



WELCOME TO THE PRESENTATION ON ENVIRONMENTAL AND SOCIAL ISSUES IN EXTRACTIVE INDUSTRIES

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Scheme of Presentation

- Introduction to Extractive Industries (4)**
- Type of impacts- Environmental and social (5)**
- Common impact parameters (social and environmental) (6,7)**
- Introduction to offshore extractive activities (8)**
 - E&P cycle (Introductory) (9)
 - Seismic data acquisition (10) and impact (11)
 - Drilling & production and impact (12-19)
 - Deep water accident in Gulf of Mexico (20- 22)
 - Extractive industry - Vulnerability of environment in armed conflicts – Gulf war (23,24)
- Onshore extractive activities (26)**
 - Mining cycle and Environmental issues (27, 28)
 - Social issues (29, 30)
 - Illegal mining (31)
 - Picture of mine (32, 33)
- Recent climate warnings (34)**
- Best practices (35)**

EXTRACTIVE INDUSTRIES - INTRODUCTION

- Industries involved in the processes or activities that lead to the extraction of raw materials from the earth (such as oil, metals, mineral coal etc.), processing and utilization by consumers.
- Onshore or offshore
- Could impact Environment and Social life
- Impact on Environment is always considered negative.
- Social impact – Mixed, but mostly negative
- Despite negative impact, sustainable development calls for extraction.

EXTRACTIVE INDUSTRIES – TYPES OF IMPACT

- In this presentation:
 - **Environmental impact** focus is more on the offshore based extractive activities (Oil and Gas)
 - **Social impact**, being more visible on onshore extractive industry, majority of the issues and examples are based on the onshore extraction (Minerals, coal, oil and gas, ores etc.)

COMMON IMPACT OF EXTRACTIVE INDUSTRIES

Sl No	Factor	Impact (+) or (-)	Impact on:
1	Air	(-)	Environment
2	Water	(-)	Environment
3	Noise	(-)	Environment
4	Bio diversity	(-)	Environment
5	Income	(+)	Socio economic
6	Employment	(+)	Social
7	Livelihood	(+) or (-)	Social
8	Poverty	(+) or (-)	Social
9	Export	(+)	Economic
10	Skill development and Trg.	(+)	Social
11	Education and literacy	(+) or (-)	Social
12	Community development	(+)	Social
13	Community access to services	(+) or (-)	Social
14	Water scarcity and quality	(-)	Environment
15	Land impact	(-)	Environment

