

ANGLO AMERICAN PLATINUM CORPORATION

FACILITY VISIT: Eastern Limb

4 March 2003

TWICKENHAM PLATINUM MINE

Chris Sheppard

Divisional Director : East Mines

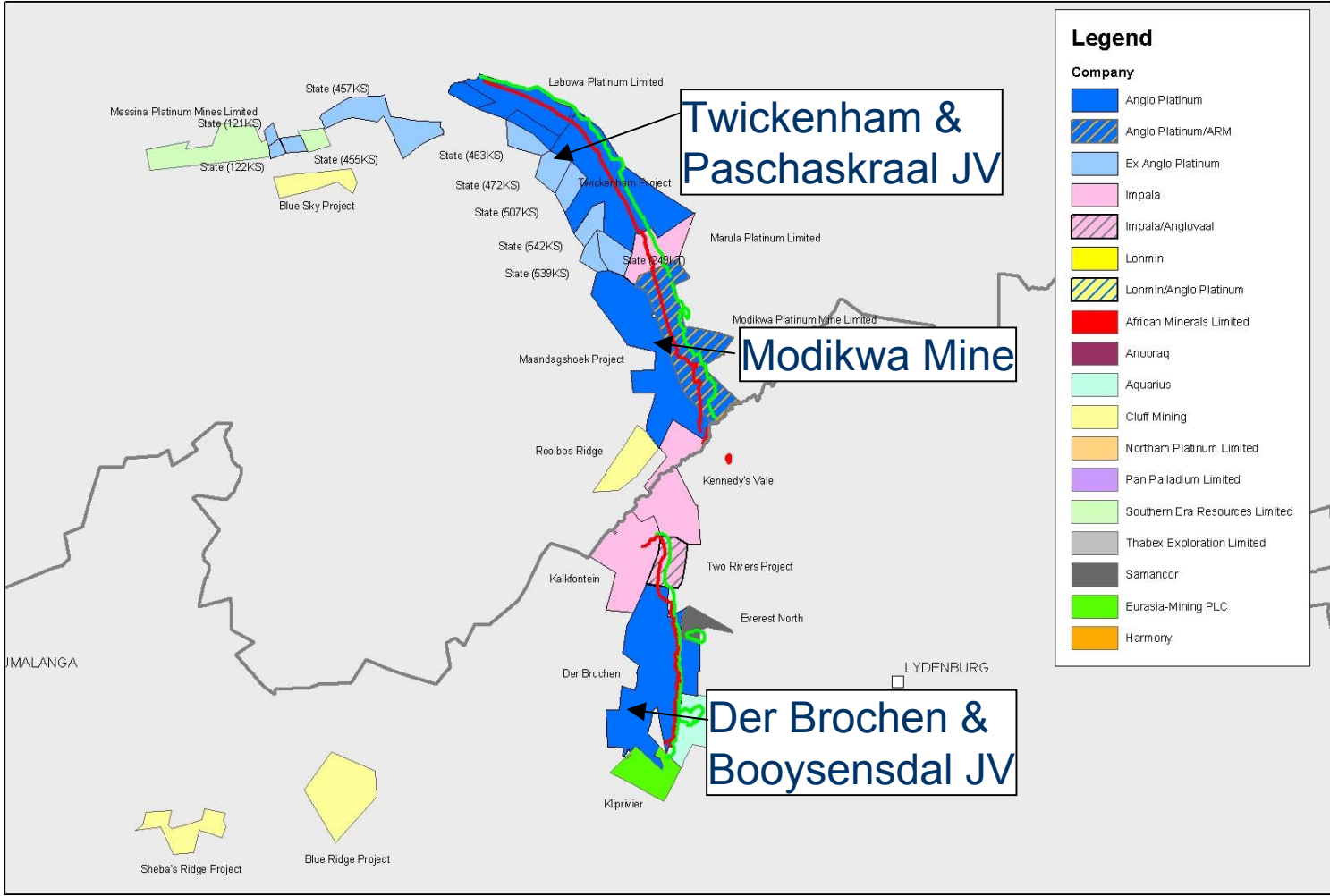
Mike Halhead

