

Lean Summit 2019



Polishing a Diamond in the Rough – Capability Development and Respect for People in the Mining Industry

Laura Mottola
Adrian White



What **WE** hope to get out of this session

To get the Lean Community interested in Mining and Metals!



To get the mining industry interested in deeper exploration of Lean thinking and practice!



What we hope **YOU** get out of this session

1. An appreciation of the work, value-added or otherwise, involved in extracting these resources so important to our everyday quality of life



What we hope **YOU** get out of this session

2. Reflect on your Gemba – Do you value your time in the Gemba? How can you overcome challenges to Gemba?
3. Reflect on the value of front-line workers – Does your organization truly show respect for these hard working people?



Agenda

- Introduction to Mining and Metals
- Respect the worker
 - *By respecting their value-added work*
 - *By engaging them in improving that work*
 - *By experimenting together*
 - *Through meaningful PDCA*
- Reflection / Discussion



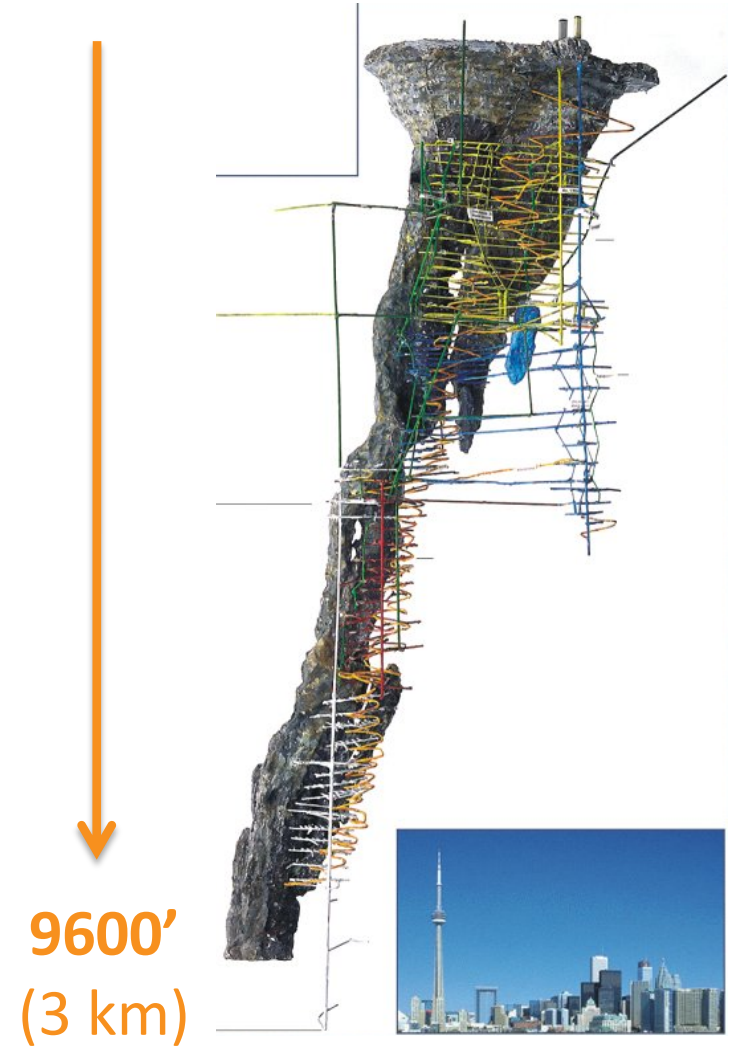
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Short Introduction to Mining

Introduction - Adrian

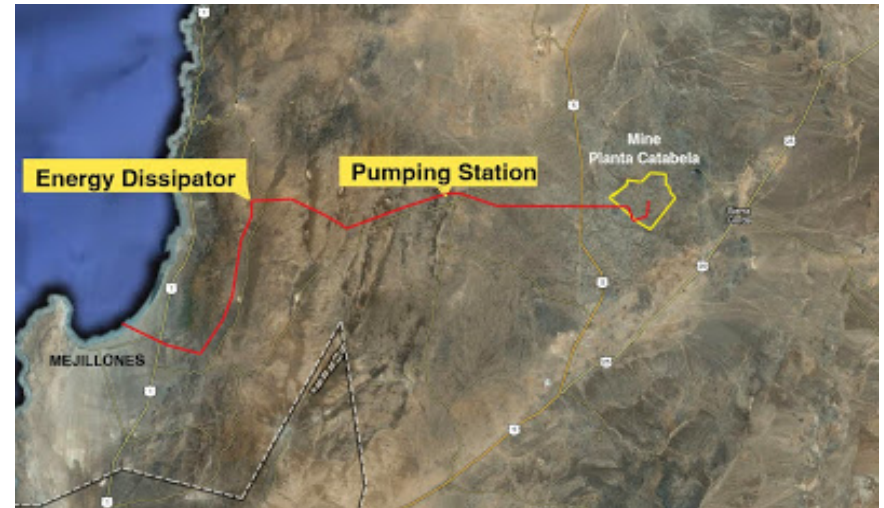
Started out in metallurgy, but transferred to the mine for something more exciting



