



ALLU

Smart Mobile Mining

Designed for soft rock mining

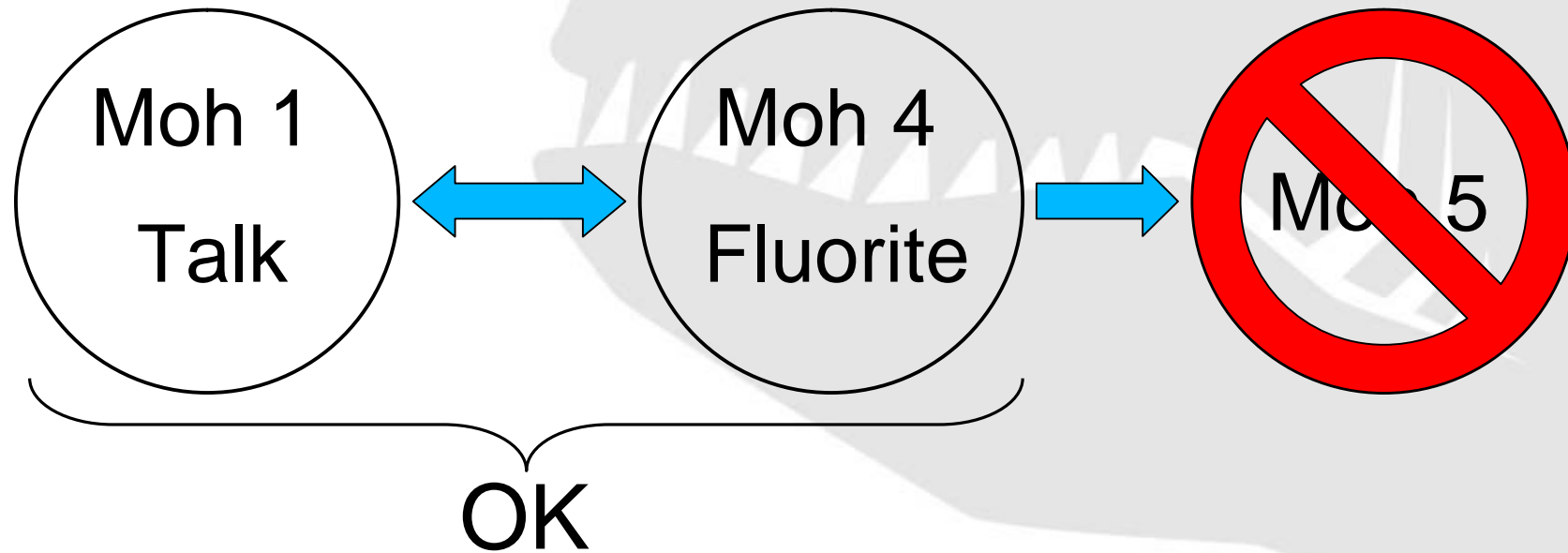
Designed for production

One Step Ahead



Smart mobile soft rock mining

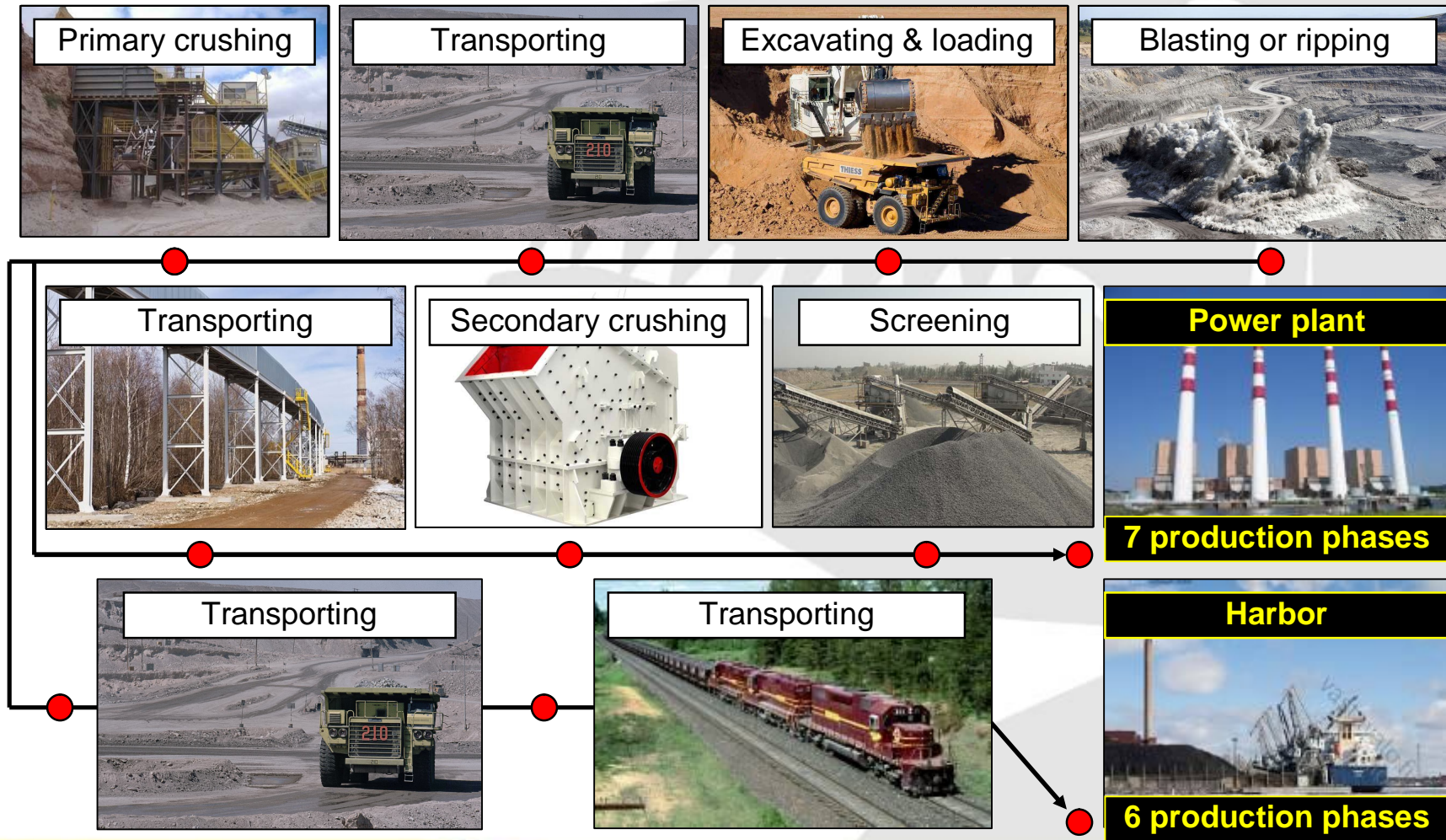
What do we mean with soft rock mining?





