

# THE ROLE OF THE REFEREES

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LBMA**

# TRIBUTE TO STEWART MURRAY



LBMA 2004 Annual Dinner.

# THE BEGINNINGS 1987-2001



Johnson Matthey



Engelhard-Clal



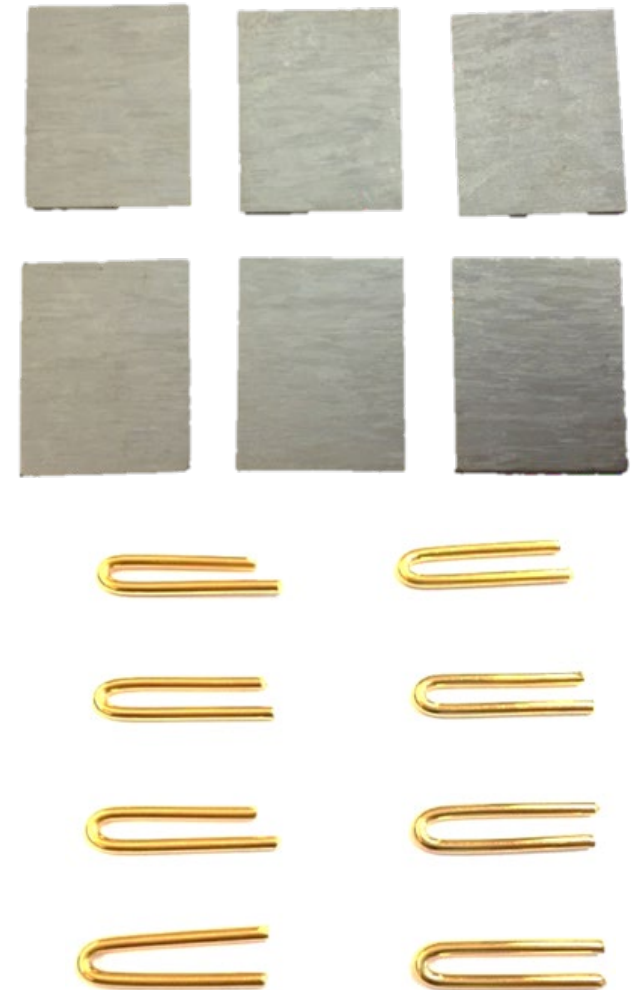
# REFEREES TESTING

## Gold

- 1,500 samples
- up to 16 different alloys
- 1,400 fire assays
- 240 ICP-OES analyses
- 2<sup>nd</sup> stage – several hundred analyses of other Referees samples

## Silver

- 200 samples
- 8 different alloys
- 1,400 ICP and spark analysis



# A NEW ERA: 2001 - 2003



**METALOR®**



MKS PAMP



RAND REFINERY



**TANAKA**

# SUMMARY OF THE REFEREES WORK



Applications for Good Delivery Accreditation

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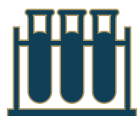
Proactive Monitoring

