

Radiation Hazard Analysis

Operator: **SES**
 Location Designation: **Washington Mediaport**
 County: **Prince William**
 Town: **Bristow**
 State/Zip: **Virginia 20136**

FCC Callsign: **E000152**
 SES ID: **NWM-3**
 STA:

Input Values	Value	Unit
$D = \text{Aperture Diameter}$	9.00	Meters
$d = \text{Subreflector Diameter}$	0.94	Meters
$G = \text{Antenna Gain}$	53.2	dBi
FCC Designation	C	Band
$F = \text{Frequency}$	6.175	GHz
$P = \text{Transmitter Power Watts}$	589	Watts
$R_{ua} = \text{closest point to uncontrolled area}$	15	meters
Elevation angle at closest point R_{ua}	10	Degrees
Height (AGL)	2.60	meters

Band	Frequency
L	1000-2000
S	2000-4000
C	4000-8000
X	8000-12500
Ku	12500-18000
K	18000-25500
Ka	26500-40000
O	40000-50000
V	50000-75000

OET 65 Calculated Values	Formula	Value	Unit
$\lambda = \text{Wavelength}$	$\frac{c}{F}$	0.0486	meters
$G = \text{Antenna Gain}$	$10^{(G/10)}$	208929.6131	(W) linear
$\eta = \text{Apperture Efficiency}$	$\frac{G\lambda^2/4\pi}{\pi D^2/4}$	62%	percentage
$A = \text{Area of reflector}$	πR^2	63.617	meters ²
$a = \text{area of subreflector}$	πr^2	6939.778	cm ²
$R_{nf} = \text{Near-Field Region}$	$\frac{D^2}{4\lambda}$	417.091	meters
		72	Meters AGL
$R_t = \text{Transition Region}$	$>R_{nf}$	417.091	>meters
	$<R_{ff}$	1001.017	<meters
$R_{ff} = \text{Far Field Region}$	$\frac{0.6D^2}{\lambda}$	1001.017	meters
		174	Meters AGL

Radiation Analysis Zone	Formula	Level	Value	Exposure Limits		
				General Public	Occupational	
				<1mW/cm2	<5mW/cm2	
1	Power Subreflector	$\frac{4P}{a}$	339.492	mW/cm2	>FCC MPE See Note 1	>FCC MPE See Note 2
2	Antenna Surface	$\frac{4P}{A}$	3.703	mW/cm2	>FCC MPE See Note 1	<FCC MPE
3	Main Reflector Ground	$\frac{P}{A}$	0.926	mW/cm2	<FCC MPE	<FCC MPE
4	$S_{nf} = \text{Near-Field Power Density}$	$\frac{4\eta P}{A}$	2.281	mW/cm2	>FCC MPE See Note 1	<FCC MPE
5	$S_t = \text{Max Transition Power Density}$	$\leq S_{nf}$	2.281	mW/cm2	>FCC MPE See Note 1	<FCC MPE
6	$S_{ff} = \text{Max Far field Power Density}$	$\frac{PG}{4\pi R_{ff}^2}$	0.977	mW/cm2	<FCC MPE	<FCC MPE
7	Off Access Level Near Field	$S_{nf} - 20 \text{ dB}$	0.02281	mW/cm2	<FCC MPE	<FCC MPE

Notes

- The antenna is installed in a controlled location access is restricted to authorized personnel only. The antenna is marked with RF Radiation Hazard signage.
- Inside the controlled area, MPE levels exceed the MPE exposure for occupational levels. The levels will be reduced to safe MPE by removing power to the transmitters when work is performed on or around the antenna. This area can only be accessed by qualified personnel.
- The field develops 2.6 meters above ground level at the minimum elevation angle which is not accessible to the general public.