

# SISHEN MINE RAMP UP OVERVIEW

**Analyst site visit 15 August 2013** 



Real Mining. Real People. Real Difference.

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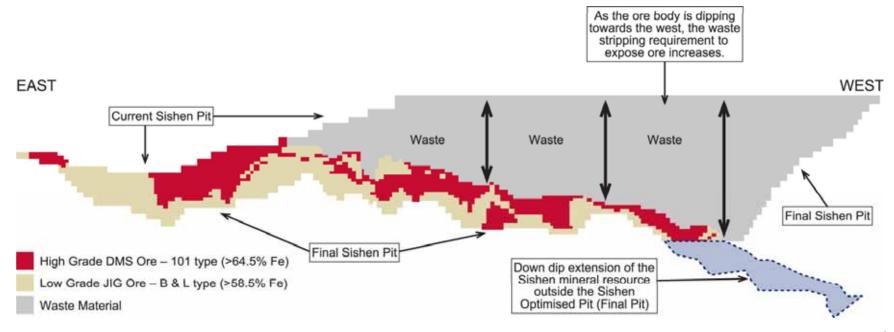


# SISHEN OVERVIEW

Female haul truck operators BOITUMELO MOSALA (assistant foreman), TSHEGOFATSO LOETO and KEIIMMETSE TSELE in front of a giant Caterpillar 795F haul truck at a parking area on Sishen mine

## **GEOLOGY AND RESERVE MOVEMENT**

- The remainder of the Sishen ore body lies to the west of the current pit; ore body dips at 11<sup>o</sup> to the west
- Current pit constraints
- Planned waste ramp up to improve flexibility in the longer term; waste levels planned to peak at ~240 to 270Mtpa
- B Grade resource reclassification in recent years; investigating new technologies
- Review of Sishen's geology and mining is continuing



# **GEOLOGY AND RESERVE MOVEMENT**

- Pit shell was revised in 2010
- Increase in production on revised, larger pit required the following:
  - Ramp-up in mining activities
  - Better definition of reserves and resources, which is now factored in LOM plan
- Better definition of B-grade material; now useable material Surface

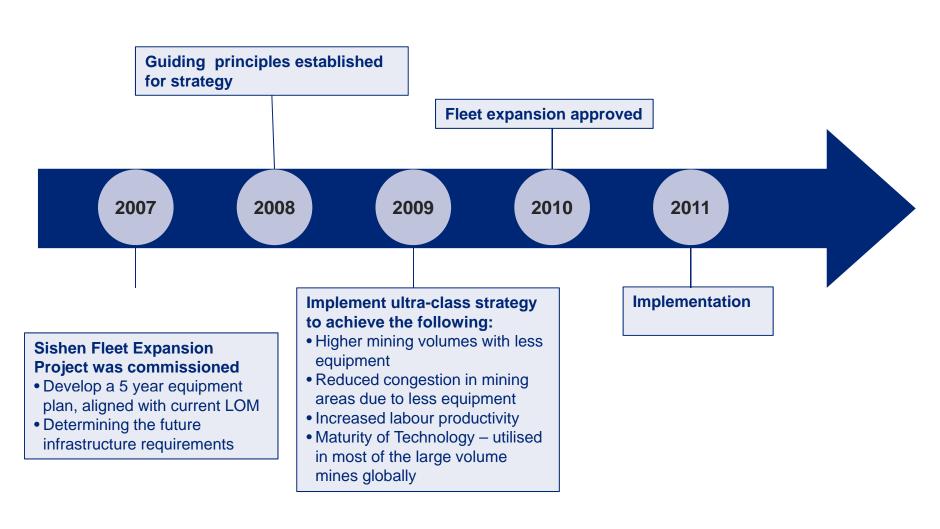




# 5 YEAR EQUIPMENT RAMP UP OVERVIEW

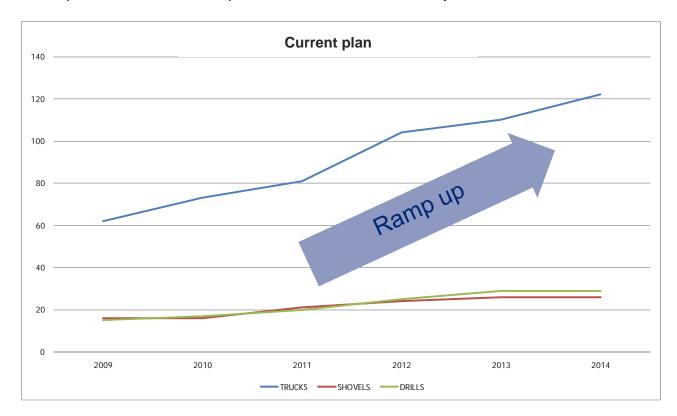
Haul truck operators at shift change at Sishen mine

