OWL ENGINEERING & EMC TEST LABS, INC.

CONSULTING COMMUNICATIONS ENGINEERS · EMC TEST LABORATORIES

5844 Hamline Avenue North, Shoreview, MN 55126
651-784-7445 • Fax 651-784-7541

ENGINEERING EXHIBIT FOR AN APPLICATION FOR A CONSTRUCTION PERMIT

KSTH-FM

ARMADA MEDIA – MC COOK, INC

HOLYOKE, CO

FACILITY ID# 85760

CHANNEL 222 35 KW (H&V) 64 METERS HAAT

DECEMBER 12, 2022

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ENGINEERING STATEMENT

This amended engineering exhibit, of which this Statement is a part, was prepared in accordance with the Rules and Regulations of the Federal Communications Commission and pursuant to the provisions of Section III-B of FCC Form 301 on behalf of Armada Media – Mc Cook, Inc (hereafter "**Armada**") in support of an application for authority to modify an existing FM broadcast facility (KSTH). The purpose of this application is to change the Class from A to C2 and with an effective radiated power of 35 KW, both in the horizontal and vertical plane. This power/height combination is an allowable Class C2 facility permitted under the current rules and regulations.

"**Armada"** proposes to operate from a site uniquely described by the geographic coordinates:

(NAD 27)
40° 34' 46" North Latitude
102° 19' 11" West Longitude

(NAD 83)
40° 34' 46" North Latitude
102° 19' 12.8" West Longitude

The tower is already registered and has registration #1026472. Engineering Figure 1 is a portion of the Holyoke, CO 7.5 minute USGS map that shows the exact location of the tower. A search was performed for the presence of any other communications facilities located nearby and none were found.

Figure 2 shows an aerial view of the proposed site and that the surrounding area is rural. Because the area is rural, there is not expected to be any problem with blanketing interference. The applicant is aware of the provisions of §73.318 of the FCC's Rules and the requirement for satisfying all complaints of blanketing interference that are received within a one-year period. The main studio for the station is located in the Holyoke area and complies with §73.1125.

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ALLOCATION CONSIDERATIONS

A review of allotments and assignments on channel 222, on the three immediately upper adjacent, the three immediately lower adjacent channels and the two channels removed by 53 and 54 channels (275 & 276) shows that the site proposed would be in full compliance with §73.207.

FM CHANNEL SPACING STUDY

Armada Media - Mccook, Inc.

REFERENCE — DISPLAY DATES
40 34 46.00 N. — CLASS = C2 — DATA 12-02-22
102 19 12.70 W. — Current Spacings to 3rd Adj. — SEARCH 12-12-22

Channel 222 - 92.3 MHz

Call	Channel		Location		Azi	Dist	FCC	Margin
KSTH	CP	222C2	Holyoke	CO	270.0	0.00	190.0	-190.0
KSTH	LIC	222A	Holyoke	CO	0.0	0.09	166.0	-165.9
NEW/KFII	CP	222A	Hugo	CO	215.4	177.00	166.0	11.0
KYOY	LIC-N	222C3	Hillsdale	WY	293.1	195.24	177.0	18.2
KADL	RSV-A	275C1	Imperial	NE	97.2	57.71	27.0	30.7
KPNE-FM	LIC	219C1	North Platte	NE	62.9	110.01	79.0	31.0
DKKHG	VAC	222A	Hugo	CO	215.7	200.59	166.0	34.6
KBRY	LIC	222C1	Sargent	NE	66.3	264.27	224.0	40.3
KADL	LIC	275A	Imperial	NE	97.2	57.71	15.0	42.7

RSV-R = reserved - needs protection, RSV-A = allocation

The allocation coordinates are the same as the present licensed facility.

COVERAGE CONTOURS

The three-to-sixteen-kilometer average terrain elevations were derived from the Defense Mapping Agency 3-second topography database.

The effective antenna radiation center height for each of the eight standard 45-degree spaced radials was used in conjunction with the F(50,50) metric curves of Figure 1 of Section 73.333 of the Rules to determine the distances to the 70 dBuV and 60 dBuV coverage contours. The contours drawn from the data are depicted on the map included as Engineering Figure 3. As is readily evident, all of Holyoke, CO is included within the proposed 70 dBuV coverage contour as required by the rules.

