



# PEAT

## Workers Environmental Education Project

### MODULE 1

#### OFFSHORE ACTIVITY



This program is a mitigation measure required by IBAMA during the federal environmental licensing process.



# SUMMARY



1. Campaign and entrepreneur
2. Phases of offshore campaign
3. Oil and Gas productive chain
4. Drilling unit and supply infrastructure
5. General concepts of global energy consumption
6. Uses of petroleum
7. Fossil Fuels: Non-renewable resource
8. Environmental impacts and risks
9. Health and safety
10. Positive social relations





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# CAMPAIGN AND ENTREPRENEUR

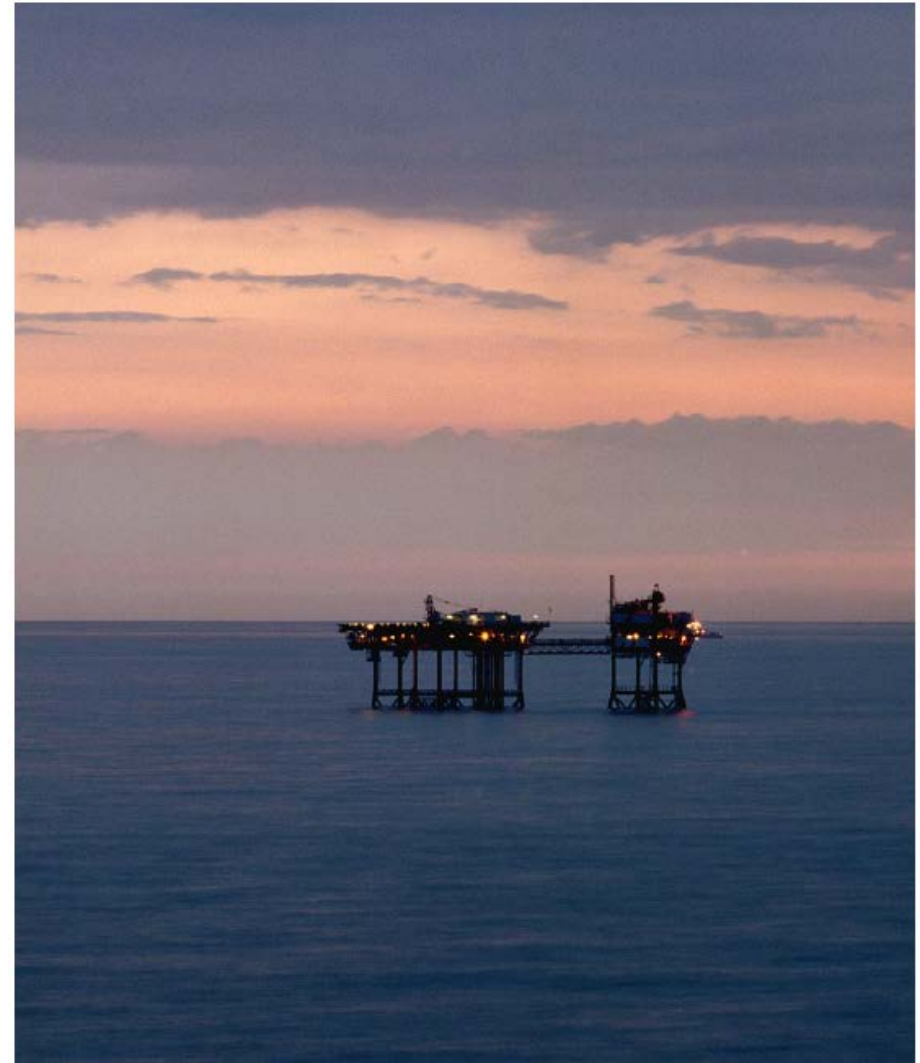




**Activity:** Offshore drilling

**Objective:** to detect the presence of oil and gas, in order to study whether it is interesting or not to produce at the site.

**Schedule:** It is estimated that the activities will begin in March 2013 and extend for over six months.





Perenco is an international Exploration and Production (E&P) Company of Oil and Gas.

This is the second time the company will operate in Brazil.

Company name:	Perenco Petr3leo e G3s do Brasil Ltda.
Registration number:	CNPJ:09.309.027/0001-35
Adress:	Rua Lauro Muller n3116-Sala 1301 - Botafogo - Rio de Janeiro/RJ CEP:22290-160
Telephone:	(21)3043-0100
Fax:	(21)2543-6361
Legal Representative:	Bernardo Franco Nieto
Contact:	Tatiana Menezes Clemente
Technicel Federal Register number for potentially Polutant activities that use Environmental Resources:	2690575

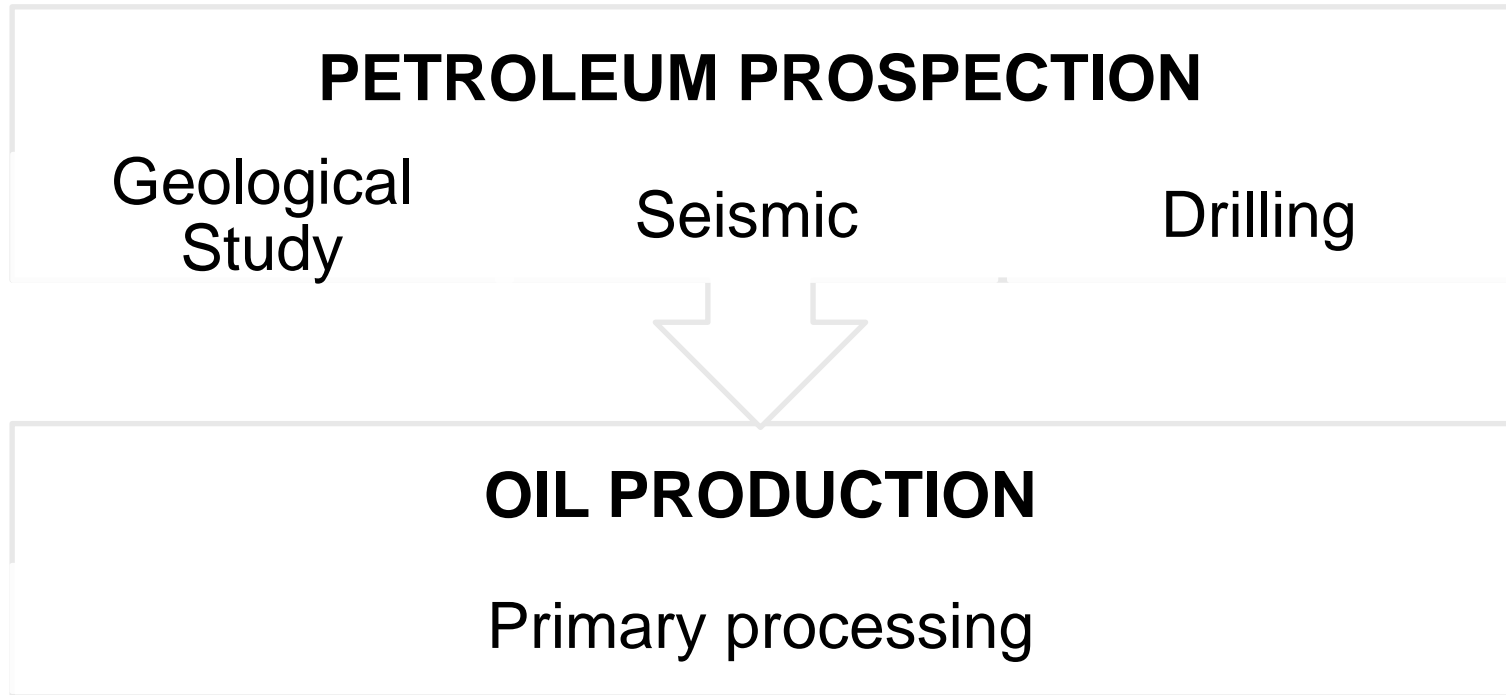


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# PHASES OF OFFSHORE CAMPAIGN



# OFFSHORE ACTIVITY STEPS





## **What is it?**

Study of geological and geophysical data of sedimentary basins.

## **Objectives:**

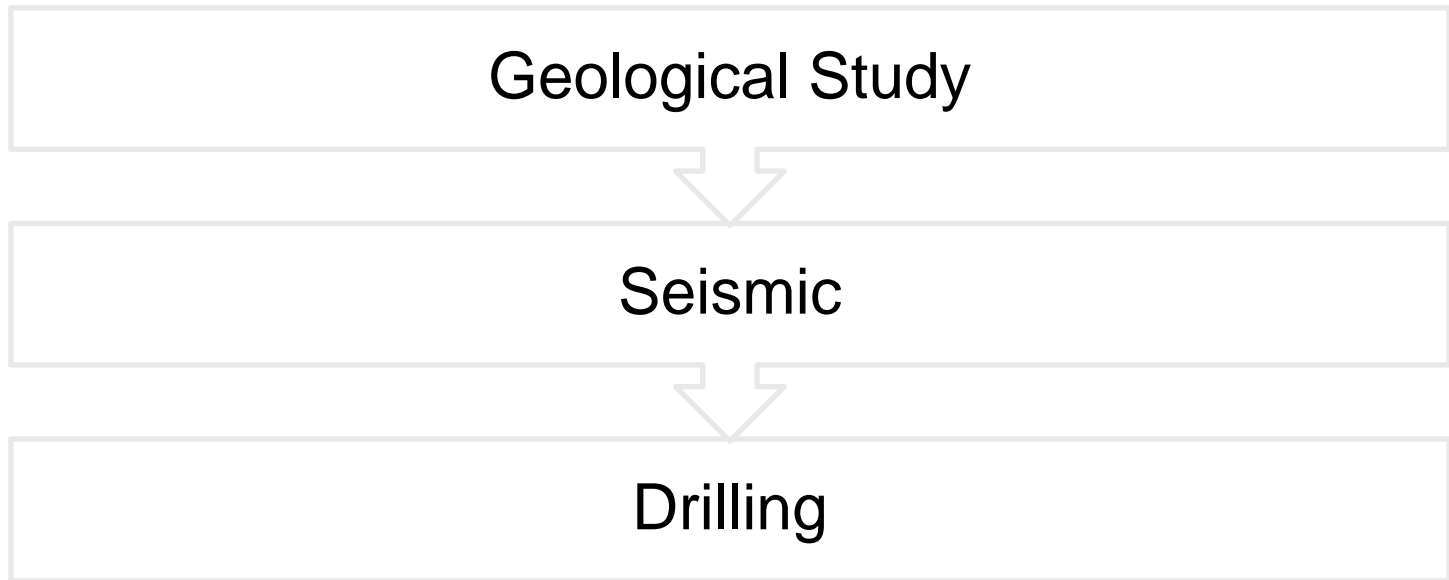
- To locate areas with geological conditions for oil accumulation;
- To check which of these areas have best chances of containing oil.







## STEPS





## Geological Study

**Objective:** to deduce, based on studies, the regions with potential for formation and accumulation of oil.





## Seismic

### What is it?

Artificial sources generate waves which will propagate inside the Earth. Sophisticated equipment capture the return of these waves.

