

T Z SAWYER TECHNICAL CONSULTANTS

2130 HUTCHISON GROVE COURT, SUITE 100
FALLS CHURCH, VIRGINIA 22043
TELEPHONE (703) 848-2130

ENGINEERING EXHIBIT EE-1:

AIRWAVES FOR JESUS, INC.

NCE FM CONSTRUCTION PERMIT APPLICATION
MINOR CHANGE APPLICATION TO LICENSE FACILITY

WJYO(FM)
FM CHANNEL 218A (91.5 MHZ)
FORT MYERS, FLORIDA
FCC FACILITY ID: 67215

AUGUST 2016

ENGINEERING EXHIBIT
IN SUPPORT OF
AN APPLICATION TO MODIFY THE
LICENSE FACILITY OF
NCE FM STATION WJYO(FM)
FORT MYERS, FLORIDA

ENGINEERING EXHIBIT EE-1:

AIRWAVES FOR JESUS, INC.

NCE FM CONSTRUCTION PERMIT APPLICATION
MINOR CHANGE APPLICATION TO LICENSE FACILITY

WJYO(FM)
FM CHANNEL 218A (91.5 MHZ)
FORT MYERS, FLORIDA
FCC FACILITY ID: 67215

AUGUST 2016

TABLE OF CONTENTS:

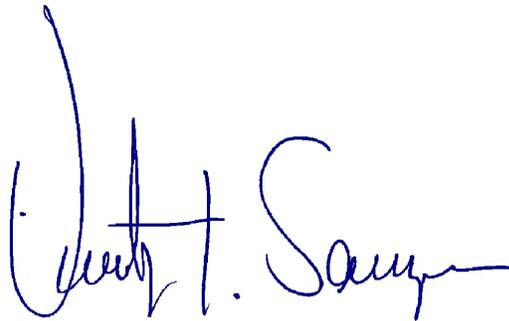
1. Declaration of Engineer
2. Narrative Statement
3. Figure 1, FAA Notification or FCC Tower Registration
4. Figure 2, Proposed Transmitter Site Topographic Map
5. Figure 3, Vertical Sketch of Proposed Antenna/Tower Structure
6. Figure 4, Map Showing Present and Proposed Predicted Service Contours
7. Figure 5, FM Channel Study - NCE Interference Study With Existing and Proposed Contour Overlaps

DECLARATION

I, Timothy Z. Sawyer, declare and that I have provided engineering services in the area of telecommunications since 1969. My qualifications are a matter of record with the Federal Communications Commission. I am a senior engineer in the firm of T Z Sawyer Technical Consultants, consulting radio telecommunications engineers with offices in Falls Church, Virginia.

I have been retained by the applicant to prepare this instant engineering exhibit in support of a Minor Change Application to the license facility of WJYO(FM) (an NCE FM station) serving the community of Fort Myers, Florida, FCC Facility ID: 67215.

All facts contained herein are true of my own knowledge except those stated to be on information and belief, and as to those facts, I believe them to be true. I declare under penalties of perjury that the foregoing is true and correct.



Timothy Z. Sawyer
Executed on the 8th day of August 2016

ENGINEERING EXHIBIT EE-1:

AIRWAVES FOR JESUS, INC.

NCE FM CONSTRUCTION PERMIT APPLICATION
MINOR CHANGE APPLICATION TO LICENSE FACILITY

WJYO(FM)
FM CHANNEL 218A (91.5 MHZ)
FORT MYERS, FLORIDA
FCC FACILITY ID: 67215

AUGUST 2016

NARRATIVE STATEMENT:

I. GENERAL:

This engineering statement and the instant engineering exhibit of which it is part has been prepared on behalf of AIRWAVES FOR JESUS, INC., (hereinafter "WJYO").

By means of the instant application, WJYO proposes to make changes to the licensed facility of NCE FM Station WJYO, Fort Myers, Florida (BLED-19881003KA), FCC facility ID: 67215.

Specifically, WJYO proposes to CHANGE the location of its antenna from one tower to another adjacent tower within the same antenna/tower complex. No change in frequency or the station's operating class or power is proposed.

The operating and site changes proposed herein are classified as "minor" changes under the Commission application processing rules.

The facilities will be built to comply with the *FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields* and the instant proposal is categorically excluded from environmental processing pursuant to the provisions of Section 1.1306 of the Commission's Rules. A more

detailed discussion of environmental factors is included under the heading Environmental Considerations below.

Information requested by exhibits in response to questions on Section VII-FM Engineering of FCC Form 340 is incorporated in the following paragraphs, figures, and/or tables.

