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Environmental Operations and Deterrence: Modeling Radioactive Contamination Mitigation Strategies through Plant Growth

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Abstract: The purpose of this research is to determine the relationship between soil type, uptake, and decontamination of radioactive isotope contamination. We approached this problem with a focus on three questions related to the influence of soil type and uptake on decontamination. Primary findings to date include permeability rates calculated for twelve key soil types and the findings of total expected isotope uptake in an average yielding acre of corn. These findings, along with calculated radioactive incidents of release, were used to determine the viability of accelerated decontamination of an agricultural environment. Future work will entail construction of a functional Systems Dynamic Model, linking together the various isotopes, environments, soil compositions, and hydrological patterns on biomass at different stages of a crop's growth cycle. This model will inform decision makers' efforts to evaluate potential means of decontamination to ensure the resiliency of a susceptible and fragile agricultural environment.

Keywords: Plant Uptake, Radioactive Isotopes, Phytoremediation