### Objective:

To study the behavior of the wave and how it spreads checking the rock types and different constitutions of the underground.

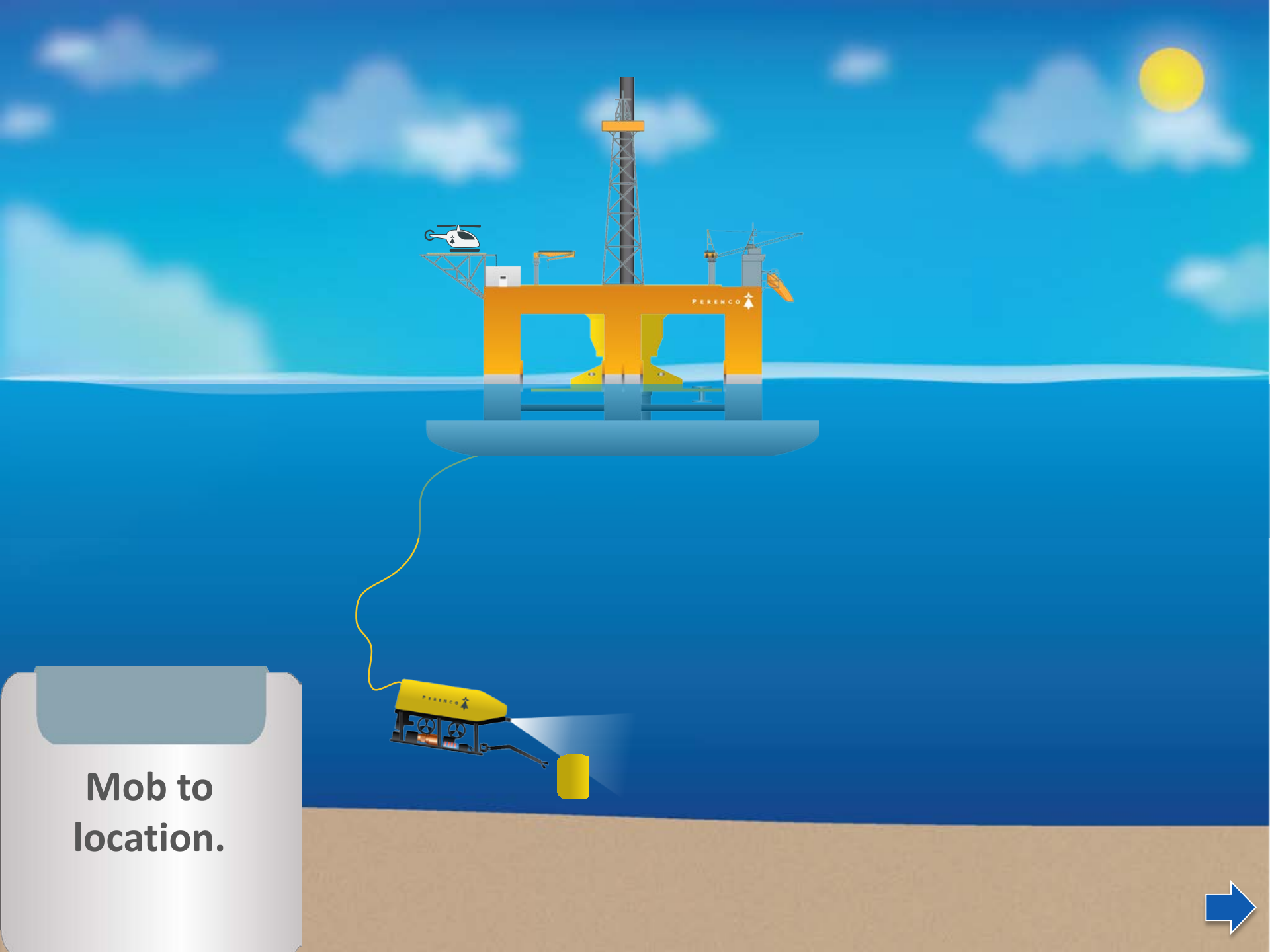




## Drilling

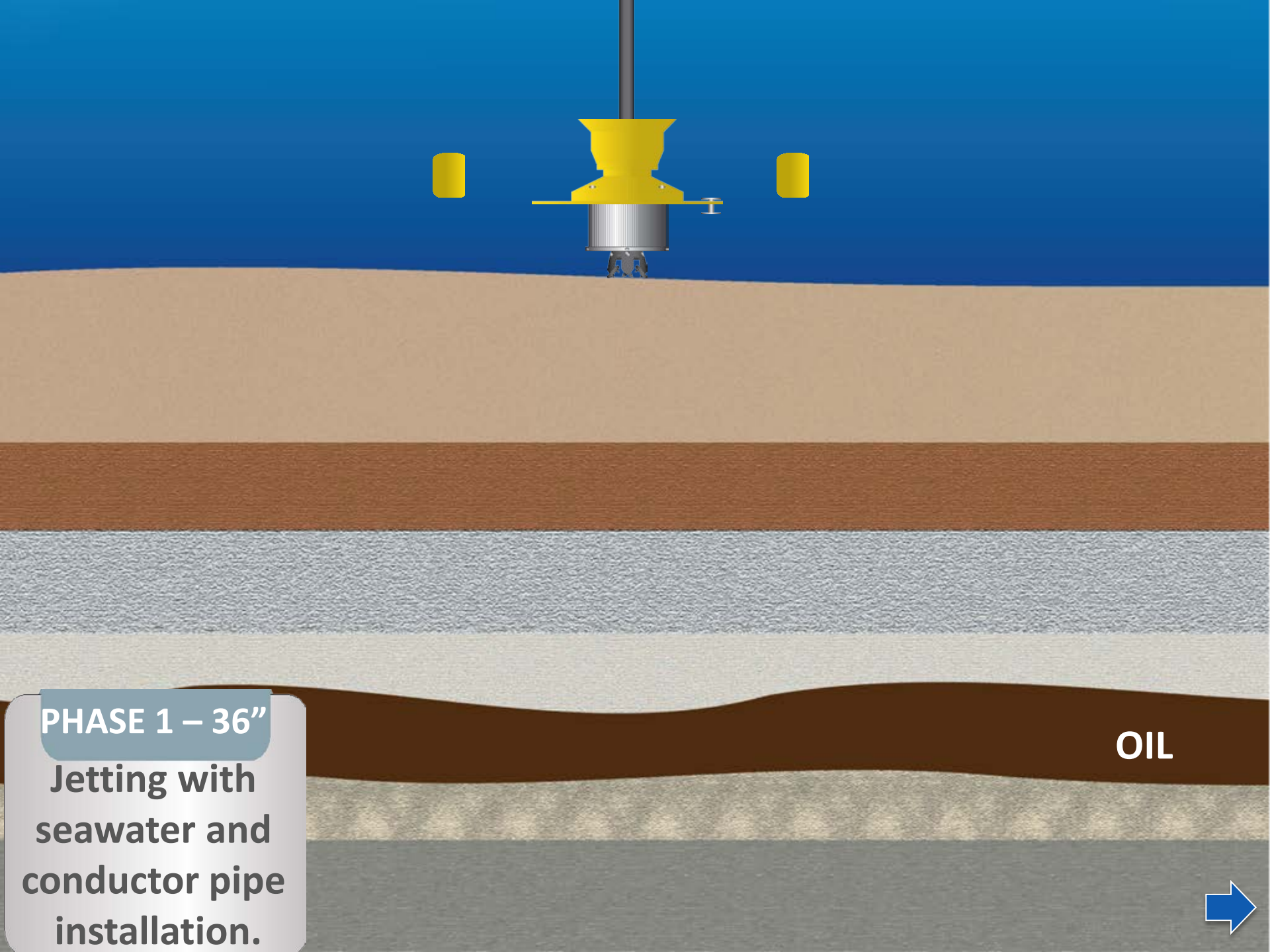
Well drilling is performed by a rig, with the help of large drill bits, in different stages.





