



Investigation and simulation on fate and transport of leachate from a livestock mortality burial site

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Leachate released from livestock mortality burial during decomposition of carcasses can be a threat to groundwater quality. Monitoring study of groundwater quality in the vicinity of livestock burial reported that a caution is needed to prevent contamination of both groundwater and soil, especially in case of mortality burial (Glanville, 2000; Ritter and Chirnside, 1995). The average concentration of ammonium-N and chloride is reported to be 12,600 mg/l and 2,600 mg/l respectively, which is 2-4 times higher than leachate from earthen manure storages and landfills (Pratt, 2009). To assess the potential threat of burial leachate to groundwater quality, simulation of leachate transport is performed based on a hydrogeologic model of an actual mortality burial site. At the burial site of this study located at a hill slope, two mortality pits have been constructed along the slope to bury swine during the outbreak of nationwide foot and mouth disease (FMD) in 2011. Though the pits were partially lined with impermeable material, potential threat of leachate leakage is still in concern. Electrical resistivity survey has been performed several times at the burial site and abnormal resistivity zones have been detected which are supposed as leachate leakage from the burial. Subsurface model including unsaturated zone is built since the leakage is supposed to occur mainly in lateral of the burial pits which is in unsaturated zone. When examining leachate transport, main focus is given to a nitrogenous compound and colloidal character of FMD virus. Nitrifying and denitrifying characters of nitrogenous compound and transport of colloidal particles are affected mainly by soil water content in unsaturated zone. Thus, the fate and transport of burial leachate affected by seasonal variation in recharge pattern is investigated.

References

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