

## Exhibit A - Coverage and interference map guidelines

The Region requires a propagation interference map using the Longley -Rice model for all applications. The region has qualified two programs that implement the model. One is Radio Soft ComStudy and the other is Spectrum E. For most applications, the interference map only needs to show two signal levels – 40 dBu coverage in the operating area and a 20 dBu co-channel interference level. It is important to use the 50% median values when setting up the calculations so that all results are consistent and conform to TSB-88 recommendations. These levels assume use of P25 modulation both Phase 1 and 2. Other modulation types will need use appropriate levels based on the TSB-88 tables or a TSB-88 methodology interference study. In no cases may contours be used in place of the matrix studies.

In cases where there is uncertainty as to protection to other co-channel users, an interference study can be done using actual transmitter locations and TSB-88 methodology. For question please contact the Region chair.

Operating area is considered as geographic boundary plus 3 miles. Transmitters should provide a minimum of 40dBu signal in required operating area for interference protection.

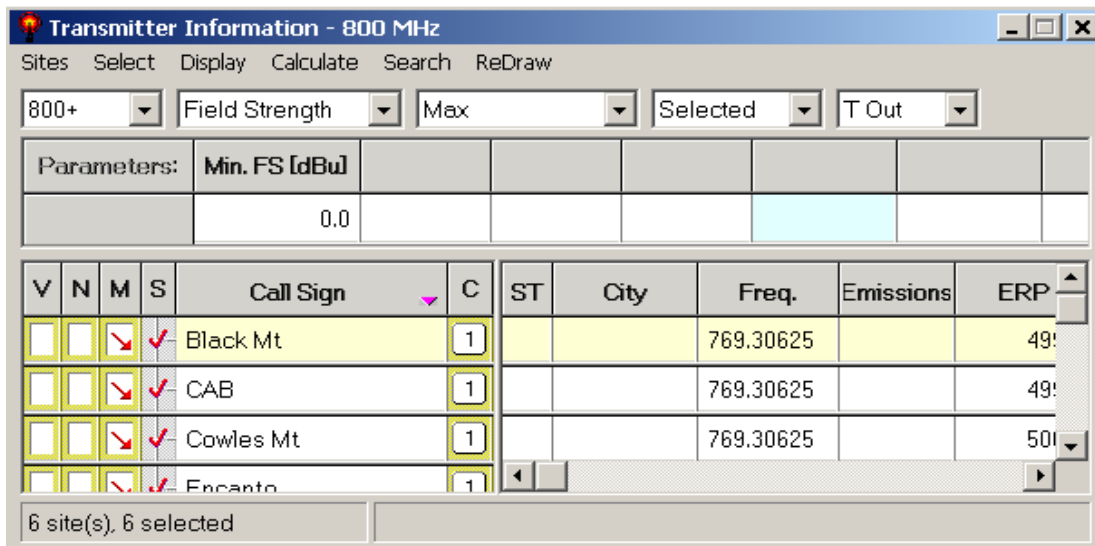
Please use similar colors for spectrum E signal level maps as used in the ComStudy examples below.

### Preparation of ComStudy2.2 maps should utilize the following parameters:

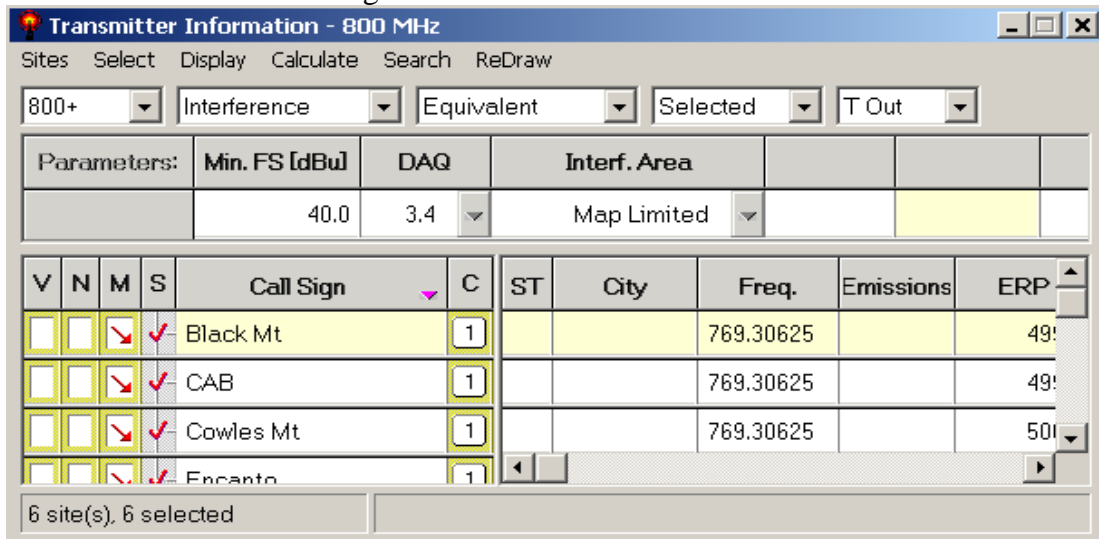
For P25 Systems- Transmitter site information menu should use modulation type C4FM @ +/- 2.8KHz.