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Conventional mining operation

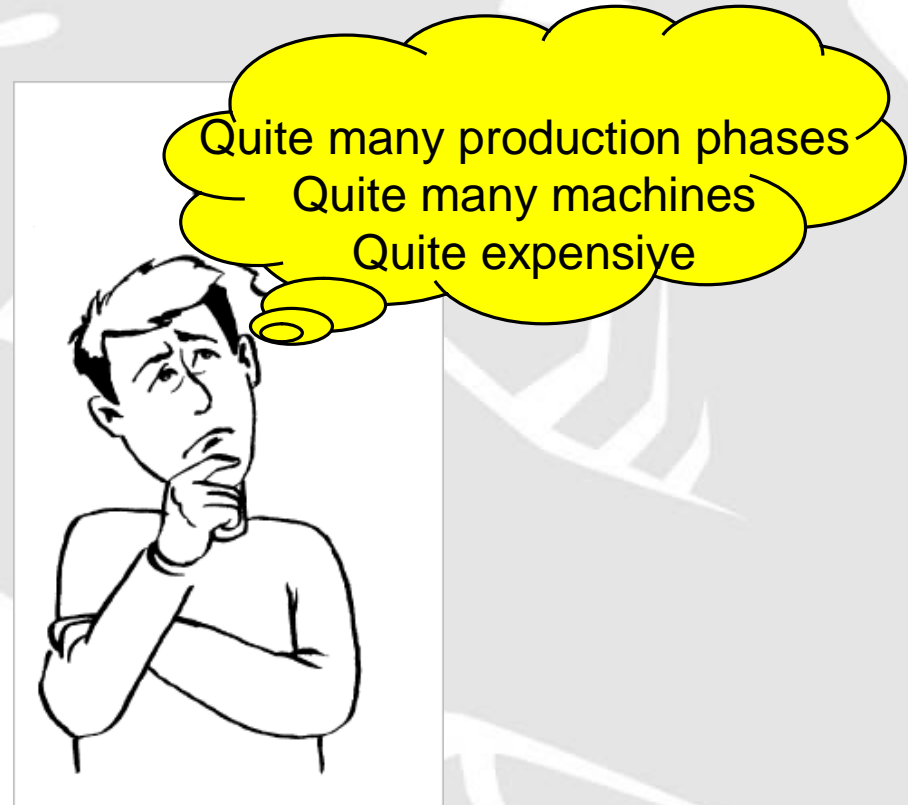
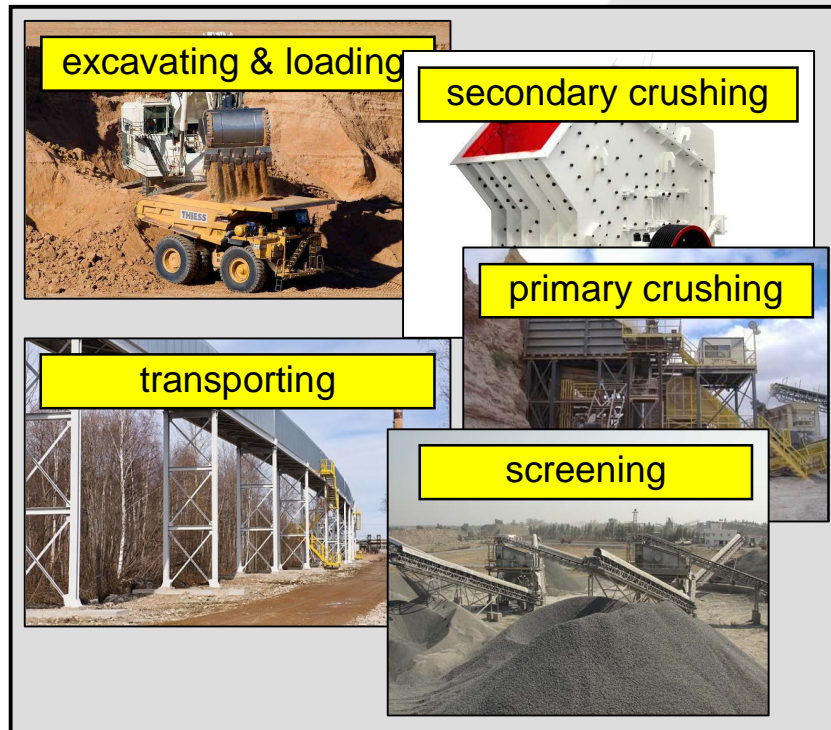


