Comprehensive Engineering Statement

prepared for

Brian Byrnes, Receiver

W240EI Harvey, Illinois

Facility ID 203056

Channel 224D 0.15 kW 220 meters AMSL

Brian Byrnes, Receiver ("*Byrnes*"), is the Permittee for W240EI (file no. BNPFT-20181105AAO) on Channel 240D utilizing a directional antenna. W240EI is a fill-in translator for standard broadcast station WBGX(AM), 1570 kHz, Harvey, Illinois. Financial constraints require that the translator be relocated to the parent station's tower #1 (unregistered). *Byrnes* proposes to use the WBGX(AM) tower #1 with coordinates at 41° 36' 14.8"N Latitude, and 87° 40' 45.7"W Longitude (NAD 83). The tower has no ASRN. The proposed antenna will be omni-directional, circularly polarized and mounted at 35 meters Above Ground Level ("AGL"). An ERP of 150 Watts is being specified.

Nature of the Proposal

The instant proposal includes a request to change channels as discussed below. The original CP specifies Channel 240 for the translator. However, incoming co-channel interference from WERV-FM (Ch. 240A, Aurora, IL) is expected to cause significant reception difficulties. In support of demonstrating interference on Channel 264, **Figure 1** depicts the 60 dBμ protected contour of the authorized W240EI facility, and the 40 dBμ F(50,10) interfering contour from WERV-FM. As shown, the WERV-FM interfering contour completely encompasses the 60 dBμ contour of the authorized CP as well as the proposed new transmitter location. Based on the likelihood[1] of incoming interference on Channel 240, *Byrnes* respectfully requests a channel change to Channel 224 as remediation to the predicted interference.

Figure 2 is a depiction of the authorized and proposed 60 dBμ contours, along with the parent station's 2 mV/m contour and the 40 km (25 mile) limit as described in §74.1201(g). As shown, the proposed Channel 224 60 dBμ F(50,50) contour is within both the 2 mV/m and the

[1] §74.1233(a)(1)(i)(A)(*2*) states that channel changes to other than first, second, third adjacent, or IF relationship channels may be proposed to remediate based upon showing of likelihood of interference. The Report and Order that instituted the Rule suggested that the interference showing can be a simple engineering statement of interference. See Report & Order, "*Amendment of Part 74 of the Commission's Rules Regarding FM Translator Interference*", FCC 19-40, MB Docket No. 18-119, adopted May 9, 2019, paragraph 8.

40 km radius of parent station WGBX(AM). As demonstrated, the 60 dBμ contour of the proposal overlaps the 60 dBμ contour of the current CP.

The antenna system for the proposed translator is a Shively SLV, 4-bay, 0.75 wavelength spaced, omni-directional antenna, which will be side-mounted on an existing unregistered structure. 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 to structure marking/lighting requirements will result.

Allocation Considerations

A study of nearby FM facilities on co-channel, adjacent-channel, and intermediate frequencies was conducted to identify which stations require further study to demonstrate compliance under §74.1204. The nearest co-channel facilities are FM translator W224EA (Ch 224D, Gary, IN), Class A stations WCPY(FM) (Ch 224A, Arlington Heights, IN), and WVLI(FM) (Ch 224A, Kankakee, IL). As demonstrated in **Figure 3**, no prohibited contour overlap will occur with nearby co-channel facilities. The closest first adjacent stations are WCLR(FM) (Ch. 223B, Dekalb, IL), and WNDV-FM (Ch 225B, South Bend, IN). As shown in **Figure 3,** the 54 dBμ F(50,10) contour of the proposed facility does not overlap the protected 60 dBμ F(50,50) contour of nearby first adjacent facilities.

The nearest second and third adjacent stations are WPWX(FM) (Ch 222B, Hammond, IN), and WXRT(FM) (Ch 226B, Chicago, IL). The proposal is well outside the protected service contours of all other second and third adjacent facilities. As depicted in **Figure 4**, the proposed site is located just inside the 69.8 dBμ contour of WXRT(FM), and the 80 dBμ contour of WPWX(FM). Since WXRT(FM) represents the worst case, studies were performed based on protection to WXRT(FM).