## SISHEN FLEET EXPANSION PROJECT TIME LINE

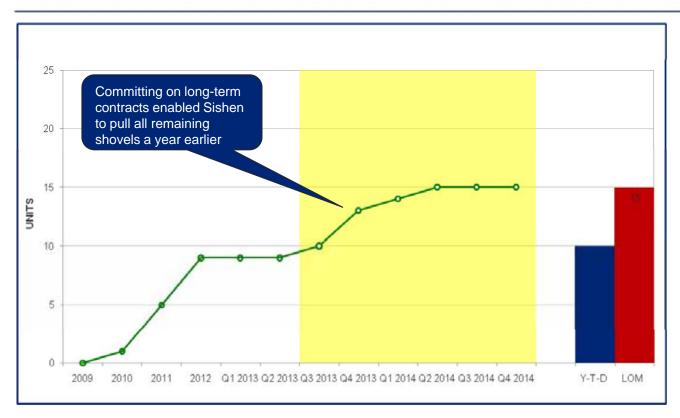


# **EQUIPMENT RAMP UP**

- Sishen recruits and trains operators for primary equipment (equipment which is directly production related) 6 months prior to the arrival of additional equipment
- Since 2009, the number of haul truck and production drill operators recruited and trained have more than doubled
- The number of production shovel operators have increased by ~73% from 2009 to 2013



# **ANTICIPATED DELIVERIES OF SHOVELS**



ROPE SHOVELS 3 x P&H 2800XPC Payload:

59mt = 19 x



109mt = 36 X





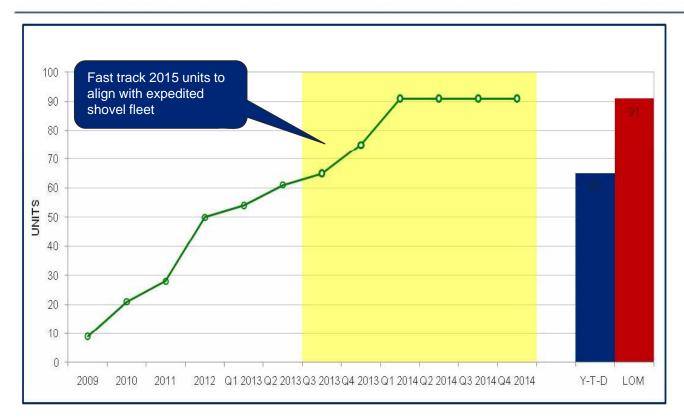


FEL's 1 x LT2350 1 x CAT 994F



HYDRAULIC SHOVELS 6 x Liebherr R996 1 x Liebherr R9800

# **ANTICIPATED DELIVERIES OF TRUCKS**





6 x CAT 795F AC trucks on test

Payload: 313 mt V/Weight: 570 mt

#### 59 x Komatsu 860E



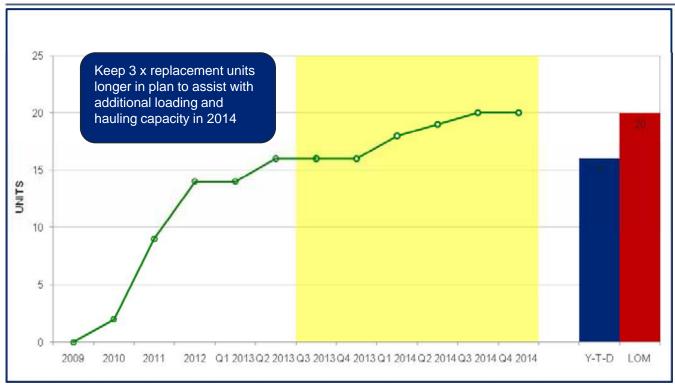
Engine: 2700 Hp Payload: 254 mt V/Weight: 448 mt