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Reference Samples

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Proficiency Testing

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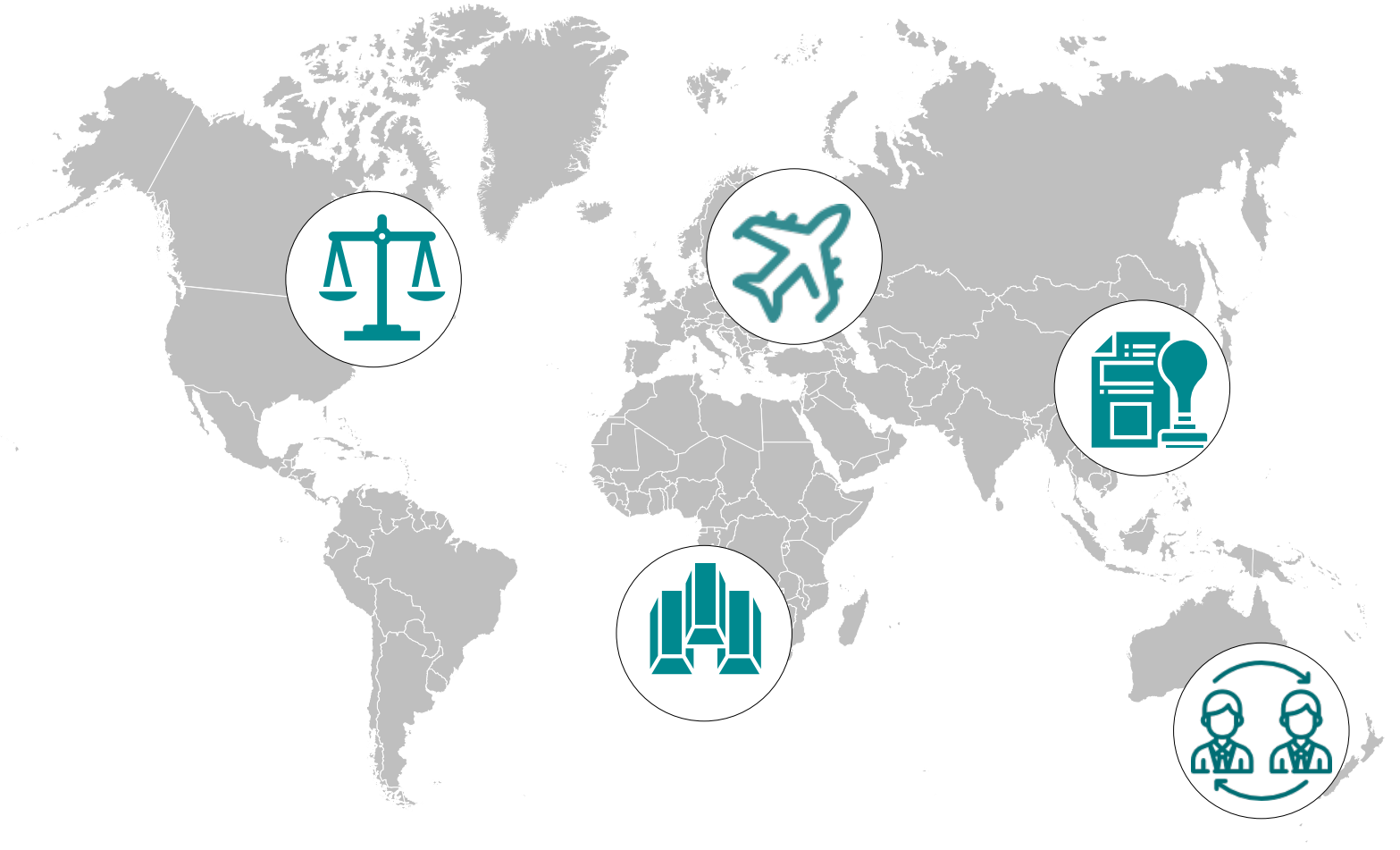


Certified Reference Materials



Quality  
Monitoring – gate  
keeper role

# GDL APPLICATION PROCESS – BAR TESTING



- Anonymous test with two Referees
- Weighing, visual inspection and assay of cut samples
- Melt and dip sampling followed by full elemental analysis