Protection of WXRT(FM) and WPWX(FM) is achieved pursuant to §74.1204(d) by demonstrating that the proposed translator's interfering contour does not reach populated areas. The proposed facility's transmitter site is located just inside the 69.8 dBμ contour of WXRT(FM) as shown in **Figure 4**. Thus, based on the -40 dB desired-to-undesired ratio specified in §74.1204(a)(3), the appropriate second-adjacent interfering signal level at this location is

109.8 dBμ. Using the manufacturer's typical vertical (elevation) pattern for the antenna in question, calculations were performed to determine the predicted signal strengths at two meters above ground in the vicinity of the transmitter site. **Figure 5** depicts the results of the calculations. As demonstrated, the signal peak is 110.4 dBμ at 22 meters from the support structure. However, this distance is on the property of the transmitter site. Beyond 26 meters, the signal does not equal or exceed the 109.8 dBμ signal strength that represents interference to WXRT(FM). Thus, the 109.8 dBμ interfering signal will not reach population at ground level. The nearest IF relationship (53 or 54 channels removed) facility is WKSC-FM (Ch 278B, Chicago, Illinois) at a distance of 30.7 km, well beyond the required 15 km from the proposal.

The instant proposal is to place the transmitting antenna on Tower #1 of parent station WBGX(AM). The proposed installation will not extend the overall height of Tower #1, and the antenna equipment will be appropriately isolated from the tower. In accordance with §1.30003(b) of the Rules, *Byrnes* will confirm that the installation has not impacted the operation of WBGX(AM) through the use of before and after partial proof measurements. Since WBGX(AM) is also owned by *Byrnes*, notification of the construction will be handled internally. There are no other AM stations within the §1.30002 notification distances of the proposed facility.

The proposed site is located more than 375 km from the Canadian and Mexican borders, well beyond the 320 km coordination distance required for translators specified in §74.1235(d). The nearest FCC monitoring station is 180.85 km distant at Allegan, MI and the facility is 662.97 km from the Green Bank Quiet Zone. These distances exceed the threshold minimum distance specified in §73.1030 that would suggest consideration.

It is therefore believed that the proposed facility satisfies all of the pertinent Commission Rules and Policies now in effect regarding allocation matters.

Environmental Considerations

The proposed facility will operate with a Shively SLV, four-bay, 0.75 wavelength spaced, circularly-polarized antenna with an ERP of 150 Watts at 35 meters AGL on an existing unregistered tower which is already used for AM station WBGX. The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according

to Note 1 of §1.1306 of the FCC Rules. Because no change in structure height is proposed, 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 Radiation

The proposed operation was evaluated for human exposure to radiofrequency energy using the procedures outlined in the Commission's OET Bulletin No. 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility meets 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 general population/uncontrolled maximum permitted exposure ("MPE") limit specified in §1.1310 for the entire FM broadcast band is 200 $\mu W/cm^2$. For the purpose of this study, "public access" will be considered at the base of the structure at locations two-meters above ground. Using the FCC's FM Model program and an EPA Type 4 (Two Piece Spiral) antenna it was determined that the proposed facility would contribute a worst-case RF power density of 0.178 $\mu W/cm^2$ at two meters above ground level near the antenna support structure, or 0.089 percent of the general population/uncontrolled limit.

§1.1307(b)(3) states that facilities at locations with multiple emitters are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent of the pertinent MPE 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 ground level as defined under §1.1307(b).

Safety of Tower Workers and the General Public

As demonstrated herein, excessive levels of RF energy will not be caused by the proposal at publicly accessible areas at ground level near the antenna supporting structure. Consequently, workers at ground level will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower access will continue to be restricted and controlled through the use of a locked gate. According to information provided by the applicant, appropriate RF exposure warning signs are posted. In the event that maintenance or other workers gain access to the tower, power output of the translator will be decreased or shut off to protect workers.

With respect to worker safety, a site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed on the tower 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. Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under §1.1306 of the Rules, hence preparation of an Environmental Assessment is not required.

Conclusion

It is therefore believed that the proposed facility satisfies all of the pertinent Commission Rules and Policies now in effect.

