Mykolaiv Water Hub

Water Leaders Course

National University of Water and Environmental Engineering

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Module 3: Water Reuse, Part 2

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Presentation Outline

- Case Study 1: Indirect potable water reuse in Maryland, USA
- Case Study 2: Off-grid agricultural water reuse in Namobuddha, Nepal

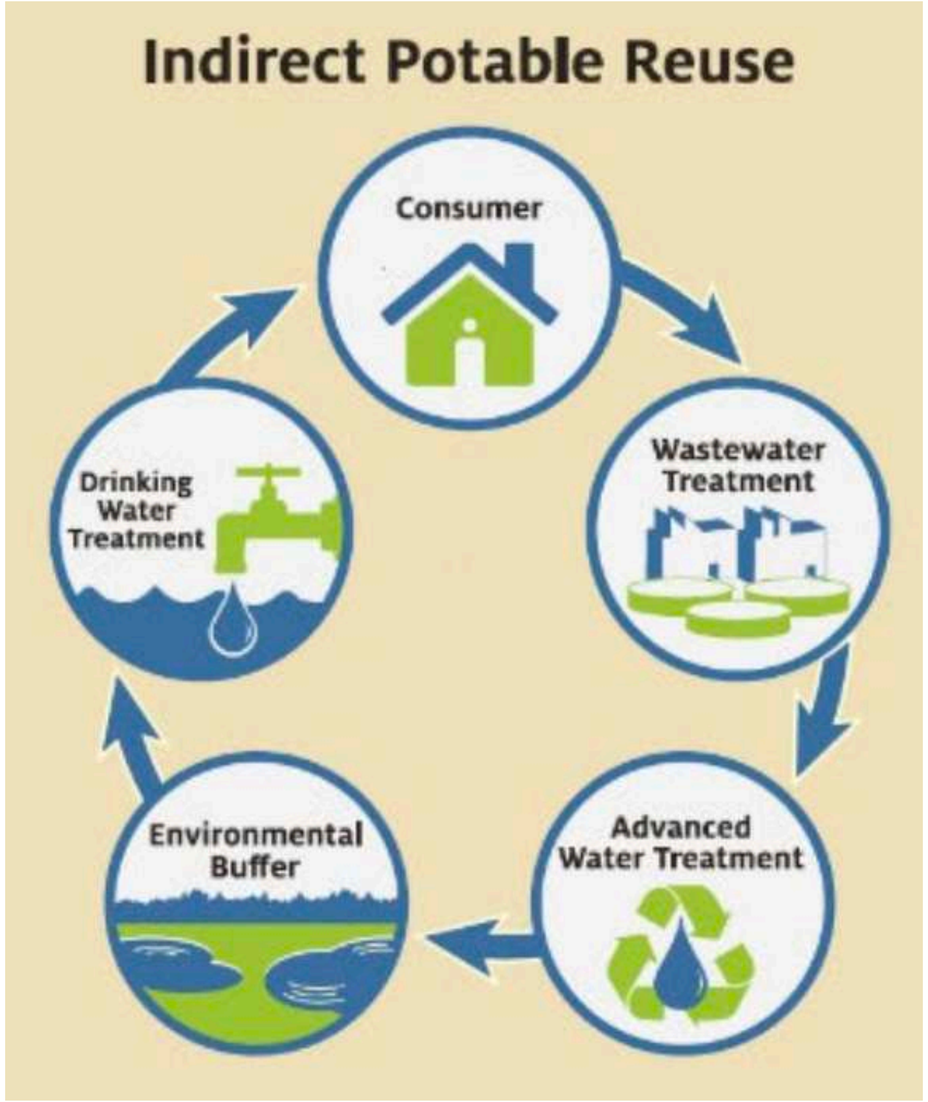




Case Study 1: Indirect Potable Water Reuse

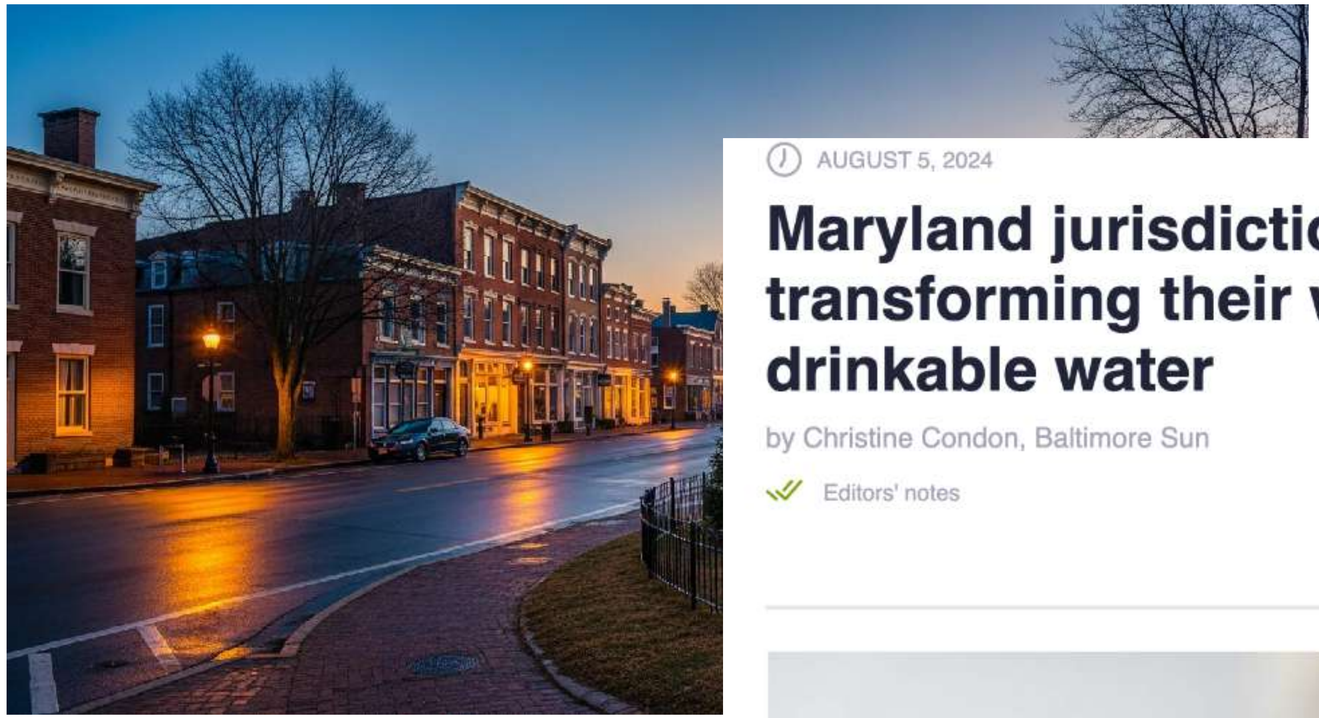
PureWater Westminster (Maryland, USA)

Recap of Indirect Potable Reuse



Source: Texas Water Development Board

Westminster, Maryland, USA



AUGUST 5, 2024

Maryland jurisdictions consider transforming their wastewater into drinkable water

by Christine Condon, Baltimore Sun

Editors' notes

Add as preferred source





PureWater Westminster

- Planned **indirect potable reuse** facility will further purify wastewater effluent
- Purified water will be discharged to a reservoir and serve as source water for the drinking water treatment plant
- First indirect potable reuse project in Maryland



Advanced Water Treatment Process

Figure 2 demonstrates all the unit processes from the existing WWTP to the proposed PUREWater Westminster facility to the Cranberry Reservoir to the existing Cranberry WTP.