**Mob to  
location.**



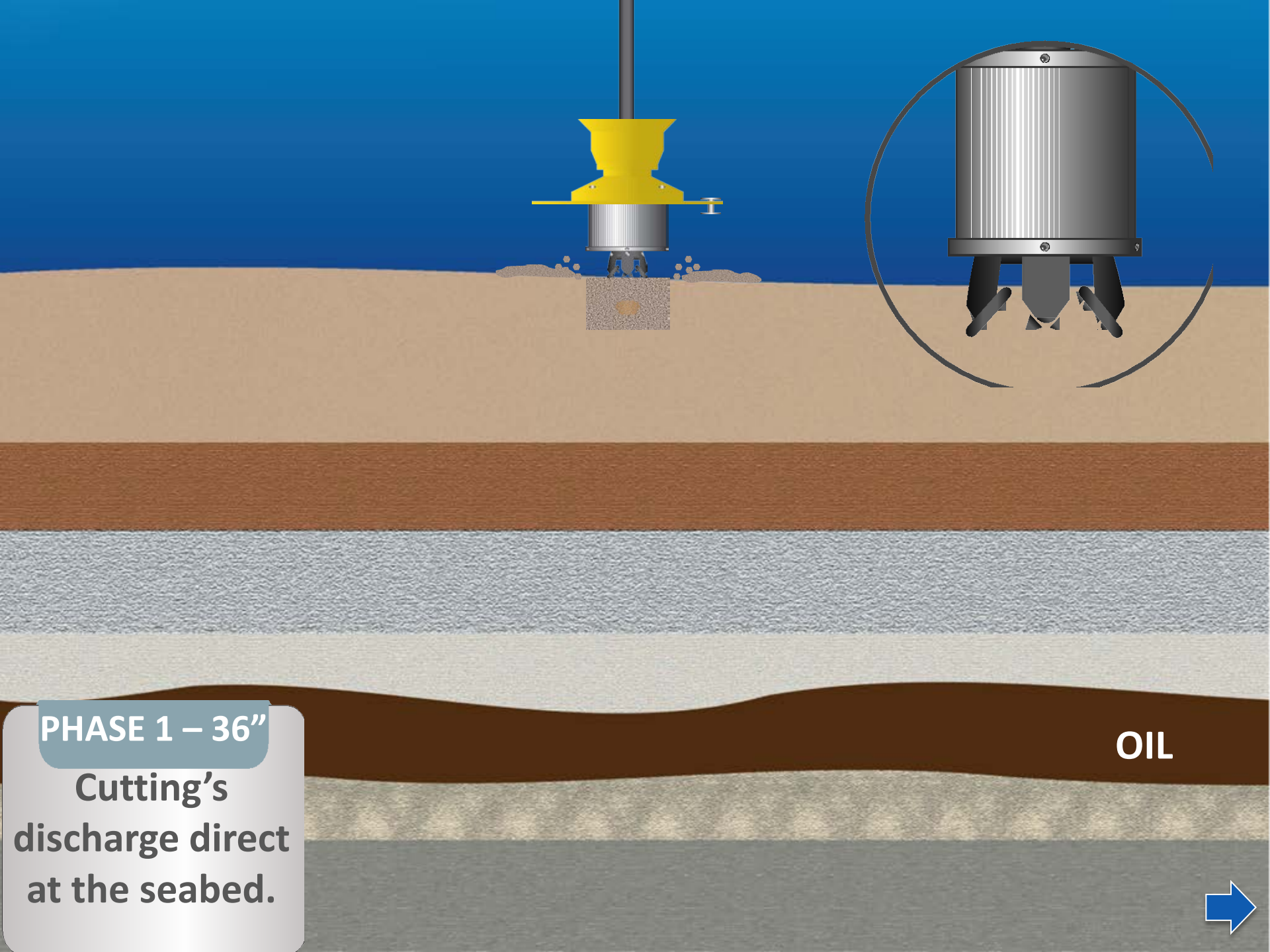


**PHASE 1 – 36"**

**Jetting with  
seawater and  
conductor pipe  
installation.**

**OIL**



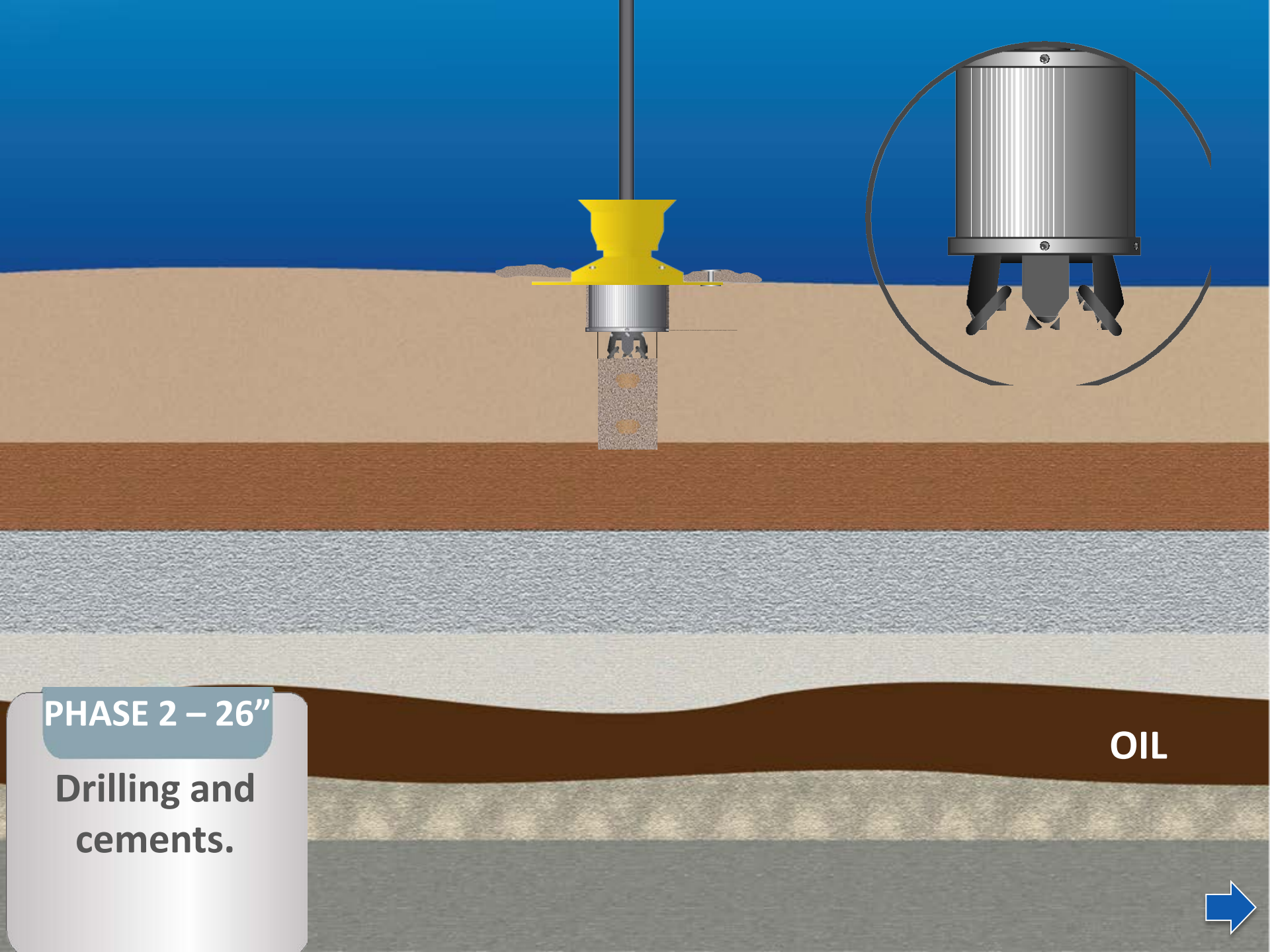


**PHASE 1 – 36"**

**Cutting's  
discharge direct  
at the seabed.**

**OIL**





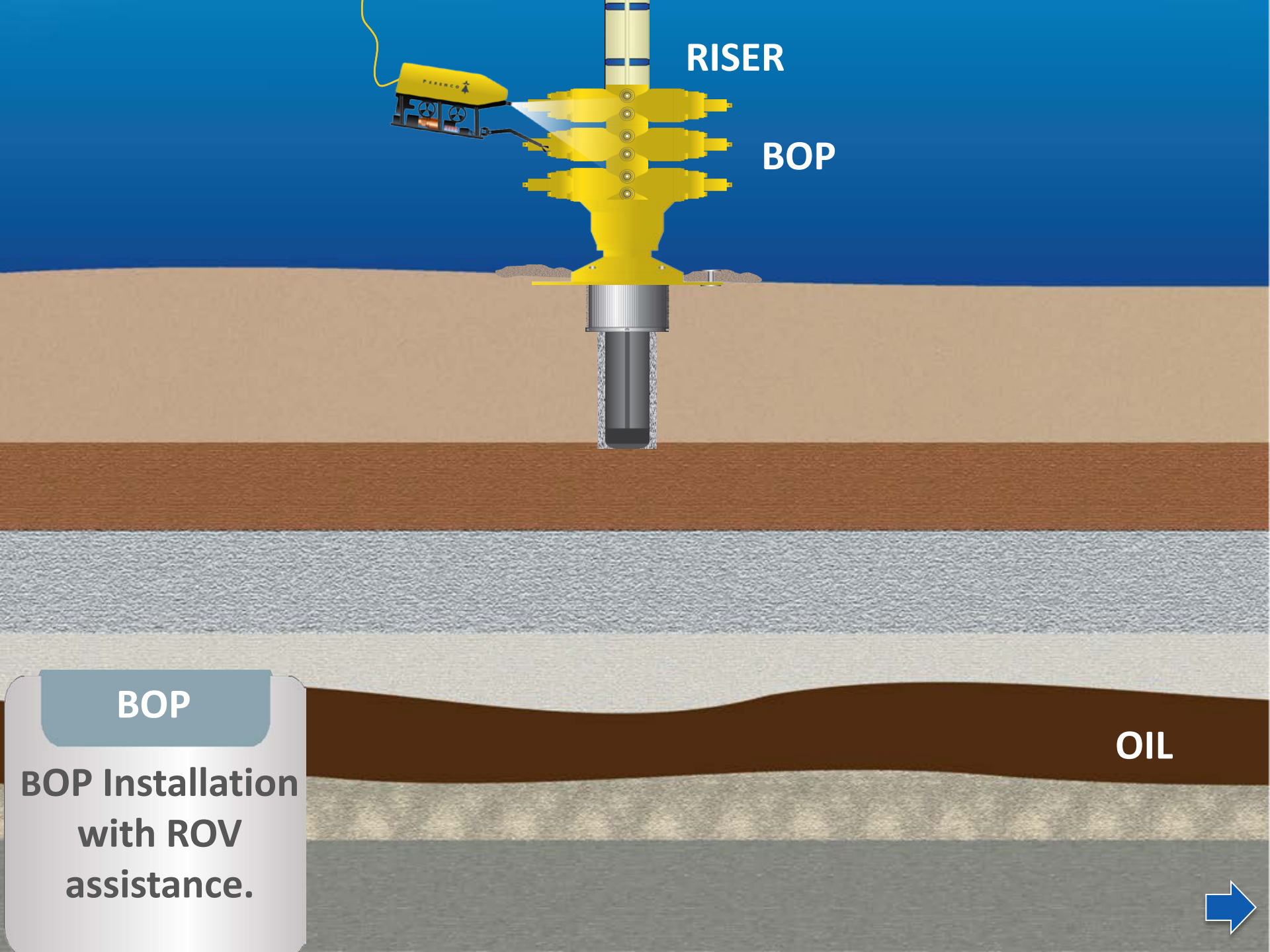