Introduction - Laura



Built an \$4B copper operation in the Atacama desert of Chile



Public Perception

Not uncommon view

- Dirty – Dangerous – Socially and environmentally irresponsible

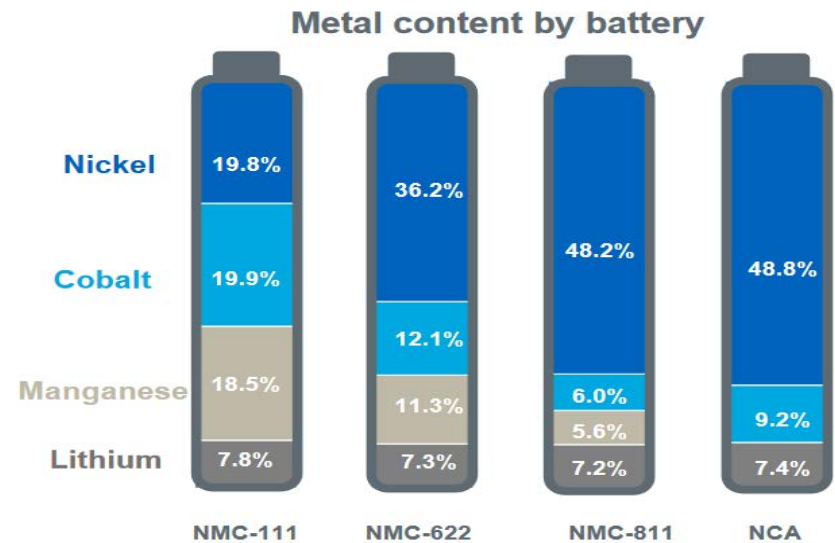
Why?

- ‘Extractive’ industry
 - non-renewable resources
 - environmental footprint
- Hear about disasters and bad stuff
- Disconnected from the final customer, the consumer

Mining in our Daily Lives

PRODUCTS THAT RELY ON MINING

- Batteries (nickel, cadmium, lithium, cobalt)
- Circuitry (gold, copper, aluminum, steel, lithium, titanium, silver, cobalt, tin, lead, zinc)
- Display screens (silicon, boron, lead, barium, strontium, phosphorus, indium)
- Electric cars (copper, lithium, aluminum, nickel, cadmium, cobalt, zinc)
- Musical instruments (copper, silver, steel, nickel, brass, cobalt, copper, iron, aluminum)
- Sports equipment (graphite, aluminum, titanium, calcium carbonate, sulphur)
- Wind turbines (steelmaking coal, iron ore, copper, nickel)
- Energy (coal, uranium, oil sands)



“We need mining to build the products we rely on in our daily lives, and for the technologies and infrastructure [of] a low carbon future”

- Mining Association of Canada

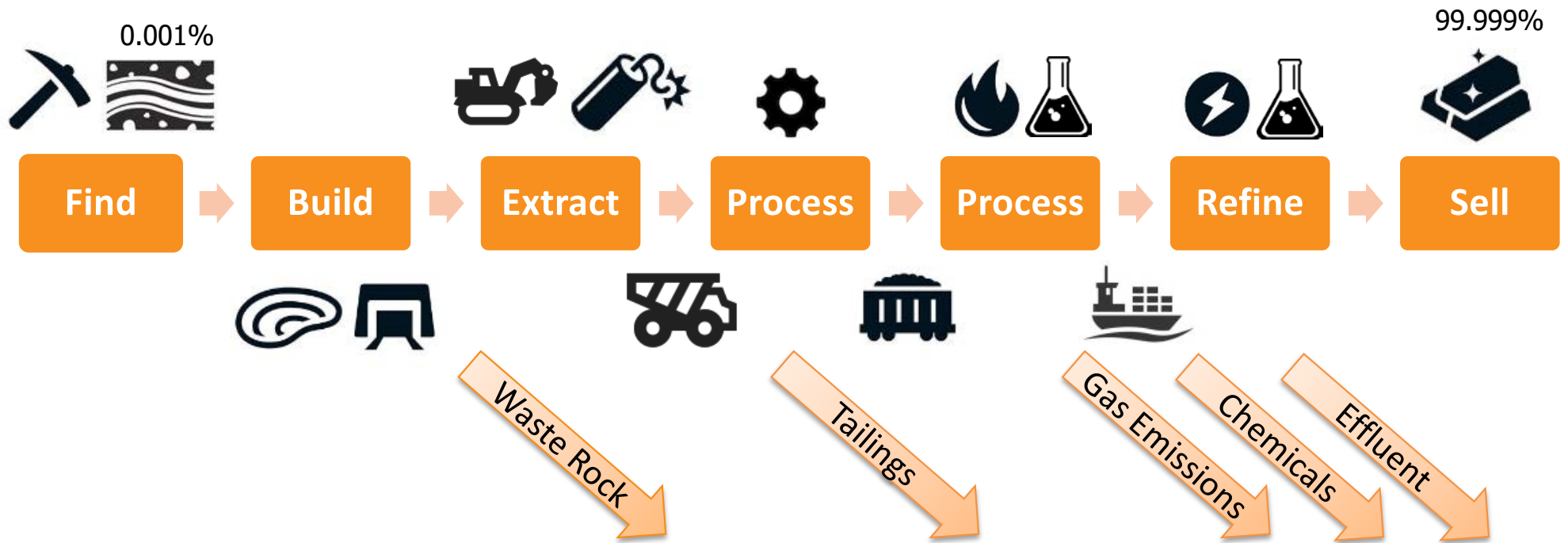
Mining in our Daily Lives

Reflection

- We need these resources
- We should improve the work (reduce waste)
- Start with respect for the worker and their value-creating work



