Team

HERMETICA

PRESENTS

THE OCEAN CLEAN UP

EXECUTIVE MEMBERS

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Introduction: -

Water pollution is a broad term that describes any kind of contamination of bodies of water such as rivers, lakes or wetlands with substances that can pose threats to human health or the natural environment. Such pollution is a major source of death and disease worldwide, especially in developing nations. Even in wealthier nations where piped water supplies mean that water pollution poses fewer direct threats to human health, many lakes and rivers are polluted. Oil spill, leakage of petroleum onto the surface of a large body of water. Oceanic oil spills became a major environmental problem in the 1960s, chiefly as a result of intensified petroleum exploration and production on continental shelves and the use of super tankers capable of transporting more than 500,000 metric tons of oil.

Spectacular oil spills from wrecked or damaged supertankers are now rare because of stringent shipping and environmental regulations. Nevertheless, thousands of minor and several major oil spills related to well discharges and tanker operations are reported each year, with the total quantity of oil released annually into the world's oceans exceeding one million metric tons.

Past studies/techniques: -

In recent years, there have been numerous studies regarding the levels of contamination of the seawater by hydrocarbons. The majority of these studies were conducted following the Gulf War of 1991 and after, the BP Deepwater Horizon (DWH) oil spill on 20th April, 2010. The BP Deepwater Horizon (DWH) oil spill on 20th April, 2010, initiated the discharge of more than 2.6 million gallons (over 800 million liters) of oil into the Gulf of Mexico over approximately three months. This oil spill was the second largest in human history. During the 1991 Gulf War, the deliberate release of over 6 million barrels of oil into the marine environment was considered as the largest in history.

Recent Techniques: -

AT SHORES

1. **Shoreline Flushing/Washing:** Water hoses can rinse oil from the shoreline into the water, where it can be more easily collected.

2. **Booms:** Long, floating, interconnected barriers are used to minimize the spread of spilled oil.

3. **Vacuums:** Industrial-sized vacuum trucks can suction oil from the shoreline or on the water surface.

4. Sorbents: Specialized absorbent materials act like a sponge to pick up oil but not water.

5. Shoreline Cleaners & Biodegradation Agents: Chemical cleaners that act like soaps may be used to remove oil, but require special permission. Nutrients may be added to help microbes break down oil.

6. Burning: Also referred to as “in situ burning," freshly spilled oil can be set on fire, usually when it's floating on the water surface and sometimes on oiled marsh vegetation, in order to effectively remove it.

AT SEA

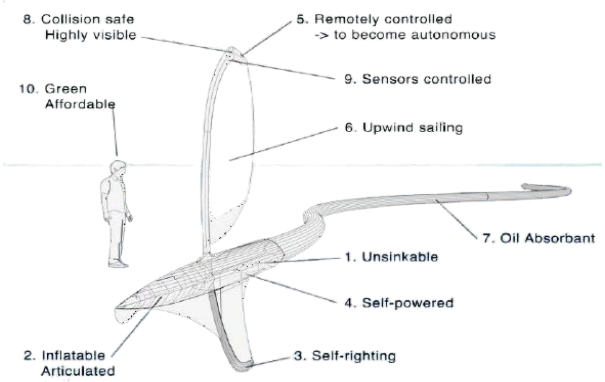
1. Dispersion: Chemical dispersion is achieved by applying chemicals designed to remove oil from the water surface by breaking the oil into small droplets.

2. Burning: Also referred to as "in situ burning," this is the method of setting fire to freshly spilled oil, usually while still floating on the water surface.

3. Booms: Booms are long, floating barriers used to contain or prevent the spread of spilled oil.

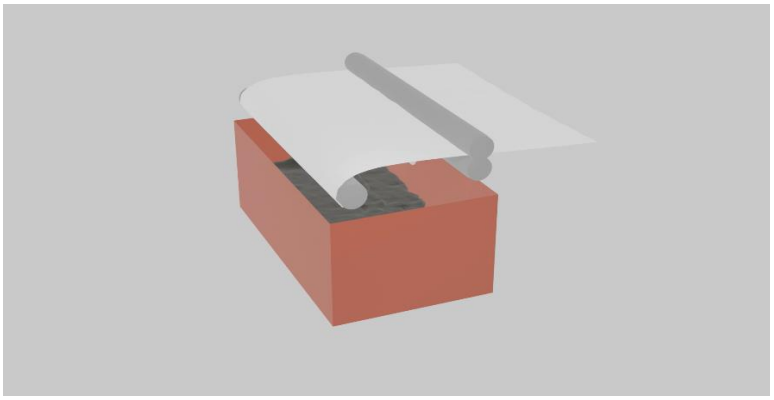
4. Skimming: Skimming is achieved with boats equipped with a floating skimmer designed to remove thin layers of oil from the surface, often with the help of booms.

