

State of AM, FM and TV Bands

- AM - Freeze on New Apps
- AM - Minor Changes are allowed
- FM - NCE, LPFM and New Commercial Freeze
- FM - Translator Freeze – Minor Changes
- TV - Band to be repacked – Minor changes only

FCC Incentive Auction NPRM

- Our central goals are to repurpose the maximum amount of UHF spectrum for flexible licensed and unlicensed use, while at the same time preserving a healthy, diverse broadcasting service.

AM Radio and environmental noise

- Dimmer Switches
- Overhead power lines
- Florescent Lights - Ballasts
- LED lights - switching power supplies
- Computers - big and small
- Televisions, particularly with Plasma Screens
- Motors
- Switches
- Car ignitions
- Lightning
- Electronic Filters
- IBOC

Proposals to 'fix' AM – won't

- All digital modulation – reinventing AM
- Modify AM antenna efficiency standards – (downward)
- Wider use - modulation dependent carriers (saves elec.)
- Reduce day/night community coverage standards
- Eliminate the “Ratchet” rule – which reduces interference contributions for minor changes
- Open window for FM translators for AM stations

FM Radio – Sources of Interference

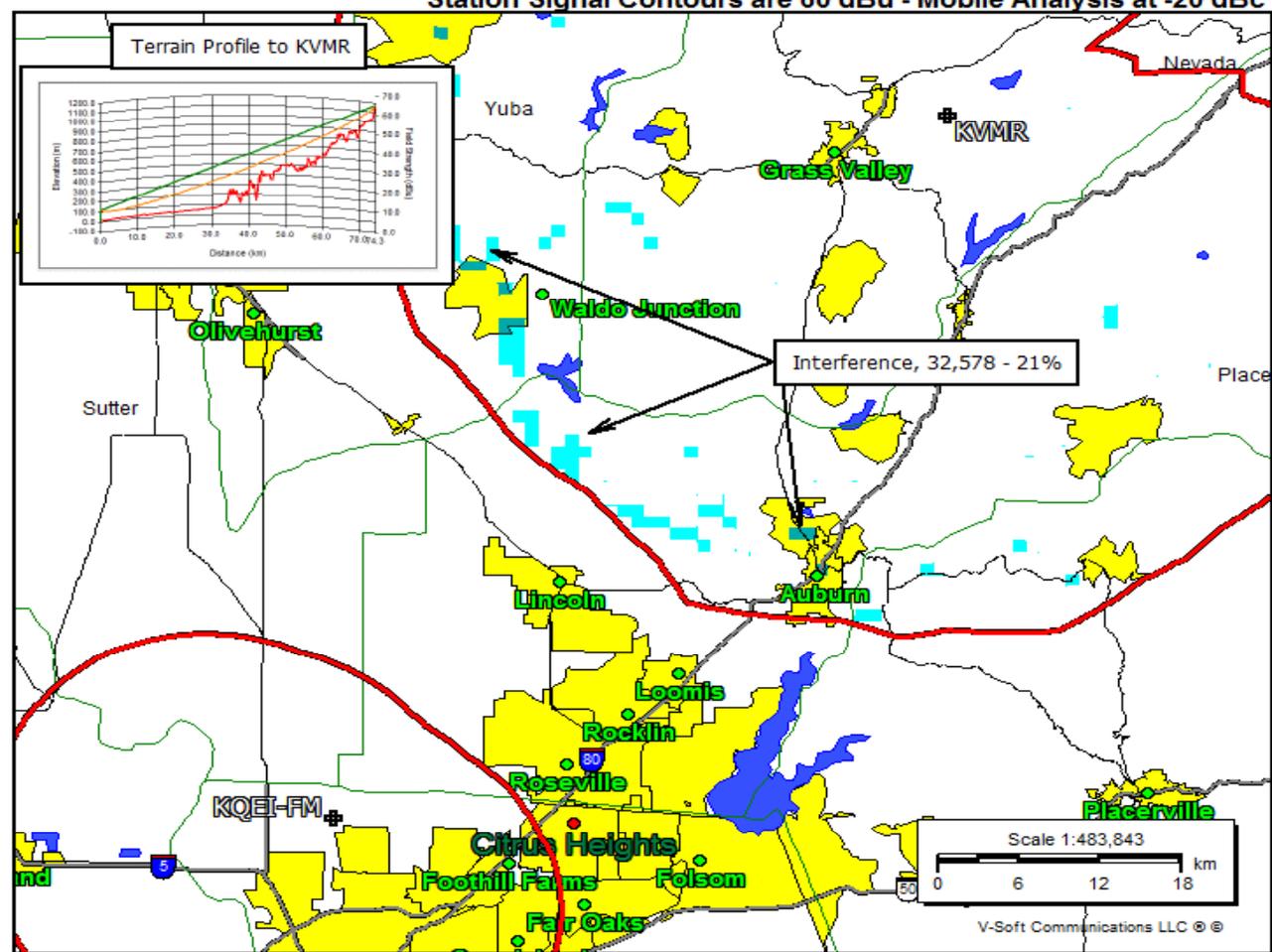
- FM radio not impacted as much as AM by noise (Thank you Mr. Armstrong.)
- All side-mounted omni antennas are directional
- Weaknesses in FCC methodology 3-16 km terrain radials
- IBOC – short spaced stations
- LPFM – reduces FM coverage past protected 60 dBu
- Environmental noise – Computer routers

Station Signal Contours are 60 dBu - Mobile Analysis at -20 dBc

KVMR
 BLED20001020AAK
 Latitude: 39-14-47 N
 Longitude: 120-57-48 W
 ERP: 1.75 kW
 Channel: 208
 Frequency: 89.5 MHz
 AMSL Height: 1205.0 m
 Elevation: 1173.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 2.0 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

KQEI-FM
 BLED20110411AAI
 Latitude: 38-42-38 N
 Longitude: 121-28-54 W
 ERP: 3.30 kW
 Channel: 207
 Frequency: 89.3 MHz
 AMSL Height: 114.9 m
 Elevation: 2.0 m
 Horiz. Pattern: Directional
 Vert. Pattern: No

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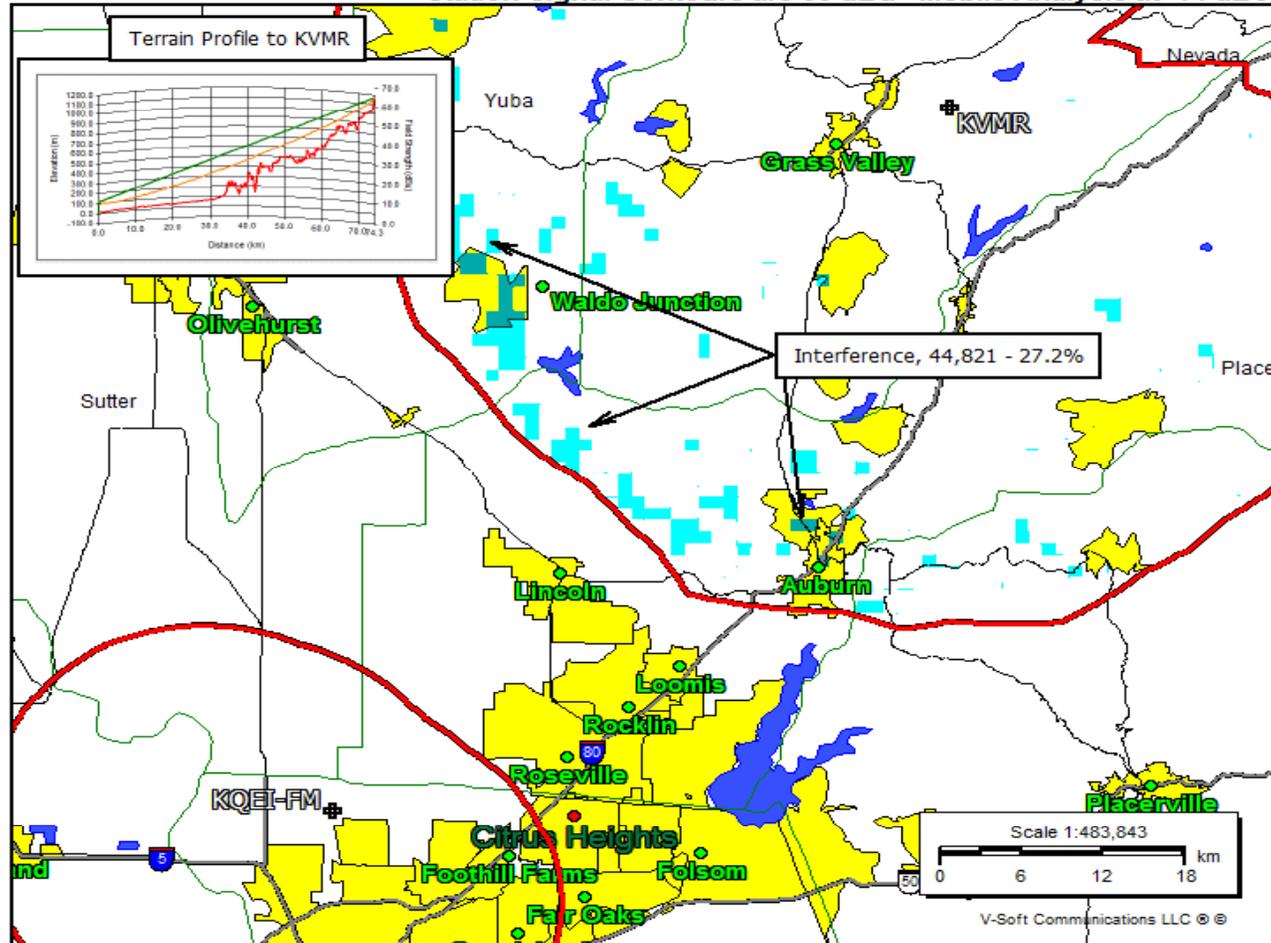