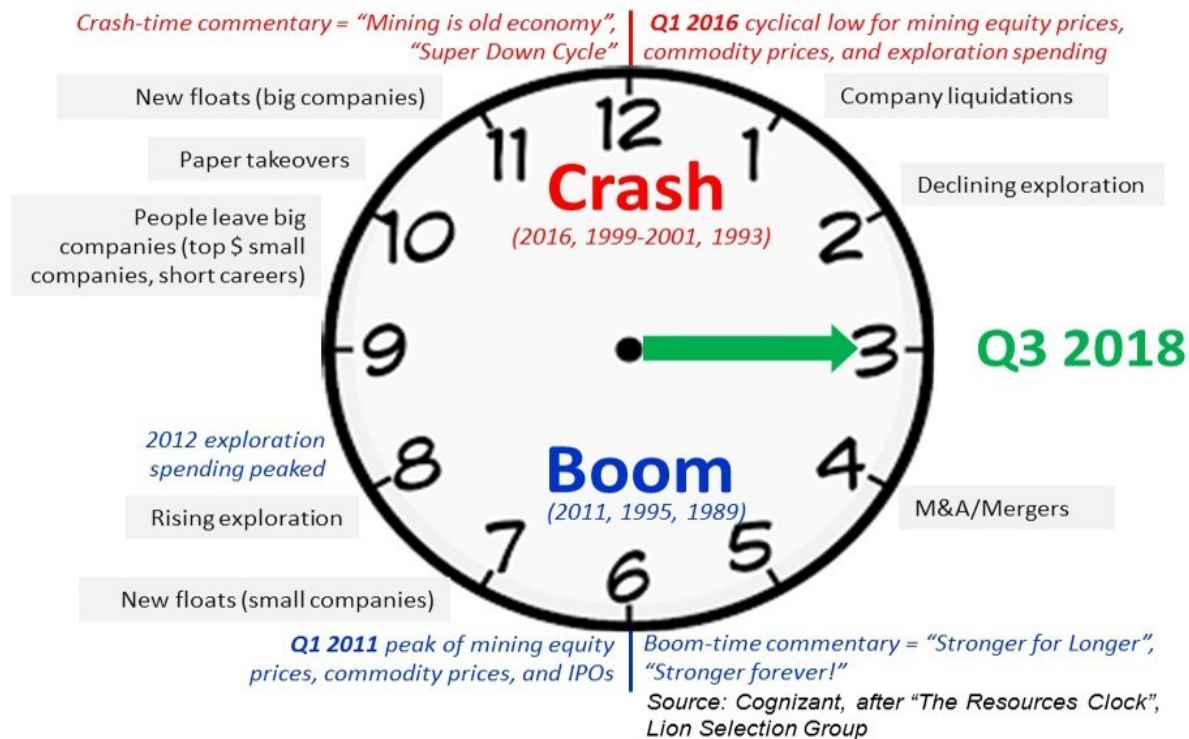
Mining and Metals Value Chain



Imagine most of the work happens to remove the non-value material (waste) to liberate and concentrate the value material; at every step, we lose some of the value

Challenging the Commodity Mindset

If performance is determined by the price of metals (commodities), what message does that send to the worker?





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Respect for the work, Respect for the worker