One Step Ahead



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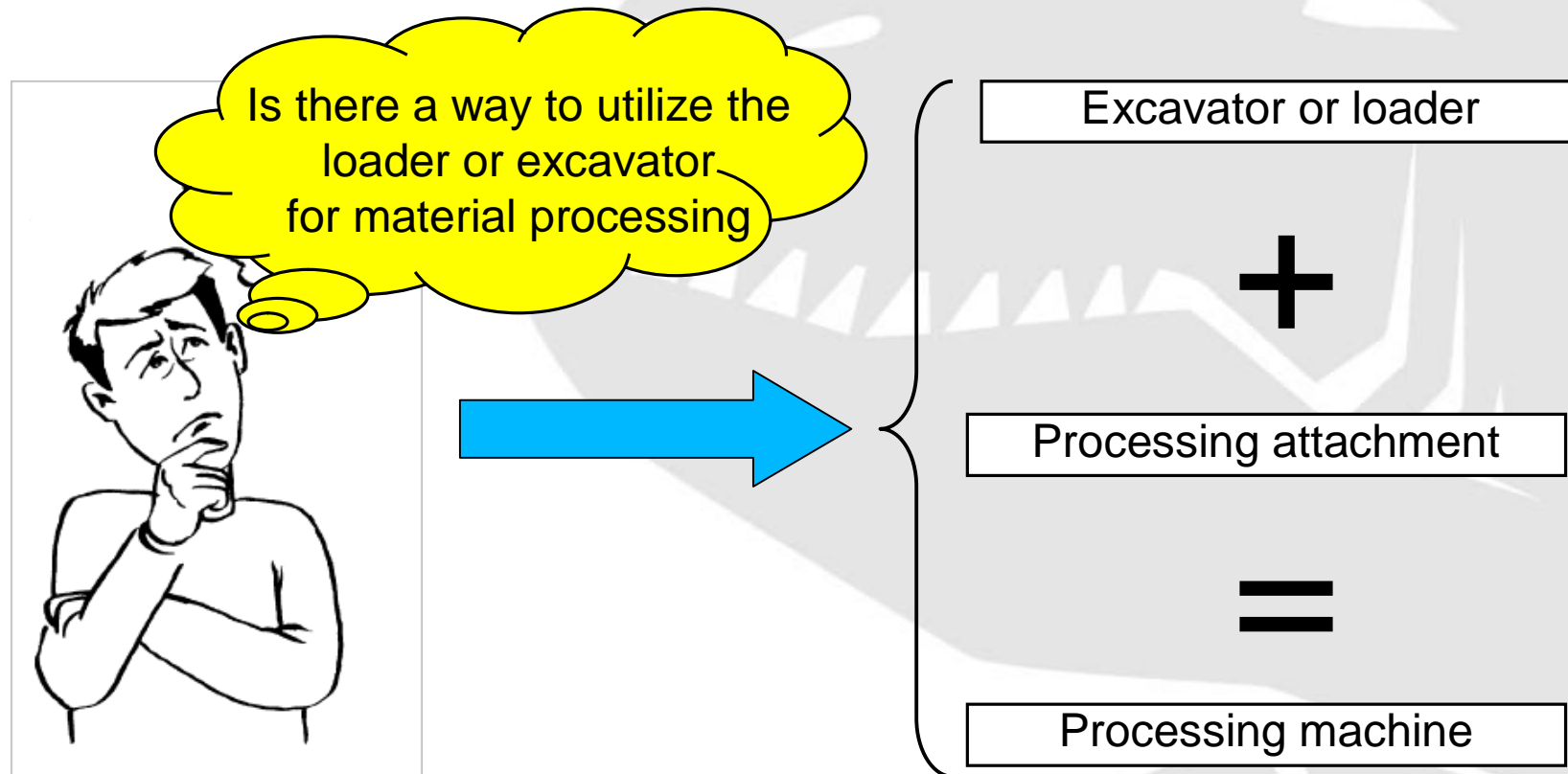
Could a mining operation be executed any other way?





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Could a mining operation be executed any other way?