II. ENGINEERING DISCUSSION:

A. Transmitter/Antenna Location:

WJYO proposes to make changes to the antenna system LOCATION by moving from one tower to another adjacent tower.

The center of radiation of the antenna is reduced by one-meter due to rounding to the nearest meter to 87 meters above ground (AGL) and 90 meters above mean sea level (AMSL). The height above average terrain (HAAT) has been recalculated using the FCC 30-second digital terrain database as noted below and is increased from 87 meters to 89 meters:

Calculated HAAT = 89 meters	
Antenna Height Above Average Terrain calculated using FCC 30 second terrain database (continental USA only)	
Individual "Radial HAAT" Values, in meters	
0°	90.0 m
45°	85.1 m
90°	87.6 m
135°	90.0 m
180°	90.0 m
225°	90.0 m
270°	90.0 m
315°	90.0 m

Figures 1, 2 and 3 provide the physical tower/antenna mounting details of the antenna and the site location. No FAA notice of construction is required as there are no changes to the overall height of the supporting structure. The tower has been registered with the FCC and issued ASR number: 1038046.

B. Antenna Proposed:

WJYO proposed the use of a simple 2-bay nondirectional antenna system utilizing 1.0 wavelength spacing between elements (bays).

C. Predicted Coverage Contours:

Figure 4, contains a map upon which the 60 dBu FCC (F50,50) predicted coverage contours have been drawn (present and proposed). As can be seen from this map, the community/city of license, Fort Myers is well served (100% of the city of license area) by the NCE FM 60 dBu predicted coverage contour.

The proposed facility will serve a population of 506,109 persons (U.S. Census 2010) which reside within the predicted 60 dBu signal level.

D. NCE FM Ch. 218A Interference Study:

Figure 5, contains an NCE FM Reserve Band Channel Study (interference/contour study) that demonstrates that operation as proposed herein can be granted and approved.

As demonstrated within the tables and maps included in Figure 5, there are no INCREASES in prohibitive contour overlap areas (or populations), to or from this proposal to other facilities. Therefore, this proposal is in compliance with the Commission's rules.

CO-Channel Overlap (Map Figure 5B)

There is minor existing overlap between this facility and co-channel facility WPSF, Clewiston, Florida (BLED-20150217ABR). The nature of the overlap is received interference to WPSF from the proposed and licensed facility of WJYO.

WJYO was licensed in 1990 (BLED-19881003KA), while WPSF was licensed in 2015. Figure 5B demonstrates that the minor received grandfathered overlap is not increased as a result of this proposal.

Present & Proposed Contour Overlap to WPSF

CONTOUR OVERLAP FROM WJYO	PRESENT	PROPOSED
AREA (sq. km)	2.63	2.12
POPULATION (2010)	95	6

3RD Adjacent -Channel Overlap

There is also minor existing overlap between this facility and third adjacent channel facility WSQR, Naples, Florida (BLED-20050510ACN). The nature of the overlap is received interference to WSQR from the proposed and licensed facility of WJYO.

WJYO was licensed in 1990 (BLED-19881003KA), while WSQR was licensed in 2005. Figures 5C demonstrates that the received overlap is not increased as a result of this proposal.

Present & Proposed Contour Overlap to WSQR

CONTOUR OVERLAP FROM WJYO	PRESENT	PROPOSED
AREA (sq. km)	15.14	15.02
POPULATION (2010)	5,779	5,631

Present & Proposed Contour Overlap from WSQR

CONTOUR OVERLAP FROM WSQR	PRESENT	PROPOSED
AREA (sq. km)	79.64	79.10
POPULATION (2010)	16,711	16,711

E. Television Ch. 6 TV Study:

There are no TV6 facilities that require study. There is a significant buffer zone (distance separation) that exists between this proposal and any TV6 operation.

