

# Repair with Hair

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## Abstract

Oil spills have been greatly impacting the ecosystem and drinking water in the Niger Delta, causing adverse health effects on the Nigerian people. We propose the use of hair mats to remove oil from contaminated water. Two filter systems were made to attempt to remove oil from the water. Though precise data could not be collected, we were able to visually show the effectiveness of hair mats.

## Background

- The Niger Delta is home to 31 million people
- Oil was found in the delta in the 1950s
  - The petroleum industry accounts for 60% of Nigeria's income today
- Attacks on oil pipelines, pipeline corrosion, and lack of safety procedures have caused over 7,000 oil spills since the 1970s
  - Over 9 million barrels of oil spilled
- Oil contamination has destroyed vast amounts of ecosystem
  - Farm land
  - Fishing grounds
- The Nigerian people suffer from numerous health issues
- No access to clean water and untainted food



## Project Goals/Objectives

- **Need:** To clean water in the Niger Delta
- **Approach:** Use hair mats to remove oil from water.
- To determine if the use of hair mats could be a potential approach to preventing the presence of oil in drinking water, through research.
- To determine the feasibility of such an approach in the Niger Delta.



## Methods/Process

### Filterer

- Create a filter by taking a small amount of hair and putting it in the stocking.
- Cut off the top of a water bottle about 1 inch from the top. Take this piece and flip it over to use as a funnel.
- Place the funnel inside the bottle and duct tape the edges to prevent oil from leaking into the bottle.
- Put the hair filter in the funnel and pour oil contaminated water into filter.

### Clean up method

- Fill stocking with hair and remove oil from water by sliding hair along the surface of the water.

## Facts About the Niger Delta and Hair Mats

- Well water in the Niger Delta contains benzene at levels 900 times above WHO guidelines.
- Long-term exposure at relatively low levels can cause serious effects:
  - Cancer
  - Gene mutations
  - Blood disorders
  - Lung, liver and kidney damage
  - Immune system suppression
  - Disruption of hormone levels
- A pound of hair absorbs a quart of oil in one minute and can be reused up to 100 times.
- 98% of the oil sopped up by the mats can be recovered.



## Results/Conclusions

- Stocking containing hair visibly removed petroleum oil from both the bath of water/oil mixture and the filtration apparatus.
- The ability of the hair mat to remove trace amounts of oil from water could not be determined.
- Based on the experiment, hair mats have the potential to be an effective means for absorbing oil in the Niger Delta.

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