

# T Z SAWYER TECHNICAL CONSULTANTS

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## DIGITAL LPTV FACILITY MINOR CHANGE APPLICATION

W21EF-LD

FCC FACILITY ID: 67935

WAUPACA, WISCONSIN

MARCH 2024

### ENGINEERING NARRATIVE

#### Minor Change Application:

W21EF-LD seeks to modify its existing LICENSE permit (LMS:0000121378) to specific a new transmission site and antenna system parameters. The proposed antenna is a SCA, PR-TV 165/345 horizontally polarized directional UHF parabolic antenna system. A full-service filter mask is to be employed. The facility requested is not contingent upon a grant or channel move of any other known facility at the time of filing.

Maximum Effective Radiated Power (ERP) is 2.5-kilowatts, horizontal polarization only.

#### Modification Compliance:

Pursuant to 47 CFR §74.787(b) the instant application is considered a “minor” change because;

- There is no change in transmitting antenna location such that the protected service contour resulting from the change does not overlap some portion of the protected service contour of the authorized facility of the station license as illustrated in Figure 1, Present & Proposed Service Contours.
- There is no change in transmitting antenna location greater than 30 miles (48km) from the reference coordinates of the existing station construction permit antenna location, as noted below:

CALCULATED DISTANCE BETWEEN EXISTING LICENSE AND PROPOSED SITES  
(via the method prescribed in 47 CFR §73.208 & 73.611(d))

SITE	LAT (NAD83)	LON (NAD83)	(KM)	(MI)
CURRENT/EXISTING	44-05-53.5 N	088-32-57.3 W	36.10	22.43
PROPOSED LIC MOD	43-48-01.1 N	088-22-11.4 W		

FCC Tower Registration - FAA Notification Not Required. ASR# 1035389

The proposed antenna mounting structure is 98.1 meters in overall height above ground level (AGL) and does NOT require further FAA notice or modification of its existing FCC Tower Registration (ASR). The antenna is to be side mounted on the supporting structure at the 35.0 meter AGL level. No change in the overall height of the structure will occur.

#### Antenna Elevations:

The ground elevation at the site is 301.5 meters above mean sea level (AMSL). The center of radiation of the proposed antenna is 35.0 meters above ground level (AGL). Thus, the center of radiation is 336.5 meters above mean sea level (AMSL), as tabulated below:

ALL ELEVATIONS IN METERS

GROUND ELEVATION	301.5
SUPPORTING STRUCTURE OVERALL HEIGHT AGL	98.1
ANTENNA HEIGHT AGL - CENTER OF RADIATION	35.0
ANTENNA RCAMSL - CENTER OF RADIATION	336.5

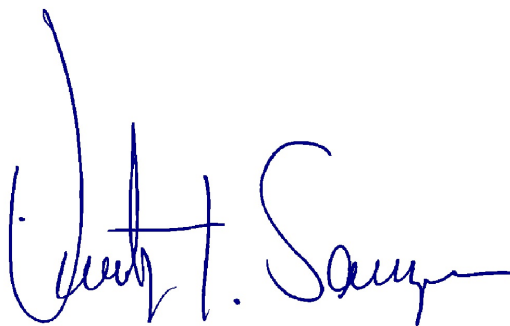
FCC TVStudy Results:

The results of a interference study of the proposal using the FCC TVStudy program (Version 2.2.5), shows that no prohibitive interference will occur from the proposal. A copy of the summary report has been included in this application. The applicant accepts any incoming interference that is predicted to exist to the proposed facility by any authorized or pending, primary or secondary TV station at the time this application is submitted. A cell size of 1.0 kilometer, with a 1.0 km profile spacing (the default setting) was used.

Environmental Evaluation Statement:

The environmental evaluation statement concerning this proposal has been included in this application and can be found as a separate file upload within the application. A grant of this proposal would NOT be an action which would have a significant environmental effect as demonstrated in the environmental evaluation statement.

March 22, 2024

A handwritten signature in blue ink, appearing to read "Timothy Z. Sawyer". The signature is fluid and cursive, with a large initial "T" and "S".