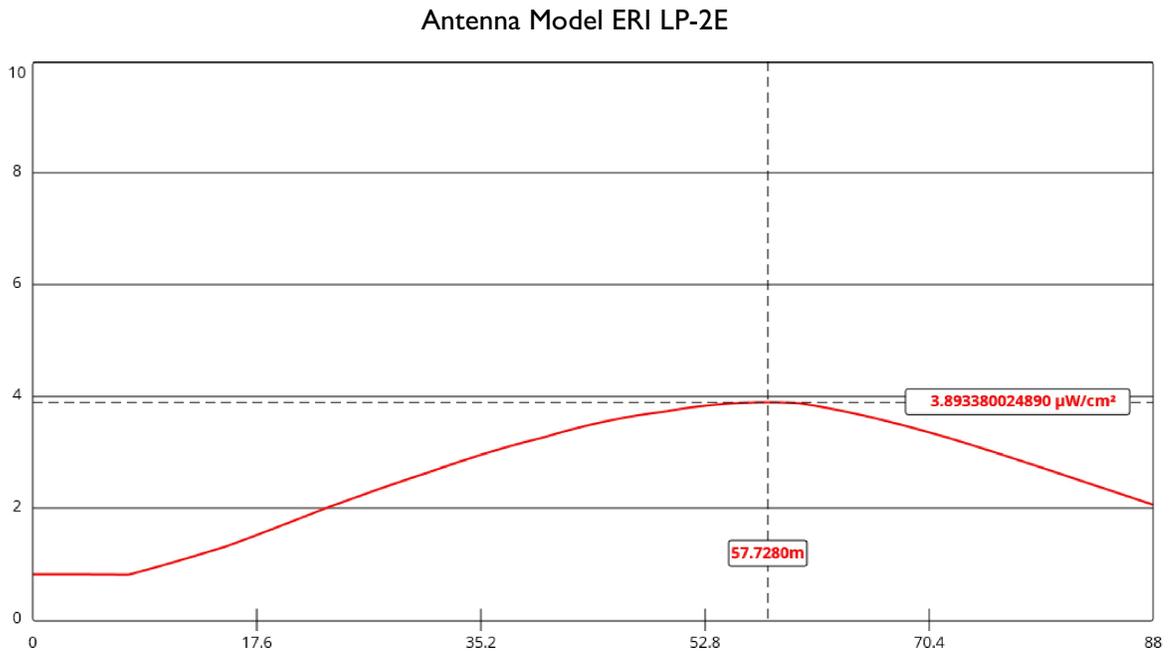
F. Environmental Considerations:

The applicant believes its proposal will not significantly affect the environment for the following reasons:

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.)

The proposed 2-bay 1.0 wavelength-spaced antenna is 87 meters above ground level, and utilizing an EPA type 3 antenna (Opposed U Dipole) and a ERP of 3-kilowatts (H + V) and the FCC's FM Model program - the facility is in compliance with Commission standards concerning radio frequency electromagnetic fields. Areas within the controlled access zone (worker only) are clearly marked and restricted from any public access.

“FCC MODEL” Program Output Graph - EPA Type 3 Antenna



The peak value of 3.89 $\mu\text{W}/\text{cm}^2$ is 1.95% of the public/uncontrolled limit and 0.39% of the worker/controlled limit as shown in the graph above, and occurs at a distance of 57.73 meters from the antenna. No further study is required as the predicted values are below 1% of the Maximum Permissible Exposure (MPE) for controlled areas and less than 5% of the uncontrolled area limits.

Access to the supporting structure is restricted and suitable warning signs are posted. The applicant will coordinate its use of the site with other and future site users and reduce or terminate operation as required in cooperation with all site users.

III. SUMMARY:

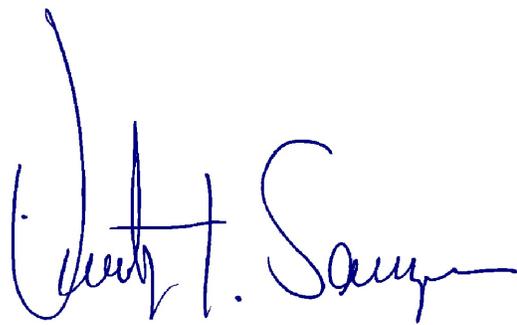
WJYO proposes in its application to make minor changes to the existing licensed facility of NCE FM Station WJYO(FM), Fort Myers, Florida.

The changes proposed herein are minor changes as classified by the Commission application processing rules. A grant of this proposal is in the public interest in that it will allow the facility to continue to serve its community.

Operation as proposed herein does not increase any normally prohibited contour overlap, and would not have any significant impact on the environment. The proposed operation will not increase prohibited interference. The proposed operation is fully in compliance with the Commission's rules and applicable international agreements.

