

**December 2013**  
**FM Translator K274CL**  
**Cottage Grove, Oregon Channel 277D**  
**Allocation Study**

The attached spacing study shows the spacing between the proposed translator site and the location of cochannel and adjacent channel stations and proposals. This study was made with the Commission's Class A spacing requirements, and individual situations were examined to determine the lack of prohibited contour overlap per the requirements of §74.1204 of the Rules. The attached allocation study map demonstrates compliance with the Commission's Rules for protection of FM broadcast stations and FM translators as outlined in §74.1204.

The proposed translator transmitter site is located within the 60 dBu protected contour of second-adjacent channel station KNRQ 279C0 Harrisburg. The proposed site is 25.56 km from the KNRQ transmitter site at a bearing of 167 degrees True. Given the KNRQ antenna's 214 meter HAAT and 100 kW ERP along this radial, KNRQ places an 80.7 dBu contour at the translator transmitter site. The corresponding interfering contour from the translator is  $80.7 + 40 = 120.7$  dBu. The attached map of the proposed transmitter site depicts the 120.7 dBu contour from the proposed facility, which extends just 102 meters from the antenna per a Free Space calculation. There is no population within this contour. Therefore, the proposed facility is believed to satisfy the requirements of §74.1204(d) with respect to KNRQ.

The attached spacing study demonstrates compliance with §73.207 of the Commission's Rules regarding spacing restrictions to stations which are 53 or 54 channels removed from the proposed operation.

## SEARCH PARAMETERS

FM Database Date: 131206

Channel: 277A 103.3 MHz  
 Latitude: 43 46 41  
 Longitude: 123 2 32  
 Safety Zone: 50 km  
 Job Title: COTTAGE GROVE 277

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Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
NEW APP	JASPER OR	BNPL-31114ABT	223L1 92.5	0.004 148.1	44-01-58 123-00-25	5.7	28.44 22.44	6 CLEAR
NEW APP	VENETA OR	BNPL-31114BQE	223L1 92.5	0.100 -42.5	44-03-30 123-22-22	319.8	40.92 34.92	6 CLEAR
K274CL CP	COTTAGE GROVE OR	BNPFT-30808AIB	274D 102.7	0.018 283.0	43-46-41 123-02-32	0.0	0.00 0.00	0 TRANS
KSJJ LIC	REDMOND OR	BMLH-60419AAH	275C1 102.9	100.000 270.0	44-02-49 121-31-50	75.6	125.05 50.05	75 CLEAR
K275AA APP	SPRINGFIELD OR	BSTA-30926BAT	275D 102.9	0.000 0.0	44-05-58 123-03-07	358.8	35.72 0.00	0 TRANS
K275AA LIC	SPRINGFIELD OR	BLFT-940620TA	275D 102.9	0.035 234.0	44-02-01 123-00-25	5.7	28.54 0.00	0 TRANS
K276BU LIC	CORVALLIS OR	BLFT-921120TB	276D 103.1	0.015 409.0	44-38-24 123-16-25	349.2	97.54 0.00	0 TRANS
K276IH LIC	MAPLETON OR	BLFT-01004ACC	276D 103.1	0.060 343.0	44-02-58 123-50-53	295.3	71.41 0.00	0 TRANS
KRSB-FM LIC	ROSEBURG OR	BLH-6794	276A 103.1	2.750 94.0	43-12-24 123-21-47	202.3	68.58 -3.42	72 SHORT
KRSB-FM RSV	ROSEBURG OR	-	276C2 103.1	0.000 0.0	43-14-43 123-38-15	219.2	76.29 -29.71	106 SHORT
NEW APP	SWEET HOME OR	BNPL-31112CGR	276L1 103.1	0.100 -87.3	44-24-23 122-40-60	22.2	75.50 19.50	56 CLEAR
KKCWaux LIC	BEAVERTON OR	BXLH-30617ABA	277C 103.3	40.000 394.0	45-31-21 122-44-46	6.8	195.27 0.00	0 AUX
KKCW LIC	BEAVERTON OR	BLH-11214AAF	277C 103.3	100.000 470.0	45-31-21 122-44-45	6.8	195.27 -30.73	226 SHORT

