

Progress on the Application of UNFC – 2009 to Mineral Resources in Thailand



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Outline

- ❖ **Introduction to Department of Mineral Resources**
- ❖ **Progress on the application of UNFC**
- ❖ **Future Work plan 2013-2014**



DMR

Department of Mineral Resources

Who we are

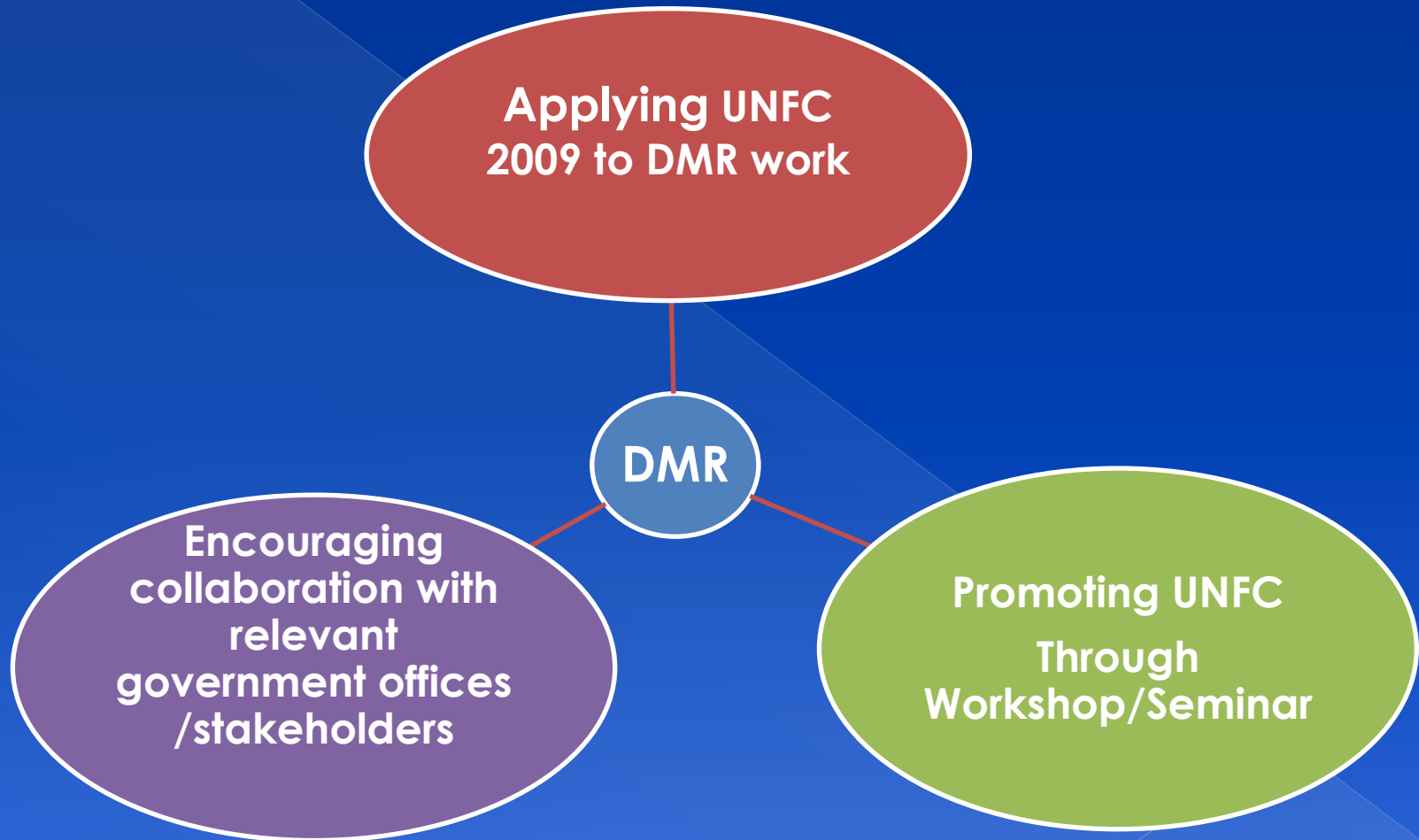
- As a government organization we are responsible for advising the Thai government on all aspects of geosciences as well as providing advice to the public

What we do

- Geological exploration, Environmental geology, Mineral resource information center



Progress on the application of UNFC to mineral resource in Thailand (DMR work environments)





