

**NI-43-101 TECHNICAL REPORT ON  
EXPLORATION RESULTS AND POTENTIAL AT THE MINERAL PROPERTIES OF  
KOREAN METALS EXPLORATION PTY LIMITED, REPUBLIC OF KOREA (SOUTH  
KOREA)**

**commissioned by**

**KOREAN METALS EXPLORATION PTY LIMITED (KME)**

**issued by**

**KOREAN METALS EXPLORATION PTY LIMITED (KME)**

**Report delivered on 09 May 2017**

**Report prepared by L W DAVIS F.Aus.I.M.M CP Geo F.A.I.G.**

**of VERONICA WEBSTER PTY LIMITED  
A.C.N. 010 299 224  
7 O'Quinn Street, Nudgee Beach, Qld 4014**

## Table of Contents

Title Page.....	1
Table of Contents.....	i
List of Tables.....	vii
Table of Figures.....	vii
Table of Photographs .....	viii
1.0 EXECUTIVE SUMMARY.....	1
1.1: Exploration target and progress to date.....	2
1.3: Exploration data quality .....	3
1.4: Future exploration and budgets .....	3
1.5: Interpretation, Conclusions and Recommendations .....	4
2.0: INTRODUCTION AND TERMS OF REFERENCE .....	4
2.1: Sources of Information.....	5
2.2. Scope of the Report .....	5
3.0 RELIANCE ON OTHER EXPERTS.....	5
4.0 PROPERTY DESCRIPTION AND LOCATION .....	7
5.1    TENURE .....	9
4.1.1 Uiseong Mining Rights.....	9
4.1.1.1 Uiseong – Surface Rights.....	10
4.1.2 Haman – Mining Rights .....	10
4.1.2.1 Haman – Surface Rights.....	11
4.1.3 Miwon – Mining Rights .....	13
4.1.4 Goseong - Mining Rights.....	15
Land Register.....	15
Registered Number.....	15
Area (ha).....	15
Registrant / .....	15
Applicant .....	15
Minerals .....	15
Mine.....	15
Registration .....	15
Date .....	15
4.1.4.1 Goseong - Surface Rights .....	17
4.2 KOREAN MINING ACT – MINING RIGHTS .....	18
4.2.1 Mine Development Permit Process .....	19

4.2.2 Environmental Social Impact Assessment (ESIA) Process.....	20
4.2.3 Mine Closure Process.....	21
5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY.....	22
5.1 General access.....	22
5.2 Climate .....	23
6.0 DESCRIPTION OF PROJECTS.....	24
6.1 UISEONG POLYMETALLIC PROJECT .....	24
6.1.1: HISTORY OF MINING AND EXPLORATION.....	24
6.1.1.1 General.....	24
6.1.1.2 Uiseong Sub-Basin and Project area.....	25
Keumdong Chilbo and Goroseoksan Mines .....	26
Keumhak Mine.....	26
Jeonheung Mine .....	27
Kyungwha, Hwanghaksan and Cheonji Mines .....	27
Keumbong Mine .....	27
Ogsan Mine .....	27
Dongil-Gunwi Mine.....	28
Daesung Mine.....	28
Cheongsong and Dopyung Mines .....	28
6.1.2 HISTORICAL MINE PRODUCTION.....	29
6.1.2.1 HISTORICAL ESTIMATES AND REMNANTS.....	29
6.1.3 GEOLOGICAL SETTING - GEOLOGY OF THE GYEONGSANG BASIN.....	31
6.1.3.1 Structure .....	36
6.1.4 PROSPECT GEOLOGY - UISEONG SUB-BASIN .....	38
6.1.5 DEPOSIT TYPES.....	38
6.1.6 MINERALIZATION .....	39
6.1.7 EXPLORATION .....	41
Metal associations.....	41
Tenor and geochemistry .....	41
Exploration Targets.....	42
6.1.8 DRILLING .....	46
6.1.9 SAMPLING METHOD AND APPROACH - KME .....	46
6.1.9.1 Surveying .....	46
6.1.9.2 Sampling - General.....	46
6.1.9.3 Stream Sediment Samples.....	46

6.1.9.4 Rock Chip Samples .....	46
6.1.10 SAMPLE PREPARATION, ANALYSES AND SECURITY - KME .....	46
6.1.11 Sample Transportation and Security .....	47
13.2 Laboratories .....	47
13.3 Rock samples.....	47
6.1.11 DATA VERIFICATION.....	47
6.1.12 ADJACENT PROPERTIES .....	51
6.1.13 MINERAL PROCESSING AND METALLURGICAL TESTING.....	51
6.1.14 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES.....	51
6.2 HAMAN POLYMETALLIC PROJECT .....	52
6.2.1: HISTORY OF MINING AND EXPLORATION.....	52
Gunbuk and Jaeilgunbuk Mine Areas .....	54
Ogok.....	55
Gilgok and Dundok.....	55
Namgok-Kitadani.....	55
Haman and Ebisu.....	56
Okbang.....	56
6.2.2 HISTORICAL MINE PRODUCTION.....	56
6.2.2.1 HISTORICAL ESTIMATES - REMNANTS.....	57
6.2.3 GEOLOGICAL SETTING - GEOLOGY OF THE GYEONGSANG BASIN .....	57
6.2.4 PROSPECT GEOLOGY – HAMAN PROJECT .....	57
6.2.5 DEPOSIT TYPES.....	61
6.2.6 MINERALIZATION .....	61
6.2.7 EXPLORATION .....	62
Gunbuk - Obong .....	64
Ogok.....	67
Jaeilgunbuk .....	71
Chaedung .....	73
Taewha .....	73
Dundok – Gilgok .....	73
Bukgok – Namgok - Kitadani .....	74
Haman (Manse and Ebisu).....	74
Daesong and Yonnok .....	74
Okbang.....	75
6.2.8 DRILLING .....	76

6.2.9 SAMPLING METHOD AND APPROACH - KME .....	76
6.2.9.1. Surveying .....	76
6.2.9.2. Sampling - General.....	76
6.2.9.3. Stream Sediment Samples.....	76
6.2.9.4. Rock Chip Samples .....	76
6.2.10 SAMPLE PREPARATION, ANALYSES AND SECURITY - KME .....	76
6.2.10.1 Sample Transportation and Security .....	76
6.2.10.2. Laboratories.....	76
6.2.10.3. Rock samples.....	76
6.2.10.4. Stream sediment samples.....	76
6.2.11 DATA VERIFICATION.....	77
6.2.12 ADJACENT PROPERTIES .....	81
6.2.13 MINERAL PROCESSING AND METALLURGICAL TESTING.....	81
6.2.14 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES.....	81
6.3 MIWON V-U-MO PROJECT .....	82
6.3.1: HISTORY OF MINING AND EXPLORATION.....	82
6.3.2 HISTORICAL MINE PRODUCTION AND EXPLORATION.....	83
6.3.2.1 HISTORICAL ESTIMATES.....	83
6.3.3 GEOLOGICAL SETTING - GEOLOGY OF THE OGCHON BELT.....	83
6.3.4 PROSPECT GEOLOGY – MIWON.....	85
6.3.5 DEPOSIT TYPES.....	88
6.3.6 MINERALIZATION .....	88
6.3.7 EXPLORATION .....	89
6.3.8 DRILLING .....	90
6.3.9 SAMPLING METHOD AND APPROACH - KME .....	90
6.3.9.1. Surveying .....	90
6.3.9.2. Sampling - General.....	90
6.3.9.3. Stream Sediment Samples.....	90
6.3.9.4. Rock Chip Samples .....	90
6.3.10 SAMPLE PREPARATION, ANALYSES AND SECURITY - KME .....	90
6.3.10.1 Sample Transportation and Security .....	90
6.3.10.2. Laboratories.....	90
6.3.10.3. Rock samples.....	90
6.3.10.4. Stream sediment samples.....	90
6.3.11 DATA VERIFICATION.....	91
6.3.12 ADJACENT PROPERTIES .....	91

6.3.13 MINERAL PROCESSING AND METALLURGICAL TESTING.....	91
6.3.14 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES.....	92
6.4 GOSEONG POLYMETALLIC PROJECT .....	93
6.4.1: HISTORY OF MINING AND EXPLORATION.....	93
Mining Activities.....	93
Goseong Group .....	94
Sambong Group .....	95
Jinheung Group .....	96
Samsan-Jaeil Group.....	97
Smelting and Refining .....	98
Modern Exploration .....	98
6.4.2 HISTORICAL MINE PRODUCTION AND EXPLORATION.....	98
YEAR.....	99
MINES.....	99
Tonnes .....	99
Ore (t).....	99
Grade .....	99
Cu (%).....	99
Grade .....	99
Au (g/t) .....	99
Grade .....	99
Ag (g/t) .....	99
Metal.....	99
Cu (t) .....	99
Metal.....	99
Au (oz).....	99
Metal.....	99
Ag (oz).....	99
6.4.2.1 HISTORICAL ESTIMATES.....	100
MINE .....	100
TONNES.....	100
(t).....	100
GRADE Cu .....	100
(%).....	100
GRADE Au .....	100
(g/t) .....	100
GRADE Ag .....	100

(g/t) .....	100
REFERENCES .....	100
6.4.3 GEOLOGICAL SETTING - GEOLOGY OF THE GYEONGSANG BASIN .....	101
6.4.4 PROSPECT GEOLOGY – GOSEONG.....	101
6.4.5 DEPOSIT TYPES.....	104
6.4.6 MINERALIZATION .....	104
Mineralization and Paragenesis.....	106
6.4.7 EXPLORATION .....	108
6.4.8 DRILLING .....	112
6.4.9 SAMPLING METHOD AND APPROACH - KME .....	112
6.4.9.1. Surveying .....	112
6.4.9.2. Sampling - General.....	112
6.4.9.3. Stream Sediment Samples.....	112
6.4.9.4. Rock Chip Samples .....	112
6.3.10 SAMPLE PREPARATION, ANALYSES AND SECURITY - KME .....	112
6.4.10.1 Sample Transportation and Security .....	112
6.4.10.2. Laboratories.....	112
6.4.10.3. Rock samples.....	112
6.4.10.4. Stream sediment samples.....	113
6.4.11 DATA VERIFICATION.....	113
6.4.12 ADJACENT PROPERTIES .....	113
6.4.13 MINERAL PROCESSING AND METALLURGICAL TESTING.....	113
6.4.14 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES.....	113
7.0 OTHER RELEVANT DATA AND INFORMATION .....	114
7.1. Company Management and Technical Expertise.....	114
8.0 INTERPRETATION AND CONCLUSIONS .....	115
8.1 Company Strategies and Plans.....	116
9.0 RECOMMENDATIONS .....	118
9.1. Future Exploration Programs and Budgets .....	118
10.0 SOURCES OF INFORMATION AND FORMAL REFERENCES.....	119
10.1 General published (and unpublished public domain) references.....	119
_____, 2003. Iron oxide-copper-gold deposits: an Andean view, <i>Mineralium Deposita</i> , 38, 7, 787-812.....	119
10.2 Internal KME Reports .....	120
10.3 Selected Historical Reports and Journal papers .....	120
10.3.1 Uiseong Project .....	120
10.3.2 Haman Project.....	121

10.3.3 Miwon Project .....	123
10.3.4 Goseong Project.....	124
11.0 CERTIFICATION OF AUTHOR - DATE AND SIGNATURE .....	129
12.0. ILLUSTRATIONS AND TABLES - GLOSSARY.....	131
12.1 Glossary of Technical Terms.....	131

## List of Tables

Table 1a. Tenement Schedule Shin Han Mine Inc - Granted Mining Rights. ....	9
Table 1b. Tenement Schedule Shin Han Mine - Applications for Mining Rights.....	9
Table 2. Tenement Schedule - Granted Mining Rights – Haman Project.....	11
Table 3. Tenement Schedule - Granted Mining Rights - Miwon Project.....	13
Table 4. Tenement Schedule - Mining Rights.....	15
Table 5. Stratigraphic Column of the Gyeongsang Basin (After Sennitt, 2010 and modified after Chang, 1988 and KIGAM, 2001). ....	34
Table 6. Drill intersections - Dongil-Gunwi Mine .....	42
Table 7a. Gunbuk - Drill intersections - Main (West) Vein. ....	66
Table 7b. Gunbuk - Drill intersections – Daesin (East) Vein. ....	66
Table 8. Drill intersections - Ogok Vein. ....	69
Table 9. Historical Mine Production of the Goseong Mining District.....	99
Table 10. Historical Mineral Resources of the Goseong Mining District.....	100

## Table of Figures

Figure 1. Location Map of Korean Metals Exploration Pty Limited Projects: Base Metal Refineries are highlighted in red and a Cobalt Refinery in blue. ....	8
Figure 2. Tenure and Topographic Map of the Uiseong Project area, illustrating the Mining Rights held and applied for by Shin Han Mine Inc. or under 1-Year Moratorium. The location of the major vein structures are shown in red and the historical workings are labelled. ....	10
Figure 3. Tenure and Topographic Map of the Haman Project area, illustrating the Mining Rights granted to Shin Han Mine Inc. The location of the major vein structures are shown in red and the historical workings are labelled.....	12
Figure 4. Tenure and Topographic Map of the Miwon Project area, illustrating the Mining Rights granted to Shin Han Mine Inc.....	14
Figure 5. County Location Map of the Goseong District. The applications and granted Mining Rights are indicated by the green squares. The town of Goseong is an ideal base for field operations. The location of the major vein structures (identified in red) and the historical mine workings are highlighted. Mineral occurrences are denoted by dot colours: Au = gold, Cu = green, Pb-Zn = blue .....	16
Figure 6. Flow Diagram of the Mining Right Reporting Process. ....	20
Figure 7. Mineral Occurrence Map of the Uiseong Metallogenic Province (After Koh et al, 2003). The numbers correspond to individual deposits referred to in the text above. ....	26
Figure 8. Tectonic Elements Map of South Korea. The Uiseong, Miwon Goseong and Haman projects are shown together with major structures. ....	32
Figure 9. Regional Geology of the Gyeongsang Basin. Refer to Stratigraphic Column for legend' Table 5. ....	33
Figure 10. Tectonic Architecture Map of the Gyeongsang Basin showing intrusive structures possibly associated with mineralization. The various sub basin depositional-centres (light	

blue highlight), collapse calderas/cauldrons (pink highlight), diatreme complexes (yellow highlight) and intrusive centres (red circles) are indicated, together with lineaments and circular ring fractures.....	37
Figure 11. Geology – Uiseong Gold-Silver-Copper-Lead-Zinc Project.....	38
Figure 12. Dongil-Gunwi deposit drill plan showing KMPC drill intersections - plotted by Senlac.....	44
Figure 13. Geological map of the Dongil-Gunwi Mine area. The interpreted geomorphological features of the area are highlighted, including the rhyodacite sill, porphyry and lava dome intrusions and associated maar-diatreme complex infilled with moat sediments and pyroclastics. ....	45
Figure 14. Residual Magnetic Intensity Map of Haman Project. The prominent intense “bullseye” magnetic anomaly of >450 nT is indicated and outlined in red with the two intense magnetic low anomalies of <450 nT outlined in blue. ....	53
Figure 15. Simplified Regional Geology Map of the Haman district. Refer to Stratigraphic Column in 6.1.3 for legend. ....	59
Figure 16. Geological Map of the Haman Project area. Mineral deposits are indicated as follows: Cu = green dots, Au = orange dots, Pb-Zn = light blue dots and Mo = dark blue dots. The vein structures are highlighted in red-yellow. The main fault structures and circular features derived from LANDSAT-7TM imagery are indicated. ....	60
Figure 17. Compilation Map of Exploration Targets, Haman Project. Intense “bullseye” magnetic anomalies are outlined in red; Intense magnetic low anomalies are outlined in blue. ....	63
Figure 18. Longitudinal Section (Looking West) of the Main Vein at the Gunbuk Mine (KMPC, 1968). The section shows the extracted portions of the Main Vein from the Upper Level (128 m asl) worked down to the 6 <sup>th</sup> Level (-68 m asl). ....	65
Figure 19. Surface Projection of Drill Intersections of the Main Vein (West Vein) and the Daesin Vein (East Vein) at the Gunbuk Mine with KMPC intersections, plotted by Senlac. .	67
Figure 20. Partial extract from the underground sampling and geological map of the Ogok Mine workings (after KMPC, 1968). Grid line spacing is 100 m. ....	68
Figure 21. Surface Projection of Drill Intersections of the Ogok Mine with KMPC intersections, plotted by Senlac.....	70
Figure 22. Partial extract from the underground sampling and geological map of the Jaeilgunbuk Mine workings (after KMPC, 1968). Grid line spacing is 100 m. ....	72
Figure 23. Geological Map of the Miwon Project .....	87
Figure 24. Longitudinal Section of the stoped out portions of the No 1 Vein at the Sambong mine (So et al, 1985). The silver grade zonation is shown as contours, along with defined ore types based on Cu and Pb-Zn content. ....	96
Figure 25. Geological Map of the Goseong project area (after Chang et al, 1983. Cungmu 1:50,000 scale Geological Map sheet). The mapped vein structures are highlighted by red-yellow lines and the various mine workings are indicated.....	103
Figure 26. Vein Distribution Map of the Goseong mining district. The veins are identified by red and yellow lines. The veins have been grouped into clusters referred to in this report based on proximity and overall tenor, as outlined in pink. The dip orientation of vein structures is indicated in black when known. ....	105
Figure 27. Exploration Target Compilation Map of the Goseong mining district. The mapped vein structures are indicated as red-yellow lines. The fault-fracture patterns recognized from satellite imagery are indicated by grey lines. Exploration Targets are labelled T1 – T4. ....	111