Timothy Z. Sawyer, Consulting Engineer

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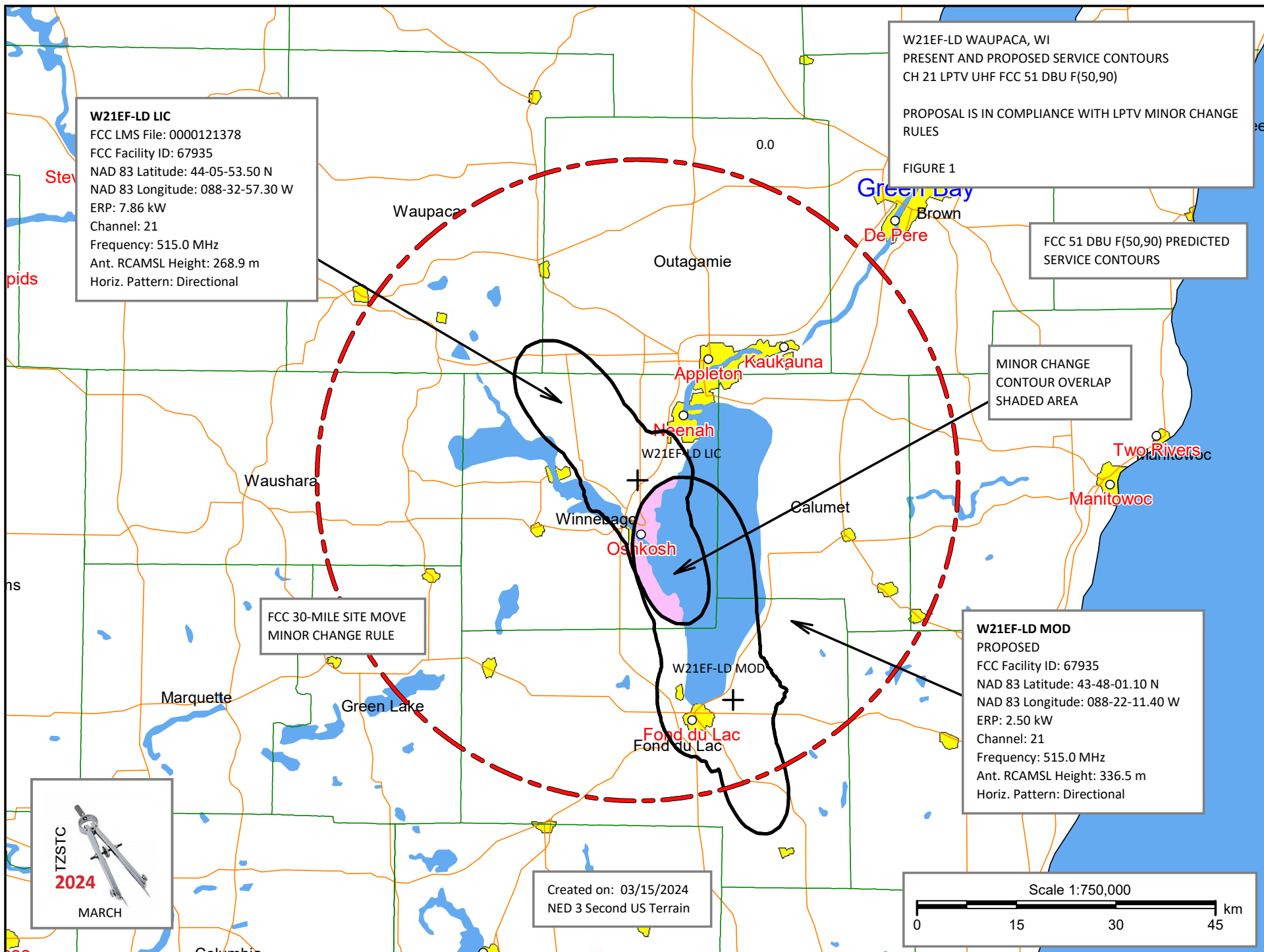
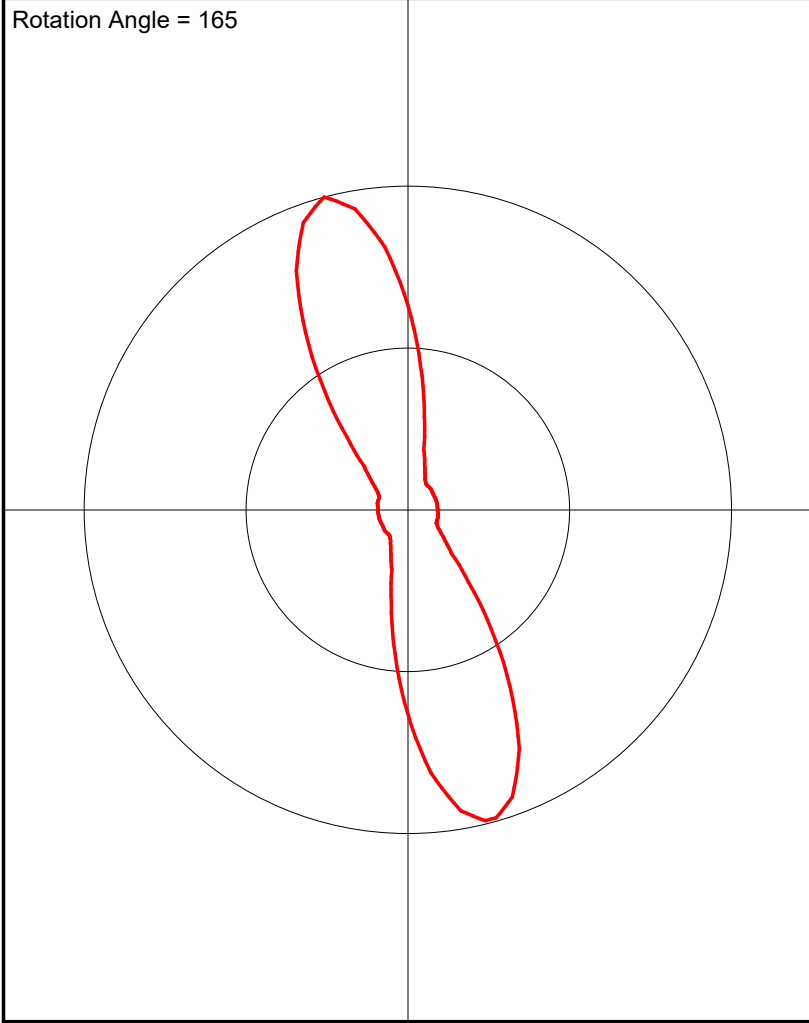