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One Step material processing with M Series crushing buckets



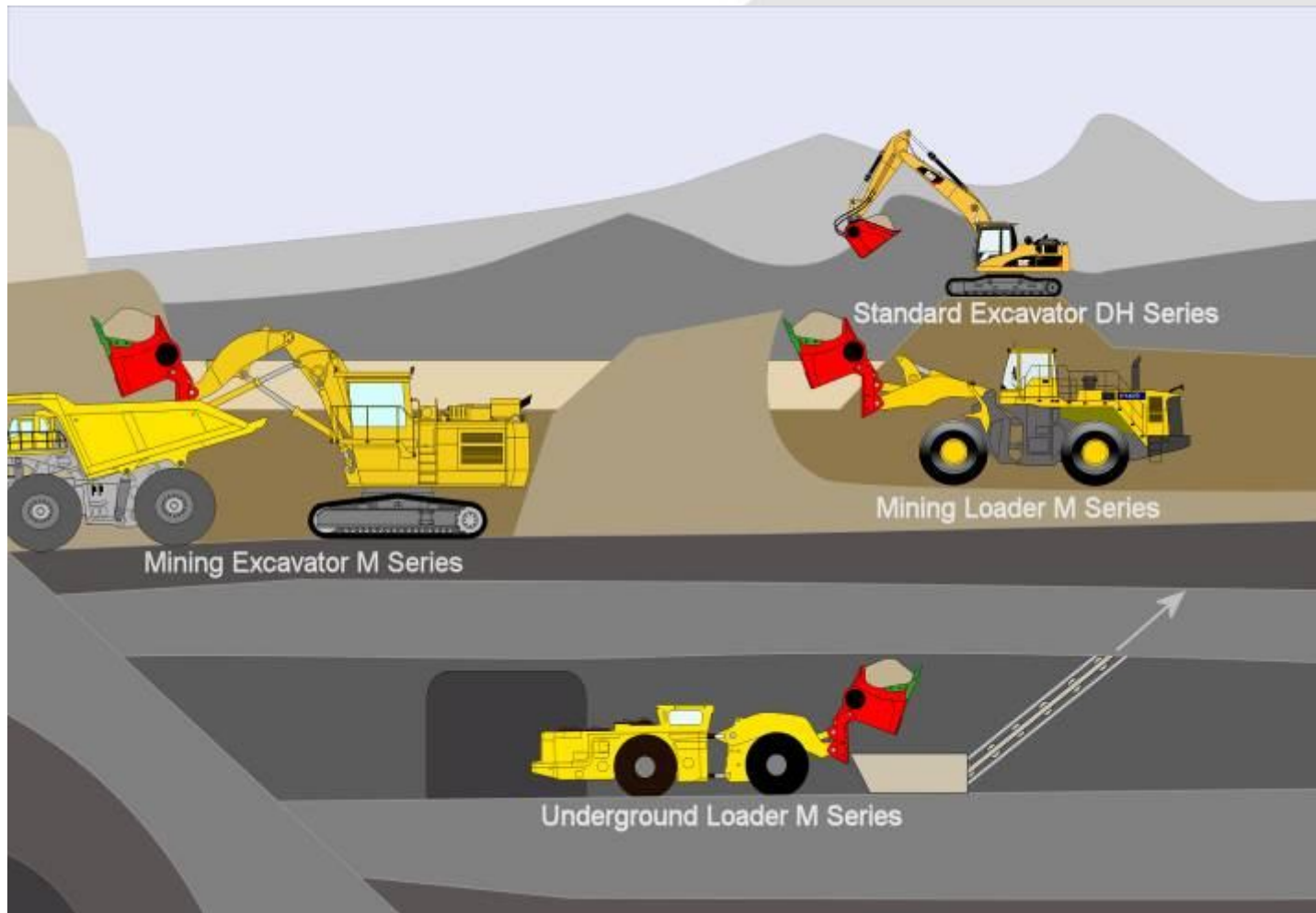
Simultaneous
Crushing – Separating - Enrichment – Loading

One Step Ahead



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One Step material processing with M Series processing buckets