**PHASE 2 – 26"**

**Drilling and  
cements.**

**OIL**







RISER

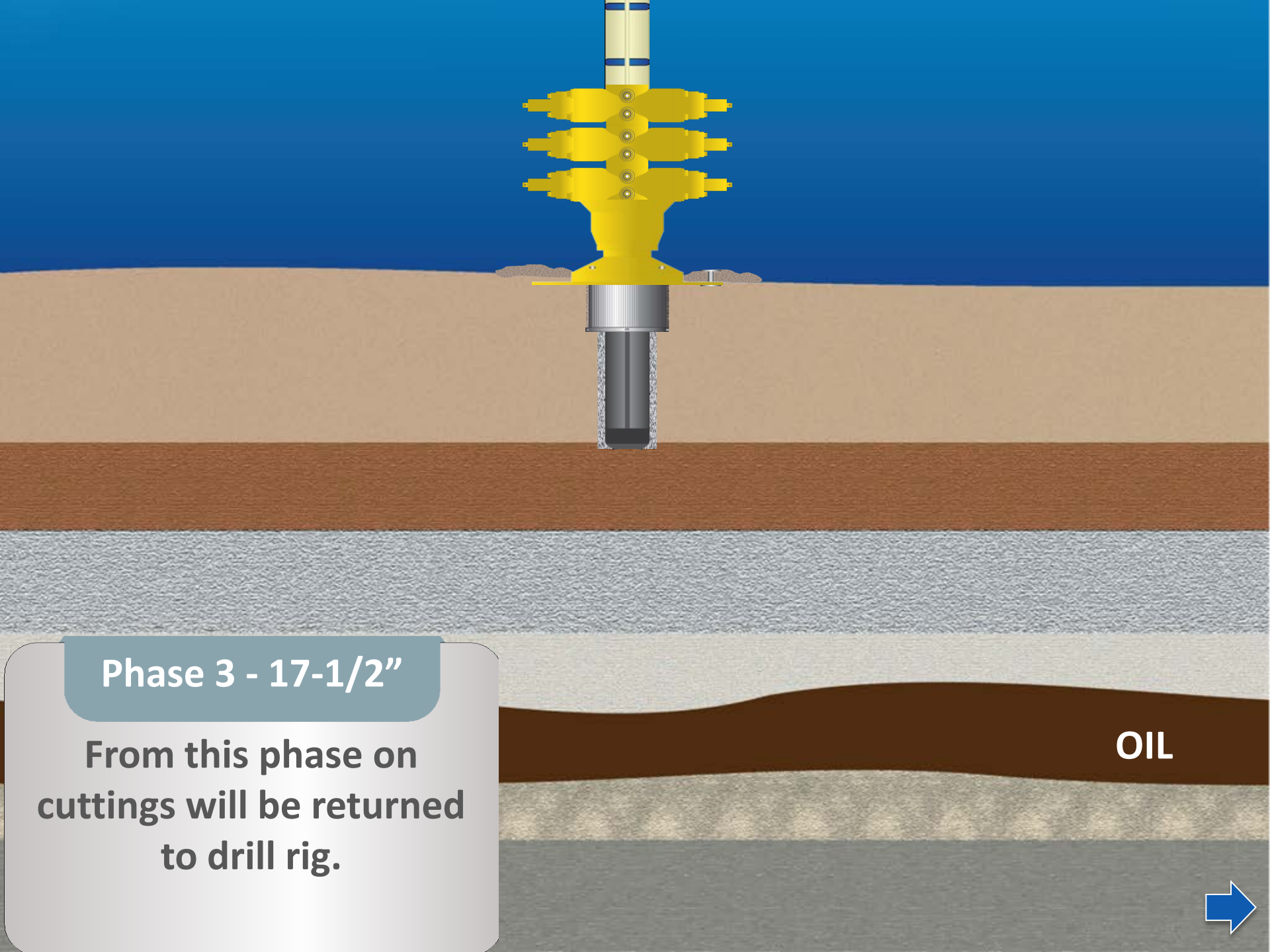
BOP

BOP

BOP Installation  
with ROV  
assistance.

OIL



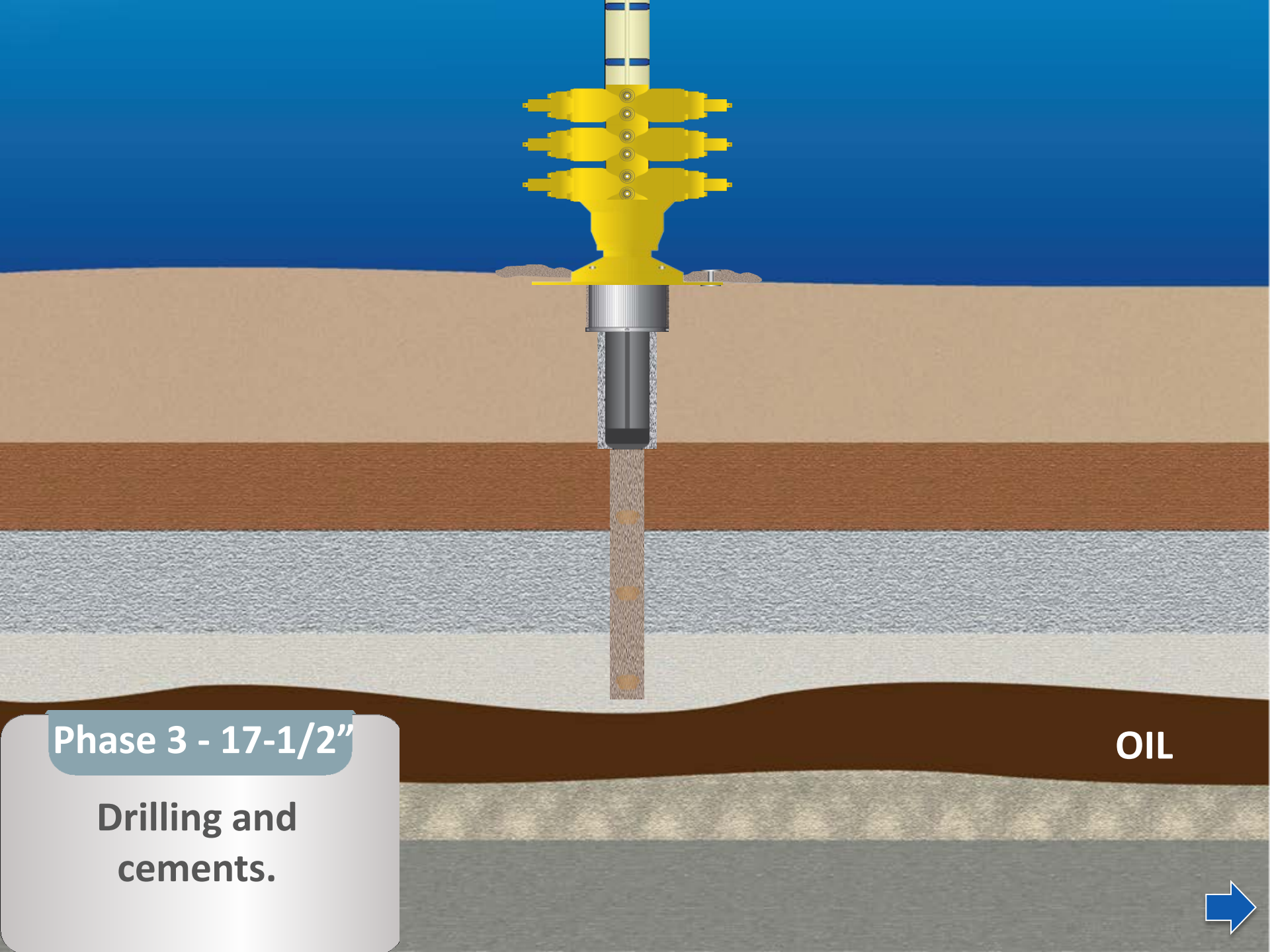


### Phase 3 - 17-1/2"

From this phase on  
cuttings will be returned  
to drill rig.

