

# The Largest Mass Poisoning In Human History

- Millions of people in South Asia depend on shallow tube wells for their drinking water.
- A large fraction of these wells are contaminated with natural arsenic, exposing over 60 million people to the poison.
- Chronic, low levels of arsenic cause painful lesions, gangrene, cancers, neurological development problems, and premature death.



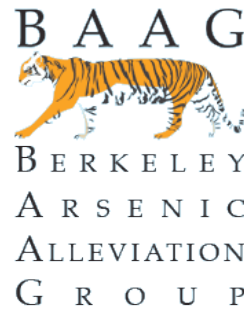
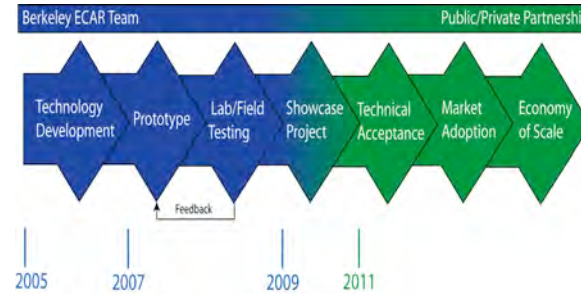
## WHY DOES THIS PROBLEM PERSIST?

Household filters suffer from lack of adoption and maintenance.

Donated community treatment centers often fall into disrepair.

**GOAL:** Create a treatment system that is technologically effective, financially viable, and socially sustainable, to remove arsenic from contaminated water and provide clean water to communities.

## FUTURE PLANS



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## ARSENIC-FREE DRINKING WATER

## ELECTROCHEMICAL ARSENIC REMEDIATION (ECAR)

*Affordable Access to Clean Water*

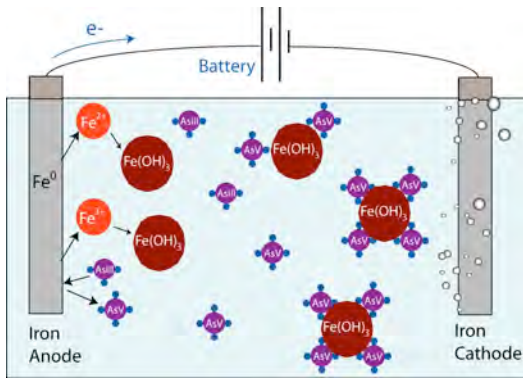


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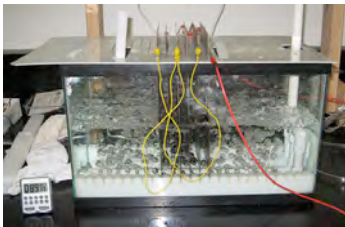
# WHAT IS ECAR?

ECAR is a technology that uses electricity to remove arsenic from water.

## HOW DOES IT WORK?



1. Electricity dissolves iron to make rust.
2. Rust binds to arsenic.
3. Rust is removed, bringing along the arsenic.
4. The water is left iron- and arsenic-free.



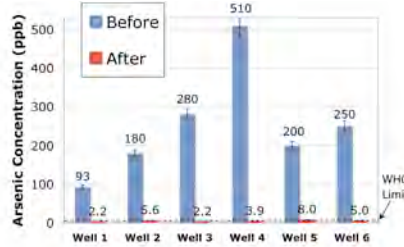
## ELECTRICITY

Requires less than 12V  
 Intermittent source ok, due to batch process  
**Where will it come from?** Power grid, solar panels, or even a car battery.  
 Cost can be covered by water sales.

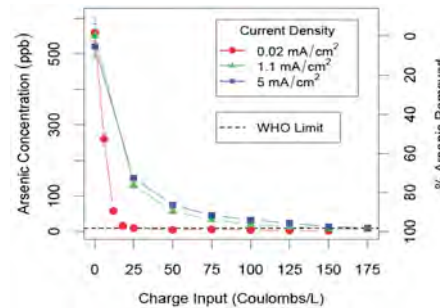
## ECAR IS EFFECTIVE

Arsenic reduced to below WHO limit (10 ppb) under a variety of operating conditions and in different groundwaters.

### In the field:



### In the lab:



## ADVANTAGES OF ECAR

**Effective:** Reduces As(III) and As(V) to <5 ppb (WHO limit = 10 ppb)

**Low Cost:** Operating Costs estimated at < 1 cent/person/day

**Low Maintenance:** Reversing the current cleans the electrodes

**Minimal Supply Chain:** ~200g of iron/person/year

**Low Waste:** ~ 300g/person/year

**Scalable:** Small infrastructure set up

Initial field tests in Bangladesh and Cambodia (Summer 2008) were successful. Level of arsenic was below WHO limit of 10 ppb in **every test**.

## A VISION FOR IMPLEMENTATION

# COMMUNITY CLEAN WATER CENTERS

Financially sustainable community systems with full cost recovery operating under a **Public-Private Partnership**



We envision a locally owned clean water center where water is sold at a modest profit for an affordable price

- Profit ensure stakeholders will remain invested long term
- End users are not responsible for operation, maintenance, and repairs
- Arsenic levels can be carefully monitored and waste can be disposed of properly
- Cost recovery can include an electricity source



Our Vision