Membrane bioreactors (MBRs) are rapidly developing as a preferred advanced wastewater treatment technology. Virus removal by MBRs is of concern, since membrane pore sizes can be larger than the size of certain viruses. In this bench-scale study, virus removal experiments were carried out using PVDF hollow fiber (0.22 and 0.45 micron nominal pore sizes) membranes operated under constant flux regime and in the presence of aeration. The permeate flow was recirculated in the feed tank. Silica particles (1-3.5um in diameter) and humic acid were selected as model foulants. Human adenovirus (HAdV) 40 was used as a model virus and quantitative polymerase chain reaction (qPCR) was employed to determine virus concentration. The individual and combined impacts of model foulants on membrane fouling and virus removal were determined and compared. The results indicate that the mixture of silica particles (800ppm) and humic acid (40ppm) can cause severe and fast fouling on both membranes (0.22 and 0.45um), while the fouling is not significant when only each one of the foulants was used alone. The effect of SiO$_2$ alone on virus removal was very small. Presence of humic acid enhanced virus removal, especially with the 0.22um membrane. When membrane filtration is carried out in the mixture of silica particles and humic acid, virus concentrations in the permeate samples were consistently higher than in the feed samples. One potential explanation is that humic acid facilitates virus adsorption on silica particles and subsequently, during filtration, silica particles accumulate on the membrane surface and form a porous layer. Then, viruses are desorbed from the silica particles due to the flux through the porous layer and are detected in the permeate. All data suggest that adsorption plays an essential role in membrane systems regarding to membrane fouling and virus removal.