#### 32 x Komatsu 960E



Engine: 3500 Hp Payload: 320 mt V/Weight: 576 mt

# **ANTICIPATED DELIVERIES OF DRILLS**



#### 3 x Bucyrus Drills



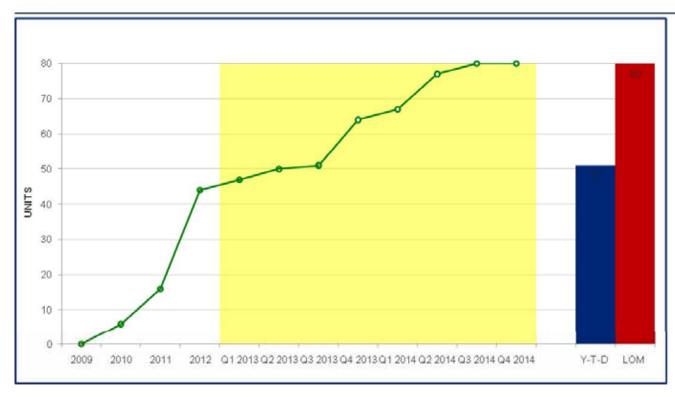
1 x Electric Driven
2 x Diesel Driven
Hole Dia: 229-381 mm
Pull down force: 50 mt



17 x Pit Viper Drills

Diesel Driven Hole Dia: 296 – 406mm Pull down force: 56,7mt

## ANTICIPATED DELIVERIES OF SUPPORT EQUIPMENT



Significant changes
A) Upgrades:
Dozers WD600 to WD900
Picture below indicate a
WD600 wheel dozer on site
helping with the general clean
up around the loading area of
the P&H4100. Dozer to small
and struggles in the operation.



Graders (16M to 24M) (Safety critical)

B) Additional Equipment:

Dozers and Front-end loaders for berm wall maintenance

5 x WA800 (FEL's) 6 x 475 Dozers 5 x 375 Dozers (Safety critical)







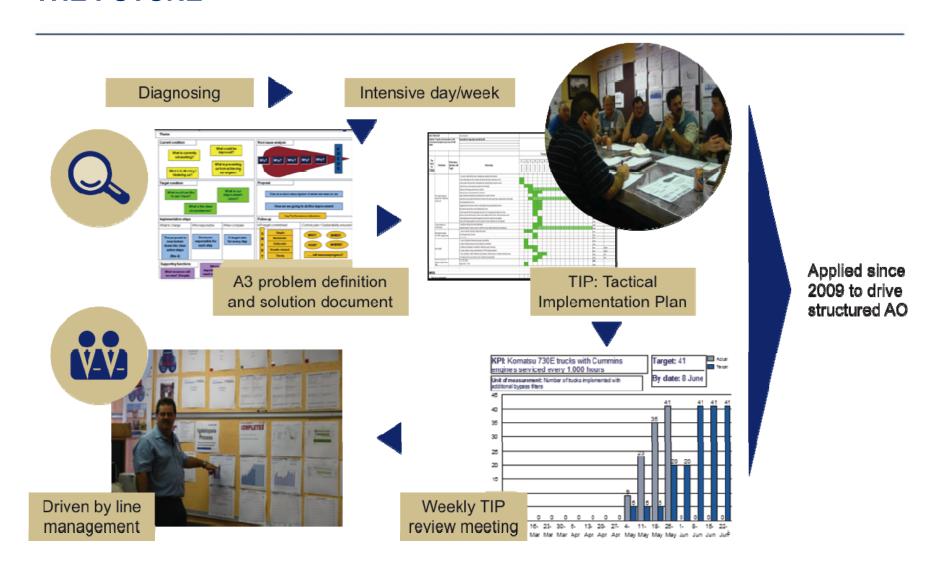




# BUSINESS IMPROVEMENT IN A GROWING MINING OPERATION

Receiving operator training on a drill rig are trainee operators NATTIE GROENEWALD, FLORENCIA BEKEND, GABRIEL BOSMAN and HEIN ROETS, with senior instructor ENOS DLADLA (far left)

# THE START OF BOKAMOSO (SOB), MEANING "START OF THE FUTURE"



## **BOKAMOSO IS AN INTEGRATED AND HOLISTIC APPROACH** TO BUSINESS IMPROVEMENT

#### **Definition**

Focus on improved capital efficiency and increasing production using different functional departments in organisation.