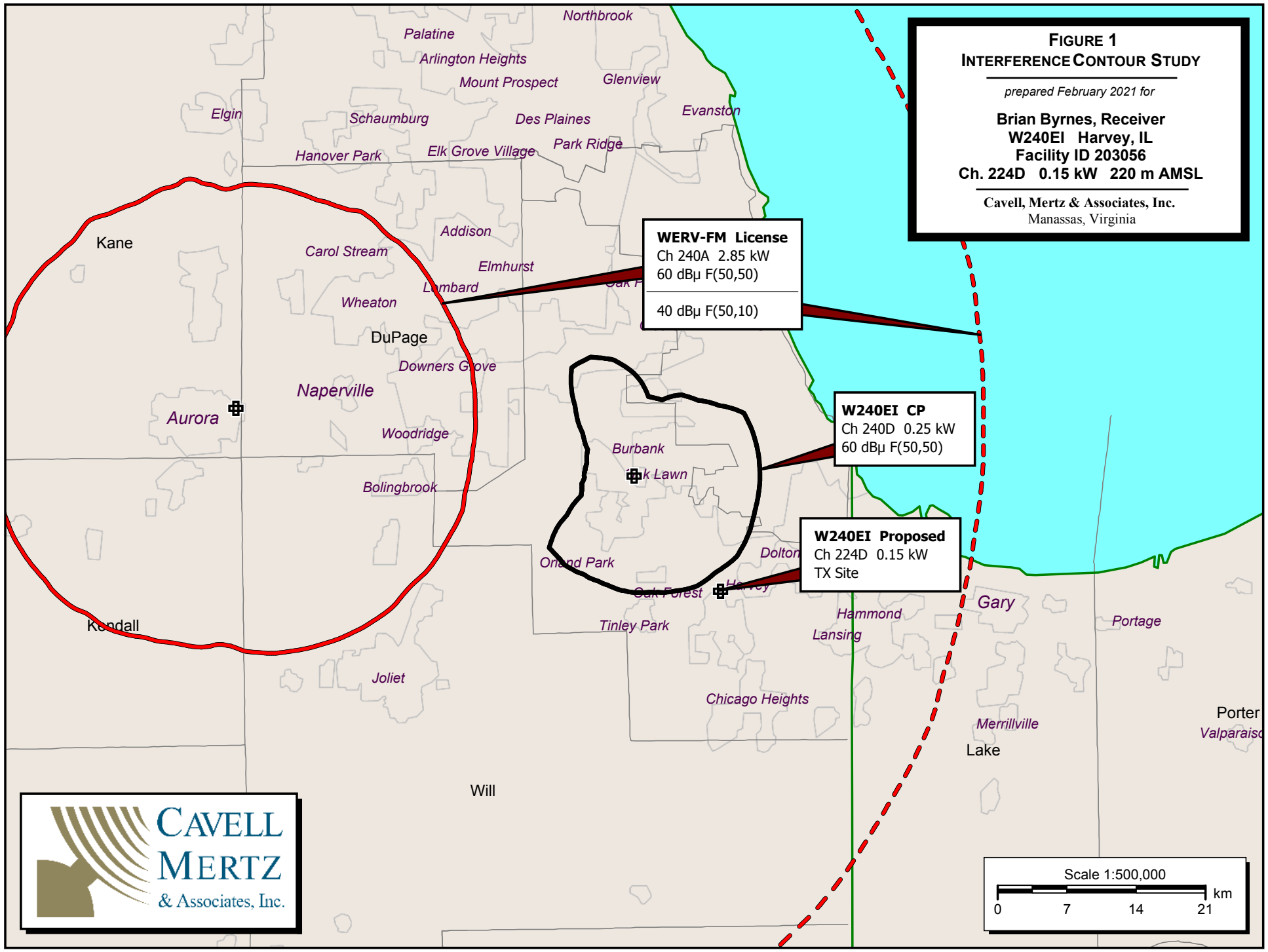
FIGURE 1
INTERFERENCE CONTOUR STUDY
prepared February 2021 for
Brian Byrnes, Receiver
W240EI Harvey, IL
Facility ID 203056
Ch. 224D 0.15 kW 220 m AMSL
Cavell, Mertz & Associates, Inc.
Manassas, Virginia
WERV-FM License
Ch 240A 2.85 kW
60 dBµ F(50,50)
40 dBµ F(50,10)
W240EI CP
Ch 240D 0.25 kW
60 dBµ F(50,50)
W240EI Proposed
Ch 224D 0.15 kW
TX Site
Northbrook
Palatine
Arlington Heights
Mount Prospect
Glenview
Elgin
Schaumburg
Des Plaines
Evanston
Hanover Park
Elk Grove Village
Park Ridge
Addison
Kane
Carol Stream
Elmhurst
Lombard
Wheaton
DuPage
Downers Grove
Naperville
Aurora
Woodridge
Burbank
Bolingbrook
Orland Park
Dolton
Oak Forest
Gary
Hammond
Lansing
Portage
Tinley Park
Kendall
Joliet
Chicago Heights
Merrillville
Porter
Lake
Will
Scale 1:500,000
0 7 14 21 km
CAVELL MERTZ & Associates, Inc.