Divisional Director : Projects

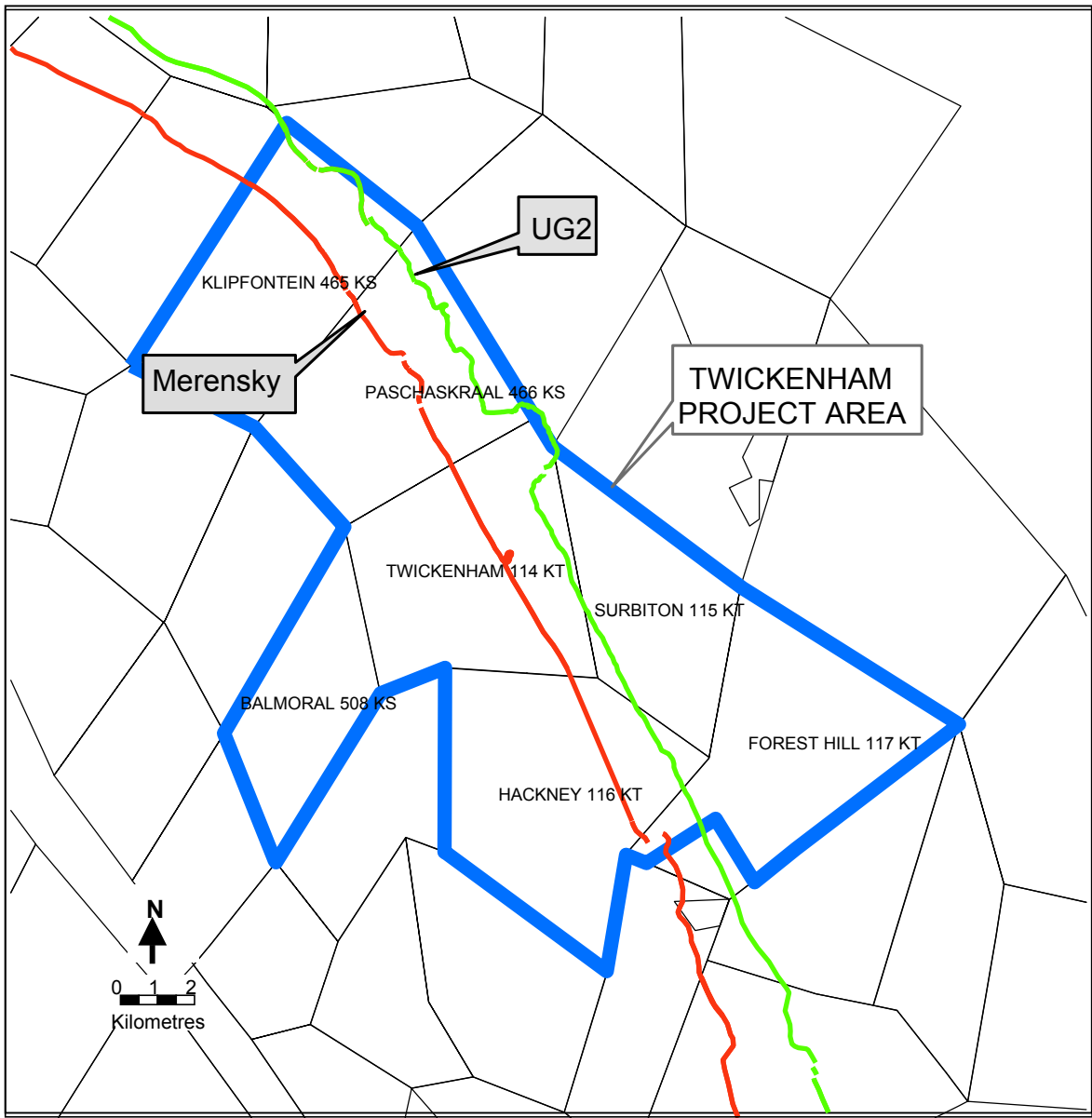
AGENDA

- **Eastern Limb orientation**
- **Safety**
- **Geology**
- **Mining strategy**
- **Infrastructure**
- **Project status**

