UNDERSTANDING SAFETY CODE 6

Points of Interest (from Tower)

X = distance from the tower base (approximately 1 meter)

Y = angle from X (approximately 31 degree angle)

Z = vertical distance above the ground (2 meters = the average human head height)

The equipment used for wireless communication, including that used by Everus to provide high-speed internet connections to your homes, works like a cordless digital telephone line. The equipment carries data, with digitized voice being carried as one type of data. Everus specializes in data transmission. The higher the frequency, the faster the data transmission will be. Each antenna does broadcast and receive similar to a two way radio (example: CB, ham radio, FRS, or walkie talkie).

The frequency used by Everus to transmit the data is in the low-to-mid-frequency level, ranging from, depending on the equipment used, 900 MHz to 5,800 MHz. The outgoing transmissions are measured in the same values as an individual would measure electricity - in Watts. The size of the antenna (or gain) and the height of the antenna will determine the calculation how many watts reach a specific distance from the point of transmission – for example, 100 feet above the ground. This calculation is a power density measured in Watts/meter^2 [a 1 meter by 1 meter area]. This calculation is using the values of the antenna operating at maximum capacity. This is a worse case scenario, or maximum power density at the point of interest.

Industry Canada wants us to normalize the values. Normalize is the description of the power calculation divided by 10 as stipulated in the Industry Canada strictures. To normalize the values we add all calculated point of interest values together to achieve a final total.

A normalized value between zero (0) and one (1) is a legally acceptable value. If the value was greater than 1.0, Everus would have to take this fact into account and take any of the following actions:

- Build elsewhere.
- Post danger signs and warning signs.
- Ensure that the distance from the tower base to any highway is three (3) times the tower height.
- Fence the area surrounding the tower.

Warning signs must be posted if the normalized density value is greater than 1.0, but may be close to 1.0 at that tower site. The values at the proposed tower site are less than a value of 1.0. These lower values would not require a posting of any signs.

These actions are not meant to alarm the public, but to comply with the Radio Frequency regulations in an effort to notify the public of potential concerns. If you look at the Safety Code 6 Calculation table, you will see that the total normalized power density with respect to Safety Code 6 General Public Limits are well below the value of one (1). This means that we would not be required to take any of the actions outlined on the previous page.

EiRP = Effective Isotropic Radiated Power in watts (W)

= Antenna emissions are measured with a noise detecting receiver (passive receptor) at the edge of the antenna where the radio signals are emitted.

The EiRP is calculated as follows:

EiRP = maximum transmitted power minus (-) any transmission loss plus (+) the antenna gain

= Δ value calculated in decibels at 1 meter distance from the antenna

The Δ value will then be converted to watts (w). The standard calculation to convert to watts is

$$\left(10^{\Delta \text{ value} \div 10} \right) \times 1000 = \text{value in watts}$$

Antenna Tilt

Imagine the world is a 3 dimensional plane.

The X is at 0°. This means that the horizontal plane is the same as the horizontal plane of the antenna.

The Y is the antenna tilt (in meters) from the X plane. In the case of the Trango M2400 SAP antenna (on the Safety Code 6 Calculation table), the Y would be at 5° from the vertical plane on which the antenna is mounted upon.

Using the X and Y values described above, the safe distance for the proposed tower site in Priceville is calculated below. This **safe distance** is the **distance from the antenna** (if **standing directly in front of the antenna**) **for long term exposure to radio frequencies**.

	Safe distance directly in front of the antenna		Antenna height from ground	
Antenna	Metric	Imperial	Metric	Imperial
Trango M5830SAP	254 cm	8’ 4”	30 m	98’ 5.10”
Trango M2400SAP	285 cm	9’ 4.2”	30 m	98’ 5.10”
Trango M900SAP	403 cm	13’2.66”	30 m	98’ 5.10”
Trango TrangoLINK	45 cm to 57 cm	1’5.71” to 1’10.44”	24 m	78’ 8.88”

In an effort to compare the radio frequencies emitted from the proposed tower, which have been explained in this handout, the example below explains the radio frequency output for a radio station.

Example: A radio station.
The calculated radio frequency power density is 0.04465 W/m². This value is much higher than the total emissions of 0.000379677 from the proposed tower site.