Description: -



Detailed view of the boat with al all specifications

Polysulphide Polymer



Rollers attached at the end of the boat

Project “THE OCEAN CLEANUP” basically focuses on the problem of the “Oil Spill”, oil spill is the release of a liquid petroleum hydrocarbon into the environment, especially the marine ecosystem, due to human activity and it is a form of pollution, which is detrimental for aquatic life. The global annual average number of oil spills is more than 700 tons of oil between 2010 to 2019, which shows that treatment of this problem is very necessary. The basic goal of our project is to overcome the complication of oil spills and rescue our environment as well as our aquatic life.

In our model we are using a boat having malleable and flexible properties and at the end of the boat a “sugarcane machine” like structured machine is fixed, where large sheets that are made up of cellulose containing polymer (polysulphide powder) which, when the polymer comes with in the contact of water it going to act like a sponge to absorb the pollutant that is caused by oil spill in a very short period of time. We will be going to leave our boat in the ocean where there will be no spill and after that boat go to the oil spill area which will soak the maximum oil present in the water. We can recover the oil by squeezing the highly buoyant material and reuse those sheets again that later on can be used to soak up more oil from the water. The boat will be remote controlled and operated through a satellite and is also capable to work in poor weather conditions as well.

Impact/ Large Scale Application: -

Oil spill impact on environments and habitats can be catastrophic: they can kill plants and animals, disturb salinity/pH levels, pollute air/water. Mammals, such as sea otters and water repellency of a bird’s feathers, thus exposing these creatures to the harsh elements. Without the ability to repel water and insulate. From the cold-water birds and mammals will die from hypothermia.

This model is very useful in oceans on a large scale to control oil spills. This is a faster and cheaper method to control oil spills. Satellite is used to operate the boat which means this is very much effective in bad conditions also on a very large-scale area. We can reuse cellulose sheets by which we can use this up to a long extent. No human and environmental intervention is caused that means no harm to human life and environment.

Advantages: -

- **Save marine animals:**

Over the past few years, the world has woken up to horrifying headlines about sea life that has unfortunately died due to consuming or being trapped by the waste we throw in the oceans. When our garbage washes up on coastlines, it gives us an opportunity to remove it before the tide washes it back out. Removing litter that we find on the beach guarantees that marine wildlife won't come into contact with it and perhaps find itself imperiled in some way or another.

- **Preserve our natural treasures:**

Beaches are diverse, beautiful, natural treasures that are here for all of us to explore and enjoy together. Unfortunately, trash on our beaches jeopardizes these shared natural treasures. By cleaning up the beach, you ensure that visitors from all over the world can enjoy your beaches fully.

- **Help the local economy:**

Seaside communities around the world get a huge boost to their economies from both fishing and tourism. When beaches are free of litter, tourists and visitors are much more likely to enjoy them and spend money at businesses near the beaches. If the water is clear of litter, fishers as well as tourist- oriented businesses like scuba diving tours are more likely to be able to make a solid living for themselves. Your beach cleanup will help the local economy!

Disadvantages: -

- Emulsification can occur if sheets are present there for a longer time.
- If signal weakens, we may lose our boat which can cause pollution; whose chances to occur is less.
- Plastic present in the water bodies may cause problems in cleaning.

Future aspects:

- The main future aspects are to make ocean free from pollution
- Every year millions of tons of oil spill happen in the oceans from ships. Therefore, solving ocean oil spills requires a combination of stemming the inflow and cleaning up what has been accumulated.
- An oil spill is dangerous to our environment, but we can convert this distraction into a useful manner.
- Dispersants and booms and skimmers are the most frequently used methods to clean up ocean oil spills.
- It is recovered quickly; the oil can be separated from the water and reprocessed. Although it probably won't be sold on the open market, this oil can be burned to power