1125-05-2986 **Julie Anne Bowman** (s707410@sbuniv.edu) and **Nicholas Lindell*** (n.lindell@uga.edu).
Games on Graphs: Seepage! Preliminary report.

The game of Seepage, first described by Clarke, et al. in 2009, is played by two players, Sludge, S, and Green, G, on a directed acyclic graph with a single source and several sinks. S and G alternately claim vertices of the graph, which subsequently cannot be claimed by the opponent. Sludge begins by claiming, or 'contaminating', the source. Afterwards, in sequence, G can claim, or 'protect', any vertex on the graph, while S can contaminate any vertex adjacent to an already contaminated vertex. S is said to win if any sink is contaminated; otherwise, G wins. The generalized version of this game allows G to claim multiple vertices each turn. The *green number* of a graph H, $gr(H)$, is defined to be the minimum k such that G can guarantee victory with at most k moves on each turn. Graphs are called $green-win$ if $gr(H) = 1$, $sludge-win$ if $gr(H) > 1$ and $k-green-win$ if $gr(H) = k$. In their paper, Clarke, et al. characterized green-win and k-green-win rooted trees T, providing a polynomial time algorithm for determining if $gr(T) = k$. We introduce a more generalized algorithm that determines if $gr(H) = k$ for any directed acyclic graph, as well as methods to reduce the number of vertices and edges of a graph without changing the green number. (Received September 20, 2016)