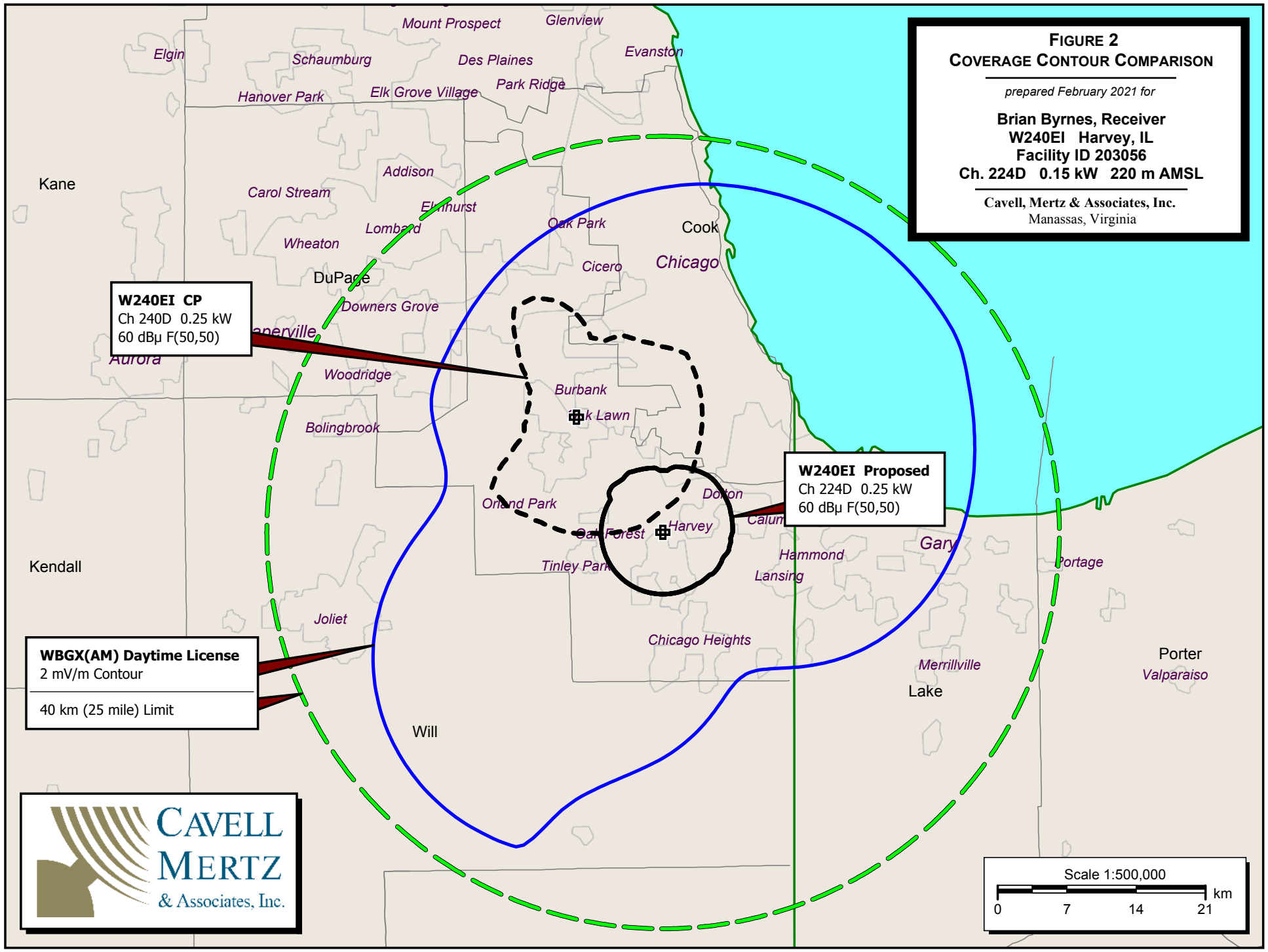
FIGURE 2
COVERAGE CONTOUR COMPARISON
prepared February 2021 for
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W240EI Harvey, IL
Facility ID 203056
Ch. 224D 0.15 kW 220 m AMSL
Cavell, Mertz & Associates, Inc.
Manassas, Virginia
W240EI CP
Ch 240D 0.25 kW
60 dBµ F(50,50)
W240EI Proposed
Ch 224D 0.25 kW
60 dBµ F(50,50)
WBGX(AM) Daytime License
2 mV/m Contour
40 km (25 mile) Limit
Kane
DuPage
Cook
Kendall
Will
Lake
Porter
Mount Prospect
Glenview
Elgin
Schaumburg
Des Plaines
Evanston
Hanover Park
Elk Grove Village
Park Ridge
Addison
Carol Stream
Elmhurst
Lombard
Oak Park
Wheaton
Cicero
Chicago
Downers Grove
Aurora
Woodridge
Burbank
Bolingbrook
Orland Park
Dolton
Harvey
Tinley Park
Hammond
Lansing
Gary
Portage
Joliet
Chicago Heights
Merrillville
Valparaiso
Scale 1:500,000
km
0
7
14
21
CAVELL MERTZ & Associates, Inc.