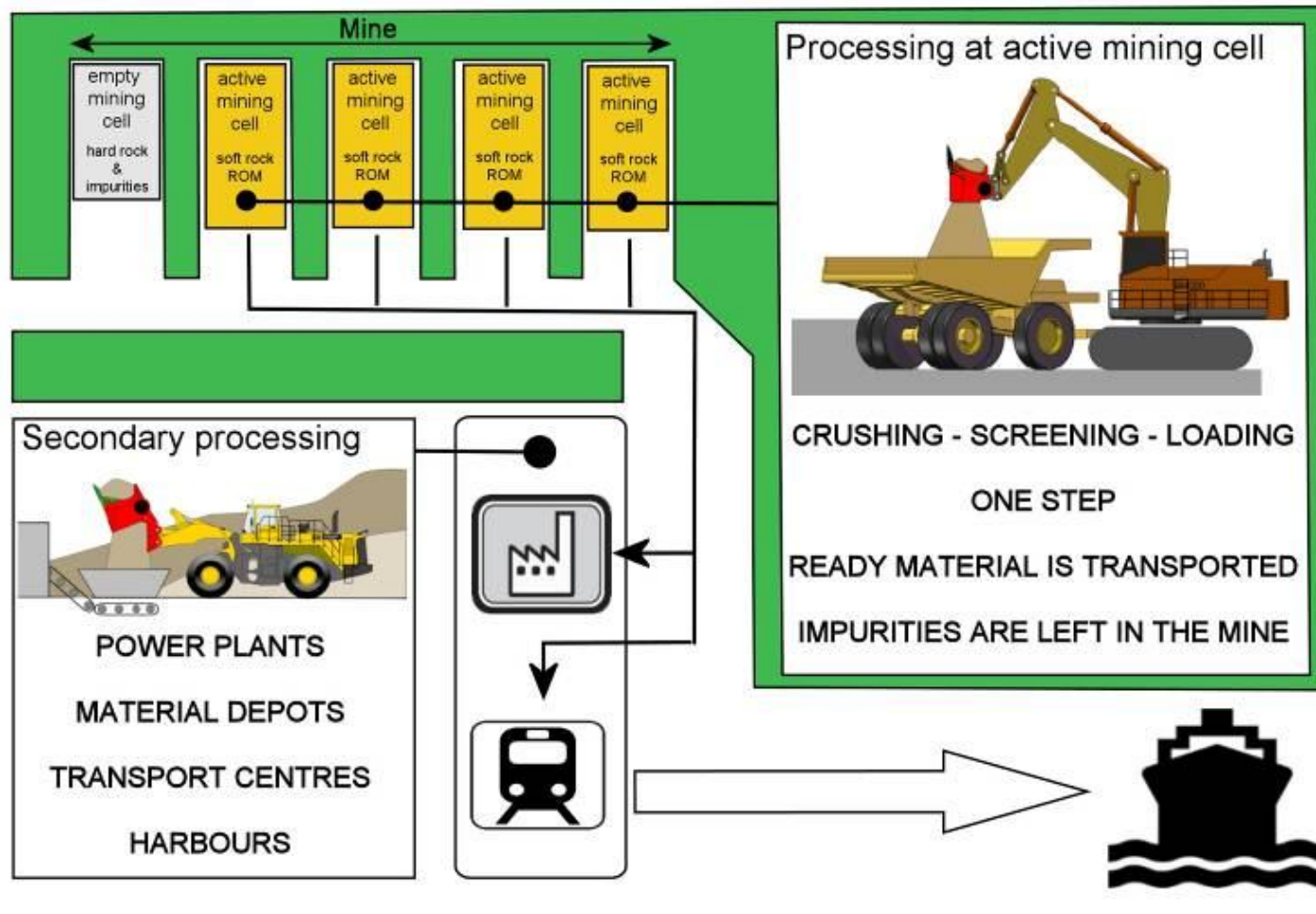


One Step Ahead



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One Step material processing with M Series processing buckets

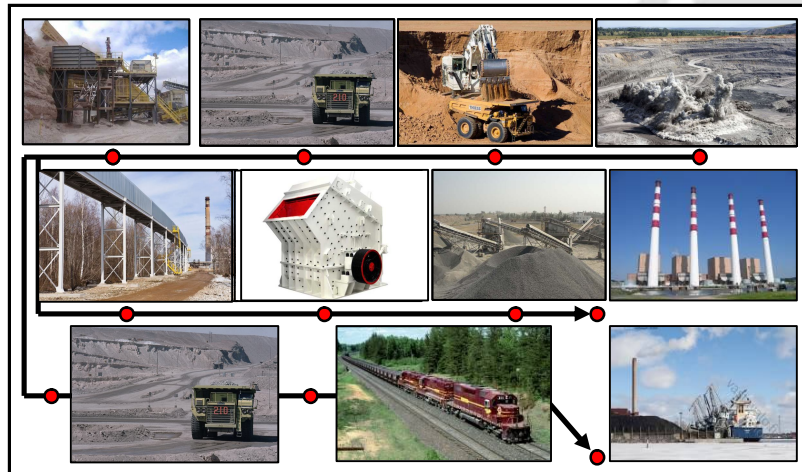




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What are the biggest differences?

Conventional



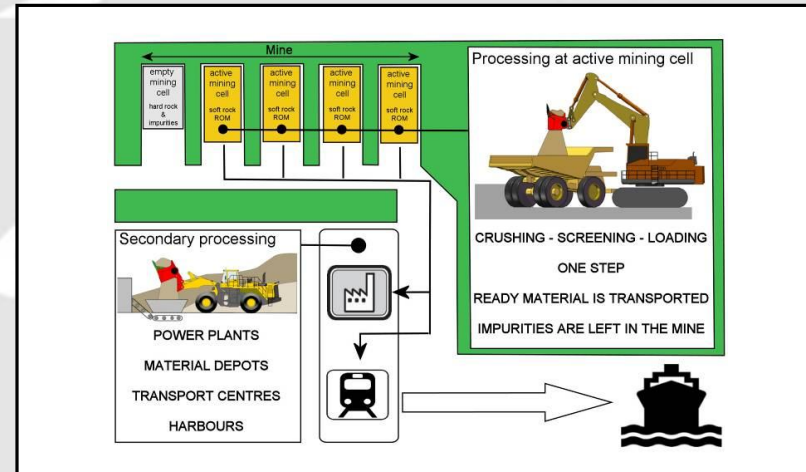
7 steps → ready material → power plant

6 steps → ready material → export

5 machines + conveyor system

- Excavator
- Dumper
- 2 crushers
- Screening plant

One Step



3 steps → ready material → power plant

4 steps → ready material → export

2 machines

- Excavator attached with ALLU M series
- Dumper



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Target mining operations

- Oil Shale mining
- Coal mining
- Bauxite mining
- Phosphate mining
- Lime stone mining
- Kaolin mining
- Dolomite mining
- Gypsum mining
- Rock salt mining
- Other similar minerals & rock