## Table of Photographs

Photograph 1 View looking west of moderately-dipping, intensely altered and mineralized volcano-lithic sandstones and siltstones outcropping at the southern part of the Dongil-Gunwi Mine. The limonite-hematite oxidised iron staining is replacing disseminated and fracture-filling sulphides. ....	48
---	----

Photograph 2. Cut slab of hornfelsed siltstone with disseminated and very thin discontinuous fracture-filling base metal sulphide veinlets, collected from the northern part of the Dongil-Gunwi Mine. Sample No 242716; 27g/t Ag, 905ppm Cu, 1.59% Pb, 1.13% Zn, 0.45% As, 13 ppm Bi, 44ppm Sb and 6.08% Fe as pyrrhotite. ....	49
Photograph 3. Cut slab of mineralized hydrothermal breccia from the southern part of the Dongil-Gunwi Mine. Note the clasts of bedded massive sulphide (pyrrhotite-pyrite-chalcoprite), sediments and quartz-carbonate veining, cemented in a finer matrix of rock flour, sulphides (pyrite, chalcoprite) and comb quartz, clearly indicating multiple episodic phases of mineralization. ....	49
Photograph 4. Cut slab of breccia-veinlet stockwork in volcano-lithic sandstone from the southern part of the Dongil-Gunwi Mine. The sandstones contain abundant disseminated early stage ruby brown grains of sphalerite. The core of the breccia veins consist of pyrrhotite and chalcoprite, with margin rims of the veins composed of galena and lesser black sphalerite (iron-rich species marmatite). Some of the chalcoprite is being replaced by covellite-bornite. The orange coloration is an oxidation and feldspar alteration halo developed around the vein breccia composed of adularia. The observed mineralogy and alteration effects are consistent with reducing-oxidation interface conditions in a complex fluid mixing environment. ....	50
Photograph 5. Malachite stained fractures, and sulphide and quartz veinlets hosted within intensely hydro-fractured/micro-faulted, tremolite-magnetite altered hornfelsed fine-grained sediments of the Haman Formation, collected from the Gunbuk Mine dump. Sample 243403: 235ppm Co, 1.10% Cu, 230ppm As and 5.72% Fe. ....	77
Photograph 6. Outcrops of extensively magnetite-argillic altered, highly fractured tonalite, exposed along the 4WD access road in the vicinity of the Oguk Mine. ....	78
Photograph 7. Outcrops of limonite stained, silica-pyrite altered/hornfelsed siltstones of the Chindong Formation, with quartz veinlet stockworks, exposed along the 4WD logging track at Bukgok. Sample 243360; 0.27g/t Au, 7g/t Ag, 0.38% Cu, 74ppm Mo ....	79
Photograph 8. Cut slab of Stage IIb Breccia overprinting Stage IIa Main ore, collected from the Haman Mine dump. Sample 243319: 1.99g/t Au, 9g/t Ag, 294ppm Co, 1.10% Cu, 508ppm As, 186ppm Bi, 71ppm Mo and 7.52% Fe. ....	80

## 1.0 EXECUTIVE SUMMARY

Korean Metals Exploration Pty Limited commissioned Veronica Webster Pty Limited to provide a National Instrument 43-101 (“NI-43-101”) Report for the mineral properties the company controls in South Korea. Mr L W Davis who is a duly authorised representative and director of Veronica Webster Pty Limited prepared the NI-43-101 Report (“Report”); he was assisted by Mr R Dawney who is an authorised representative of VWPL. VWPL has not engaged any other services, but has discussed certain aspects of mining narrow vein systems, both by open pit and underground methods with experienced mining engineer associates.

This NI-43-101 Report is principally concerned with exploration to generate Exploration Targets at abandoned mines that are compliant with recent JORC Code and NI-43-101 guidelines. Ideally, Korean Metals Exploration Pty Limited would aspire to proceeding quickly to the mining stage because the historical drilling contains numerous favourable intersections at these mines.

Korean Metals Exploration Pty Limited holds the following projects through its wholly-owned subsidiary Shin Han Mine Inc:

1. Uiseong Polymetallic (Au-Ag-Cu-Pb-Zn) Project. Two granted Mining Rights held jointly with Se Woo Mining Co. Limited plus 20 applications with no competitor held by Shin Han Mine Inc.
2. Haman Polymetallic (Cu-Co-Au-Ag) Project. Eleven granted Mining Rights held by Shin Han Mine Inc.
3. Miwon Sedimentary (V-U-Mo) Project. Four granted Mining Rights held by Shin Han Mine Inc.
4. Goseong Polymetallic (Cu-Au-Ag±Pb-Zn-Co) Project. Three applications held by Shin Han Mines Inc.

The project areas are all within a few hours’ drive from Seoul.

At the Uiseong, Haman and Goseong projects polymetallic epithermal and mesothermal quartz veins are hosted in Cretaceous age sediments and volcanics of the Gyeongsang Basin.

The Uiseong district produced polymetallic concentrates between 1966 and 1988, mainly from the Dongil, Goroseoksan and Jeonheung mines.

The Haman district includes Goseong and was the principal copper and cobalt producing region of South Korea up until the end of World War II and resumed again during the 1970s and 1980s. KME considers the area to be prospective for magmatic-hydrothermal breccia-hosted iron oxide copper gold deposits, associated with a tonalite intrusion into sediments containing evaporites.

The Miwon sedimentary Vanadium-Uranium-Molybdenum Project is located in the Cambrian age Ogchon Basin, within graphitic schist horizons of the Guryongsan Slate unit.

The Korean Mining Promotion Corporation during the 1970s and the Korean Institute of Energy and Resources during the 1980s carried out extensive exploration and drilling. These historical investigations of the mines and deposits in the Uiseong, Haman and Miwon projects provide a useful database for target generation. In the 1970s gold was not a sought-after commodity; more commonly gold mines were closing globally. As a consequence, the Korean organisations analysed their samples primarily for Cu, Pb and Zn whilst Au and Ag were analysed to a lesser extent.

VWPL concludes that the historical drill results do not accurately reflect the gold and silver content of the deposits because of selective sampling and assaying practices and low core recovery which might be expected with the small diameter core that was used exclusively. Gold-silver mineralization not associated with visually strong veins and base metal minerals may have been missed entirely.

### 1.1: Exploration target and progress to date

Korean Metals Exploration Pty Limited's primary exploration targets are the Dongil-Gunwi Au-Ag-Cu-(Pb-Zn) deposit within the Uiseong Project area and the Gunbuk and Ogok Au-Ag-Cu-(Co) deposits within the Haman Project area.

Mineralization at Dongil consists of epithermal quartz vein stockworks hosted within a rhyodacite lava dome and volcanoclastic sediments. Nearby, at the Keumdong Chilbo, Goroseoksan, Ogsan, Kyungwha, Keumhak and Jeonheung mines, historical drill intersections of Au-Cu-Ag-Zn-Pb require follow-up investigation to evaluate their potential as satellite deposits.

Within the Haman Project, high-grade Cu-Ag-Au mineralization occurs at the Gunbuk and Oguk mines hosted in hornfelsed siltstones and tonalite intrusion. The nearby mineralization and alteration at the Manse-Dundok-Gilgok workings, the Bukguk-Namgok-Taehwa workings, and the Jaeilgunbuk Mine require investigation for both high-grade veins and bulk, low-grade gold-copper-silver zones, where sheeted vein systems and stockworks have been recorded. Cobalt concentrates were produced from the Yonnok and Gunbuk mines during World War II, is anomalous in stream sediments and is noted in rock chip sampling and maps of the underground workings at Oguk, and Jaeilgunbuk. Consequently cobalt provides another appealing target.

On the Miwon Project, historical inferred resources have been estimated at the Miwon (Isikri) and Guimanri (Yongyuri) deposits of vanadium and uranium:

- At the Guimanri (Yongyuri) deposit, a historical inferred resource of 1,602,000 t grading 0.20% V<sub>2</sub>O<sub>5</sub> and 0.05% U<sub>3</sub>O<sub>8</sub> for 7.05 million lb of contained vanadium and 1.76 million lb of contained uranium (KIER, 1986).
- At the Miwon (Isikri-Jukeumri) deposit – an inferred resource of 1,670,000 t grading 0.50% V<sub>2</sub>O<sub>5</sub> and 0.034% U<sub>3</sub>O<sub>8</sub> for 18.37 million lb of vanadium and 1.25 million lb of uranium (KIER, 1986).

No suitable Competent Person has examined the resource estimates to classify them in accordance with the JORC Code and NI-43-101 requirements.

At the Goseong Project, exploration targets have been identified at the Jinheung mine, Samjeon mine, Samsan-Seongji mines, and the Daedun mine, where Cu-Au-Ag

mineralization is hosted in sheeted veins, horsetail splays, breccias and stockworks. Cobalt was never assayed but was identified in ore studies.

### 1.3: Exploration data quality

Korean Metals Exploration Pty Limited's exploration activities of literature research, data compilation, survey and sample collection, data recording, sample preparation, analyses and security are of an acceptable industry standard.

### 1.4: Future exploration and budgets

Korean Metals Exploration Pty Limited intends to focus its exploration strategy to advance its priority projects into commercial production as rapidly as possible. The company has formulated an exploration program with the following sequential project ranking and priorities:

1. Dongil-Gunwi Au-Ag-Cu-Pb-Zn Mine (Uiseong Project)
2. Gunbuk and Ogok Au-Ag-Cu-Co mines (Haman Project)
3. Haman Au-Ag-Cu-Co and Cu-Co deposits
4. Goseong Cu-Au-Ag±Pb-Zn-Co Project
5. Miwon V-U-Mo Project

At each mine or project resource definition drilling, metallurgical testwork and preliminary economic assessment will be followed by scoping and feasibility studies.

KME has allocated approximately US\$5 million budget for the first year of operations to be followed by approximately US\$5 million in the second year. Activities include 5400 m of drilling at Haman, 2700 m at Goseong and 18,000 m at Dongil, and a feasibility study at the Dongil Mine, Uiseong Project. The company has formulated an exploration program with sequential priorities as outlined in the company strategies.

The initial goal is to have JORC compliant Indicated and Inferred Resource estimates on the Dongil -Gunwi project by the end of the first year. Metallurgical testwork will have commenced.

In the second year, the goal is to have completed metallurgical testwork and a bankable feasibility study on the Dongil-Gunwi Mine. Measured and Indicated Resource/reserve estimates will be completed by end of year. Social and Environmental "baseline studies" will be completed over a 12-month period, taking into account the four climate seasons.

Exploration will proceed at the Goseong Project once the mining right applications are granted.

At the Miwon V-U-Mo Project the company will evaluate the vanadium and uranium markets prior to re-assessing the historical resources.

KME desires to raise and apply funds as follows:

Allocation of Funds (over 2 years)		
Feasibility – Dongil	4,097,800	27%
Exploration - Dongil - Uiseong	2,209,850	15%
Exploration – Haman	1,816,800	12%

Korean Metals Exploration Pty Limited  
NI 43-101 Report.

VWPL May 2017

Exploration – Goseong	1,268,000	8%
Contingency	1,886,500	13%
Fees of the offer	500,000	2%
Business development, transaction expenses	630,000	4%
Overheads	2,758,400	9%
Total	15,000,000	100%

## 1.5: Interpretation, Conclusions and Recommendations

It is the opinion of the author that the favourable geological setting and results of the work done to date show that the Korean Metals Exploration Pty Limited tenements have the potential to host economically feasible precious and base metal mineral deposits. The program and budget outlined in this Report is considered appropriate.

## 2.0: INTRODUCTION AND TERMS OF REFERENCE

Korean Metals Exploration Pty Limited (“KME”) commissioned Veronica Webster Pty. Limited (“VWPL”) to provide a National Instrument 43-101 compliant Report (“NI-43-101”) (Report) for the mineral properties of KME situated in the Republic of Korea (South Korea). KME is a privately-owned Australian company with a 100%-owned Korean subsidiary Shin Han Mine Inc. (“Shin Han”). The sole Director of KME is Mr Christopher M. Sennitt, a consulting geologist with 35 years’ mineral exploration experience throughout Australia, Asia and Korea. Mr Kim Wan Joong, a geologist with 20-years’ experience in mineral exploration and tenure management in Korea is the sole Director of Shin Han.

Mr Sennitt and Mr Kim Wan Joong jointly own KME.

KME and Shin Han do not have any other assets apart from those described in this Report.

The purpose of this report is to provide KME with all the technical geological and exploration information relevant to the exploration properties of KME together with conclusions and recommendations. The report has been prepared in accordance with the Form 43-101F1, Technical Report format outlined under NI-43-101. This Report has also been prepared in compliance with the JORC Code 2012 Edition of Reporting of Mineral Resources and Ore Reserves guidelines.

The current business of KME is principally exploration within polymetallic gold, silver and base metal systems, but there is one project targeting vanadium-uranium-molybdenum mineralization.

Some of the mineral properties tenements are in the application stage and there is no guarantee that they will be granted.

Mr L W Davis who is a duly authorised representative and director of VWPL prepared the NI-43-101 and was assisted by Mr R Dawney who is also a duly authorised representative of VWPL.

VWPL is an independent mining consultancy and holds no interest in KME and Shin Han, their partners or their affiliated companies, and neither Mr Davis nor Mr Dawney

hold any interest either directly or indirectly. VWPL will be paid a fee for the preparation of this NI-43-101 according to normal consulting practice.

## **2.1: Sources of Information**

The KME projects consist of a number of granted Mining Rights and several applications. These are detailed in Section 4.0 below. Mr R Dawney, representing VWPL, visited the main project areas of interest from 25<sup>th</sup> November to 28<sup>th</sup> November 2016 to observe the geology, historical mines, etc.

KME has provided copies of all the relevant maps, analytical data, presentations, photographs and documents relating to the project areas, as well as reports and memoranda on KME's strategies and plans for exploration together with budgets.

References to the various reports and records are made throughout the report and are listed in the Sources of Information and References, Section 10.

VWPL has not carried out any check sampling to confirm analyses or assays in known mineralized zones.

## **2.2. Scope of the Report**

This report details the findings of the due diligence studies on technical aspects of the KME projects, and is based on:

- Observations of historical mines, geology and mineralization styles from R Dawney's personal inspection of some of the properties.
- A comprehensive review of available geological and exploration information.
- The mineralization models that are relevant to the project areas.
- The historical exploration carried out on the project areas and the results from this exploration.
- The work carried out by KME to date, with verification.
- The proposed exploration work to be carried out by KME.
- A review of company management and technical capabilities and those strategies and plans relating to the exploration projects.

## **3.0 RELIANCE ON OTHER EXPERTS**

This NI-43-101 Report has been prepared specifically for KME by Mr Davis of VWPL assisted by Mr R Dawney who is an authorised representative of VWPL. VWPL has not engaged any other services, but has discussed certain aspects of mining narrow vein systems with experienced mining engineer associates.

VWPL has not provided advice on the validity or legality of the tenements (refer Section 4 of this report), political issues, financial issues or other issues, all deemed to be outside the scope of the contract. That contract permits KME to file this Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on its website.