Station Signal Contours are 60 dBu - Mobile Analysis at -14 dBc

KVMR
 BLED20001020AAK
 Latitude: 39-14-47 N
 Longitude: 120-57-48 W
 ERP: 1.75 kW
 Channel: 208
 Frequency: 89.5 MHz
 AMSL Height: 1205.0 m
 Elevation: 1173.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 2.0 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

KQEI-FM
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 AMSL Height: 114.9 m
 Elevation: 2.0 m
 Horiz. Pattern: Directional
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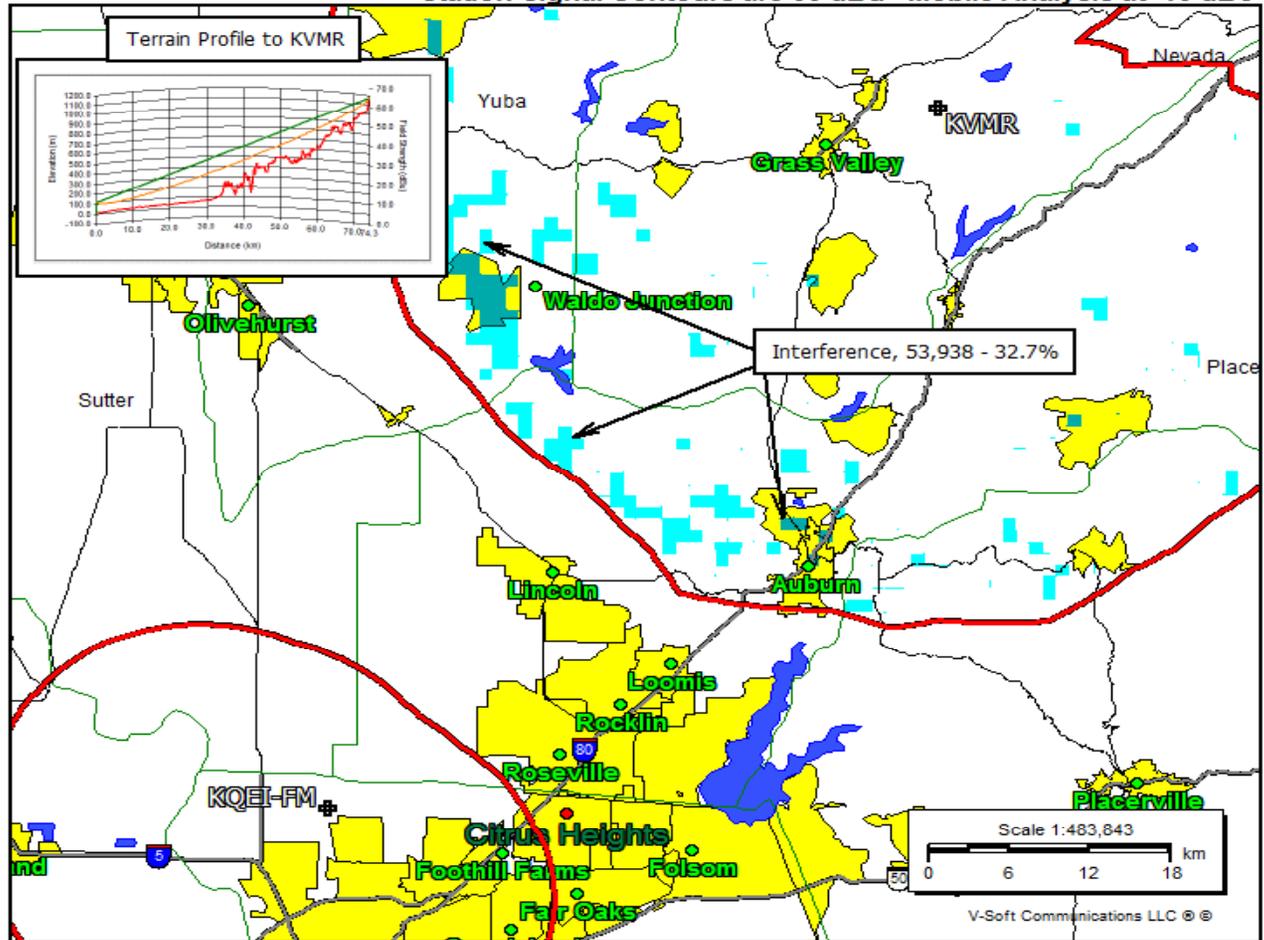


Station Signal Contours are 60 dBu - Mobile Analysis at -10 dBc

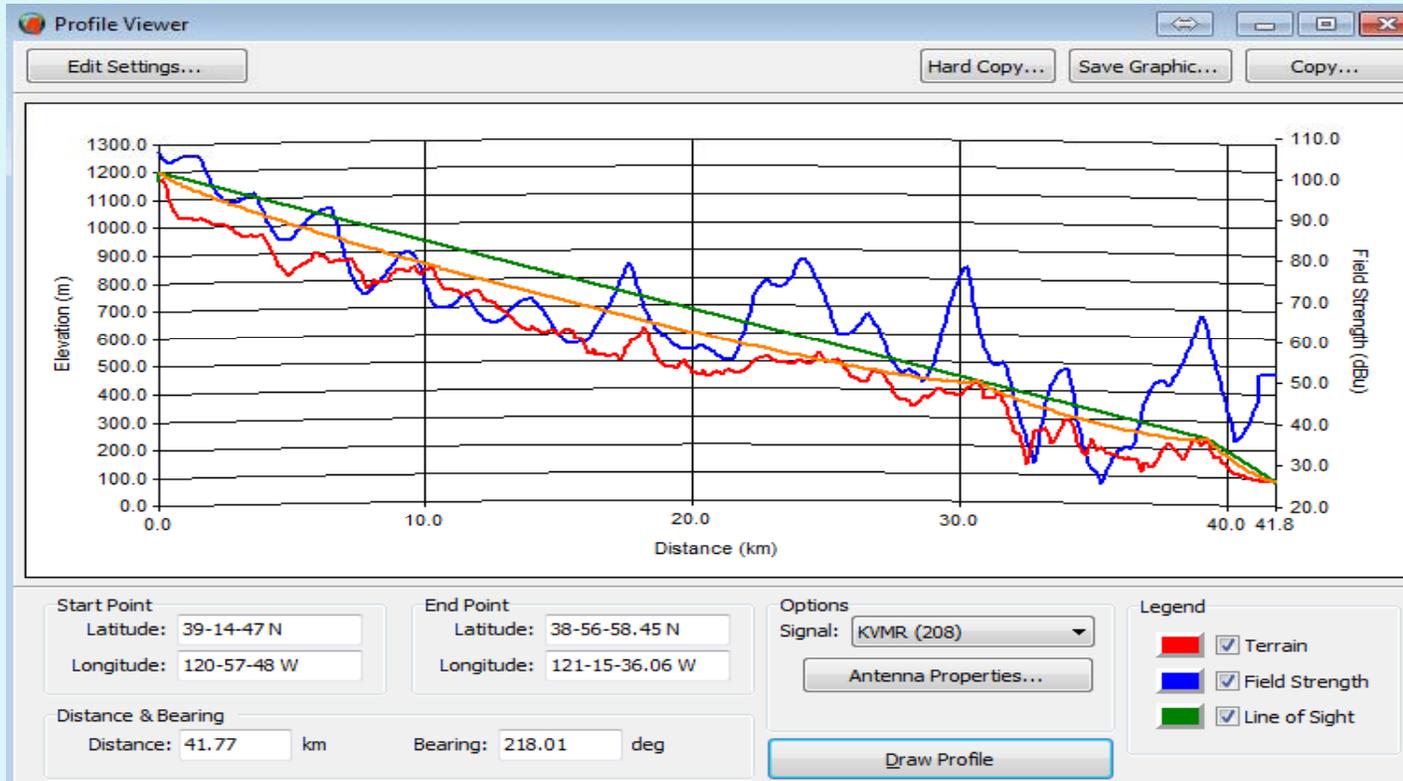
KVMR
 BLED20001020AAK
 Latitude: 39-14-47 N
 Longitude: 120-57-48 W
 ERP: 1.75 kW
 Channel: 208
 Frequency: 89.5 MHz
 AMSL Height: 1205.0 m
 Elevation: 1173.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 2.0 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