Recommended signal strength should be reduced below 40dBu beyond the three miles of the co-channel agency jurisdiction as quickly as possible by use of patterned and/or down tilted antennas.

The upper fields of the Field Strength Information menu should be set as shown below for new transmitter(s) with existing co-channel users..



The upper fields of the Transmitter Information menu should be set as shown below for new transmitters where there are existing co-channel .



## GENERATING COVERAGE MAPS

Map size should be set to include areas of the co-channel agencies not just the applicants coverage area. Remember this is intended to show that no harmful interference to co-channel users..

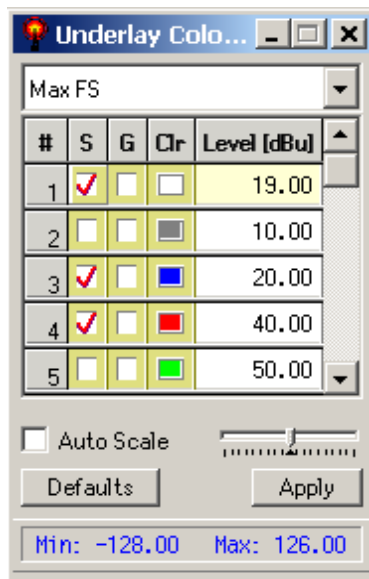
## USING TEMPLATES

ComStudy 2.2 provides a method to create coverage maps using predetermined parameters stored in a template. Templates to create the required maps are stored on the CAPRAD website. In the 700 MHz tab select PLANNING. On the left side of the screen select “Plan Documents”. Download the files “700MHz TSB-88 Interference.CST” and “700 MHz Field Strength.CST” and store on your hard drive in the folder CS20\data. Also download the .csv file for a Spectrum E template and fill out even if using ComStudy as this lets those reviewing the maps to more easily import into Spectrum E. Include the Planet files used for antenna patterns with the files attached to the application and sent to the co-channel users.

Select the appropriate template to set the map size parameters for signal strength calculations. Select the File pull down menu and cursor to templates - apply template. Select the appropriate template name. (Field Strength or TSB-88 interference

If your application is for licensing on channels with current users, you may need to use the TSB-88 method. Remember to select “V” for victim in the transmitter information menu for each site that the new site will protect in turn. Only select the new site and victim site to get correct results.

The template will set the map colors using the correct scale as shown below. Gradients will be off. (G box will be un-checked)



The template will also prepare the map for printing. To prepare for printing, Go to “File”, “Page Setup”, and add your Agency Name in the header and the Site Name and Coordinates in the text above the map. (See sample map on last page)

Calculate site matrix of new transmitter(s) using parameters shown below. Lower left box will differ but needs to be appropriate for calculation of the large area.