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DISTANCE TO CONTOURS

DISTANCES TO CONTOURS (Kilometers):
Antenna COR elevation (AMSL): 1220 meters Average HAAT: 64 meters
Frequency: 92.3000 MHz
Coordinates: N 40° 34′ 46.00″ W 102° 19′ 12.80″
F(50,50) Curves Number of Contours: 2

AZ (degs)	HAAT (m)	ERPd (kW)	CONTOUR LEVELS (dBuV): 70.0	60.0
0.0	60	35.0000	19.5	33.5
30.0	76	35.0000	22.1	37.5
60.0	90	35.0000	24.1	40.3
90.0	98	35.0000	25.1	41.7
120.0	93	35.0000	24.5	40.9
150.0	83	35.0000	23.2	39.0
180.0	66	35.0000	20.5	35.0
210.0	56	35.0000	18.8	32.4
240.0	47	35.0000	17.1	29.8
270.0	43	35.0000	16.4	28.7
300.0	48	35.0000	17.3	30.2
330.0	53	35.0000	18.3	31.7

ANSI Power Density Calculations

The power density at the base of the tower was calculated using the following formula from OST Bulletin Number 65, August, 1997:

$$S = \frac{(0.64)(1.64)(ERP)(1000)(milliwatts/watt)}{(pi(R)^2)}$$

where: S = power density in milliwatts per square centimeter
ERP = effective radiated power in watts
R = distance to radiation source in centimeters
pi = 3.14

Using this formula and the values shown below, a power density of 0.463 mW/cm^2 is found to exist at the base of the tower. This predicted value is 232% of the public exposure maximum limit of 0.2 mW/cm^2.

ERP = 70,000 watts
R = 7,100 cm.

The proposed antenna will be energized such that it produces an effective radiated power of 35 kW from a center of radiation 71 meters above ground level.

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Using the FCC FM Model program the maximum RF Radiation level assuming A Type 3 antenna the predicted radiation levels is 0.039 mW/cm^2 or 6.9% of the maximum public exposure limit and 1.4% of the controlled limit.

Access to RF circuitry is restricted by a metal fence that surrounds the property that limits access to the public. Signs are posted warning of the potential danger. When persons require access to the site, tower or antenna for maintenance purposes, the transmitter power will be reduced or completely eliminated to comply with ANSI guidelines. Hence, the conditions of §1.1306(b)(3) would not be involved.

ENVIRONMENTAL IMPACT STATEMENT

The instant proposal is categorically excluded from environmental processing since none of the conditions of §1.1306(b)(2) and (3) would be involved for the following reasons:

1) The site proposed is not in or near any location referenced in Section 1.1306(b)(1) as being of environmental interest.

2) The provisions of Section 1.1306(b)(2) relating to the use of high intensity strobe lighting do not apply since this tower is not utilizing this type of lighting.

3) Compliance to Section 1.1306(b)(3) regarding human exposure to RF radiation was examined for multiple sources. A search was made about the proposed site coordinates to locate any additional sources of RF radiation and none were found.

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CONCLUSIONS

Based on the engineering studies provided, the following conclusions can be obtained:

(1) Implementation of the instant proposal will continue to provide Holyoke with a full time aural broadcast service.

(2) All of Holyoke would be served with a signal of 70 dBuV or greater from the proposed construction site.

(3) The proposal is in complete conformance with all technical rules of the Federal Communications Commission.

