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Ref: 46962

2 November 2006

Company Announcements Office Australian Stock Exchange Limited 20 Bridge Street SYDNEY NSW 2000

Dear Sir / Madam

#### **Paladin Resources Presentation Update**

We attach a presentation outlining the Langer Heinrich metallurgical process and status of commissioning as presented recently to investors.

Yours sincerely Paladin Resources Ltd

JOHN BORSHOFF Managing Director

# PALADIN RESOURCES LTD UPDATE

## LANGER HEINRICH METALLURGICAL PROCESS REVIEW

and

**COMMISSIONING** 



#### **Disclaimer**

This presentation includes certain statements that may be deemed "forward-looking statements". All statements in this presentation, other than statements of historical facts, that address future production, reserve or resource potential, exploration drilling, exploitation activities and events or developments that Paladin Resources Ltd (the "Company") expects to occur, are forward-looking statements. Although the Company believes the expectations expressed in such forward-looking statements are based on reasonable assumptions, such statements are not guarantees of future performance and actual results or developments may differ materially from those in the forward-looking statements. Factors that could cause actual results to differ materially from those in forward looking statements include market prices, exploitation and exploration successes, and continued availability of capital and financing and general economic, market or business conditions. Investors are cautioned that any such statements are not guarantees of future performance and actual results or developments may differ materially from those projected in the forward-looking statements. The Company does not assume any obligation to update or revise its forward-looking statements, whether as a result of new information, future events or otherwise.



## PRESENTATION OUTLINE

- BFS Process Development
  - Historic work
  - Mintek BFS work
- Uranium Process Enhancement
  - ANSTO
- Vanadium Process Enhancement
- Process Summary
- Staged Commissioning Status of Project



### HISTORICAL TESTWORK

#### **Gencor 1975-1981**

- Laboratory testwork
- On-site crushing and screening
- Pilot plant (3,000t treated)
- Acid leach consumed 150-200kg acid/tonne ore
- Hot, alkaline (carbonate) leach process selected
- CIX with NaCl elution & peroxide precipitation
- Identified effective U<sub>3</sub>O<sub>8</sub> recovery process after exhaustive testwork program

#### **Acclaim**

- Laboratory scoping testwork at Mintek
- Hot, alkaline (carbonate) leach <u>but</u> at pressure
- Process recovered U<sub>3</sub>O<sub>8</sub> but at higher cost

Both investigations identified an alkaline/carbonate leach as the preferred method over the traditional acid leach process



### **BFS PROCESS DEVELOPMENT**

## Testwork (by Mintek)

- Scrubbing & Attritioning circuit developed to recover 95% U in 40% mass (reduces capex & opex requirements)
- Numerous leach tests conducted to confirm efficiency and operating conditions for alkaline carbonate/bicarbonate leach
- Vendor participation for CCD (or filtration) circuit to guarantee efficient solid/liquid separation
- Resin supply, adsorption, elution & regeneration processes investigated extensively
- "Yellow cake" produced to converter's specifications

Final developed flowsheet very similar to proven Gencor circuit

- Mintek results confirm original Gencor pilot work
- Process & flowsheets signed off by Mintek, Minproc, Banks
- ASPEN simulation model confirmed BFS assumptions
- Paladin continued to optimise process during project engineering stage (including BFS recommendations)



## U PROCESS ENHANCEMENT BFS recommendations

The following areas of potential enhancement were identified and listed in the BFS report.

- Improve proposed Ion exchange circuit (increase U loadings)
- Develop vanadium recovery circuit
- Quantify the carbonate balance across the leach & IX circuits
- Reduce levels of chloride & sulphate salts in solution (as identified by ASPEN simulation model)

Note: None of the above were identified as "fatal flaws", only areas for potential improvements



## U PROCESS ENHANCEMENT ANSTO testwork program

Enhancements developed in conjunction with the Australian Nuclear Science & Technology Organisation.

- Elution & precipitation optimisation by:
  - Conversion to bicarbonate elution (from sodium chloride)
  - Precipitation via SDU process (significant drop in sulphuric acid)
  - No "bleed stream" to control chlorides (reagent savings)
  - Reduced vanadium loadings onto resin & vanadium "strip" introduced
  - Now able to recycle all elution & precipitation reagents
- Chloride ions greatly reduced by conversion of elution process
- Sulphate ions greatly reduced (lower sulphuric acid addition)
- Vanadium recovery process developed
- Carbonate balance still to be finalised but has scope for significant reductions



### **IMPACT ON PROJECT**

#### **Plant modifications:**

- Piping and valving around IX & precipitation
- Sodium Diuranate circuit added
- Reagent storage & mixing facilities re-allocated
- No "chloride bleed" circuit

All reasonably minor enhancements, using existing equipment

#### **Impact on project:**

- Minor delay in construction of IX & precipitation areas
- Minimal additional capex

Project still on schedule to meet December 22nd handover & US\$92M budget. No impact on OPEX (US\$/lb  $U_3O_8$ )



### **VANADIUM RECOVERY**

#### ANSTO has developed a process which can:

- Produce saleable vanadium product
- Minimise vanadium in feed to IX
- Avoid introduction of foreign ions into leach
- Recycle reagents to minimise costs

#### **Project status:**

- Preliminary "scouting" work identified a suitable "adsorbent"
- Vanadium recovery & precipitation process developed
- Further testwork on process refinements and reagent consumption determinations is in progress
- Pilot plant scheduled December (ANSTO) & early 2007 (site)



## **SUMMARY**Process

- BFS process enhanced through minor modifications
- Alkaline/carbonate leach is not a process risk
- Ion exchange circuit modified to a bicarbonate elution
- Elution & precipitation solutions all now recycled
- Resin loadings improved through reduced contamination
- Modifications implemented using existing equipment
- Vanadium recovery process identified and being developed
- Carbonate balance to be finalised (potential to reduce usage)
- Washing ore to reduce chlorides/sulphates being investigated
- High confidence in metallurgical process and flow sheet as constructed
- No impact on final capex, opex or project handover forecasts



## LANGER HEINRICH

### **Commissioning Status**

- Construction 95% complete
- Power & water supply complete & functional
- Crusher commissioned early
- Scrubber, screens & attrittioners run
- Pre leach thickener, leach & CCD circuit water filled Control system logic tested
- Control system logic tested
- Packaging system dry run
- Operational work force fully recruited (112 in total with only 3 non Namibians), trained & assisting with commissioning



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