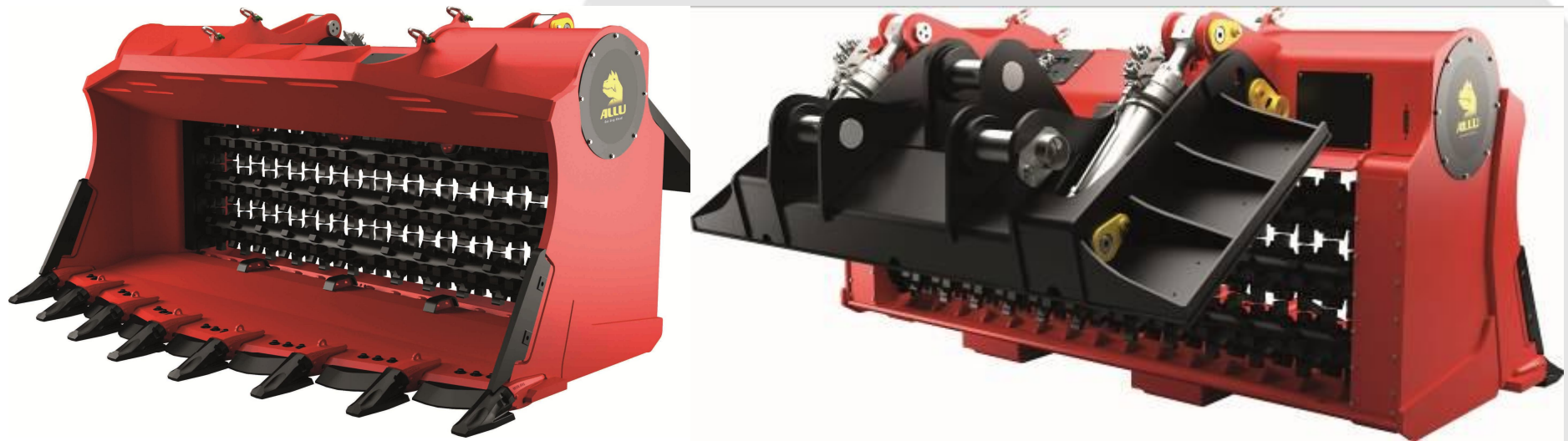


Crushing, screening, enrichment and loading performed in One Step



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ALLU M series product line designed for mining



Hydraulically powered attachment that converts the carrier into a processing machine

3 models for mining excavators

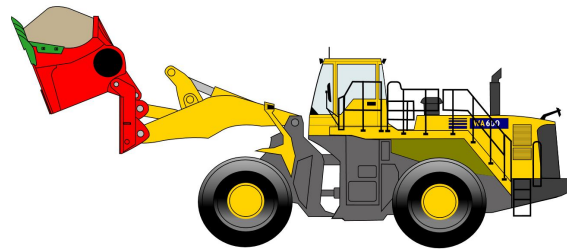
3 models for mining wheel loader

Can also be mounted on sub terrain loaders

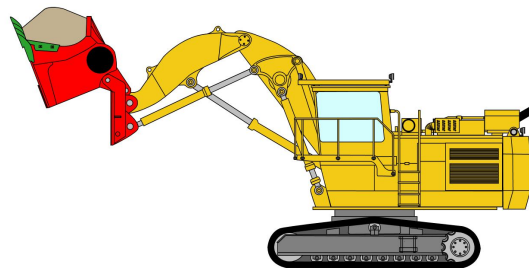


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ALLU M series product line designed for mining



Model	Operating weight	Volume
M 3-32 L	30 – 50 ton	5,0 m3
M 3-32	50 – 60 ton	6,5 m3
M 4-32	60 – 90 ton	8,0 m3



Model	Operating weight	Volume
M 3-20	50 – 70 ton	3,0 m3
M 3-23	70 – 120 ton	4,5 m3
M 4-23	120 – 160 ton	6,0 m3



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Carrier example

- ❑ Komatsu WA 600
- ❑ Mining loader
- ❑ 53 ton operating weight
- ❑ Hydraulic output 460 l/min, 350 bar
- ❑ Two way auxiliary hydraulics
- ❑ Regular bucket 6,4-7,0 m³
- ❑ Tipping load straight 34 tn.
- ❑ Tipping load 43 degrees 29 tn.