8 August 2016

T Z Sawyer Technical Consultants
2130 Hutchison Grove Court, Suite 100
Falls Church, Virginia 22043
Tel. (703) 848-2130
Email to: tzsawyer@tzsawyer.com



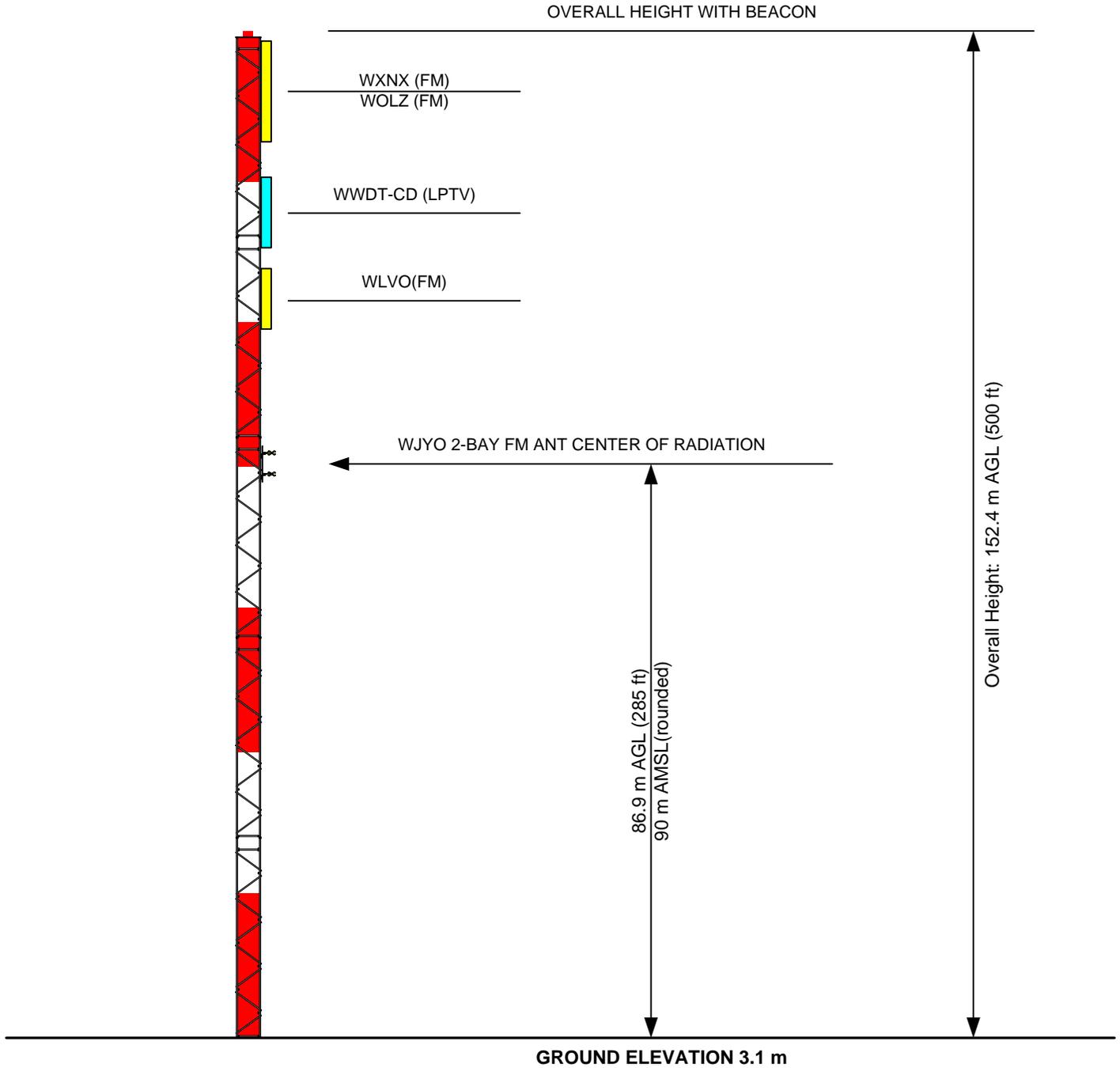
Timothy Z. Sawyer

FCC TOWER REGISTRATION 1038046
FAA NOTIFICATION NOT REQUIRED - NO CHANGES IN OVERALL HEIGHT ARE PROPOSED

Registration Detail			
Reg Number	1038046	Status	Granted
File Number	A1036472	Constructed	12/08/2013
EMI	No	Dismantled	
NEPA	No		
Antenna Structure			
Structure Type	GTOWER - Guyed Structure Used for Communication Purposes		
Location (in NAD83 Coordinates)			
Lat/Long	26-30-19.6 N 081-51-07.7 W	Address	TWR 3 - 16341 OLD US 41 S
City, State	FORT MYERS , FL		
Zip	33912	County	LEE
Center of AM Array	26-30-18.0 N 081-51-13.0 W	Position of Tower in Array	
Heights (meters)			
Elevation of Site Above Mean Sea Level		Overall Height Above Ground (AGL)	
3.1		152.4	
Overall Height Above Mean Sea Level		Overall Height Above Ground w/o Appurtenances	
155.5		152.4	
Painting and Lighting Specifications			
FAA Chapters 12, 3, 4, 5 Paint and Light in Accordance with FAA Circular Number 70/7460-1L			
FAA Notification			
FAA Study	2016-ASO-12699-OE	FAA Issue Date	06/20/2016

