

Kenya Water Supply Project

Project Overview

This project focuses on the development of a sustainable borehole-based water supply system for the Kogwari community in Homa Bay County, Kenya. The community of approximately 180 families currently relies on seasonal water pans and distant boreholes, both of which are unreliable and frequently contaminated. An assessment conducted confirmed public health risks, as well as the disproportionate burden placed on women and children who travel long distances to collect water. Following hydrogeological studies, environmental review, and community agreement, a central borehole site was selected. The project has now advanced into the implementation phase, with borehole drilling completion in December 2025. In May 2026, the team will travel to support system installation, oversee construction, and conduct community training. The completed system will include a solar powered pump, elevated storage tanks, water sanitization components, and a piped distribution network designed to provide approximately 30,000 liters of safe water per day. This infrastructure will establish a reliable, community managed water supply.



COLLABORATION OF FACULTIES, STUDENTS, AND LICENSED PROFESSIONAL ENGINEERS

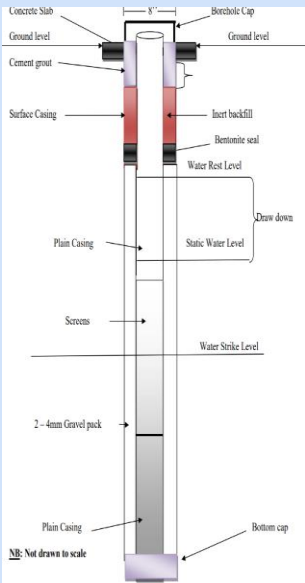
Students collaborate closely with licensed professional engineers, faculty mentors, and in country technical experts through Engineers Without Borders USA to design and implement a safe, sustainable water system for Kogwari. Technical oversight from experienced professionals, including the Responsible Engineer in Charge and faculty leadership at Howard University, ensures that all designs meet engineering standards and prioritize long term public welfare. Student leaders manage day to day coordination, budgeting, safety planning, communications, and monitoring efforts while receiving structured mentorship in technical design, construction oversight, and ethical decision making. This integrated approach strengthens students' professional development while ensuring the community receives a reliable, community managed water system built to last.

November 2024
Phase 0: Project Adoption and Approval

Spring 2026
Phase 2: Borehole Implementation and System Construction

May 2025
Phase 1: Assessment and Hydrogeological Data Collection on.

Post-Implementation
Phase 3: Monitoring & Evaluation evaluate system performance.



Schematic design for borehole completion

KNOWLEDGE/SKILLS GAINED

- Technical Application:** Apply engineering theory to a real-world humanitarian challenge through borehole design, pump and storage sizing, solar integration, hydraulic analysis, and water quality evaluation under licensed Engineers Without Borders USA mentors.
- Professional Development:** Build leadership, budgeting, fundraising, logistics, and cross-cultural communication skills by planning and executing assessment and implementation trips.
- Ethics & Public Welfare:** Uphold core engineering principles by prioritizing safety, sustainability, and community ownership—under faculty and professional guidance—while understanding how technical decisions directly impact public health and daily life.

MULTIDISCIPLINE AND ALLIED PROFESSION PARTICIPATION

The project integrates civil, environmental, mechanical, electrical, and chemical engineering disciplines alongside public health and project management. Students apply skills in borehole design, pipeline routing, solar pump integration, and water quality testing while coordinating budgeting, fundraising, travel logistics, safety planning, and community education. Guided by professional engineers and supported by local leaders and government partners, the team ensures the system is technically sound, culturally appropriate, and sustainable.



Property Tested	Lake Bottle	Lake Bottle	Otaro Bottle	Otaro Bottle	B1 Bottle	B1 Bottle	B2	B3	WHO
pH	6	6	8	8	8	8	8	8	5
Caco3 (mg/L)			425	425	425	425	100	425	60
Fe (mg/L)									0.3
Cu (mg/L)			0.2	0.2					0.1
Pb (mg/L)			5	5	5	5	5		0.05
Mn (mg/L)									0.1
Cl (mg/L)									250
Hg (mg/L)									0.001
No3 (mg/L)									10
No2- (mg/L)									0
So4 (mg/L)									400
Zn (mg/L)					5	5	5		5
F (mg/L)									0
NaCl (mg/L)									0
TA (mg/L)	120	120	180	180	180	180	180	180	0

Resulting summary of water quality



Protecting public health and safety is a core focus of the project. A protected borehole will access a deeper aquifer, and water will be tested and treated through chlorination and filtration before entering sealed elevated storage tanks and a closed pipe distribution network to prevent contamination. This infrastructure reduces exposure to waterborne diseases and minimizes the risk of recontamination at the household level. Shorter travel distances to tap stands improve physical safety for women and children, while community training on system maintenance and safe water practices supports long term health and reliability.

PROTECTION OF THE HEALTH, SAFETY, AND WELFARE OF THE PUBLIC