OIL



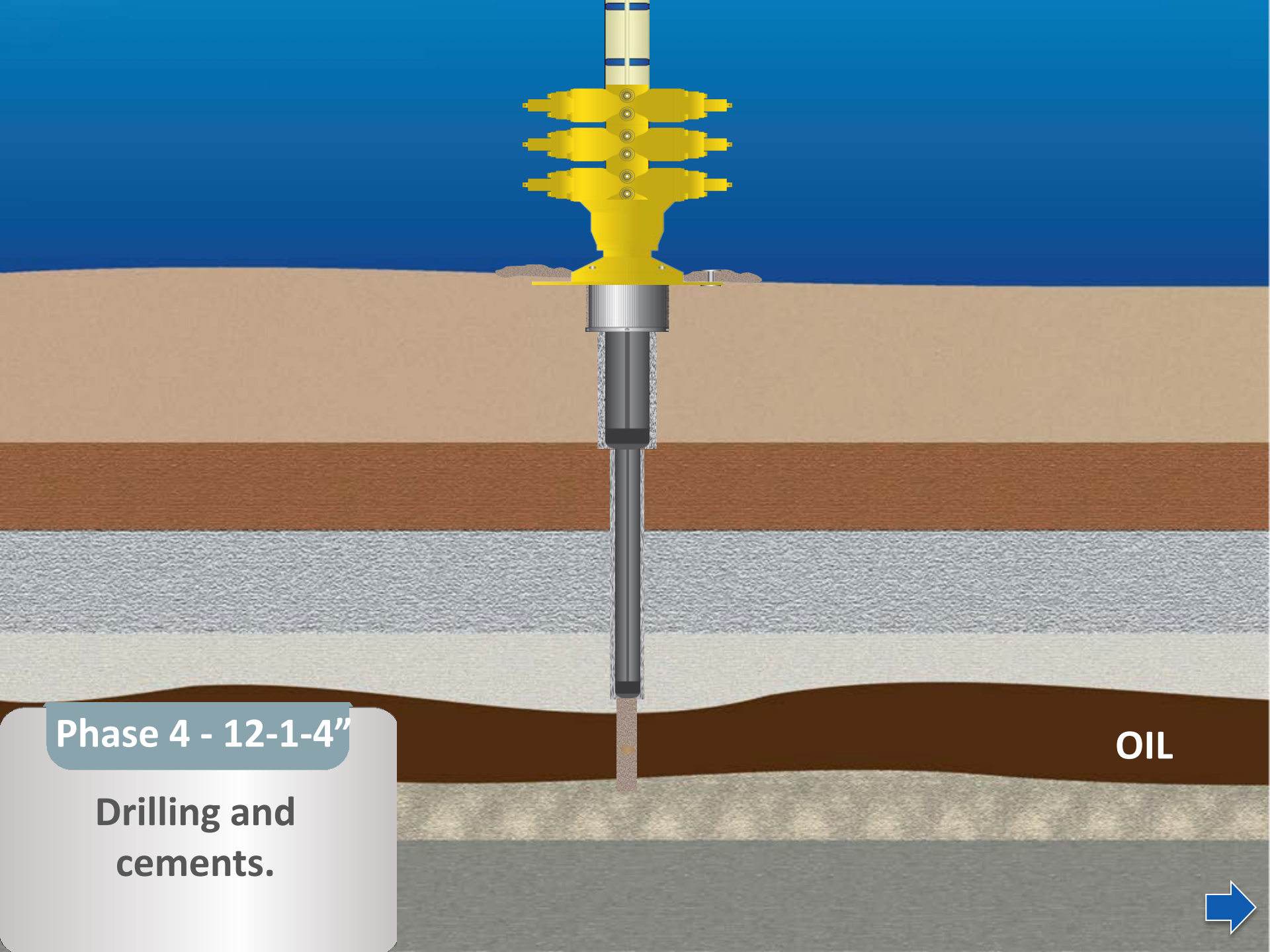


**Phase 3 - 17-1/2"**

**Drilling and  
cements.**

**OIL**



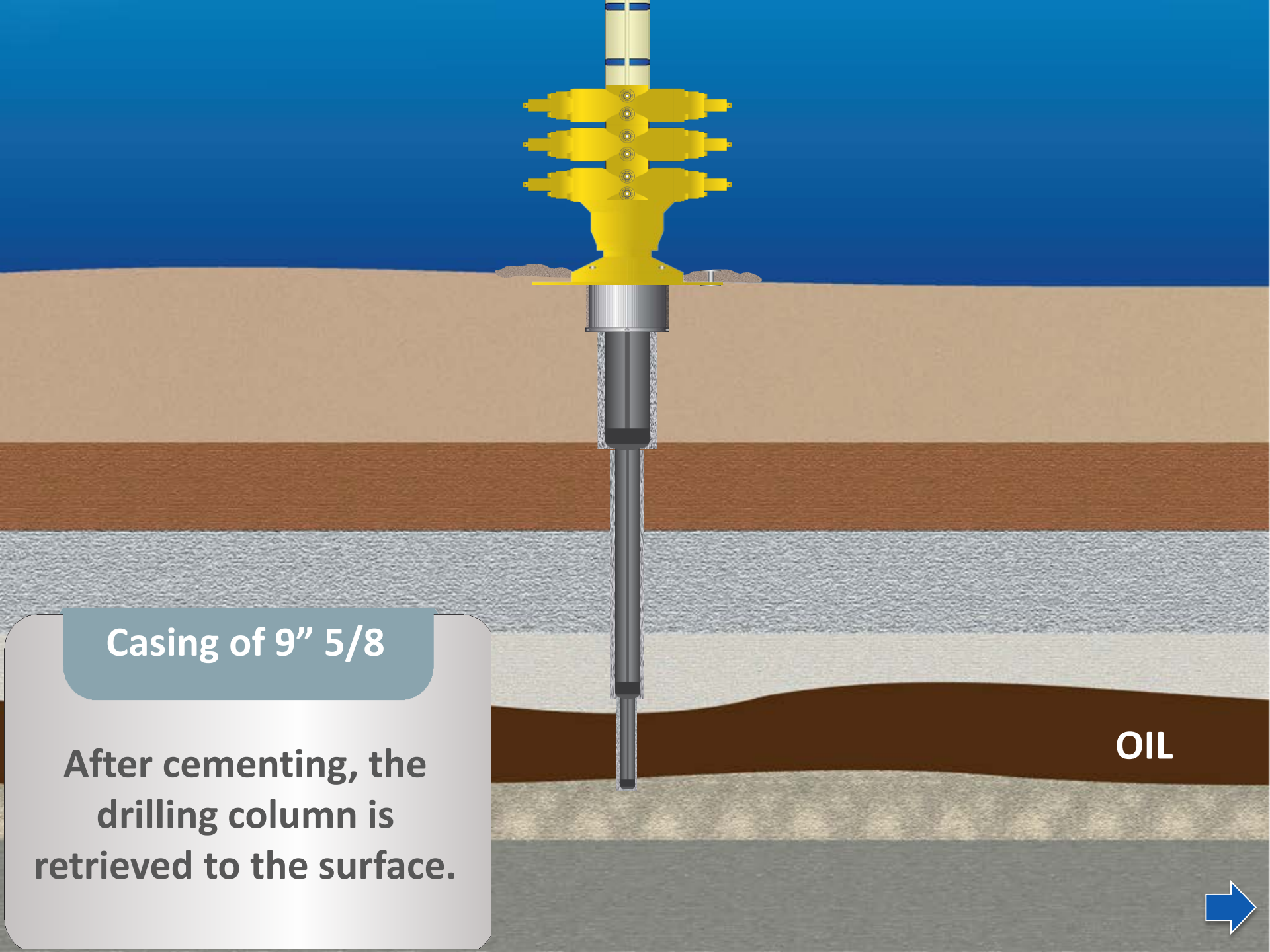


Phase 4 - 12-1-4"

Drilling and  
cements.

OIL



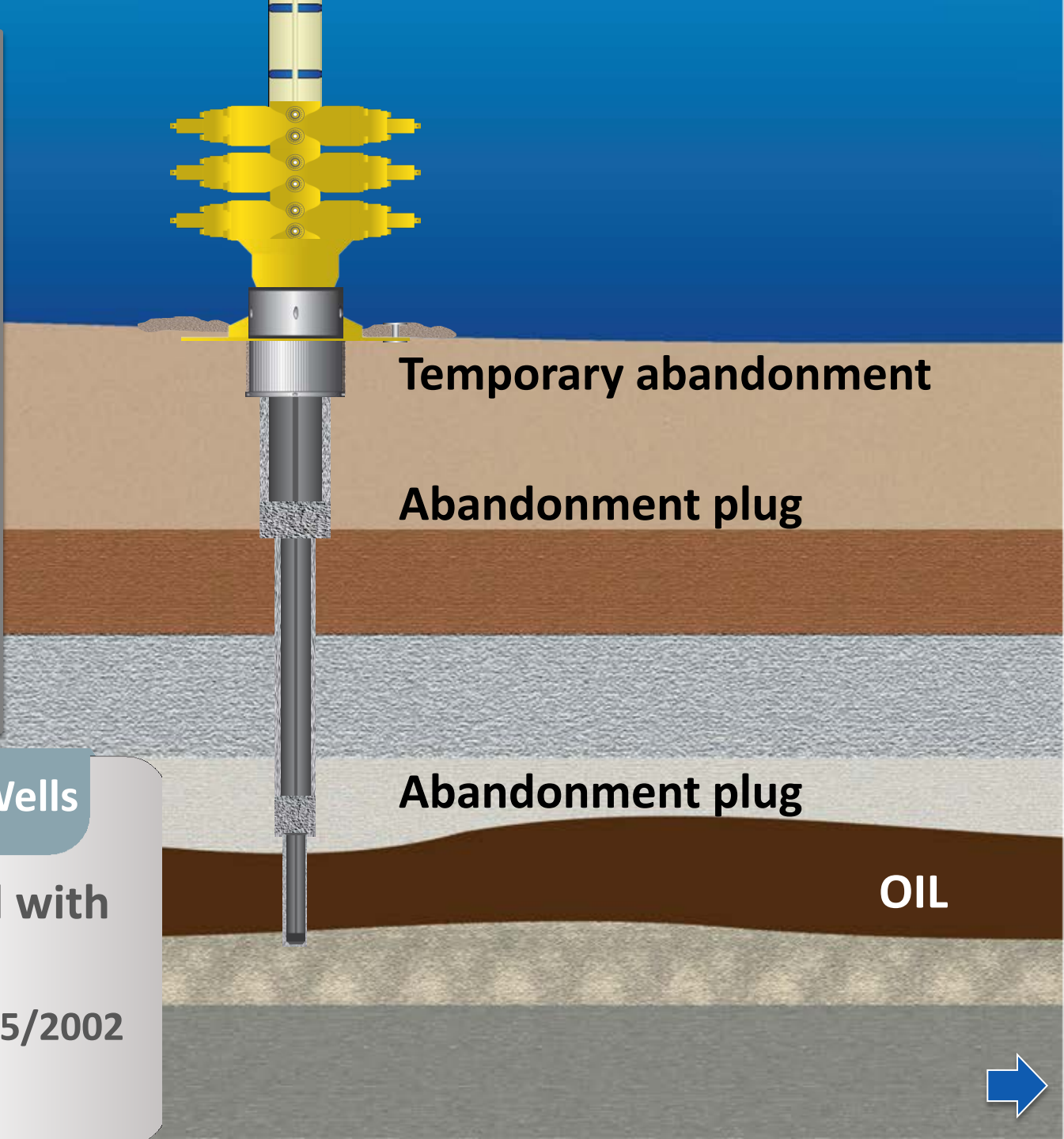
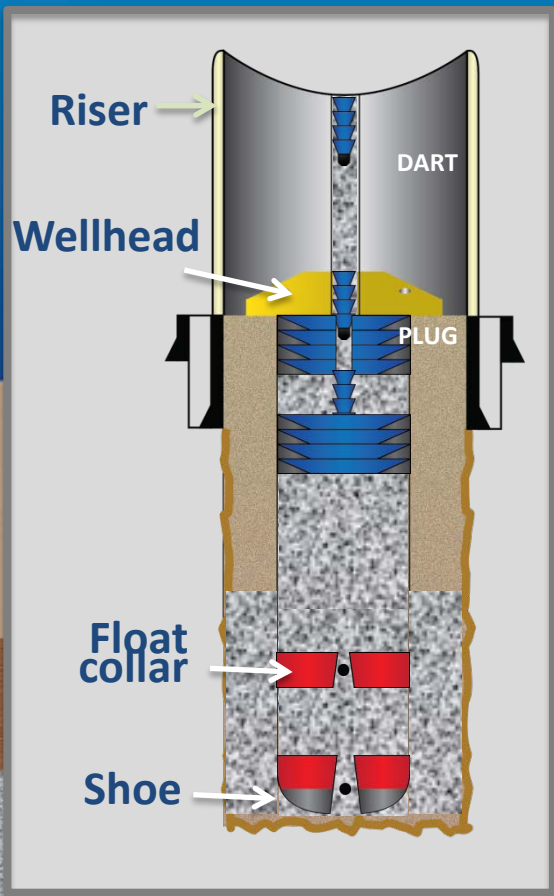


**Casing of 9" 5/8**

**After cementing, the drilling column is retrieved to the surface.**

**OIL**



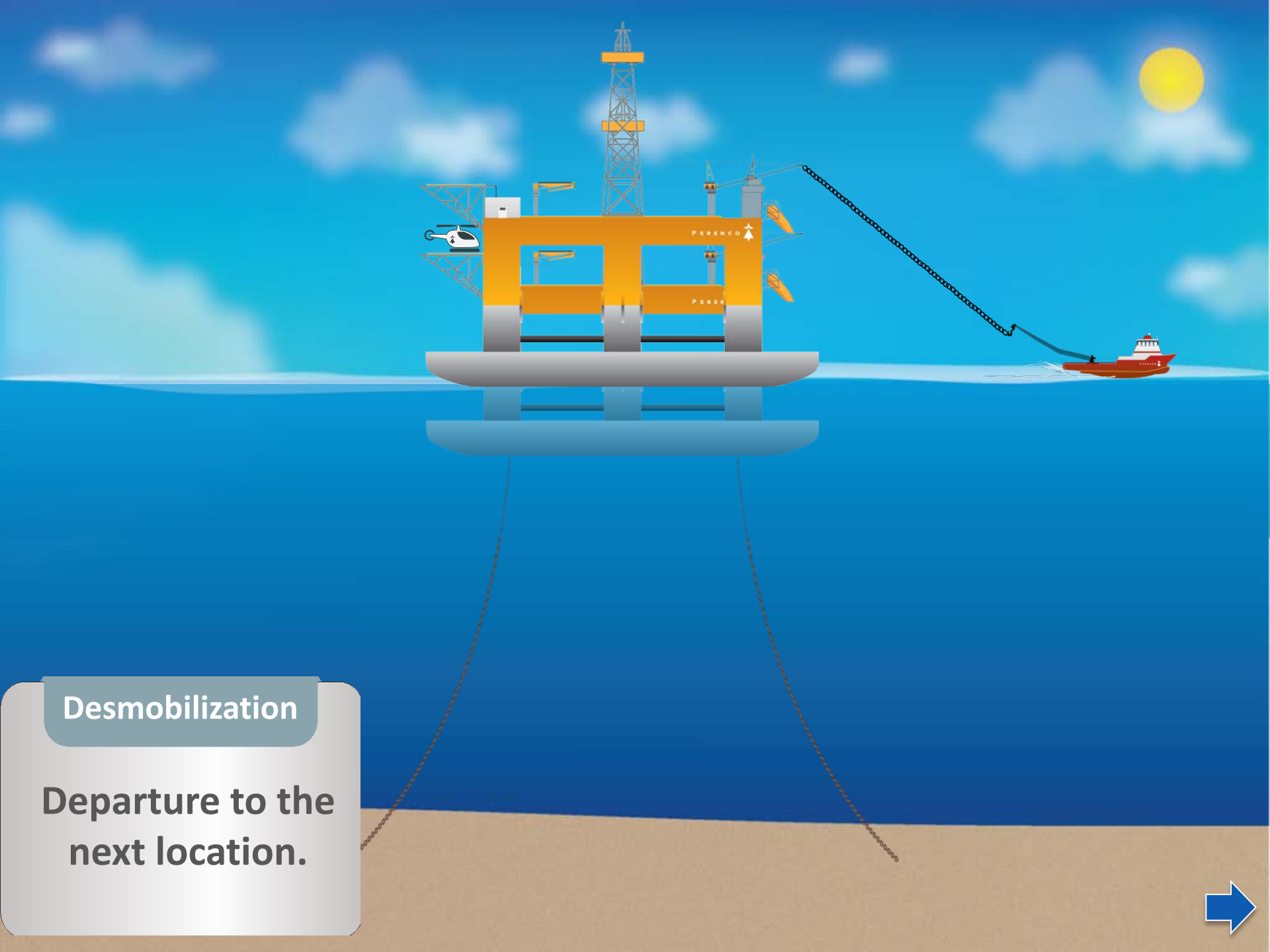


## Abandonment of Wells

Wells will be sealed with cement plugs.

