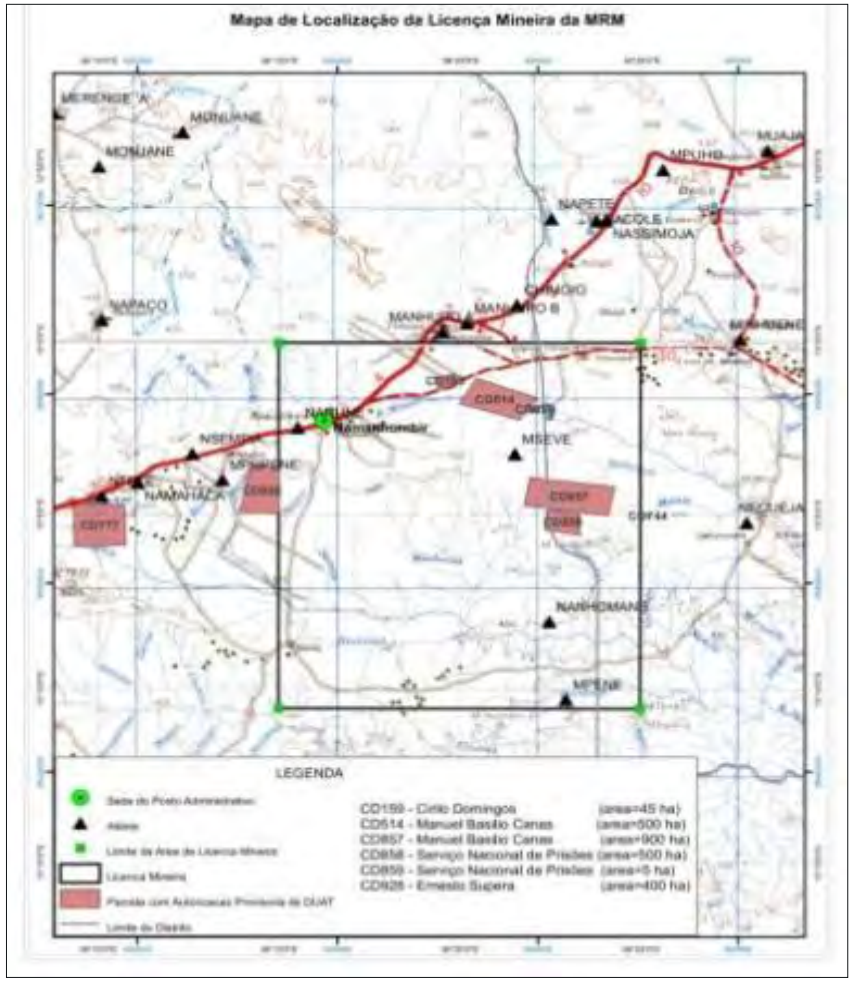
GEMFIELDS

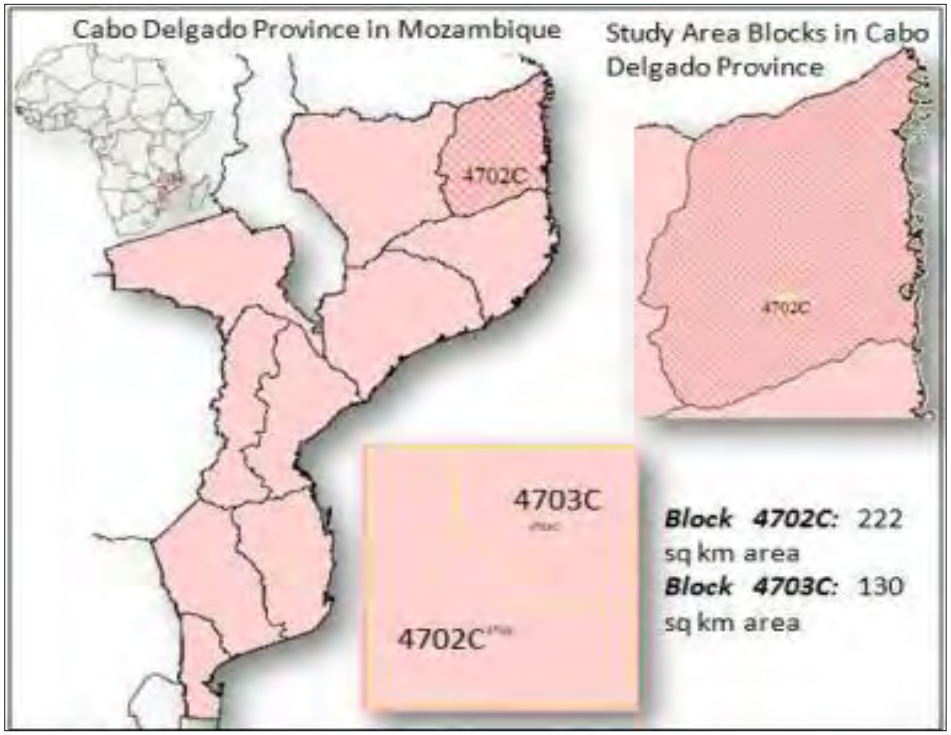
MONTEPUEZ RUBY MINING

A Gemfields Group Company

A warm welcome to the delegation from London

MRM — Location & Accessibility






Mine
Wash Plant
Mine Camp
© 2014 Google
Image © 2014 DigitalGlobe
Google earth
2012
Imagery Date: 11/5/2012 13°05'24.81" S 39°20'35.89" E elev 1464 ft eye alt 4073 ft