SEARCH PARAMETERS

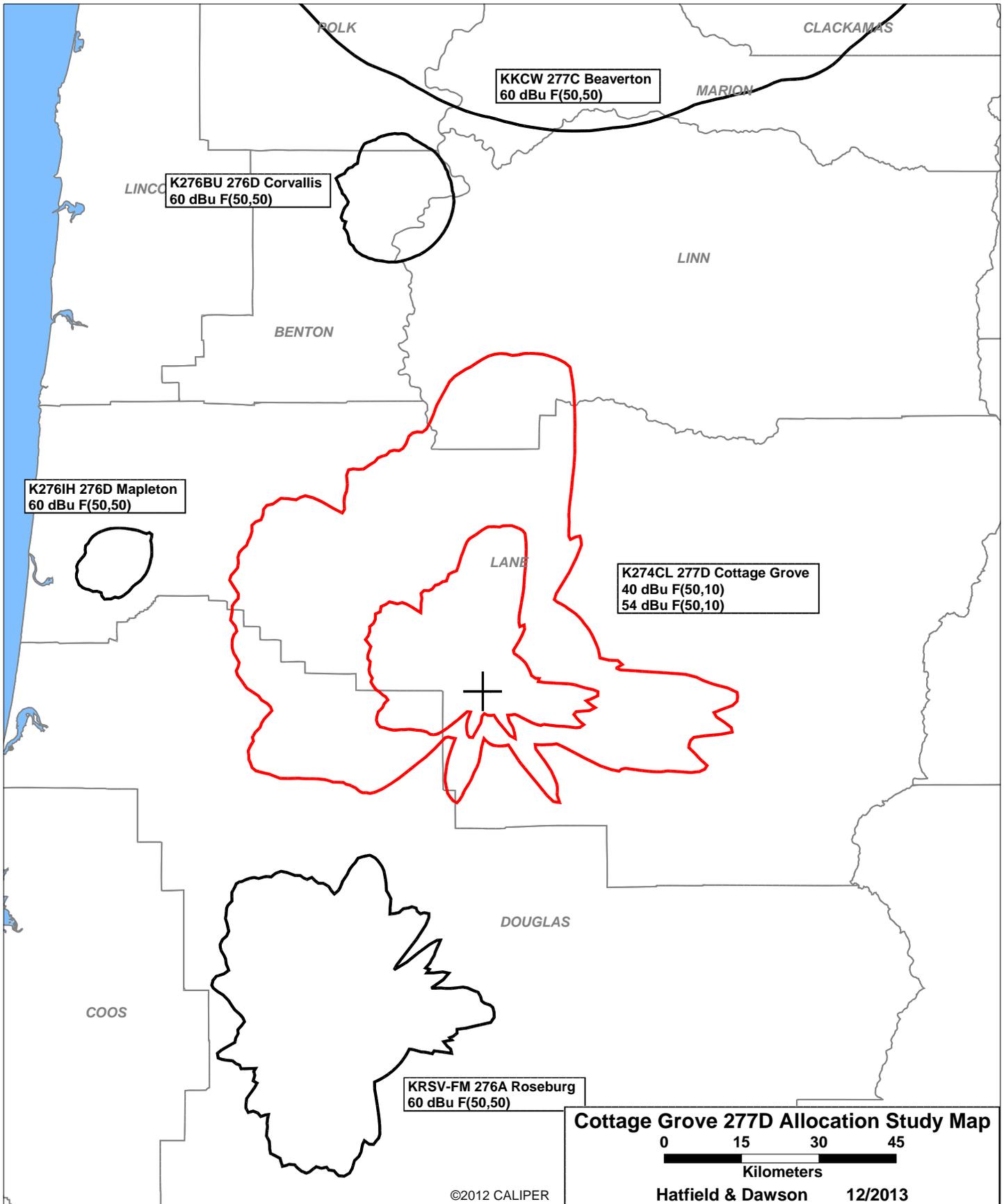
FM Database Date: 131206

Channel: 277A 103.3 MHz  
 Latitude: 43 46 41  
 Longitude: 123 2 32  
 Safety Zone: 50 km  
 Job Title: COTTAGE GROVE 277

Page 2

Call Status	City St	FCC File No.	Channel Freq.	ERP(kW) HAAT(m)	Latitude Longitude	Bearing deg-True	Dist (km)	Req (km)
KLDZ LIC	MEDFORD OR	BLH-40927AFO	278C1 103.5	100.000 146.0	42-17-13 123-00-15	178.9	165.68 32.68	133 CLEAR
KNRQ LIC	HARRISBURG OR	BLH-30729AIJ	279C0 103.7	100.000 310.0	44-00-08 123-06-50	347.1 SS	25.56 -60.44	86 SHORT
KNRQ RSV	HARRISBURG OR	-	279C0 103.7	0.000 0.0	44-36-18 123-02-46	359.8	91.89 5.89	86 CLOSE
K279AJ LIC	ROSEBURG OR	BLFT-50823ABS	279D 103.7	0.075 DA 283.0	43-12-08 123-22-54	203.3	69.62 0.00	0 TRANS
K280BJ LIC	SUTHERLIN OR	BLFT-940822TA	280D 103.9	0.004 332.0	43-22-19 123-21-15	209.2	51.68 0.00	0 TRANS