The quality of information and conclusions of this report are dependent on Mr Davis' services and opinions, based on:

- information available at the time of preparation, which KME warrants is complete and accurate,
- assumptions, conditions and qualifications mentioned in this NI-43-101.

Mr Davis is an experienced geologist with both an exploration and mining background but he is not qualified to assess mining and metallurgical aspects although he is familiar with them.

KME has begun to investigate and review metallurgical processes which might assist the company to produce an economic product from mineralization discovered. So far, only historical work has been reviewed. VWPL has referred to these issues in Section 6.3.13 of the report and because the investigations are experimental and do not relate to resource scoping studies, VWPL has not sought the advice of a metallurgical associate. The metallurgical studies are not for feasibility but a guide as to whether exploration is worth pursuing.

#### 4.0 PROPERTY DESCRIPTION AND LOCATION

The location of KME's three project areas is shown on Figure 1. They are all between 34° 50' and 37° 00' north latitudes and 127° 00' and 129° 00' east longitudes. KME holds the following projects:

- Uiseong Au-Ag-Cu-Pb-Zn Project. Two granted Mining Rights held jointly with Se Woo Mining Co. Limited ("See Woo") plus 20 applications with no competitor held by Shin Han.
- Haman Cu-Co-Au-Ag Project. Eleven granted Mining Rights held by Shin Han.
- Miwon V-U-Mo project. Four granted Mining Rights held by Shin Han Mine Inc.
- Goseong Polymetallic (Cu-Au-Ag±Pb-Zn-Co) Project. Three applications held by Shin Han Mines Inc.



Figure 1. Location Map of Korean Metals Exploration Pty Limited Projects: Base Metal Refineries are highlighted in red and a Cobalt Refinery in blue.

## 5.1 TENURE

### 4.1.1 Uiseong Mining Rights

The Uiseong Project area is covered by two granted Mining Rights (jointly held under an Acquisition Agreement with Se Woo Mining Co. Limited) (Table 1a) and 12 Mining Right applications (Table 1b) held 100% by Shin Han Mine Inc. The tenements are illustrated in Figure 2.

**Table 1a. Tenement Schedule Shin Han Mine Inc - Granted Mining Rights.**

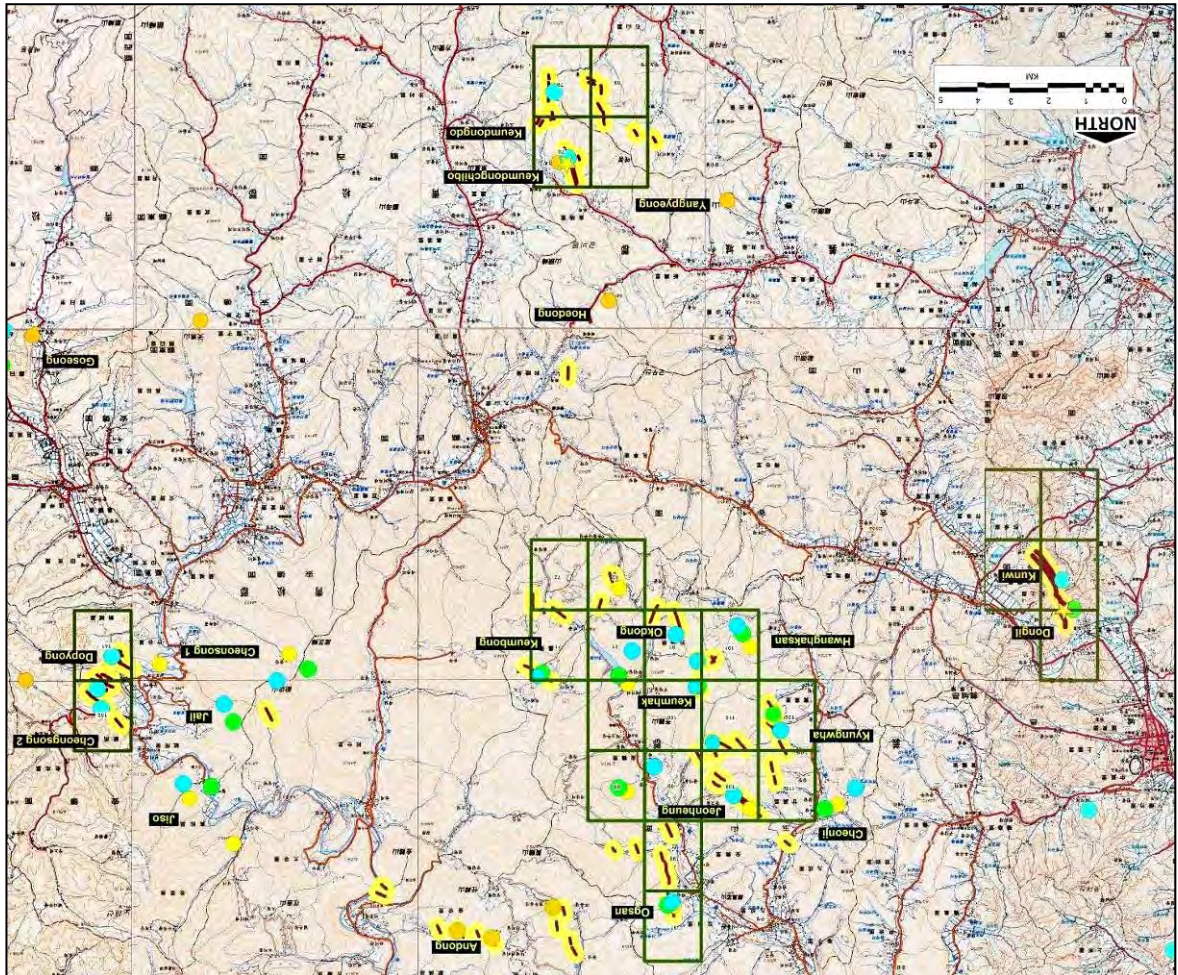
Land Register	Registered Number	Area (ha)	Registered Holders	Minerals	Mine	Grant Date
Gunwi 11	79247	277	<i>Shin Han Mine Inc and Sewoo Mining Co Limited</i>	Au, Ag, Cu, Pb and Zn	Dongil	10/02/2011
Gunwi 12	79248	277	<i>Shin Han Mine Inc and Sewoo Mining Co Limited</i>	Au, Ag, Cu, Pb and Zn	Kunwi	10/02/2011

**Table 1b. Tenement Schedule Shin Han Mine - Applications for Mining Rights.**

Land Register	Application Number	Area (ha)	Applicant	Minerals	Mine	Application Date
Gusandong 71	00810	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn	Keumbong	22/09/2016
Gusandong 72	00811	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		22/09/2016
Gusandong 78	00764	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn	Keumdong Chilbo	22/09/2016
Gusandong 79	00765	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn	Goroseoksan	22/09/2016
Gusandong 81	00812	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		22/09/2016
Gusandong 82	00813	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		22/09/2016
Gusandong 89	00766	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		22/09/2016
Gusandong 91	00814	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn	Okdong	22/09/2016
Gusandong 101	00815	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn	Kumhak	22/09/2016
Cheonji 99	00818	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		22/09/2016
Cheonji 109	00819	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn	Jeonheung	22/09/2016
Cheonji 110	00820	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn	Cheonji	22/09/2016
Gusandong 41	01013	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		25/10/2016
Gusandong 42	01014	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		25/10/2016
Gusandong 52	01015	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		25/10/2016
Cheonji 88	01020	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		25/10/2016
Cheonji 20	01016	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn	Jaeil	25/10/2016
Cheonji 29	01017	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		25/10/2016
Cheonji 30	01018	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		25/10/2016
Cheonji 40	01019	277	<i>Shin Han Mine Inc</i>	Au, Ag, Cu, Pb and Zn		25/10/2016

#### 4.1.1.1 Uiseong – Surface Rights

The Uiseong Project area is covered by Surface Rights held by Forestry or several private landowners. The local communities at the small rural villages of Chiseon, Mancheon, Geumo, Geumhak, Gamgye, and Geumbong could be potentially affected by any proposed mining and processing operation in the Uiseong Project area.



**Figure 2. Tenure and Topographic Map of the Uiseong Project area, illustrating the Mining Rights held and applied for by Shin Han Mine Inc. or under 1-Year Moratorium. The location of the major vein structures are shown in red and the historical workings are labelled.**

#### 4.1.2 Haman – Mining Rights

The Haman Project area is covered by 11 granted Mining Rights (Euiryeong-59, 67, 68, 69, 70, 77, 78, 79, 80, 87 and 88), all held 100% by Shin Han Mine Inc (as in Table 2, below) and illustrated in Figure 3.

**Table 2. Tenement Schedule - Granted Mining Rights – Haman Project.**

Land Register	Registered Number	Area (ha)	Applicant	Minerals	Mine	Registration Date
<b>Euiryeong-59</b>	<b>200740</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Minamidani	8/07/2016
<b>Euiryeong-67</b>	<b>200741</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Taewha	8/07/2016
<b>Euiryeong-68</b>	<b>200742</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Bukguk	8/07/2016
<b>Euiryeong-69</b>	<b>1514</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu and Co	Haman	10/05/2016
<b>Euiryeong-70</b>	<b>200743</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Okbang	8/07/2016
<b>Euiryeong-77</b>	<b>200766</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Chaedung	27/09/2016
<b>Euiryeong-78</b>	<b>200744</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu		8/07/2016
<b>Euiryeong-79</b>	<b>200767</b>	271	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Ogok	27/09/2016
<b>Euiryeong-80</b>	<b>200768</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Ebisu	27/09/2016
<b>Euiryeong-87</b>	<b>200745</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	JaeilGunbuk	8/07/2016
<b>Euiryeong-88</b>	<b>01961</b>	280	<i>Shin Han Mine Inc</i>	Au, Ag, Cu and Co	Gunbuk	16/11/2015

#### 4.1.2.1 Haman – Surface Rights

The Haman Project area is covered by Surface Rights held by several landowners. The local communities at the small villages of Sachon-ri, Ogok-ri, Ogyong-ri, Dundook-ri and Okbang-ri could be potentially affected by any proposed mining and processing operation at Haman.

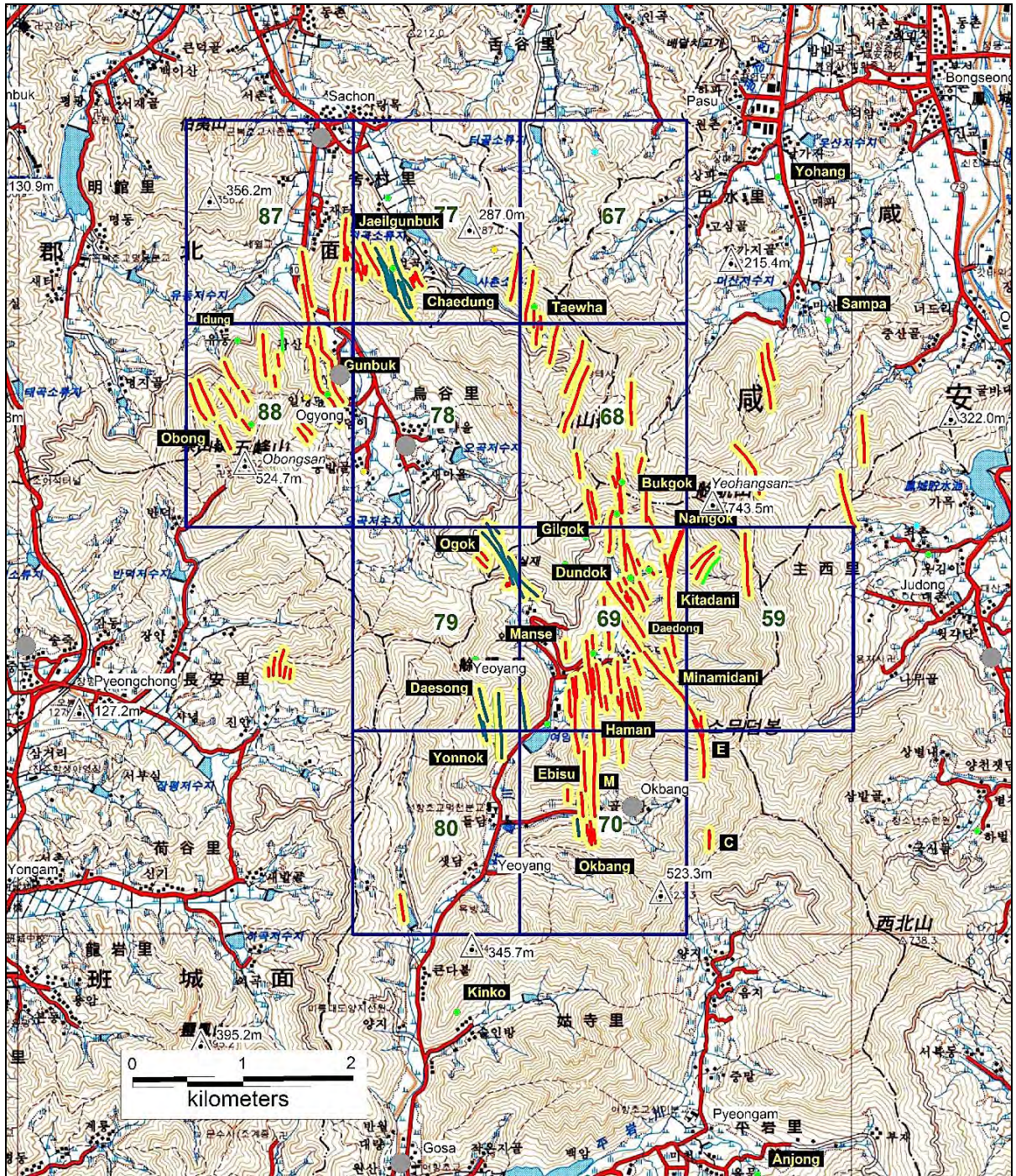


Figure 3. Tenure and Topographic Map of the Haman Project area, illustrating the Mining Rights granted to Shin Han Mine Inc. The location of the major vein structures are shown in red and the historical workings are labelled.

#### 4.1.3 Miwon – Mining Rights

The Miwon Project area is covered by four granted Mining Rights (Young U Ri-142 and 143 and Miwon-004 and 015), all held 100% by Shin Han Mine Inc (see Table 3 and Figure 4).