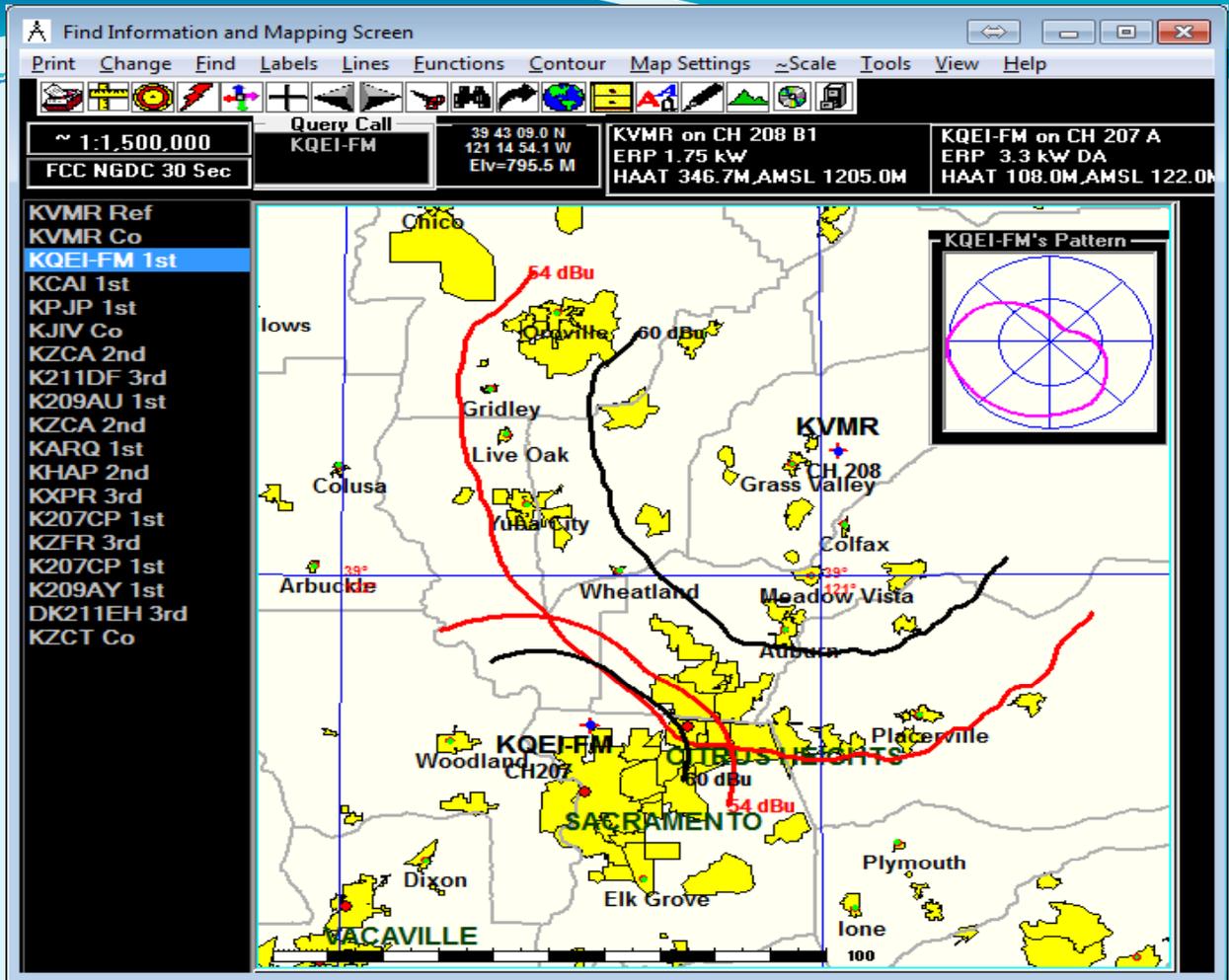
KQEI-FM
 BLED20110411AAI
 Latitude: 38-42-38 N
 Longitude: 121-28-54 W
 ERP: 3.30 kW
 Channel: 207
 Frequency: 89.3 MHz
 AMSL Height: 114.9 m
 Elevation: 2.0 m
 Horiz. Pattern: Directional
 Vert. Pattern: No

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Path from KVMR toward KQEI-FM - to its 60 dBu Contour



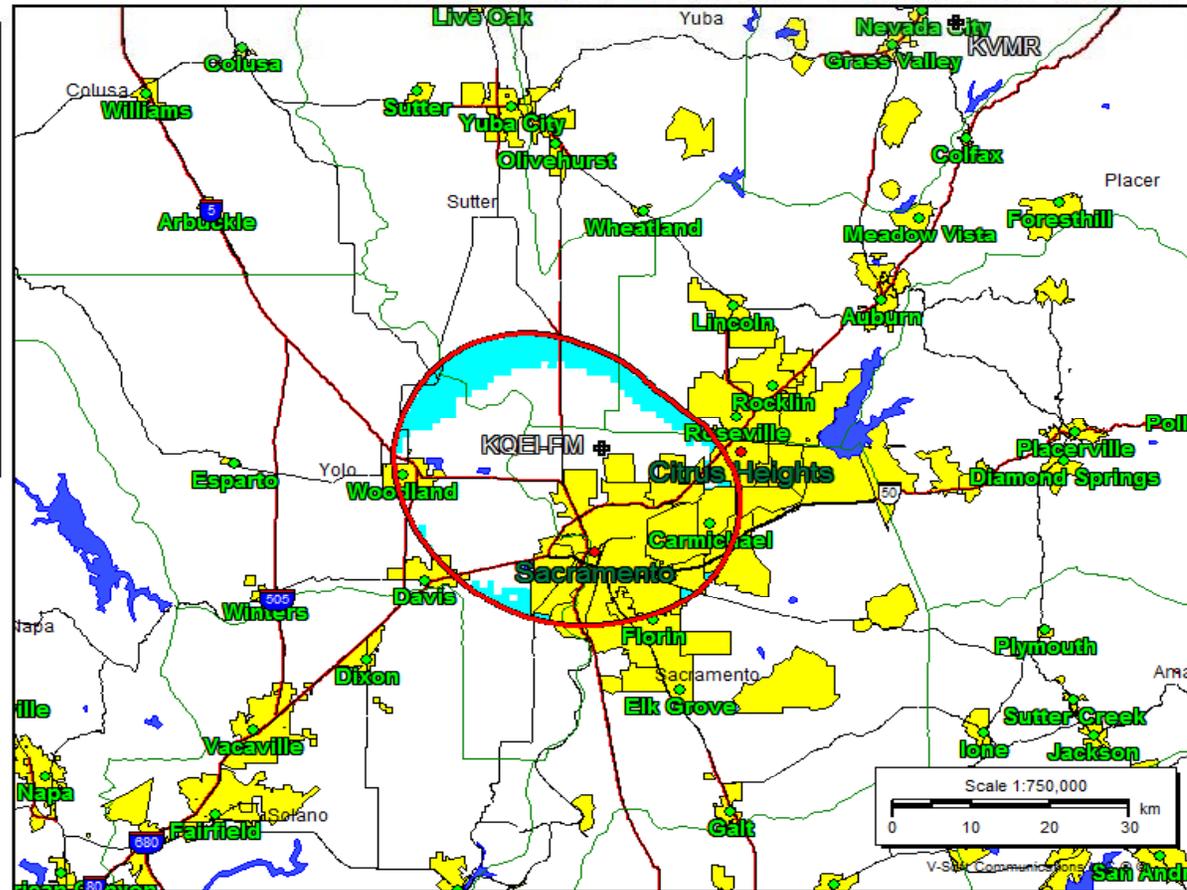


KVMR to KQEI-FM -20 dBc - Mobile 2 Meter Antenna

KQEI-FM
 BLED20110411AAI
 Latitude: 38-42-38 N
 Longitude: 121-28-54 W
 ERP: 3.30 kW
 Channel: 207
 Frequency: 89.3 MHz
 AMSL Height: 122.0 m
 Horiz. Pattern: Directional
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 9.1 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

KVMR
 BLED20001020AAK
 Latitude: 39-14-47 N
 Longitude: 120-57-48 W
 ERP: 1.75 kW
 Channel: 208
 Frequency: 89.5 MHz
 AMSL Height: 1205.0 m
 Horiz. Pattern: Omni


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FMCommander ©V-Soft Communications® Minimum Spacings

File Print Settings Class Channel ≤ Down ≥ Up Find Views WatchDog Help About

Spacings Mode DATA: 03-15-14 - Zone 1

N. Lat. 41 25 27.0 84 M COR Current Tables Narragansett M wrni-fm.vsf
W. Lng. 71 28 38.0 1.95 kW N CH 274.102.7 A 69.0 M HAAT * Job: 03-16-14

Call	Type	Ch	Location	Azi	Dist	FCC	Margin	
WRNI-FM	LIC-N	274A	Narragansett Pi	RI	0.0	0.00	115.0	-115.0
WKLB-FM	LIC-N	273B	Waltham	MA	11.3	100.41	113.0	-12.6
WMOS	LIC	272A	Stonington	CT	266.4	30.18	31.0	-0.8
WDRC-FM	LIC	275B	Hartford	CT	278.1	115.19	113.0	2.2
WPXC	LIC-N	275B1	Hyannis	MA	72.2	98.77	96.0	2.8
WFPR-LP	CP	275L1	Franklin	MA	4.1	72.90	56.0	16.9
WBAZ	LIC	273A	Bridgehampton	NY	232.8	95.92	72.0	23.9
WODS	LIC	277B	Boston	MA	12.0	100.34	69.0	31.3
W277CE	LIC	277D	Montville	CT	274.9	60.94	26.0	34.9
WYPH-LP	CP	273L1	Manchester	CT	297.5	91.63	56.0	35.6
WODS	CP	277B	Boston	MA	17.5	107.60	69.0	38.6
1592742	APP	275L1	Brockton	MA	18.1	97.23	56.0	41.2
1593510	APP	275L1	Auburndale	MA	12.0	100.34	56.0	44.3
WWFS	LIC	274B	New York	NY	251.2	223.77	178.0	45.8
WQMC-LP	CP	272L1	East Falmouth	MA	78.2	75.08	29.0	46.1
1594335	APP	275L1	Worcester	MA	340.5	103.48	56.0	47.5
1581870	APP	275L1	Worcester	MA	340.6	103.62	56.0	47.6