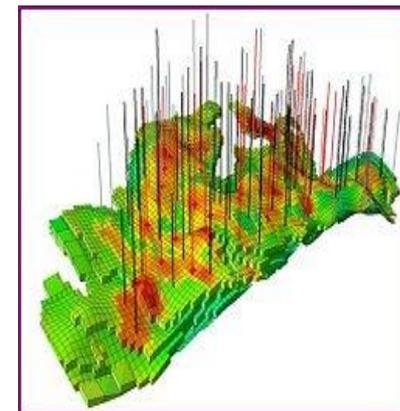
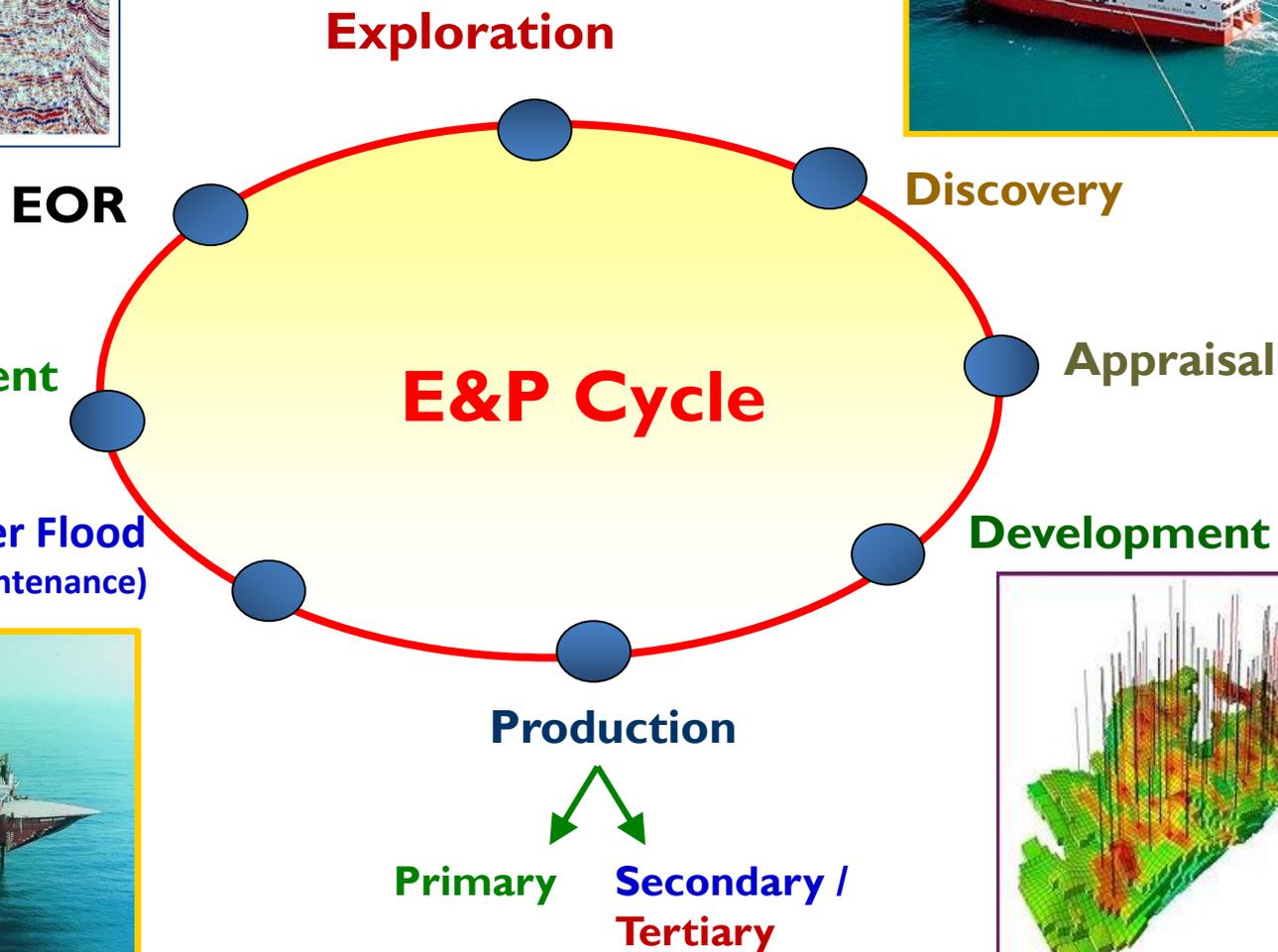
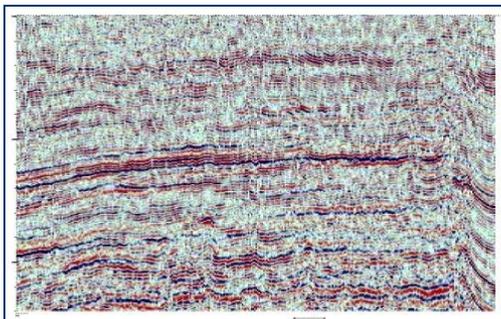
COMMON IMPACT OF EXTRACTIVE INDUSTRIES CONTD...

SI No	Factor	Impact (+) or (-)	Impact on:
16	Assets impacts	(-)	Environment
17	HIV/AIDS/STDs	(-)	Social
18	Security	(-)	Social
19	Gender	(+) or (-)	Social
20	Safety and accidents	(-)	Social and Environment
21	Violence/Drugs/Money laundering	(-)	Social
22	Cultural pollution	(-)	Social
23	Migration	(+) or (-)	Social
24	Impacts on tribal people	(-)	Social
25	Impact on agriculture	(-)	Environment
26	Children rights/Child labour	(-)	Social
27	Human rights	(-)	Social
28	Human trafficking	(-)	Social
29	Bribery and corruption	(-)	Socio economic