**Table 3. Tenement Schedule - Granted Mining Rights - Miwon Project.**

Land Register	Registered Number	Area (ha)	Registered Holder	Minerals Sought	Historical Mine	Registration Date
<b>Young U Ri-142</b>	<b>200808</b>	<b>275</b>	<i>Shin Han Mine Inc</i>	V, Mo	<b>Gyimanri</b>	7/12/2016
<b>Young U Ri-143</b>	<b>200809</b>	<b>275</b>	<i>Shin Han Mine Inc</i>	V, Mo	<b>Youngyuri</b>	7/12/2016
<b>Miwon-004</b>	<b>200826</b>	<b>277</b>	<i>Shin Han Mine Inc</i>	V, Mo		09/02/2017
<b>Miwon-015</b>	<b>200827</b>	<b>277</b>	<i>Shin Han Mine Inc</i>	V, Mo	<b>Jukeumri</b>	09/02/2017

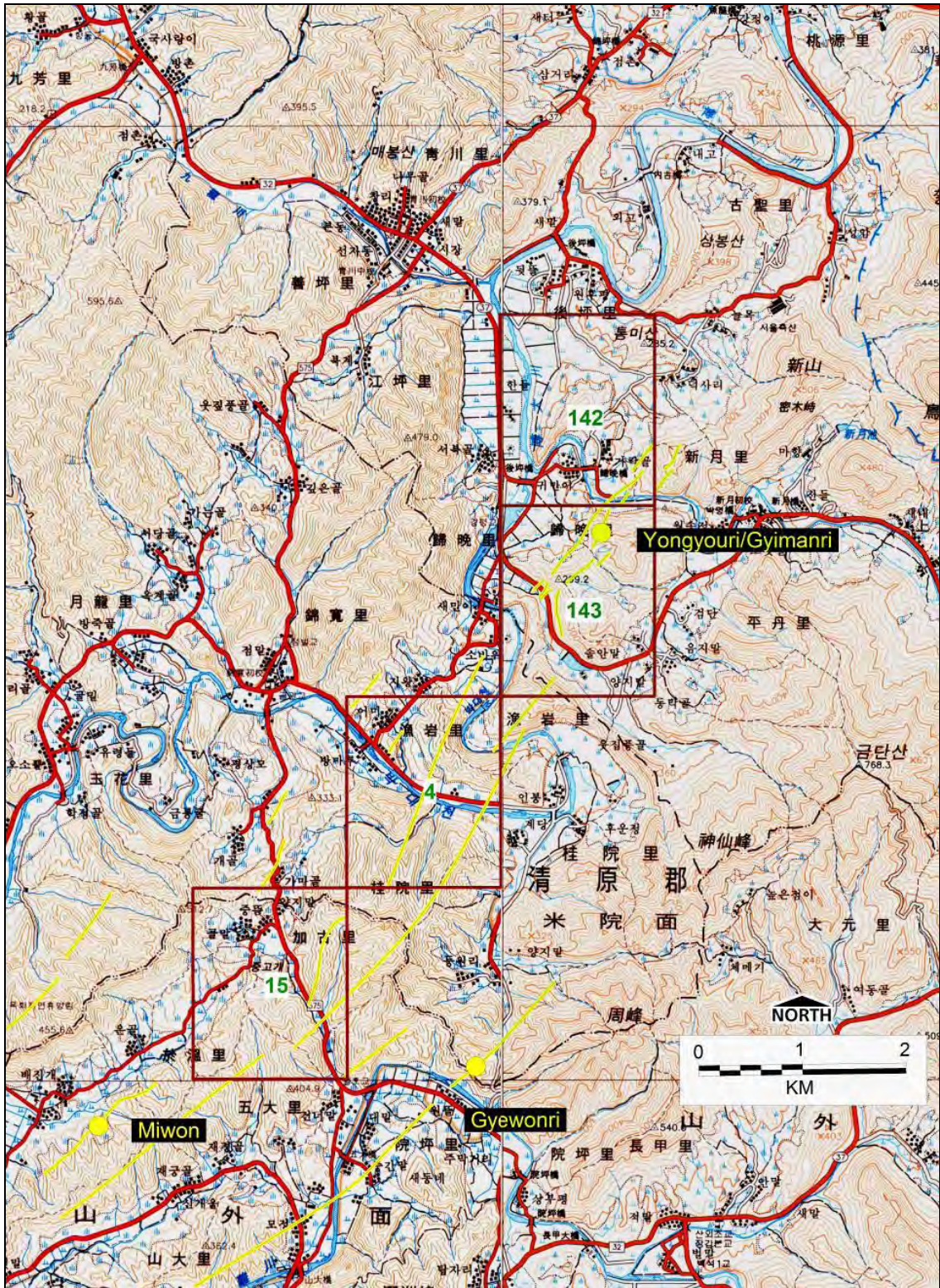


Figure 4. Tenure and Topographic Map of the Miwon Project area, illustrating the Mining Rights granted to Shin Han Mine Inc.

#### 4.1.4 Goseong - Mining Rights

Three applications for mining rights have been made by Shin Han Mine Inc over the Goseong project, The Mining Rights are shown in Table 4 and Figure 5.

**Table 4. Tenement Schedule - Mining Rights.**

Land Register	Registered Number	Area (ha)	Registrant / Applicant	Minerals	Mine	Registration Date
Chungmu-123	Application	281	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Samsan-Jaeil	
Chungmu-124	Application	281	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Samsan	
Chungmu-143	Application	281	<i>Shin Han Mine Inc</i>	Au, Ag, Cu	Samjeon	



Figure 5. County Location Map of the Goseong District. The applications and granted Mining Rights are indicated by the green squares. The town of Goseong is an ideal base for field operations. The location of the major vein structures (identified in red) and the historical mine workings are highlighted. Mineral occurrences are denoted by dot colours: Au = gold, Cu = green, Pb-Zn = blue

#### 4.1.4.1 Goseong - Surface Rights

The Goseong Project area is covered by Surface Rights held by several landowners. The local communities at the small villages of Jangchi-ri, Miryong-ri, Byeongsan-ri, Dupo-ri, and Idang-ri could potentially be affected by any proposed mining and processing operation at Goseong.

## 4.2 KOREAN MINING ACT – MINING RIGHTS

The Korean Mining Act is administered by the Ministry of Trade, Industry and Energy (“MOTIE”). The Korean Mining Act was promulgated and wholly updated on 29 January 1981. The Mining Act has subsequently been revised and updated several times. The last recorded update was made on 23 July 2010.

A Mining Right is the only form of mining title in Korea. A Mining Right covers a one minute by one minute graticular block (approximately 280 ha, or 2.8 km<sup>2</sup> in area). Applications for Mining Rights are made in the Central Mining Registry office in Seoul, or with the local County office of the MOTIE department.

No royalty is payable. Mining Rights are transferable. A Mining Right permits the holder to conduct exploration within the Mining Right.

A “Permit to Mine” is required by the holder of a Mining Right to engage in mining development and mining activities.

### Mining Right Application Process

Under the Korean Mining Act, a Mineral Deposit Survey Report must be lodged with Central Mining Registry office in Seoul, or with the local County office of the Ministry of Trade, Industry and Energy department, within six months after submission of an Application for Mining Rights.

The Mineral Deposit Survey Report must be prepared by a Registered Geologist, classified as a “Competent Person”. The Mineral Deposit Survey Report must describe and indicate the following items:

- Area Map at 1:50,000 scale (Topographic Map Series).
- Mineralization description. Provide evidence of mineralization by sample analysis.
- Geology description.
- Physiography, geography, location and access.
- Proposed Work Program for six years. Drilling (must have three drill sites for 450 m), but can include geophysics, geochemistry and tunnelling.

The Korean Mining Act stipulates that certain threshold values for each element applied for must be met in order for a Mining Right to be granted.

Approval of mining title is issued after completion of field investigation by local MOTIE officers. The area is reviewed by a combined five-member panel of MOTIE and KORES officers to determine if tenure is contrary to the public interest.

Once mining title is approved and documentation completed, Registration Tax is payable within 30 days of the approval notice. Registration Tax is currently KRW 108,000 per Mining Right (about US\$100 ea). Mining title is officially recorded upon receipt of monies.

A Mining Right is granted for a total period of seven years. After registration, a one year “Decision” period is granted, in which the Mining Right holder is required to

negotiate access to the Mining Right area with Landowners. The exploration period then lasts for six years.

### **Work Requirements**

The holder of a Mining Right is required to drill three holes of 150 m depth (for a total metreage of 450 m) as a requirement of meeting the work requirement conditions of the “Exploration Stage” of the Korean Mining Act.

The holder of a Mining Right is entitled to apply for technical assistance from the Korean Resources Corporation (KORES) after holding the Mining Right for at least 12 months. KORES is a wholly government-owned enterprise mandated to support the Korean domestic mining sector. Independent domestic resource developments are one of the key tasks of KORES. KORES is able to provide technical assistance to the Mining Right holder, including diamond drilling, geological and geophysical surveys and laboratory analysis. KORES usually reviews requests for technical assistance in October of each year, as it prepares its budgets for the following year.

### **Reporting Requirements**

An Exploration Report is required to be submitted up to six months before expiry to the Central Mining Registry office in Seoul, or with the local County office of the Ministry of Trade, Industry and Energy department. The report should describe the work completed on the Mining Right during the six year exploration reporting period.

#### **4.2.1 Mine Development Permit Process**

After preparation of an Exploration Report, the Mining Right holder must elect to proceed to the “Mining Stage”, or abandon. If the Mining Right holder decides to progress to the Mining Stage, then an Application for “Mine Development Permit” is lodged.

The Mine Development Permit process requires submittal of a mine plan, financial studies, an Environmental Social Impact Assessment (“ESIA”) management plan that takes into account environmental disturbance, air quality (dust) and hydrological (surface and ground water) aspects and community social impact studies (noise, disruption, employment issues, etc). The typical ESIA process is set out in Section 4.2.2 below.

In order for mining to commence, negotiations and agreements are required with the owners of Surface Rights over the area affected by mining activities. This could potentially entail either outright acquisition or long-term leasing arrangements with the owner of the Surface Rights.

The process is outlined in Figure 6.

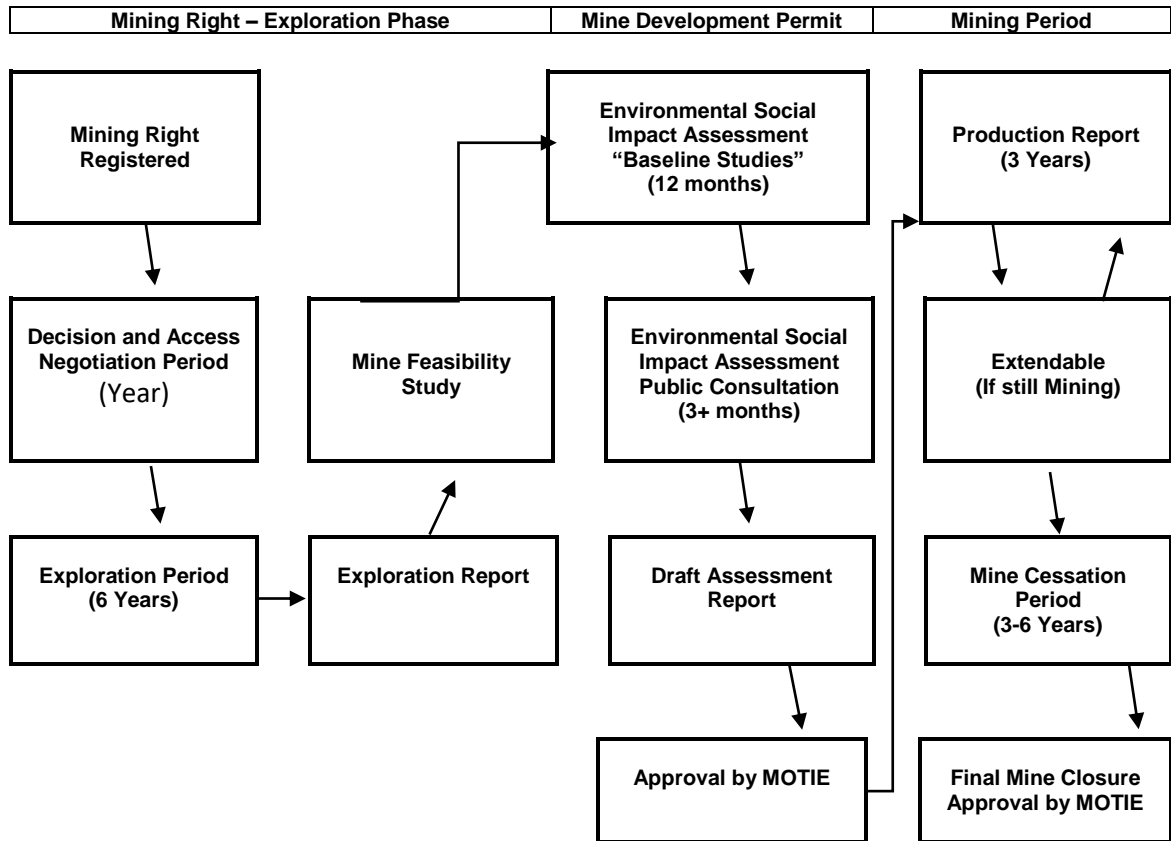


Figure 6. Flow Diagram of the Mining Right Reporting Process.

#### 4.2.2 Environmental Social Impact Assessment (ESIA) Process

The Mine Development Permit process requires submittal of an ESIA management plan, involving “baseline” environmental studies conducted over four seasons (12-month period), together with engagement of the local community and stakeholders. The ESIA process is summarised below.

##### Project Description

Project Characterisation, Scoping Study Report and Project Background Information Document.

##### Draft Assessment Plan (DAR)

- ESIA Committee established.
- Identify Stakeholders, including Landowners, Local Community, Local Government, Provincial Government and Regulatory Agencies involved in ESIA process.
- Key Project Issues, Regulatory Responsibilities, Stakeholder engagement, Develop Regulatory Review and Tracking Mechanisms.
- Additional Technical Issues to meet International Best Practice.
- Identification of Local Restrictions, Habitat Conservation and Protection Zones and Cultural Heritage.
- Development of Management Plan.

- Prevention and Mitigation Measures.
- Preparation of Draft Assessment Report (DAR).
- Submission of DAR to Stakeholders.

#### Baseline Studies

- Baseline Studies designed and data collected over four seasons and analysed
- Social Impact Evaluation (Surface Hydrology, Groundwater, Dust, Noise, Fauna, Flora and Local Community).

#### Stakeholder Engagement, Group Discussion and Public Consultation

- Regulatory Agencies involved in ESIA process.
- Project Background Information Document distributed to local community.
- Community Liaison Office.
- Group Discussion Meeting.
- 30-day Public Notification Awareness Campaign.

#### Public Hearing

- Comments from Stakeholders.
- Comments from Local Community.

#### Revision of the DAR and Finalisation of the ESIA

- Collection of Opinions on the DAR.
- Collect Opinions from Public Hearing.
- Recommendations from ESIA Committee.

### **4.2.3 Mine Closure Process**

Rehabilitation is required after completion of mining activities and is regulated by the Korea Mine Reclamation Corporation (MIRECO). Visual issues, soil, revegetation and water quality issues mainly apply to restoration of the disturbed mine area. Approximate estimated cost of rehabilitation after mining is considered to be about US\$200,000 per ha disturbed.

## 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

### 5.1 General access

South Korea is well serviced by international flights into Incheon Airport, near the capital Seoul. There are also international connections with some Asian destinations into Busan and Taegu. The major shipping container ports are Incheon in the northwest, near Seoul, Pyeongtaek further to the south and Busan in the southeast of the Korean Peninsula, Figure1, above.

The project areas are all within a short number of hours' drive from Seoul: Uiseong four hours, Haman and Goseong five hours', Miwon two hours' drive. The country has an excellent network of motorways. Although the peninsula is mostly a mountainous landscape, tunnels and elevated roads in the valley areas ensure rapid commute between major centres.

South Korea has an immature volcanic landscape with no extensive plains; its lowlands are the product of mountain erosion. Approximately 30 percent of the area of South Korea consists of valley flats and the rest consists of uplands and mountains. The great majority of the lowland areas which are intensely cultivated lie along the coasts, particularly the west coast and along the major rivers.

The Uiseong Project is situated 250 km southeast of Seoul and 20 km southeast of the rural town of Uiseong, located in Gyeongsangbuk-Do Province, in the southeastern region of the Korean Peninsula (Figure 1). Uiseong with a population of 14,409 (2014 census) is a convenient base for field operations. Andong City, situated 30 km to the north of the Uiseong Project area, is the capital of Gyeongsangbuk-Do Province, with a population of 167,826 (2014 census).

The Haman Project is situated 300 km southeast of Seoul and 16 km west of Changwon City, located in Gyeongsangnam-Do Province. Changwon is the capital of Gyeongsangnam-Do Province, with a population of 1,089,039 (2010 census). Changwon is an industrial centre with important chemical and heavy machinery sectors. Changwon is also an important education centre, with two universities and five colleges.

The Miwon Project is situated 150 km southeast of Seoul and 21 km east of Cheongju City, located in Chungcheonbuk-Do Province in the western central region of the Korean Peninsula.

The Goseong Project is situated in the southern coastal region of the Korean peninsula, approximately 310 km southeast of Seoul. Goseong, with a population of 55,950 (2010 Census) is a fishing port and lies 19 km west of Sacheon City (population of 114,556) and Tongyeong Port (population 134,082). Tongyeong is a major shipbuilding center. Sacheon has a high-technology aerospace industrial complex, together with a domestic airport and an airforce base.

## 5.2 Climate

South Korea has a temperate continental climate with distinct seasons. Winters (October to March) are usually long, cold and dry. Summers (June to August) are short, hot, and humid. Spring and autumn are pleasant but short. Seoul's mean temperature in January is  $-5^{\circ}\text{C}$  to  $-2.5^{\circ}\text{C}$  ( $23^{\circ}$ - $27.5^{\circ}$  Fahrenheit) and in July the mean temperature is about  $22.5^{\circ}\text{C}$  to  $25^{\circ}\text{C}$  ( $71^{\circ}$ -  $75^{\circ}$  Fahrenheit). The country generally has sufficient rainfall to support a robust agricultural industry, rarely does less than 75 cm (30") of rain fall in any given year; for the most part, rainfall is over 100 cm (39"). Serious droughts have occurred on average, once in every eight years. About two-thirds of the annual precipitation occurs between June and September.