The application of UNFC 2009 to DMR Mineral Exploration Project

Background : DMR Mineral Resources Classification





The application of UNFC 2009 to DMR Mineral Exploration Project

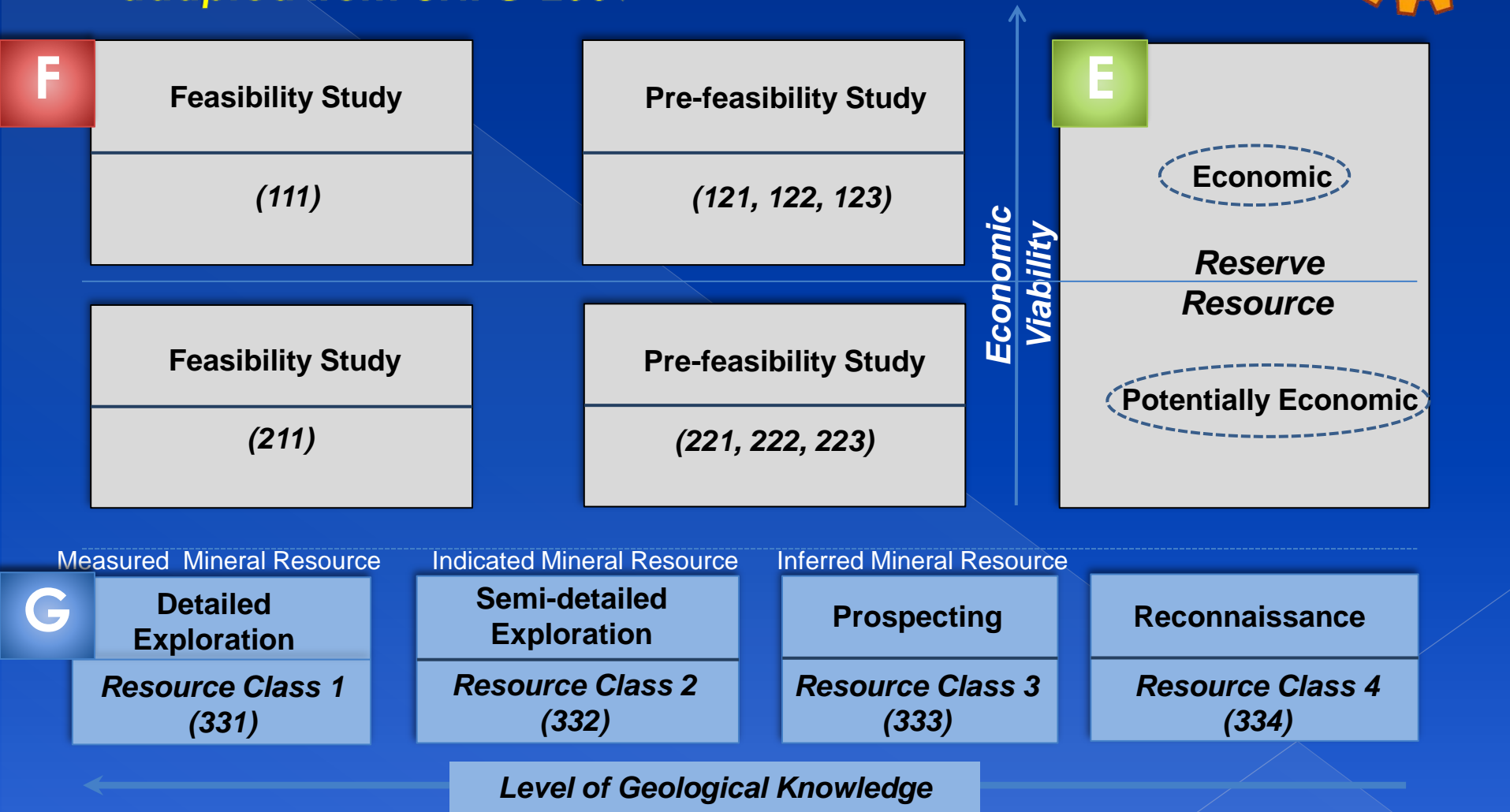
- ❑ Published the guidelines in Thai
(modified from UNFC-2009)
- To facilitate and ensure consistency



Current DMR's Mineral Resource

Classification:

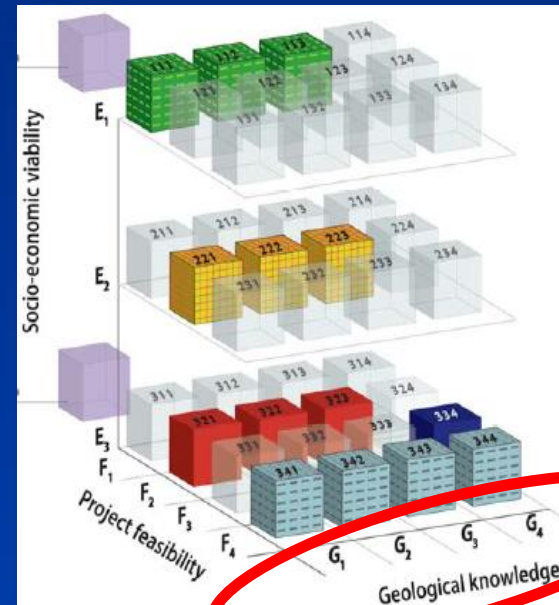
adapted from UNFC-2009



Increasing level of geological knowledge and confidence

Current DMR's Mineral Resource

Classification:
adapted from UNFC-2009



Measured
Mineral Resource

Indicated
Mineral Resource

Inferred
Mineral Resource

Reconnaissance
Mineral Resource

G

Detailed
Exploration

*Resource Class 1
(331)*

Semi-detailed
Exploration

*Resource Class 2
(332)*

Prospecting

*Resource Class 3
(333)*

Reconnaissance

*Resource Class 4
(334)*

Level of Geological Knowledge

Increasing level of geological knowledge and confidence

DMR work

Currently Exploration Projects (fiscal year 2013)