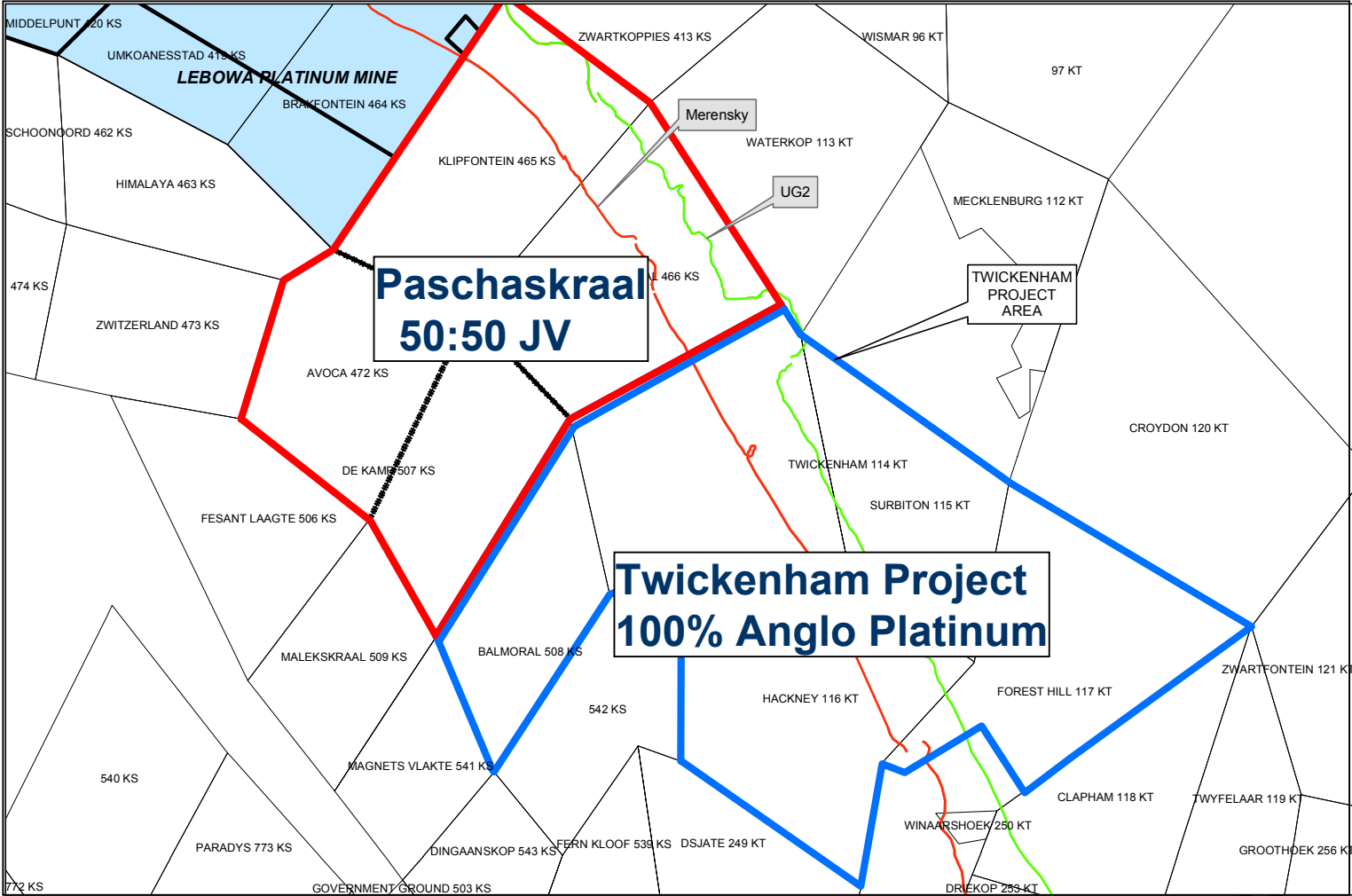
BUSHVELD COMPLEX EASTERN LIMB



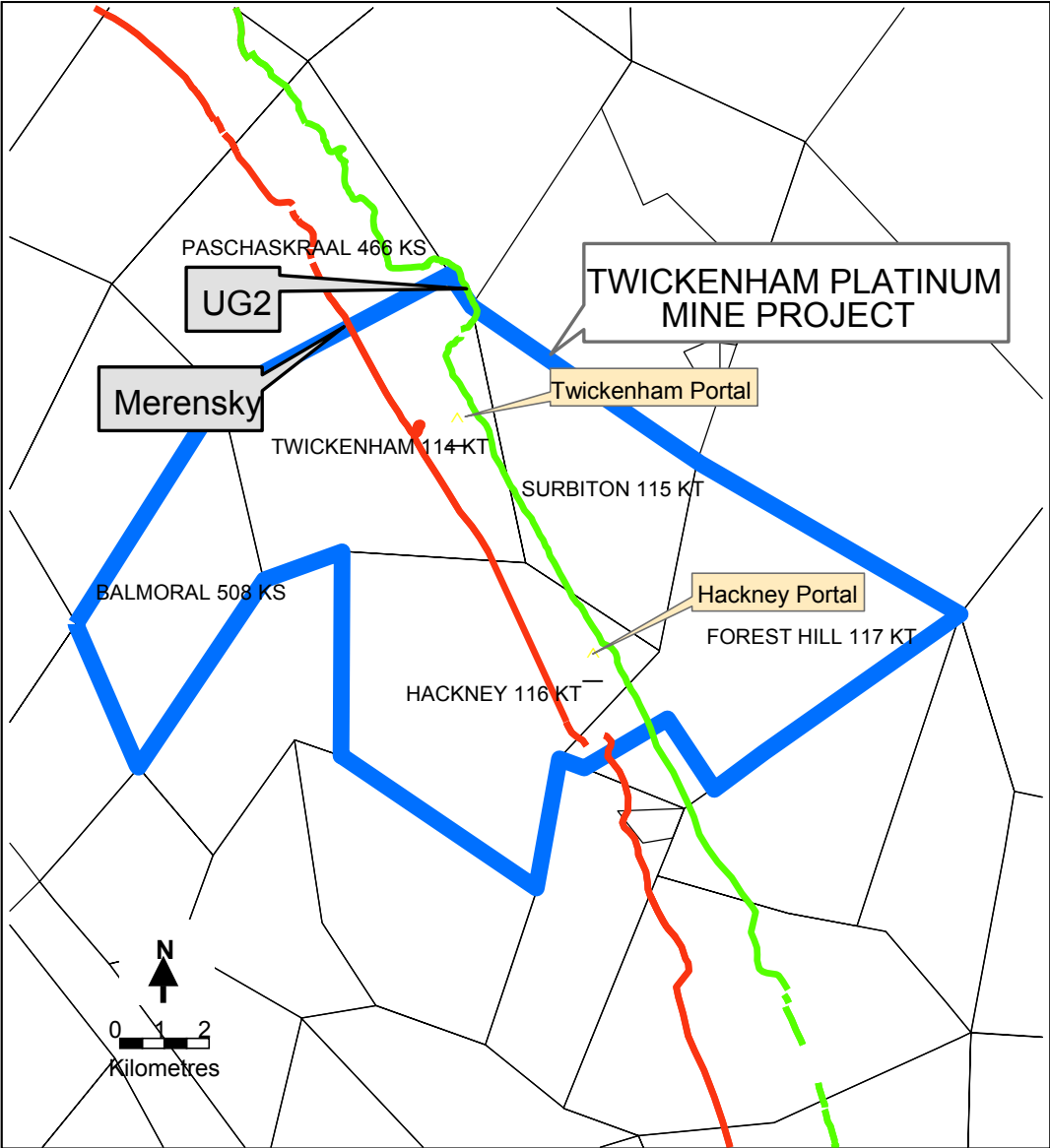
TWICKENHAM PROJECT AREA



PASCHASKRAAL JV & TWICKENHAM PROJECTS



TWICKENHAM MINE PROJECT AREA



TWICKENHAM MINE PROJECT PARAMETERS

- **Proposed mining area now comprises the farms Twickenham and Hackney**
- **First phase includes 2 decline shaft systems on Hackney and Twickenham**
- **Production – 250 ktpm, 160 koz Pt/annum, 176 koz Pd/annum**
- **Capex R3,2 billion (real 2003 terms)**
- **Commissioning – 2005**
- **Full Production - 2007**

TWICKENHAM SAFETY STRATEGY

- Focused on critical aspects, including
 - Zero tolerance → target zero
 - Work ethic → stop and fix
 - Personal contact
 - Safety first
 - Training and coaching
 - Behaviour based safety
 - Safety integration
 - Teamwork and communication
- Since November 2001
 - 100 701 shifts have been worked
 - 1 reportable injury
 - 1 million lost time injury free hours February 2003

SAFETY: TWICKENHAM SITE VISIT

- Overview by site construction personnel
- Demarcated access area
- Issue of personal protective equipment (PPE)
 - hard hat
 - closed shoes if required.
- Walk to portal entrance, return to coach

PROJECT OVERVIEW

What has changed in a year?