Garrett G. Lysiak, P.E.
December 12, 2022

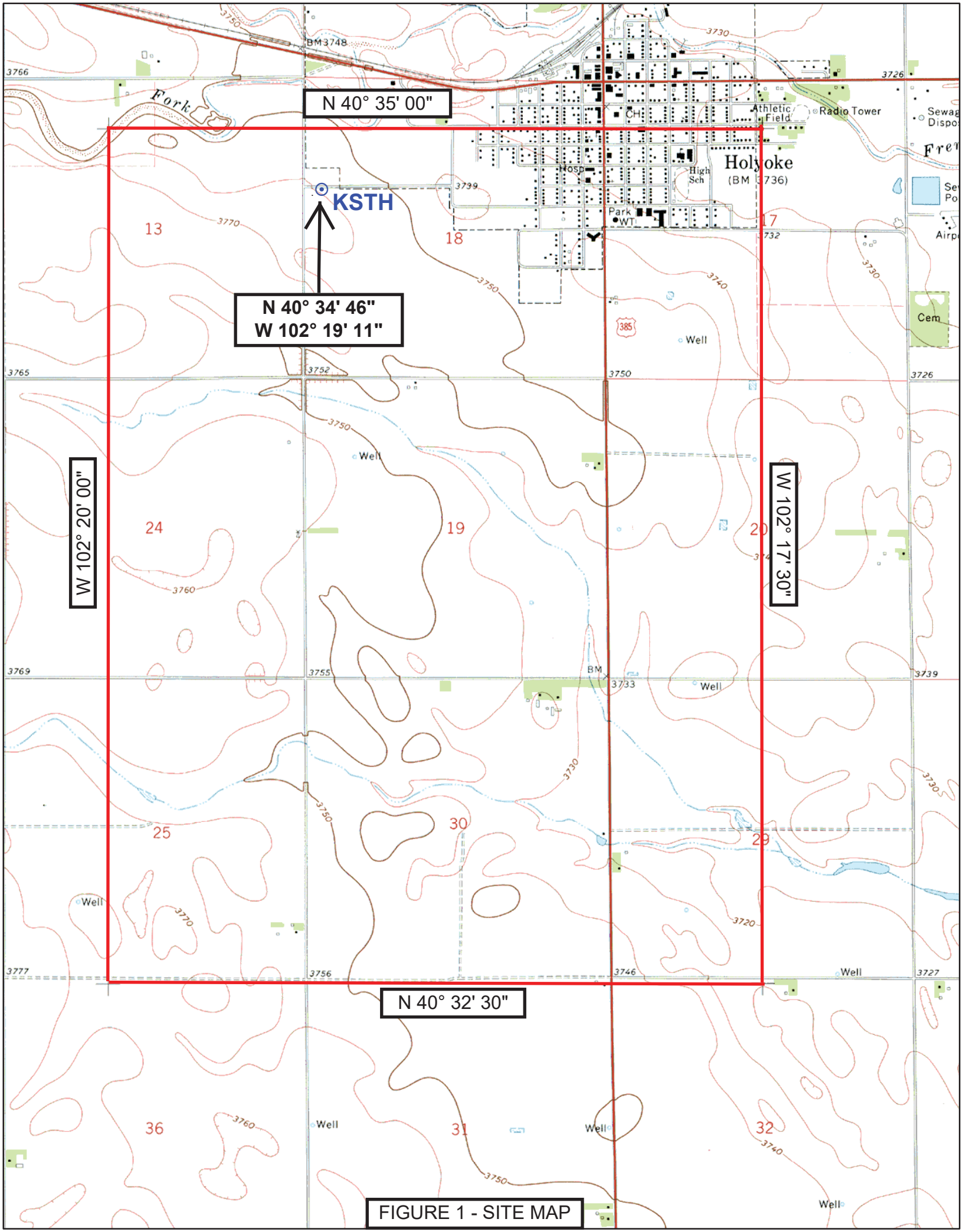
N 40° 35' 00"
KSTH
N 40° 34' 46"
W 102° 19' 11"
W 102° 20' 00"
W 102° 17' 30"
N 40° 32' 30"
Holyoke
(BM 3736)
Athletic Field
Radio Tower
Hosp
High Sch
Park
WT
Cem
Well
BM3748
BM 3733
13
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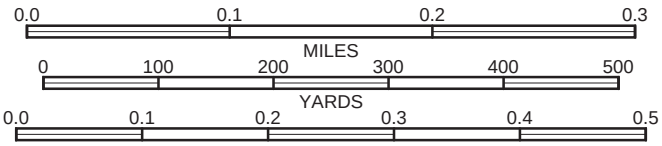
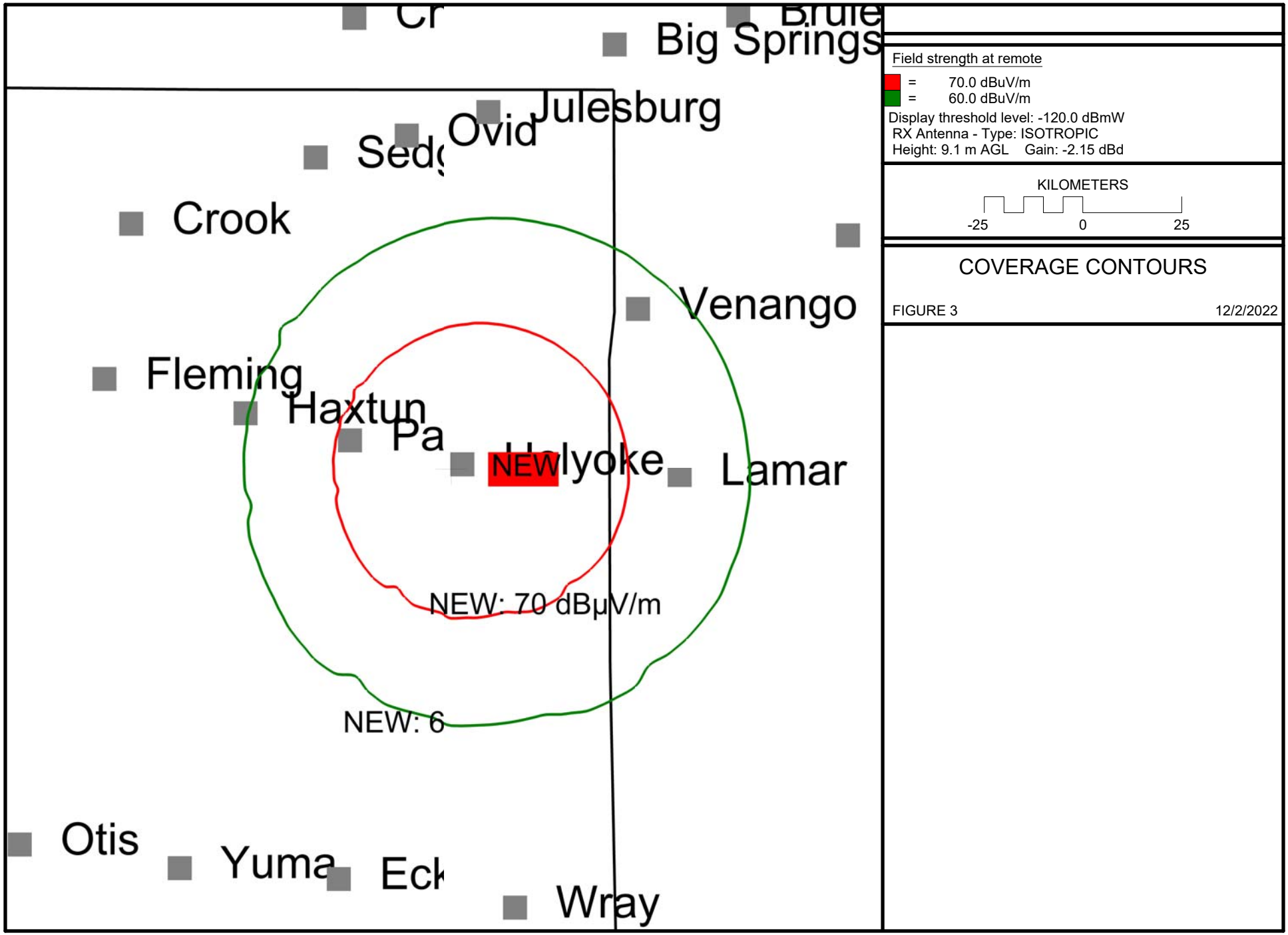
FIGURE 1 - SITE MAP

FIGURE 2 - AERIAL VIEW

SCALE 1:6000




Big Springs
Julesburg
Ovid
Crook
Venango
Fleming
Haxtun
Lamar
NEW
NEW: 70 dBµV/m
NEW: 6
Otis
Yuma
Wray
Field strength at remote
= 70.0 dBuV/m
= 60.0 dBuV/m
Display threshold level: -120.0 dBmW
RX Antenna - Type: ISOTROPIC
Height: 9.1 m AGL Gain: -2.15 dBd
KILOMETERS
-25
0
25
COVERAGE CONTOURS
FIGURE 3
12/2/2022