Tools to measure success Measuring OEE.

**Technical Systems** 

Management Infrastructure

# Mindsets,

# **Capabilities**

and Behaviour

#### **Definition**

Focus area ensures that employees are mature and ready for changes.

#### **Tools to measure success**

- Personal Insight Workshop.
- Foundations of feedback.
- High performance teams.
- Diversity programme.
- IDP management system.

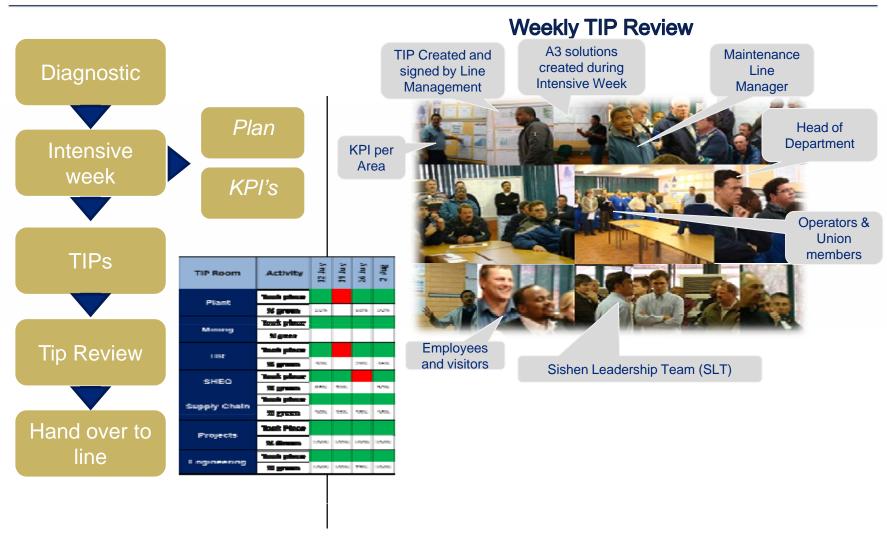
#### **Definition**

Assist team members in defining and tracking improvement initiatives identified in Technical System.

#### Tools to measure success

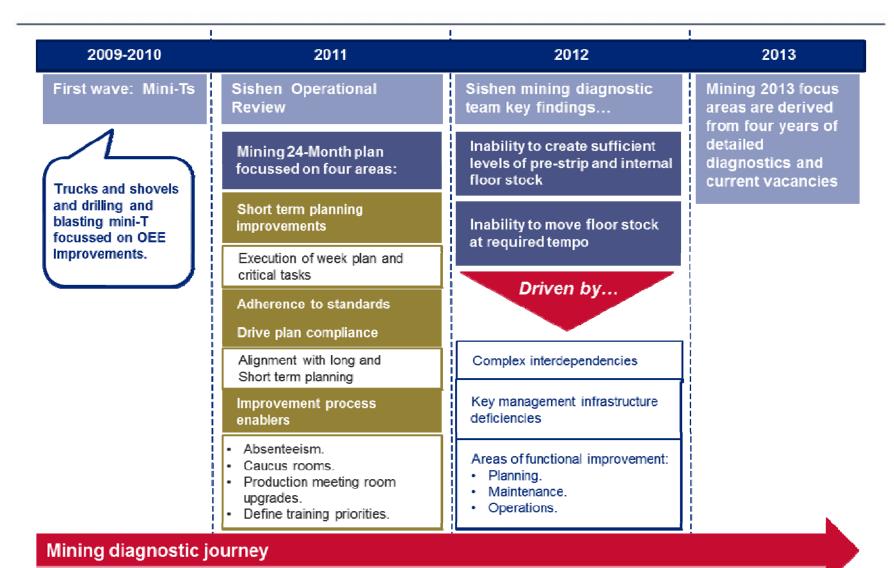
- TIP reviews (Mining, Plant, Supply Chain, Engineering, HR and SHEQ).
- War rooms.
- KPIs.
- Management support.