How Lean thinking and practice can make a difference

Respect for the work, Respect for the worker

Surface mining nickel and cobalt in Cuba

Underground narrow vein gold mining in Chile

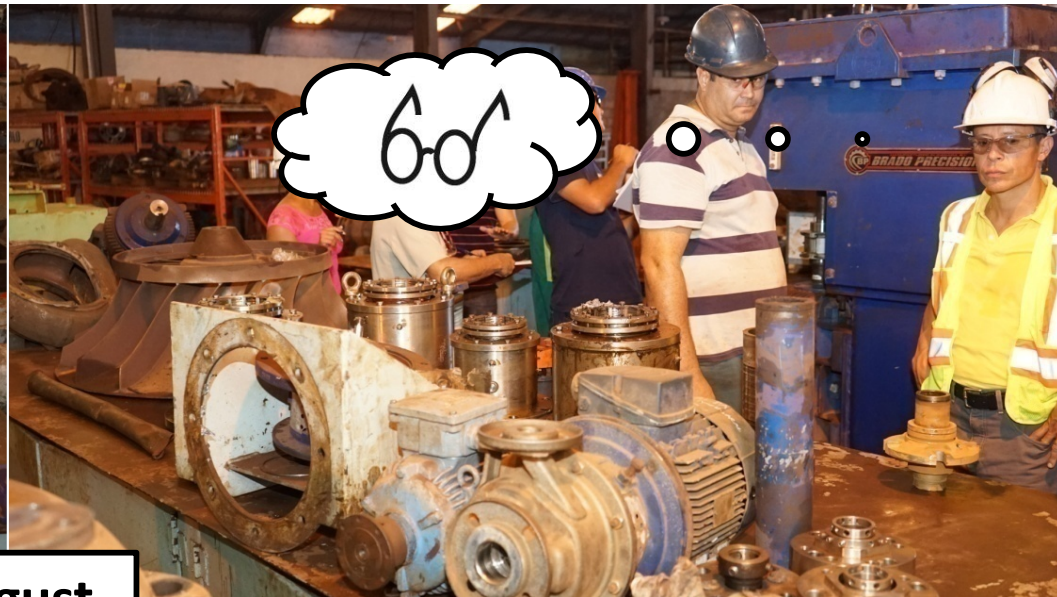


The Workers of Central Maintenance





Why bother with me and my spanglish?



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August



Gotta help fix this



Slow going



October

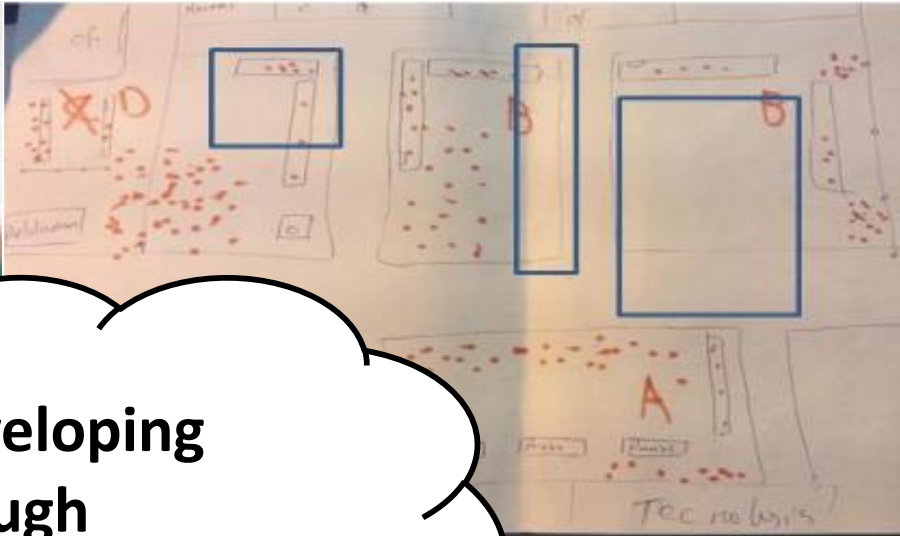


March

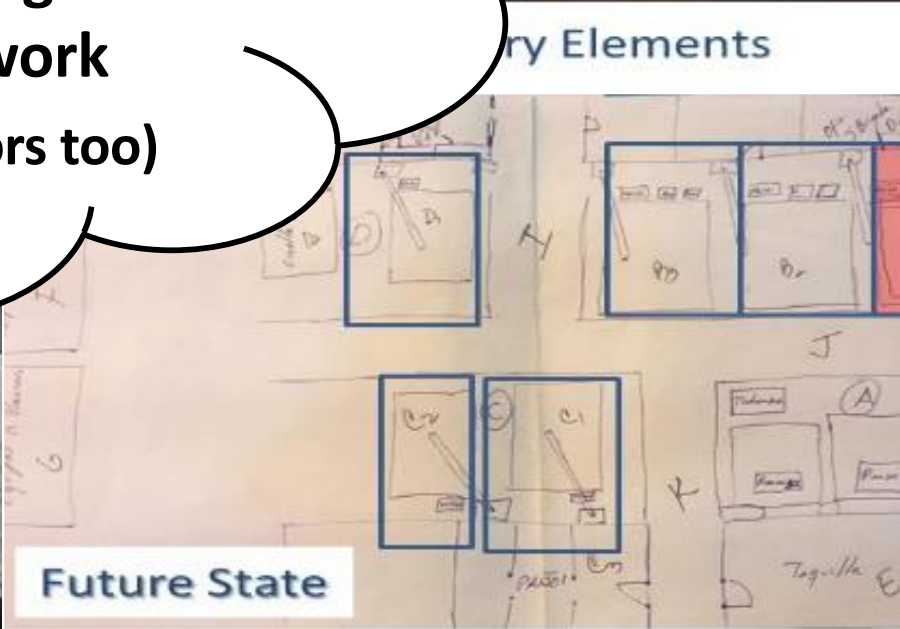
**Respect for
the worker
implies PDCA**



January



Respect means developing capability through improving the work (front-line supervisors too)



Respect for the Worker

Reflection (with a partner)