Timeline of Key Events

Montepuez Ruby Mining LDA ('MRM') — 75% owned by Gemfields PlC

- **03rd Jun 2011**: JV agreement signed between Gemfields plc and Mwiriti Lda
- **30th Aug 2011**: Montepuez Ruby Mining Lda (MRM) comes into existence
- **24th Feb 2012**: The mining licenses 4702 and 4703 issued in the name of MRM, valid for 25 years.
- **9th Mar 2012**: Environmental licenses issued in the name of MRM, valid for five years.
- **4th Apr 2012**: First Fleet of equipment arrive onsite.
- **23rd Aug 2012:** Start of bulk sampling.
- **03rd Nov 2012:** Commissioning of Wash Plant and trial
- **16th Nov 2012:** Start of Sorting in Sort House
- **20th Apr 2013**: His Excellency the President of Mozambique visits the Mine.
- **15th Dec 2013**: Completion of shifting of offices and housing to Namanhumbir Camp

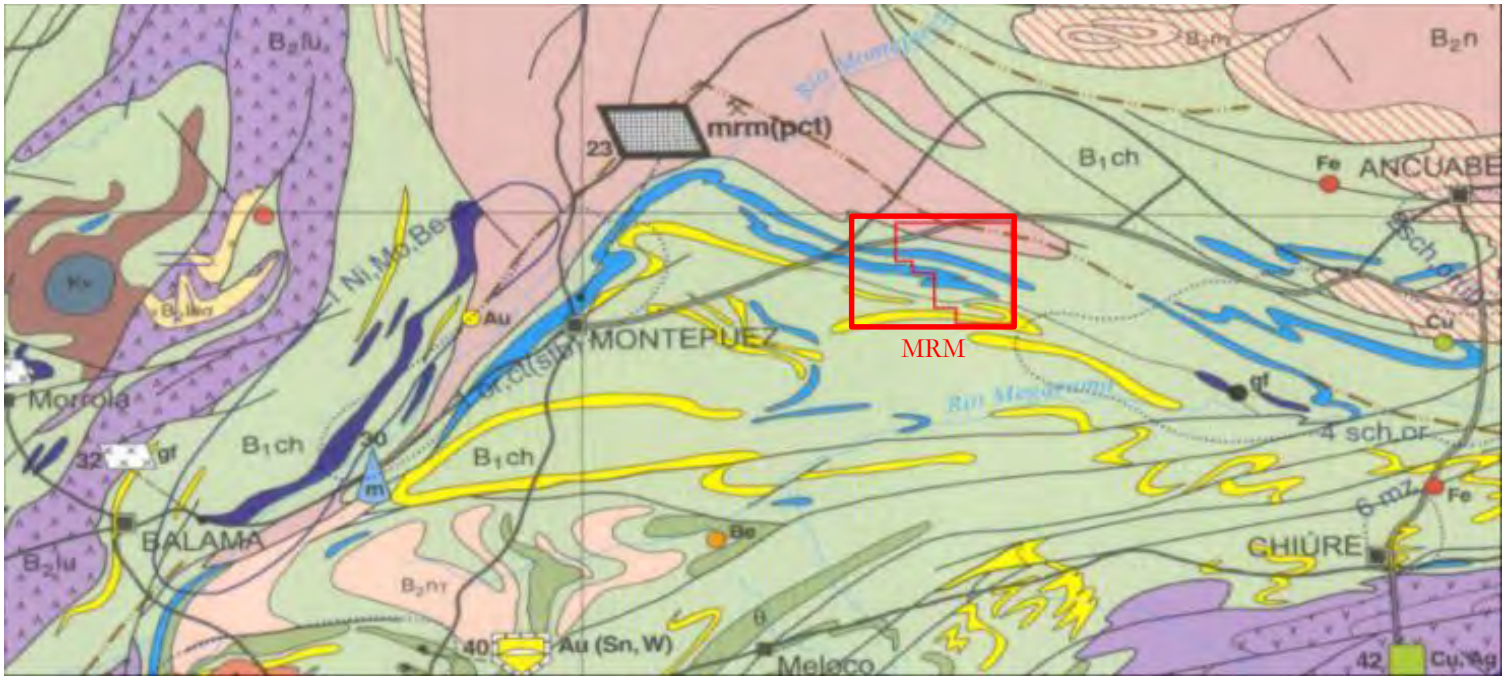
The first heavy mining machinery arrived on site in **April 2012**. The total fleet as now consisted of:

- CAT 330D excavator x 4
- CAT 725 ADT x 11
- TATA 2523 tipper x 3
- CAT D7R dozer x 1
- CAT 950H wheel loader x 1
- CAT 428E back hoe loader x 1
- CAT 140H motor grader x 1
- Volvo diesel bowser
- Mercedes water bowser

Processing plant modified and augmented to a 100 TPH capacity.

