



Navigating heap leach projects requires clarity around the technical terms and equipment involved. This guide demystifies the core terminology used in heap leaching—from stacking methods and leach pads to conveyors and retreat systems—so mine operators, engineers, and procurement teams can communicate with precision and confidence. Designed for African mining conditions, our focus is on practical, modular solutions that deliver performance in the field.

1. **Acid Consumption:** The amount of acid, typically sulfuric acid, used per ton of ore in the leaching process to dissolve metals, often measured in kilograms per ton.
2. **Acid Curing:** Pre-treatment using acid to enhance permeability and preparation, particularly for copper or uranium heaps.
3. **Agglomeration:** The process of binding fine ore particles with moisture and a binder (e.g., cement) to form larger, permeable aggregates, improving heap leaching efficiency.
4. **Agglomeration Drum:** A rotating cylindrical device that mixes ore with water and binders to create agglomerates, enhancing heap permeability.
5. **Bacteria (e.g., *Acidithiobacillus ferrooxidans*):** Microorganisms used in bioleaching to oxidize sulphide minerals, aiding extraction of metals like copper and gold.
6. **Barren Solution:** The leach solution after metal extraction, often recycled back to the heap for further use.
7. **Best Available Techniques (BAT):** Advanced methods and technologies to minimize environmental impacts in heap leaching, as defined by regulatory standards.
8. **Bio-Heap Leaching:** A heap leaching variant using microorganisms to enhance metal extraction from sulfide ores through oxidation.
9. **Bornite:** A copper iron sulphide mineral (Cu_5FeS_4), an important copper ore in heap leaching.
10. **Cell:** A designated section of the heap pad with its own irrigation and drainage; allows staged leaching and easier management.
11. **Chalcocite:** A copper sulphide mineral (Cu_2S), a significant source of copper for leaching.
12. **Chalcopyrite:** The primary copper ore mineral (CuFeS_2), commonly processed in heap leaching.
13. **Chloride Content:** The concentration of chloride ions in the leach solution, which can impact metal solubility and recovery.
14. **Copper Recovery:** The percentage of copper extracted from ore during the leaching process.
15. **Copperas:** Iron(II) sulphate (FeSO_4), a historical term for a by-product or chemical used in some leaching processes.
16. **Covellite:** A copper sulphide mineral (CuS) that can be leached to recover copper.
17. **Crusher:** A machine that reduces ore particle size (e.g., to 12-50 mm) to prepare it for leaching.
18. **Cut-off Grade:** The minimum ore grade economically viable for processing, determining which material is sent to the heap.
19. **Cyanide:** A chemical (e.g., sodium cyanide) used as a lixiviant to dissolve gold and silver in heap leaching.