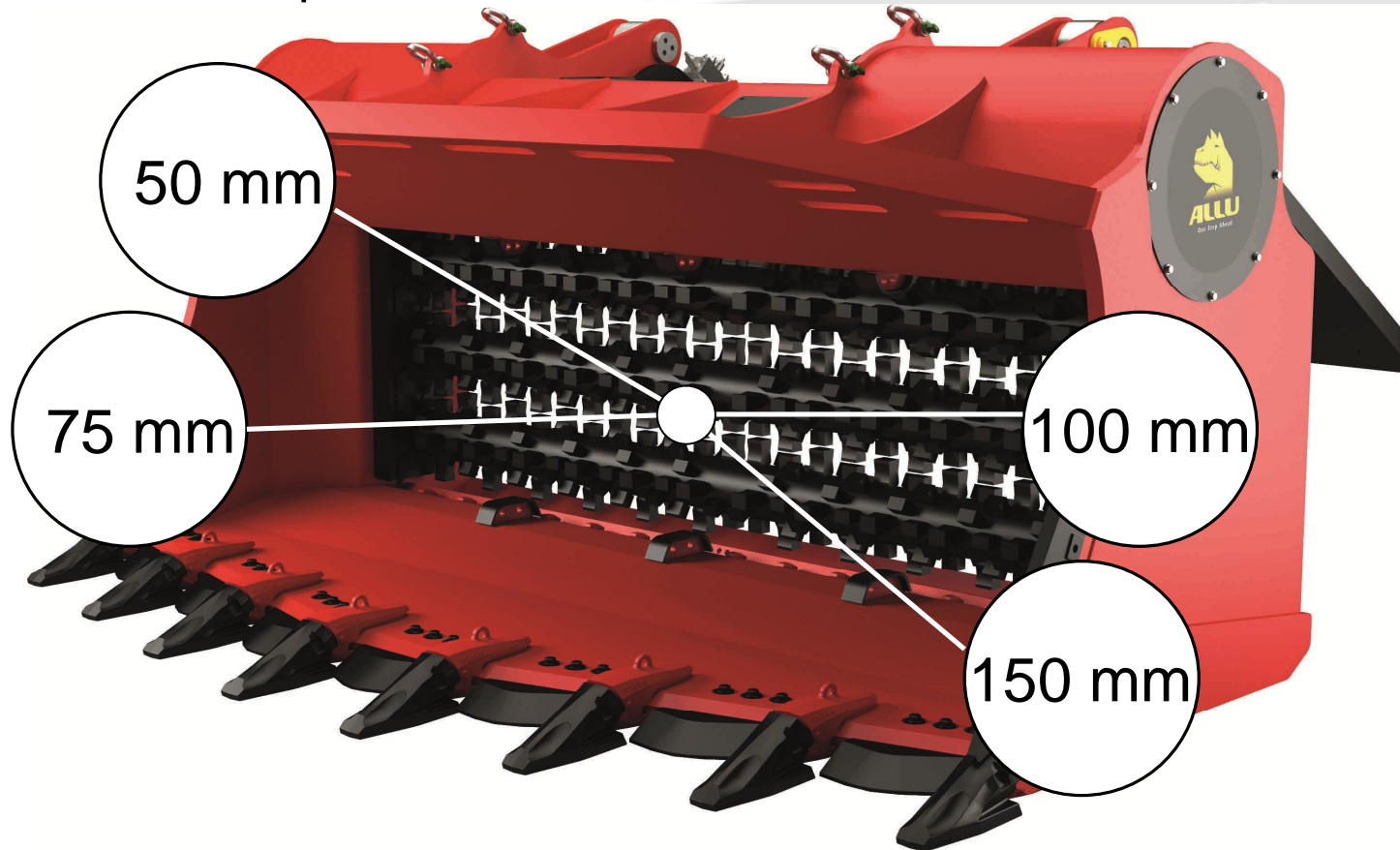
Equipped with 6,5 m³ ALLU M 3-32





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The M series adapts to the needs & ROM of the customer

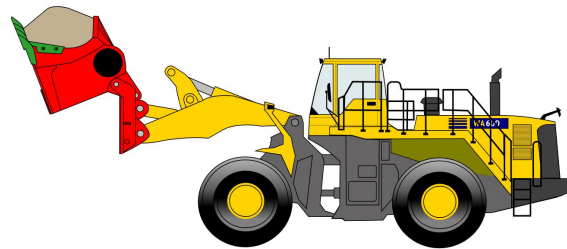


4 drum configurations – 4 fragment sizes – 100 % crushing – crushing & separating

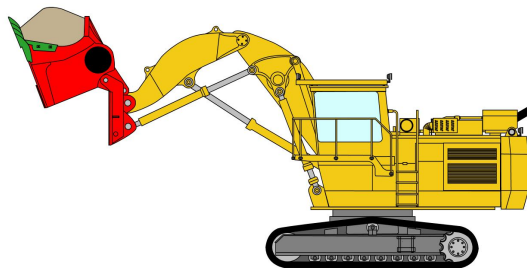


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ALLU M series product line designed for productivity



Model	Volume	Capacity
M 3-32 L	5,0 m ³	250 ton / hour
M 3-32	6,5 m ³	350 ton / hour
M 4-32	8,0 m ³	450 ton / hour



Model	Volume	Capacity
M 3-20	3,0 m ³	350 ton / hour
M 3-23	4,5 m ³	500 ton / hour
M 4-23	6,0 m ³	600 ton / hour



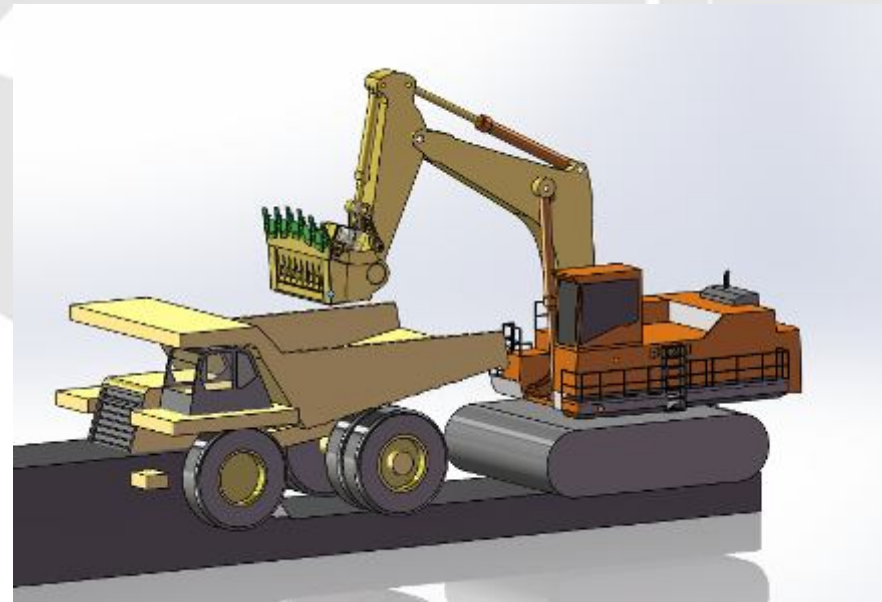
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The M series adapts to the needs & ROM of the customer

