Drift support of NIMIQ-2 from USN's Hawaii ground station

NIMIQ-2 is a Telesat Canada communications satellite being drifted from 66° East to 148° East. USN has been contracted to support the NIMIQ-2 spacecraft geo spacecraft for a period of up to 90 days as it is drifted to its new orbital position and then a subsequent test period before it becomes operational in its new slot.

The Hawaii ground station will have visibility of the spacecraft as it approaches 127° East on its way to 148° East over the western Pacific ocean. Hawaii will be called on to support several hours to days at a time during the drift and orbital checkout. Support will be receive only.

	Downlink	Uplink
NIMIQ-2	12202.500 MHz	NA
NIMIQ-2	12695.000 MHz	NA

Flux Density impinging on the ground in Hawaii from NIMIQ-2

The Flux density is calculated as:

$$\boldsymbol{Flux\ density = EIRP \div (4\,\pi\, Rse^2)}$$

Where $\boldsymbol{Rse}$ is the distance from spacecraft to the ground?
Where $\boldsymbol{EIRP}$ is the Effective Isotropic Radiated Power of the spacecraft?

Data from the spacecraft owner indicates that the nominal EIRP for the spacecraft is +8.20 dBW. Being a near circular orbit geo orbit the altitude (and thus the closest distance to earth during an overhead pass) is = 35,800 Km.

Converting +8.20 dBW to scalar watts = 6.606 watts transmitted at 12202.5 MHz

Therefor:

$$\boldsymbol{Flux\ density = 6.606 \div (4\,\pi * 35{,}800{,}000\ meters^2)}$$

Flux density = 4.102 x 10^{-16} Watts/meter^2
Or
Flux density = 4.102 x 10^{-17} mW/cm^2