==== END OF FM SPACING STUDY FOR CHANNEL 277 =====

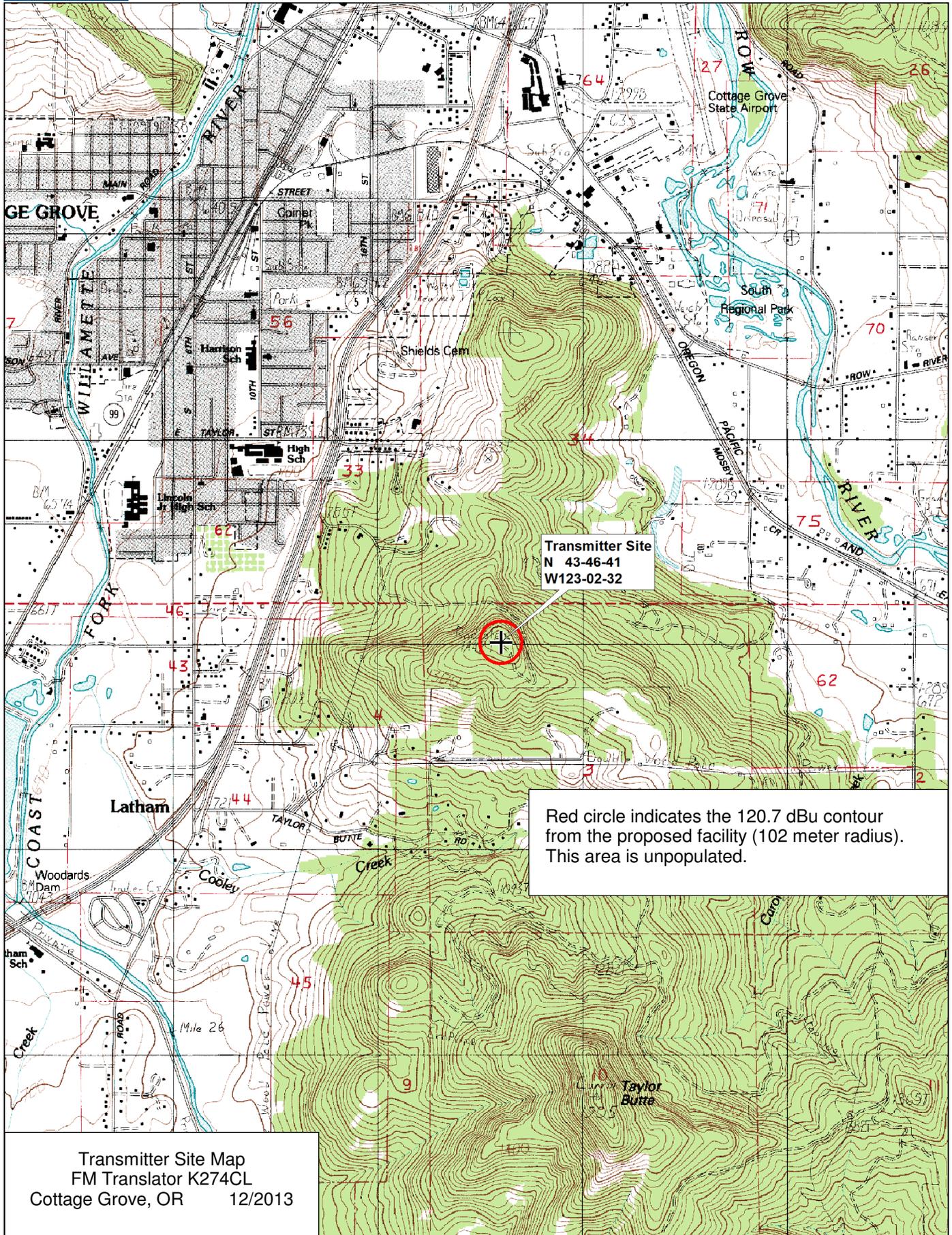


**Cottage Grove 277D Allocation Study Map**

0 15 30 45

Kilometers

Hatfield & Dawson 12/2013



Transmitter Site  
 N 43-46-41  
 W123-02-32

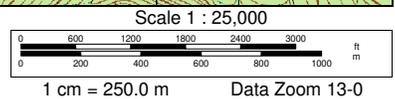
Red circle indicates the 120.7 dBu contour from the proposed facility (102 meter radius). This area is unpopulated.