The dialog box is titled "Field Strength Site Matrix Setup" and has three tabs: "General", "Losses", and "Longley-Rice". The "General" tab is active. It contains several sections of controls:

- Propagation Model:** A dropdown menu set to "Longley-Rice".
- Confidence:** A text box with "50.0" and a percentage sign, next to a "Parameters" button with a gear icon.
- Receiver height:** A text box with "2.0" and "[m]".
- Mobile TX Power:** A text box with "0.0" and "[W]".
- Mobile TX Gain:** A text box with "0.0" and "[dB]".
- Size of FS Matrix Cell:** A dropdown menu showing "30" ~ 1 km". Below it are two radio buttons: "Size by Area" (selected) and "Size by Field".
- Terrain Spacing:** A text box with "0.20" and "[km]".
- Radio earth curvature k:** A text box with "1.333".
- Auto size to map:** A checked checkbox.
- Matrix Dimensions Table:**

	Distance [km]	# Cells
Matrix Width	342.80	439
Matrix Height	237.18	256
Total	81306	112384
- Apply Land Use Attenuation:** An unchecked checkbox.
- Talk Out Matrix:** A checked checkbox.
- Talk Back Matrix:** An unchecked checkbox.

At the bottom right are "OK" and "Cancel" buttons.

The dialog box is titled "Field Strength Site Matrix Setup" and has three tabs: "General", "Losses", and "Longley-Rice". The "Losses" tab is active. It contains several text boxes and dropdown menus:

- Time %:** Text box with "50.0".
- Location %:** Text box with "50.0".
- Confidence %:** Text box with "50.0".
- Conductivity (S/m):** Text box with "0.0050".
- Dielectric constant:** Text box with "15.000000".
- Climate Zone:** Dropdown menu set to "Continental Temperate".
- Service Application:** Dropdown menu set to "Mobile".
- Use Longley-Rice version 1.2.1:** Unchecked checkbox.
- OET69: Longley-Rice with Error #3:** Unchecked checkbox.

At the bottom right are "OK" and "Cancel" buttons.

After calculations are completed, print map into portable document format (pdf) for attachment to application.

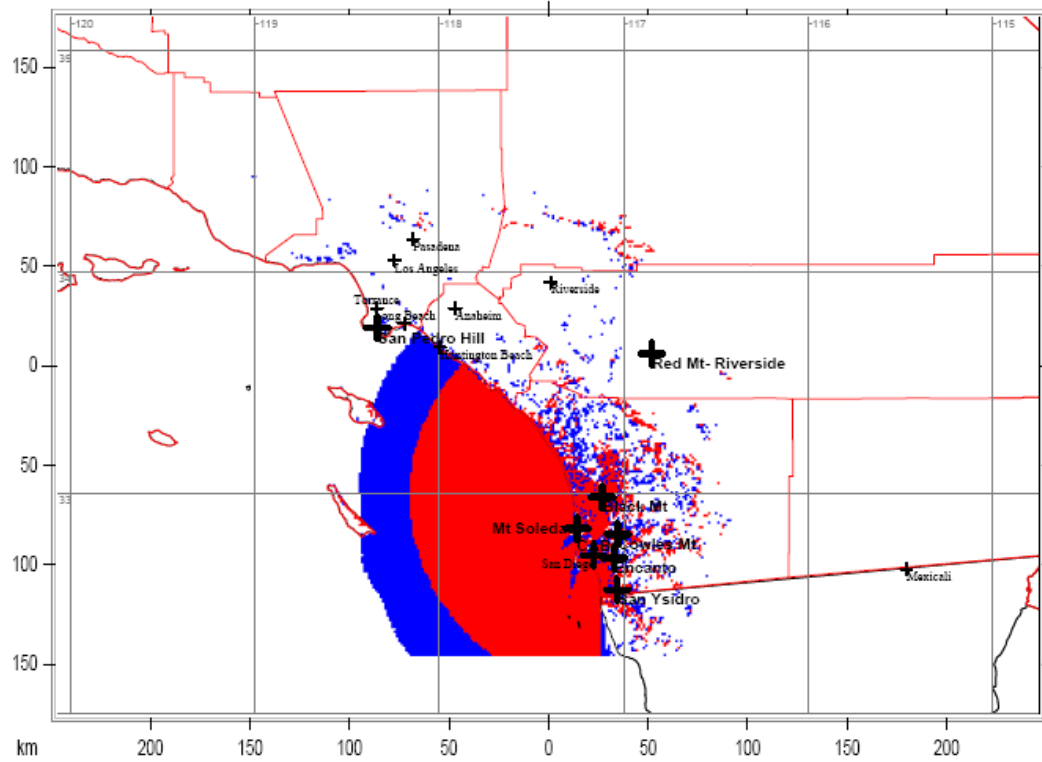
# Sample of completed ComStudy Field Strength map