<p align="center">T Z SAWYER TECHNICAL CONSULTANTS (703) 848-2130 www.tzsawyer.com</p>	FCC TOWER REGISTRATION 1038046			FIGURE 1
	NCE FM STATION WJYO FORT MYERS, FLORIDA			
FALLS CHURCH, VA 22043	SIZE A	FSCM NO N/A	DWG NO 20160808WJYO-F1	REV NONE
(c) 2016, ALL RIGHTS RESERVED	SCALE	N/A	AUGUST 2016	SHEET

**FCC TOWER ASR #: 1038046
EXISTING STRUCTURE**



**T.Z. SAWYER TECHNICAL
CONSULTANTS**
Tel.: (703) 848-2130
www.tzsawyer.com

VERTICAL SKETCH OF EXISTING STRUCTURE

**NCE FM STATION WJYO
FORT MYERS, FLORIDA**

**FIGURE
3**

FALL CHURCH, VIRGINIA 22043

SIZE
A

FSCM NO
N/A

DWG NO
20160808WJYO-F3

REV
NONE

(c) 2016, ALL RIGHTS RESERVED

SCALE 1"=75' VERTICAL ONLY

AUGUST 2016

SHEET

WJYO APP
 THIS APPLICATION
 FCC Facility ID: 67215
 Latitude: 26-30-18.30 N
 Longitude: 081-51-08.40 W
 ERP: 3.00 kW
 Channel: 218 Frequency: 91.5 MHz
 Antenna HAAT Height: 89.0 m
 Antenna AMSL Height: 90.0 m
 Antenna AGL Height: 86.9 m
 Ground Elevation: 3.1 m
 Horiz. Pattern: Omni

PRESENT AND PROPOSED SERVICE CONTOUR
 CONTOUR COLORS
 RED - PROPOSED
 BLACK - EXISTING LICENSED
 CITY OF LICENSE FORT MYERS, FLORIDA
 FIGURE 4

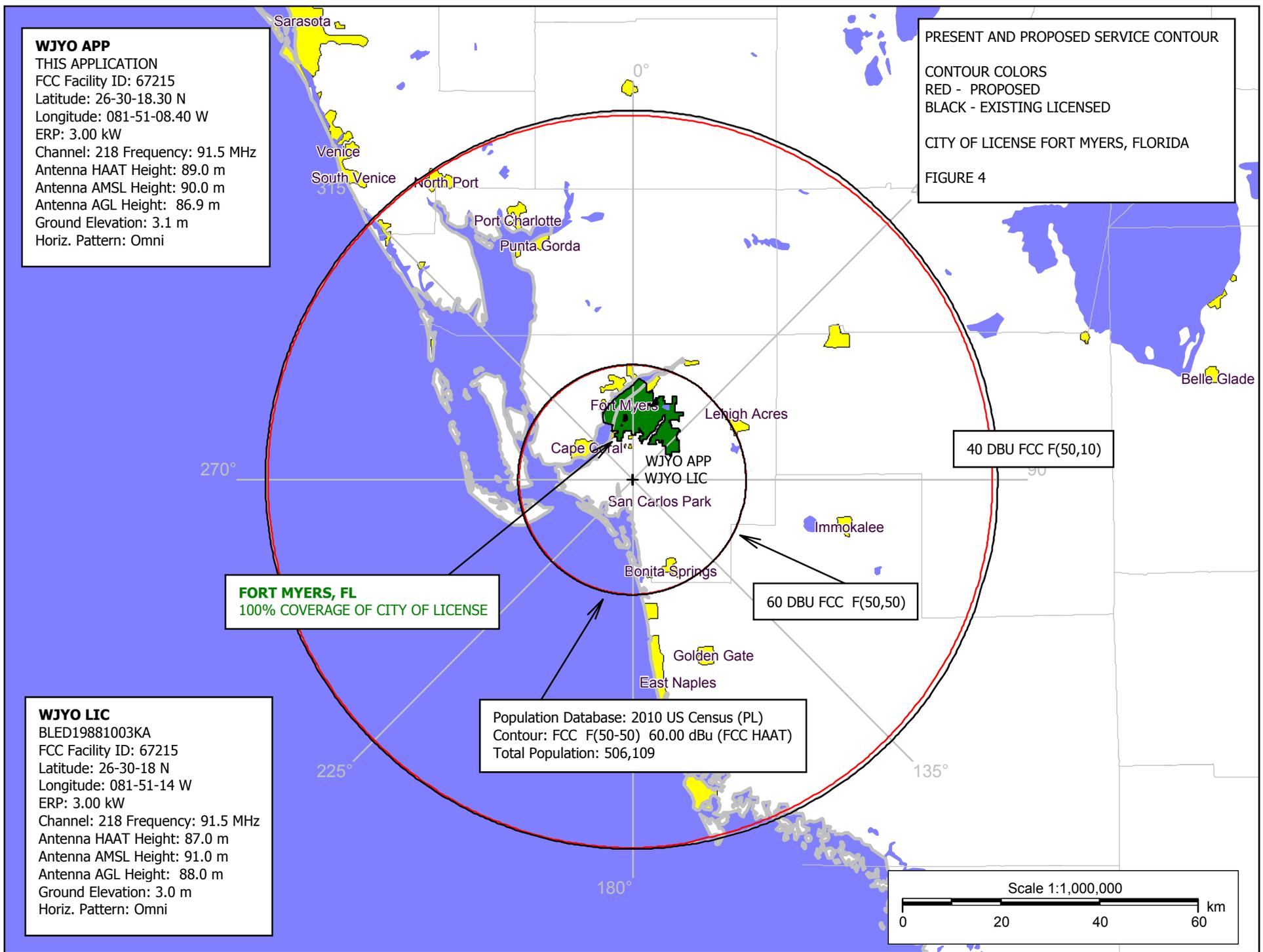
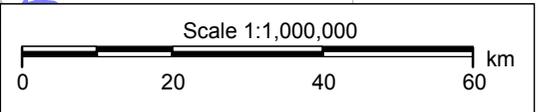
FORT MYERS, FL
 100% COVERAGE OF CITY OF LICENSE