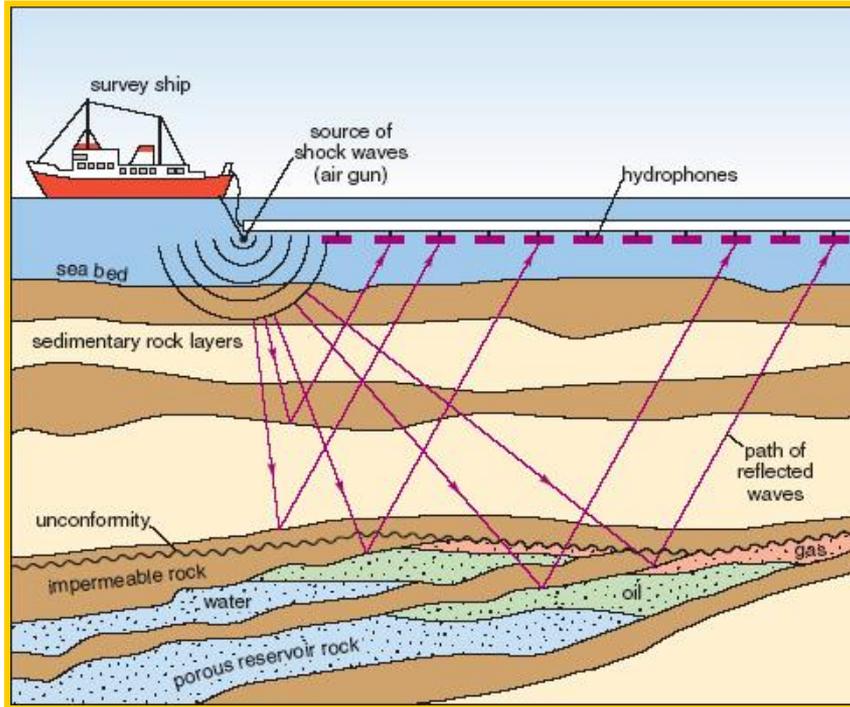
BRIEF INTRODUCTION TO OFFSHORE EXTRACTIVE ACTIVITIES

- For better appreciation of the subject, offshore activities explained in few slides:
 - Majority – Oil and Gas
 - Termed as Exploration and Production (E&P) Also termed as Upstream activities.
 - Downstream refers to refining and Marketing (*Not covered here as the subject is limited to E&P*)
 - Upstream includes onshore as well as offshore
 - Offshore includes Shallow Water and Deep Water

The Exploration and Production cycle



Seismic Data Acquisition



- **Seismic reflection is the principal method by which petroleum industry images hydrocarbon bearing structures**
- **Compressed air guns towed behind a seismic vessel discharge high pressure pulse of air just beneath the sea surface.**
- **High pressure pulse penetrate the subsurface and are reflected back towards the hydrophones / Geophones from the rock interface**

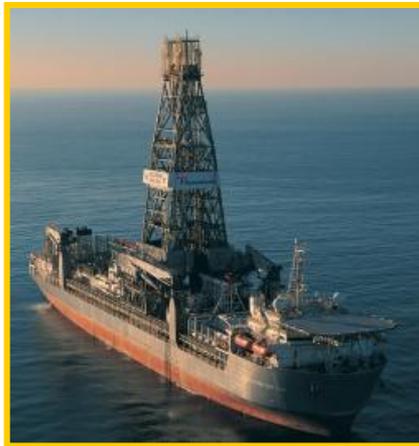
Seismic Data Acquisition – Adverse Impacts

- Environmental (Water contamination, Disturbance to the marine species, Marine Park depletion)
- Social (Fishermen losing fishing days, possible loss of fishing area if found oil or gas bearing)