# PROACTIVE MONITORING



Mandatory for all LBMA GDL Refiners

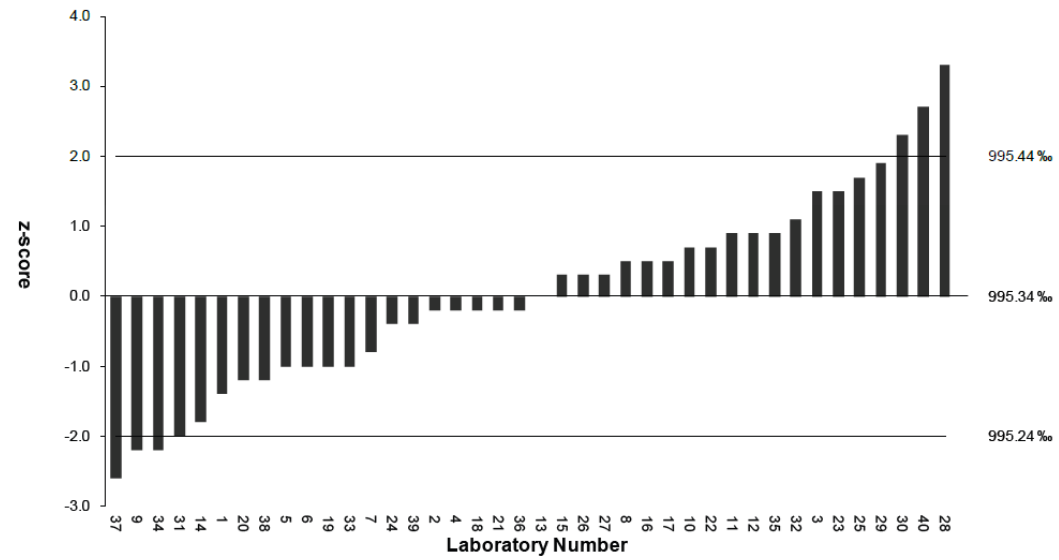
Demonstrate casting and assaying capabilities

Competence reviewed on a three-year basis

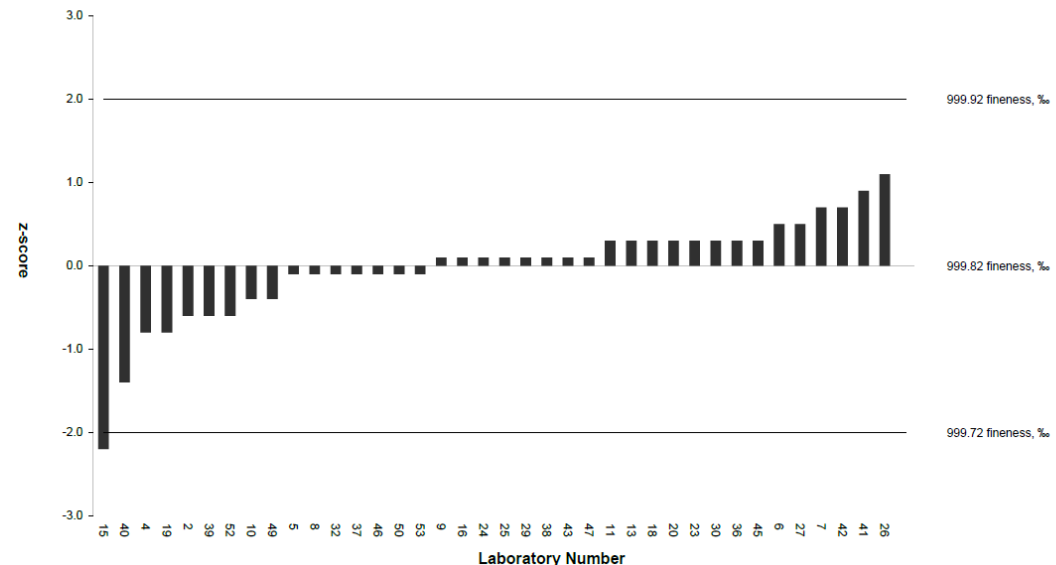
# PROFICIENCY TESTING SCHEME

- Anonymous, voluntary scheme open to all refiner's and laboratories
- It is not necessary to have the GD accreditation
- Important external quality control
- The performance of the GDL labs has improved