FIGURE 2 W21EF-LD SCA PRTV-2 164/345  
Pre-Rotation Antenna Pattern....

Azimuth (deg)	Relative Field
0.0	0.989
10.0	0.814
20.0	0.447
30.0	0.19
40.0	0.125
50.0	0.097
60.0	0.096
70.0	0.093
80.0	0.092
90.0	0.092
100.0	0.092
110.0	0.093
120.0	0.096
130.0	0.097
140.0	0.125
150.0	0.19
160.0	0.447
170.0	0.814
180.0	1.0
190.0	0.814
200.0	0.447
210.0	0.19
220.0	0.125
230.0	0.097
240.0	0.096
250.0	0.093
260.0	0.092
270.0	0.092
280.0	0.092
290.0	0.093
300.0	0.096
310.0	0.097
320.0	0.125
330.0	0.19
340.0	0.447
350.0	0.814

Rotation Angle = 165



# FIGURE 3 - W21EF-LD MINOR CHANGE - FCC TVSTUDY SUMMARY REPORT

Proposal: W21EF-LD D21 LD APP WAUPACA, WI  
 File number: W21EF-LD MOD  
 Facility ID: 67935  
 Station data: User record  
 Record ID: 756  
 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	WWME-CD	D20	DC	LIC	CHICAGO, IL	BLANK0000086882	221.8 km
No	WWME-CD	D20	DC	CP	CHICAGO, IL	BLANK0000196954	219.9
No	WCMW	D20	DT	LIC	MANISTEE, MI	BLANK0000087364	165.7
No	WHA-TV	D20	DT	LIC	MADISON, WI	BLANK0000089074	125.3
No	KGCW	D21	DT	LIC	BURLINGTON, IA	BLANK0000107917	320.3
No	WJYS	D21	DT	LIC	HAMMOND, IN	BLANK0000087539	221.8
No	WFYI	D21	DT	LIC	INDIANAPOLIS, IN	BLANK0000100803ADB	469.3
No	WZPX-TV	D21	DT	LIC	BATTLE CREEK, MI	BLANK0000087609	271.9
No	WWJ-TV	D21	DT	LIC	DETROIT, MI	BLANK0000125983	447.5
No	WFUP	D21	DT	LIC	VANDERBILT, MI	BLANK0000087814	324.8
No	WUMN-LD	D21	LD	LIC	MINNEAPOLIS, MN	BLANK0000125868	410.5
No	WEUX	D21	DT	LIC	CHIPPEWA FALLS, WI	BLANK0000078776	291.8
Yes	WIFS	D21	DT	LIC	JANESVILLE, WI	BLANK0000090143	125.3
No	W21DS-D	D21	LD	LIC	SAYNER/VILAS COUNTY, WI	BLANK0000055208	264.3
No	WLS-TV	D22	DT	LIC	CHICAGO, IL	BLANK0000232100	221.8
No	WLLA	D22	DT	LIC	KALAMAZOO, MI	BLANK0000122579	273.0
No	WPBN-TV	D22	LD	LIC	TRAVERSE CITY, MI	BLANK0000143350	218.7
No	W22FK-D	D22	LD	LIC	BARABOO, WI	BLANK0000215895	167.7
Yes	WFRV-TV	D22	DT	LIC	GREEN BAY, WI	BLANK0000163103	66.9
No	WISC-TV	D22	LD	CP	MADISON, WI	BLANK0000152659	124.2
No	WPVS-LD	N29z	TX	LIC	MILWAUKEE, WI	BLTTL20080221AAP	46.7

