

NITRATE MITIGATION SYSTEMS FOR SPRINGS PROTECTION

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Increasing nitrate levels in springs are a major concern for their associated ecosystems. The sources of the nitrates have been identified as agricultural and urban fertilizer use, septic tanks, municipal wastewater treatment facilities, and livestock operations. To help mitigate these sources, a nitrate mitigation system has been developed that captures nitrate laden water as it enters the top of the surficial aquifer. The extracted groundwater is either used for irrigation or is pumped through a denitrification bioreactor to strip the nitrates from the water before returning it to the aquifer. Five systems have been installed on five separate farms in north Florida. The nitrate mitigation systems design, lessons learned, and current systems' performances will be presented. For example, the latest system installed on a 125-acre dairy sprayfield captured approximately 4.5 tons of nitrate (as N) from the groundwater for irrigation reuse in its first six weeks of operation, while the denitrification bioreactor for this system has also demonstrated an over 95% nitrate removal efficiency. This technology will also be discussed as to how it can be applied the other sources, including leachate from septic tank drainfields and residential fertilization, with potential nitrate removal rates approaching 100%.

PRESENTER BIO: Dr. Bottcher is president of SWET with more than 40 years of experience in the development and implementation of best management practices for water quality control for both agricultural operations and urban stormwater. He has led over 50 different projects throughout Florida and internationally dedicated to reducing anthropogenic impacts on the environment.