1. Regional mineral exploration

All potential mineral types

- Nakhonsrithamarat Province
- Surat-Thanee Province

2. Semi-detailed mineral exploration

Tin

- Phang-Nga Province

Rare Earth

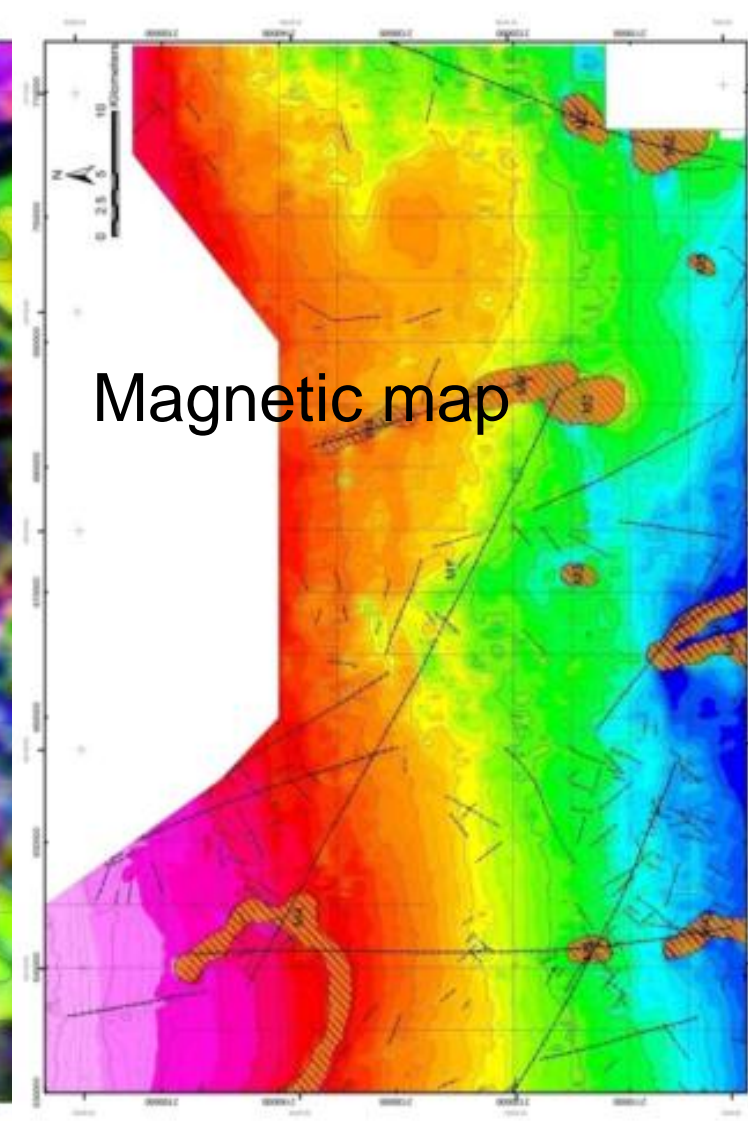
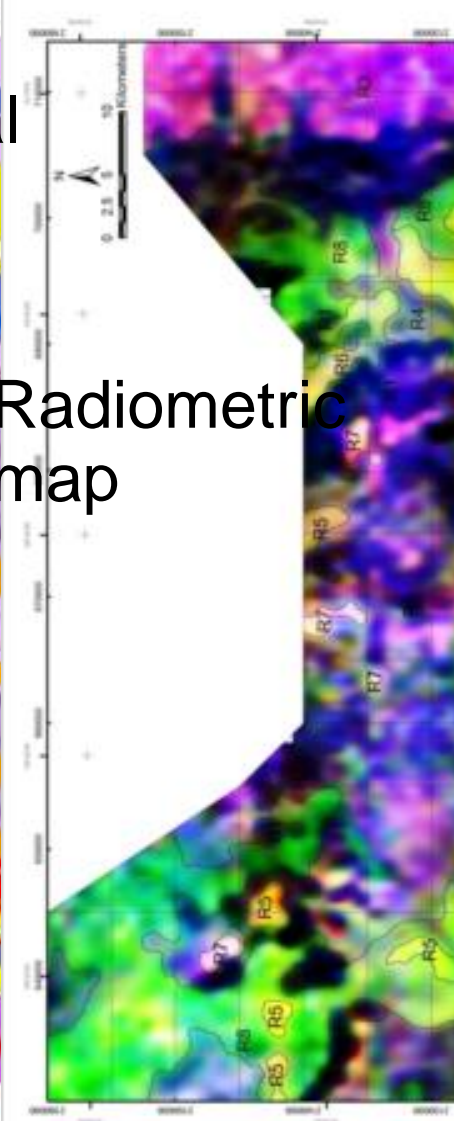
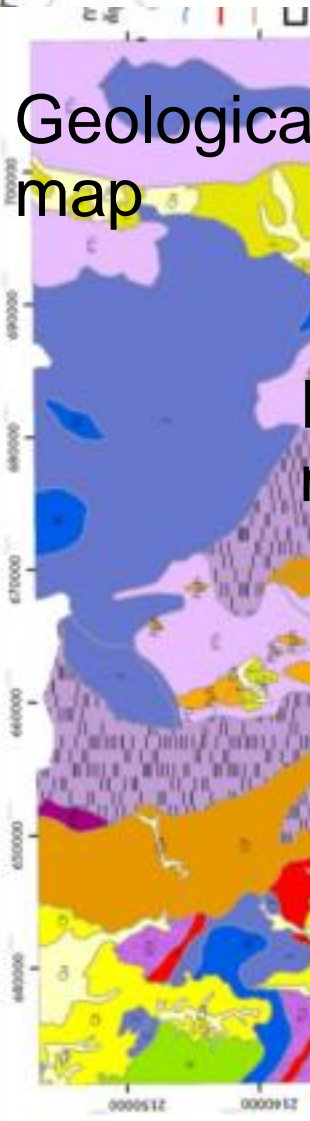
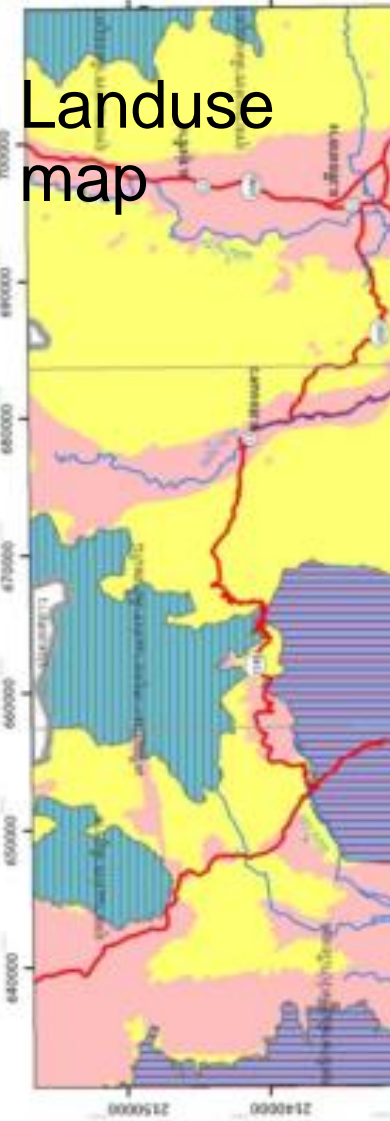
- Ranong Province

