

Gravity Fed Water Distribution System

Filo Verde, Panama



Project Overview

Summer of 2014, ABC's Inc. traveled to Filo Verde, Panama (Figure 1) to gather data in order to update and expand the gravity fed water distribution system currently in the community.

The problems with the community's water system include:

- Not receiving enough or reliable water
- 5 houses above the tank which cut into the system
- Pipes break often and are not repaired properly
- Community does not believe that their water is unsuitable for drinking



Figure 1: Map of Panama

Mission Statement

Design a reliable, sustainable, and safe water distribution system for the community of Filo Verde. This design will include a rehabilitation of the current water distribution system as well as the addition of a new water source. ABC's Inc. has designed this system to be economically feasible, reliable, and physically constructible for the Filo Verde community.

Community Background



- Population: 375 people
- Language: Ngäbere & Spanish
- 2.5 mile hike from nearest road
- Elementary school in community
- 68% under the age 20
- Average grade: 6th
- Cash crops: pifá & cacao
- Located between 2 rivers
Río Caño Clarita
Río Caño Sucio

Data Gathered

Surveying included the following:

- Current system from the spring source to the tank
- New spring source to the community
- Elevation profiles through the community

Water quality tests were performed on the following:

- Taps throughout the community
- Current tank
- New spring source
- Rivers

The results (Figure 2) were shown to the community and the Peace Corps Volunteers and ABC's Inc. are endorsing in home treatment.



Figure 2: Water Test Result showing 190 fecal coliforms

Proposed System

The community members discovered a new spring source that was included in the design to provide a larger amount and more reliable water. The current system and the proposed system will be combined into one system. A map can be seen in Figure 3 and below are the proposed system elements.

- A spring box to protect the new spring source from contamination
- Over a 700 foot elevation change from the new spring source to the community
- 2 pressure break tanks
- A cable-tie river crossing over the Caño Sucio with concrete anchors and steel towers
- An elevated wooden platform for plastic storage tank to allow the two systems to work together

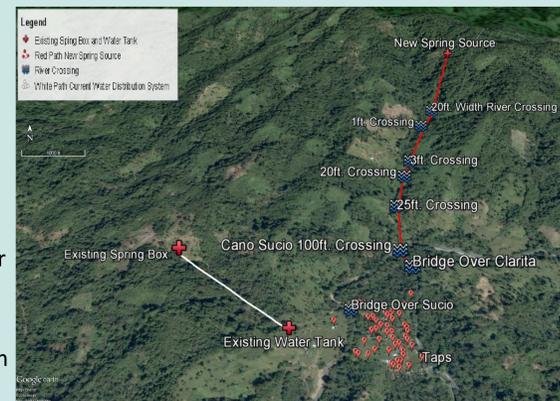


Figure 3: Map of systems in community

Current System

- New reinforced concrete tank above the current tank with 2 chambers
 - Chamber 1 provides water for the 5 houses that are currently above the tank
 - Chamber 2 provides water to the rest of the community
- Install cut-off valves to allow broken pipes to be repaired properly

Schedule

52 days to construct the system with 15 people working. The community only works for 3 hours on Friday and Saturday, so it will take about 5.5 months.

- | | |
|--------------------------------|--------------------------------------|
| New System Construction | Current System Rehabilitation |
| -Spring box 7 days | -New tank 6 days |
| -Pressure break tanks 5 days | -Cut-off valves 3 days |
| -River crossing 8 days | |
| -Platform 10 days | |
| -Piping 9 days | |

Cost Estimate

Component	Cost
Materials: New System	\$6,986
Materials: Current System	\$830
Labor: New System	\$1,641
Labor: Current System	\$247
Equipment	\$133
Total Cost	\$9,837

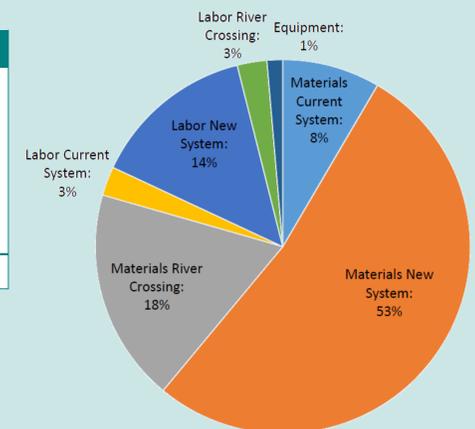


Figure 4: Total Cost Estimate Breakdown by Components

-Community's contribution to the government-funded project will be through providing labor.

Recommendations



- ABC's Inc. has designed a system and updated the community's current system that satisfies all the needs given by the community members in Filo Verde, Panama.
- ABC's Inc. is endorsing in home treatment of the water instead of including treatment in the system.

ABC'S INC.



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