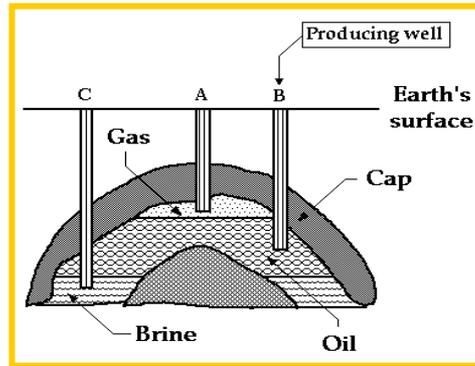
Drilling- Different Options



Onland Rig



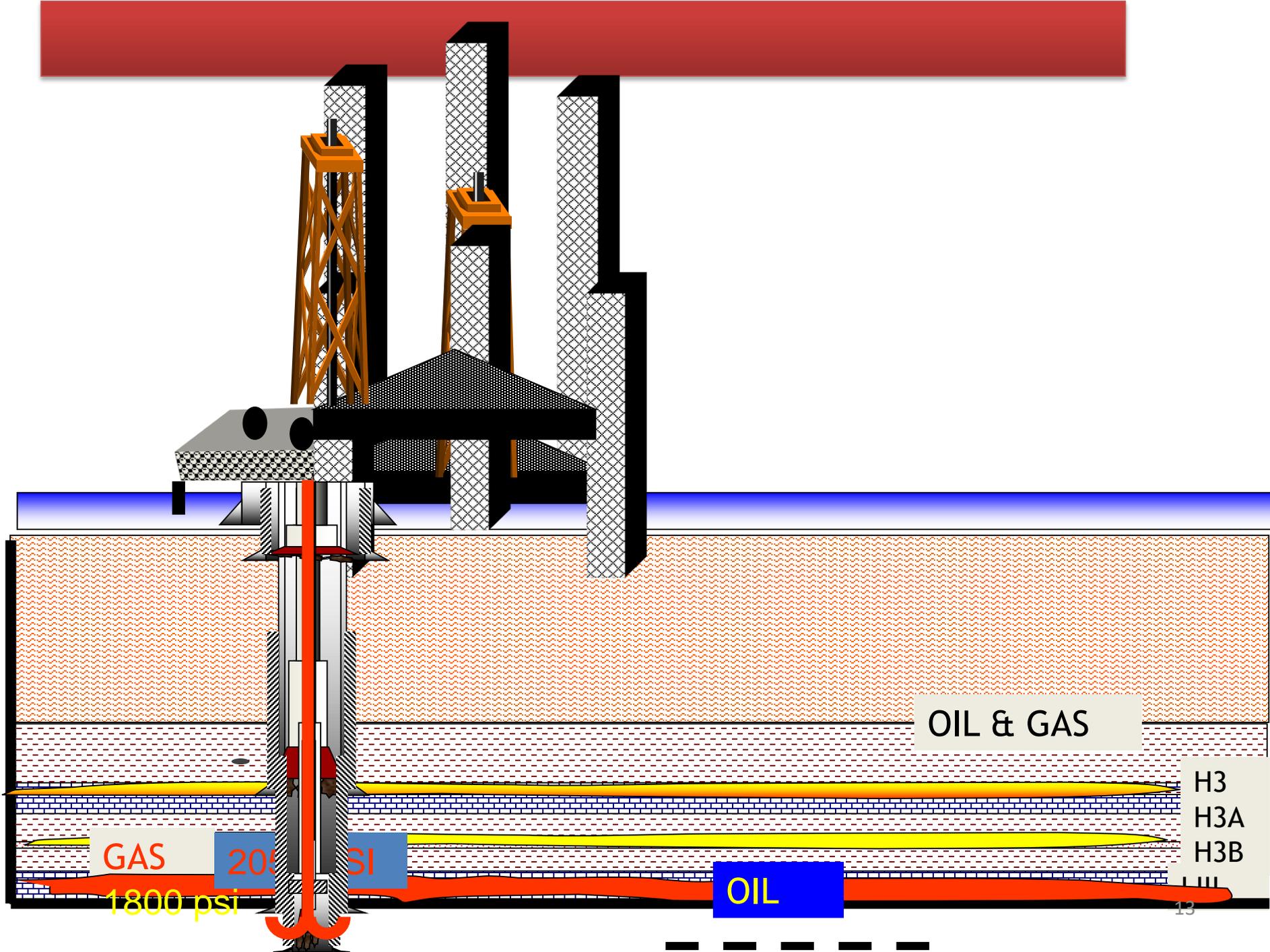
Drill Ship



