TABLE II
TRUNKED RADIO FREQUENCY IN INDONESIA [20][21][22]

Type	Transmitter	Receiver	Channel Spacing
Trunking 400 MHz	380 - 389 MHz	390 - 399 MHz	12.5 KHz
	407 - 409 MHz	417 - 419 MHz	12.5 KHz
	419 - 422.5 MHz	426.5 - 429.75 MHz	12.5 KHz
	412.5 - 414 MHz	422.5 - 424 MHz	12.5 KHz
Trunking 800 MHz	806 - 821 MHz	851 - 866 MHz	25 KHz

Following the picture above, the West Java regional police (Polda) frequency is 806 to 821 MHz and 851 to 866 MHz. Several types of interference occur in TETRA network planning: adjacent and co-channel. Adjacent interference arises because of adjacent frequencies, and Co-channel interference is interference due to the same frequency. Therefore, the frequency placement must be appropriately regulated so that interference does not occur [20].

With the standard TETRA technology, the carrier frequency distance of 25 kHz consists of 4 channels, with three channels used for voice/data and one channel for signaling control, it requires a carrier on the uplink or downlink) is (94 channel / 3 carrier) = 32 carrier (25 kHz), so it takes uplink or downlink spectrum = (32 carrier x 25) KHz = 800 KHz, so it takes spectrum for 2 directions, for uplink and downlink directions = 2 x 800 kHz = 1600 KHz. Meanwhile, the frequency is obtained by calculating the available channels: 15 MHz: 25 KHz = 600 channels. Then it can be compared that the need for canals is 94 channels while the available channels are 600 channels, far from sufficient for the essential requirement

IV. CONCLUSION

The results of PPDR planning and analysis using digital radio trunking can be implemented and reach all districts and municipalities in West Java Province with a need for 58 sites (Base Station). The TETRA used uses frequencies 806 to 821 MHz and 851 to 866 MHz with a bandwidth of 15 MHz or 600 channels, while the need for the number of channels is 94 channels which can serve as many as 1400 mobile station (MS) users with a traffic size of 70 Erlang. Then the TETRA signal quality is at a reasonable level, is -70 dBm to -105 dBm, so this is feasible to be implemented in the West Java region.

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