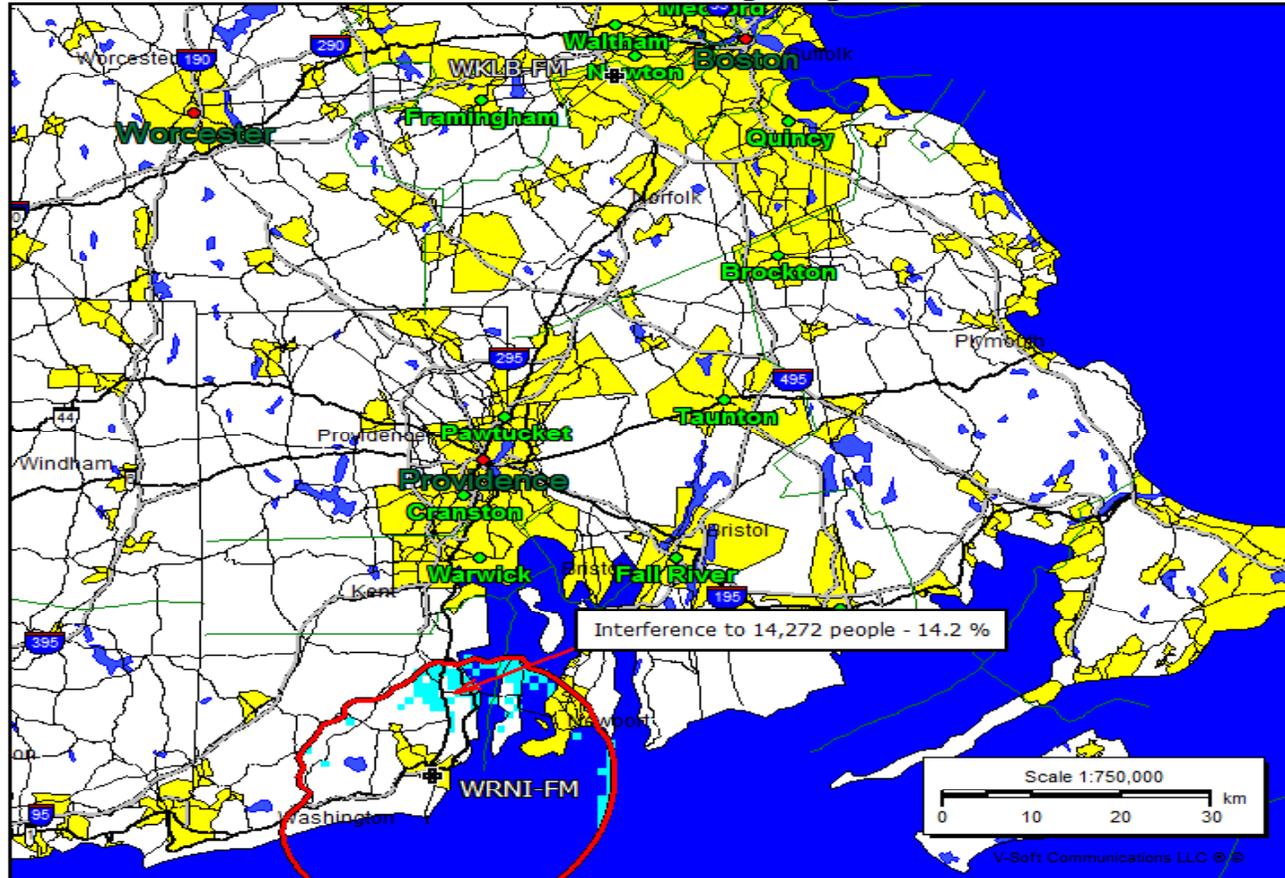
More...

Interference caused to WRNI-FM analog using U/D for -20 dBc -Indoor 2 M Rcrv

WRNI-FM
 BLED20120403AAJ
 Latitude: 41-25-27 N
 Longitude: 071-28-38 W
 ERP: 1.95 kW
 Channel: 274
 Frequency: 102.7 MHz
 AMSL Height: 84.0 m
 Elevation: 26.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 2.0 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

WKLB-FM
 BLH20090515ABT
 Latitude: 42-18-37 N
 Longitude: 071-14-14 W
 ERP: 14.00 kW
 Channel: 273
 Frequency: 102.5 MHz
 AMSL Height: 320.0 m
 Elevation: 47.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No

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Interference caused to WRNI-FM analog using U/D for -14 dBc -Indoor 2 M Rcrv

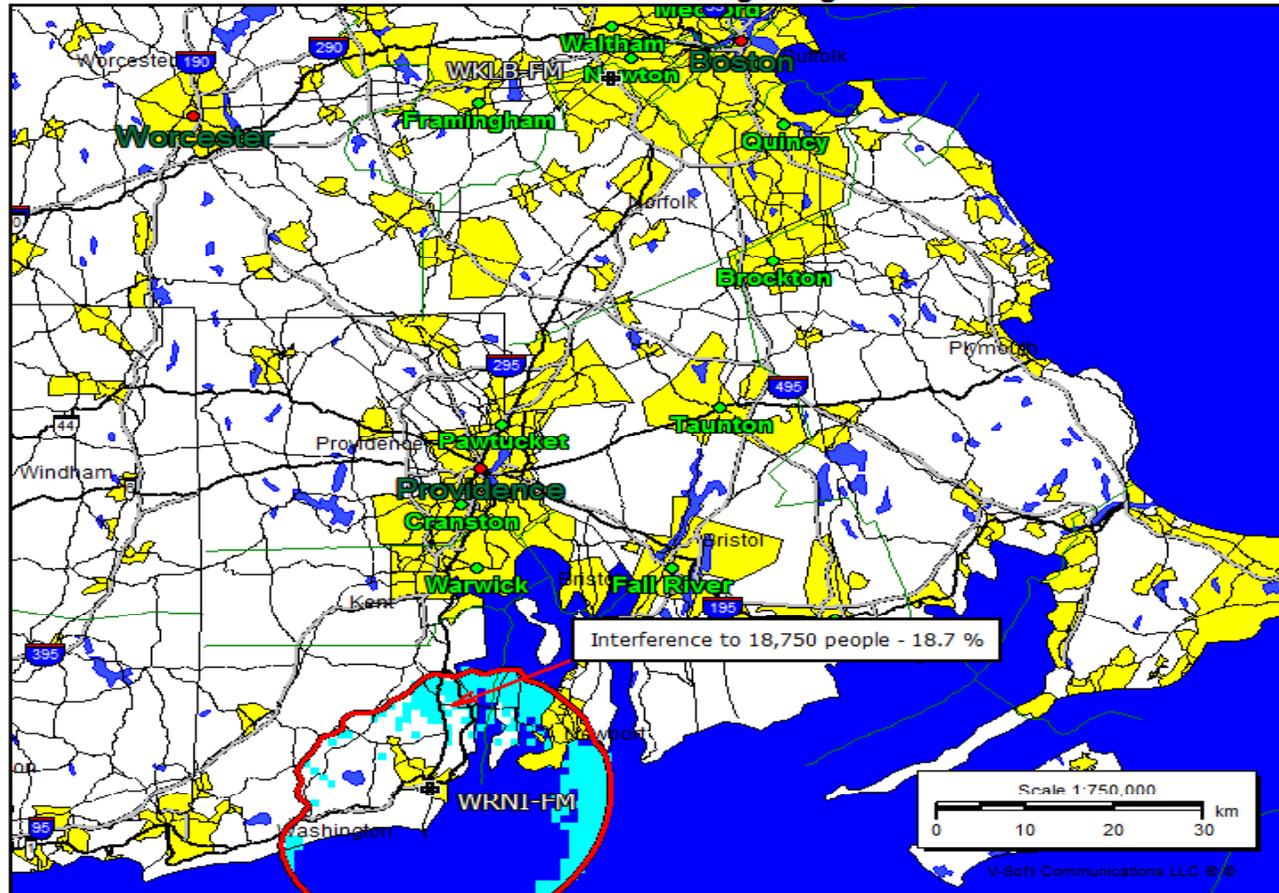
WRNI-FM

BLED20120403AAJ
 Latitude: 41-25-27 N
 Longitude: 071-28-38 W
 ERP: 1.95 kW
 Channel: 274
 Frequency: 102.7 MHz
 AMSL Height: 84.0 m
 Elevation: 26.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 2.0 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