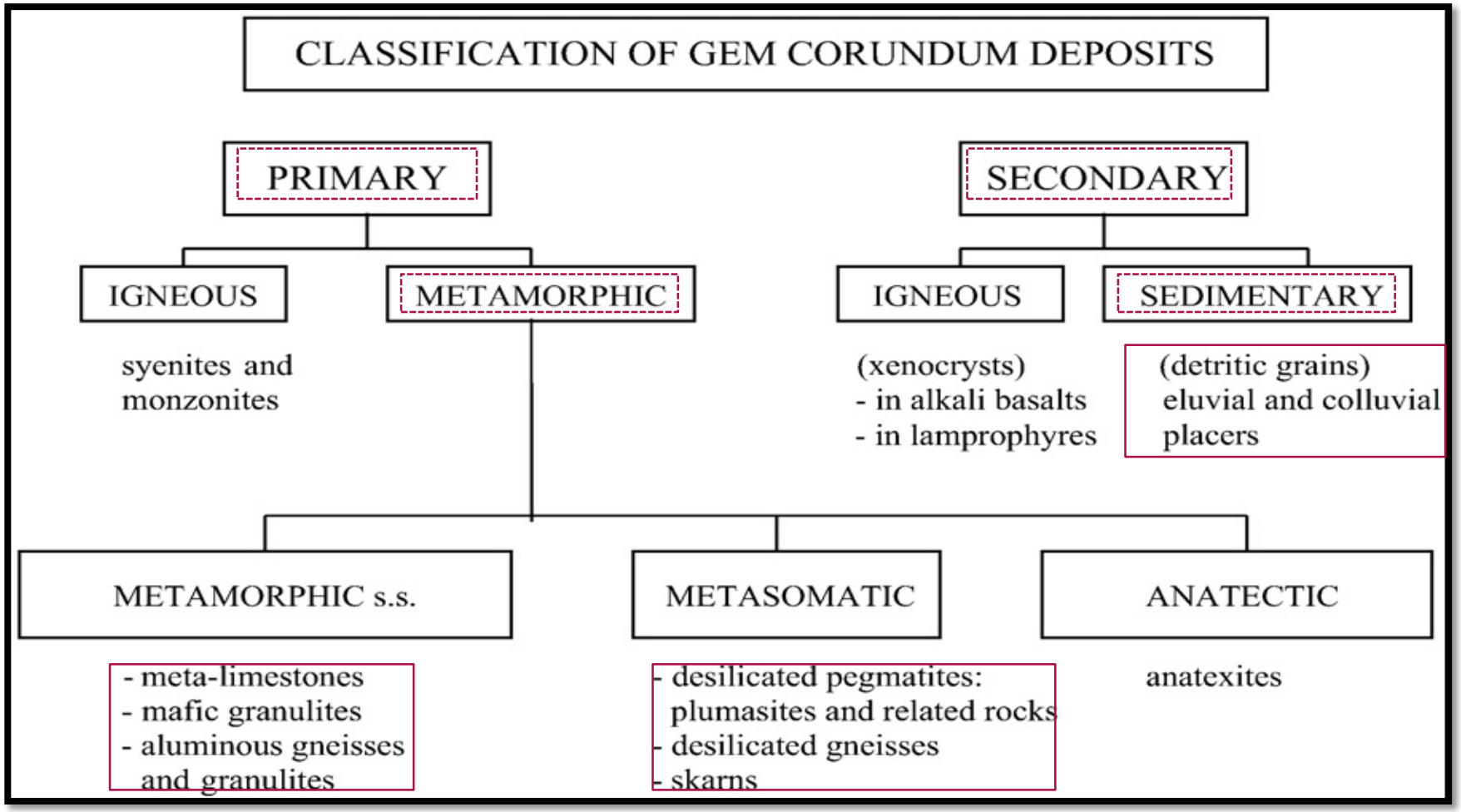
MRM — Geology Explained

Rubies are hosted by eluvial/colluvial/alluvial material and in the underlying amphibolitic bedrock.



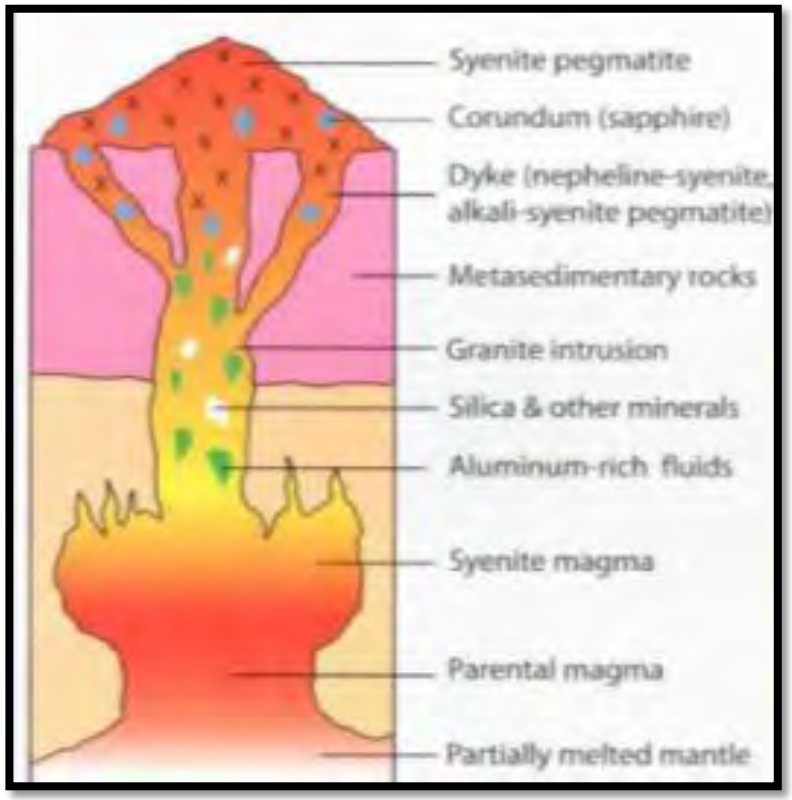
The Montepuez Complex comprises of rocks, ranging from granitic to amphibolitic in composition, with quartzites and marble at places. The rocks of the Montepuez Complex are strongly folded into tight and isoclinal folds on all scales, and have later been cut by a number of mainly NE–SW -trending shear zones.