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D21  
 Mask: Full Service  
 Latitude: 43 48 1.10 N (NAD83)  
 Longitude: 88 22 11.40 W  
 Height AMSL: 336.5 m  
 HAAT: 0.0 m  
 Peak ERP: 2.50 kW  
 Antenna: SCA PR-TV 2-ARRAY 165/345 165.0 deg  
 Elev Patrn: Generic

49.5 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.995 kW	104.1 m	31.3 km
45.0	0.023	38.6	8.0
90.0	0.021	41.2	8.1
135.0	0.090	17.2	10.1
180.0	0.995	18.6	18.4
225.0	0.023	87.1	12.1
270.0	0.021	97.0	12.5
315.0	0.090	107.0	18.9

Database HAAT does not agree with computed HAAT  
 Database HAAT: 0 m Computed HAAT: 64 m

Distance to Canadian border: 420.4 km  
 Distance to Mexican border: 1938.3 km

Conditions at FCC monitoring station: Allegan MI  
 Bearing: 123.3 degrees Distance: 236.4 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
 Bearing: 259.5 degrees Distance: 1447.6 km

No land mobile station failures found

Study cell size: 1.00 km

Profile point spacing: 1.00 km

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

Maximum new IX to LPTV: 2.00%

Proposal causes 0.03% interference to BLANK0000090143 LIC scenario 1

Proposal causes 0.01% interference to BLANK0000163103 LIC scenario 1

---- Below is IX received by proposal W21EF-LD MOD ----

Proposal receives 0.72% interference from scenario 1

No IX check failures found.

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W21EF-LD

LPTV CHANNEL 21 OPERATION

FCC FACILITY ID: 67935

WAUPACA, WISCONSIN

MARCH 2024

## ENVIRONMENTAL EVALUATION STATEMENT

A grant of this proposal would NOT be an action which would have a significant environmental effect as demonstrated in this environmental evaluation statement. Any changes in equipment, or construction, if necessary will not trigger any event with regards to Section 106 of the National Historical Preservation Act (NHPA).

The proposal does not meet any of the criteria specified in Section 1.1307 of the FCC Rules. More specifically, the proposed facilities are not known to fall within any of the categories enumerated in Sections 1.1307(a)(1)-(7) and will not involve the use of high intensity white lights. Furthermore, operation of the proposed facility will not involve the exposure of workers or the general public to levels of radio frequency electromagnetic fields exceeding guidelines adopted by the Federal Communications Commission. (The current FCC guidelines are based upon criteria contained in the National Council of Radiation Protection and Measurements (NCRP) Report No.86 (1986) and ANSI/IEEE C95.1-1992.)


CALCULATED POWER DENSITY AT 2 METERS AGL (0.5 ANTENNA RELATIVE FIELD VALUE) ERP MAX (H ONLY)

CR AGL 35.0 M ERP MAX 2.5 KW	MPE ( $\mu\text{W}/\text{CM}^2$ )	CALCULATED VALUE ( $\mu\text{W}/\text{CM}^2$ )	% OF MPE	PASS/FAIL
CONTROLLED AREA	1716.7	19.1690	1.12%	PASS
PUBLIC AREA	343.3		5.58%	PASS

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs are posted at the site. The applicant will coordinate exposure procedures with any co-located facilities and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

March 22, 2024

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Timothy Z. Sawyer, Consulting Engineer