Quartz

- Kanchanaburi Province

Example of Regional Mineral Exploration

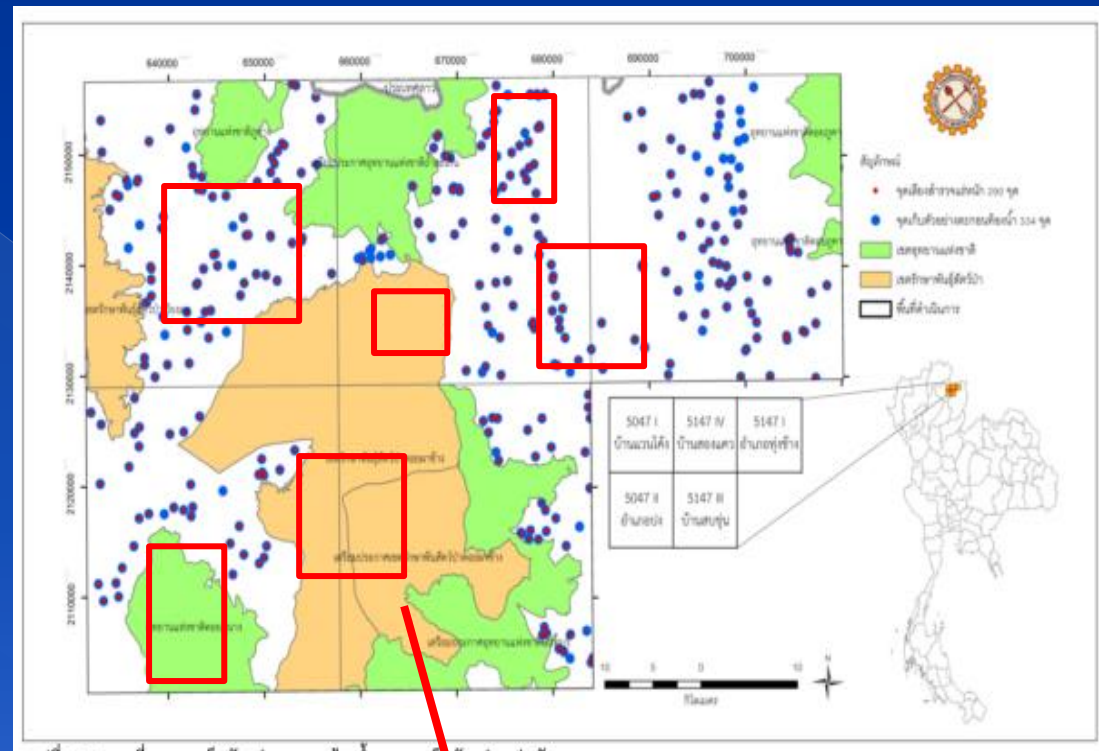
➤ Complied pre-existing geological information