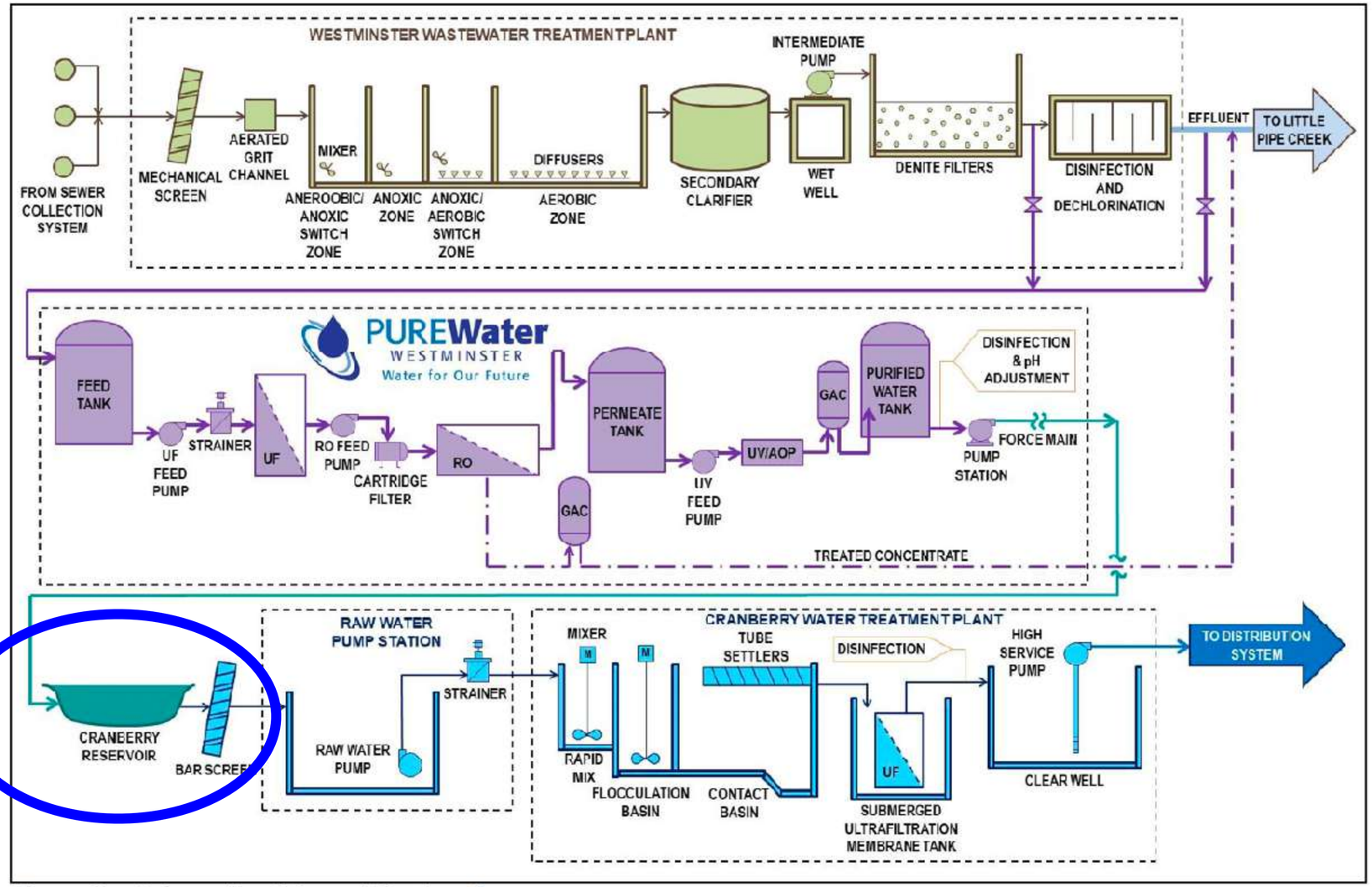


Figure 2 – Schematic of Overall System Processes

The essence of indirect potable reuse.