Ordinance ANP N<sup>o</sup> 025/2002





## Desmobilization

Departure to the next location.





## Production

Phase of production of the discovered oil.

**Primary processing of fluids:** the oil and gas are separated from the water and the impurities produced.





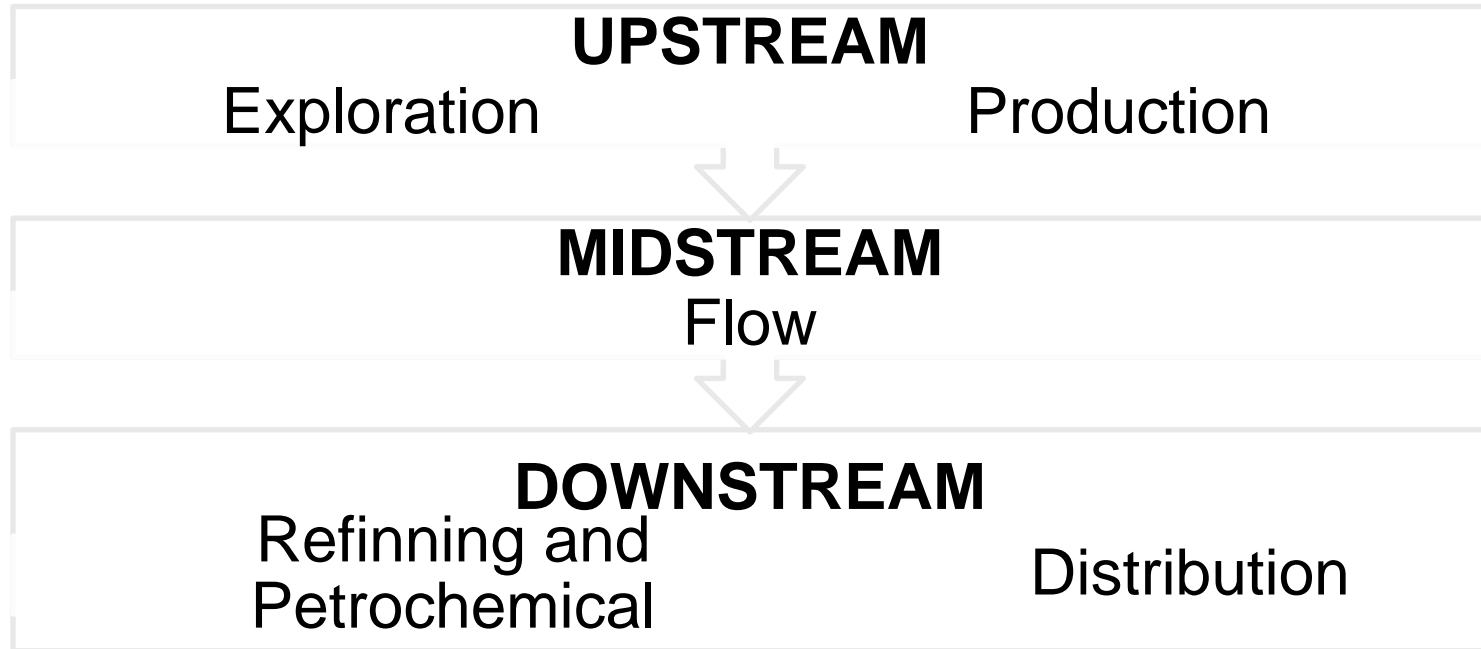


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# PRODUCTIVE CHAIN OF OIL



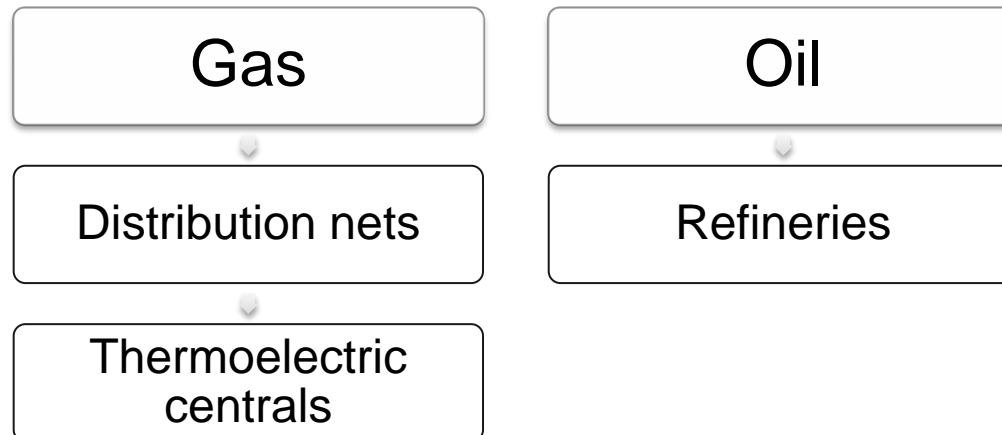
# PRODUCTIVE CHAIN OF OIL





The transport of oil and gas often over great distances by land and sea, through places with easy and/or difficult access.

Oil and gas pipelines can be used for transportation.





**Refining** is the processing of oil into different products.

The **petrochemical** industry transforms LGN<sup>1</sup>, natural gas and products from the refining into base products of other industries, such as the plastic industry.

1 – Liquefied Natural Gas





Necessary logistics to carry the finished products of refineries and petrochemical industries to the final consumer.





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# DRILLING UNIT AND SUPPLY INFRASTRUCTURE



# DRILLING UNIT



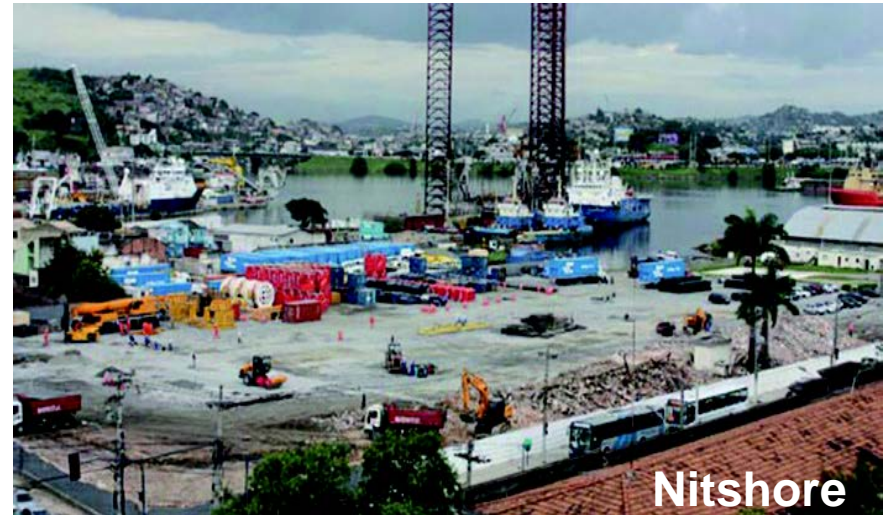
- Semi-submersible anchored **Ocean Star**
- **Proprietary:** Diamond Offshore Drilling
- **Certification:** ABS
- **Construction Year:** 1973





## Onshore Base

- **Nitshore**, located in Niterói, Rio de Janeiro will be the primary onshore base for logistical support.
- **Vitória Offshore Logistics-VOL**, located in Vila Velha, Espírito Santo will be the secondary onshore base for logistical support.
- **Function:** to receive and store materials and waste from the platform; provide material to the supply boats.







## Supply Vessels

- Far Sagaris an AHTS (Anchor Handling Tug Supply) vessel owned by Farstad Supply AS.
- UOS Navigator – owned by ATL Offshore GmbH &Co.



Supply Vessel: Far Sagaris

## Function:

- Transporting resources, equipment, waste, and products between the platform and the shore base;
- Assist in emergency operations;
- Towing and DMA<sup>1</sup> operations of the drilling unit.

1 - Undocking, Movement and Anchoring





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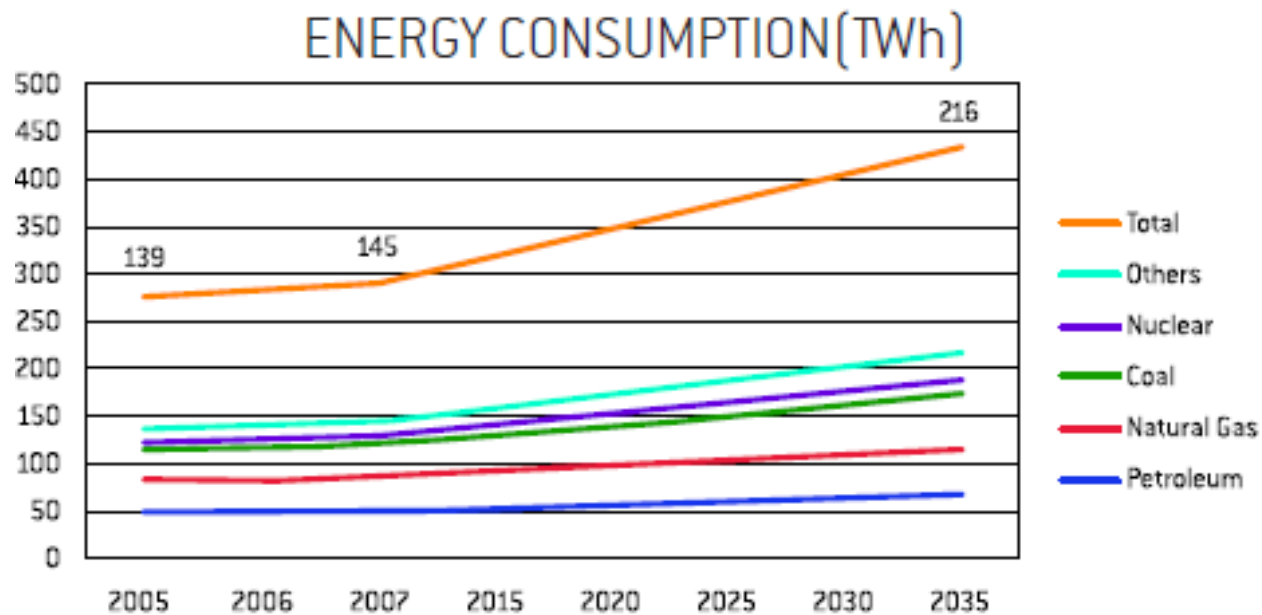
# GENERAL CONCEPTS OF GLOBAL ENERGY CONSUMPTION



# WORLD'S ENERGY CONSUMPTION



Increase of 55% in the world's energy consumption until 2035.