20. **Drip Emitters:** Irrigation devices that deliver lixiviant to the heap in a controlled, drop-by-drop manner to minimize evaporation.
21. **Dump Leaching:** A heap leaching method using uncrushed, run-of-mine ore, typically for very low-grade deposits.
22. **Geomembrane:** A synthetic, impermeable liner (e.g., HDPE) used in heap leach pads to prevent leachate contamination.
23. **Grasshopper Conveyor:** A portable conveyor used to transport ore to the heap leach pad, designed for flexibility and repositioning.
24. **Heap Height:** The vertical height of the ore heap, affecting leaching kinetics and pad stability.
25. **Heap Leaching:** A process where crushed ore is stacked on a lined pad and irrigated with a chemical solution to extract metals.
26. **Horizontal Index Conveyor:** A conveyor that moves ore horizontally across the leach pad for even distribution.
27. **Hydraulic Conductivity:** A measure of the ore's ability to transmit water, impacting lixiviant flow through the heap.
28. **Hydrometallurgy:** Field of extractive metallurgy using aqueous chemistry, including heap leaching, solvent extraction, and electrowinning.
29. **In-Situ Leaching:** Leaching ore in place without excavation, by injecting lixiviant into the ore body.
30. **Intermediate Leach Solution (ILS):** Solution collected from intermediate lifts in a multi-lift heap, with varying metal concentrations.
31. **Interlift Liner:** A liner placed between ore lifts to improve drainage and stability in tall heaps.
32. **Irrigation System:** The network of pipes, sprinklers, or drip emitters used to apply lixiviant to the heap.
33. **Leach Cycle:** The duration of irrigation and leaching, typically weeks to months, depending on ore and metal type.
34. **Leach Pads:** Engineered structures with impermeable liners where ore is stacked for leaching.
35. **Lift:** A horizontal layer of ore (5-10 m high) stacked on the heap, with multiple lifts forming the total heap.
36. **Lixiviant Application Rate:** The rate at which lixiviant is applied, measured in litres per square meter per hour, critical for metal dissolution.
37. **Lixiviants:** Chemical solutions (e.g., cyanide, sulfuric acid) used to dissolve metals from ore during leaching.
38. **Merrill-Crowe Process:** A method to recover gold and silver from pregnant leach solution using zinc dust precipitation.
39. **Ore Grade:** The concentration of valuable metal in the ore, expressed as grams per ton (g/t) or percentage.
40. **Oxidation-Reduction Potential (ORP):** A measure of a solution's tendency to gain or lose electrons, crucial for leaching chemistry.
41. **Oxide Minerals:** Oxidized minerals that are more soluble and easier to leach than sulphide minerals.
42. **Pad Curing:** Initial irrigation of freshly stacked lift to verify permeability and pad integrity before full operations.

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43. **Percolation:** The downward flow of lixiviant through the ore heap, enabling metal dissolution.
44. **Percolation Flux:** Rate of leachate flow through ore per unit area over time (e.g., $\text{m}^3/\text{m}^2/\text{day}$).
45. **Permeability:** The ore's ability to allow fluid flow, essential for effective leaching.
46. **pH:** The measure of acidity or alkalinity of the leach solution, controlled to optimize metal extraction.
47. **Pregnant Leach Solution (PLS):** The solution containing dissolved metals collected from the heap.
48. **Pressure Leaching:** Leaching under high pressure and temperature to accelerate metal extraction, typically for refractory ores.
49. **Radial Stacker:** A conveyor that pivots to stack ore in a radial pattern, optimizing leach pad space.
50. **Raffinate:** The depleted solution after metal extraction, often recycled in the leaching process.
51. **Ramp:** An entrance or internal access road within the heap, used by equipment (stackers, conveyors) to access higher lifts
52. **Ramp Conveyor:** A conveyor designed to transport ore up inclines for heap construction.
53. **Ramp-Up Irrigation:** Gradually increasing leachate application rate (from low to design flow) to optimize permeability and reduce early consolidation
54. **Recovery Rate:** The percentage of metal extracted from the ore compared to its total content.
55. **Redox Potential:** Another term for ORP, indicating the oxidizing or reducing conditions in the leach solution.
56. **Secondary Sulphides:** Sulphide minerals formed from primary sulphide alteration, requiring specific leaching conditions.
57. **Solution Pond (Barren Pond, Pregnant Pond):** Ponds storing barren and pregnant leach solutions in the heap leach circuit.
58. **Solvent Extraction-Electrowinning (SX/EW):** A process to extract metals from leach solutions using solvent extraction followed by electrowinning.
59. **Sprinklers:** Devices that spray lixiviant over the heap surface for even distribution.
60. **Sulfuric Acid:** A strong acid used as a lixiviant for copper, uranium, and other metals in heap leaching.
61. **Tank Leaching:** Leaching ore in tanks with agitation, offering faster extraction but higher costs than heap leaching.
62. **Transverse Conveyor:** A conveyor that moves ore across the leach pad, aiding even distribution.
63. **Yellowcake:** A uranium oxide concentrate (U_3O_8) produced from leach solutions.