The perturbation correction factors ($p_{w,det}$) of LiF and CaF_2 solid detectors irradiated by clinical kilovoltage photon beams (50 - 300 kV x-rays) in a water phantom have been determined using the EGS4 Monte Carlo system. $p_{w,det}$ is defined as the deviation of the mass energy absorption coefficient ratio of water to the detector material, $[(\overline{m_{en}}/\rho)_{w,det}]$, from the absorbed dose ratio of water to the detector material. The detectors were in the form of discs of diameter 3.61 mm and thickness 1 mm at depths of 1 cm and 5 cm in a water phantom. Effects due to cavity size, depth of irradiation, density and atomic number of the detector materials were investigated. The perturbation correction factor, $p_{w,det}$ can be overestimated by up to 27% if it is assumed that the photon energy spectrum in the medium and cavity material is the same and this assumption is used to compute the average mass energy absorption coefficient ratio of water to a high-Z detector like CaF_2. This assumption makes little difference (less than 1%) in the computed value of $(\overline{m_{en}}/\rho)_{w,LiF}$ or any other low-Z atomic number detector. The value of $p_{w,det}$ for LiF varies from unity by less than 0.5% and for CaF_2 by about 1% over the entire kV energy range investigated. The dependence of $p_{w,det}$ and $(\overline{m_{en}}/\rho)_{w,det}$ on cavity size and depth of irradiation for LiF was also less than 0.5% but for CaF_2 can be as large as 3.5%.