# THE BOKAMOSO PROCESS IS ENTRECHED THROUGHOUT THE MINE TO DRIVE IMPROVEMENTS AND EFFICIENCIES

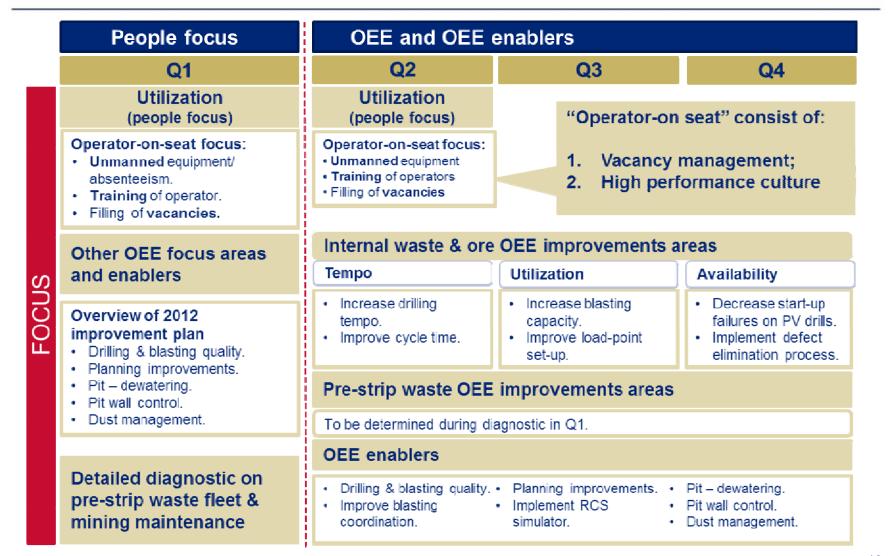


The rigorous tracking and management of the Tactical Implementation Plans (TIP) drives quick action and commitment. Total organizational commitment is required to maintain the energy

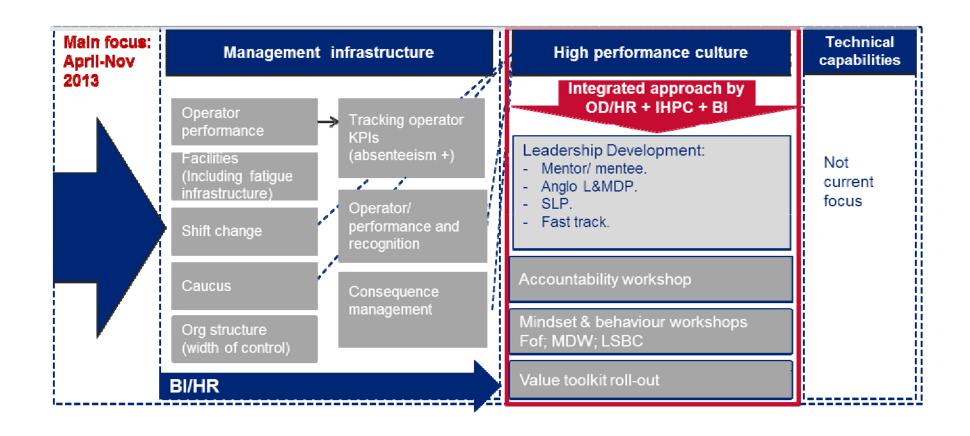
## MINING PROCESS IMPROVING TO ADDRESS BOTTLENECK



# 1Q13 AND 2Q13 FOCUS: OPERATORS-ON-SEATS AND BUILDING HIGH PERFORMING TEAMS POST 4Q12 UNPROTECTED STRIKE



# 2013 INTERVENTION IN PLACE; FOCUS ON HIGH PERFORMANCE CULTURE



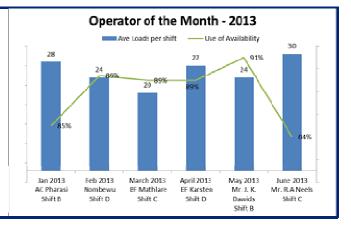
# PERFORMANCE OF OPERATORS AND SHIFTS RESPECTIVELY RECOGNISED MONTHLY & QUARTERLY