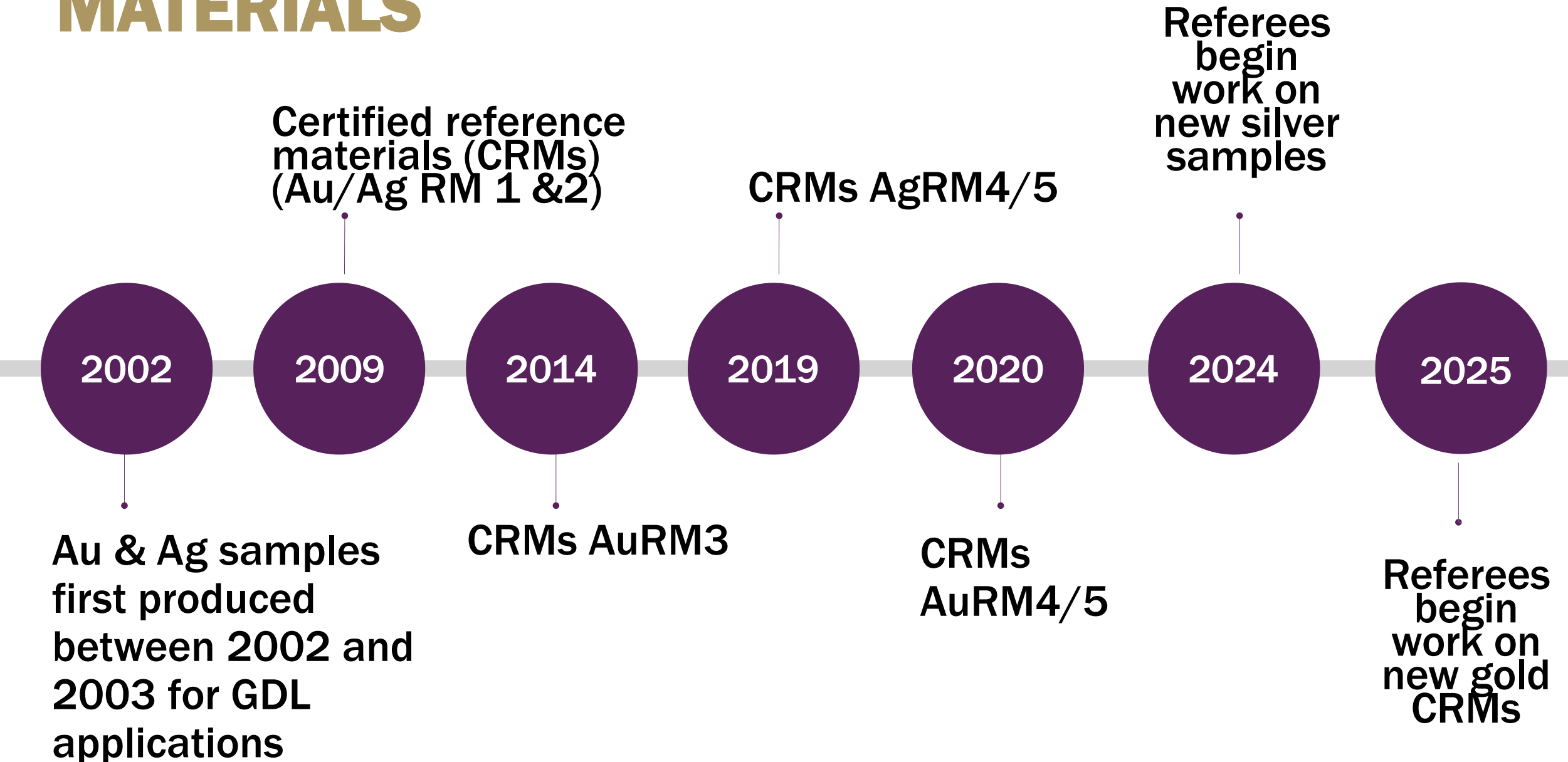
LBMA Report L0101



LBMA Report L0113 – Part A: GDL labs



# SAMPLES AND CERTIFIED REFERENCE MATERIALS



# DEVELOPMENTS OVER TIME



## VISUAL GUIDE

Providing the market  
with a consistent  
approach

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Defect versus  
Imperfections

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Evolution of the Good  
Delivery Rules

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## POROSITY

Conventionally  
cast vs  
continuous  
induction furnace

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Technology  
developments

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Non-destructive testing

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# ADVANCING METAL STANDARDS

## London Good Delivery List of Approved Refiners



Guaranteeing  
metal quality in  
the global OTC  
market



Gold list  
represents 85-  
92% of all  
annual mined  
gold  
production



The de facto  
standard  
trusted around  
the world




# ACKNOWLEDGEMENTS


**ALL REFEREES  
LBMA STAFF  
DR . STEWART MURRAY**

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 [lbma.org.uk](http://lbma.org.uk)

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