WJYO LIC
 BLED19881003KA
 FCC Facility ID: 67215
 Latitude: 26-30-18 N
 Longitude: 081-51-14 W
 ERP: 3.00 kW
 Channel: 218 Frequency: 91.5 MHz
 Antenna HAAT Height: 87.0 m
 Antenna AMSL Height: 91.0 m
 Antenna AGL Height: 88.0 m
 Ground Elevation: 3.0 m
 Horiz. Pattern: Omni

Population Database: 2010 US Census (PL)
 Contour: FCC F(50-50) 60.00 dBu (FCC HAAT)
 Total Population: 506,109

40 DBU FCC F(50,10)

60 DBU FCC F(50,50)



WJYO APPLICATION STUDY

FIGURE 5A

NAD 27 DATUM
 REFERENCE
 26 30 18.3 N.
 81 51 08.4 W.

Airwaves For Jesus, Inc.
 CH# 218A - 91.5 MHz, Pwr= 3 kW, HAAT= 89.5 M, COR= 90 M
 Average Protected F(50-50)= 23.0 km
 Omni-directional

CH CITY	CALL	TYPE	ANT STATE	AZI. <--	DIST FILE #	LAT. LNG.	Pwr(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
218A Fort Myers	WJYO!	LIC	CN FL	266.6 86.6	0.15 BLED19881003KA	26 30 18.0 81 51 14.0	3.000 87	74.0 91	23.0 Airwaves For Jesus, Inc.	-96.8	-96.8 [1]
215C1 Naples	WSOR	LIC	C FL	142.2 322.2	22.99 BLED20050510ACN	26 20 29.0 81 42 38.0	36.000 275	7.3 279	60.6 The Moody Bible Institute	-7.4*	-39.8* [2]
218A Clewiston	WPSF	LIC	CX FL	76.3 256.7	97.52 BLED20150217ABR	26 42 34.8 80 54 00.0	1.200 161	72.5 165	24.2 American Educational Broad	2.2	-0.0 [3]
219C3 Marco Island	WMKO	LIC	DC FL	163.5 343.5	52.28 BLED20051123AFF	26 03 10.0 81 42 11.0	6.900 113	25.3 113	16.9 Board Of Trustees, Florida	4.1	0.6
217C1 Englewood	WSEB	LIC	DEN FL	312.1 131.9	59.54 BLED19890424KA	26 51 48.0 82 17 54.0	62.000 86	33.6 86	22.5 Suncoast Educational Broad	3.0	2.5
219A Port Charlotte	WVIJ	LIC	CX FL	338.0 157.9	56.83 BLED20070625ADU	26 58 49.0 82 04 03.0	1.900 63	26.1 67	17.7 Port Charlotte Educational	7.8	4.6
220A Fort Myers	WMYE	LIC	ZCX FL	10.1 190.1	31.55 BLED20080625ACD	26 47 07.5 81 47 46.6	1.200 100	1.8 108	20.1 Call Communications Group,	6.9	9.3
218C0 New Port Richey	WCIE	LIC	DCX FL	334.3 153.9	206.76 BLED20131121AVZ	28 10 56.0 82 46 05.9	75.000 389	175.5 391	76.1 Radio Training Network, In	8.3	56.9
221A Immokalee	WAFZ-FM«	LIC	NCX FL	96.1 276.4	58.26 BLH20070622AAU	26 26 54.0 81 16 17.0	5.600 100	2.7 105	27.7 Glades Media Company Llc	31.0R	27.3M