Ruby Formation Explained



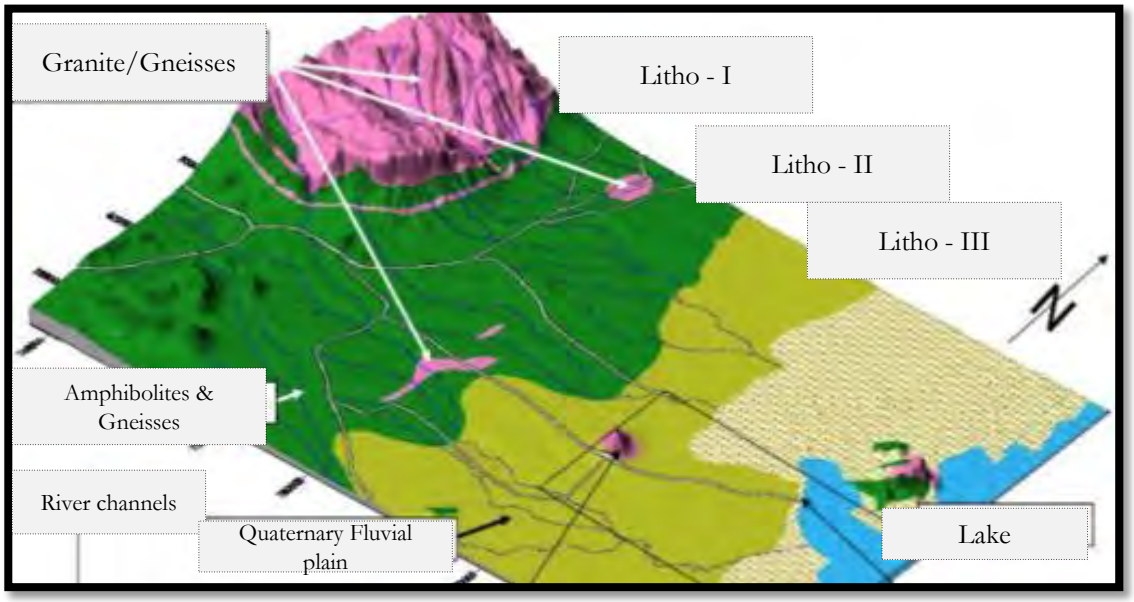
Primary & Secondary Ruby Mineralisation

Primary Ruby Deposits



Unlike many other rocks, rubies and sapphires can only form under a limited Range of high pressure and temperature. These rare conditions occurred during Continental plates crashed in Archean times.

Secondary Ruby Deposits



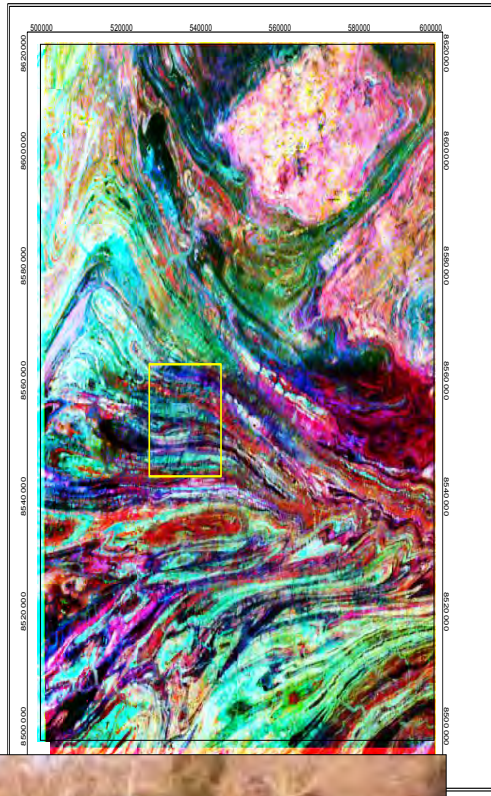
Ruby is liberated by physical and chemical weathering process from rocks and concentrated by water and deposited as alluvial//Colluvial/eluvial material over weathered bedrock.