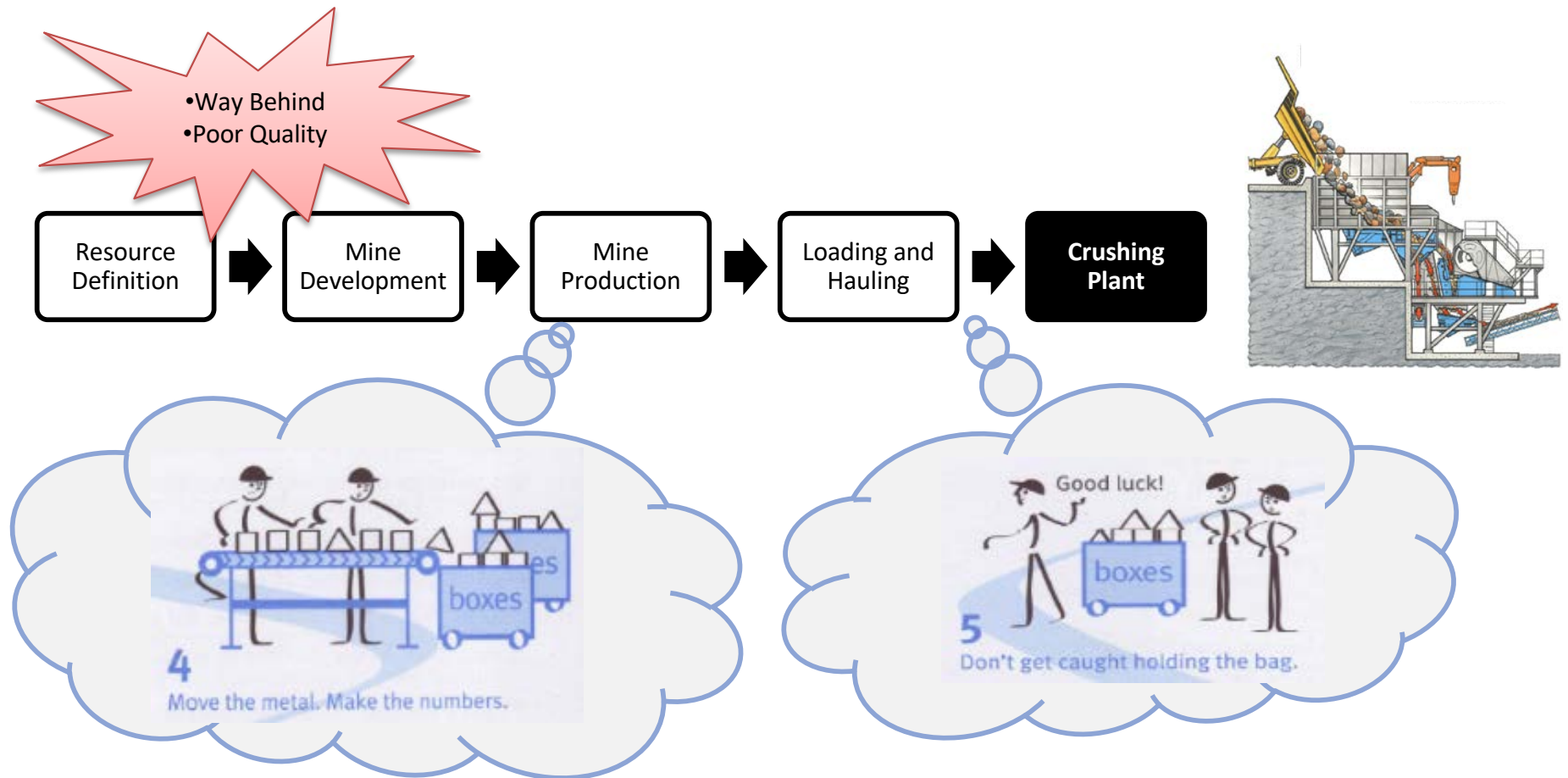
How does this thinking apply to your situation?

Can you share an example?

Will you do anything differently as a result?



Story of the Work at an Underground Gold Mine



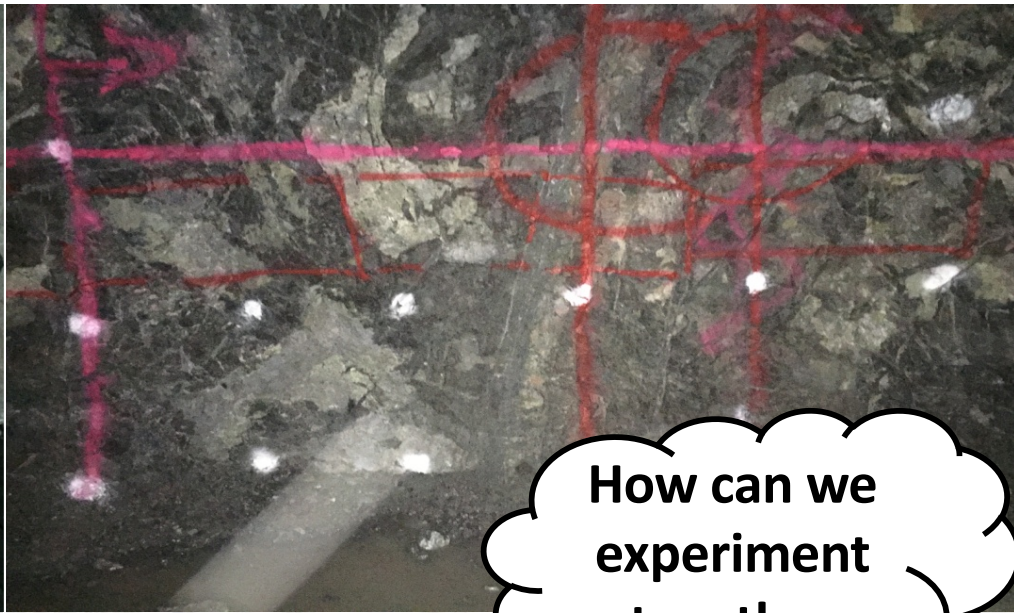
The Workers of Mine Development





Why are we over excavating?

