

## Problem and Scope

Water availability is constant issue for people in less developed regions around the globe.

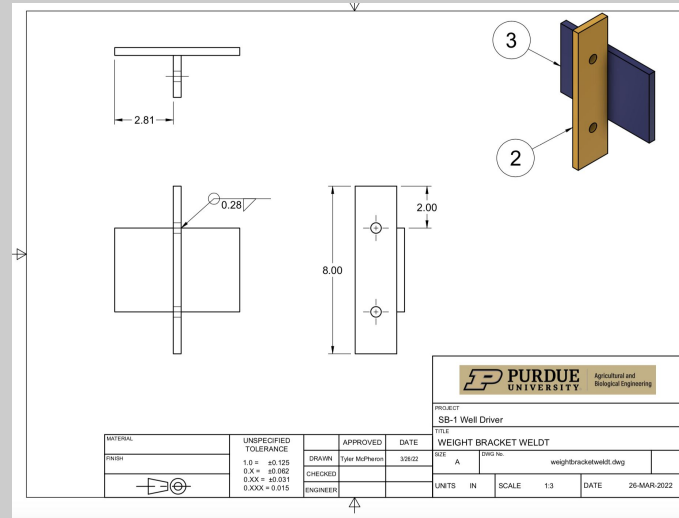
With the SB-1 Project the team would introduce a vehicle that is capable of navigating these less developed regions to drive wells for villages and local farms focusing on aquifers close to the surface.

The goal is to not compete with current commercial well-driving, but to have a cheap alternative allowing these less developed regions to have clean, easily accessible water sources.

## Solution

Implementing weights to double total weight of Ram.

With a heavier load the tubes driven can reach further depths.



Ram Weight Technical Drawing

SB-1 Well-Driver			
Description	Value	Units	Equation
<b>Fixed Displacement Hydraulic Pump Specifications</b>			
Manufacturer	Haldex Barnes		
Serial #	02137D		
Mfg. Date	Oct-97		
<b>Measured Values</b>			
Pump Displacement	6.06	cc/rev	
Rotational Speed	1800	RPM	
Relief Valve Setting	1750	Psi	
cc/rev to cu-in/rev	16.3871	cu-in/rev	
GPM conversion	231	GPM	
HP Conversion	1714	HP	
In-lbs. Conversion	6.28	in-lbs.	
<b>Calculated Hyd. Pump Metrics</b>			
Outlet Flow	2.88	GPM	$(1800\text{rpm} * (6.06\text{cc/rev}/16.3871))/231$
Fluid Power HP	2.94	HP	$(1750\text{psi} * (2.88\text{GPM}))/1714$
Pump Torque	103.05	in-lbs.	$(1750\text{psi} * (6.06\text{cc/rev}/16.3871))/6.28$

Hydraulic Pump Specifications

## Results

The SB-1 Project has implemented designs for safety, cost effectiveness, and efficiency. By utilizing the frame of an earlier PUP project the SB-1 is designed to fulfill all requirements.

By being a cost effective solution it will be able to compete with multi-thousand dollar commercial wells in less developed regions.



Ram Weight Fabricated Results



SB-1 Project Being Tested



### Features:

- Can drive in varied terrain with ease.
- Can drive wells to reach aquifers.
- Safe, easy to use operation allows for quick production of wells.

### Impact:

In the short term, the project will be continued through further research, validation, and testing by grad students.

In the long term, the plan is to have multiple vehicles in less developed areas producing wells for those who need it.

### Value Proposition:

Where commercial drilling costs 5 to 6 thousand dollars this project offers a cheaper, cost effective solution.



## SB-1 Improvements to The Well-Driver PUP

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*Striking Water  
Scarcity One Well  
at a Time*

Well Depth (ft.)	Cost (\$)
20	\$ 232.26
25	\$ 265.12
30	\$ 297.98
35	\$ 330.84
40	\$ 363.7
45	\$ 396.56
50	\$ 429.42

(Baldwin, 2022)