Backhoe for top of heap position



Front shovel for ground level position



Excavator is recommended for primary work in the mine because of work speed & reach



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The M series adapts to the needs & ROM of the customer

Power Plants

Transportation
centre



Depots
classification

Harbor
operations



Loader is recommended for secondary & service work because of best mobility



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Intelligent material processing equipment

- ❑ operator data monitor inside cabin
- ❑ mobile data uplink to service terminal
- ❑ hydraulics monitoring
- ❑ time monitoring
- ❑ parts temperature monitoring
- ❑ parts condition monitoring
- ❑ bucket process angle monitoring
- ❑ assists operator
- ❑ prevents break down before happening
- ❑ real time after sales service
- ❑ and even more





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Benefits summary

- ❑ strong, rigid and durable construction
- ❑ designed especially for mining carriers
- ❑ higher cost efficiency in the mine
- ❑ increases loader utilization time
- ❑ less investment costs for process equipment
- ❑ high versatile production
- ❑ very high equipment mobility
- ❑ multipurpose machine
- ❑ separates hard waste material while crushing
- ❑ no need for site electrics



we bring the machine to the material and not the material to the machine



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Conventional open cast Oil Shale mining for power plant

Selective mining:

1. Removal of top layers → drag liner
2. Selective mining → ripper dozer
 - lime stone layers partly removed
3. Loading of material → electric excavator
4. Material transportation to storage → dumper
5. Blending of material → ripper dozer
6. Blended material to crusher → ripper dozer
7. Material crushed → crushing plant
8. Transportation to power plant → train



The required calorific value is achieved by blending different grades of material



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Oil Shale mining with M Series for power plant → dry enrichment method

One Step mining:

1. Removal of top layers → drag liner

2. Blasting

3. One Step processing in the mine of all layers

- crushing of oil shale
- lime stone separation
- loading

4. Material transportation to power plant → dumper



The required calorific value is achieved by removing lime stone from ROM



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Rough comparison of selective and one step dry enrichment method

Selective mining

- 8 steps in the material flow
- 6 machines needed
- Calorific value by blending material
- Indirect material flow from the mine
- Lot of lime stone in material
- Burning produces a lot of ash



Dry enrichment

- 4 steps in the material flow
- 3 machines needed
- Colorific value by lime stone removal
- Direct material flow from the mine
- Lime stone removed from ROM in the mine
- Minimum ash when burning



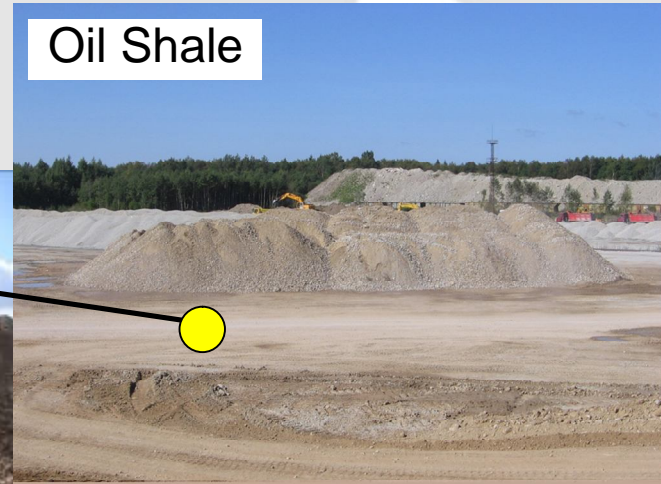


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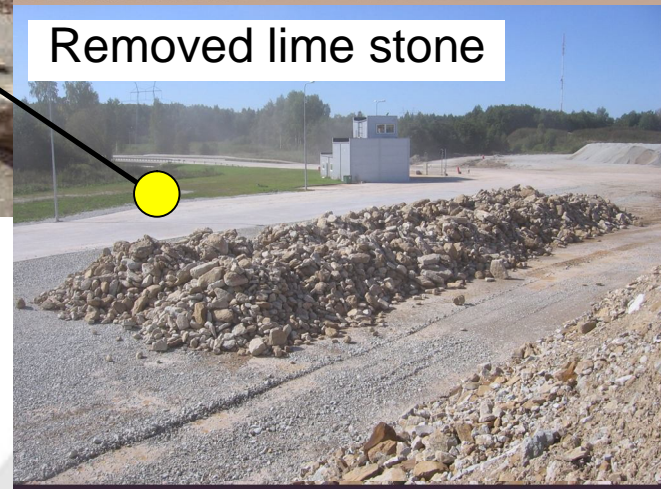
One step dry enrichment with ALLU method in brief



ROM



Oil Shale



Removed lime stone



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Thank you



www.allumining.net