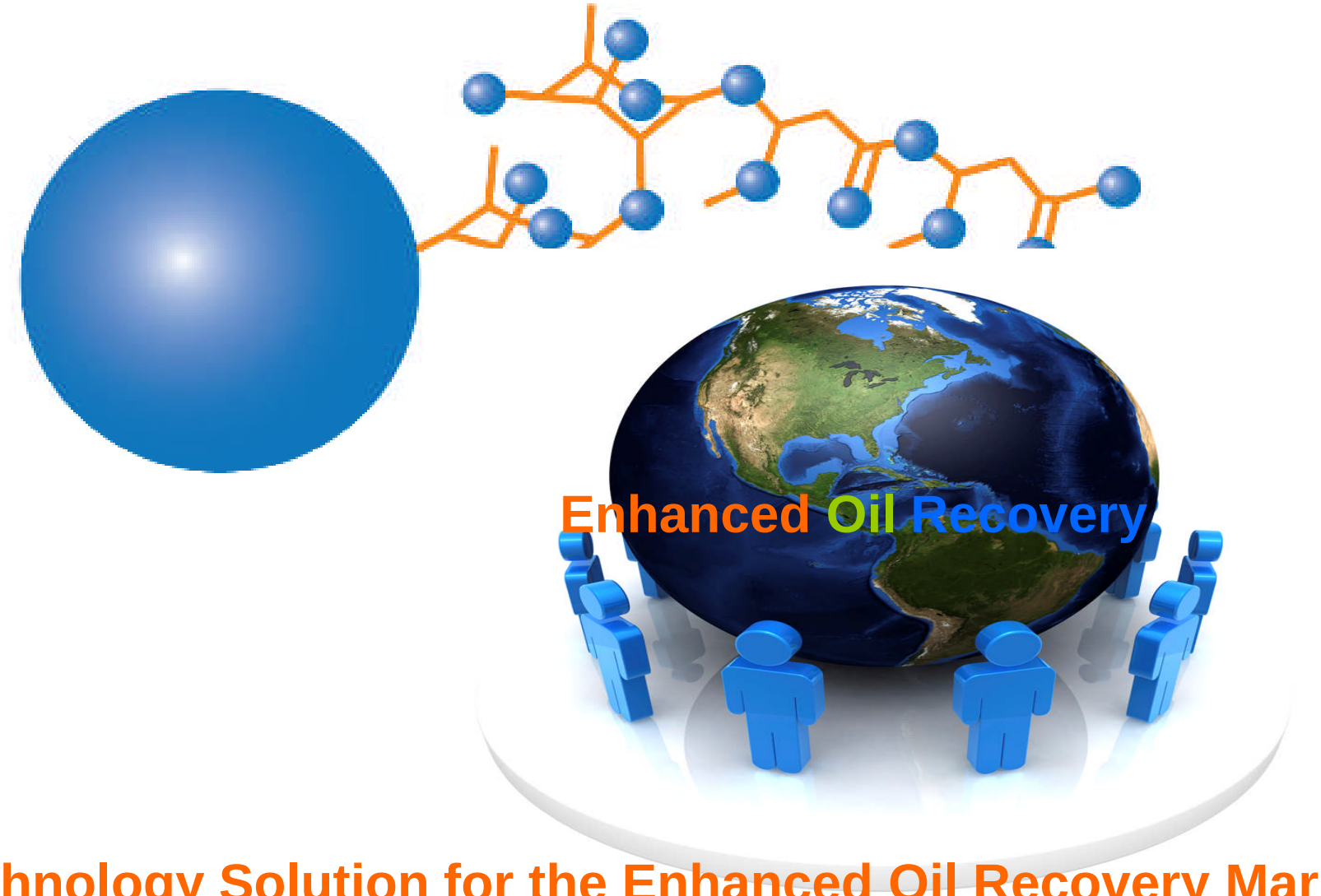
BIOSURFACTANT EOR, INC



“Technology Solution for the Enhanced Oil Recovery Market”

Biosurfactant EOR, Inc., www.BioEOR.com

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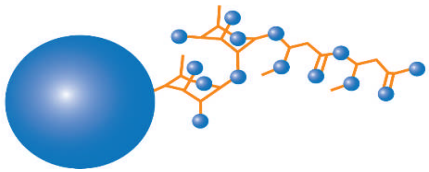

Department of Energy (DOE)- estimated that full use of next generation‘ EOR in United States could generate over 240 billion barrels of recoverable oil resources

Enhanced Oil Recovery (EOR) a technique used to increase the amount of oil extracted after the primary and secondary production stage has been exhausted.