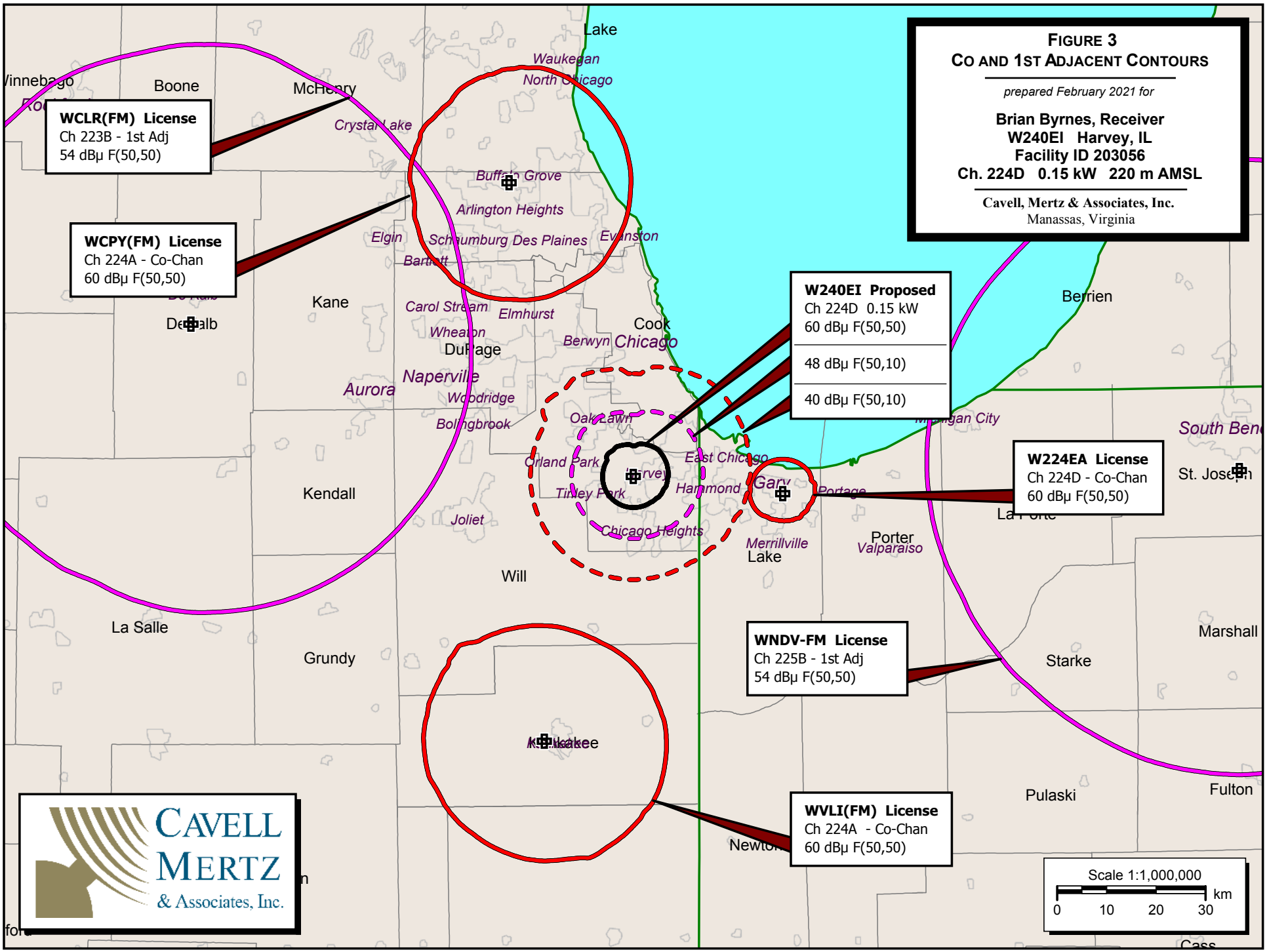
FIGURE 3
CO AND 1ST ADJACENT CONTOURS
prepared February 2021 for
Brian Byrnes, Receiver
W240EI Harvey, IL
Facility ID 203056
Ch. 224D 0.15 kW 220 m AMSL
Cavell, Mertz & Associates, Inc.
Manassas, Virginia
WCLR(FM) License
Ch 223B - 1st Adj
54 dBµ F(50,50)
WCPY(FM) License
Ch 224A - Co-Chan
60 dBµ F(50,50)
W240EI Proposed
Ch 224D 0.15 kW
60 dBµ F(50,50)
48 dBµ F(50,10)
40 dBµ F(50,10)
W224EA License
Ch 224D - Co-Chan
60 dBµ F(50,50)
WNDV-FM License
Ch 225B - 1st Adj
54 dBµ F(50,50)
WVLI(FM) License
Ch 224A - Co-Chan
60 dBµ F(50,50)
Lake
Waukegan
North Chicago
Boone
McHenry
Crystal Lake
Buffalo Grove
Arlington Heights
Elgin
Schaumburg
Des Plaines
Evanston
Bartlett
Kane
DeKalb
Carol Stream
Elmhurst
Wheaton
DuPage
Berwyn
Cook
Chicago
Berrien
Naperville
Aurora
Woodridge
Bolingbrook
Oak Lawn
Orland Park
Harvey
East Chicago
Gary
Hammond
Portage
Tinley Park
Joliet
Kendall
Chicago Heights
Merrillville
Porter
Valparaiso
Lake
Will
La Salle
Grundy
Marshall
Starke
Pulaski
Fulton
Newton
Cass
South Bend
St. Joseph
Scale 1:1,000,000
km
0 10 20 30
CAVELL MERTZ & Associates, Inc.