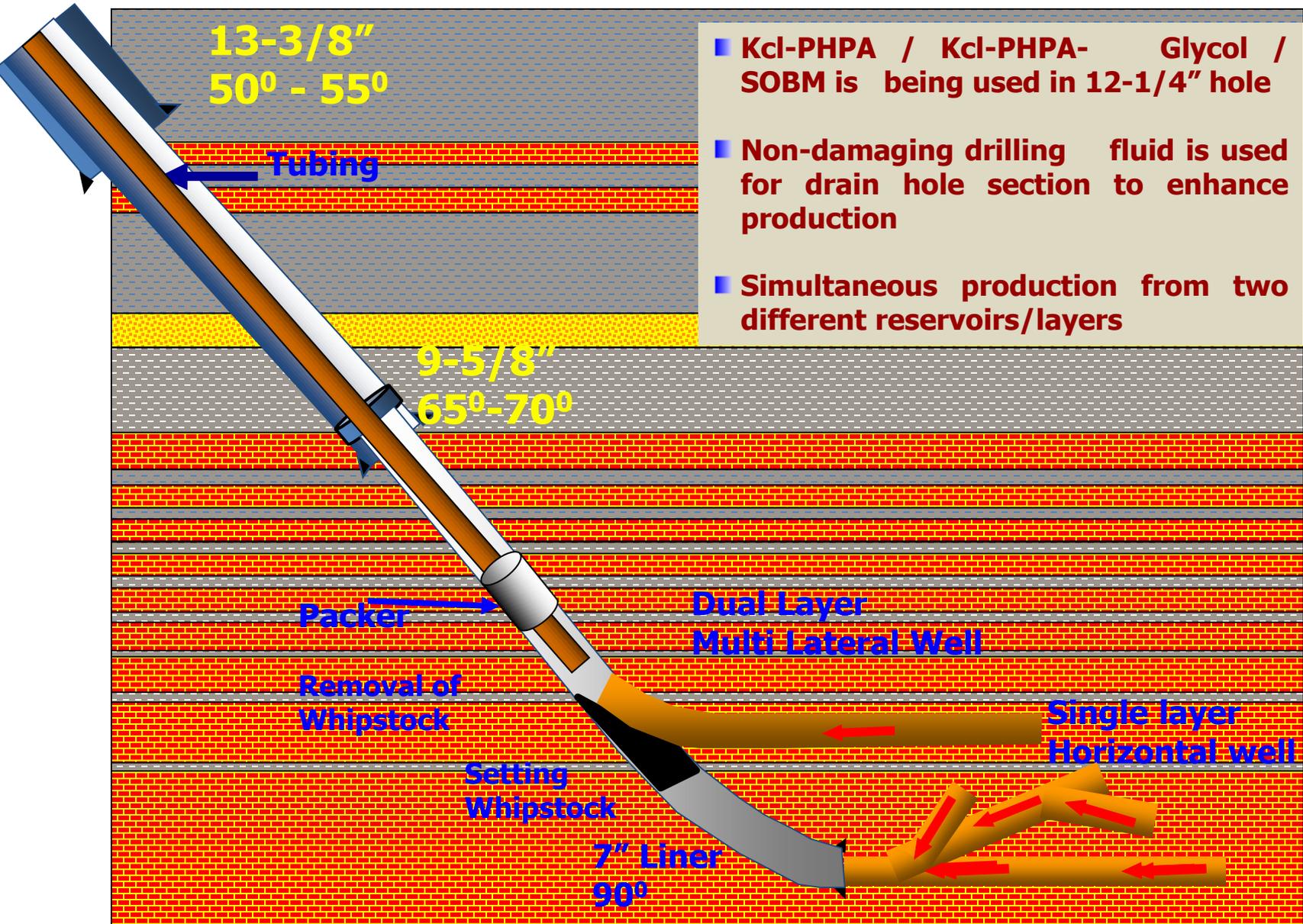
Jack Up Rig



Semi Submersible Rig



A Typical Hi-Tech Well in Offshore



Drillship "XXXXXXXXX XXXXXXXXX"