ComStudy

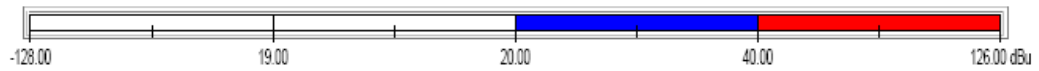
Agency Name

Wednesday, September 23, 2009

Site Name and Coordinates



Longley Rice Median 50%; Max FS; T out



■ County Borders   
  State Borders   
  Lat/Lon Grid

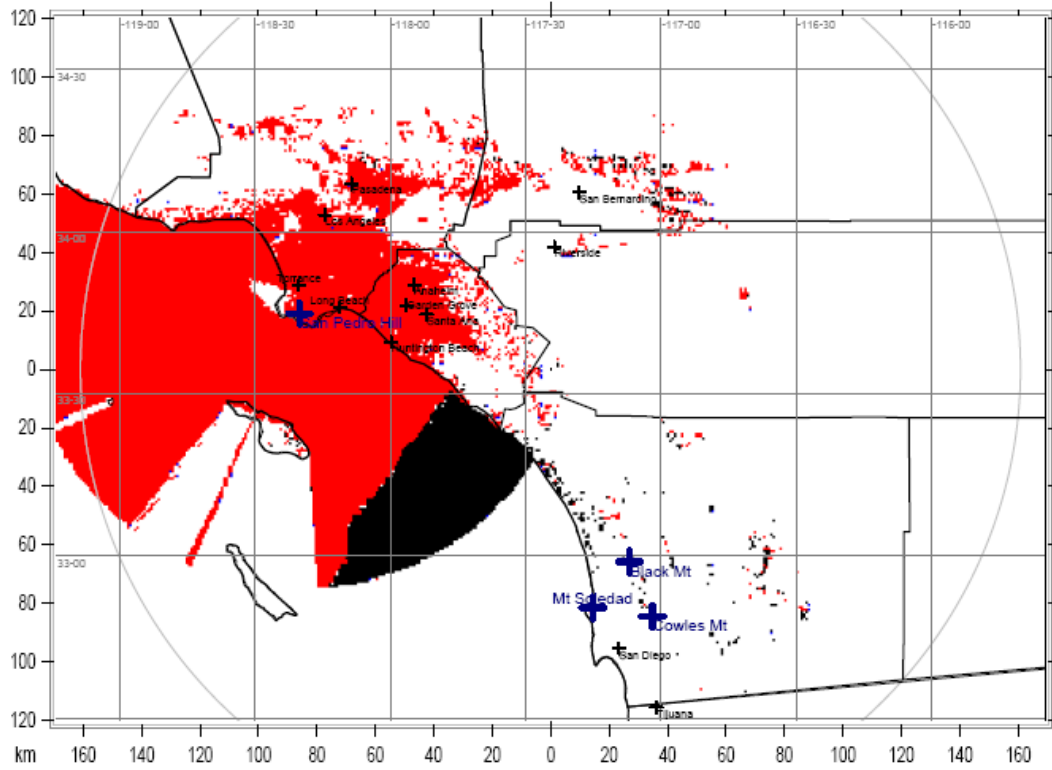
# Sample of completed ComStudy TSB-88 interference map

ComStudy

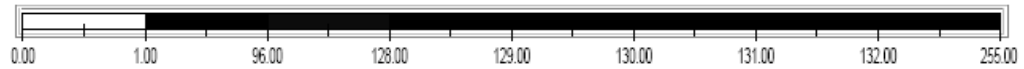
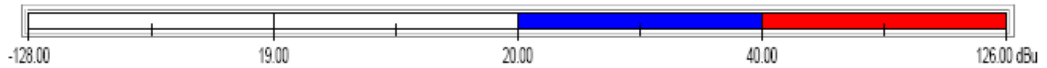
Agency Name

Wednesday, September 23, 2009

Site Name and Coordinates



Longley Rice Median 50%; TSB-88 Interference T out



Country Borders    State Borders    Lat/Lon Grid