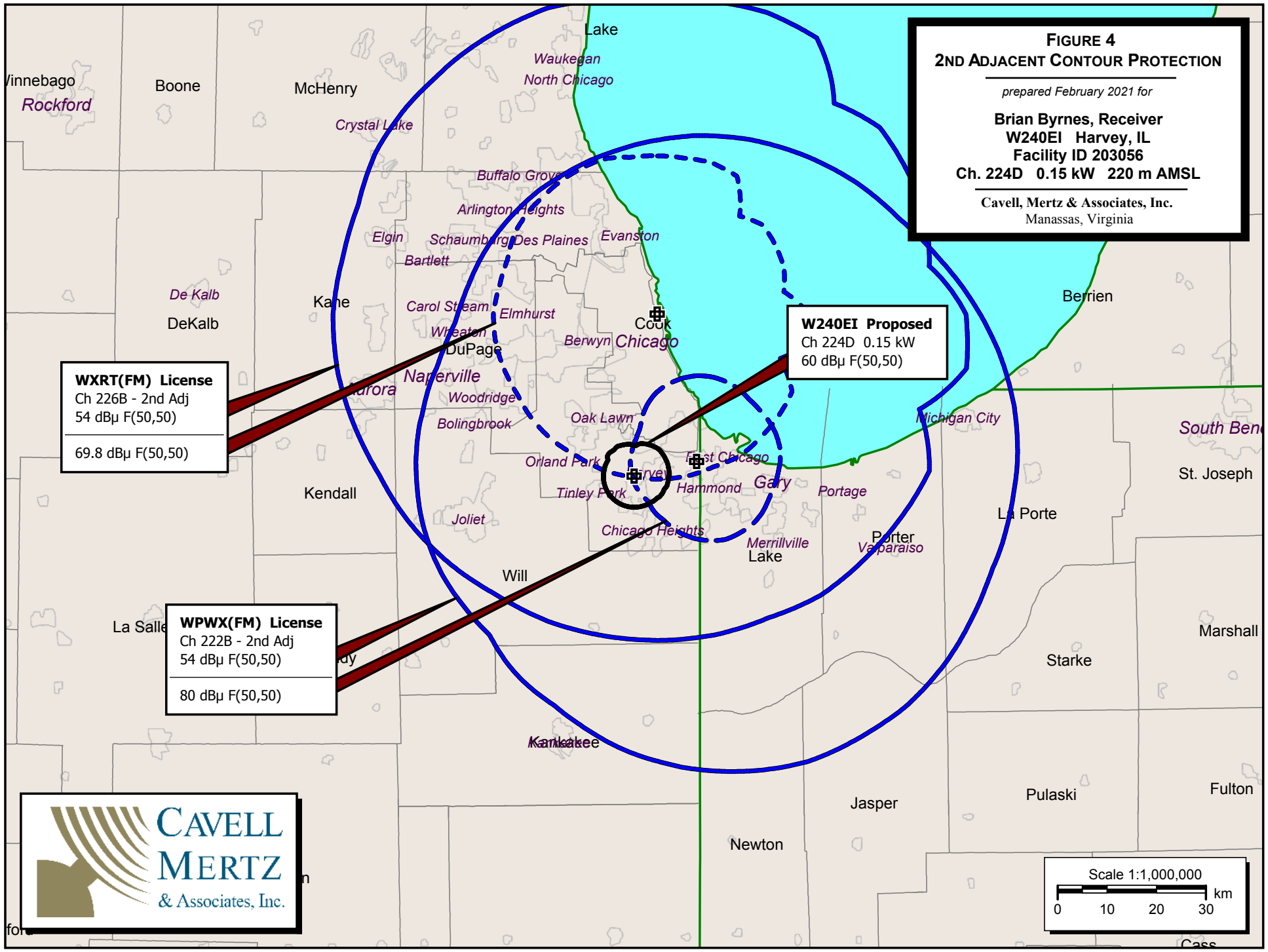
FIGURE 4
2ND ADJACENT CONTOUR PROTECTION
prepared February 2021 for
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W240EI Harvey, IL
Facility ID 203056
Ch. 224D 0.15 kW 220 m AMSL
Cavell, Mertz & Associates, Inc.
Manassas, Virginia
W240EI Proposed
Ch 224D 0.15 kW
60 dBµ F(50,50)
WXRT(FM) License
Ch 226B - 2nd Adj
54 dBµ F(50,50)
69.8 dBµ F(50,50)
WPWX(FM) License
Ch 222B - 2nd Adj
54 dBµ F(50,50)
80 dBµ F(50,50)
Lake
Waukegan
North Chicago
Boone
McHenry
Rockford
Crystal Lake
Buffalo Grove
Arlington Heights
Elgin
Schaumburg
Des Plaines
Evanston
Bartlett
De Kalb
DeKalb
Kane
Carol Stream
Elmhurst
Wheaton
DuPage
Cook
Chicago
Berwyn
Berrien
Naperville
Aurora
Woodridge
Bolingbrook
Oak Lawn
Orland Park
Tinley Park
Hammond
Gary
East Chicago
Michigan City
South Bend
St. Joseph
Portage
La Porte
Kendall
Joliet
Chicago Heights
Merrillville
Porter
Valparaiso
Lake
Will
La Salle
Marshall
Starke
Kankakee
Jasper
Pulaski
Fulton
Newton
Scale 1:1,000,000
km
0 10 20 30
CAVELL MERTZ & Associates, Inc.