- The typical drilling cycle of an oil well involves two stages:
- The Primary Stage - Utilizes the oil well's natural pressure to release the oil - taps about 25% of the reserve.
- The Secondary Stage - Utilizes additional pressure, usually water flooding, to release the oil - taps an additional 15% of the reserve

This leaves about 60% of the oil reserve still entrapped, or stuck in the ground due to more extreme geological conditions

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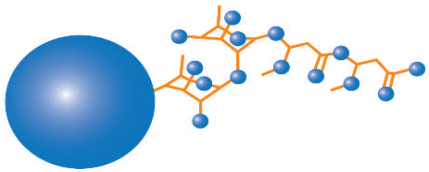

With 'easy oil' gone, companies must turn to technology-
Houston Business Journal"

CURRENT ENHANCED OIL RECOVERY (EOR) METHODS HAVE ***BEEN INEFFECTIVE- Nearly 380 billion barrels of crude oil - in the United States alone are stuck in sandstone or sand-packed columns Containing entrapped crude oil-*** **Encyclopedia Britannica**

- Typically, the petroleum industry has used a variety of EOR processes including mechanical (steam/CO2), chemical polymer and surfactants processes to increase production in oil and gas wells. These chemical or synthetic based methods have experienced only marginal success and provide short-term solutions with the following limitations:

- High cost of chemicals and injection and lift equipment
- Excessive chemical loss and gravity segregation often less effective
- Hazardous to the workers and the environment

Field tests have proven that rhamnolipids represents one of the next widely used surfactant technologies in Enhanced Oil Recovery…."*Rhamnolipids have been receiving increasing attention as a result of their unique properties, i.e., mild production conditions, lower toxicity, and higher biodegradability compared to their synthetic chemical counterparts"* **California Institute of Technology.**

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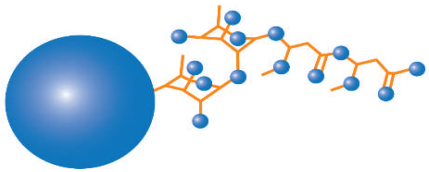

"An advanced Biosurfactant method to recover an additional 42% of entrapped Oil", DOE

- Biosurfactant enhance oil recovery is based on 'surfactant' technology, a word that is short for "surface active agent". Surfactants work at the boundary layer (the *interface)* between two materials. In the case of EOR, this would be the layer between the injected water and the entrapped crude oil in the ground.
- **How Surfactants Work-** Each surfactant molecule has a hydrophilic (water-loving) head that is attracted to water molecules AND a hydrophobic (water-hating) tail that repels water and simultaneously attaches itself to the crude oil. These opposing forces loosen the crude oil and suspend it in the water. The pressure of the oil well then pulls the crude oil toward the surface.
- **What are Biosurfactants-** They are biodegradable, a diverse natural based group of surface active molecules that simply reduce surface and interfacial tensions. Biosurfactants are superior over existing chemical based counterparts because of the following::
  - Lower toxicity & Higher biodegradability
  - Better environmental compatibility "**Green Technology**"
  - Higher selectivity and specific activity at extreme temperature, PH, and salinity
  - Ability to be synthesized from renewable feedstock – unlimited supply!
- Biosurfactants perform better than chemical counterparts in reducing surface tension. For example, distilled water has a surface tension of 72 mm. A chemical surfactant will reduce the surface tension to 30. **Rhamnolipid based Biosurfactants will reduce tension to 29 and are biodegradable!**

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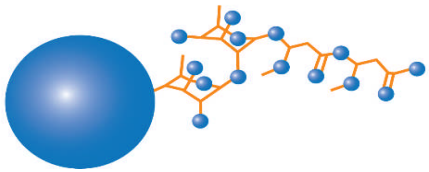

Positioned to capitalize on the exploding need!

Rhamnolipids were identified over 50 years ago. Historically used to clean oil spills – *Exxon Valdez spill*

– BioEOR now makes it possible for the petroleum industry to experience dramatically **increased oil recovery levels at a competitive cost** while also greatly reducing the environmental impact compared to other EOR methods.

A combination that has never been available until now!

Biosurfactant EOR, Inc.'s technology is superior to other conventional EOR methods:

1. Proven 40% plus release of entrapped oil.
2. Excellent surface tension qualities compared to synthetic surfactants.
3. All natural and environmentally safe with no residual toxic hazards.
3. Economically priced to compete with synthetics and other EOR technologies.
4. Minimal application effort and costs.