Terrain database is NGDC 30 SEC, R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM
 In & Out distances between contours are shown at closest points. Reference Zone= - Zone 2, Co to 3rd adjacent.
 Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
 "*"affixed to 'IN' or 'OUT' values = site inside restricted contour.
 « = Station meets FCC minimum distance spacing for its class.

STUDY NOTES:

- [1] - EXISTING SITE - MOVE TO ADJACENT TOWER
- [2] - GRANDFATHERED OVERLAP - SEE MAP 5C AND ENGINEERING NARRATIVE STATEMENT
- [3] - GRANDFATHERED OVERLAP - SEE MAP 5B AND ENGINEERING NARRATIVE STATEMENT

ANY EXISTING CONTOUR OVERLAPS ARE REDUCED AS A RESULT OF THIS PROPOSAL

Facility is okay with respect to AM station towers.
 Closest AM Facility is WMYR, FORT MYERS, FL, L, DAN at 358.8° at a distance of 13.1 km
 Facility is okay with respect to FCC monitoring stations.
 Closest FCC Monitoring Station is 171.6 km= Vero Beach, FL
 Facility is okay toward West Virginia Quiet Zone.
 Facility is okay toward Table Mountain.

GRANDFATHERED OVERLAP
 PREDICTED CONTOUR OVERLAP TO/FROM
 WPSF CHANNEL 218A
 CLEWISTON, FL
 FIGURE 5 B

WJYO APP
 THIS APPLICATION
 Latitude: 26-30-18.30 N
 Longitude: 081-51-08.40 W
 ERP: 3.00 kW
 Channel: 218
 Frequency: 91.5 MHz
 AMSL Height: 90.0 m
 Elevation: 3.1 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: None