#### Criteria for Best Operator/month

- Loads;
- Tones:
- Time;
- Distance:
- · No disciplinary;
- No AWOP;
- No safety incidents



Hauling: June 2013 Rail Aswell Neels



#### **Best Performing Shift: Quarter 2**

Shift B – Best Attendance

Shift D – Best Safety

Shift B - Best Dust Observation

Shift D – Best Drilling

Shift C - Best Ore Loading

Shift C - Best Waste Loading

**Overall Best Performing Shift: Shift D** 



Shift D – Best Safety & Drilling: Lucas Bezuidenhout, Isaac Mosala and Pretorius Bezuidenhout

#### MINING IMPROVEMENT PROGRAMME REVIEW UNDERWAY

## Mine design

## **Operational Efficiency**

## Ramp-up

- 1. Clay mining
- 2. Practical limit of the pit
- 3. Infrastructure planning
- 4. Detail planning infrastructure and production
- 5. Revisit mine design optimize
  - Equipment
  - Sequencing
  - Space
  - Plan to incorporate big shovel

- Pre strip floor stock, correct dimensions
- 2. Assumptions in plan (drill grids, loading tempos, moving
- 3. Interdependencies of loading and drill path
- 4. Capacity/ sequencing/ clean up/ pre splits/ execution on time
- 5. Critical tasks execution
- 6. Back to standards (quality focus):
  - Floor heights
  - Grade box
- 7. Better utilization of secondary equipment
- 8. Fragmentation of floor stock
- 9. Shovel placements

- 1. Support to a 24 hour operation:
  - Maintenance;
  - · Medical; and
  - Light Duty Vehicle workshop
- 2. Skill retention
- 3. Housing

#### **Enablers**

- Pit dewatering
- Motivator
- Modular dispatch optimization



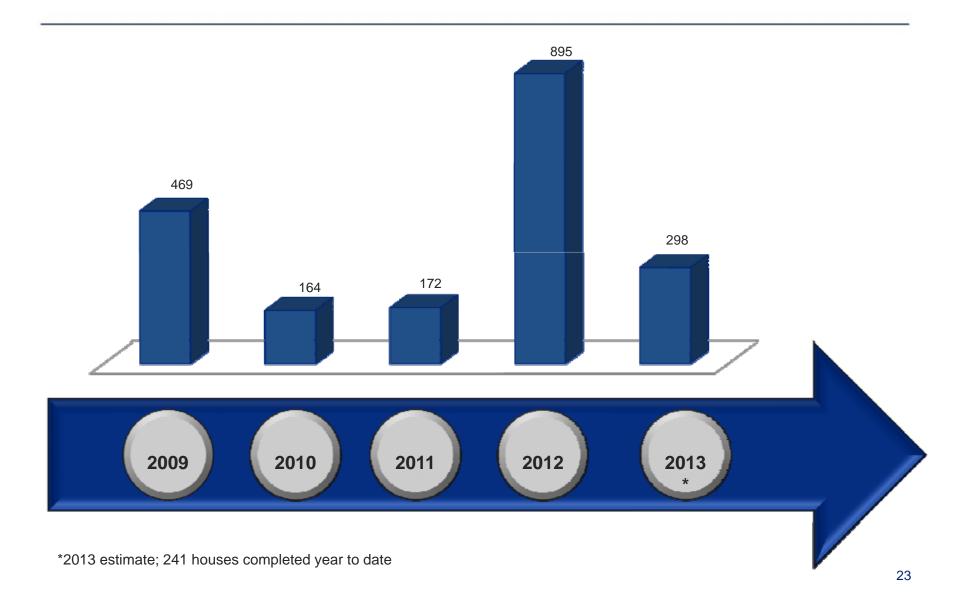


# OUR PEOPLE AND HOUSING

ITUMELENG TSHEKEDI (Millwright) in one of the newly constructed houses.