What do you think?



How can we experiment together



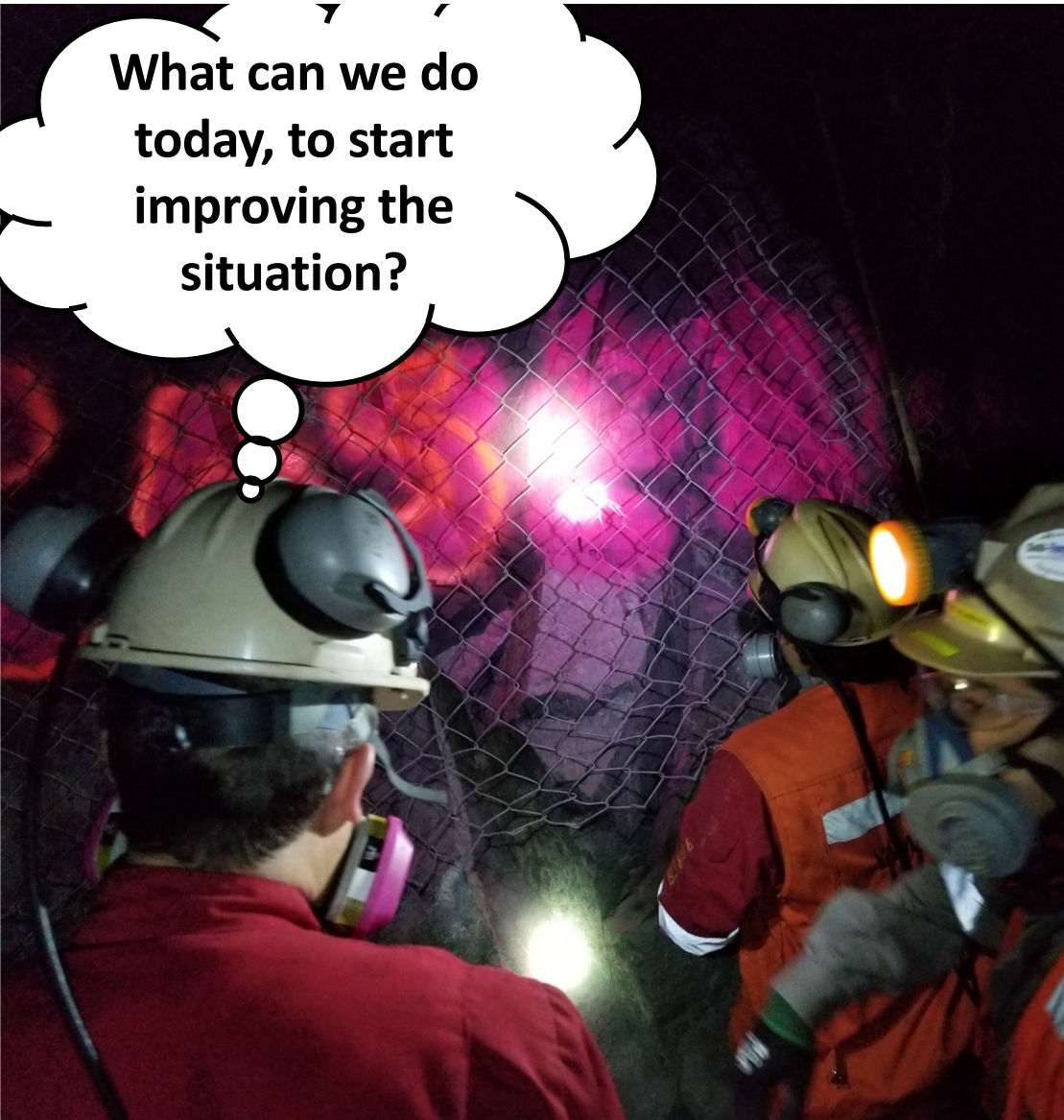
The Workers of Loading and Hauling



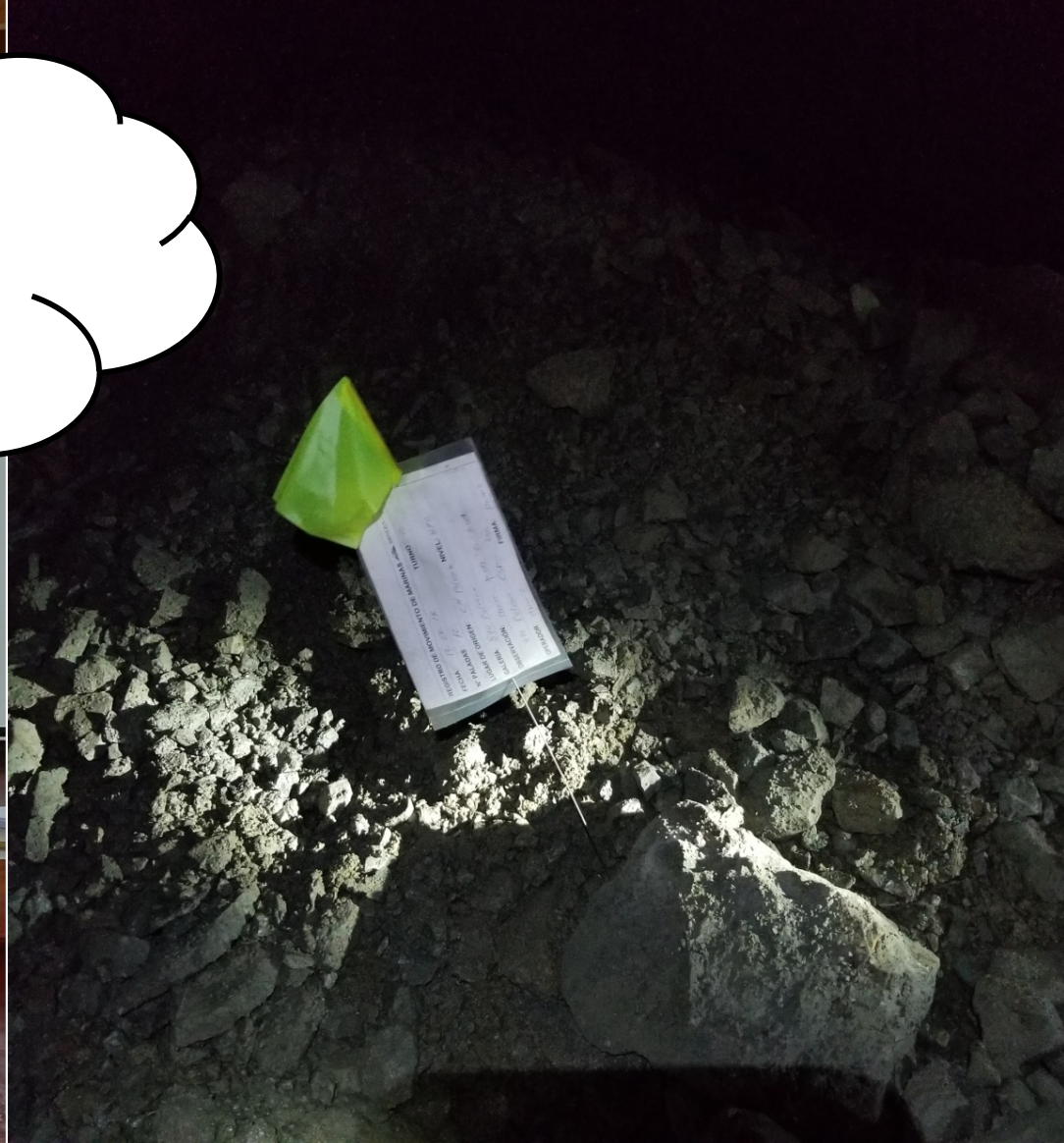


**Which is ORE
and which is
WASTE?**

What can we do today, to start improving the situation?



**I have an idea, but
it requires
management
support**



The Workers of Mine Production

We are having problems with quality of drilling – What do you think?



Can you show us the work?