Transmitter Site Map  
 FM Translator K274CL  
 Cottage Grove, OR 12/2013

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**December 2013  
 FM Translator K274CL  
 Cottage Grove, Oregon Channel 277D  
 RF Exposure Study**

**Facilities Proposed**

The proposed operation will be on Channel 277D (103.3 MHz) with a maximum lobe effective radiated power of 250 watts. Operation is proposed with an antenna to be mounted on an existing tower on Hansen Butte, having FCC Antenna Structure Registration Number 1050233. This site hosts several FM translator and TV translator stations.

**RF Exposure Calculations**

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

*D* is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

Since the Commission's FMModel program does not include an element model for the Scala 2CA2CP antenna to be used for this translator, calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the "worst case" element pattern for a "ring stub" antenna. Under this worst case assumption, the highest calculated ground level power density from this proposal alone occurs at a distance of 4 meters from the base of the antenna support structure. At this point the power density is calculated to be 22.0 μW/cm<sup>2</sup>.

Calculations of the power density produced by the proposed facility and the other stations at this transmitter site are summarized in the following table:

Call	Avg or Peak ERP Antenna Model	Relative Field	Height AGL	Calculated Max Exposure	Gen Pop FCC Limit	% of Limit
Cottage Grv 277D	0.250 kW avg SCA 2CA2CP 0.87 wavelength	FMModel	21 m	22.0 μW/cm <sup>2</sup>	200 μW/cm <sup>2</sup>	11.0%
K218AE	0.075 kW avg SHI 6812-2-SS	FMModel	21 m	1.2 μW/cm <sup>2</sup>	200 μW/cm <sup>2</sup>	0.6%

K225BE	0.230 kW avg SHI 6812-4-SS	FMMModel	41 m	0.2 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	0.1%
K230AD	0.250 kW avg SHI 6812-4-SS	FMMModel	50 m	0.2 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	0.1%
K244DL <sup>1</sup>	0.250 kW avg SHI 6812-3-SS	FMMModel	30 m	0.9 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	0.5%
K248AG <sup>2</sup>	0.250 kW avg SHI 6812-4-SS	FMMModel	40 m	0.3 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	0.2%
K270BJ	0.250 kW avg SHI 6812-2	FMMModel	24 m	4.5 $\mu\text{W}/\text{cm}^2$	200 $\mu\text{W}/\text{cm}^2$	2.3%
K14LP-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	313 $\mu\text{W}/\text{cm}^2$	0.03%
K20IR-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	337 $\mu\text{W}/\text{cm}^2$	0.03%
K22HO-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	345 $\mu\text{W}/\text{cm}^2$	0.03%
K40IS-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	417 $\mu\text{W}/\text{cm}^2$	0.02%
K42HK-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	425 $\mu\text{W}/\text{cm}^2$	0.02%
K44JP-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	433 $\mu\text{W}/\text{cm}^2$	0.02%
K46IP-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	441 $\mu\text{W}/\text{cm}^2$	0.02%
K47AV-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	445 $\mu\text{W}/\text{cm}^2$	0.02%
K48KC-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	449 $\mu\text{W}/\text{cm}^2$	0.02%
K50CT-D	0.200 kW avg KAT 1X3KBBU	0.200	57 m	0.1 $\mu\text{W}/\text{cm}^2$	457 $\mu\text{W}/\text{cm}^2$	0.02%

(For TV translators, the relative field value indicated is the maximum value which occurs at 45 degrees or more below the horizontal, based on the manufacturer's vertical plane pattern. The resulting adjusted ERP value is assumed to be radiated straight down to a point 2 meters above ground level at the base of the tower.)