Because of its location between the Sobaek and Taebaek mountain ranges in the eastern region of Korea, the Uiseong Project within the Gyeongsangbuk-Do Province has a relatively hot summer climate compared to other parts of Korea, being hot and humid in summer, and cold in winter. Freezing temperatures occur during November-March and snowfalls are common.

The Haman and Goseong project because of their location near the south coast, in Gyeongsangnam-Do Province have a relatively milder climate compared to other parts of Korea, being less humid and cooler in summer, slightly wetter and warmer in winter. Although freezing temperatures can occur during December-March, snowfalls are uncommon.

South Korea is less vulnerable to typhoons than neighbouring countries. From one to three typhoons can be expected per year. Typhoons usually pass over South Korea in late summer, especially in August and bring torrential rains.

The hilly to mountainous terrain of the project areas are well forested: ubiquitous temperate alpine vegetation, with an admixture of fir, pine and Korean cedar. Bamboo is found in the lower parts. Thick dense undergrowth, consisting of scrubby thorny vegetation develops quickly in June after the first heavy rains, making access difficult. The scrubby undergrowth dies out rapidly during October-November at the onset of winter. Consequently, the best field season is immediately before and shortly after winter.

## 6.0 DESCRIPTION OF PROJECTS

### 6.1 UISEONG POLYMETALLIC PROJECT

The Uiseong Au-Ag-Cu-Pb-Zn Project is situated in the eastern region of South Korea, 250 km southeast of Seoul in the Gyeongsang Basin.

KME considers the project to be prospective for epithermal gold-silver-base metal style deposits. The area has not been explored by modern exploration methods and concepts. KME has identified a drill-ready Exploration Target at Dongil- for priority resource definition drilling. Additional exploration targets have been identified as requiring further investigation before resource drilling.

#### 6.1.1: HISTORY OF MINING AND EXPLORATION

##### 6.1.1.1 General

Korean organisations have been very active in the mining industry and have provided a wealth of information which is of great use to explorers. The following regional surveys provide data which is important to all three of KME's project areas

South Korea has been mapped geologically at 1:50,000 scale by Korean and Japanese geologists in several phases. Digital and paper 1:250,000 and 1:50,000 scale maps are available for the entire country from the Korean Institute of Geology Minerals and Mining ("KIGAM") in Daejeon City. Each map sheet is accompanied by explanatory notes.

Topographic maps are available in raster and vector digital file and paper form for all of South Korea in 1:50,000, 1:20,000 and 1:5,000 scales. These maps can be purchased through retail map shops of the Korean National Mapping Service.

The KIGAM, in 2001 conducted a country-wide stream sediment geochemical survey in 1971 to provide an excellent geochemical background database for the entire country. The data was primarily used for lithological characterisation and environmental background purposes, but can also be used for mineral exploration purposes. The individual map sheets were scanned as JPEG files and registered for use in the MAPINFO™ GIS database.

Stream sediment samples were collected at a density of one sample per about 3.5 km<sup>2</sup> area on a provincial wide basis. Samples were collected from the active fine sand fractions and sieved in the field to -100 mesh (-150µm) and approximately 70-100 g collected. A total of 5,407 stream sediment sites were sampled in Gyeongsangbuk-Do Province, providing a very large number for robust and meaningful statistical analysis. Elements analysed included Ba, Be, CaO, Co, Cr, Cu, Fe<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O, Li, Mg, Na<sub>2</sub>O, Ni, Pb, Rb, Sr, Ti, V, Zn, Zr, together with conductivity (eH) and acidity (Ph).

In 2001, the Korea Institute of Geoscience and Mineral Resources released a large database of the mineral occurrences of the Gyeongsang Basin, documenting some 25 Au-Ag-Cu workings in the Uiseong Metallogenic Province.

The KIGAM (2001) data was further analysed by Koh et al (2003), indicating the age of mineralization in the Uiseong province is 62.3-57.5 Ma (Palaeocene). The Palaeocene age is similar to that of acidic plutonism (biotite granite and quartz porphyry) encountered near the deposits, suggesting a close genetic relationship.

KIGAM, in 2002 conducted an airborne geophysical survey over the Gyeongsang Basin during 1989-1991, using a BK-117 helicopter flown at terrain clearance altitude of 120 m. East-west flight lines were flown at a spacing of 1.5 km and tie lines at 8.0 km spacing. The helicopter was equipped with a Geometrics G-813 proton precision magnetometer and a Geometrics G822A caesium magnetometer.

The source airborne geophysical data is not available for purchase from KIGAM and so the published magnetic anomaly maps for the Andong NJ52-14 and Busan NJ52-2 map sheets were purchased, scanned as high resolution JPEG files and registered for use in the MAPINFO™ GIS database.

#### 6.1.1.2 Uiseong Sub-Basin and Project area

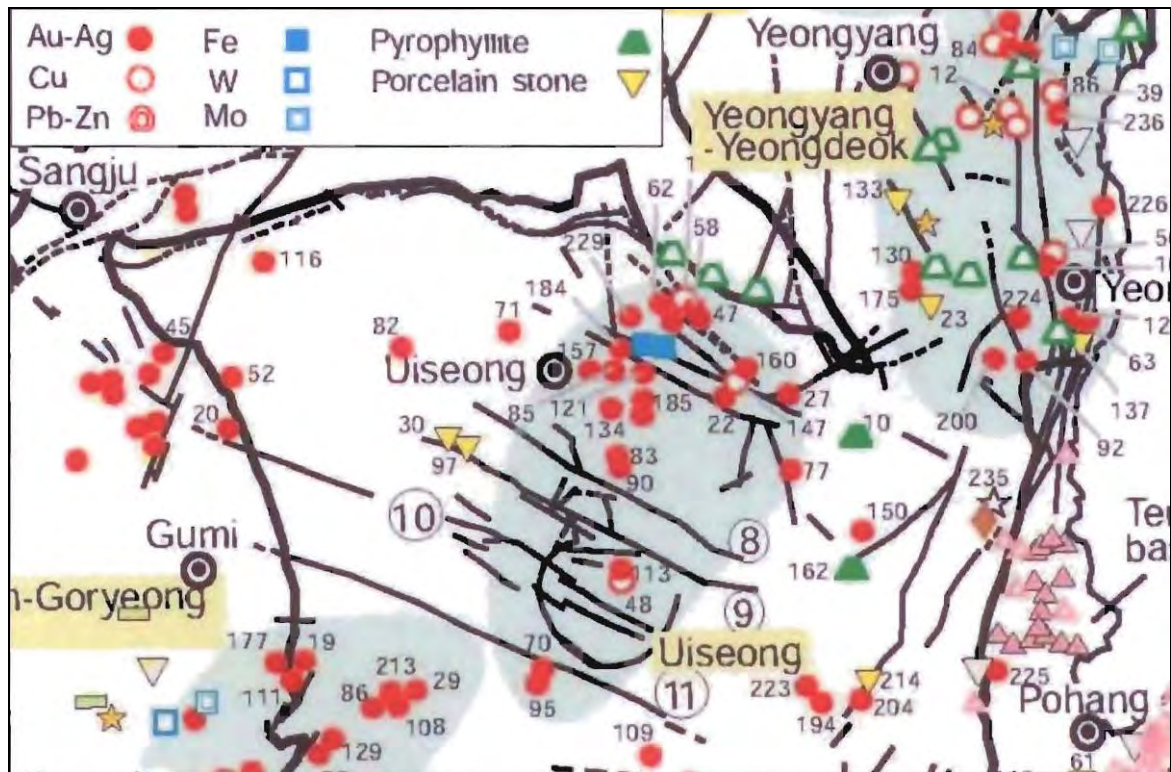
The Uiseong Project area is covered by the Cheonji, Euseong, Gunwi, Gusandong, and Cheongsong 1:50,000 scale Geological Map sheets and by the Kunwi NJ52-14-25, Hwabuk NJ52-14-26, Uiseong NJ52-14-18 and Kiran NJ52-14-19 1:50,000 scale topographic map sheets.

The Atlas of Mineral Resources – Republic of Korea was compiled by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) in 1987. The ESCAP Atlas (1988) lists several polymetallic mineral occurrences in the Uiseong Metallogenic Province, including the Jeonheung, Ogdong, Kumhak, Goseong, Uiseong and Gunwi/Daedonga deposits.

Detailed gravity surveys were undertaken in the Uiseong Sub-basin by Park et al (2008) and magnetotelluric surveys by Yang et al (2008), following limited gravity surveys by Yu et al (2005) and Kim et al (2000).

Historical exploration of the Uiseong Metallogenic Province was undertaken by the Korean Mining Promotion Corporation (“KMPC”) during the 1970s and the Korean Institute of Energy and Resources (“KIER”) during the 1980s. Exploration activities included basic geological mapping, underground adit mapping and sampling, some ground TDEM (Time Domain Electromagnetic surveying), magnetometer and VLF-EM (Very Low Frequency Electromagnetic surveying) geophysical surveys and diamond drilling in several campaigns.

In 2001, KIGAM released a large database of the mineral occurrences of the Gyeongsang Basin, documenting some 25 Au-Ag-Cu workings in the Uiseong Metallogenic Province, see Figure 7. These workings included the Jeonheung (157), Kumhak (85), Kyungwha (121), Hwanghaksan (134), Yeonjeon (229), Andong (1), Dongwha (62), Ogsan (185), Dongcheok-Ogsan (58), Daesong #1 (47), Keumdong-Chilbo (83), Geumjong (90), Changgang (13), Daesong #2 (48), Cheongsong #1 (22), Jiso (160), Cheonmasan (27), Jail (147), Eunseong (70), Geumryong (95), Yeongcheon (223), Samseong (194), Seongrim (204), Toheung (214), Jukjang (162), Jangja (150), Geoseong (77), and Bunam (10) mines.



**Figure 7. Mineral Occurrence Map of the Uiseong Metallogenic Province (After Koh et al, 2003). The numbers correspond to individual deposits referred to in the text above.**

KMPC and KIER diamond drilled several deposits in the Uiseong Project area. The sampling and assaying of the small BQ size (36.5 mm diameter) drill core by the KMPC and KIER was sporadic, incomplete and selective, with Pb and Zn analysed primarily and Cu, Au and Ag analysed to a lesser extent. There was no sampling outside of visually obvious mineralized zones and it is considered highly likely some weaker mineralized zones were not detected by this sampling. No drill core remains available for inspection.

#### **Keumdong Chilbo and Goroseksan Mines**

The KMPC drilled four diamond drill holes of 200 m length in 1979 and another four 200 m holes in 1981. The drilling intersected wide zones of brecciated, sericite alteration, accompanied by narrow, 2-5 cm thick sulphide-mineralized veins. The workings at Keumdong Chilbo consisted of two adits, but no production details are recorded. Mine production grades were reported as 2-12% Pb and 1-6% Zn (Se Woo 2008).

#### **Keumhak Mine**

Earliest records indicate Japanese interests operated the Keumhak Mine during 1940-1945. The Kumhak Mine was acquired by Korean private interests in 1968 and a total of four adits and levels were developed.

In 1974, three diamond drill holes were completed on the southern Keumhak Mine workings area for 380 m of core. Another three holes were drilled in 1975 for 350 m of core and another four holes drilled in 1977 for 450 m of core.

### **Okdong Vein**

In 1983, ground geophysical surveys conducted within a 650 m by 550 m area included magnetic, VLF-EM and TDEM surveys. Four coincidental TDEM and VLF-EM anomalies were detected. One anomaly is related to the mineralized vein structure. In 1983, five diamond drill holes were completed on the Okdong vein structure for 700 m of core. Low-grade disseminated Ag-Pb-Zn mineralization was intersected over a 22.5 m interval in hole 83 YB-2.

### **Jeonheung Mine**

The Jeonheung Mine reportedly had five adits (Se Woo 2008). A 100 tpd capacity flotation mill was constructed in 1976.

In 1976, three diamond drill holes were completed on the Jeonheung Mine area for 500 m of core. In 1977, another two holes were drilled for 450 m of core.

Metallurgical test-work on oxidized Pb-Zn-Cu ore from Jeonheung was conducted by the KMPC (Hwang and Yang 1977).

### **Kyungwha, Hwanghaksan and Cheonji Mines**

During 1976-1977, eight diamond drill holes were completed on the Kyungwha Mine area for 1,150 m of core. Several holes intersected significant Au-Ag-Cu-Pb-Zn mineralization. In 1983, five diamond drill holes were completed on the Okdong vein structure for 700 m of core. Low-grade disseminated Ag-Pb-Zn mineralization was intersected over a 22.5 m interval in 83 YB-2.

Mine production grades were reported by Se Woo (2008) to be 0.5-1.0 g/t Au, 58-824 g/t Ag, 0.27-9.51% Cu, 1.42-27.93% Pb and 0.2-7.38% Zn.

### **Keumbong Mine**

In 1983, ground geophysical surveys were conducted over a 400 m by 300 m area, including magnetic, VLF-EM and TDEM surveys. Two coincidental TDEM and magnetic anomalies were detected and considered to be related to mineralization. During 1983, five diamond drill holes were completed at Keumbong Mine area for a total of 550 m of drill core. Most drill holes intersected Ag-Cu-Pb-Zn mineralized vein structures.

### **Ogsan Mine**

In 1973, six diamond drill holes were completed within the Ogsan Mine area for 650 m of core. Three holes intersected Au-Ag-Cu-Pb-Zn mineralization.

The Ogsan Mine consists of five adits. According to Se Woo (2008), production grades were 0.3-0.4% Cu, 2.2-2.73% Pb, and 3.36-5% Zn. No production tonnes figures were reported.

## **Dongil-Gunwi Mine**

Earliest records indicate Japanese interests operated the Dongil-Gunwi Mine during 1926-1945. The mines were acquired by Korean private interests in 1966. Two adits and levels were excavated in 1968. Production during 1968-1975 from the Dongil-Gunwi Mine was reported by Se Woo (2008) as 4,740 t of 5.5-15.0% Cu. Production grades were 68-151 g/t Ag, 1.63-21.22% Cu, 2.8% Pb and 2.55% Zn.

In 1970 and 1978, Self Potential (SP) geophysical surveys were conducted over the Dongil-Gunwi Mine area with the objective of defining the trend and intensity of conductive sulphide mineralization. The SP survey indicated the presence of an anomalous conductive zone within the felsite intrusion.

The KMPC drilled 28 diamond drill holes (total 4,970 m core) in several campaigns between 1971 and 1979. The drill hole pattern spacing was approximately 100 m apart along strike and each hole was drilled at an angle of 60°, with azimuths perpendicular to the main vein-breccia structural trend. The drilling programs intersected wide zones of Au-Ag-Cu-Pb-Zn mineralization, as presented in Table 5 below, Section 6.1.7 EXPLORATION (Se Woo 2008).

## **Daesung Mine**

Earliest records indicate Japanese interests operated the Daesung Mine during 1940-1945. The mine was acquired by a Korean private owner in 1971. The Daesung Mine consisted of four adits. Production during 1971-1974 was reported to be 1,560 t of 2 g/t Au, 250 g/t Ag, 60% Pb, 10% Cu and 4% Zn (KMPC, 1976 and Se Woo, 2008). Production grades were 100 g/t Ag, 2.5% Cu, 2.5% Pb and 2.5% Zn.

Two diamond holes were drilled in 1972 for a total of 180 m of core. No assays were reported.

## **Cheongsong and Dopyung Mines**

Earliest records indicate Japanese interests operated the Cheongsong Mine during 1926-1945. The mine was acquired by a Korean private owner and adits and levels excavated in 1970. The KMPC constructed a 30 tpd flotation plant in 1971. Production during 1972-1973 from the Cheongsong Mine was approximately 218 t of 50% Pb, 226 t of 50% Zn and 43 t of 6% Cu (Se Woo 2008). Production grades were 32 g/t Ag, 2% Pb, 4% Zn, 2% Cu.

The Cheongsong Mine consisted of 11 adits, including the Main Adit, Jungang, Yangji, Byungchang, Gaebal, and the No 2, No 3, No 5, No 6, No 7 and No 8 adits.

