

Broadcast Engineering Services of Bonny Doon, Inc.

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Engineering Statement in support of an application for an Auxiliary facility for KNUQ, Pa`auilo, Hawaii BPH-20180404AAU

The licensee proposes to add an auxiliary facility for this station. The proposed antenna will be located on the main facility tower, 23 meters above ground level, 2992 meters above sea level, and 1758 meters above average terrain. It is proposed to utilize 250 watts effective radiated power and a single bay antenna, mounted at the top of the tower structure. It will only be used in the case of a failure of the main antenna, or when other circumstances require the main facility to be shut down.

The site is located behind multiple locked gates, and not accessible to the general public. Site access is limited to service personnel and the tower and the overall site already has fences and RFR caution and warning signage posted throughout.

The applicant will, in coordination with other users of the site, reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from Radiofrequency Electromagnetic fields in excess of FCC guidelines.

Respectfully submitted,



Donald E. Mussell Jr. NCE-CBT
Consulting Engineer
March 26, 2019

Broadcast Engineering Services of Bonny Doon, Inc
 Don Mussell, Consulting Engineer
 KNUQ Aux
 Visionary Related Entertainment, Inc.

REFERENCE		DISPLAY DATES
20 42 34.0 N.	CLASS = C	DATA 03-24-19
156 15 49.0 W.	Current Spacings to 3rd Adj.	SEARCH 03-24-19
----- Channel 280 - 103.9 MHz -----		

Call	Channel	Location	Azi	Dist	FCC	Margin
KNUQ_%	CP 280C	Paauilo	HI 0.0	0.00	289.5	-289.5
KNUQ_%	APP 280C	Paauilo	HI 238.3	15.34	289.5	-274.2
KNUQ_%	LIC 280C	Paauilo	HI 238.3	15.34	289.5	-274.2
KNUQ-FM1	LIC-D 280D	Kahului	HI 13.0	7.51	236.5	-229.0
K277AX	LIC 277D	Paia	HI 306.0	32.65	18.5	14.2
K277AW	LIC-D 277D	Napili	HI 279.6	63.39	18.5	44.9

