Hydrolysis of phosphorus and metals from anaerobically digested sewage sludge was tested using inorganic acids (H2SO4, HCl, and HNO3) and organic acids (citric, oxalic, and acetic). Then, the optimize conditions for release of high phosphorus and low metals from digested sludge using H2SO4 by Box-Behnken design was investigated. Optimum PO4-P and metals (Ca, Mg, Na, K, Al, Fe and Zn) release was obtained at H2SO4 0.3 M, acid/sludge ratio (mL/g) 10/1 and mixing time 90 min, respectively. Donnan dialysis having a Nafion 117 cation exchange membrane was employed the selective separation of released PO4-P and metals in the hydrolysed sewage sludge liquid obtained at optimum conditions. HCl at different concentrations (0.1 and 1.0 M) were used in receiver side. High levels of metals (Ca 78.73%, Mg 38.11%, Na 49.43%, K 64.62%, Al 97.59% and Zn 34.73%) were passed the receiver side using 1 M HCl for 24 h. Hence, it was observed that selective separation of phosphate and metals from digested sludge using Donnan dialysis process was achieved for phosphorus recovery.