Ruby Exploration Methods

GEOLOGICAL METHOD
TYPICAL ASSOCIATION WITH CERTAIN ROCKS OR MINERALS

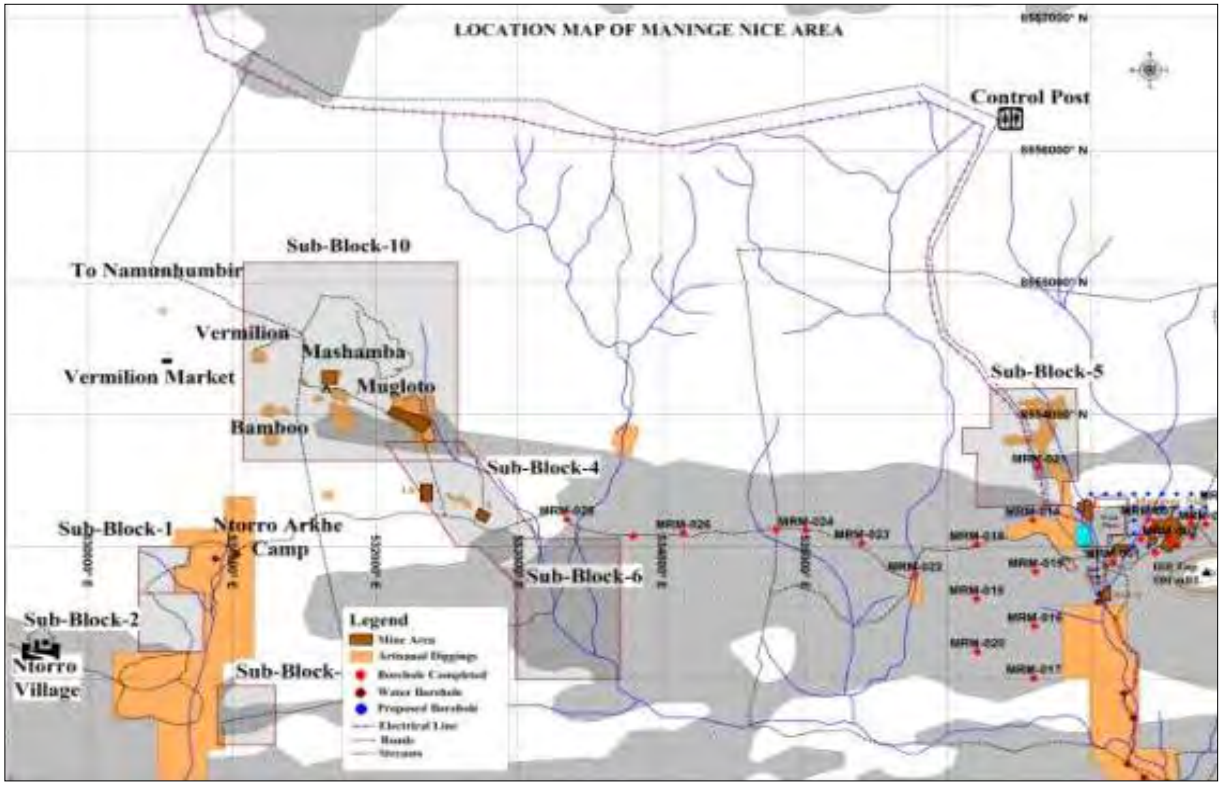
GEOPHYSICAL METHOD
MAGNETIC SUCEPTIBILITY, SPECIFIC GRAVITY, CONDUCTIVITY, RADIOACTIVITY

GEOCHEMICAL METHOD
CHEMICAL SIGNATURES OF HIDDEN MINERAL DEPOSITS, OFTEN DISPERSED OVER WIDE AREAS BY CHEMICAL OR PHYSICAL PROCESSES LIKE WEATHERING AND EROSION

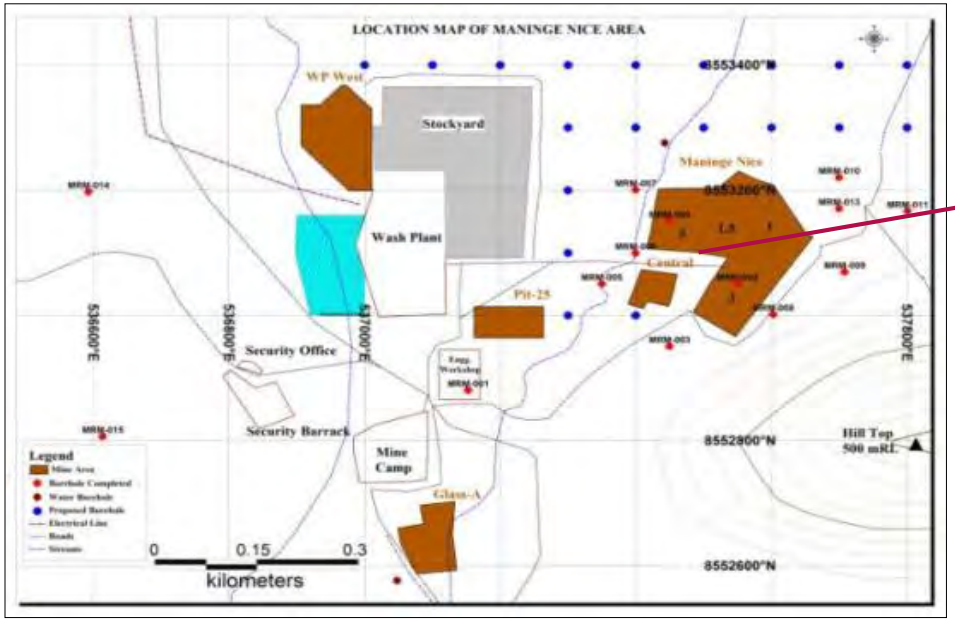


MRM — Bulk Sampling

- Bulk sampling began in August 2012
- To the end of Feb 2014 total rock handling is 960,000 tonnes
- Bulk sampling is presently taken place within 2 main networks – the Core Sector and Mugloto. Within each network are a series of pits, most notably the Maninge Nice and Mugloto Pits.
- Mineralisation occurs in two forms:
- Primary amphibolites at the bottom of the Maninge Nice pit
- Secondary weathering and transported gravel bed (0.2 – 1 m thick)