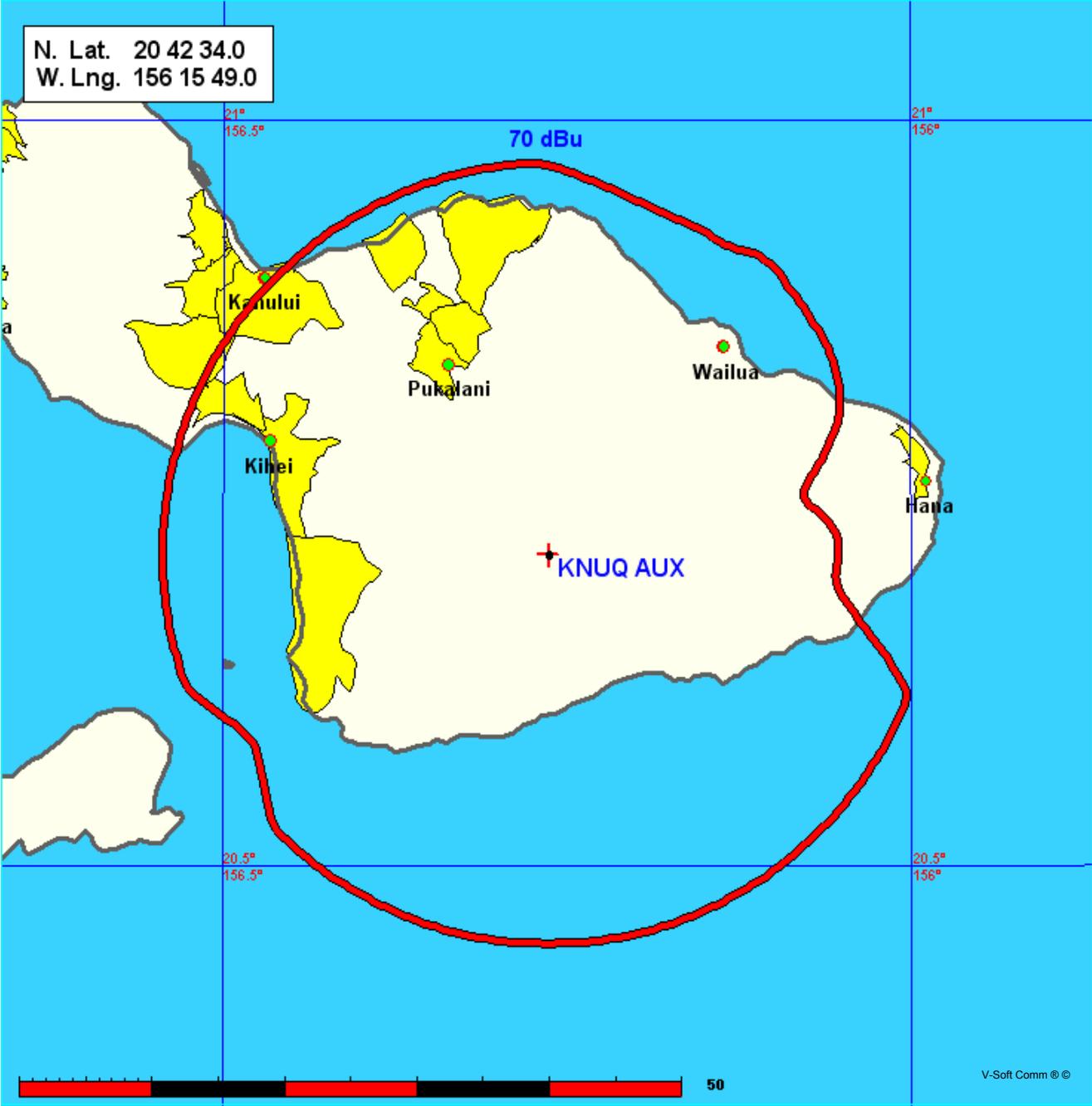
% = Station Fails minimum 73.215 spacings

All separation margins include rounding

KNUQ Aux
Visionary Related Entertainment, Inc.