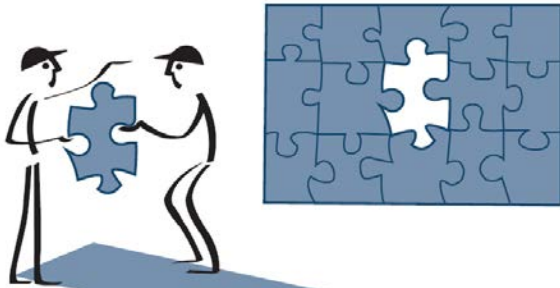
Don't forget the front line supervisor



Tips for Respecting the Worker

1

What do you think?
Leader = teacher.



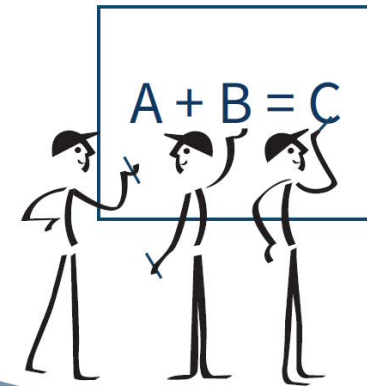
2

Go see for yourself.



6

Everyone solves problems using
simple methods.



Changing the Conversation by Respecting the Work



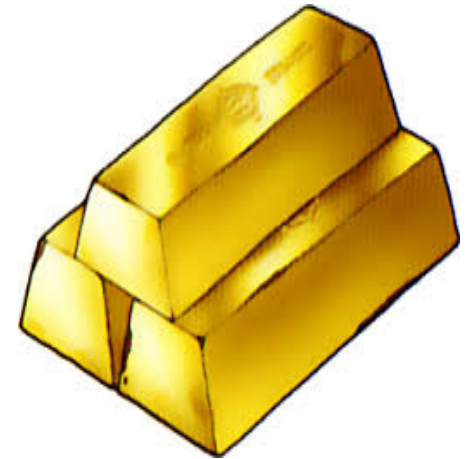
Respect for the Worker

Reflection (with a partner)

How does this thinking apply to your situation?