PRESENT
 40 DBU F(50,10)
 WPSF CHANNEL 218A

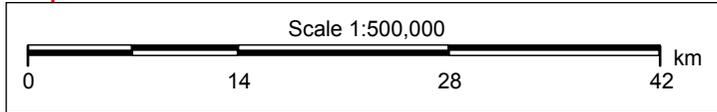
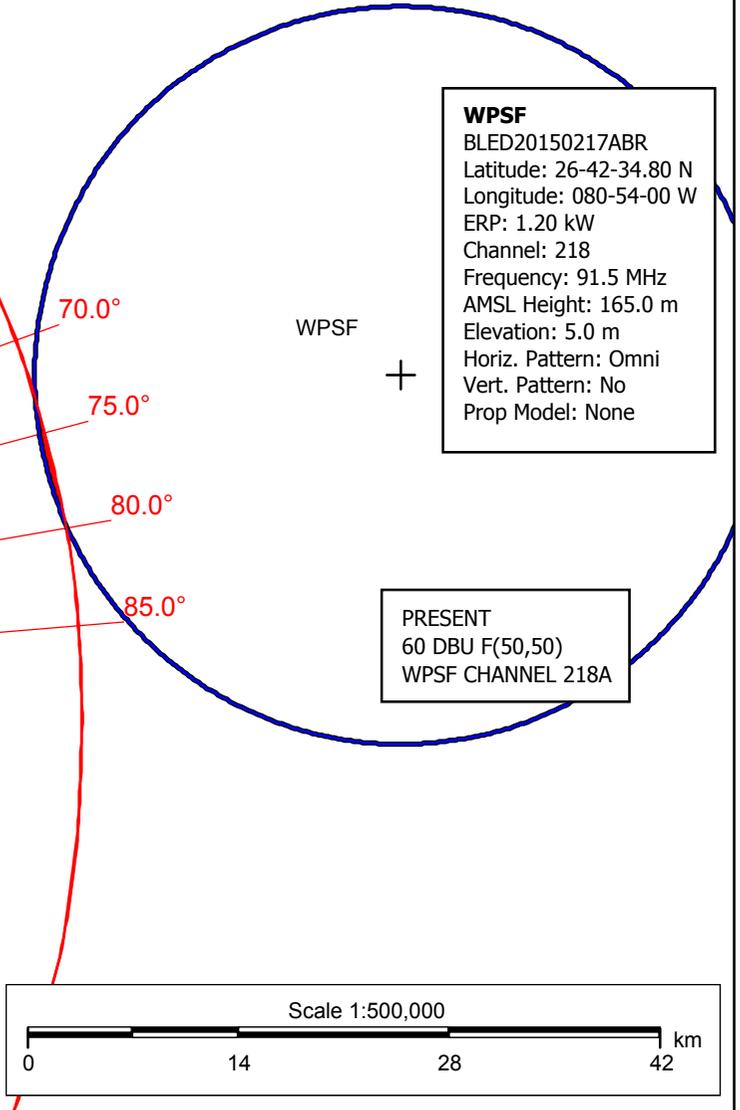
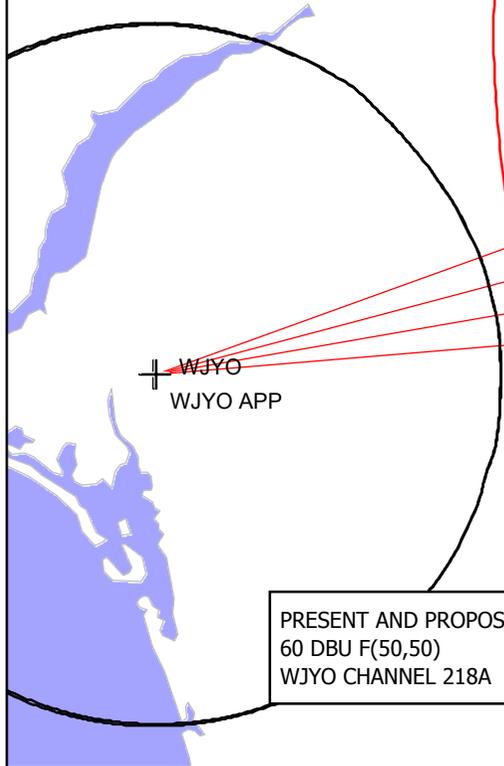
PRESENT AND PROPOSED
 40 DBU F(50,10)
 WJYO CHANNEL 218A

30-SECOND TERRAIN DATA
 GRANDFATHERED OVERLAP AREA
 PRESENT 2.63 SQ KM
 PROPOSED 2.12 SQ KM

WPSF
 BLED20150217ABR
 Latitude: 26-42-34.80 N
 Longitude: 080-54-00 W
 ERP: 1.20 kW
 Channel: 218
 Frequency: 91.5 MHz
 AMSL Height: 165.0 m
 Elevation: 5.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: None

PRESENT
 60 DBU F(50,50)
 WPSF CHANNEL 218A

PRESENT AND PROPOSED
 60 DBU F(50,50)
 WJYO CHANNEL 218A



WJYO APP
 BLED19881003KA
 Latitude: 26-30-18.30 N
 Longitude: 081-51-08.40 W
 ERP: 3.00 kW
 Channel: 218
 Frequency: 91.5 MHz
 AMSL Height: 90.0 m
 Elevation: 3.1 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: None

GRANDFATHERED OVERLAP
 PREDICTED CONTOUR OVERLAP TO/FROM

 WSQR CHANNEL 215C1
 NAPLES, FL

 FIGURE 5C

PRESENT AND PROPOSED
 100 DBU F(50,10)
 WJYO CHANNEL 218A

30-SECOND TERRAIN DATA
 GRANDFATHERED OVERLAP AREA
 PRESENT 15.14 SQ KM
 PROPOSED 15.02 SQ KM

WJYO
 WJYO APP

PRESENT AND PROPOSED
 60 DBU F(50,50)
 WJYO CHANNEL 218A

WSOR
 BLED20050510ACN
 Latitude: 26-20-29 N
 Longitude: 081-42-38 W
 ERP: 36.00 kW
 Channel: 215
 Frequency: 90.9 MHz
 AMSL Height: 279.0 m
 Elevation: 5.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: None

WSOR

PRESENT
 100 DBU F(50,10)
 WSQR CHANNEL 215C1

PRESENT
 60 DBU F(50,50)
 WPSF CHANNEL 215C1

30-SECOND TERRAIN DATA
 GRANDFATHERED OVERLAP AREA
 PRESENT 79.64 SQ KM
 PROPOSED 79.10 SQ KM

