We propose a new multi-component KP (mcKP) hierarchy which includes two kinds of KP equation with self-consistent sources. This hierarchy also admits reductions to the well-known $k$-constrained KP hierarchy, which contains second type of soliton equation with self-consistent sources, and $n$-reduced KP hierarchy with self-consistent sources i.e. Gelfand-Dickey hierarchy with self-consistent sources. The new mcKP hierarchy provides general approach to find the soliton equations with self-consistent sources and their Lax representations (Received September 19, 2007)