- **Greatly enhanced geological understanding**
- **Agreement with government**
- **Significant project progress**

GEOLOGY

- Improved structural knowledge and re-interpretation of all available datasets (3 dimensional structural model pending completion)
- Increased confidence in reef plane contours
- Refined geological loss estimation and specification for the most prominent individual features
- Better understanding of pothole distributions and frequency within the shaft and early mining areas
- Better outcrop / sub-outcrop and dyke delineation
- Layout optimisation enhanced

GEOLOGY

- 600 Boreholes at various depths (Exploration and Geotechnical) completed to date (approx. 250 since compilation of CBE=21000m)
- Improvement in achieved borehole grid spacings
 - 2 year footprint: 140 by 70 metres
 - 5 year footprint: 500 by 500 metres
 - Outside footprint areas: varying due to focus on 2 and 5 year outlines

HACKNEY SHAFT INITIAL CONSTRUCTION (Aug 2002)



BULK SAMPLE / EARLY START MINING AT HACKNEY SHAFT (Aug 2002)



HACKNEY PORTALS AREA (Feb 2003)



HACKNEY PORTALS (Nov 2002)



HACKNEY EARLY START MINING

- Bulk sample
- Training area for stoping and development
- Reef winze currently being developed
- Main portal construction in progress
- Stope production 7 000tpm