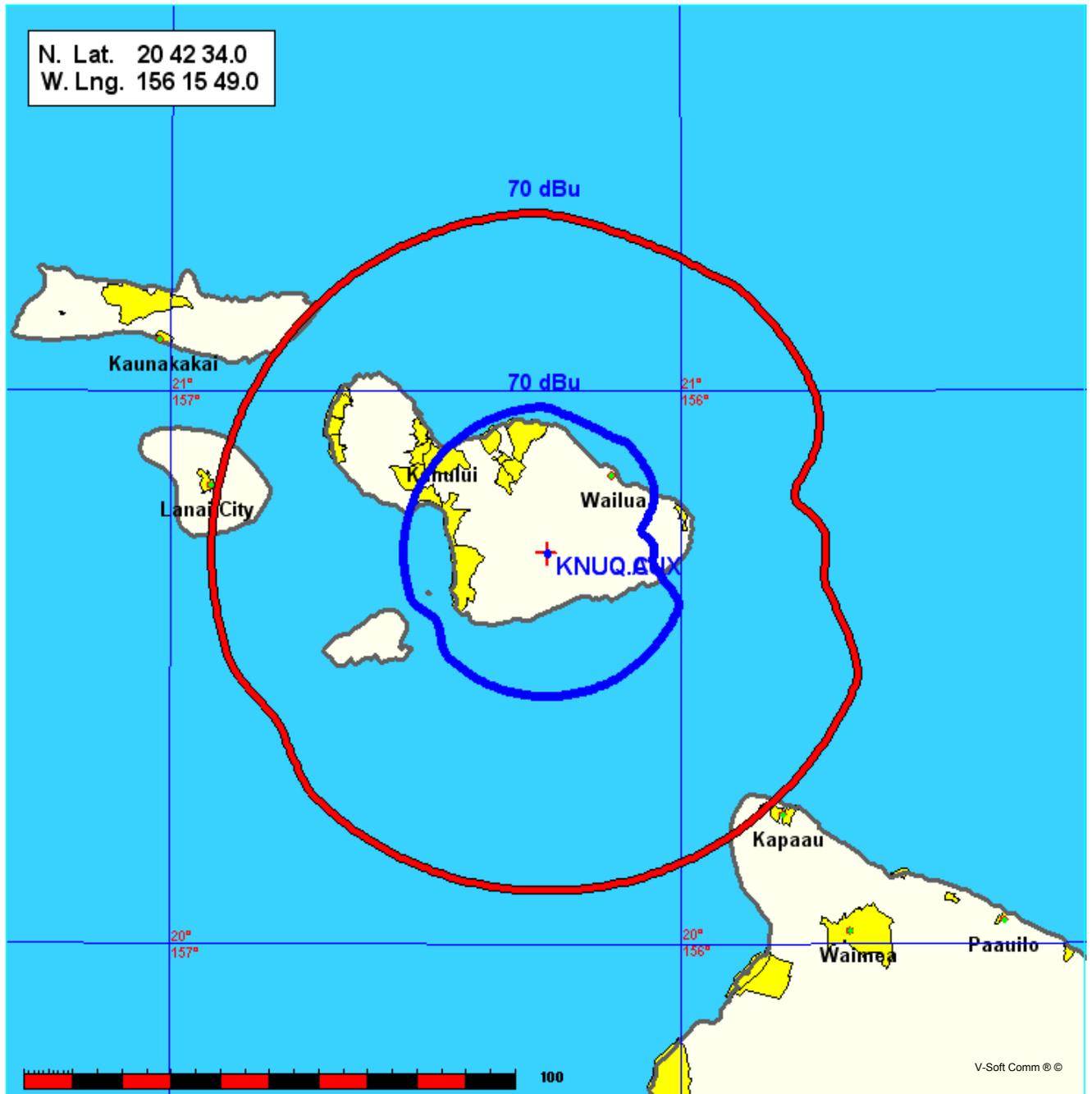
Coverage Study - FCC NGDC 30 Sec
03-24-2019

KNUQ AUX CH280 C , 0.25 kW, 1757.9m HAAT, 2992.1m COR AMSL
Service Contour = 70 dBu. Population = 64,841



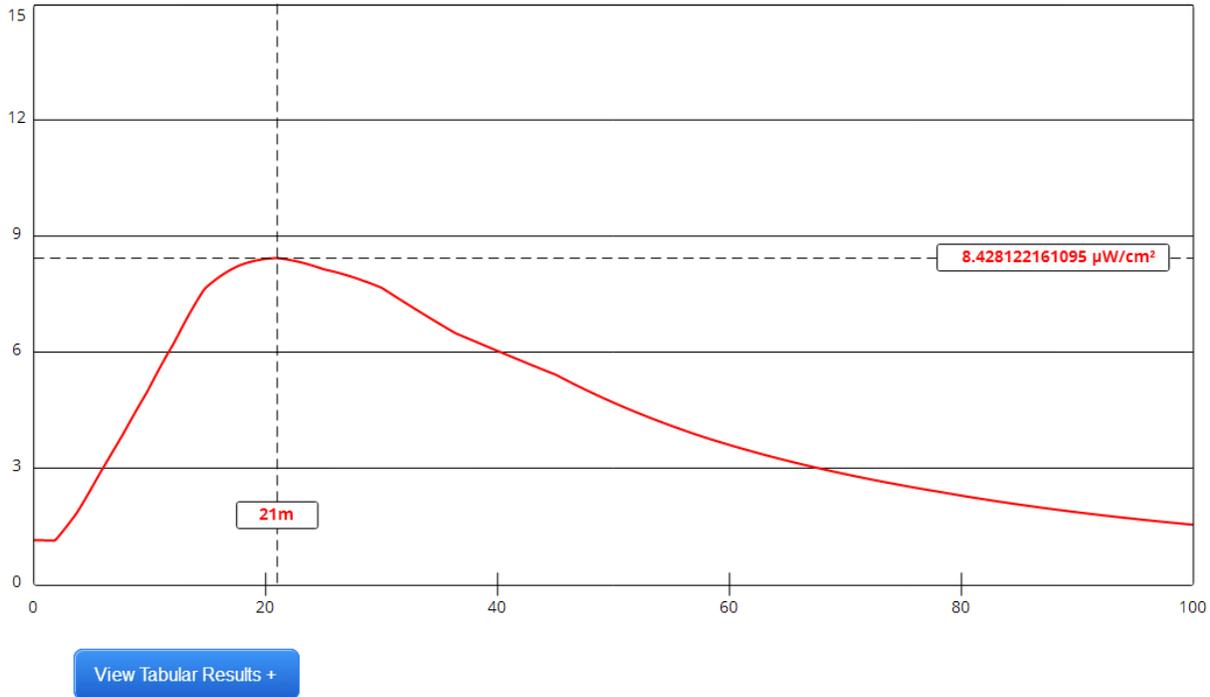
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Coverage Study - FCC NGDC 30 Sec
03-24-2019