Example of Regional Mineral Exploration

➤ Limited geological survey and sampling

Mineral potential area
G3

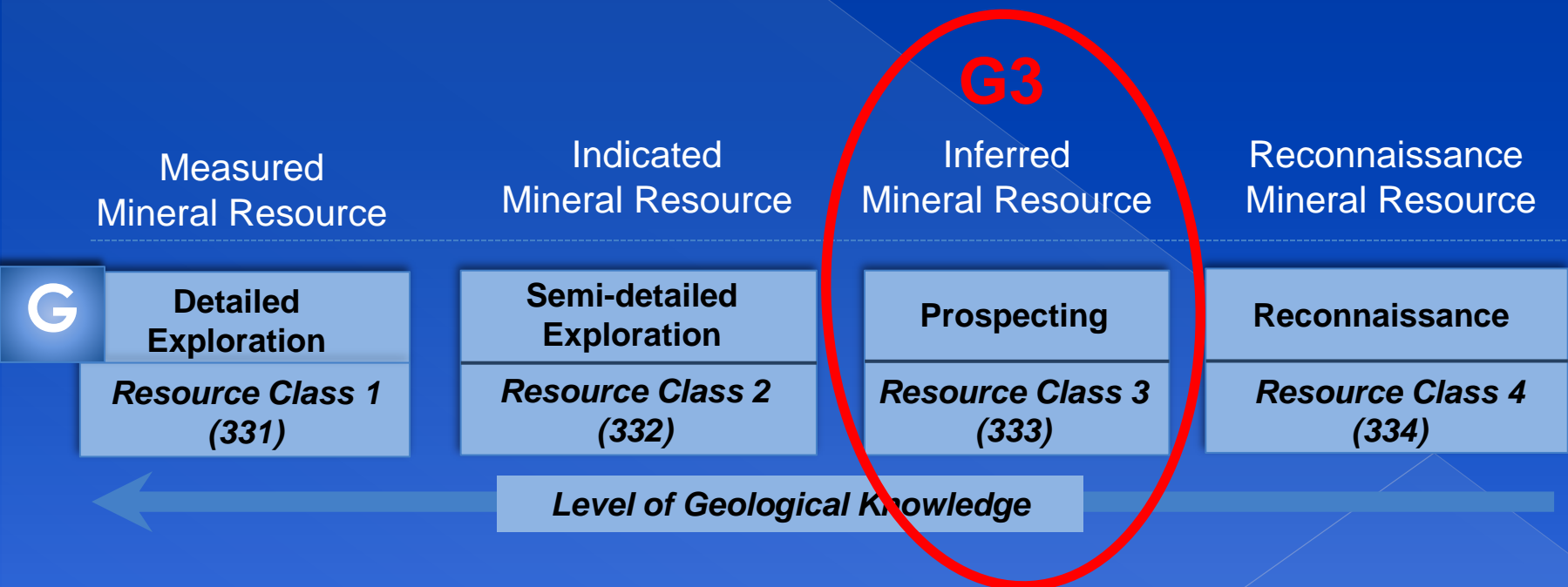


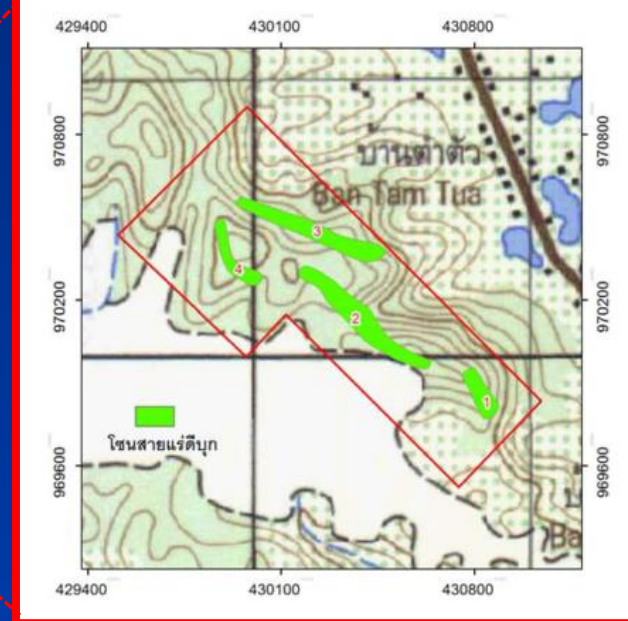
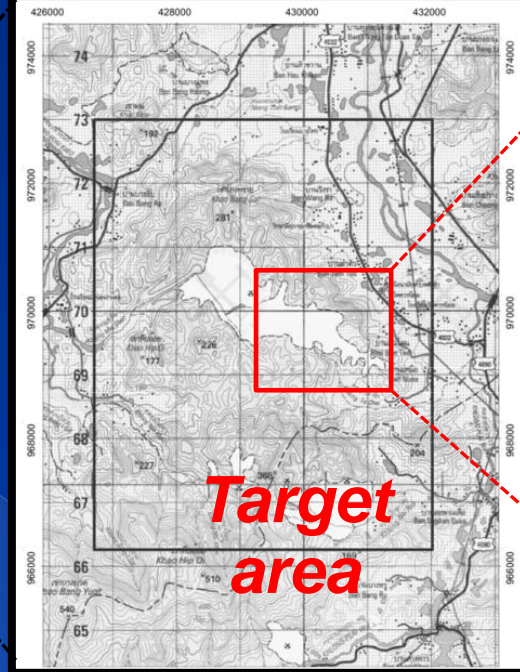
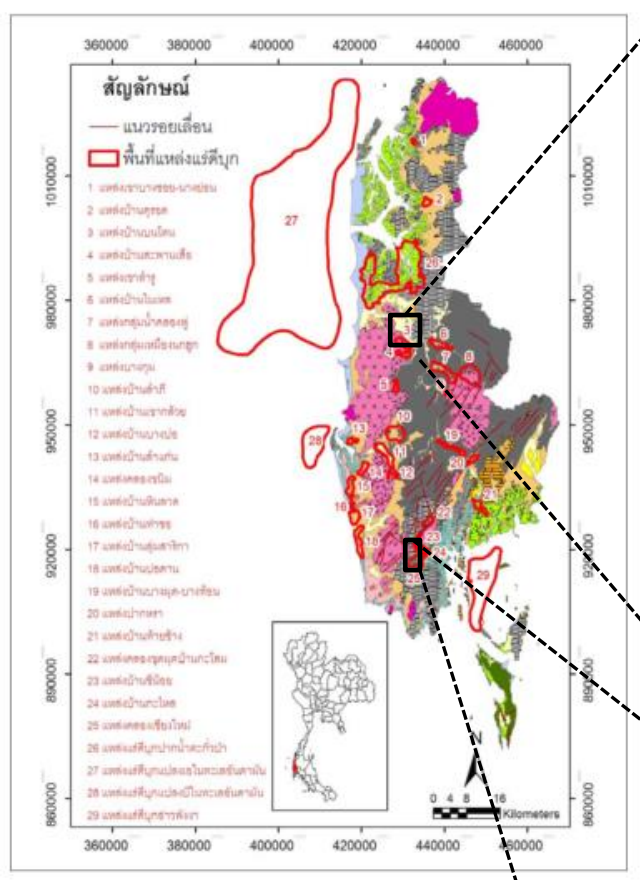
Mineral potential area

Example of Regional Mineral Exploration

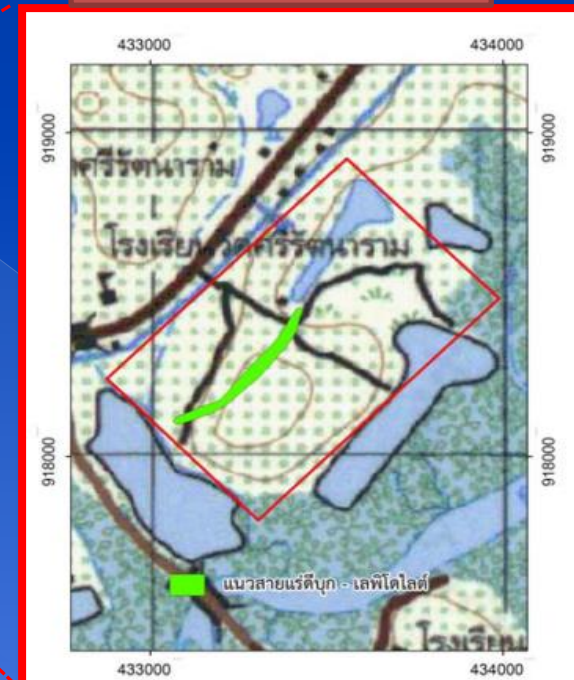
Exploration results :

➤ Geological evidence is sufficient to define **mineral potential area** but not verify grade or mineral quality





**Mineral deposits
Grade/Quality**



➤ **Semi-detailed investigation**

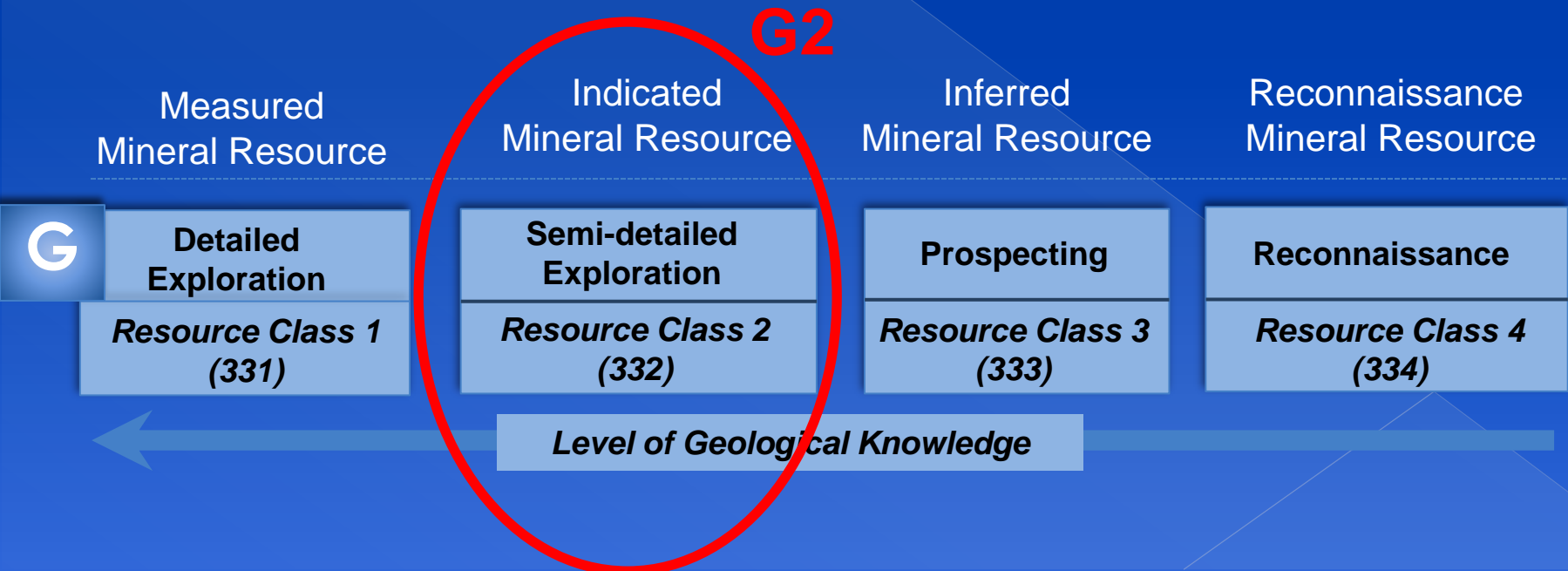
- Sampling/testing
- Geophysical survey
- Pitting
- Trenching