These calculations show that the maximum calculated power density produced at two meters above

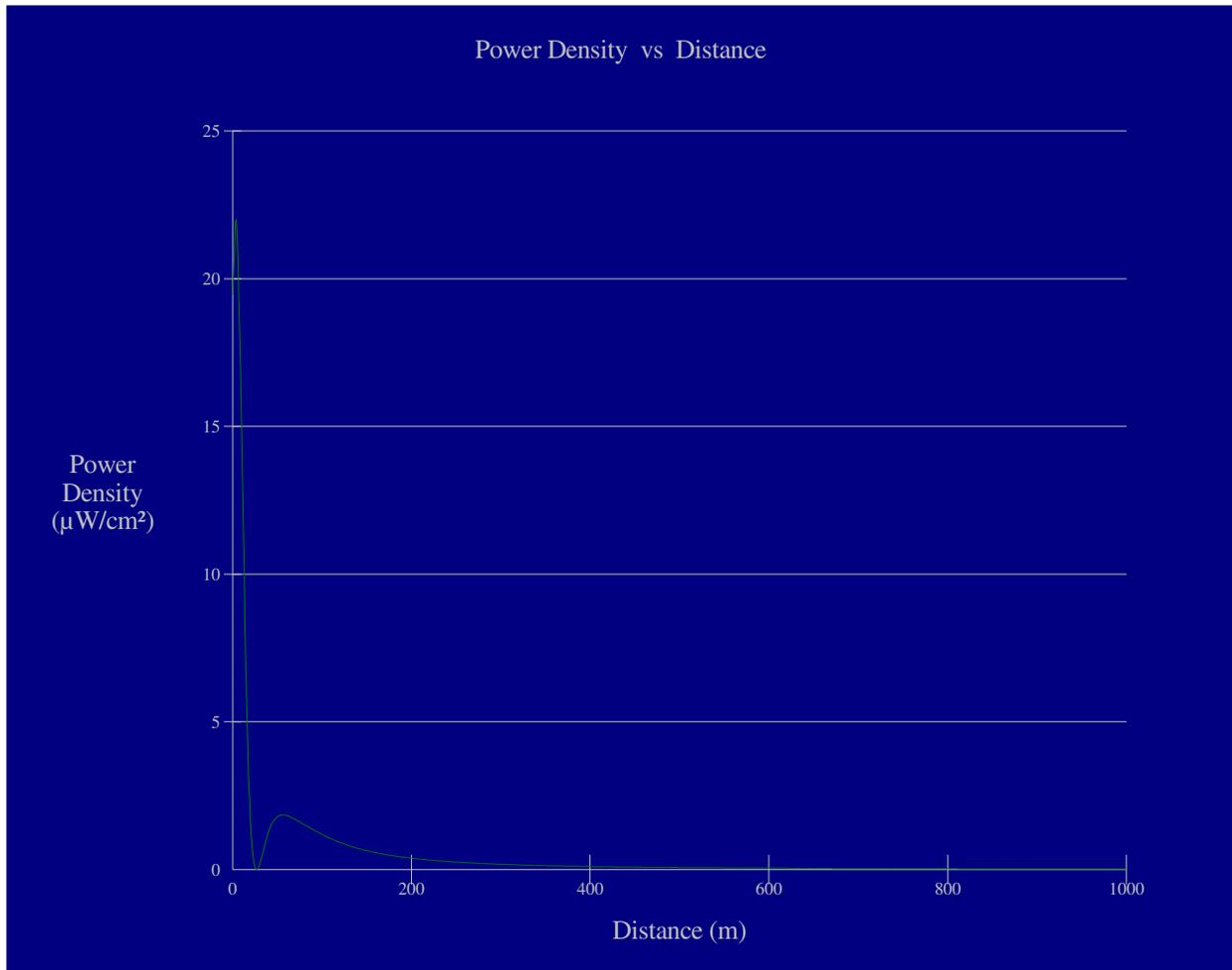
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<sup>1</sup> K244DL antenna model and height above ground are not included in the FCC database, and were provided by the site manager.

<sup>2</sup> K248AG antenna model and height above ground are not included in the FCC database, and were provided by the site manager.

ground level by the proposed operation of the Cottage Grove translator and the present operation of the other stations at this site (were their maxima to coincide, which they do not) is 15% of the FCC standard for uncontrolled environments.

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.



### Ground-Level RF Exposure

OET FMModel

#### K274CL 277D Cottage Grove

Antenna Type: Scala (2)CA2-CP ("ring stub" element model assumed)

No. of Elements: 2

Element Spacing: 0.87 wavelength

Distance: 1000 meters

Horizontal ERP: 0.250 kW

Vertical ERP: 0.250 kW

Antenna Height: 21 meters AGL

Maximum Calculated Power Density is  $22.0 \mu\text{W}/\text{cm}^2$  at 4 meters from the antenna structure.