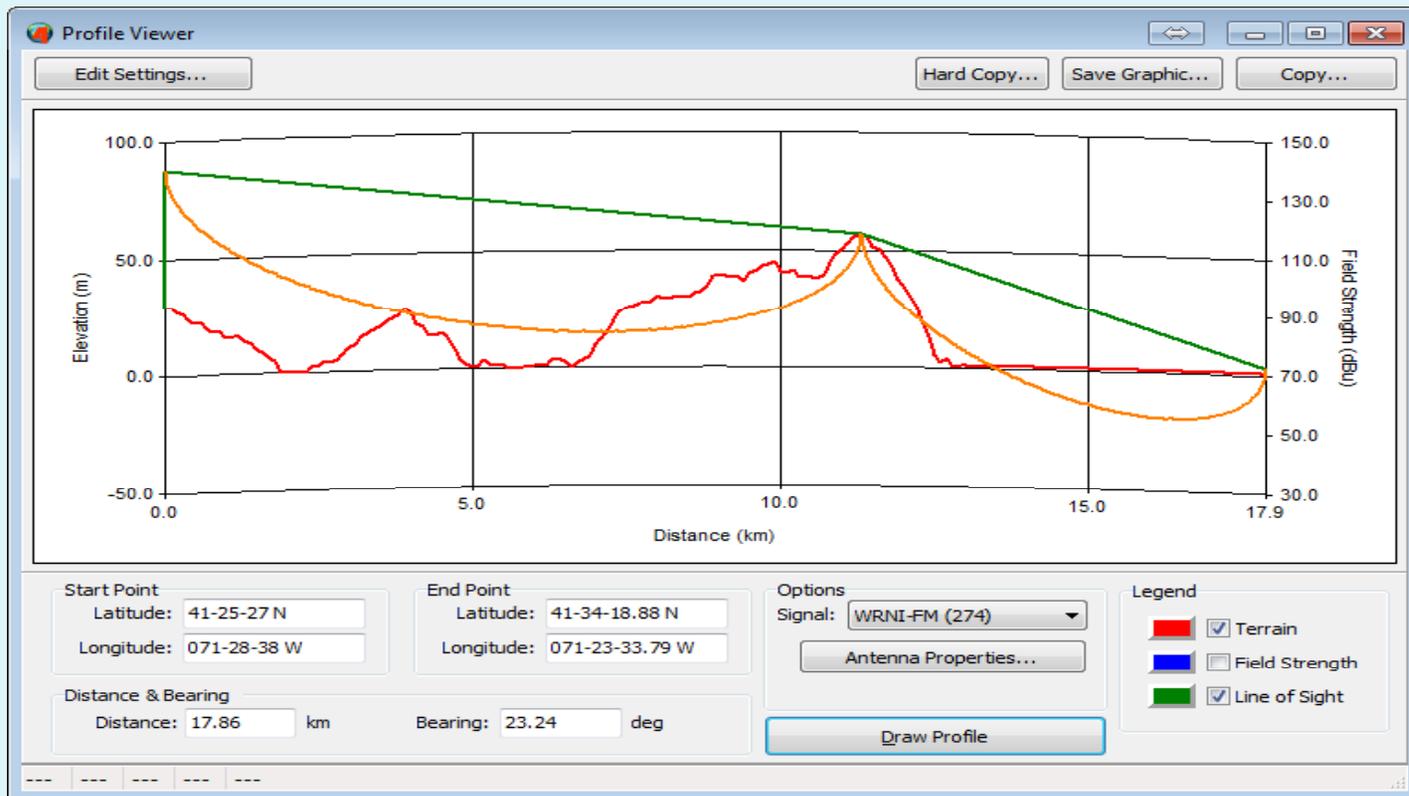
WKLB-FM

BLH20090515ABT
 Latitude: 42-18-37 N
 Longitude: 071-14-14 W
 ERP: 14.00 kW
 Channel: 273
 Frequency: 102.5 MHz
 AMSL Height: 320.0 m
 Elevation: 47.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No


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Path from WRNI-FM to the 60 dBu Contour on Azimuth to WKLB-FM

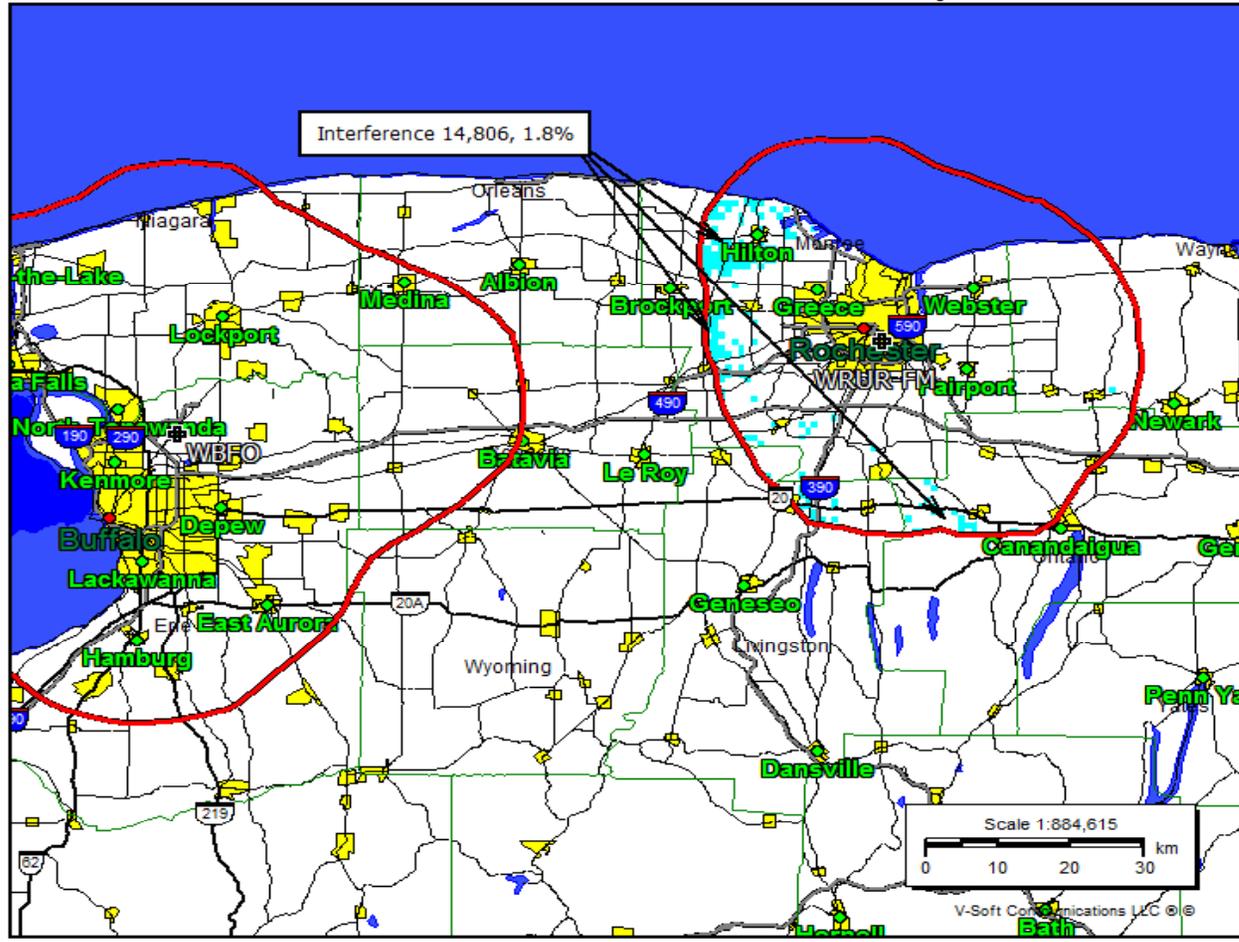


60 dBu Contours are Shown - Mobile Analysis -20 dBc 2 m Rcrv

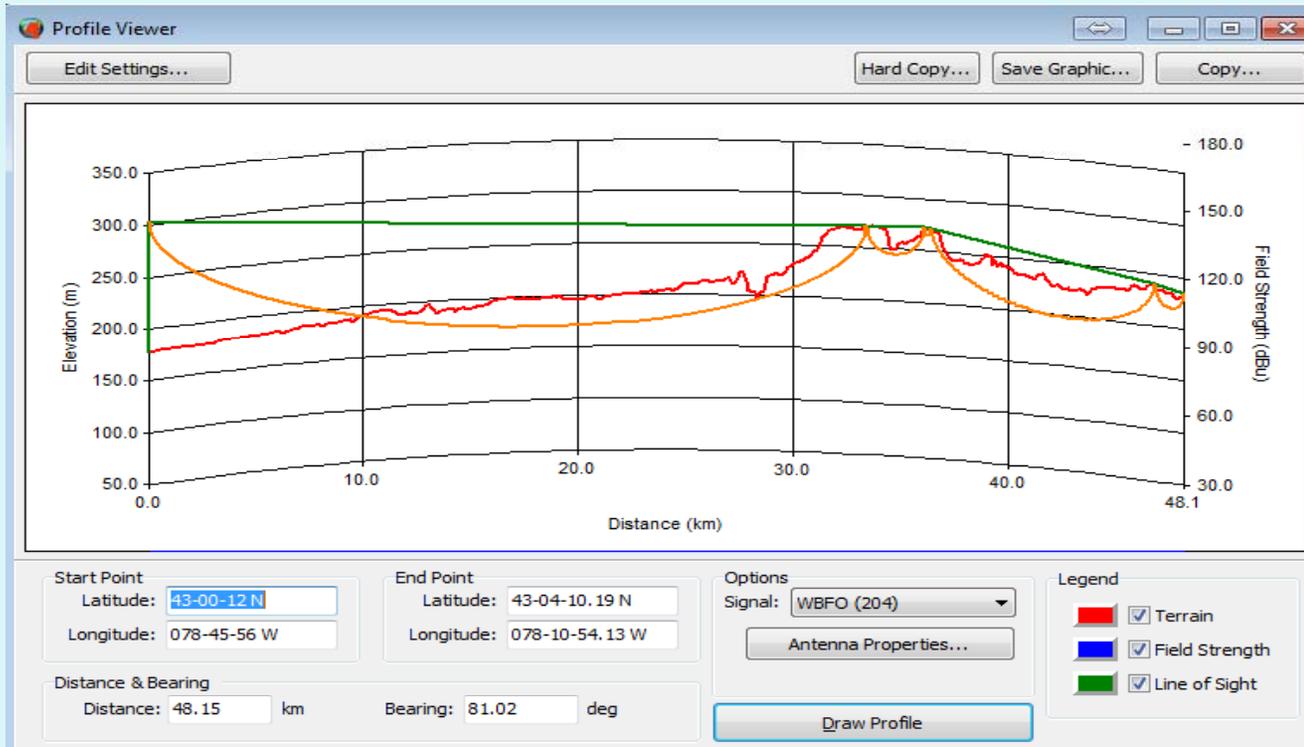
WRUR-FM
BLED20110810ABU
Latitude: 43-08-07 N
Longitude: 077-35-03 W
ERP: 15.10 kW
Channel: 203
Frequency: 88.5 MHz
AMSL Height: 262.9 m
Elevation: 205.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: Longley-Rice
Climate: Cont temperate
Conductivity: 0.0200
Dielec Const: 15.0
Refractivity: 315.0
Receiver Ht AG: 2.0 m
Receiver Gain: 0 dB
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

WBFO
BLED20080424ACE
Latitude: 43-00-12 N
Longitude: 078-45-56 W
ERP: 50.00 kW
Channel: 204
Frequency: 88.7 MHz
AMSL Height: 305.0 m
Elevation: 178.0 m
Horiz. Pattern: Directional
Vert. Pattern: No