Fonte: U.S. Energy Information Administration (May/2010)

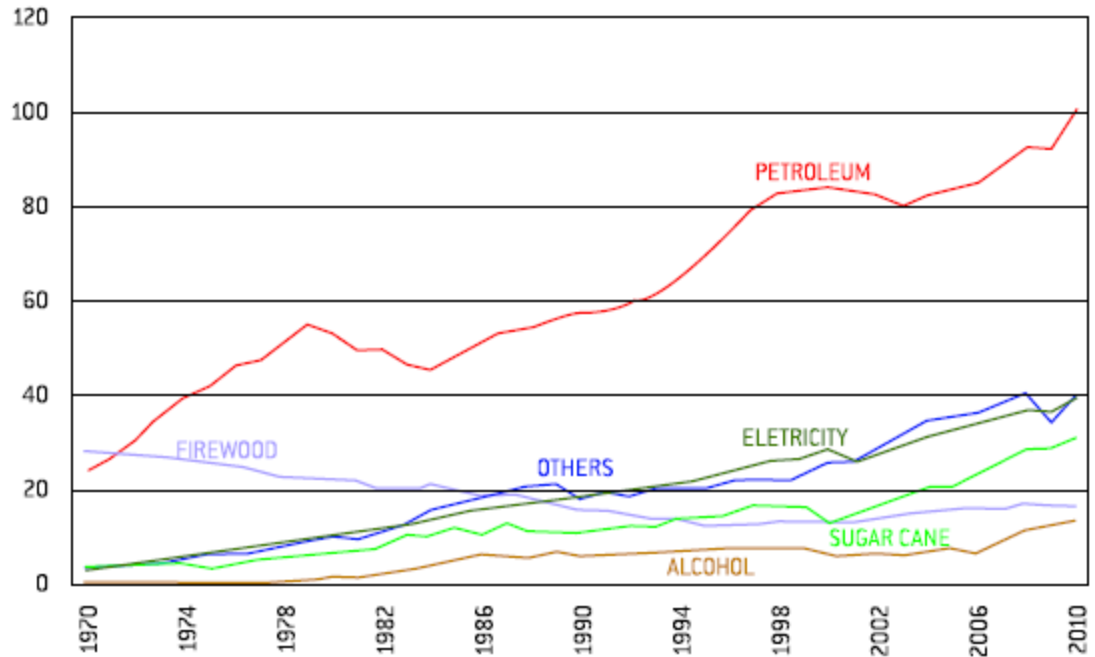


# BRAZIL'S ENERGY CONSUMPTION



Significant increase in oil consumption (1970-2010)

ENERGY CONSUMPTION BY SOURCE (10<sup>6</sup> TEP)



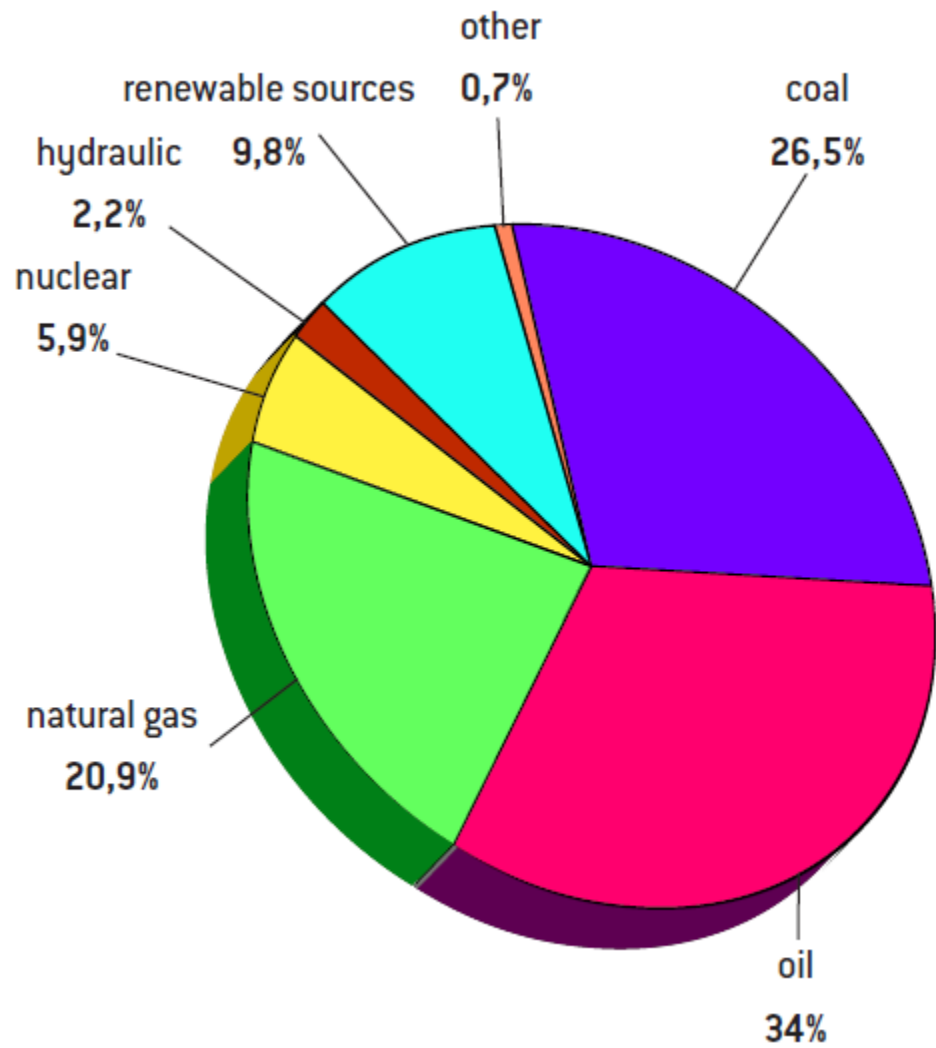
Source: MME – Ministry of Mines and Energy (*Ministério de Minas e Energia*)

# WORLD ENERGY MATRIX



Oil + Natural Gas + Coal = 80%

Renewable Sources = 12%



Source: EPE – Energy Research Company (*Empresa de Pesquisa Energética*)





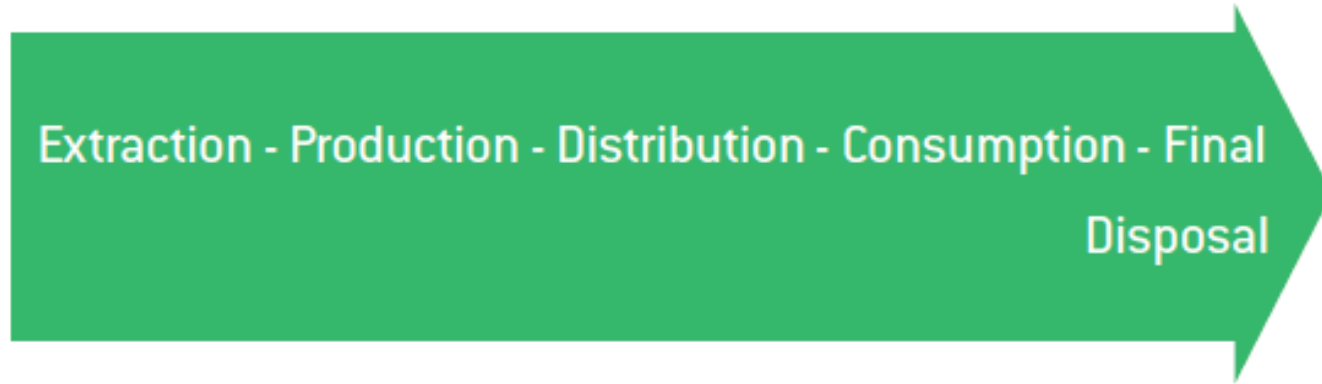
In nature **nothing is created, everything is transformed.**

The fact that you cannot consume all the matter until its complete elimination makes the **generation of waste inevitable in all human activities.**





# PRODUCT LIFE CYCLE



There will always be a need for new materials and always non-recyclable waste will be generated.

An adequate environmental management and wise use of resources are essential to mitigate this inevitable path.





## What is this?

Global warming is the increase in the average temperature of the Earth, resulting from the enhance in the concentration of greenhouse gases (GHG) in the atmosphere.

## IMPORTANT:

The greenhouse effect is a natural mechanism of the Earth that is responsible for maintaining the temperature of the Earth and preserving life on the planet.



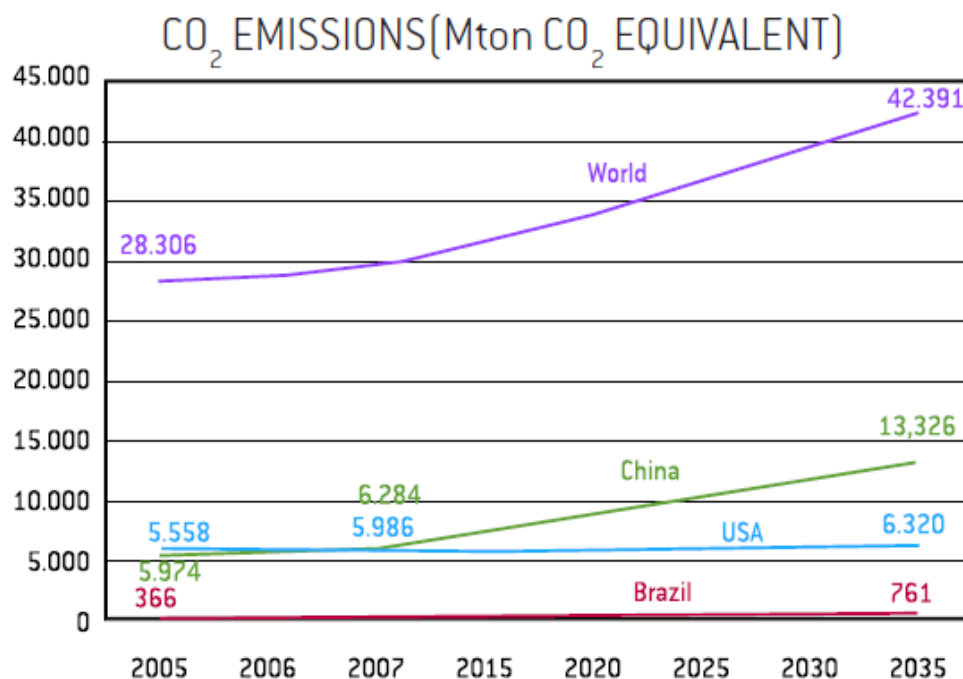


# GLOBAL WARMING



GHG emissions in Brazil and in the world will double from 2005 to 2035

GHG emissions from China already exceeded USA's



Source: U.S. Energy Information Administration (May/2010)





## **What is it?**

It is an international treaty, signed by several countries with the commitments to reduce GHG emissions.





