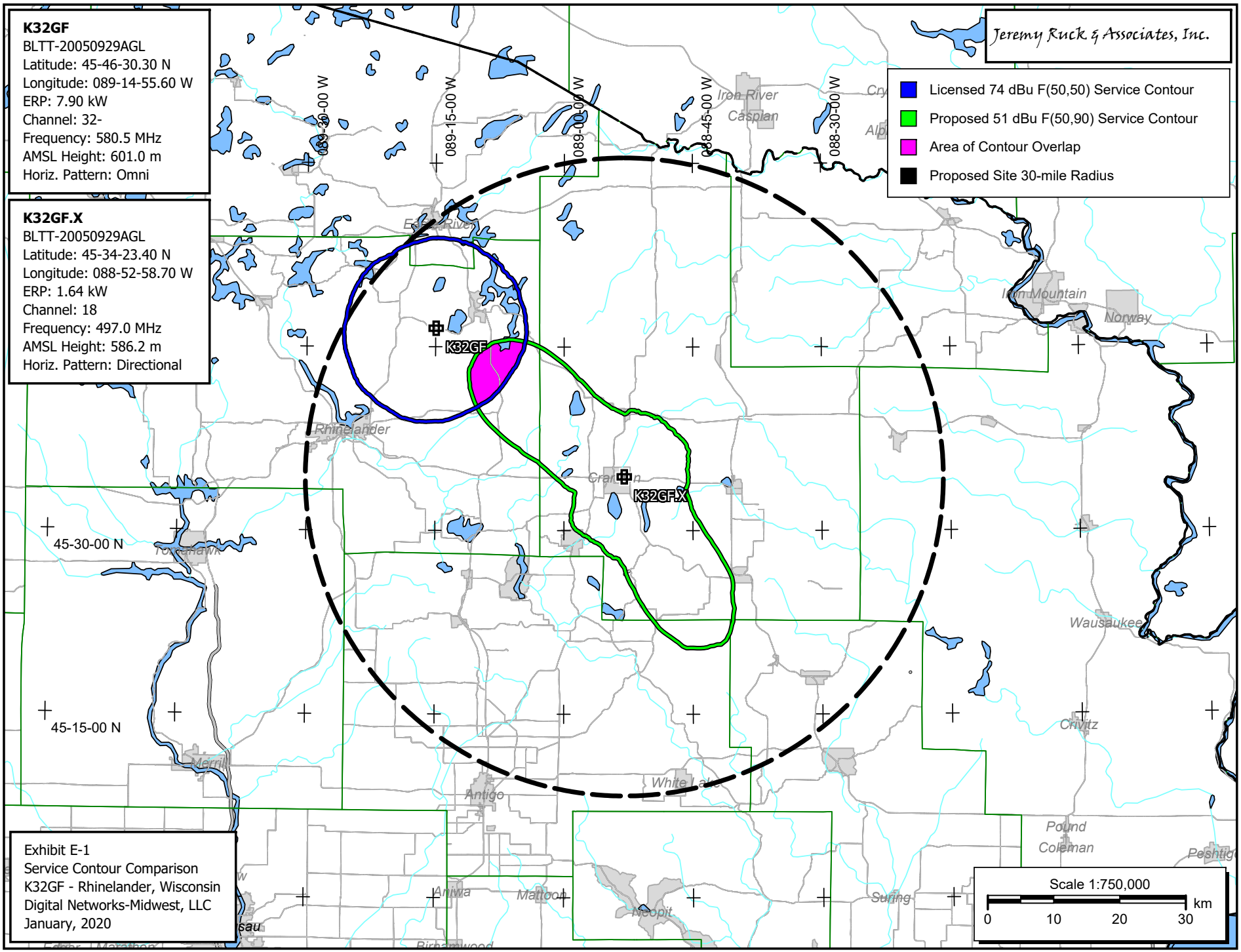
K32GF
BLTT-20050929AGL
Latitude: 45-46-30.30 N
Longitude: 089-14-55.60 W
ERP: 7.90 kW
Channel: 32-
Frequency: 580.5 MHz
AMSL Height: 601.0 m
Horiz. Pattern: Omni
K32GF.X
BLTT-20050929AGL
Latitude: 45-34-23.40 N
Longitude: 088-52-58.70 W
ERP: 1.64 kW
Channel: 18
Frequency: 497.0 MHz
AMSL Height: 586.2 m
Horiz. Pattern: Directional
Jeremy Ruck & Associates, Inc.
Licensed 74 dBu F(50,50) Service Contour
Proposed 51 dBu F(50,90) Service Contour
Area of Contour Overlap
Proposed Site 30-mile Radius
089-30-00 W
089-15-00 W
089-00-00 W
088-45-00 W
088-30-00 W
45-30-00 N
45-15-00 N
K32GF
K32GF.X
Iron River
Caspian
Iron Mountain
Norway
Rhinelander
Antigo
White Lake
Wausaukee
Crivitz
Pound
Coleman
Merrill
Scale 1:750,000
0
10
20
30
km
Exhibit E-1
Service Contour Comparison
K32GF - Rhinelander, Wisconsin
Digital Networks-Midwest, LLC
January, 2020

Exhibit E-2 - TVStudy Interference Study

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tvstudy v2.2.5 (4uoc83)
Database: 127.0.0.1,  Study: K32GF DCC Ch 18 ASRN 1051793 SCA PR-TV x2 1@150 1@310,  Model: Longley-Rice
Start: 2020.01.22 09:57:16

Study created: 2020.01.22 09:57:16

Study build station data: LMS TV 2020-01-22

    Proposal: K32GF D18 LD APP RHINELANDER, WI
 File number: BLTT20050929AGL
 Facility ID: 129701
Station data: User record
   Record ID: 6
     Country: U.S.