In 1976 and 1979, Self Potential (SP) geophysical surveys were conducted over the Cheongsong Mine area with the objective of defining the trend and intensity of conductive sulphide mineralization. The SP survey indicated the presence of three anomalous conductive zones.

Between 1973 and 1978, a total of five diamond drill holes were completed on the Cheongsong Mine area for 820 m of core. A further five holes were drilled in 1980 into a SP geophysical anomaly.

## 6.1.2 HISTORICAL MINE PRODUCTION

The Uiseong Metallogenic Province was a base metal producing district during the Japanese occupation period until 1945 and then again during 1970-1975. Japanese mine production records were examined by Gallagher (1963), indicating there was little base metal production for the Province, but indicated the following minor gold production figures: Yeongcheon (Eisen) Mine produced 1505 g of gold in 1941-42, together with some silver and copper, Jail (Cheil) Mine produced 563 g of gold during 1941-42 and Keumdong Chilbo (Kuchon) produced 193 g of gold in 1941.

Production in the Uiseong Metallogenic Province during 1968-1975 was documented by Se Woo (2008), with the following production figures reported:

- Production during 1968-1975 from the Dongil-Gunwi Mine was 4,740 t of 5.5-15.0% Cu.
- Production during 1971-1974 from the Daesung Mine was reported to be 1,565 t of 2 g/t Au, 250 g/t Ag, 60% Pb, 10% Zn and 4% Cu (KMPC, 1976 and Se Woo, 2008).
- Production during 1971-1973 from the Keumhak Mine was 231 t of 200 g/t Ag, 3-6% Cu, and 50% Pb-Zn, Se Woo (2008).

The various mines and exploration activities were reviewed and summarized in several reports on Mining Rights held by Se Woo (2008).

### 6.1.2.1 HISTORICAL ESTIMATES AND REMNANTS

The mineral resources below were estimated at some of the historical mine workings by the KMPC and KIER during the 1970s (Se Woo, 2008).

Resource estimates are typically made by the KORES, or its predecessor the KMPC, using a standardised system for reporting. These resource estimates are usually robust, involving channel face sampling along adit and drive walls at 10 m intervals. However, they do not comply with Canadian Institute of Mining, Metallurgy and Petroleum practice nor are they NI-43-101 or JORC Code compliant, as they lack check QA/QC sampling using blanks, duplicates and standards and do not employ geostatistical analytical methods.

- 1,134 t grading 3.41% Pb and 6.65% Zn at the Cheongsong Mine.
- 4,635 t grading 5.1 g/t Au, 117 g/t Ag, and 3.90% Cu remaining in stopes at the Dongil-Gunwi Mine.
- 152,800 t grading 3.67% Cu at the Dongil-Gunwi Mine.
- 49,030 t grading 105 g/t Ag, 3.1% Cu, 2.65% Pb and 3.94% Zn at the Daesung Mine.
- 11,840 t grading 4% Cu, 2.28% Pb and 5.2% Pb remaining in the Hwangsan adit at the Ogsan Mine.
- 67,000 t grading 4% Cu and 6-13% Pb-Zn at the Ogsan Mine.

- 2,590 t grading 2.3% Cu remaining in stopes at the Kumhak Mine.
- 100,458 t grading 165 g/t Ag, 2.10% Cu, 2.44% Pb, 4.40% Zn at the Jeonheung Mine.

It should be noted that these mineral resource estimates are historical and do not comply with current JORC Code or NI-43-101 standards.

### 6.1.3 GEOLOGICAL SETTING - GEOLOGY OF THE GYEONGSANG BASIN

During the Cretaceous Period, East Asia was characterized by Andean-type continental margin formed by the subduction of the Kula Plate and the Kula-Pacific Ridge. This marginal zone was subjected to extensional tectonism of the magmatic arc, resulting in the development of fault-bounded continental depressions, including the Gyeongsang Basin, see Figure 8. This tectonism eventually led to the opening of the Sea of Japan.

In its deepest parts the Gyeongsang Basin sequence attains a maximum thickness of about 9000 m. The sequence mainly strikes north northeast to north and dips gently, sometimes moderately to the southeast.

Geological mapping of the Gyeongsang Basin has been completed at 1:50,000 scale by the Korea Geological Survey. The number of formations is large and because of the repetitive nature of sedimentation is somewhat confusing, as nomenclature varies from map sheet to map sheet and was not well co-ordinated. As a result, the stratigraphy of the Gyeongsang Basin has been defined and revised by several researchers, including Kim et al (1968), Choi (1986), Chang (1988), Chang et al (1990) and more recently at 1:250,000 scale by the KIGAM, 2001.

The Gyeongsang Basin geology, see Figure 9 can be subdivided into four distinct tectono-sedimentary cycles (or episodes) of tectonism, sedimentation and associated igneous volcanism and intrusive activity. The cycles are summarized below.

- During Cycle 1, the Gyeongsang Basin developed initially as an intra-arc basin with deposition of a non-marine sequence comprising the basal Early Cretaceous continental "red bed" Sindong Group into the Nakdong Trough.
- During Cycle 2 in the Middle Cretaceous, scattered centres of andesitic and basaltic-andesitic volcanism formed, resulting in deposition of the volcano-sedimentary Hayang Group. Inferred depo-centres in the basin are indicated and volcanic centres are indicated by red circles on the Cycle 2, Figure 9 below.
- The basin then evolved rapidly during Cycle 3 into a mature volcanic arc during the Late Cretaceous, with extrusion of alternating lava flows and pyroclastics of the volcanic-dominated Yuchon Group. The composition of the volcanic rocks changed from intermediate to later acid volcanism. Andesitic volcanism dominated over rhyolitic volcanism and the associated inferred volcanic centres are indicated by red circles on Figure 9 below.
- The emplacement of stocks and batholiths of the Bulgugsa Series took place during Cycle 4, which was essentially co-magmatic with Cycle 3. The composition of the volcanic and igneous rocks changed from initial intermediate to late-stage acid intrusions. The wide variety of igneous rocks indicates that a multi-phase, highly fractionated and evolved intrusive magma underlaid the basin.

The extensional basin is characterized by an interconnected set of listric extensional faults and associated transfer faults. These faults extend into the basement and are in part formed by the reactivation of basement structures, which are the locus of magmatic activity both in the basin and the basement to the west.

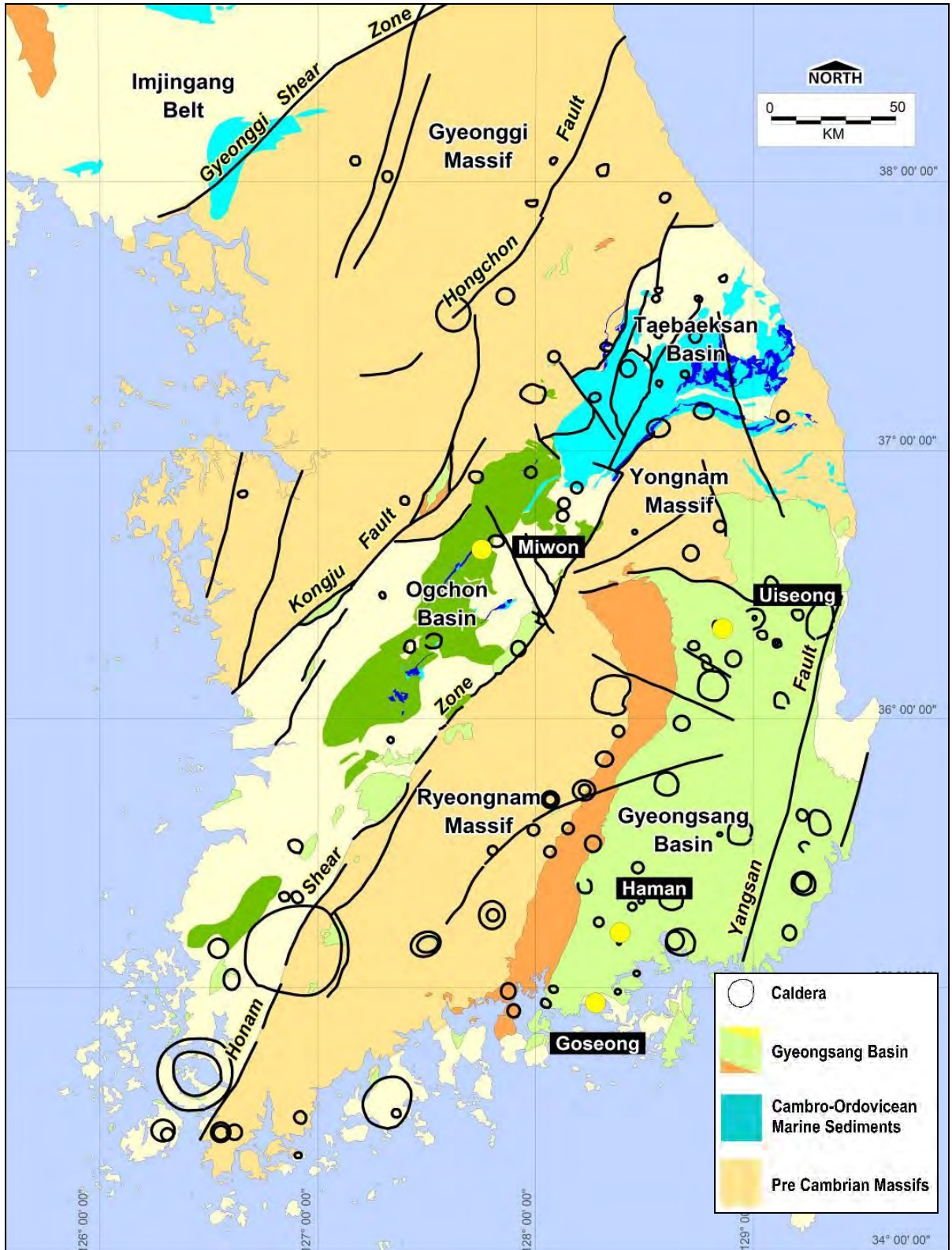


Figure 8. Tectonic Elements Map of South Korea. The Uiseong, Miwon Goseong and Haman projects are shown together with major structures.

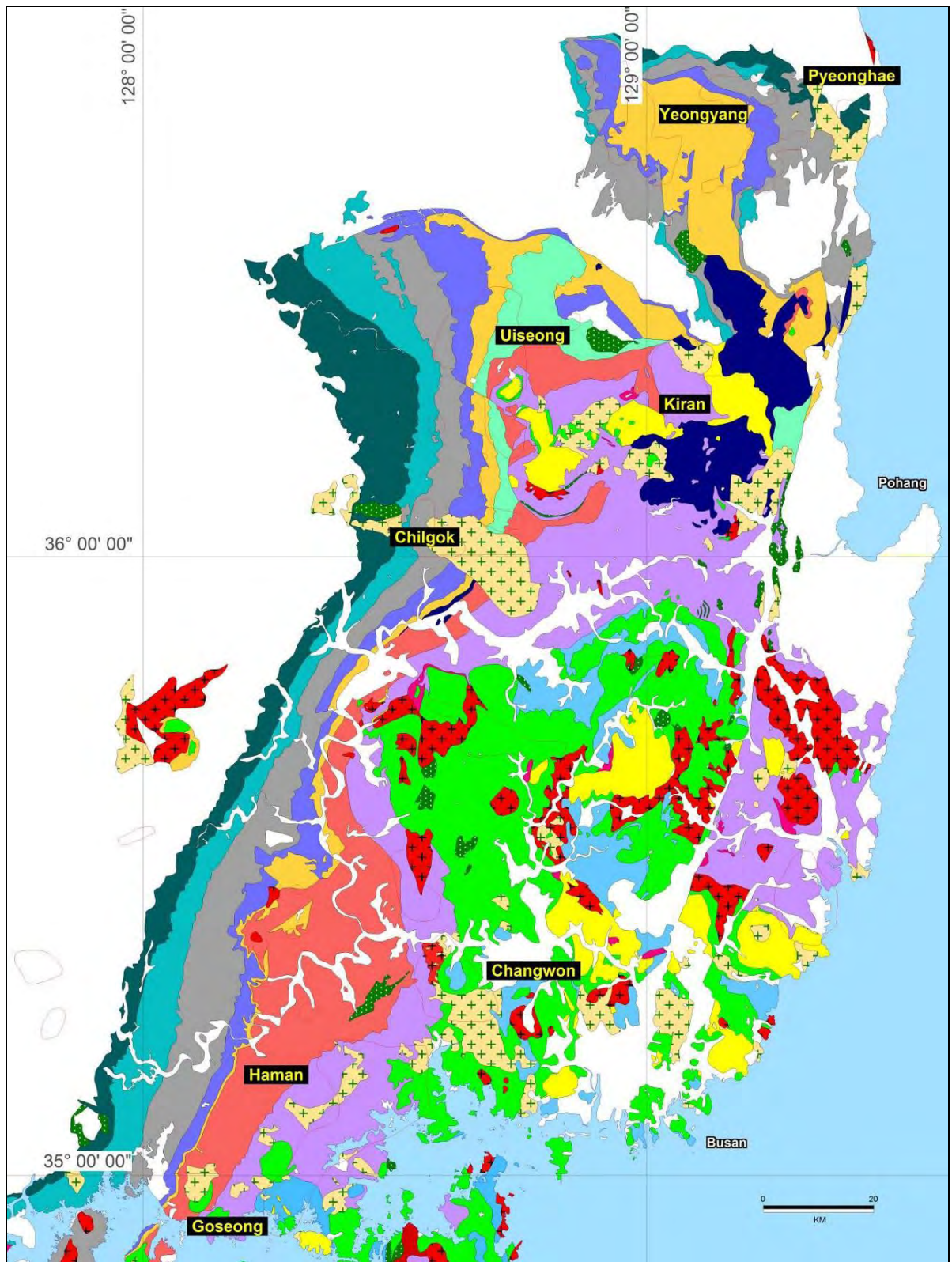
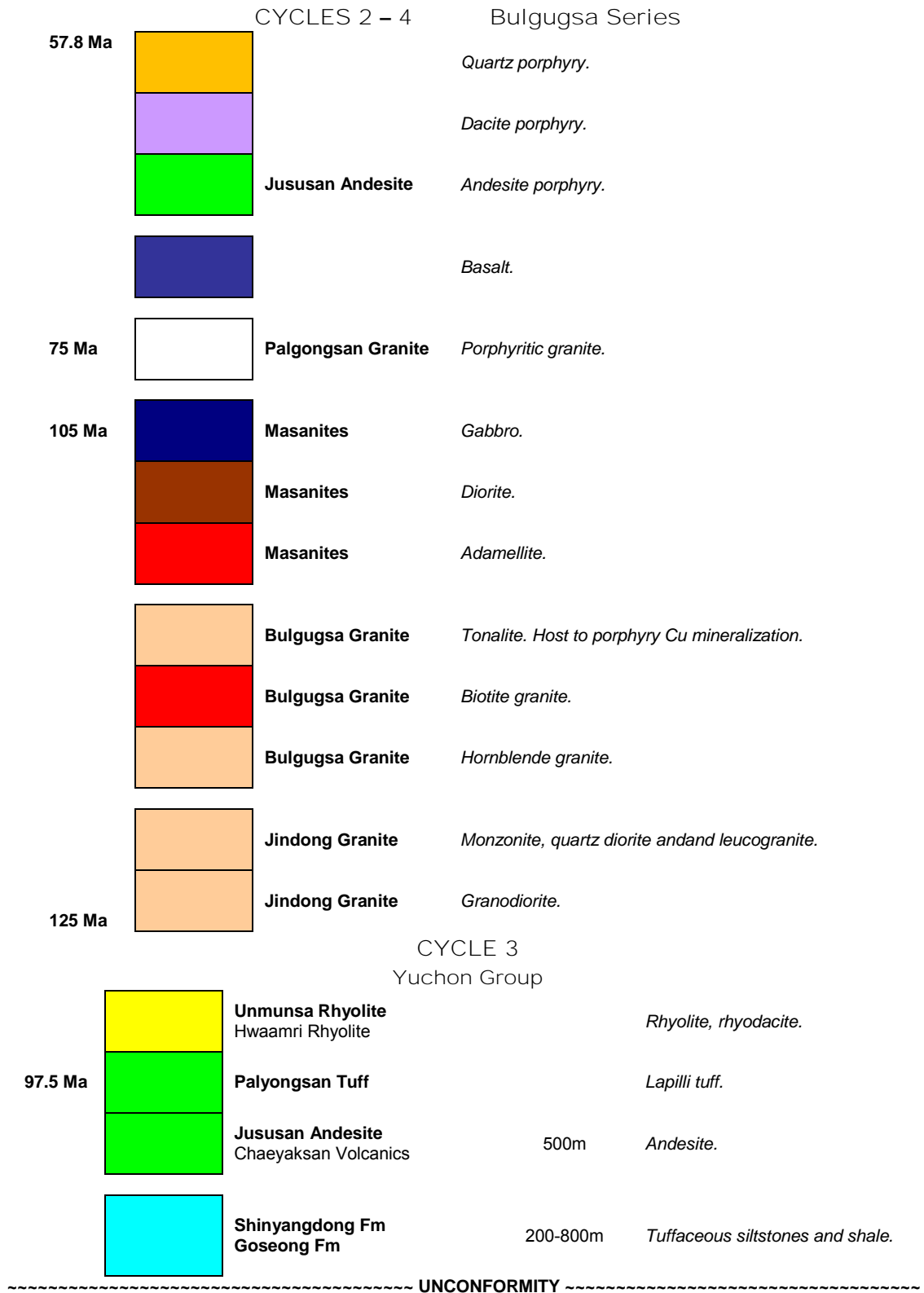


Figure 9. Regional Geology of the Gyeongsang Basin. Refer to Stratigraphic Column for legend' Table 5.

