



Antenna Site Plan

82 Standard Radials (50.29 meters)
38 Shortened Radials

120 Total Radials

Average Radial Length is 45.32 meters

WSTP (AM)
1490 kHz
1 kW Daytime / 1 kW Nighttime
Salisbury, North Carolina
February 2020

BROMO BROADCAST
TECHNICAL CONSULTANTS
COMMUNICATIONS

Ground System Description

WSTP(AM)

1470 kHz

1kW Daytime / 1 kW Nighttime

Salisbury, North Carolina

February 2020

WSTP (AM) proposes to utilize 120 buried copper radials. Due to property constraints, 82 radials are full quarter wavelength long while 38 radials are shortened by property boundaries. The proposed ground system is shown on the Antenna Site Plan exhibit. Mathematical ratio and proportion was used to determine the length of each of the short radials. Below is a tabulation of the shortened radial lengths.

<u>Radial</u>	<u>Length in meters</u>
102°	49.74
105°	46.32
108°	43.40
111°	41.04
114°	39.18
117°	37.07
120°	35.46
123°	34.40
126°	33.35
129°	32.29
132°	31.23
135°	30.73
138°	30.18
141°	29.62
144°	29.12
147°	28.57
150°	28.32
153°	28.32
156°	28.32
159°	28.32
162°	28.57
165°	28.87
168°	28.87
171°	29.12
174°	29.62
177°	30.18
180°	30.73
183°	31.23
186°	32.29
189°	33.35

192°	34.40
195°	35.45
198°	37.07
201°	39.01
204°	41.04
207°	43.40
210°	46.32
213°	<u>49.74</u>
	1314.24 meters of shortened radials

The full quarter wavelength radial on 1490 kHz is 50.29 meters. Having 82 standard radials, $50.29 \times 82 = 4123.78$ meters of standard radials. There are 38 shortened radials. From the tabulation above, it can be seen that there are 1314.24 meters of shortened radials.

4123.78 meters of standard radials
 1314.24 meters of shortened radials
 5438.02 meters total length of all 120 radials
 $5438.02 \div 120 \text{ radials} = \mathbf{45.32 \text{ meters length of the average radial}}$

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Next, the FCC Figure 8 was consulted. The following values were used:

1490 kHz = Frequency
 Meters and Kilometers = Unit of Measurement
 61.87 Meters = Tower Height above base insulator
 1 kW = Effective Radiated Power
 45.32 Meters = Average Length of Ground Radials
 120 = Number of Ground Radials

After supplying the above data to the FCC's computerized Figure 8, the site calculated the corrected field to be **312.857 mV/m per kW at 1 km.**