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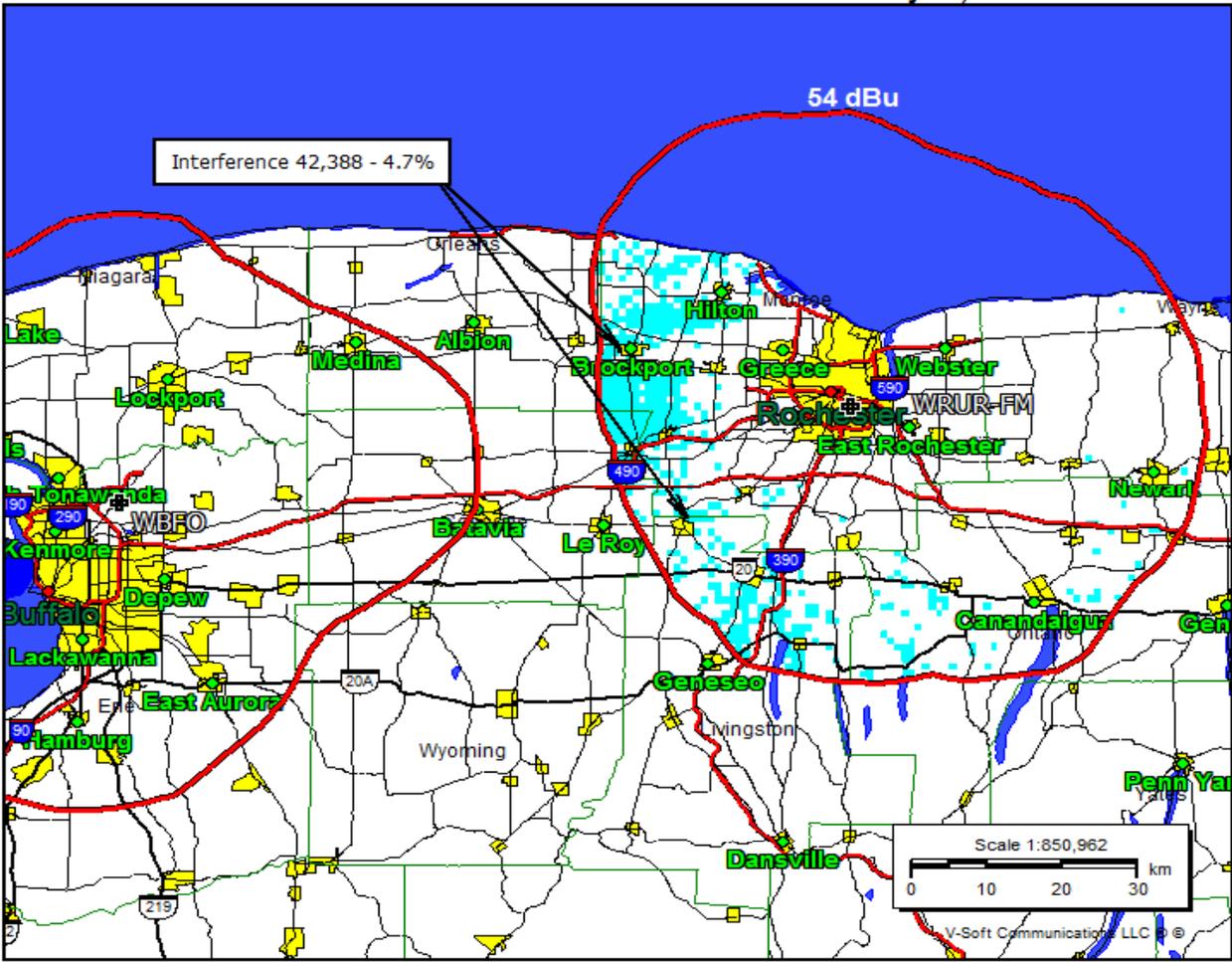
Path from WBFO toward WRUR-FM - to its 60 dBu Contour



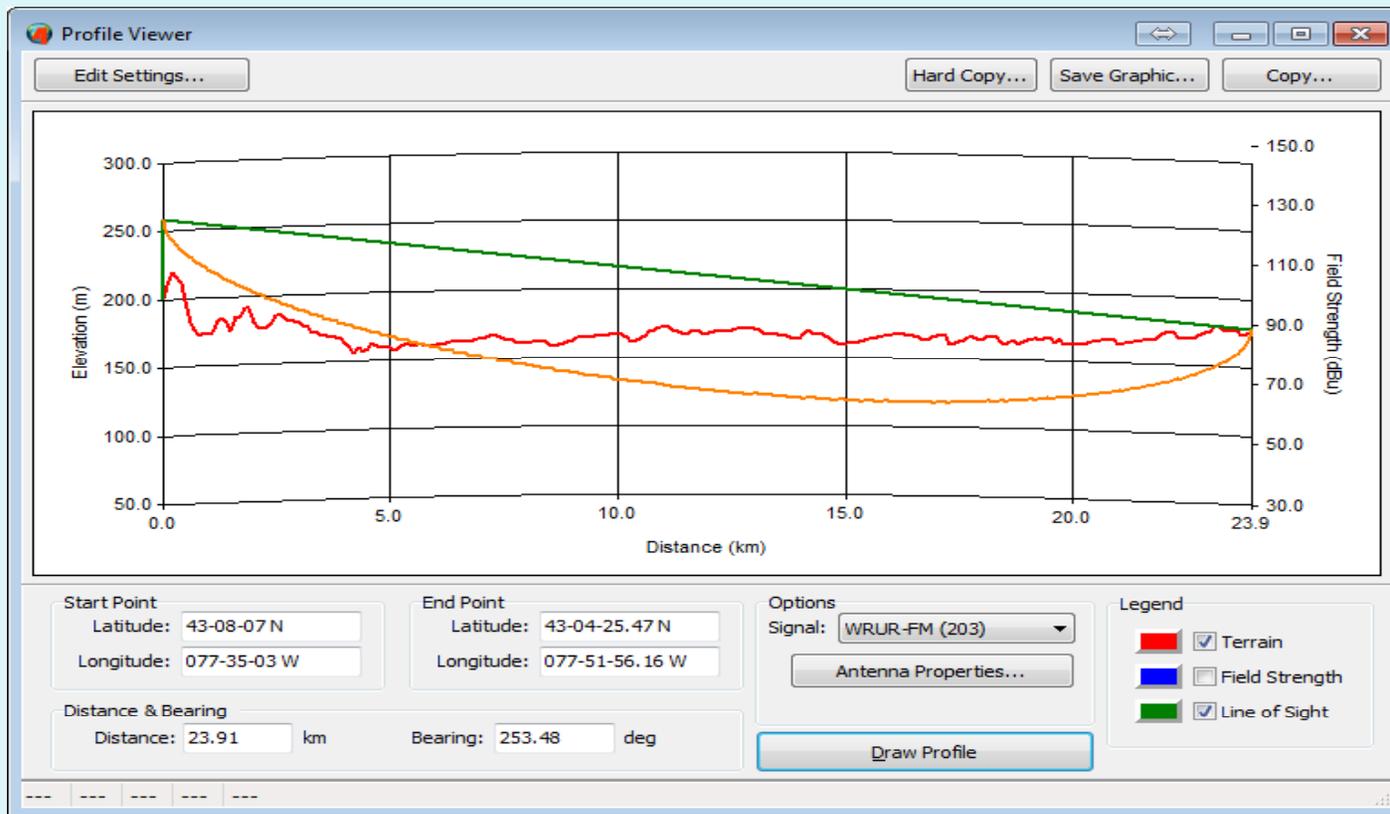
Mobile Analysis, -20 dBc - 2 m Rcrv

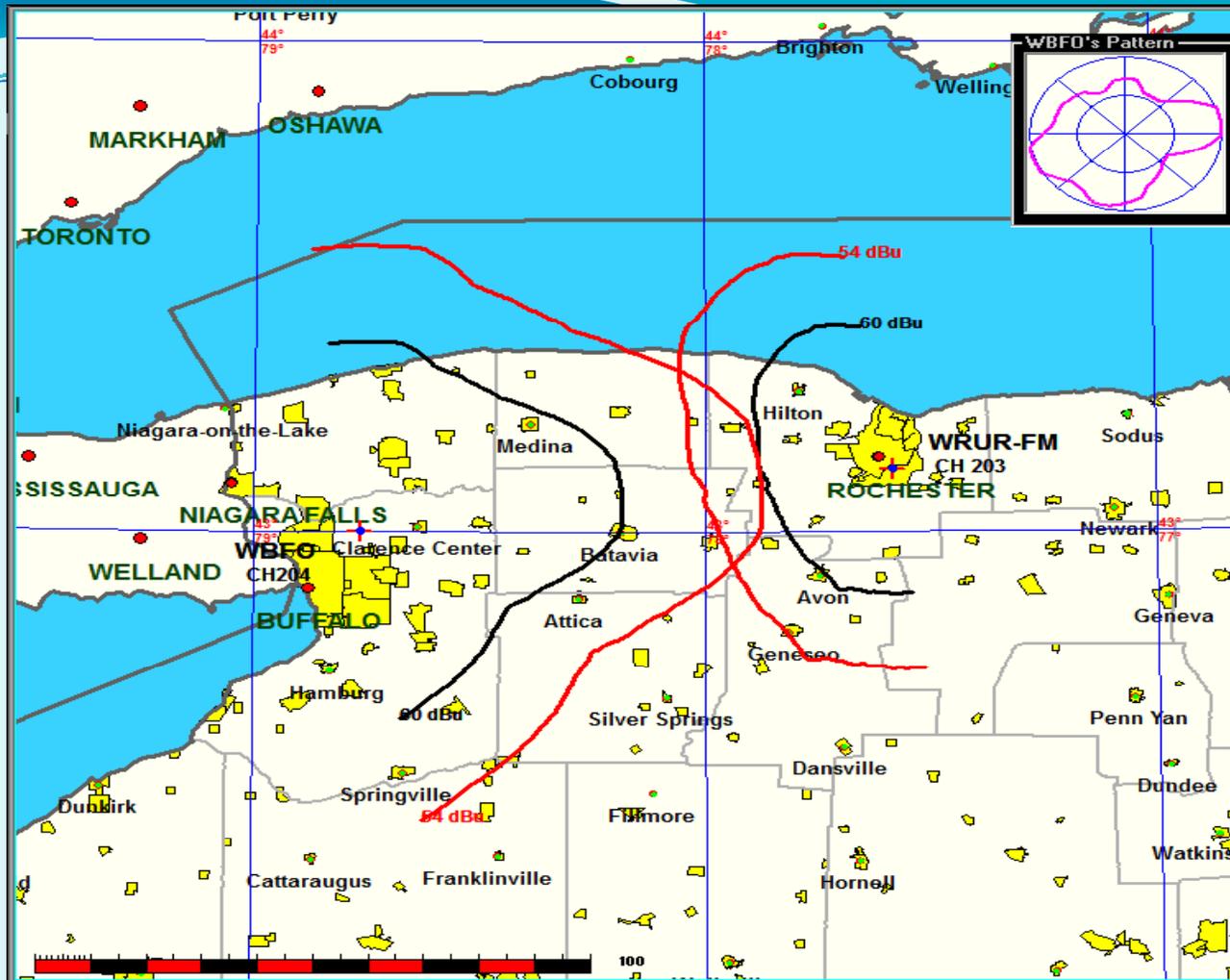
WRUR-FM
 BLED20110810ABU
 Latitude: 43-08-07 N
 Longitude: 077-35-03 W
 ERP: 15.10 kW
 Channel: 203
 Frequency: 88.5 MHz
 AMSL Height: 262.9 m
 Elevation: 205.0 m
 Horiz. Pattern: Directional
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 2.0 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

