Austin Kim October, 2024

Forge Garden

Water Feature Research

- 1) Project Description
- 2) Interview Summary
- 3) Brainstorm
- 4) Research
- 5) Design



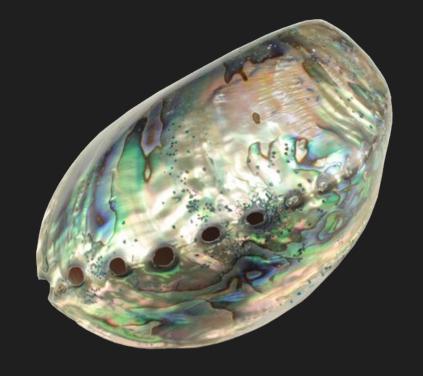
Project Description

- Collaboration with the Muwekma Ohlone Tribe and Forge Garden
- For the Muwekma Ohlone Tribe and the general community
- **Objective:** Create a water feature, where the sound of running water could be heard Preferred budget: \$100

Interview Summary

- Abalone shells are an importance to the Muwekma Ohlone Tribe
- The water should fall vertically and the fountain itself should be relatively small
- The system should be on 24/7 using renewable energy
- Cares about longevity, but can have some maintenance necessities aspects
- Abalone shells are emphasized (we don't know if she wants it on the fountain or around)

Elements that are needed







Abalone Shells

Aesthetics

Water Feature

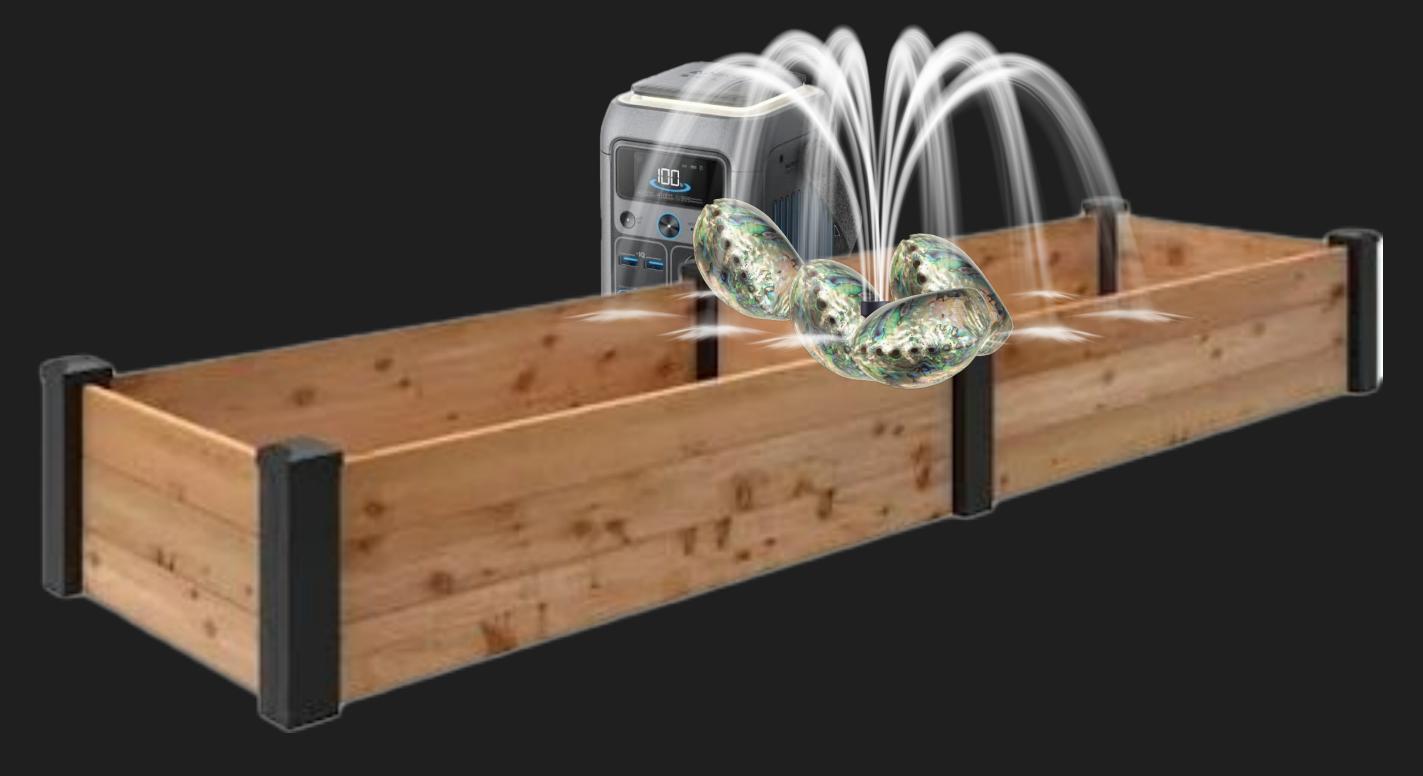
Core of Project

Uninterruptible Power Supply (UPS) with solar

Additional Benefit



Plant Bed (provided)







Proposed Plan

Battery Cap in Wh x Battery Efficiency / Wattage = Total Time

Runtime Calculation will differ for each pump Consider the efficiency, and power factor of the battery.

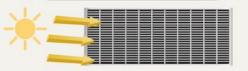
Consider the solar panel conversion factor.



Working Process of a Solar-Powered Water Pump



Solar Panels Collect Sunlight



When the sun's rays strike these cells, they excite the electrons and create an electric current through a process known as the photovoltaic effect.

The electricity generated by PV cells is Direct Current (DC), which flows from the panels to cables to the inverter or directly to the pump.

PV Cells Generates
Direct Current

2

Inverter Converts
DC Into AC



The inverter then converts the DC electricity into an Alternating Current and passes it on to the controller.

The controller then regulates the voltage within the safe limits to prevent overcharging and potentially damaging the batteries.

Controller Regulates
The Voltage



5

Water Pump
Operation



The DC or AC electricity is passed onto the water pump, which uses it to lift water from the source and deliver it to the desired location.

Source

www.jackery.com

Cost Analysis: Battery w/ Panels \$109.99



Affordable

22,500 mah

\$319.98

+ Longevity + 90,000 mah

Cost Analysis: Water Features



\$43.39

- + 16" x 27"
- + Rustic Barrel
- Might not be what they're looking for



\$62.57

- + More sound
- Needs water underneath



\$99.35

- + Wood
- Pricy

Cost Analysis: Abalone Shell

\$15.99

- Cheap More reflections and coverage



- + Full shells
- Pricy



\$17.97

- + Many Shells- Looks less like abalone Less shiny

Alternate: DIY Build a Water Feature



Material Estimated Costs (from video):

Pump: \$34.28

1/4 Tube: \$11.99

Water Holding: \$71.95

Screws: \$9.32

Total cost: ~\$127.54

Note: This price does not include the renewable energy