AKAMUNE G EBRUBA

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QUESTION 1

River water pollution by wastewater can cause significant negative impact on the aquatic sustainability. Hence, accurate modeling of this complicated system and its cost-effective treatment and reuse decision is very important because this optimization process is related to economic expenditure, societal health, and environmental deterioration. In order to optimize this complicated problem, we should first consider various life cycle costs of wastewater treatment and reuse alternatives such as micro-screening filtration, nitrification, and diverted fertilization-wise irrigation as well as settling and biological oxidation. Under the optimally minimized budget, all the technical and regulatory constraints such as dissolved oxygen level along the river reach, nitrate-nitrogen level in groundwater, nitrogen amount for crop uptake, irrigation area size, and treatment amount in filtration process should be addressed.

QUESTION 2

Environmental engineers and waste water engineers have played pivotal roles in protecting the public from viral illnesses, and continue to do so today.

-Theydevelop drinking water and municipal wastewater treatment technologies.

-They make discoveries that inform related regulations and policies, and conduct critical research on the presence, persistence, and transport of viruses in the environment.

-They are well positioned to apply their unique skill sets and experience with interdisciplinary research to address these needs.