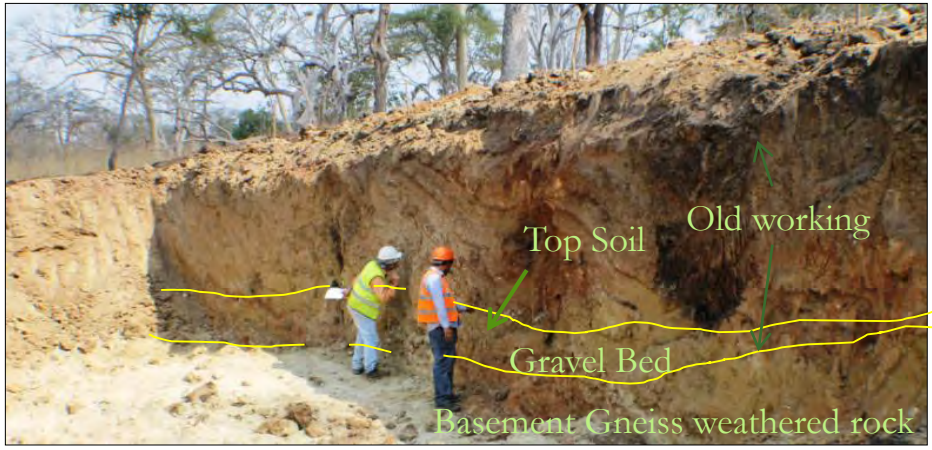


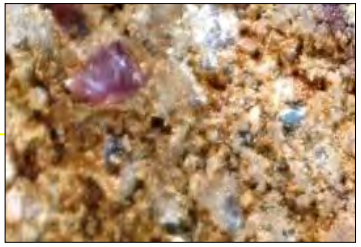
Maninge Nice Bulk Sampling



Top Soil

Ruby mineralisation





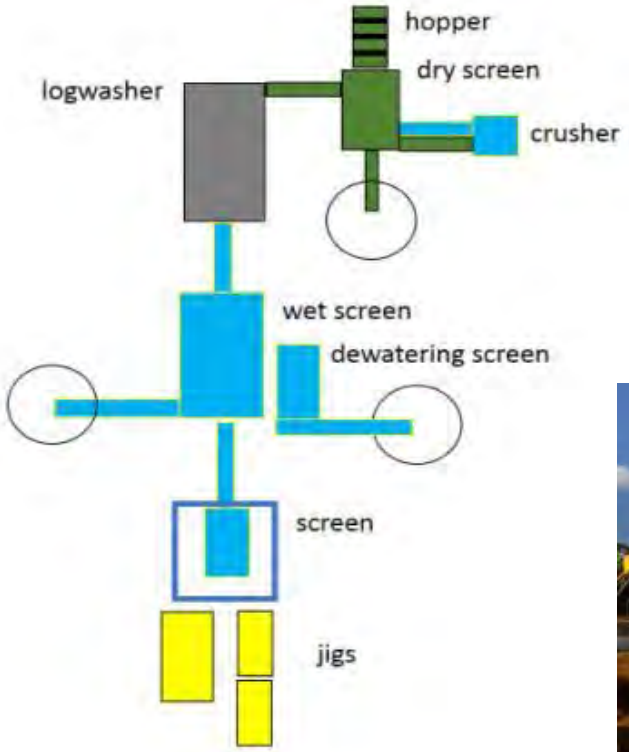
Pit	Total Rock Handling	Ore Mined		Ore Washed		Gem Production		Ore Grade		Stripping Ratio
		Primary	Secondary	Primary	Secondary	Primary	Secondary	Primary	Secondary	
	T	*T*	*T*	*T*	*T*	*ct*	*ct*	*ct/T*	*ct/T*	
Maninge Nice	600,282	89,669	110,660	14,526	49,081	2,324,046	4,878,732	160	99	2.00
Central	24,589	4,134	2,563	2,585	64	506,244	19,113	196	299	2.7
Ntorro Test & Reservoir	13,361	-	51	-	59	-	53	-	0.89	
Glass A	31,650	-	15,091	-	1,759	-	48,234	-	27	1.1
Pit 25	18,049	-	823	-	-	-	-	-	-	
Reservoir & Wash Plant W	106,152	-	34,342	-	-	-	-	-	-	2.1
Mugloto 1	26,817	-	12,250	-	11,189	-	63,162	-	5.65	1.2
Mulgoto 1A	51,803	-	15,288	-	1,403	-	160	-	0.11	2.4
Mugloto 2 & 2A	204,687	-	50,513	-	21,865	-	35,784	-	1.64	3.1
Mugloto 3	24,103	-	-	-	-	-	-	-	-	-
Other	45,963	-	-	-	26	-	321,225			
Total	**1,147,456**	**93,802**	**241,582**	**17,111**	**85,446**	**2,830,290**	**5,366,462**	**165**	**63**	**2.4**