Drilled for ONGC in Water depth of 3k+ meters and well depth of 5k+ meters



State of the Art 5th Generation Drillship

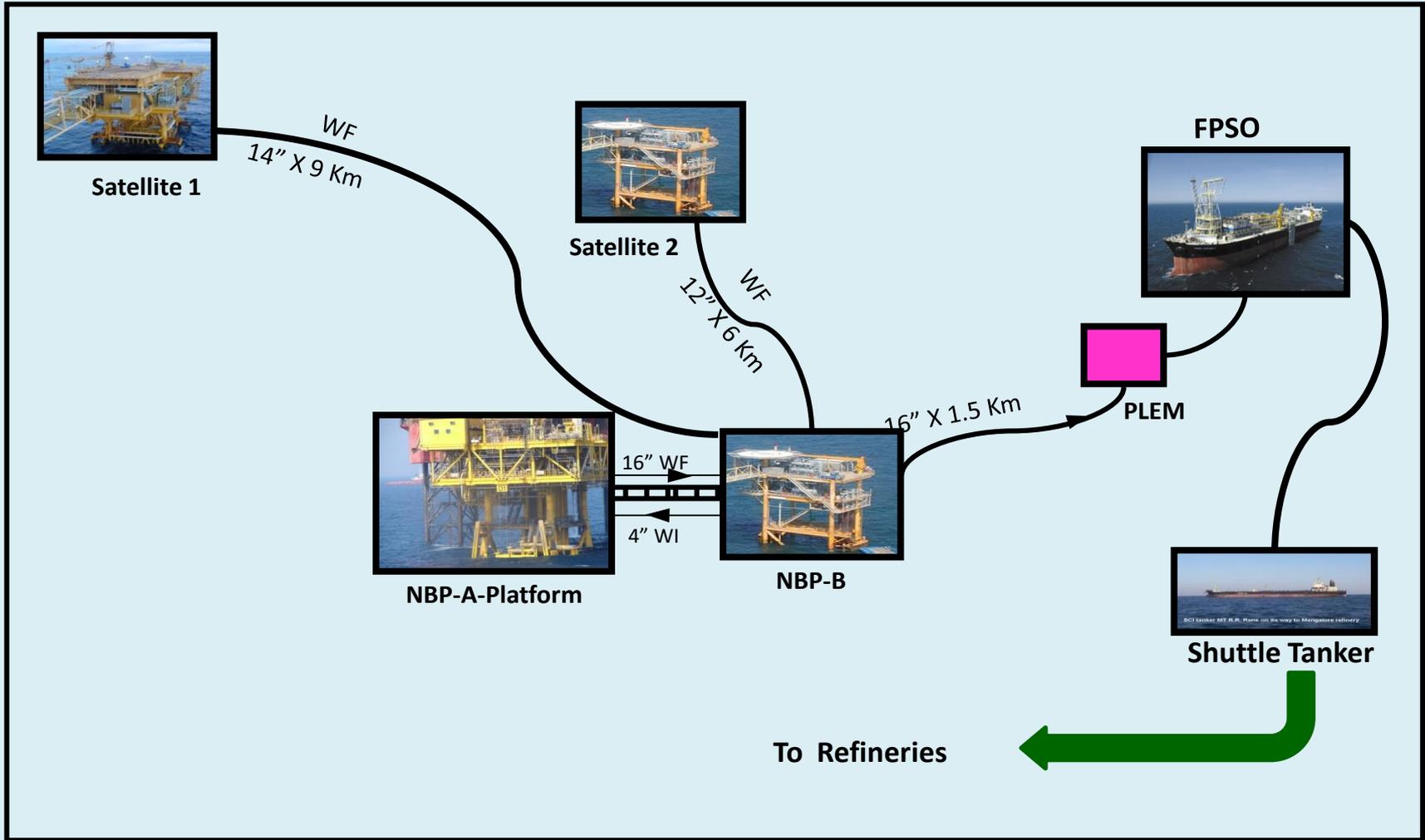


JACK-UP RIG & PRODUCTION PLATFORM

Gas flare – Inevitable? Pollution plus depletion of reserves



TYPICAL OIL PROCESSING AND EVACUATION SYSTEM



Drilling and production– Adverse Impacts

- Environmental (Water contamination, Riserless wells - Sea bed filled with debris, possible radio active substances used in well logging, too much of supply and support vessel movements, non restoration of site after abandoning the wells if found dry, Disturbance to the marine species, change in marine ecology etc.)
- Social (Fishermen loosing fishing days, possible loss of fishing area if found oil or gas bearing)
- Subsurface deterioration in back injection
- Catastrophic Accidents (Eg: Deep water disaster)
- Friendly oil can turn enemy - Gulf oil spill (Man made disaster)
- One oil well off the southeastern coast of Louisiana, owned by Taylor Energy, has been **leaking** since 2004, spilling between 300 and 700 barrels per day. The well's reserves could keep it **leaking** for the next 100 years if it isn't capped, meaning it will one day eclipse the **Deepwater Horizon** spill in terms of volume.

The Deep water Disaster in Gulf of Mexico

- The ***Deepwater Horizon* oil spill** was an industrial disaster that began on 20 April 2010, in the Gulf of Mexico on the BP-operated Macondo Prospect, considered to be the largest marine oil spill in the history of the petroleum industry. (Capping cement failed, BoP failed, annular cementing gave way, Casing pipes and tubing tilted, top kill and static kills failed, two wells drilled to reach the leaking spot, finally capped from depth)
- The US Federal Government estimated the total discharge at 4.9 million barrels (210 million US gal; 780,000 m³).
- After several failed efforts to contain the flow, the well was declared sealed on 19 September 2010.
- Reports in early 2012 indicated that the well site continued to leak. The *Deepwater Horizon* oil spill is regarded as one of the largest environmental disasters in American history.