KNUQ Aux facility RFR Statement

The results of using FM Model to obtain a picture of the RFR generated by this proposal resulted in a calculated level of 8.4 mW/cm², which is well below the 200 mW/cm² public limit.



Channel Selection	Channel 280 (103.9 MHz) ▼		
Antenna Type +	EPA Type 3: Opposed U Dipole ▼		
Height (m)	<input type="text" value="23"/>	Distance (m)	<input type="text" value="100"/>
ERP-H (W)	<input type="text" value="250"/>	ERP-V (W)	<input type="text" value="250"/>
Num of Elements	<input type="text" value="1"/>	Element Spacing (λ)	<input type="text" value="1"/>
Num of Points	<input type="text" value="500"/>	<input type="button" value="Apply"/>	

Actual RFR measurements were conducted at the proposed site. RFR measurements Utilizing a Narda NBM-550 test instrument (Serial Number E-0960) with an EF-0391 wide-band probe (Serial Number A-1311), measurements were made in and around the KKUA/KIPM/KMVK/KQMY tower site on August 15, 2017. A series of measurements around the tower revealed RFR levels in compliance with the public limit of 200 microwatts per squared centimeter, with a maximum level of 137 microwatts per squared centimeter found at various points around the tower. Within the fence surrounding the tower, the Narda meter and probe revealed lower levels, the maximum level found was 65 microwatts per squared centimeter directly below the antenna systems and tower.

Because the measured and calculated cumulative RFR level are close to the public standard of 200 mW/cm^2 , and well below the occupied standard of 1000 mW/cm^2 , the existing and proposed operation appears to be compliant with FCC and ANSI limits.

However, because of the complexities of calculations with multiple radiators on various locations and heights on both towers, the applicant is concerned that theoretical calculations may not reflect actual conditions, and may provide inaccurate results. Accordingly, the applicant respectfully requests that the Commission grant the instant Construction Permit with the condition that the applicant make RF measurements after constructing the facility and submit the results of those measurements when the application for license is made. If the results of the measurements and subsequent calculations reveal that there are areas that would exceed the requirements of FCC and ANSI limits for controlled or uncontrolled access, the applicant will work with the site owners and site users to erect fencing and/or signage or other needed measures to fully comply with FCC and ANSI limitations, and submit the results of these efforts in resolving any RFR issues that may arise as a part of the license to cover application.

The site is located behind multiple locked gates, and not accessible to the general public. Site access is limited to service personnel and the tower and the overall site already has fences and RFR caution and warning signage posted throughout.

The applicant will, in coordination with other users of the site, reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from Radiofrequency Electromagnetic fields in excess of FCC guidelines.