WBFO
 BLED20080424ACE
 Latitude: 43-00-12 N
 Longitude: 078-45-56 W
 ERP: 50.00 kW
 Channel: 204
 Frequency: 88.7 MHz
 AMSL Height: 305.0 m
 Elevation: 178.0 m
 Horiz. Pattern: Directional
 Vert. Pattern: No



Path from WRUR-FM to its 60 dBu Contour on Azimuth toward WBFO



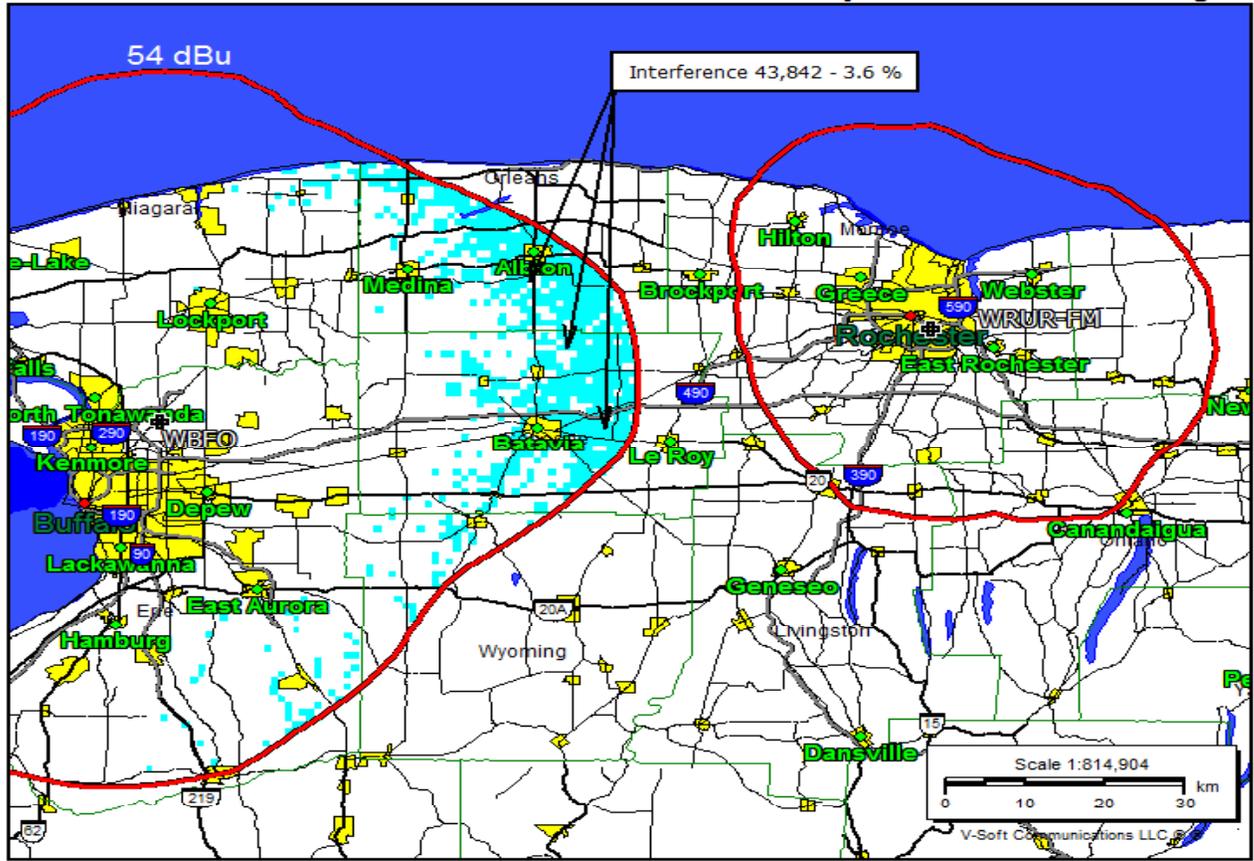


Predicted IBOC Interference - 54 dBu Contours - Mobile Analysis -20 dBc - 2 m Rcrv Height

WRUR-FM
 BLED20110810ABU
 Latitude: 43-08-07 N
 Longitude: 077-35-03 W
 ERP: 15.10 kW
 Channel: 203
 Frequency: 88.5 MHz
 AMSL Height: 262.9 m
 Elevation: 205.0 m
 Horiz. Pattern: Directional
 Vert. Pattern: No

WBFO
 BLED20080424ACE
 Latitude: 43-00-12 N
 Longitude: 078-45-56 W
 ERP: 50.00 kW
 Channel: 204
 Frequency: 88.7 MHz
 AMSL Height: 305.0 m
 Elevation: 178.0 m
 Horiz. Pattern: Directional
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 2.0 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

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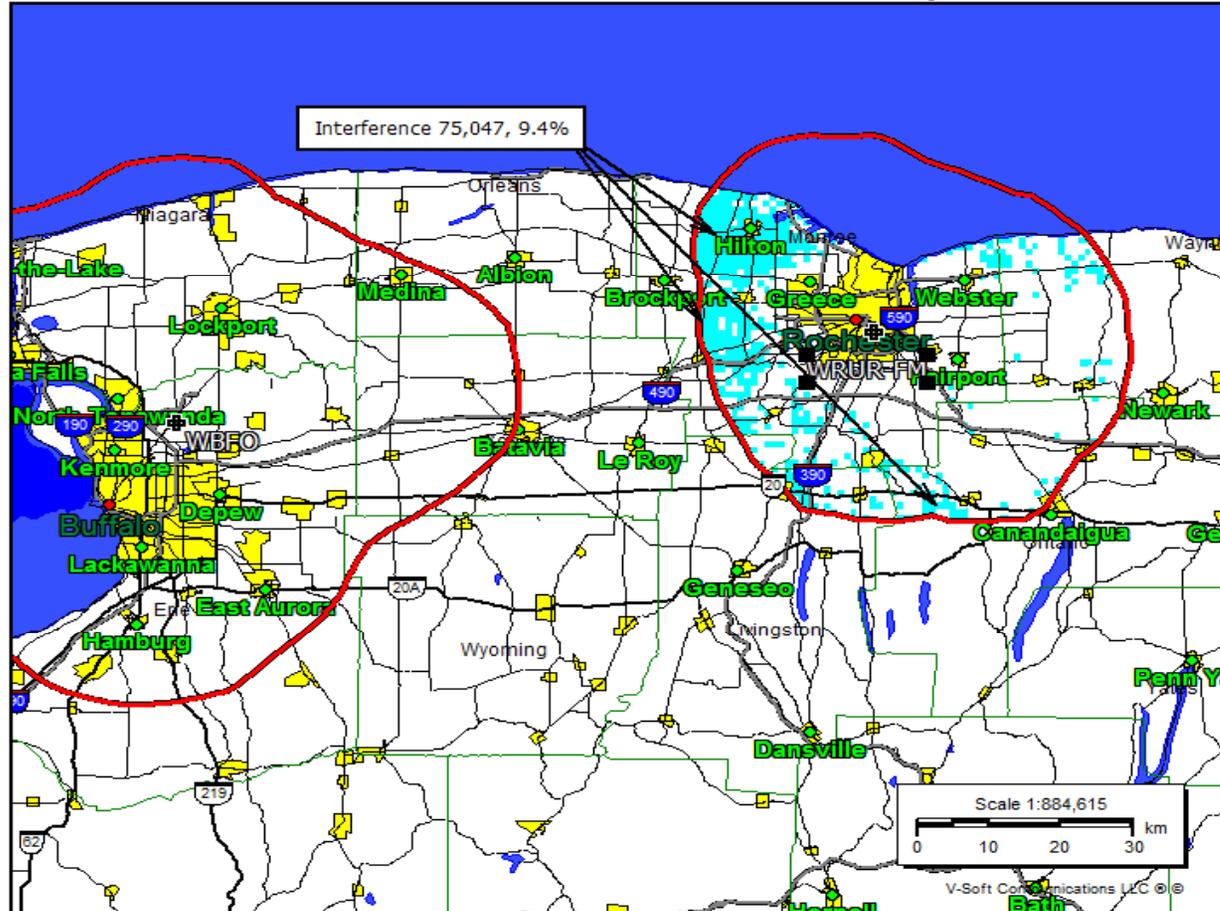