Build options:
Protect pre-transition records not on baseline channel

Stations potentially affected by proposal:

IX   Call      Chan       Svc Status  City, State              File Number             Distance
No   WGBD-LD   D17        LD  LIC     GREEN BAY, WI            BLANK0000068358         147.1 km
No   WEAU      D17        DT  CP      La crosse, WI            BLANK0000034098         191.8
No   W02CF     D17z       LD  CP      MINOCQUA, WI             BLANK0000071851          77.8
No   W17DZ-D   D17        LD  LIC     SISTER BAY, WI           BLANK0000086983         144.7
No   KYIN      D18        DT  LIC     MASON CITY, IA           BLEDT20090612AHJ        382.4
No   KRIN      D18        LD  APP     WATERLOO, IA             BDRTEDT20120604AFO      366.7
No   WMEU-CD   D18        DC  LIC     CHICAGO, IL              BLANK0000086889         422.6
No   WMKB-LP   D18z       LD  CP      Rochelle, IL             BLANK0000054707         398.4
No   W18ER-D   D18        LD  LIC     MUSKEGON, MI             BLANK0000068548         331.5
No   WURO-LD   D18        LD  LIC     ROSCOMMON, MI            BLDTL20141113AFT        370.8
No   WPBN-TV   D18        LD  CP      TRAVERSE CITY, MI        BLANK0000058651         265.8
No   WPBN-TV   D18        LD  APP     TRAVERSE CITY, MI        BLANK0000094903         265.8
No   KQDS-TV   D18        DT  CP      DULUTH, MN               BLANK0000027535         283.5
No   KHVM-LD   D18        LD  CP      MINNEAPOLIS, MN          BLANK0000052068         340.2
No   WBOO-LP   D18        LD  CP      ELK MOUND, WI            BDISDTT20091223AMF      220.1
No   WMSN-TV   D18        DT  CP      MADISON, WI              BLANK0000034381         284.6
No   WVTV      D18        DT  LIC     MILWAUKEE, WI            BLCDT20101012ADH        286.1
No   NEW       D18        LD  CP      WAUSAU, WI               BNPDTL20090914AAF        86.4
No   WZMQ      D19        DT  CP      MARQUETTE, MI            BLANK0000036114         140.5
No   WZMQ      D19        DT  LIC     MARQUETTE, MI            BLCDT20100928AJX        140.5
No   WTPX-TV   D19        DT  LIC     ANTIGO, WI               BLANK0000054113          71.6
No   WLWK-CD   D19        DC  LIC     STURGEON BAY, WI         BLANK0000072454         139.9
No   WODR-LD   D19        LD  LIC     WAUSAU, WI               BLANK0000014093         139.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

    Channel: D18
       Mask: Full Service
   Latitude:  45 34 23.40 N (NAD83)
  Longitude:  88 52 58.70 W
Height AMSL: 586.2 m
       HAAT: 85.1 m
   Peak ERP: 1.64 kW
    Antenna: SCA PR-TV x2 Array 1@150 1@310 0.0 deg
Elev Pattrn: Generic

49.1 dBu contour:
Azimuth      ERP       HAAT   Distance
  0.0 deg  0.012 kW    86.2 m   10.5 km
 45.0      0.013       96.5     11.3
 90.0      0.013       89.0     10.8
135.0      0.645       73.6     25.6
180.0      0.066       80.8     15.4
225.0      0.014      103.7     12.0
270.0      0.029       70.1     11.7
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315.0       1.46       81.2     30.8

Proposal 24.15 dBu contour does not cross Canadian border
Distance to Canadian border: 269.1 km

Distance to Mexican border: 2067.5 km

Conditions at FCC monitoring station: Allegan MI
Bearing: 143.7 degrees   Distance: 404.2 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 251.4 degrees   Distance: 1457.9 km

No land mobile station failures found

Proposal is not within the Offshore Radio Service protected area


Study cell size: 1.00 km
Profile point spacing: 0.10 km

Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%


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Interference to proposal scenario 1

             Call      Chan  Svc Status  City, State              File Number             Distance
Desired:     K32GF     D18   LD  APP     RHINELANDER, WI          BLTT20050929AGL

Undesireds:  WPBN-TV   D18   LD  CP      TRAVERSE CITY, MI        BLANK0000058651         265.8 km
             KQDS-TV   D18   DT  CP      DULUTH, MN               BLANK0000027535         283.5
             NEW       D18   LD  CP      WAUSAU, WI               BNPDTL20090914AAF        86.4

        Service area       Terrain-limited              IX-free        Percent IX
   973.8       5,427     953.6       5,422     946.6       5,422     0.74     0.00

Undesired                          Total IX            Unique IX   Prcnt Unique IX
KQDS-TV D18 DT CP          2.0           0       1.0           0     0.11     0.00
NEW D18 LD CP              6.0           0       5.0           0     0.53     0.00
```