The Deep water Disaster in Gulf of Mexico

Controlled fire- Chemicals and dispersants used- oil collected- still damage caused.



Effect of oil spill



Extractive Industry and Environment- Most vulnerable during armed conflicts

- The **Gulf War oil spill**, or the Persian Gulf oil spill- one of the largest oil spills in history, resulting from the Gulf war in 1991.
- Considered an act of [environmental terrorism](#)
- In January of 1991, xxxxxx forces allegedly began dumping oil into the Persian Gulf to stop a United States water landing on their shores.
- The spill likely was about 4,000,000 US barrels (480,000 m³).
- An initial study in 1993 found that the spill will not have long-term environmental consequences, but many studies since 1991 have concluded the opposite, claiming that the spill is responsible for environmental damage to coastline sediments and marine species and ecosystems.
- The slick reached a maximum size (area) of 101 miles (160 km) by 42 miles (68 km) and was 5 inches (13 cm) thick in some areas

IMAGES- POST GULF WAR



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In another 20 minutes.....

- ❑ **Onshore extractive activities (26)**
 - Mining cycle and Environmental issues (27, 28)
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- ❑ **Recent climate warnings (34)**
- ❑ **Best practices (35)**

Onshore extractive industries (Mining)

Onshore – Mining cycle & Environmental issues

Mining Cycle and Impacts –Environmental impacts of mining can occur at local, regional, and global scales

Environmental and Social (Cycle includes 8 steps)

- All stages of the mining cycle have different types and levels of impacts
- Impact mitigation to be tailored to suite the requirements

Steps in mining and Environmental issues in each step

- **Prospecting** (Preliminary survey, Aerial survey, Gravity magnetic survey, geological modelling based on available data etc.) (Lots of vehicle movements through forests and agriculture areas)
- **Exploration** (drilling holes, explosives, coring) (deforestation, displacement)

Onshore – Mining cycle & Environmental issues

- **Pre-feasibility** (Rough estimate of reserves, feasibility to transport and market)
- **Feasibility** (Delineation of reserve to establish commerciality)
- **Construction** (Civil- Electrical-Mechanical- causing environmental disturbance)
- **Operation** (Extraction- Transport- storage) – (Air, water, sound and light pollution, lower Water-Table Landslides- -Greenhouse gases- Ozone layer depletion- Temperature - - Glacier melting and rise in sea levels etc.)
- **Closure** (Filling back, Levelling) (Never like the original topography)
- **Rehabilitation** (Land becomes unusable for agriculture, displaced people loses job and nowhere to go- Profit reaped by the giants)

Onshore – Social issues

- Loss of land
- Loss of livelihood
- Biodiversity leading to change in the livelihood
- Inequality in income and wealth
- Misuse of compensation leading to acquiring bad habits
- Lifestyle diseases
- Occupational diseases
- Hazardous waste

Onshore – Social issues contd...

- When **mine** closures result in sudden unemployment and loss of income, **social** problems often follow. After a series of **mine** closures in Elliot Lake, Ontario, domestic disturbances tripled, weapons use and demand for **social** services increased, and student enrolment dropped.

Illegal mining

- Illegal mining – Very rampant and not generally accounted for.
- An occupation limited to the source.
- Very ill organised and unscientific.
- Does not take Environmental issues seriously
- No sustainable development concept- Asset damage
- No taxes and levies to Government
- Lots of social issues (Child labour, safety, security, gender, human rights abuse, Groups and clashes, illiteracy, exploitation, slavery and bonded labour)

Live Mine



Live Mine



Recent climate warnings

- Increase of air and water temperature lead to global warming, rising sea levels, supercharged storms and higher wind speeds, more intense and prolonged droughts and wildfire seasons, heavier precipitation and flooding.
- The evidence is overwhelming and the results devastating
- Land slides, glacier burst- cloud burst
- Change in climatic pattern
- Increased frequency of Tornados, hurricanes, typhoons & flash floods
- The number of climate-related disasters **has tripled in the last 30 years.**

Best practices

- Better regulation
- Community involvement
- Restoration provisioning at the beginning
- CSR compliance
- Environmental and social cost accountability
- Recycling of water to the extent possible
- Effluent discharge after treating
- Site restoration to its original state

Thank You



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