Weathered ore

Access crosscut

Reef winze

Old JCI workings

Main portals

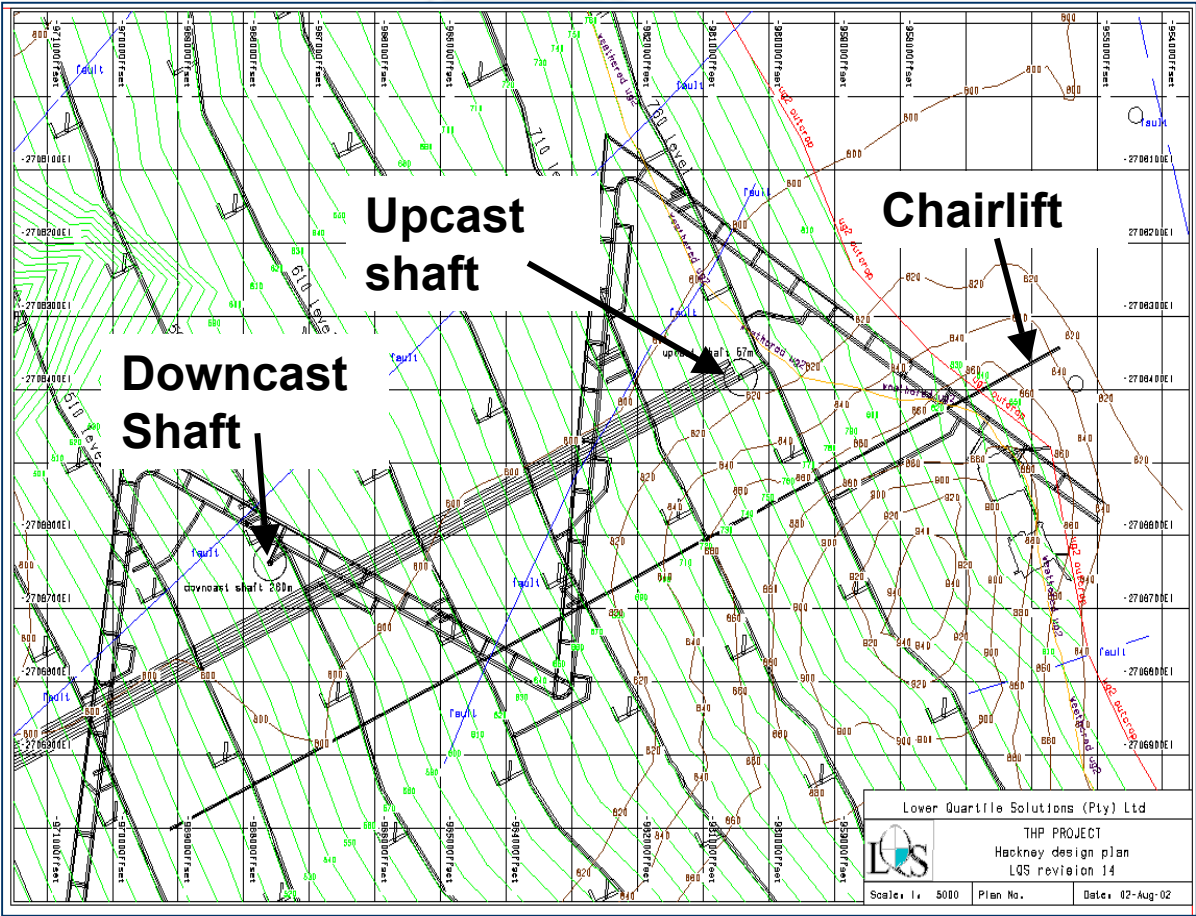
Early start stopes

PLAN

TWICKENHAM PROJECT : ACCESS AT HACKNEY

- **Twin 9° decline system – 4m x 4.5m conveyor and 5m x 5.3m material way in footwall of reef**
- **Interconnecting laterals every 70m**
- **Trackless equipment – drilling, cleaning and support**
- **LHD cleaning onto a temporary conveyor**
- **Chairlift 2.8m high by 3.2m wide raised conventionally in true dip direction**

HACKNEY DECLINES AND SHAFT SYSTEM LAYOUT



MAIN DEVELOPMENT

The following characteristics pertain to the mining layout:

- Average true dip of the reef 16°
- Vertical interlevel spacing 50m
- Inclined distance between levels 181m
- Drive width 5.3m
- Drive height 4.5m
- Raise width 1.5m
- Raise height 2.2m