**Mineral resource
(grade/quality)
G2**

Example of semi-detailed exploration project

Exploration results :

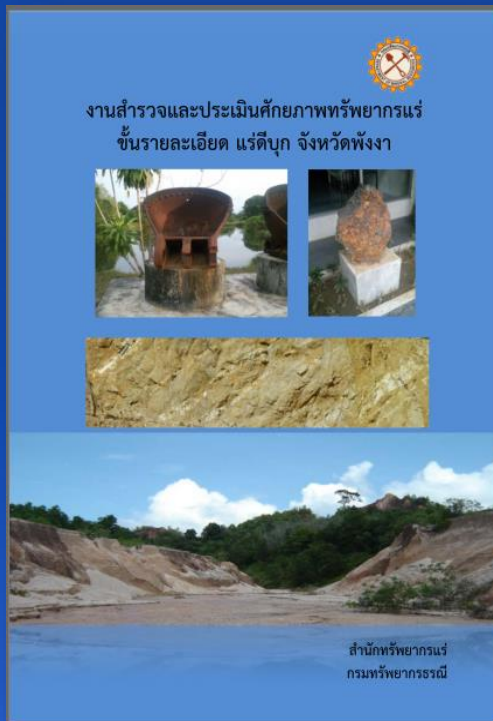
- Geological evidence is derived from detailed exploration and is sufficient to assume **mineral deposits with grade/quality**



The application of UNFC 2009 to DMR Mineral Exploration Project



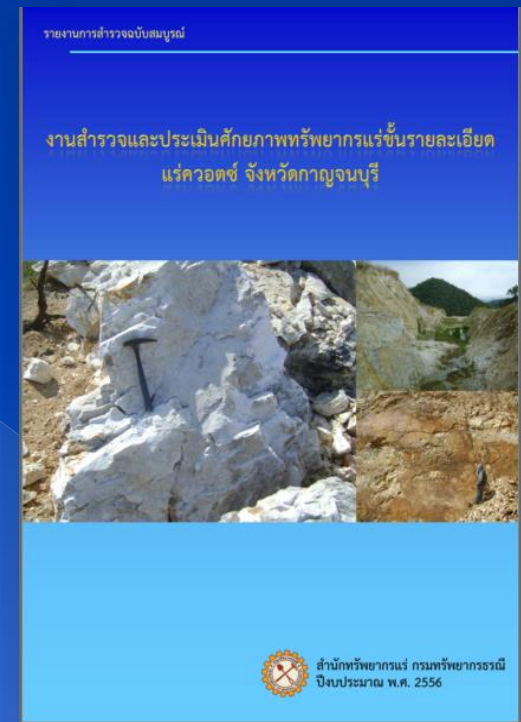
➤ Publishing reports providing exploration results and mineral classification based on UNFC system