Gem production is inc

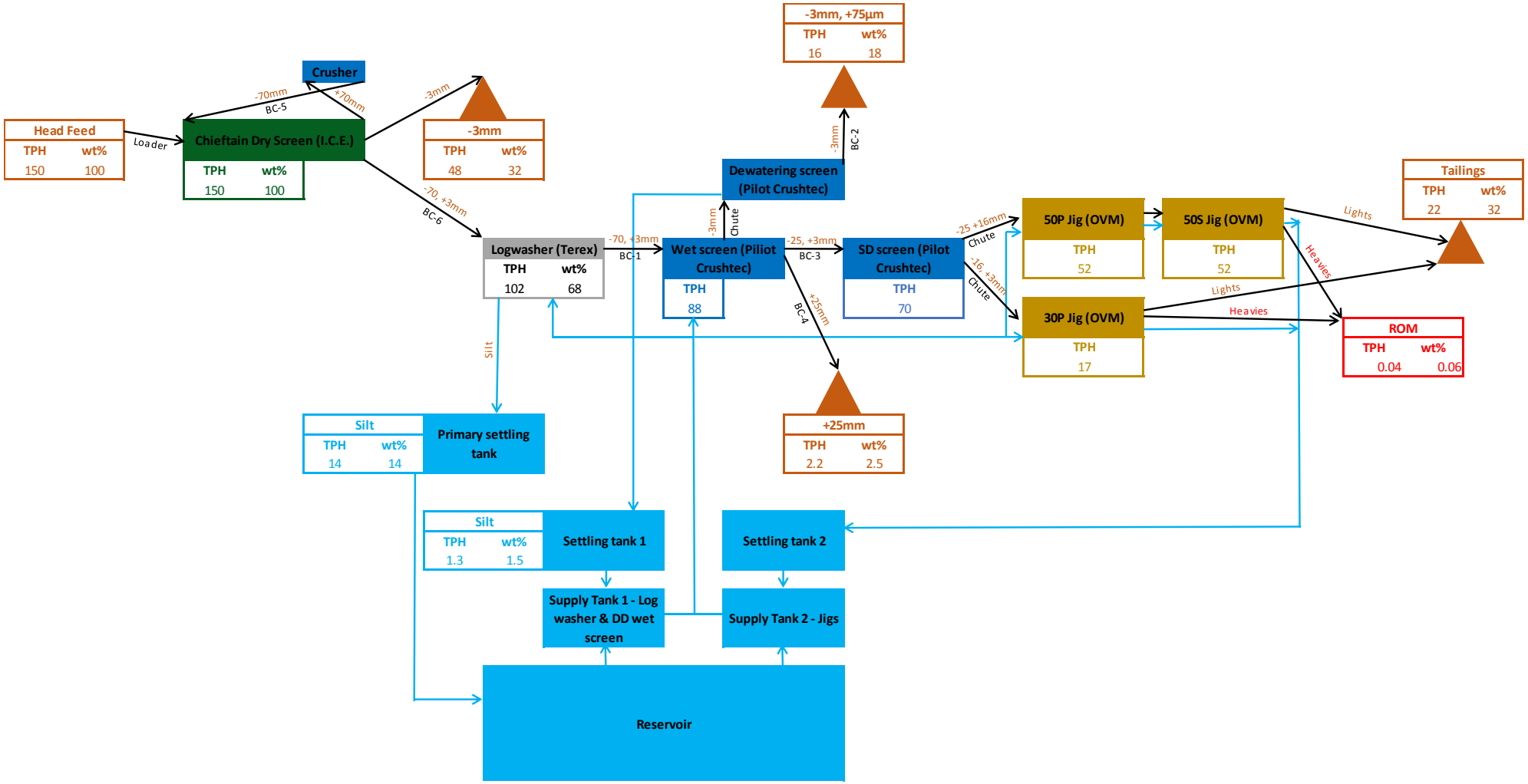
A view of Maninge Nice Pit

Wash Plant

Initial 50 TPH pilot wash plant has been augmented to a 100 TPH realistic and more efficient capacity since its arrival in Nov 2012 with further additions of dry screen, logwasher and jigs