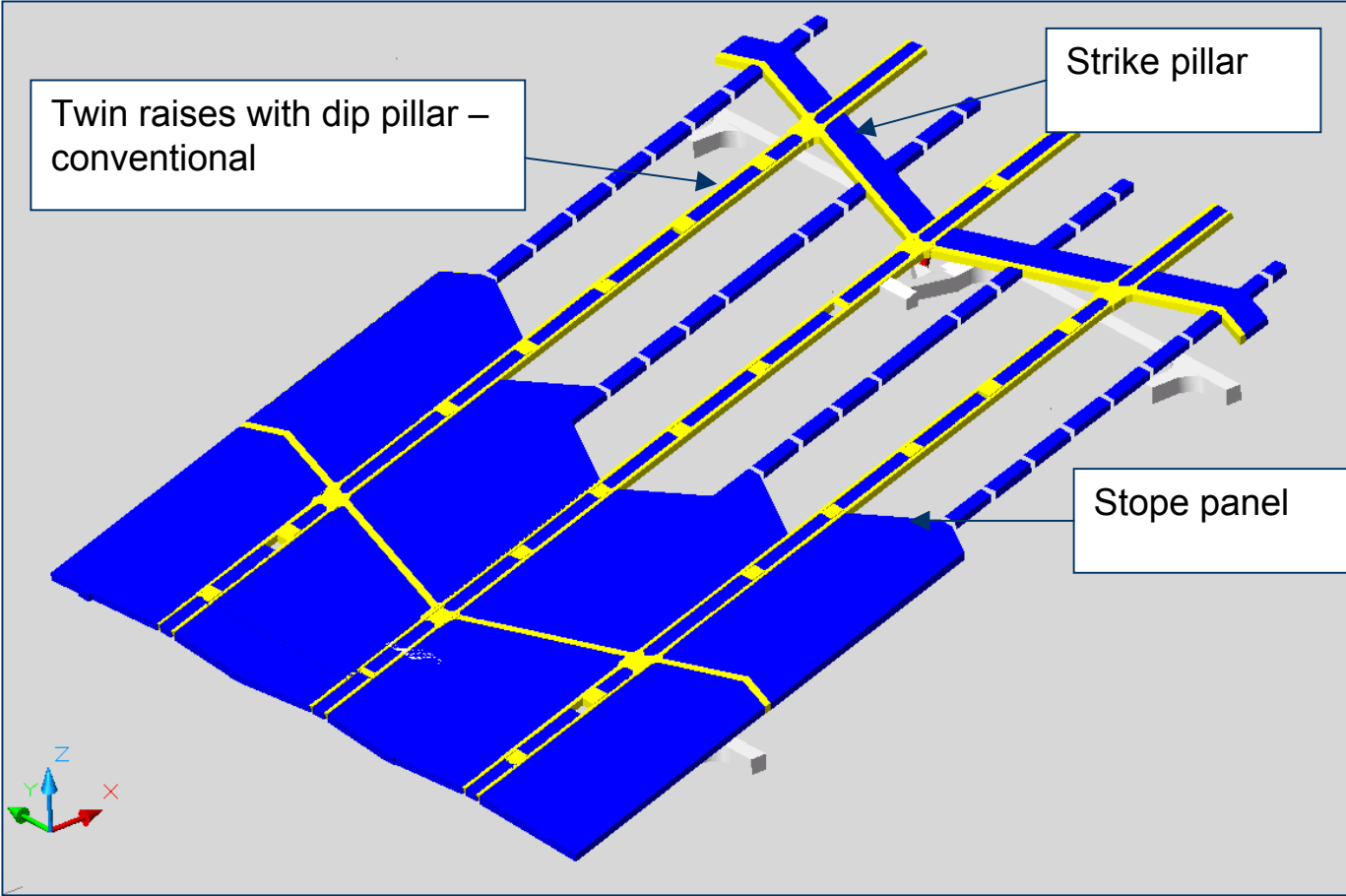
MAIN DEVELOPMENT

- Advance strike gully (ASG) width 2m
- ASG height 2.2m
- Muckbay spacing 210m
- Turning point spacing 105m
- Main waste and reef passes 500t
- Footwall drives below reef 10m
- Chairlift below footwall drive 10m

STOPING

- Stoping will be conventional down-dip from the pre-developed raises on true dip, scraper winch cleaned into muckbays
- The stoping operations are planned as follows :
 - Stoping width 0.9m
 - Face length per panel 30.3m
 - Face advance per blast 1.2m
 - Planned face advance per month 14m
 - Relative density of ore 3.82t/m³
 - Shifts per day 2
 - Average days worked per month 28