**Table 5. Stratigraphic Column of the Gyeongsang Basin (After Sennitt, 2010 and modified after Chang, 1988 and KIGAM, 2001).**



CYCLE 2  
Hayang Group

114 Ma	KM7	<b>Chindong Fm</b> Kisadong Fm Chunsan Fm Kasongdong Fm Konchongri Fm Sinyangdong Fm Banyawol Fm	1100m	<i>Black shale and and intercalated thin oolitic limestone, stromatolitic limestones, minor sandstone and and conglomerate. Probable diatreme moat sediments. Dark grey lacustrine mudstone, green-grey chert (hornfels ?), caliche nodules, evaporate deposits.</i>
		<b>Gusandong Tuff</b>	4m	<i>Thin bed of crystal-rich rhyodacite ignimbrite at base of the Chindong Formation.</i>
	KM6	<b>Haman Fm</b> Sagok Fm Dogyedong Fm Chongokri Fm	800m	<i>Purple mudstones, shale, siltstone and and sandstone.</i>
		<b>Osipbong Volcanics</b> Hakbong Volcanics	400m	<i>Basalt lava, agglomerate and and sandstone. Native Cu-bearing.</i>
		<b>Jeomgog Fm</b>	0-450m	<i>Dark grey shale, mudstone, conglomerate and and sandstone.</i>