Can you share an example?

Will you do anything differently as a result?





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Thoughts on Health, Safety and Respect for the Worker

Does unsafe work add value? A mining example

Safety and Respect for the Worker

1. Can we ask workers to tackle waste in their workplace but tolerate unsafe conditions?
2. Can we ask workers to tackle waste in their work but tolerate unsafe acts?
3. Does value-added work performed unsafely truly add value?



Woo hoo!



Doing 5S but we should be tackling worker safety



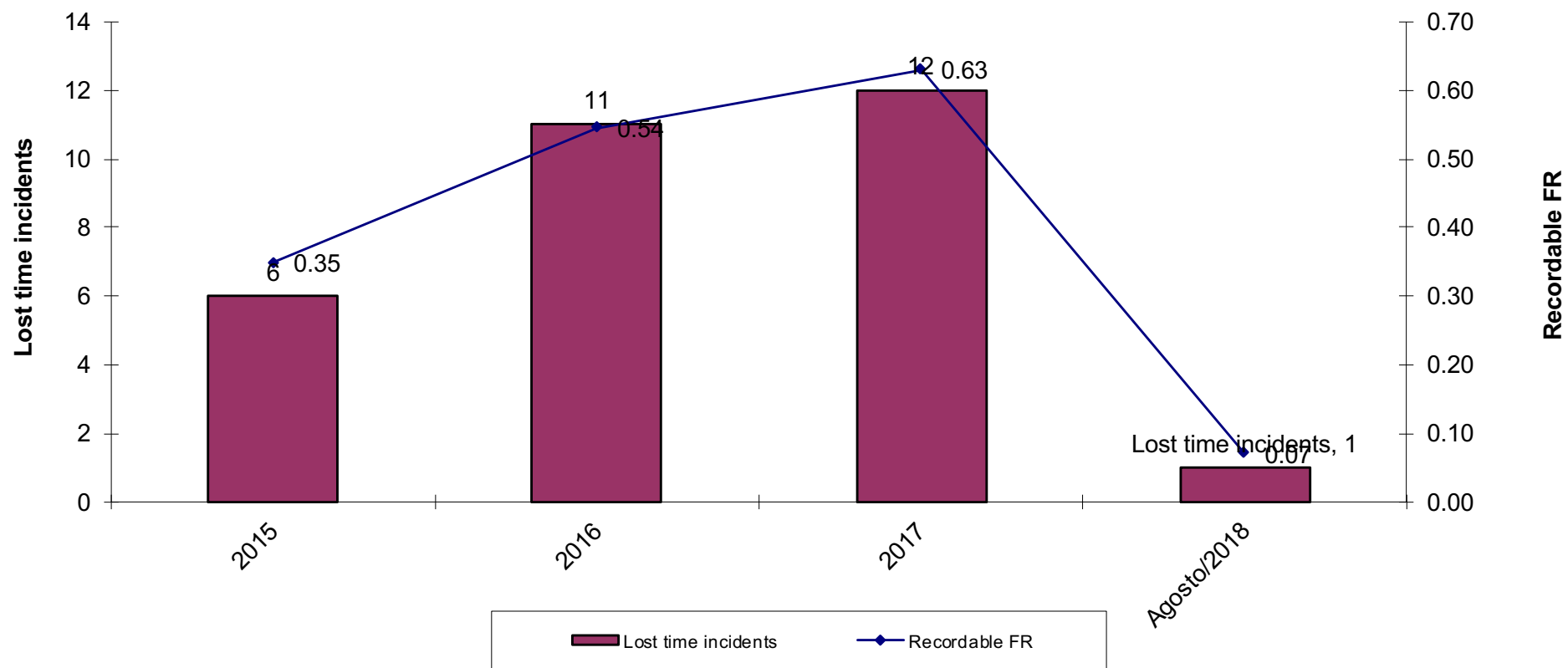
Wow - what happened?



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Respecting the worker by engaging them in making the work safer





Making Problems Visible

Developing capability and solving problems



A3 – Procurement of C

RO y PERSPECTIVAS

ELEVACIÓN DE ESTANDARES DE SEGURIDAD

Pedro Sotto Alba

TRABAJO EN ALTURA (Cont.)

ARNES DE TRABAJO ENALTURA

Marca: DBI Sala
 Modelo 1110575 SM, 1110576 M, 1110577 L
 Certificación aprobada: CSA
 Estado de la compra: En uso.
 Alcance: Brigada de Andamios, Linieros.

Respect for the Worker and his/her Safety

Reflection (with a partner)

How does this thinking apply to your situation?

Can you share an example?

Will you do anything differently as a result?



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Final Thoughts

LMI Slide

How we are trying to increase Lean experience in the mining industry

What we are trying to do different to continue learning



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Thank you! And Q&A