STOPE LAYOUT



TWICKENHAM SHAFT AREA



TWICKENHAM SHAFT FIRST BLAST

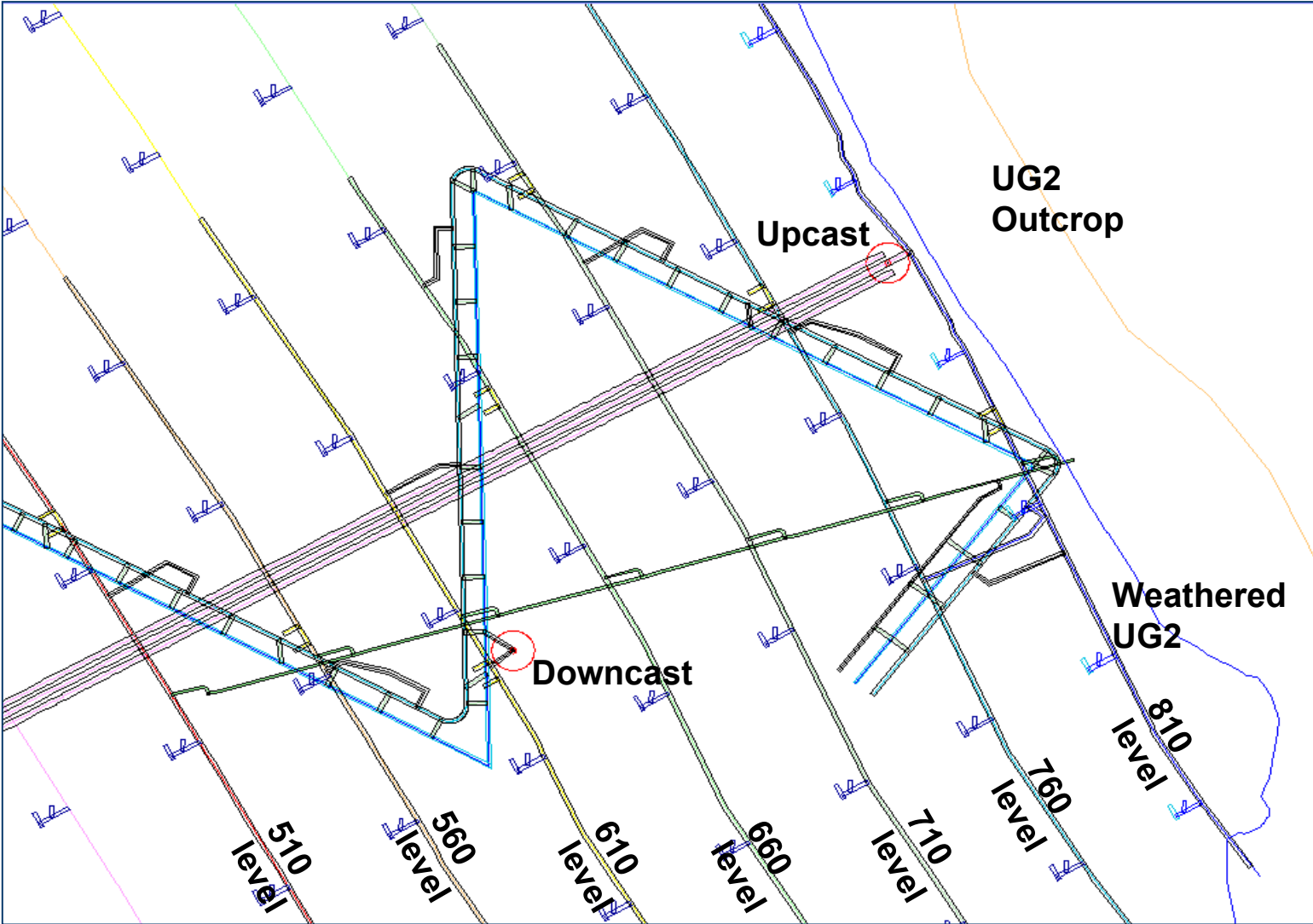


(5 Feb 2003)

TWICKENHAM PORTALS (Feb 2003)



TWICKENHAM SHAFT LAYOUT



ACCESS - TWICKENHAM

- Triple decline system for the first leg developed from the hanging wall position
- First leg conveyor, material and chairlift declines together
- Remaining declines similar to Hackney

RELOCATION

Ga pila understanding invaluable

Scattered relocation:

- **25 houses to be built**
- **12 completed – successful relocation**
- **13 completed by end March 2003**

MECKLENBURG A TOWNSHIP

(89 families to relocate)

- **Bulk services/roads in progress 50% complete**
 - **Construction of roads in progress**
 - **Cemetery completed**
 - **On program – completion planned for June 2003**
- **Dwellings**
 - **Contract awarded Grinaker/LTA**
 - **Site establishment in progress**
 - **Occupation of first families: end June 2003**

SITE ACCOMODATION

- **Contractors camp**
 - **First units (768 beds) plus feeding facilities available end June 2003 – on track**
- **Mine camp**
 - **Mobile homes to be moved from Montrose**
 - **Permanent central facility**
 - **Contractor on site**

GENERAL INFRASTRUCTURE

- **Main access roads**
 - **Construction of deviation road in progress**
 - **On program – completion planned for July 2003**

CONCENTRATOR - PROGRESS

- **EPCM contract awarded**
- **CBE in preparation**
- **Plant design complete**
- **Procurement in progress – Mills, Larox filters and flotation cells**
- **Earthworks – Site establishment targeted for May 2003**

CONSTRUCTION COMPLETED

- Hackney portals
- Power lines to shafts
- Lebolelo water supply line
- Raw-water dam
- Raw-water line to Hackney

CONSTRUCTION IN PROGRESS

<i>Description</i>	<i>Planned Completion</i>
Main access roads and inter shaft roads	July 2003
Contractors camp – Phase 01	June 2003
Management camp	July 2003
Twickenham portals	June 2003
Bulk sample mining project (training centre)	July 2003
Mecklenburg A – Bulk infrastructure	June 2003
Scattered houses	April 2003

FUTURE CONTRACTS

- **Buildings**
- **Main mining contract**
 - *Adjudication in progress*

CONCLUSION

- Twickenham project : (100% Anglo Platinum) in place
- Hackney portals complete
- Twickenham portals commenced
- Early start mining project in place

TWICKENHAM PLATINUM MINE

QUESTIONS