Tin
E3-F3-G2

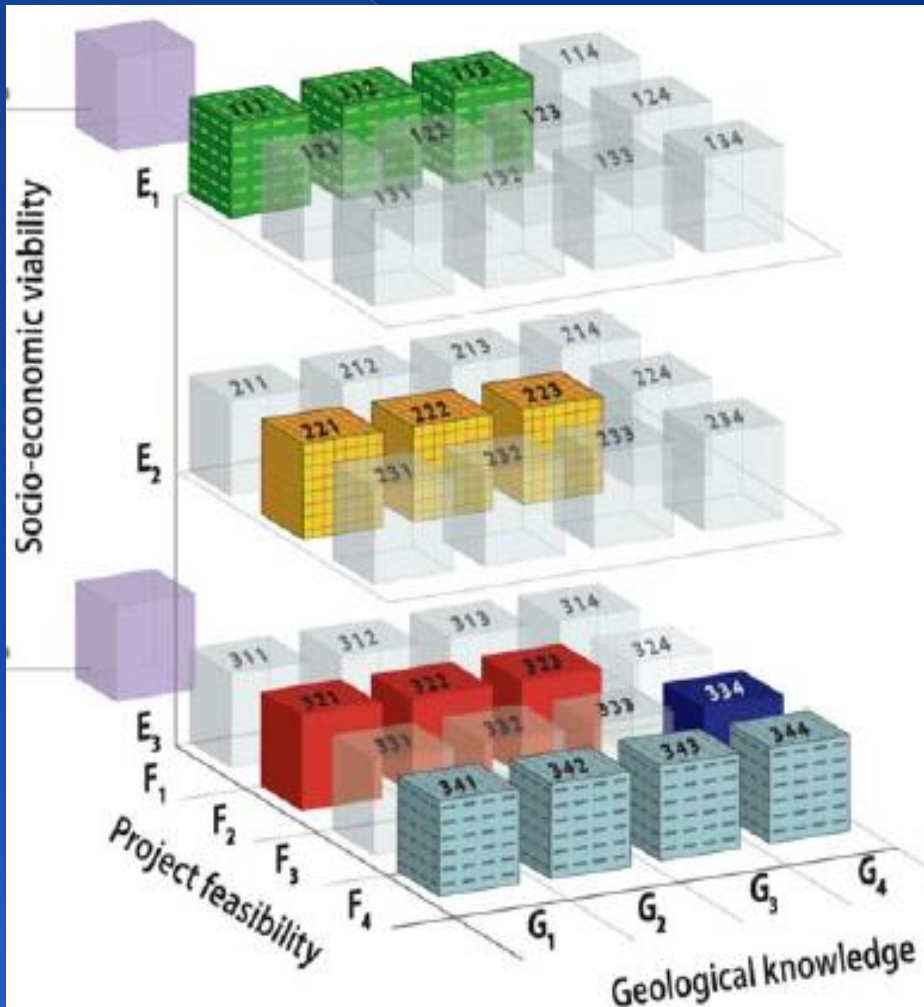


Rare Earth
E3-F3-G2



Quartz
E3-F3-G2

Encouraging collaboration with relevant government offices and stakeholders



E and F :

Collaboration with relevant government offices and stakeholders

- ❖ Department of Primary Industries and Mines (DPIM)
- ❖ Mining Industry Council
- ❖ Department of National Parks, Wildlife and Plant Conservation (DNP)
- ❖ Department of Environmental Quality Promotion (DEQP)
- ❖ Pollution Control Department (PCD)

G - Geological knowledge

DMR Exploration Results

Case study: Akara Gold Mining

Success
Commercial Project
E1-F1-G1



Geological setting

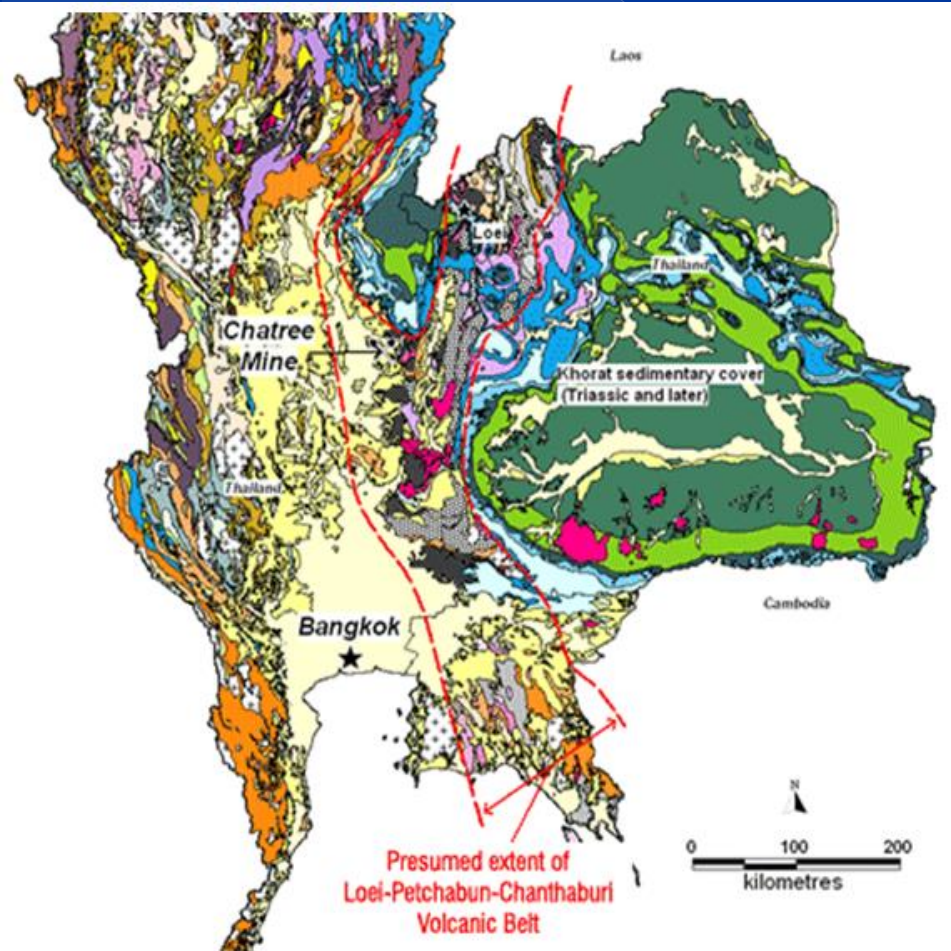
Located in central Thailand, 280km north of Bangkok

Associated with the Permo – Triassic Loei-Petchabun-Chanthaburi **volcanic belt**

Epithermal low sulfidation veins

Reserve estimates

81.7 million tons





Project feasibility - Open cut and using "Carbon in Leach" takes low-grade gold mineralized rock containing 1-2 g/ton

**Commercial Project
E1-F1-G1**



Case study: Tungkam Gold Mining

Geological setting -Sulfide ore zones
Reserve - 3.46 million tons (4.38 g/t gold)
Processing Plant- carbon-in-leach

Project on Hold
E2-F2-G1

E2-F2 : Project on hold due to local communities protest



Socio-economic viability (E)
→ most challenge



Promoting UNFC through Workshop/Seminar

- *28 - 30 May 2013 Co-organized seminar and excursions with DMR-DPIM-CCOP on Best Practices on Mining Thailand*
- *5-7 June 2013 Seminar on the modified UNFC 2009 to DMR's mineral exploration project Thailand*
- *19 March 2014 Training and Workshop on UNFC-2009 Thailand*
- *Participated UNFC workshop and Expert Group meeting Geneva*
 - *The 3rd Session, 2-4 May 2012*
 - *The 4th Session, 23-26 April 2013*
 - *The 5th Session, 29 April -2 May 2014*

