

TRAINING TITLE

SOLID AND SLUDGE ANALYSIS IN OIL AND GAS

TRAINING DURATION

5 Days

TRAINING VENUE AND DATES

Ref. No. LM099	Solid And Sludge Analysis in Oil and Gas	5	18 - 22 May 2025	\$5,500	Muscat, Oman
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In any of the 4 or 5-star hotels. The exact venue will be informed soon.

TRAINING FEES

\$5,500 per participant includes Training Materials/Handouts, Tea/Coffee breaks, Refreshments, and Lunch.

TRAINING CERTIFICATE

DEFINE Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING OVERVIEW

TRAINING INTRODUCTION

- **What is Sludge Analysis?**

Semi-solid waste remaining after industrial wastewater or sewage treatment is known as sludge. It includes a diverse combination of organic and inorganic constituents, pathogens, heavy metals, and nutrients. The major goals of sludge analysis are as follows:

Environmental Compliance:

Ensuring that the disposal or remedy of sludge adheres to environmental policies.

Resource Recovery:

Identifying potential for ecologically useful reuse or recycling of sludge.

Health and Safety:

To examine the viable health risks linked with sludge, mainly in terms of microbiological contamination.

- **Why is Sludge Analysis Required?**

There are several reasons why Sludge Analysis is necessary. First, it plays a part in ensuring that the treated sludge satisfies regulatory specifications at the point of disposal or reuse. Second, it is useful for the understanding of sludge composition

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that matters while determining what to do with them either disposal or reuse. Lastly, it helps identify any potential environmental hazards associated with the sludge thereby enabling informed decision-making on its management.

TRAINING OBJECTIVES

Upon the successful completion of this course, participants will be able to:-

To provide participants with the essential knowledge and practical skills to sample, analyze, and manage solids and sludge in oil and gas operations, ensuring effective decision-making, regulatory compliance, and environmental protection.

TRAINING METHODOLOGY:

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course. All presentations are made in excellent colourful power point. Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

WHO SHOULD ATTEND?

- Laboratory technicians and chemists responsible for the analysis of crude oil samples for quantity and quality purposes
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- Refinery personnel responsible for evaluating crude oil to determine their processing characteristics.
- Operating (field) personnel responsible for collecting samples will also benefit from a better understanding of how test results are directly dependent on proper sample collection and handling.
- Traders and buyers are involved in the sale, purchase, or exchange of crude oil.

DAILY COURSE OUTLINE

The Significance of Sludge Analysis in Everyday Life

Sludge Analysis is significant in preserving the environment and public health. By analyzing the sludge composition, we can discover if there are harmful contaminants present that may affect ecosystems or even human health in the case

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is not managed properly. This is one of the most important types of knowledge necessary for proper sludge management that would prevent it from causing harm to nature and, as a result, communities residing in its direct nearby.

Parameters Checked in Sludge Analysis

In the Sludge Analysis, we referred to several key parameters and figured out what in this sludge is, and how good or bad it is. These parameters include, but are not limited to:


Heavy Metal Content:

Toxic substances such as heavy metals like lead, mercury and cadmium if found at above-normal concentrations in water may cause degradation of the environment or pose very high health risks.

Nutrient Levels:

On the one hand, nitrogen and phosphorus are nutrients for growing plants; however when in high concentration levels they can cause eutrophication of water bodies.

Analytical Methods

- 
- TSS, SS, Dissolved Solid, DO, pH, mix liquor,
 - Water components (hydrocarbon)
 - COD (chemical oxygen demand)
 - Hydrocarbons in water
 - BODs
 - Sulfide
 - Moisture
 - Carbonate

Scale analysis

• Preliminary Analysis:		Weight	
%	Method		
• Magnetic properties :			• Magnet
• H ₂ S Present :			• Lead Acetate paper

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• CO ₂ Present :				• Effervesce Test
• Loss @ 105°C (Water Content)				• Gravimetric
• Chemical Analysis:		Weight		
%	Method			
• Loss @ 500°C (Organic matter, Sulphides, etc...)				• Gravimetric
• Carbonates (Loss on ignition @ 900°C as CO ₂)				• Gravimetric
• Sulphide as Iron Sulphide				• Iodometric
• Water Soluble – IC Analysis :		Weight		
%	Method			
• Calcium as Ca ²⁺				• IC
• Magnesium as Mg ²⁺				• IC
• Sodium as Na ⁺				• IC
• Chloride as Cl ⁻				• IC
• Sulphate as SO ₄ ²⁻				• IC
• Phosphate as PO ₄ ³⁻				• IC
• Acid Soluble – ICP Analysis :		Weight		
%	Method			
• Silicate as Silica (SiO ₂)				• ICP
• Calcium as CaO				• ICP
• Magnesium as MgO				• ICP
• Aluminium as Al ³⁺				• ICP
• Chromium as Cr ³⁺				• ICP
• Iron as Fe ₂ O ₃				• ICP

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• Nickel as Ni ²⁺		• ICP
• Zinc as Zn ²⁺		• ICP
• Barium as Ba ²⁺		• ICP
•		•
• Acid Insoluble <div style="display: flex; justify-content: space-between;">%Method</div>		Weight
• Silica and Acid Insoluble		• Gravimetric
• Organic Analysis (Mainly Hydro Carbon): <div style="display: flex; justify-content: space-between;">%Method</div>		Weight
• Toluene Soluble		• Extraction
• Comments		

Pathogen Presence:

It is hypothesized that pathogens in the sludge may indicate potential health hazards and proper disposal differentiation before they are thrown away

NOTE:

- Pre & Post Tests will be conducted.
- Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.

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