

What is the process of buoy tailing



Overview

How a Tailings Storage Facility (TSF) Works in Mining Understand how tailings storage facilities (TSFs) operate in mining, from tailings deposition to water.

Key Takeaways

Buoy tailing refers to the handling and deposition of fine mineral tailings in slurry form, often using flotation and controlled settling techniques to separate solids from water. Overview of Tailings

In mining, tailings are the leftover materials after extracting valuable minerals from ore. They typically consist of finely ground rock particles, water, and residual chemicals from processing, forming a slurry that is transported to a Tailings Storage Facility (TSF) or pond for deposition. Tailings differ from overburden, which is the unprocessed waste rock removed during mining.

Steps in the Buoy Tailing Process

- **Ore Processing and Concentration** The ore is crushed and ground to liberate valuable minerals. Techniques such as froth flotation, gravity separation, and magnetic separation are used to concentrate the target minerals. Froth flotation introduces chemical reagents that attach to specific minerals, allowing them to float and be collected, while the remaining uneconomic material becomes tailings.



- **Tailings Slurry Formation** After mineral extraction, the remaining fine particles are mixed with water to form a slurry, typically containing 50–55% solids. This slurry is pumped through pipelines to the TSF . The buoyancy of the water helps transport the tailings efficiently and allows finer particles to remain suspended longer, facilitating controlled deposition.
 - **Deposition and Settling** At the TSF, the slurry is discharged at designated points. Coarse particles settle first, forming a stable beach near the discharge, while finer silt and clay-sized particles travel further, creating a gradient of particle sizes. This natural separation is critical for stability and water recovery .
 - **Water Management** The process leaves a supernatant pond of relatively clear water in the center, which can be recycled back into the processing plant. Modern systems may use thickened or filtered tailings to remove more water before deposition, improving stability and reducing environmental risks .
 - **Optional Beneficiation** Some operations perform tailings beneficiation to recover residual minerals. This involves additional physical separation (magnetic, gravity, or flotation) or chemical processing (leaching or bioleaching) to extract metals like copper, gold, or rare earth elements from the tailings .
- Environmental and Operational Considerations

Buoy tailing processes are designed to minimize environmental impact by controlling water content, preventing dam failures, and reducing toxic chemical mobilization. Proper management ensures tailings are safely stored, and water is recycled, while residual minerals may be recovered for economic benefit .

Summary

The buoy tailing process combines mineral processing, slurry transport, controlled deposition, and water management to handle mining waste efficiently. It leverages the buoyancy of water to separate coarse and fine particles, ensures stability in tailings storage, and can include beneficiation to recover additional minerals, reducing environmental and economic losses.

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Deposition Methods of Tailings

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What are Tailings - Society for Mining, Metallurgy & Exploration

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Tailings What Are Tailings?

This page briefly highlights the generation and nature of tailings. The various tailings storage and

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About Tailings

Downstream designs start with an impervious starter dam. Tailings are then discharged into the dam and as the embankment is

What are Tailings?

The tailings disposal method should be selected based on various factors, including site topography, climate, environmental factors,

Tailings

A main reason tailings dams are unsafe is because it is too expensive to build them safely and mining companies do not have an

Oil Sands Tailings: What Needs to be Done

Also, the CT process does not improve the thermal energy efficiency of the oil sands plants because of the discharge

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Mine Tailing

Mine tailings are defined as the waste produced after the extraction of targeted metals from ore, consisting of fine-fraction slurry that

Tailing Ponds: What are they & how can we improve them?

What Are Tailing Ponds? Tailing ponds serve as temporary storage facilities

How to reshape the future of tailings?

Read the latest blog article and learn why it's important to reshape the tailings management and how to accelerate the

How to manage tailings efficiently and economically

Tailings management is not a matter of finding the most technically suitable equipment or solution; it is about

Tailings Dams: Where Mining Waste is Stored Forever

Currently, there are about 3,500 tailings dams worldwide. The contents of the tailings themselves depend on what

Process effluents and mine tailings: sources, effects and ...

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What to do with tailings? - ailings obtained from mineral processing ...

Both the short and long-term behaviour of tailings are mostly determined by the dewatering of the different phases present and in

What are Tailings?

Tailings management and storage facilities are engineering projects which comply with safety and environmental control

Mine Tailing

The process of mineral mining generates a large amount of waste material known as tailings. Mine tailings are “mixtures of crushed

Tailings Dam

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Mine Tailings: The Cornerstone of Safe Mining Operations

What are Mine Tailings? In mining, tailings refer to the residual waste material that remains after the desired minerals

What Are Tailings in Mining and How Are They Managed?

Tailings are the materials remaining after valuable minerals have been extracted from ore during mining operations.

Tailings ponds for mining and oilsands waste: FAQs | CBC News

Tailings from oilsands can contain naphthenic acids, polycyclic aromatic hydrocarbons, phenolic compounds, ammonia,

What Are Mining Tailings?

Mining tailings are, simply put, the waste materials left over after the valuable minerals have been separated from the

Tailings management and water stewardship in mining

Tailings management and water stewardship in mining Traditional wet tailings storage facilities consume

How tailings management is everyone's concern

The Brumadinho disaster brought the issue of tailings and its impact on communities to light. What is the outlook for

Numerical analysis of fishtailing motion, buoy kissing and pullback ...

A double spring hydrodynamic response system model composed of "Anchoring-Buoy" and "Hawser-Tanker"

Best Practices for Tailings Dam Design

Furthermore, the process of thickening or filtering tailings requires a larger footprint for mechanical equipment, which

Tailings Pond

The tailings ponds were built without any proper base liner, so the process water from the ponds has infiltrated the subsoil, causing

Safety guidelines and good practices for tailings management

tailings dam is a tailings embankment or a tailings disposal dam. The term “tailings dam” encompasses embankments, dam walls or

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