60 dBu Contours are Shown - Mobile Analysis -10 dBc 2 m Rcrv

WRUR-FM
BLED20110810ABU
Latitude: 43-08-07 N
Longitude: 077-35-03 W
ERP: 15.10 kW
Channel: 203
Frequency: 88.5 MHz
AMSL Height: 262.9 m
Elevation: 205.0 m
Horiz. Pattern: Directional
Vert. Pattern: No
Prop Model: Longley-Rice
Climate: Cont temperate
Conductivity: 0.0200
Dielec Const: 15.0
Refractivity: 315.0
Receiver Ht AG: 2.0 m
Receiver Gain: 0 dB
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

WBFO
BLED20080424ACE
Latitude: 43-00-12 N
Longitude: 078-45-56 W
ERP: 50.00 kW
Channel: 204
Frequency: 88.7 MHz
AMSL Height: 305.0 m
Elevation: 178.0 m
Horiz. Pattern: Directional
Vert. Pattern: No

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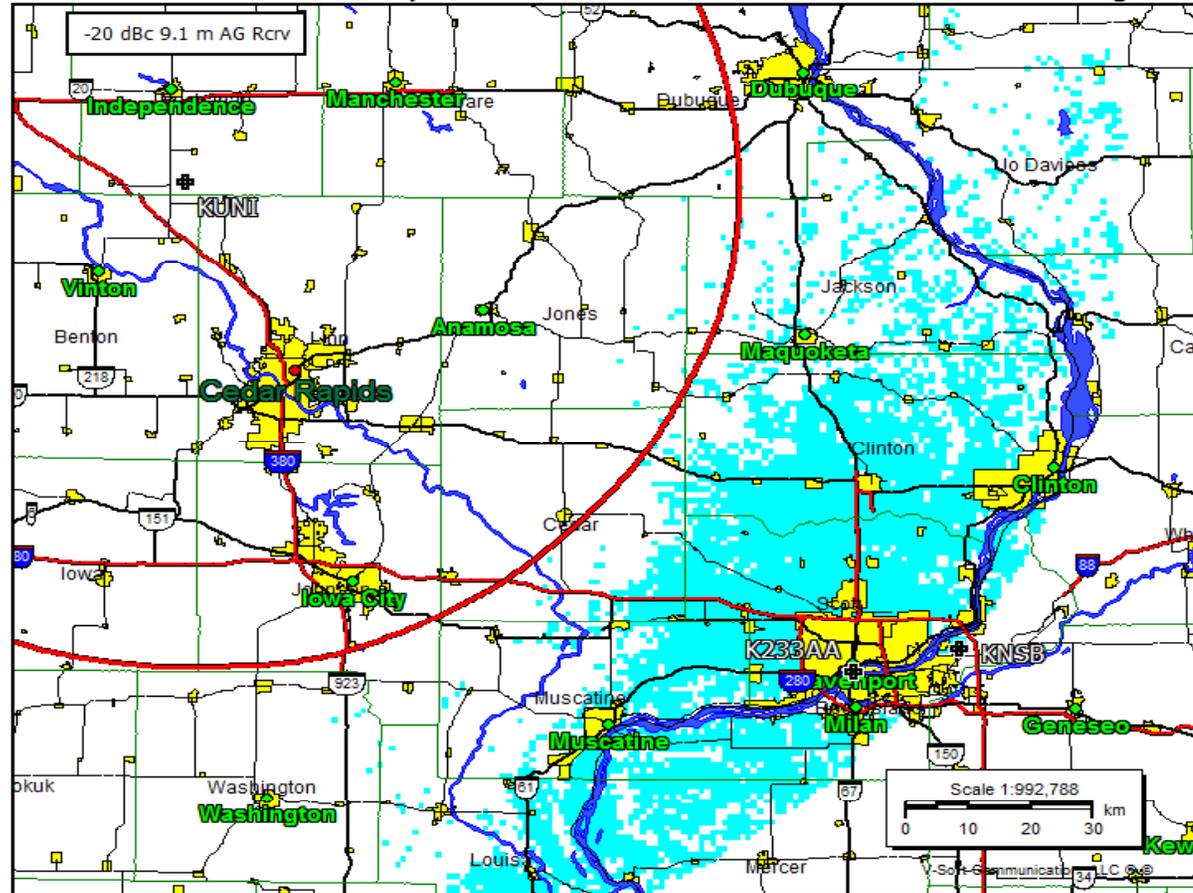


V-Soft Communications LLC ©

Map shows IBOC Interference to Translator Re-broadcasting KUNI

KUNI
 BMLED19841106LW
 Latitude: 42-18-59 N
 Longitude: 091-51-31 W
 ERP: 100.00 kW
 Channel: 215
 Frequency: 90.9 MHz
 AMSL Height: 799.0 m
 Elevation: 310.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 9.1 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

KNSB
 BLED20100616ADO
 Latitude: 41-32-43.80 N
 Longitude: 90-22-23.6 W
 ERP: 0.74 kW
 Channel: 216
 Frequency: 91.1 MHz
 AMSL Height: 311.4 m
 Elevation: 203.9 m
 Horiz. Pattern: Omni
 Vert. Pattern: No

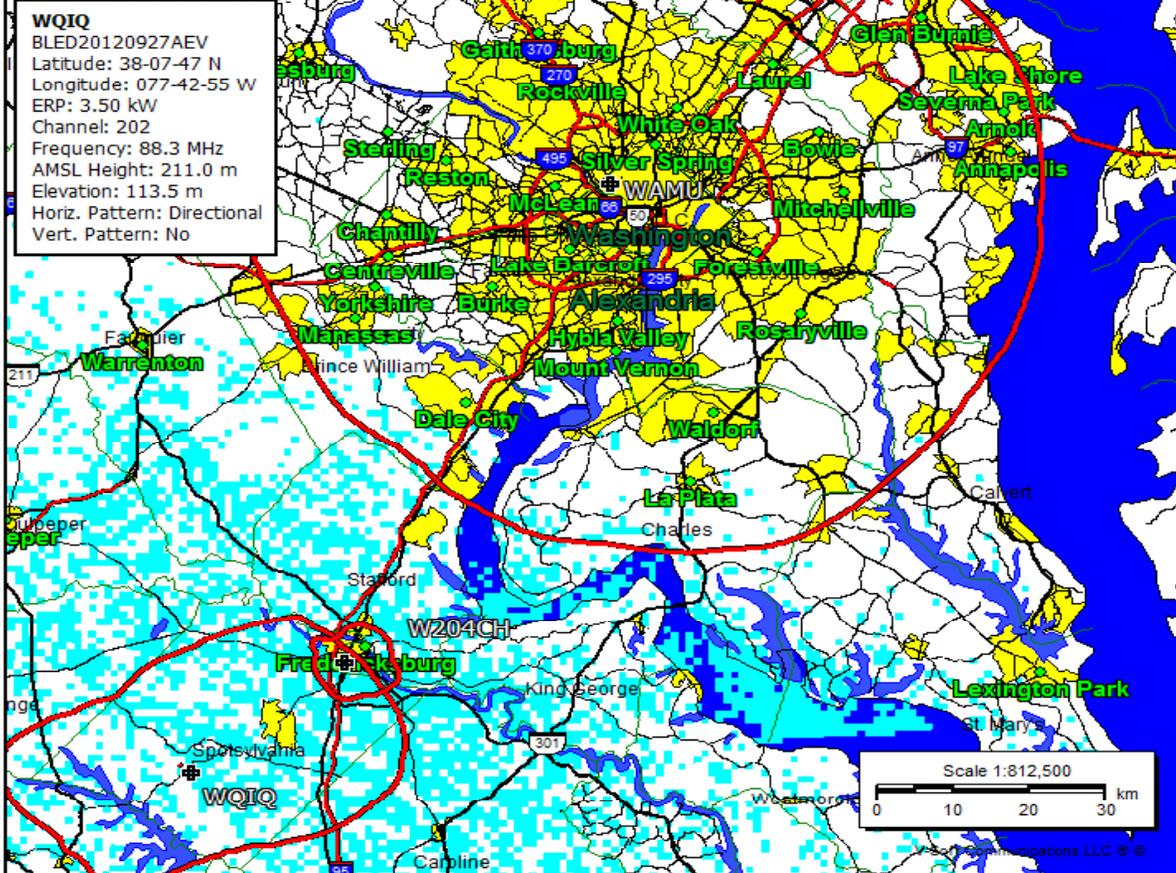


Double Interfering Stations to WAMU's Feed to W204CH -14 dBc

WAMU
 BMLED20070112AHP
 Latitude: 38-56-10 N
 Longitude: 077-05-33 W
 ERP: 50.00 kW
 Channel: 203
 Frequency: 88.5 MHz
 AMSL Height: 223.0 m
 Elevation: 112.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No
 Prop Model: Longley-Rice
 Climate: Cont temperate
 Conductivity: 0.0200
 Dielec Const: 15.0
 Refractivity: 315.0
 Receiver Ht AG: 2.0 m
 Receiver Gain: 0 dB
 Time Variability: 50.0%
 Sit. Variability: 50.0%
 ITM Mode: Broadcast

W204CH
 BLFT20101018ACO
 Latitude: 38-16-53 N
 Longitude: 077-29-24 W
 ERP: 0.027 kW
 Channel: 204
 Frequency: 88.7 MHz
 AMSL Height: 113.0 m
 Elevation: 57.0 m
 Horiz. Pattern: Omni
 Vert. Pattern: No

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TV Interference

- Environmental Noise – DTV pixilation – black screen
- Low Band channels (2-13) weakness
- Repacking, Telco Interference
- No protection proposed for LPTV
- Longley-Rice – OET-69 - kwx points are thrown out
- Co-channel – unusual prpagation
- Noisy kids



Questions?

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