HOW CAN YOU REDUCE ENERGY CONSUMPTION  
AND FIGHT AGAINST GLOBAL WARMING?



# HOW TO SAVE ENERGY?



## ADJUST THE TEMPERATURE OF YOUR AIR CONDITIONER

During summer, when you turn your air conditioner on, **increase the temperature in two degrees** above you usually use.

This attitude can **reduce by up to one third of a ton of CO<sub>2</sub>** emitted per year.





## USE ENERGY SAVING LIGHTBULBS

If every house in Brazil used just **one low energy lamp**, it would save as much energy as the **generation capacity of a hydroelectric plant**.





## STOP APPLIANCES FROM STANDING BY

Do not leave electronic devices on stand-by .

Turn them off for real by unplugging them, and cut your home energy-related emissions by 10% or more.



# HOW TO SAVE ENERGY?



## SAY NO TO PLASTIC BAGS

About **1 trillion of plastic bags** are used per year!

These plastic bags often end up in rivers and seas, polluting the environment and suffocating animals that confuse them with food.



# HOW TO SAVE ENERGY?



## BUY LOCALLY PRODUCED PRODUCTS

Each item in your supermarket traveled around **16.000 km** to arrive there.

To buy locally produced products **reduces the energy used in transportation.**







## TAKE YOUR MUG

Take your mug to work and avoid using disposable cups.



# HOW TO SAVE ENERGY?



## USE PUBLIC TRANSPORTATION

A **bus** can carry as many people as **50 cars**! Subways and trains can carry even more.

For each **2 km** traveled, public transportation uses **half the fuel** than a private car.



# HOW TO SAVE ENERGY?

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## RIDE A BIKE

Bike or walk to school or work at least once a week.  
This will give a rest to the atmosphere.



# HOW TO SAVE ENERGY?

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## TAKE SHORT BATHS

Decreasing your bath in just **1 minute** will save up to **1800 liters** of water a year



# HOW TO SAVE ENERGY?

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## PLANT A TREE

**From a single tree comes enough oxygen for two people to live their entire lives**





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# USES OF PETROLEUM



# USES OF PETROLEUM

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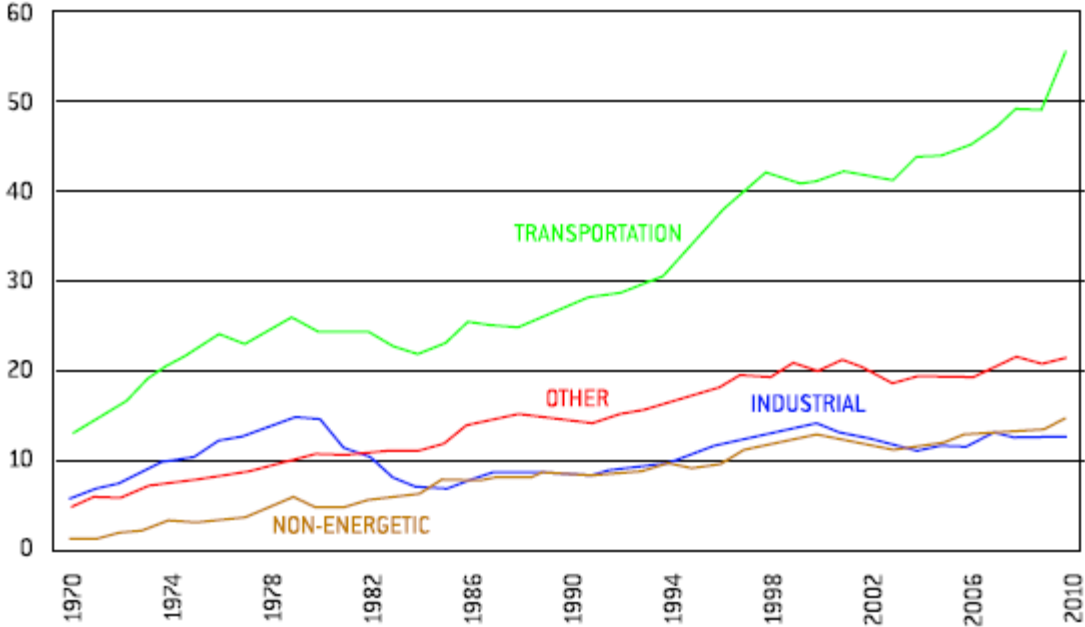
gas, gasoline, aviation fuel, diesel, lubricants, solvents, asphalt, plastics, fertilizers, among others.



# USE OF PETROLEUM IN BRAZIL



### TOTAL CONSUMPTION OF PETROLEUM AND NATURAL GAS DERIVATIVES (10<sup>6</sup> tep)



Source: MME – Ministry of Mines and Energy (*Ministério de Minas e Energia*)





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# FOSSIL FUELS: NON-RENEWABLE RESOURCES



# THE ORIGIN OF PETROLEUM

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Petroleum originated with the deposition of organic matter with sediments millions of years ago.



# NON-RENEWABLE RESOURCE

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Petroleum is a non-renewable resource. When current reservoirs run out, petroleum will be a resource no longer available to man.

It is important to invest in researching new energy sources and technologic development.





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# ENVIRONMENTAL IMPACTS AND RIKS





**Effective impacts:** which occurrence is expected during the activities implementation

**Potential impacts:** due to possible spill of diesel, chemical products and crude oil

RISK = PROBABILITY OF OCCURRENCE X SEVERITY



# EFFECTIVE IMPACTS



Environmental Factor	Environmental Aspect	Impact	Mitigation Measures	Qualification
<b>Physical Environment</b>				
Bottom Sediment	Dispose of cuttings and drilling fluid; Positioning and deactivation of the platform.	Revolving and modification of chemical characteristics and composition of the sediment.	Control the volume of gravel and fluid discharged. Separation of the fluid for disposal of gravel.	Negative
Water	Dispose of cuttings and drilling fluid; Positioning and deactivation of the platform. Discharge of grinded food, deck water and treated sewage.	Changing the chemical and physical characteristics of water. Revolving of sediments and consequent water turbidity.	Control the volume of gravel and fluid discharged. Separation of the fluid for disposal of gravel. Maintenance and monitoring of effluent treatment equipment.	Negative
Air	Combustion of fuel by power generators and diesel engines. Formation test emissions.	Emission of air pollutants.	Maintenance of power generators and diesel engines.	Negative



# EFFECTIVE IMPACTS



Environmental Factor	Environmental Aspect	Impact	Mitigation Measures	Qualification
<b>BIOTA</b>				
Turtles/ Marine Mammals/ Fishes/ Plankton	Noise Production; Presence of the maritime unit; Disposal of grinded organic waste.	Disruption of organisms; attractive effect; collision with maritime units.	Guidance to workers about the presence and importance of these organisms. Monitoring the presence of animals. Grinding organic waste before disposal.	Negative
Benthos	Dispose of cuttings and drilling fluid; Positioning and deactivation of the platform.	Burial and contamination of organisms.	Testing of metal concentration and toxicity in the drilling fluid.	Negative



# EFFECTIVE IMPACTS



Environmental Factor	Environmental Aspect	Impact	Mitigation Measures	Qualification
<b>SOCIOECONOMIC ENVIRONMENT</b>				
Fishery	Use of maritime space.	Exclusion of fishing areas.	Dissemination of information and awareness. Project of Fishing Monitoring. Project of Environmental Education.	Negative
Trade/ Services/ Workforce	Procurement of materials, equipments, supplies and services.	Generation of specialized job, income and tax revenue.	N/A	Positive







Although inherent to the activities, these risks have mostly **low severity, with temporary and localized impacts.**



# POTENTIAL IMPACTS



Impact	Control Measures	Response Measures
<b>SPILL OF DIESEL OIL; CHEMICAL PRODUCTS AND CRUDE OIL</b>		
Change in water and air quality, contamination and death of marine organisms; Contamination of coasts and death of birds and animals; Changes in fishery and tourist activities.	Inspection and maintenance of equipments and security and emergency systems; execution of drills.	Activation of the PEI





Spill of diesel oil, chemical products and crude oil have **low probability of occurrence**, however **can be quite severe** depending on the environment and the amount spilled into sea.





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# HEALTH AND SAFETY





Safety is a basic rule for maintaining the health of workers and the preservation of the environment.

**When in doubt, stop, look and ask.**





## Communication

Your report is very important!!

Use the Risk Observation Card to report hazardous situations.

It might be: an unsafe act, a lack of protection, lack of PPE, lack of knowledge, disorganization at the workplace and even a managerial failure.



**Example:** tool stored in inappropriate location. If it is in a high place, it can fall on someone; if it is on the ground, someone could trip over it.





## RISK PERCEPTION

We can only identify what we understand.

When you visit a new place or perform a new task,  
inquire before.

When in doubt, stop, look and ask.





## USE OF PPE

You are also responsible for your safety.

PPEs avoid or minimize the consequences of accidents.

**Do not take unnecessary risks! Always use the appropriated equipment.**







## **PARTICIPATION**

Participate in safety trainings, drills and emergency trainings.

This way you will know how to act at critical moments.





- Eat in a healthy way, maintaining a balanced diet;
- Drink plenty of water;
- Use sunscreen;
- Watch your posture;
- Take care of your personal hygiene;
- Make regular check-ups and consult a doctor if you notice something wrong.



# BASIC TIPS FOR SAFETY



- Use proper PPE;
- Obey safety signs;
- Keep the workplace organized and clean;
- Find out about the chemical product that you will handle (FISPQ/MSDS);
- Attention to operate machinery and equipment, especially to moving parts;
- Obey the permit to work (PTW) for activities such as: confined space entry; working at height; hot work; working with electricity;
- When observing a hazardous situation, immediately notify your supervisor and fill a Risk Observation Card.

**Keep alert, avoid inattention, hurry or neglect.**

**When in doubt, stop, look and ask.**





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# POSITIVE SOCIAL RELATIONS





The prolonged permanence, isolation, bad weather and hard work are **stressful factors**.

Be **sympathetic** with others, we are all far from our homes and families.

Remember that **we are all different** and have free will to make our personal choices.

**Respect others and be respected.**



# TIPS FOR A POSITIVE SOCIAL RELATIONS

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- Try to communicate clearly and objectively;
- Avoid making horseplay or pranks;
- Avoid discussions about politics, religion and sports;
- Avoid gossip;
- Try not to make noise in the corridors of cabins. Remember that people from the other shift are sleeping;
- Keep the workplace and accommodations clean and organized;
- Try to maintain a good relationship with everyone on board and with the crews of other units;
- Respect the social, ethnic and cultural differences;
- Be tolerant;
- Be supportive.