To promote and introduce UNFC-2009

To discuss and share experiences on the application of UNFC 2009

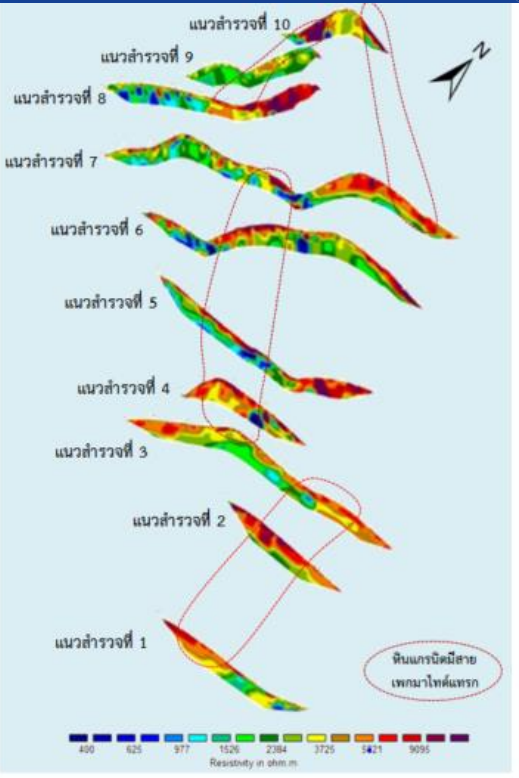
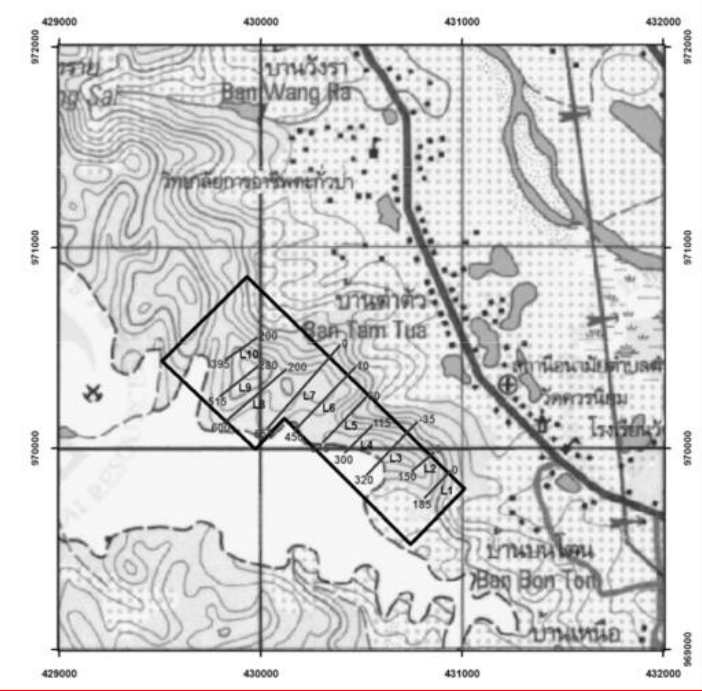


Future Work Plan 2013-2014

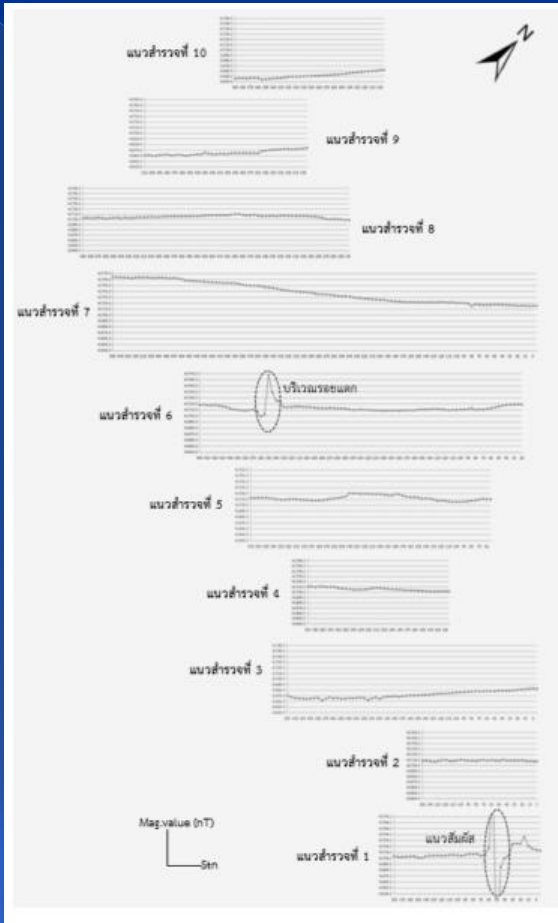
- **Applying the UNFC-2009 to DMR work**
- **Promoting UNFC through workshop/Seminars/
Publications**
- **Organizing a meeting with relevant government offices
and stakeholders**
- **Implement the mineral resource classification guidelines**
- **Translation of UNFC-2009 and the specifications in Thai**
- **Setting up a mechanism on the application of UNFC 2009
to mineral resources in Thailand**

Thank you for your attention

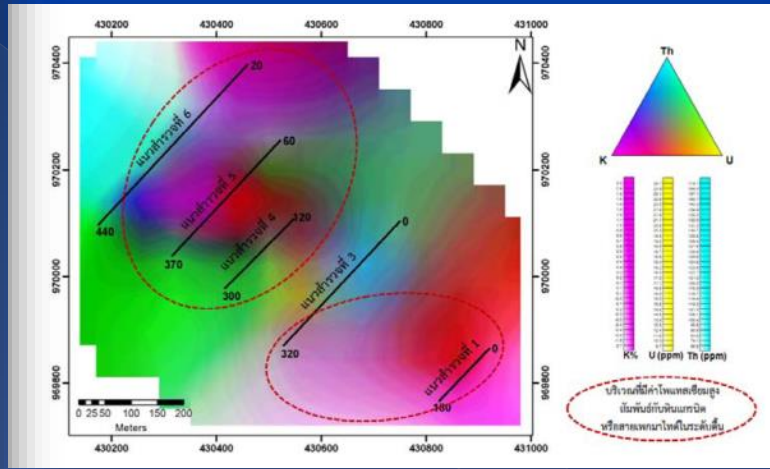
- semi-detailed investigation in target area
- geochemical survey (stream sediments sampling and panning)
- subsurface investigation (geophysical survey/pitting/trenching)



resistivity



Magnetic



Ground radiometric