FIGURE 5
SIGNAL AT 2M ABOVE GROUND

prepared February 2021 for

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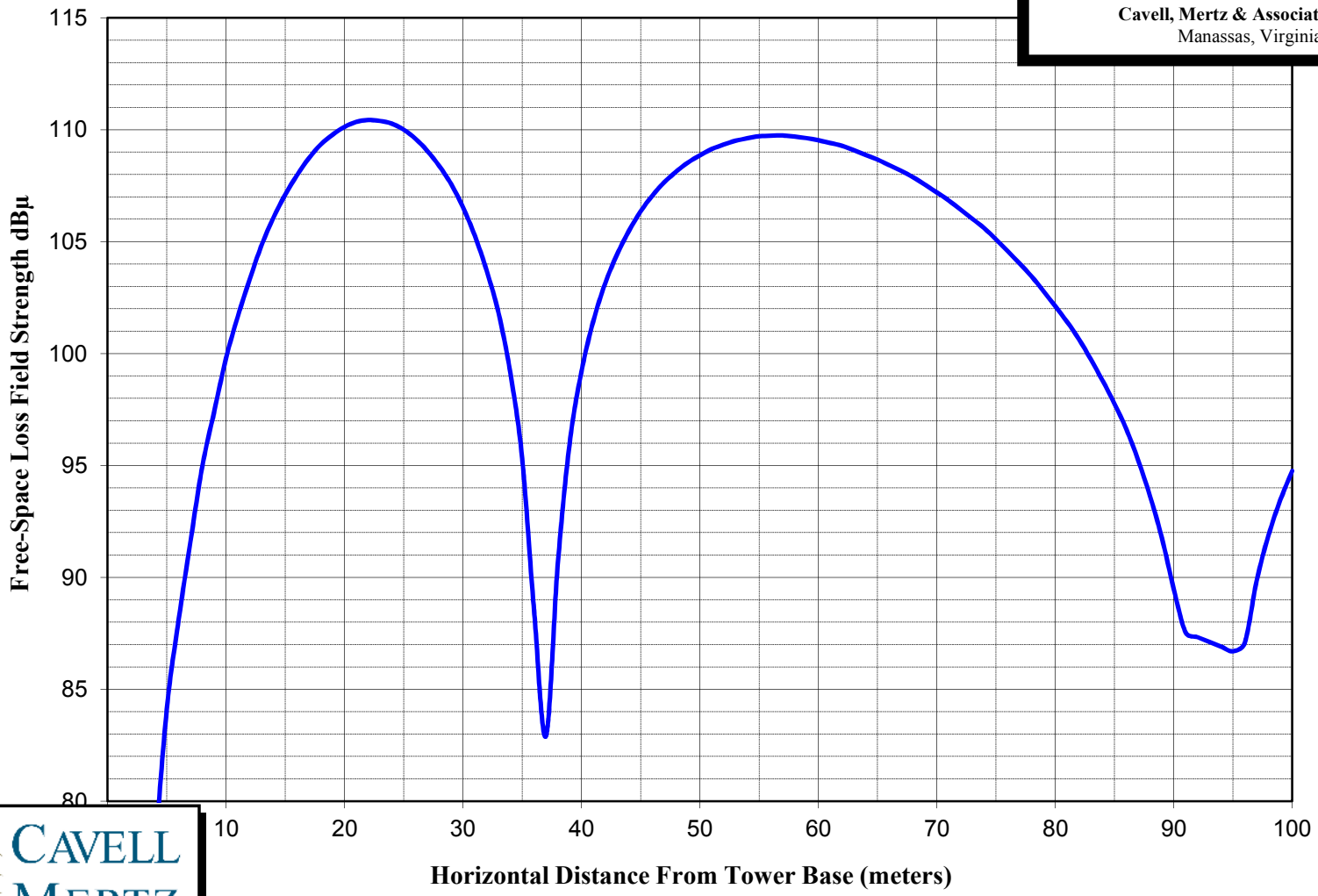
W240EI Harvey, IL
Facility ID 203056
Ch. 224D 0.15 kW 220 m AMSL

Cavell, Mertz & Associates, Inc.
Manassas, Virginia



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