https://www.westminstermd.gov/purewater

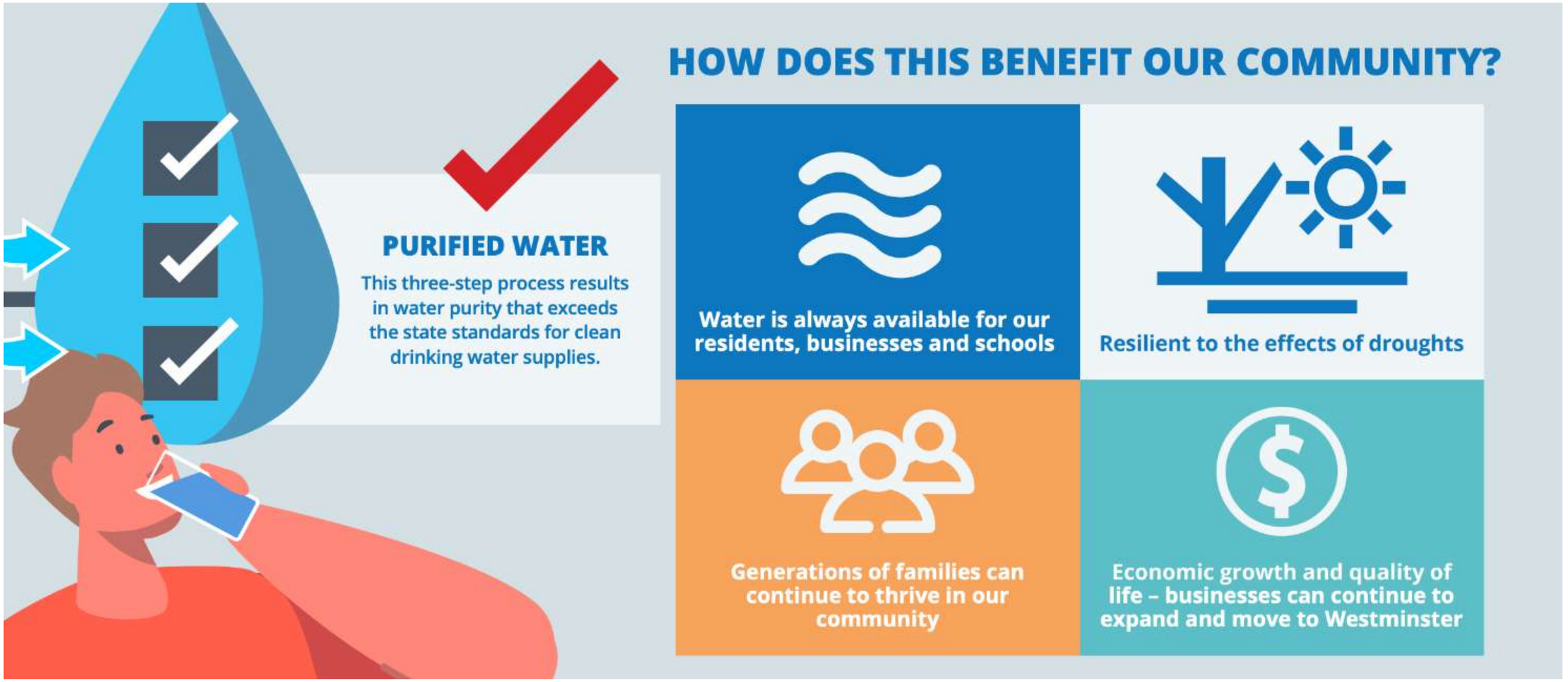
Example Bacterial Results from Our Lab

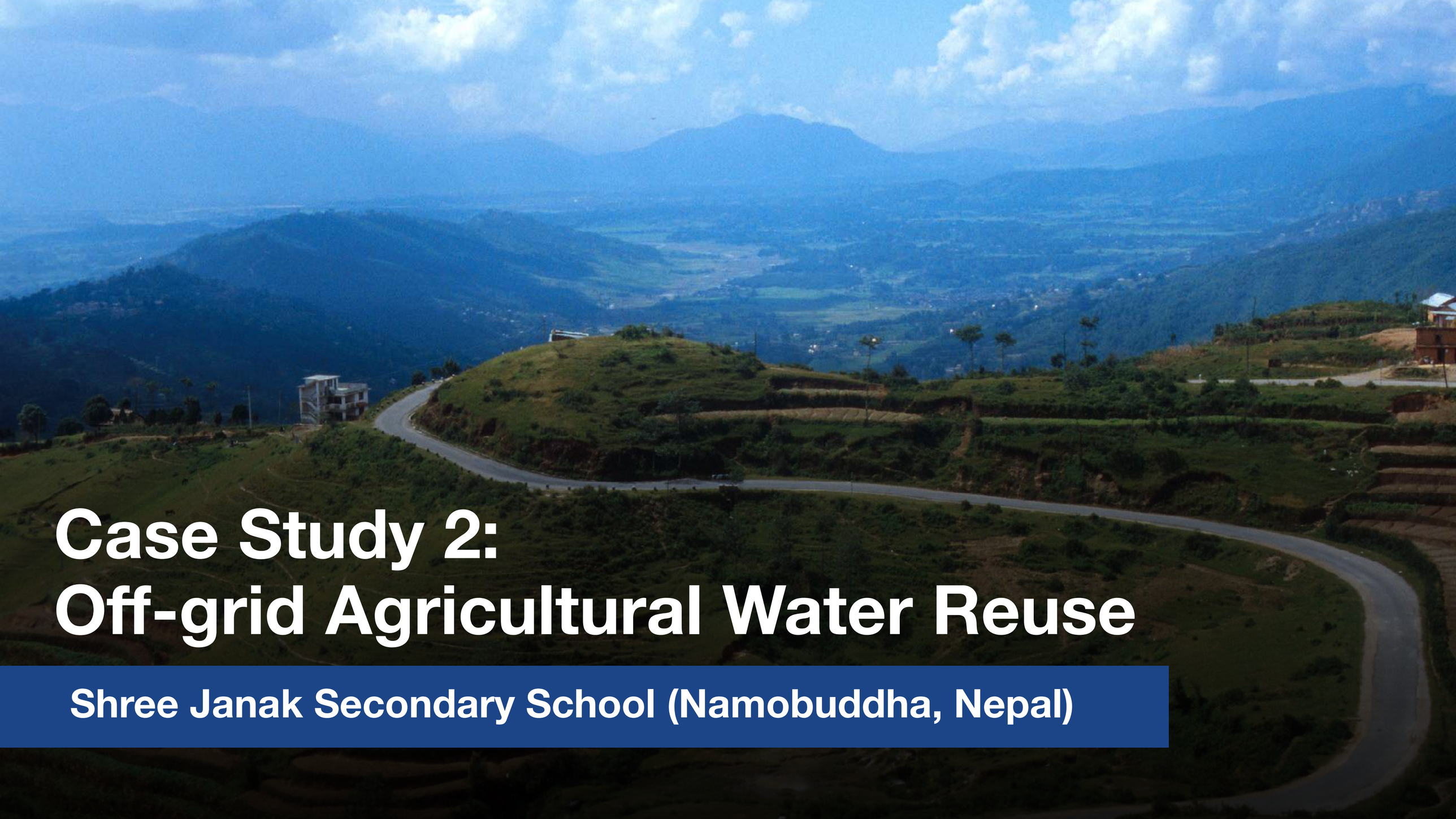
Table 52 – *E. coli* Log Removal Values (LRVs) From Raw Wastewater Influent To The Effluent Of The Pilot Plant

Sample Location	12/15/21	1/12/22	1/20/22	1/27/22	2/2/22	Mean	SD
Raw Wastewater Composite	4.20E+07	3.30E+07	2.30E+07	3.40E+07	3.20E+07	3.28E+07	6.76E+06
S-11 or S-8R (beginning on 12/15/21) Purification Facility Effluent (CFU/100mL)	0	0	0	0	0	0.00	0.00
S-11 or S-8R (beginning on 12/15/21) Purification Facility Effluent (Estimated CFU/mL value utilized in LRV calculation)*	0.5	0.5	0.5	0.5	0.5	0.50	0.00
LRV = log10 (Influent Concentration/Effluent Concentration)	7.92	7.82	7.66	7.83	7.81	7.81	0.09
Percent Removal	99.99999%	99.99999%	99.99999%	99.99999%	99.99999%	99.99999%	0.00000%

* The detection limit of the MI agar method is 1 CFU/mL. Since all of the S-11 and S-8R findings were below the limit of detection, we need to estimate the actual value in order to perform the LRV calculation. Here, we are using ½ the limit of detection or 0.5 CFU/mL. We are currently exploring more sophisticated estimation approaches.

Community Benefits





Case Study 2: Off-grid Agricultural Water Reuse

Shree Janak Secondary School (Namobuddha, Nepal)

Namobuddha, Nepal: Shree Janak Secondary School



“Shree Janak Secondary School is one of the oldest, most reputable, and well-established educational institutions in Bagmati Province.”



The Challenge

- Untreated wastewater from the school’s dormitory was being released into the environment

- The school’s “Learn to Earn” hands-on agricultural program was constrained by limited irrigation water





The Solution



The Laguna Innovation wastewater treatment system turns wastewater into safe irrigation water for the school’s instructional food plots.



Off-grid, solar-powered wastewater treatment and reuse

Take Home Messages About Water Reuse

- Global water shortages threaten environmental and public health
- Climate change is exacerbating existing water challenges
- Water reuse is an important part of future water and food security solutions
- Potable and agricultural reuse solutions will enhance the sustainability of communities around the globe



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Thank you!

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