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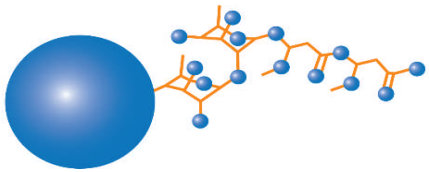

A Proven, LOW risk technology!

"With oil prices topping $100/barrel, interest in EOR in this country has never been higher" **Penn Energy, 2008**

Benefits of EOR:

* Increases overall oil production and supply
* Existing infrastructure/proven well already in place
* No new drilling exploration risk or negative publicity
* Enormous reserves of residual oil waiting to be released.
* Extends the life of the average well without increasing excessive lifting costs

Benefits of Biosurfactant EOR, Inc,:

- **Our compounds are pure Rhamnolipids, a 100% customizable solution.**
- **We understand that various components of Rhamnolipids have unique properties and application needs.**
- **We understand that the purity of this remarkable compound opens the door to a wide variety of end uses.**
- **Rhamnolipids are a Better emulsifier.**
- **Rhamnolipids can be diluted up to 1,000 percent.**

www.Bioeor.com

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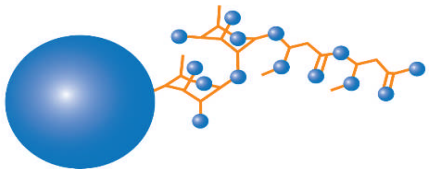

The research, field tests and producing well applications are indisputable: Rhamnolipid surfactants work!!!

"With just 250mg/L Rhamnolipids…42% of oil otherwise trapped oil was recovered from sand pack…These results are promising towards the application rhamnolipid for the EOR application"

U.S. Department Of Energy Study 2004 – 2007

"Rhamnolipid as a potent natural biosurfactant has a wide range of potential applications, including enhanced oil recovery"

Power, Energy and Environment Research (PEER) Center

The U.S. DOE Reservoir Database currently contains more than 600 reservoirs with over **12 billion barrels** of unrecoverable oil that are immediate targets for enhanced oil recovery.

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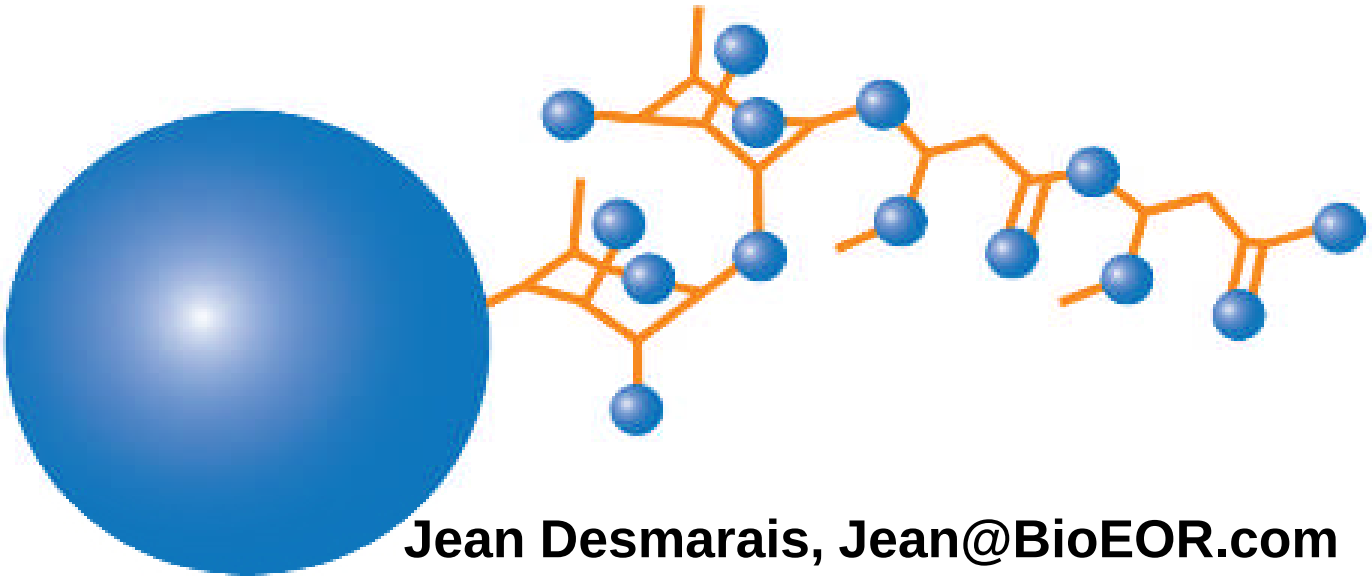

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Enhanced Oil Recovery –

“A Technology Solution for the Enhanced Oil Recovery Market”