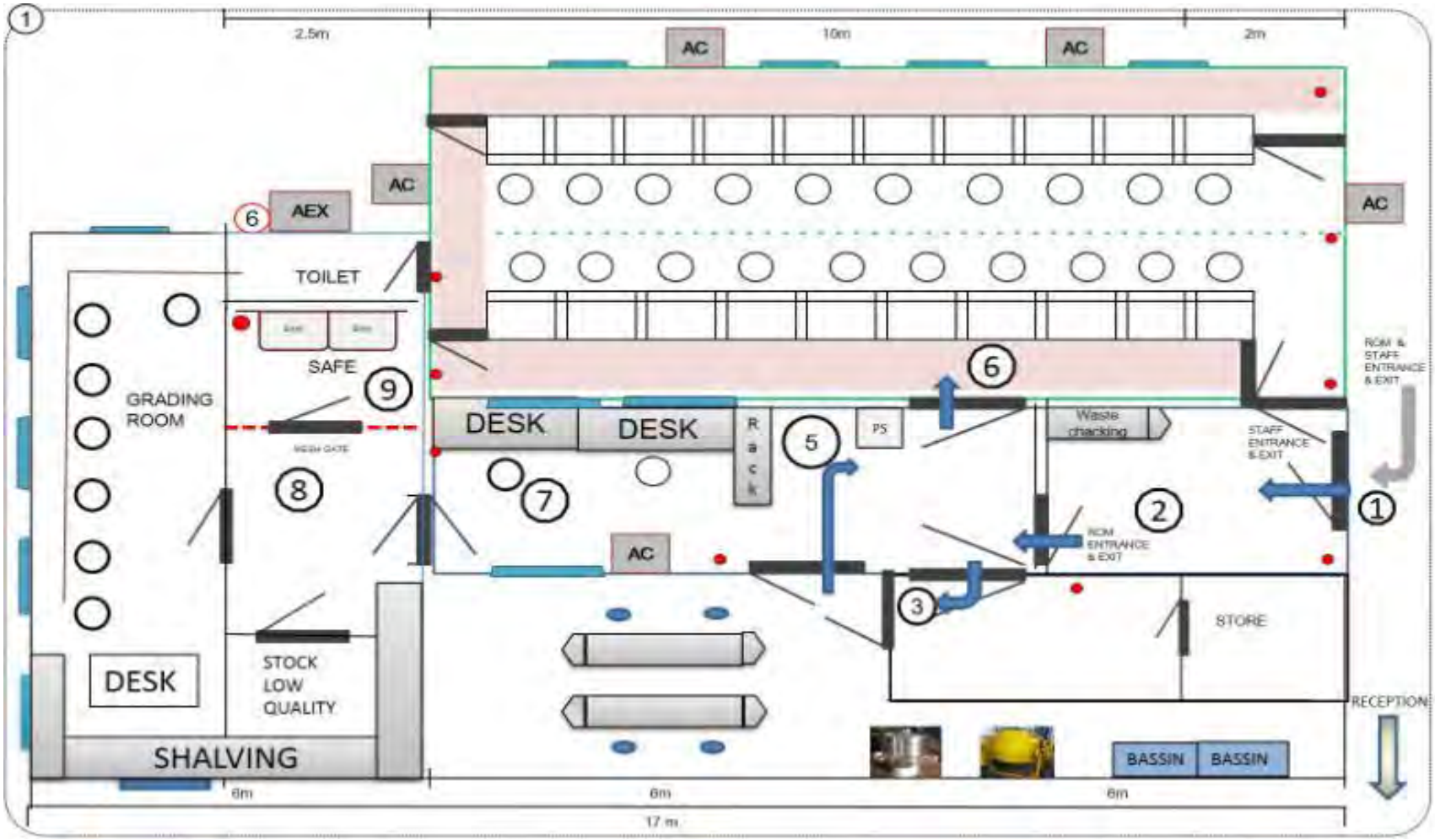
Wash Plant Flow Sheet



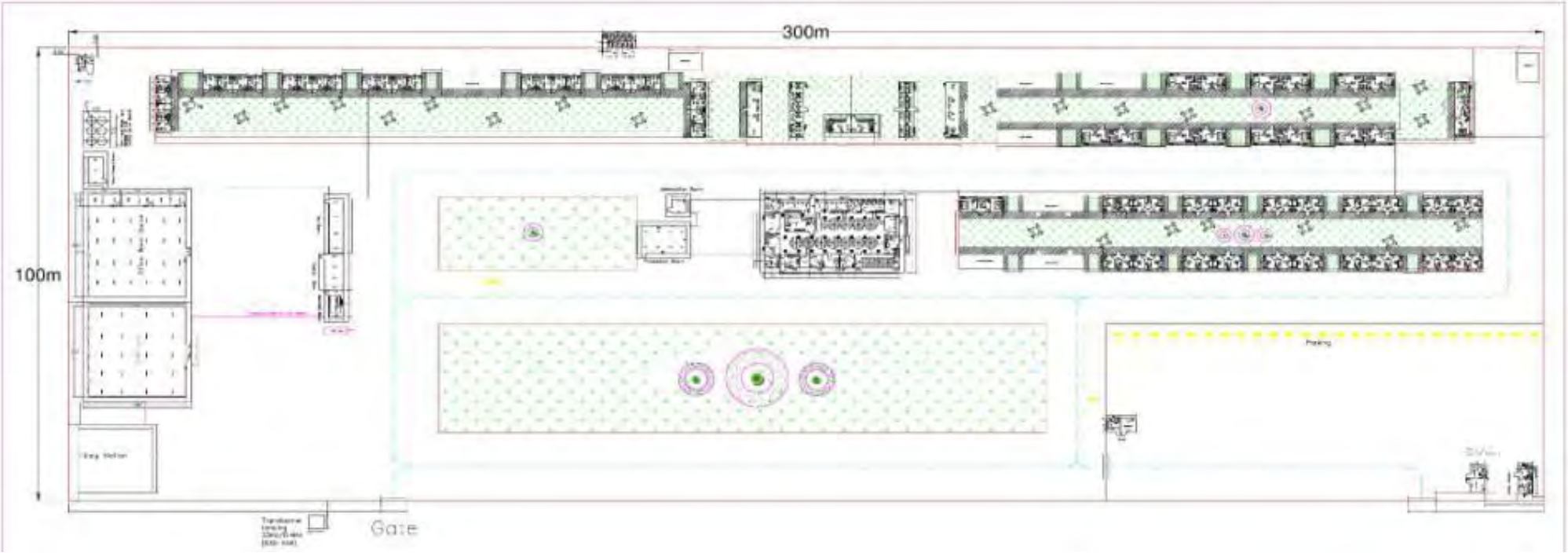
Sort House

MRM have formulated the world's first grading system for Montepuez rubies in the rough.

Sort House


1
2.5m
10m
2m
AC
AC
AC
AC
AC
AEX
6
TOILET
SAFE
9
GRADING ROOM
MESH GATE
8
DESK
DESK
Rack
5
PS
6
Waste checking
STAFF ENTRANCE & EXIT
ROM & STAFF ENTRANCE & EXIT
1
2
ROM ENTRANCE & EXIT
7
3
STORE
DESK
STOCK LOW QUALITY
SHALVING
RECEPTION
BASSIN
BASSIN
6m
6m
6m
17 m

Namanhumbir Housing & Office Complex



Work Plan – Phase I

Activity	Time line	Status	Realistic time Line
Arrival of mining equipment:	Apr 2012 –Arrived on 3rd April	Commissioned	
Approach roads, ground preparation etc.:	Apr-Jun 2012	On going	On going
Camp erection in Namanhumbir:	May-Nov 2012	Completed – landscaping in progress	April 2014
Treatment plant import and commissioning:	Sep – Oct 2012	Completed	
Commencement of exploratory mining:	August 2012	Waste	Started on 23rd August 2012
		Ore	Started on 23rd August 2012
Commencement of ore treatment:	October 2012	On-going	On-going
Import and commissioning of drilling rig:	September 12	Completed	Completed
Commencement of exploratory drilling:	October 2012		Commissioned in April 2013
Airborne geophysical survey:	September 12	Field follow up in progress	2014
HT electric line:	2013-2014	Erected, awaiting connection and charging	April 2014
Export of ruby:	Dec 2012	May 2014	May 2014

Presidential Visit – April 2014







Corporate Social Responsibility








Thank you