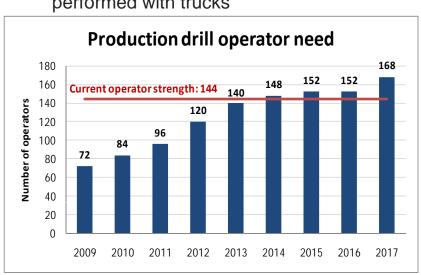
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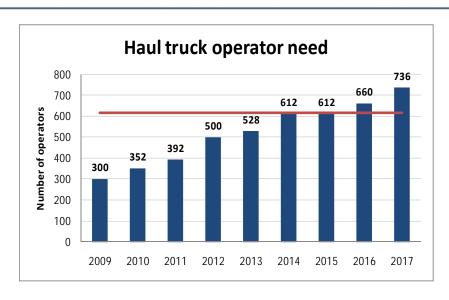
# **DELIVERING ON HOUSING PLAN**



### **HEAVY MINING EQUIPMENT OPERATOR DELIVERY PLAN**

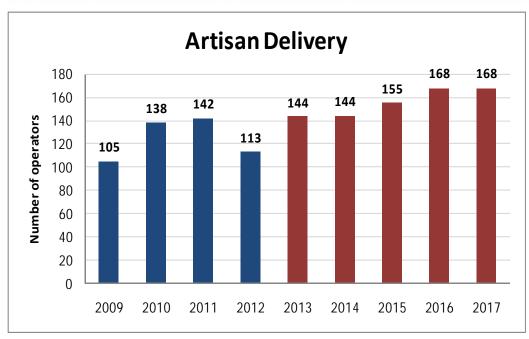
- Over the next 3 years Sishen will require:
  - 122 new truck operators
  - 24 new drill operators
- Current 896 equipment operators are licensed to operate on average 3 different types of equipment
  - Aim to increase the average licenses per operator from 3 to 4
- Ramp-up efficiency through simulators
  - Production time gained ~80%
  - Performs safety training tasks that cannot be performed with trucks







# **ARTISAN DELIVERY PLAN**









# **THANK YOU**





# **ANNEXURES**

KITO MOYO and AMO HLUNGWANI Electricians working on the construction of the Ultra High Dense Media Separation pilot plant at Sishen mine

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# ON TRACK WITH IMPLEMENTING VACANCY MANAGEMENT PLAN POST UNPROTECTED STRIKE AND RAMP UP REQUIREMENTS 2014

Mining Operations Capacity Tracking															
		Previous Reported Capacity (June 2013)	Current Capacity	Jan 2013	Feb 2013	Mar 2013	Apr 2013	May 2013	Jun 2013	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	Dec 2013
Haul Trucks	Candidates Planned to Complete Training	94.28%	100.33%	58	11	0	48	13	48	0					
	Candidates Actual Completed Training			58	11	0	0	11	48	37					
	Projected Capacity %			82.84%	84.64%	84.64%	84.64%	86.44%	94.28%	100.33%					
	Projected Complement			507	518	518	518	529	577	614					
	Deficit	-	-	105 <b>0</b>	94 <b>0</b>	94 <b>18</b>	94	83	35	-2					
Production Shovels	Candidates Planned to Complete Training Candidates Actual Completed Training	101.47%	101.47%	0	0	18	0	0	11						
	Projected Capacity %			80.88%	80.88%	94.12%	94.12%	94.12%	101.47%						
	Projected Capacity 78  Projected Complement			110	110	128	128	128	138						
	Deficit			26	26	8	8	8	-2						
Drills	Candidates Planned to Complete Training	97.30%	97.30%	7	9	0	0	6	6	0	6				
	Candidates Actual Completed Training			7	0	9	0	0	6	0					
	Projected Capacity %			87.16%	87.16%	93.24%	93.24%	93.24%	97.30%	97.30%	101.35%				
	Projected Complement			129	129	138	138	138	144	144	150				
	Deficit			19	19	10	10	10	4	4	-2				
Secondary Equipment	Candidates Planned to Complete Training	85.94%	93.16%	17	0	13	36	30	39	29	20	25			
	Candidates Actual Completed Training			17	0	8	37	1	24	37					
	Projected Capacity %			72.27%	72.27%	73.83%	81.05%	81.25%	85.94%	93.16%	97.07%	101.95%			
	Projected Complement			370	370	378	415	416	440	469	489	514			
	Deficit			142	142	134	97	96	72	43	23	-2			

2013 and 2014 approved operator manpower compliment to be filled by end June 2013