-----DISCONFORMITY-----

CYCLE 1  
Hayang Group

	Km5	<b>Hupyeongdong Fm</b> <b>Silla Conglomerate</b> Chongryangsan Fm	240-500m	<i>Red bed pebble, cobble and and boulder volcanic conglomerate, sandstone, mudrocks.</i>
	Km4	<b>Chilgok Fm</b> Dongwachi Fm Ijjig Fm Ullyeonsan Fm	650m	<i>Red bed arkosic-feldspathic sandstone and and chert-pebble conglomerate, dark grey shale, nodular marl and and tuff.</i>
119 Ma	Km3	<b>Chinju Fm</b> Kyongjongdong Fm	600-1200m	<i>Dark grey sandstone, medium grey shale, marl and limestone with stromatolites, ooids and gypsum evaporites..</i>
124 Ma	Km2	<b>Hasandong Fm</b> Saniri Fm	550-1400m	<i>Red silty sandstone, silty shale, conglomerate.</i>
131 Ma	Km1	<b>Nakdong Fm</b>	840-2100m	<i>Basal conglomerate.</i>

~~~~~UNCONFORMITY~~~~~

### 6.1.3.1 Structure

Hwang (2008) and others propose that the Gyeongsan Basin developed in a regional continental strike-slip zone at a convergent plate boundary. They suggest the basin underwent several geotectonic stages of block rotations. East-west extension along pre-existing Jurassic age shear zones (the Andong and Homyeong Faults and the Jecheon Shear Zone) during the Early Cretaceous is believed to have resulted in the initial opening of the Gyeongsang Basin and continued throughout the basin development (Choi et al. 2002 and Egawa et al. 2006).

Dextral deformation along northwest-striking transfer faults then occurred and formed the northern and western boundary faults of the basin with basement. This tectonic activity resulted in debris fan conglomerates depositing along the fault margins into the basal sedimentary sequence during Cycle 1.

Kim and others (2000) conducted a lineament study using LANDSAT-5TM satellite imagery of the Uiseong Sub-basin. Analysis indicated the primary lineament directions in decreasing abundance were north northeast, east northeast and west northwest. Interpretation of satellite imagery by KIGAM (2001) indicated the dominant north northwest, northwest and subordinate north northeast fracture sets, as well as a series of circular ring fracture structures, some of which are associated with caldera-cauldron collapse (Hwasun, Mageumsan Cauldrons), diatremes (Uiseong and Shinyangdong) and others with intrusive plugs, see Figure 10.

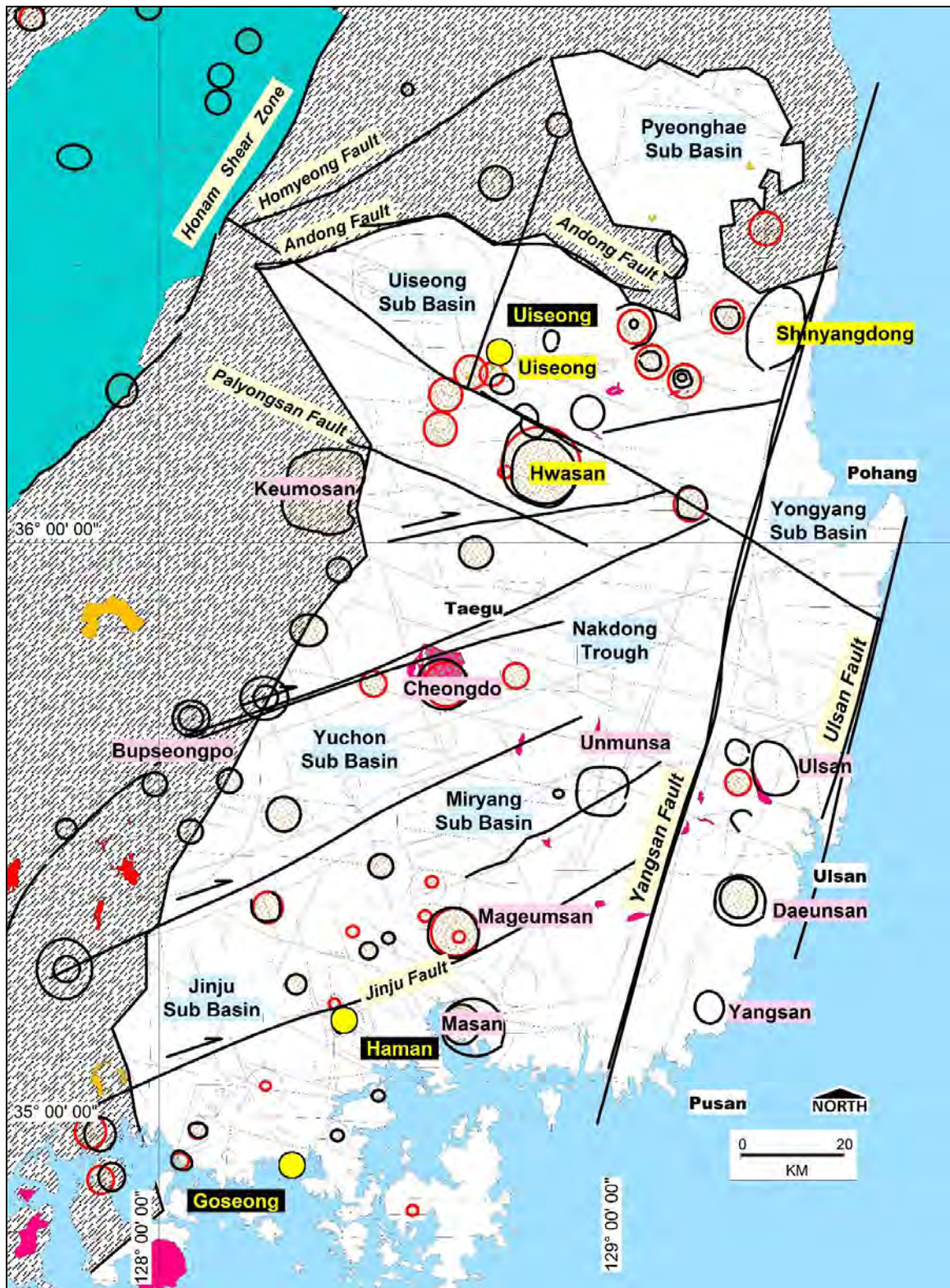


Figure 10. Tectonic Architecture Map of the Gyeongsang Basin showing intrusive structures possibly associated with mineralization. The various sub basin depositional-centres (light blue highlight), collapse calderas/cauldrons (pink highlight), diatreme complexes (yellow highlight) and intrusive centres (red circles) are indicated, together with lineaments and circular ring fractures.

### 6.1.4 PROSPECT GEOLOGY - UISEONG SUB-BASIN

The geology in the immediate tenement area is summarised on Figure 11.

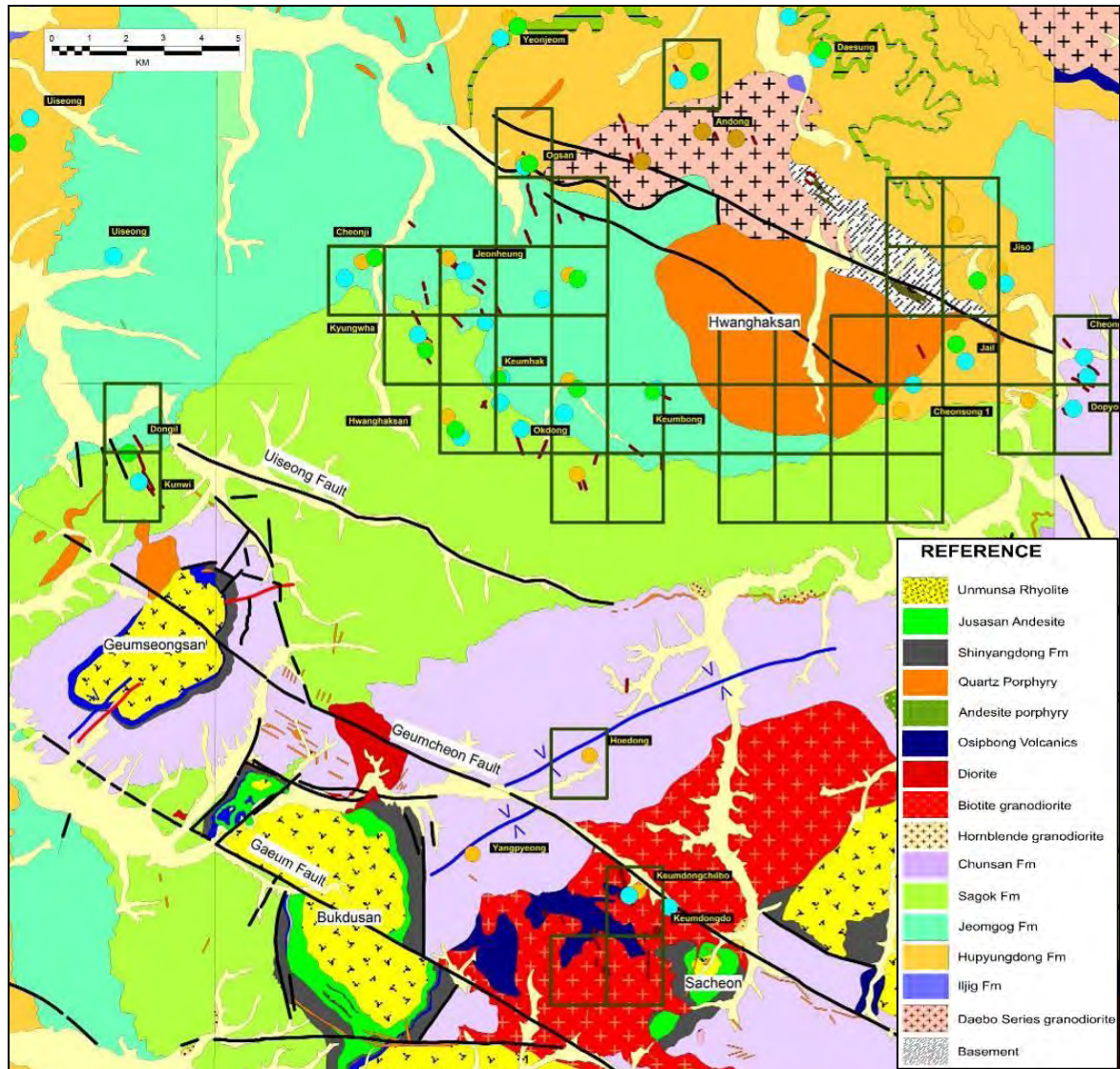


Figure 11. Geology – Uiseong Gold-Silver-Copper-Lead-Zinc Project.

### 6.1.5 DEPOSIT TYPES

The only recorded deposit types that are present are polymetallic (Au-Ag-Cu-Pb-Zn) epithermal/mesothermal quartz veins. These infill fissures are hosted in Cretaceous age sediments (Cycle 2) and volcanics (Cycle 3) of the Gyeongsang Basin. The quartz vein structures generally strike north northwest and occur in a subparallel, sheeted arrangement. Individual vein widths vary from 5 cm up to 2.0 m and tend to display ‘pinch and swell’ characteristics. Each deposit that has been investigated and mined historically contains several veins which vary greatly in strike length from a few metres to ~2000 m.

The characteristics are dealt with fully under 6.1.6 MINERALIZATION.

The geology of the Gyeongsang Basin is similar in age, tectonic setting and geology to the Andes mountain chain of South America. Consequently, mineralization styles found within the Gyeongsang Basin are also similar to those found in the Andes. They are all interpreted to be "intrusive-related", might be hosted in a number of settings and associated with a number of processes: volcanic stockworks and breccias above intrusives, diatreme-maar veins and breccias, limestone replacement mineralization, flow dome veins and breccias and caldera-related epithermal venation. KME considers that Mexican-style epithermal gold-silver, tourmaline breccia pipe and iron-oxide-copper-gold models may be applied in parts of the Gyeongsang Basin.

Perhaps the closest Mexican geological analogy for the Uiseong Metallogenic Province is the Zacatecas mining district, where a deeply eroded caldera has exposed ring dyke fractures, ashflow tuffs, and rhyolitic lava domes and plugs (Ponce and Clark, 1988). The Ag-Pb-Zn-Cu-Au mineralization occurs in concentric ring faults and tangential fractures hosted in Cretaceous microdiorite that is overlain by Tertiary red-bed volcanoclastic sandstones, tuffs and ignimbrites, with subaerial hot spring silica beds. The major structure trends are north northeast and northwest, identical to those of the Uiseong Sub-basin, with the fissure veins occurring as horsetail splay dilational jogs orientated west northwest.

Calderas and maar-diatreme vent-type facies are recognised at Geumseongsan, Bukdusan, Hwasun and Sacheon and are associated with rhyodacite intrusions. These areas are considered favourable for epithermal style precious metal deposits.

#### 6.1.6 MINERALIZATION

The mineralogy and fluid inclusions of the Au-Ag-Cu-Pb-Zn deposits were investigated in detail by Chi et al (1991), Choi and So (1992), Lee and Kim (1993) and Lee et al (2003). Two styles of epithermal mineralization were recognized within individual deposits, including gold-silver shallow-level epithermal style and a silver-base metal deeper-level epithermal style, as described in the following sections.

##### Gold-Silver Epithermal Style

Mineralogical studies indicate the presence of galena, pyrite, sphalerite, chalcopyrite, chalcocite, and silver-bearing tetrahedrite in decreasing relative abundance, with rare electrum, native silver, and argentite observed. Minor rutile, hematite and native copper (cuprite) were observed. Bladed carbonate pseudomorph replacement textures were observed in some veins suggesting boiling took place at shallow depth of vein formation of about 500 m.

Electron microprobe analyses indicate electrum and native silver are most closely associated with chalcopyrite, with native silver also associated with tetrahedrite and galena. Lee et al (2003) indicate there is a wide variation in Ag content within electrum. Fluid inclusions indicate relatively low temperatures of formation of quartz of 200-300°C. Sphalerite deposited at fluid temperatures of 180-270°C. Impurities recognised within sphalerite include cadmium but Lee et al. (2003) indicate the sphalerite is characterized by a low content of FeS. Salinities in fluid inclusions observed in quartz ranged from 1 to 5 eq.wt.% NaCl, indicating low-moderate levels of salinity. Oxygen fugacity levels of -32 to -34 atmospheres were recorded.

### Silver-Base Metal Epithermal Style

Mineralogical studies indicate the presence of pyrite, sphalerite, galena, and arsenopyrite in decreasing relative abundance, with minor chalcopyrite, bornite, silver-bearing tetrahedrite and the sulphosalts polybasite and pyragyrite. The base metal sulphides are generally coarse grained.

Electron microprobe analyses indicate silver-bearing tetrahedrite and sulphosalts are most closely associated with pyrite, galena and sphalerite. Impurities recognised within sphalerite include iron, manganese, and antimony. Fluid inclusions indicate higher temperatures of formation of 250-350°C with sphalerite depositing at 270-320°C. Salinities in fluid inclusions observed in quartz ranged from 2 to 6 eq.wt.% NaCl, indicating moderate levels of salinity. Oxygen fugacity levels of -36.5 to -38.5 atmospheres were recorded.

The combination of base metal sulphides with Ag-bearing sulphosalts, accompanied by Sb, reflect a higher temperature, moderate salinity epithermal mineralizing fluid found at palaeo-depths of 500-1000 m.

### Paragenesis

Examination of cut slabbed hand specimens from the Keumdong Chilbo and Dongil-Gunwi mine dumps by Senlac Geological Services Pty Limited (“Senlac”) has identified the following paragenetic sequence:

#### Stage I Chalcedony and Cryptocrystalline Quartz

The earliest vein phase consists of grey coloured, cloudy fine-grained chalcedonic and cryptocrystalline quartz. The veining is clearly of a low-temperature quartz style. Bands of fine sulphide are observed in this phase. Bladed pseudomorph carbonate replacement textures were observed in this phase at Keumdong Chilbo.

#### Stage II Breccia

The middle vein stage is a breccia overpressure event that overprints the early Stage I chalcedony-cryptocrystalline quartz phase. Both angular and milled clasts of Stage I veining have been entrained and then cemented in the matrix of the breccia by fine silica and cryptocrystalline quartz.

#### Stage III Sulphide-Quartz-Carbonate

The open spaces resulting from the Stage II breccia event have been infilled by sulphides, comprising coarse grained galena, sphalerite, pyrrhotite with chalcopyrite. Crustiform and sacharoidal comb quartz and occasional adularia have then deposited followed by late “dog-tooth” comb quartz crystals in remaining open spaces. These quartz crystals contain low-density vapour-rich inclusions. Finally, fluorite, calcite, siderite and rhodochrosite were deposited.

### Alteration

Lee et al (2003) identified alteration minerals consisting of silica, sericite chlorite, epidote, carbonate, siderite and fluorite. A sericite-pyrite-carbonate alteration (phyllic assemblage) is typically developed around the mineralized veins within the intrusive at Keumdong Chilbo. Silica-sericite-celadonite-clay altered volcanoclastic (phyllic assemblage) was observed at Dongil-Gunwi.

Age dating indicates mineralization within the Uiseong Metallogenic Province is constrained to the period 78-60 Ma and suggests polymetallic epithermal hydrothermal systems were active over a period of possibly up to 18 Ma.

## Conclusions

The mineralization observed in the Uiseong Metallogenic Province is consistent with low-temperature, low-sulphidation style of epithermal mineralization and formed at epithermal palaeo depths of formation of 500-1000 m. Fluid inclusions contain low-moderate salinity levels (2 to 6 eq.wt.% NaCl), which together with anomalous levels of molybdenum, bismuth and antimony and probably reflect a reduced, near-neutral, dilute hydrothermal fluid, originally developed from a distal magmatic source. The mineralization fluid characteristics are consistent with mixing of a distal magmatic-derived fluid with circulating cooler, dilute oxidizing meteoric fluids at shallow-deep epithermal levels. The co-existence of two epithermal styles suggests telescoping-overprinting of the early Au-Ag-Cu system by an advancing and hotter Ag-Pb-Zn mineralized hydrothermal fluid.

## 6.1.7 EXPLORATION

Systematic rock chip sampling of the historical mine dumps and outcropping vein structures at the Dongil-Gunwi and Keumdong Chilbo mines was undertaken by Senlac with the objectives of determining the geochemical tenor of each vein structure, mineral paragenesis and also to identify possible geochemical zonation patterns to assist exploration targeting.

### Metal associations

The geochemical tenor of the main vein structures and mineralization consists of the following metal associations:

- Quartz veining accompanied by Zn-Pb-Fe-As-Cu ± Au-Ag-Mo-Sb.
- Disseminated and fracture-filling sulphide style mineralization containing Zn-As-Pb-Fe-Cd ± Ag-Sb-Bi.

Au-Cu dominant mineralization is identified from drill results at the Keumdong Chilbo, Dongil-Gunwi, Ogsan, Kyungwha, Keumhak and Jeonheung mines.

Ag-Pb-Zn dominant mineralization is identified from drill results at the Keumbong, Cheonsong, Dopyung, and Daesung mines.

### Tenor and geochemistry

Rock chip sampling from Keumdong Chilbo in late 2015 by Senlac obtained consistent assays of 0.12-1.37 g/t Au, 16-307 g/t Ag, 0.06-0.24% Cu, 0.66-4.32% Pb, 0.36-9.66% Zn. The mineralization is accompanied by highly anomalous molybdenum (13-131 ppm Mo), antimony (0.17% Sb), arsenic (0.31-1.93% As), bismuth (16 ppm Bi), cadmium (550 ppm Cd), barium (900 ppm Ba), and iron (3-8% Fe) as magnetite.

Rock chip sampling from Dongil-Gunwi in late 2015 by Senlac obtained maximum assays of 0.60 g/t Au, 94 g/t Ag, 905 ppm Cu, 2.42% Pb, 16.60% Zn from a sample of siliceous breccia with coarse-grained base metal sulphides and several samples of disseminated and thin discontinuous fracture-filling sulphides in volcanoclastic sandstone. The mineralization is accompanied by highly anomalous levels of arsenic (>15.00% As), bismuth (65 ppm Bi), cadmium (1125 ppm Cd), antimony (153 ppm Sb), and iron (19.95% Fe) as pyrrhotite.

## Exploration Targets

At the Dongil-Gunwi Mine, Senlac compiled a drilling database from the historical drilling data, with significant drill intersections presented in Table 6 below. The surface projections of the drill intersections are illustrated in Figure 12. From the surface projection of the mineralized structures, it is apparent that the Dongil-Gunwi vein stockworks can be traced, possibly continuously, over a strike length of 2,000 m, varying in width from 0.7 m up to 23.0 m.

Using the historical drill results, Senlac prepared a preliminary Exploration Target estimate compliant with the JORC Code (2012) for the vein structures, using several assumptions, see Table 5:

- True vein width was not estimated.
- Specific gravity of 2.75 g/cc.
- Length equals the estimated along strike influence for the intersection.
- Depth equals the vertical height of 150 m below surface.
- No mining parameters were applied.
- Cutting of grades was not applied.

Exploration Target for the Dongil-Gunwi Mine of 8.0 to 10.0 million tonnes grading between 0.8 and 1.3 g/t Au, 40 to 55 g/t Ag and 0.5 to 1.1% Cu. Lead and zinc can be expected to grade around 1%.

It is uncertain that evaluation and further work will result in the estimation of a Mineral Resource in accordance with the JORC Code (2012).

**Table 6. Drill intersections - Dongil-Gunwi Mine**

| Hole ID | Intersection (m) | Grade Au (g/t) | Grade Ag (g/t) | Grade Cu (%) | Grade Pb (%) | Grade Zn (%) | Length (m) | Depth (m) | Volume (k m <sup>3</sup> ) | SG (g/cc) | T (k t) |
|---------|------------------|----------------|----------------|--------------|--------------|--------------|------------|-----------|----------------------------|-----------|---------|
| 71-1    | 0.7              |                | 38             |              | 3.52         | 5.12         | 170        | 150       | 17.9                       | 2.75      | 49.1    |
|         | 1.1              |                |                | 0.03         | 4.35         | 1.78         | 170        | 150       | 28.1                       | 2.75      | 77.1    |
|         | 3.5              |                | 25             |              | 0.54         | 12.50        | 175        | 150       | 91.9                       | 2.75      | 252.7   |
| 71-2    | 0.3              |                |                | 1.61         | 0.05         | 6.15         | 133        | 150       | 6.0                        | 2.75      | 16.5    |
|         | 2.0              |                | 34             |              | 1.03         | 1.27         | 133        | 150       | 39.9                       | 2.75      | 109.7   |
| 71-4    | 1.0              |                |                | 1.05         |              |              | 190        | 150       | 28.5                       | 2.75      | 78.4    |
|         | 9.0              |                | 28             | 0.18         |              | 0.21         | 198        | 150       | 267.3                      | 2.75      | 735.1   |
| 73-1    | 7.0              | 2.25           | 201            | 4.00         | 0.63         | 1.15         | 90         | 150       | 94.5                       | 2.75      | 259.9   |
| 73-2    | 1.4              |                | 51             | 0.40         | 0.43         | 1.85         | 133        | 150       | 27.9                       | 2.75      | 76.8    |
| 76-1    | 1.8              |                | 225            | 2.12         | 1.02         | 3.01         | 163        | 150       | 44.0                       | 2.75      | 121.0   |
|         | 0.8              |                | 51             | 1.02         | 0.25         |              | 163        | 150       | 19.6                       | 2.75      | 108.7   |
| 76-2    | 13.6             |                |                | 2.37         | 0.14         | 0.99         | 111        | 150       | 226.4                      | 2.75      | 622.7   |
| 76-3    | 2.3              |                | 60             | 1.68         | 1.66         | 0.22         | 175        | 150       | 60.4                       | 2.75      | 166.0   |
|         | 0.4              | 2.00           | 102            |              | 1.24         | 0.12         | 109        | 150       | 6.5                        | 2.75      | 18.0    |
| 76-4    | 23.2             |                | 21             |              | 1.65         | 0.22         | 109        | 150       | 379.3                      | 2.75      | 1043.1  |
|         | 9.0              | 1.42           | 54             | 0.09         | 2.49         | 2.73         | 120        | 150       | 162.0                      | 2.75      | 445.5   |
| 76-5    | 11.0             |                | 38             | 1.52         | 0.12         |              | 231        | 150       | 381.2                      | 2.75      | 1048.2  |
|         | 3.2              |                | 45             | 0.48         | 0.10         | 0.28         | 212        | 150       | 101.8                      | 2.75      | 279.8   |

| Hole ID         | Intersection (m) | Grade Au (g/t) | Grade Ag (g/t) | Grade Cu (%) | Grade Pb (%) | Grade Zn (%) | Length (m) | Depth (m) | Volume (k m <sup>3</sup> ) | SG (g/cc) | T (k t) |
|-----------------|------------------|----------------|----------------|--------------|--------------|--------------|------------|-----------|----------------------------|-----------|---------|
| 76-6            | 21.3             | 0.93           | 55             | 0.11         | 2.42         | 0.71         | 222        | 150       | 709.3                      | 2.75      | 1950.5  |
| 77-1            | 0.6              | 3.2            | 305            | 4.12         | 14.22        | 11.48        | 109        | 150       | 9.8                        | 2.75      | 27.0    |
| 77-2            | 0.8              |                | 18             | 0.42         | 2.48         |              | 73         | 150       | 8.8                        | 2.75      | 24.1    |
| 77-3            | 6.0              | 0.01           | 45             | 1.63         |              |              | 54         | 150       | 48.6                       | 2.75      | 133.7   |
| 77-4            | 4.0              | 8.50           | 12             | 0.64         |              |              | 102        | 150       | 61.2                       | 2.75      | 168.3   |
|                 | 1.1              | 9.80           | 24             | 2.45         | 0.10         | 0.08         | 112        | 150       | 18.5                       | 2.75      | 50.8    |
|                 | 3.0              | 14.20          | 32             | 1.46         |              |              | 130        | 150       | 58.5                       | 2.75      | 160.9   |
|                 | 4.5              | 3.86           | 8              | 0.54         | 0.05         | 0.01         | 130        | 150       | 87.8                       | 2.75      | 241.3   |
| 78-3            | 2.1              | 0.09           | 276            |              | 1.92         | 0.78         | 173        | 150       | 54.5                       | 2.75      | 149.9   |
|                 | 3.0              | 0.30           | 310            |              | 1.99         | 5.59         | 164        | 150       | 73.8                       | 2.75      | 203.0   |
| 78-6            | 1.0              |                | 43             | 0.40         | 0.48         | 0.14         | 172        | 150       | 25.8                       | 2.75      | 71.0    |
| 79-1            | 0.3              | 2.20           | 2              | 0.07         | 3.33         | 0.63         | 50         | 150       | 2.3                        | 2.75      | 6.2     |
|                 | 1.4              | 1.30           | 59             | 0.05         | 0.20         |              | 50         | 150       | 10.5                       | 2.75      | 28.9    |
|                 | 1.4              |                |                | 0.09         | 0.16         | 9.29         | 50         | 150       | 10.5                       | 2.75      | 28.9    |
| 79-2            | 3.1              | 0.33           | 30             | 1.42         | 0.07         | 0.18         | 76         | 150       | 35.3                       | 2.75      | 97.2    |
|                 | 0.1              | 23.70          | 43             | 0.56         | 0.26         | 1.65         | 76         | 150       | 1.1                        | 2.75      | 3.1     |
| 79-4            | 2.2              |                | 25             | 0.34         | 0.57         | 0.70         | 123        | 150       | 40.6                       | 2.75      | 111.6   |
| Averages/Totals | 4.2              | 0.96           | 53             | 0.73         | 1.19         | 1.15         |            | 150       | 3239.9                     |           | 8909.6  |

Host rocks at the Dongil-Gunwi deposit are fine-grained dark grey and green sandstone, mudstone, grey-green shale and minor conglomerate of the Hayang Group, which strike east northeast, dipping moderately to the southeast. The sediments have been intruded by fine-grained cream-pink coloured rhyodacite (felsite) interpreted as a lava dome (see Figure 13).

Mineralization at the Dongil-Gunwi Mine consists of 1.0-3.0 m thick individual quartz veins hosted within a quartz vein network-stockwork and disseminated sulphide zone which is up to 20.0 m in width. The structure strikes north northwest, dipping steeply to the west and was traced over a strike length of 600 m and a vertical distance of >40 m within the underground workings. Within the quartz veins, primary sulphide minerals consist of chalcopyrite, galena, sphalerite, arsenopyrite, pyrrhotite and pyrite, along with malachite in the surface and weathered oxidized zone.

Senlac's interpretation of the magnetic anomaly map image identifies several magnetic anomalies and features, which might represent structural controls for mineralization that are associated with intrusions. An anomaly to the south of Dongil-Gunwi Mine corresponds with andesite porphyry intrusion into the Jeomgog Formation. A prominent circular "bullseye" magnetic high anomaly (>200 nT) lying within the Chunsan Formation is possibly related to the Bulgugsa Series granitoid mapped to the south. The most conspicuous magnetic anomaly in the Uiseong Metallogenic Province corresponds with a Bulgugsa series granitoid. A northwesterly-trending "ridge" of elevated magnetic response, corresponds to the Ogsan-Keumbong line of mineralized vein structures near the contact zone of a large quartz porphyry intrusion.

In comparison with other sectors of the Gyeongsang Basin, the Uiseong Metallogenic Province displays relatively elevated magnetic response. Detailed gravity surveys were undertaken in the Uiseong Sub-basin by Park et al (2008) and magnetotelluric surveys by Yang et al (2008), following limited gravity surveys by Yu et al (2005) and Kim et al (2000). As with magnetic surveys there is coincidence of features with intrusives and possible caldera/cauldron collapse structures.

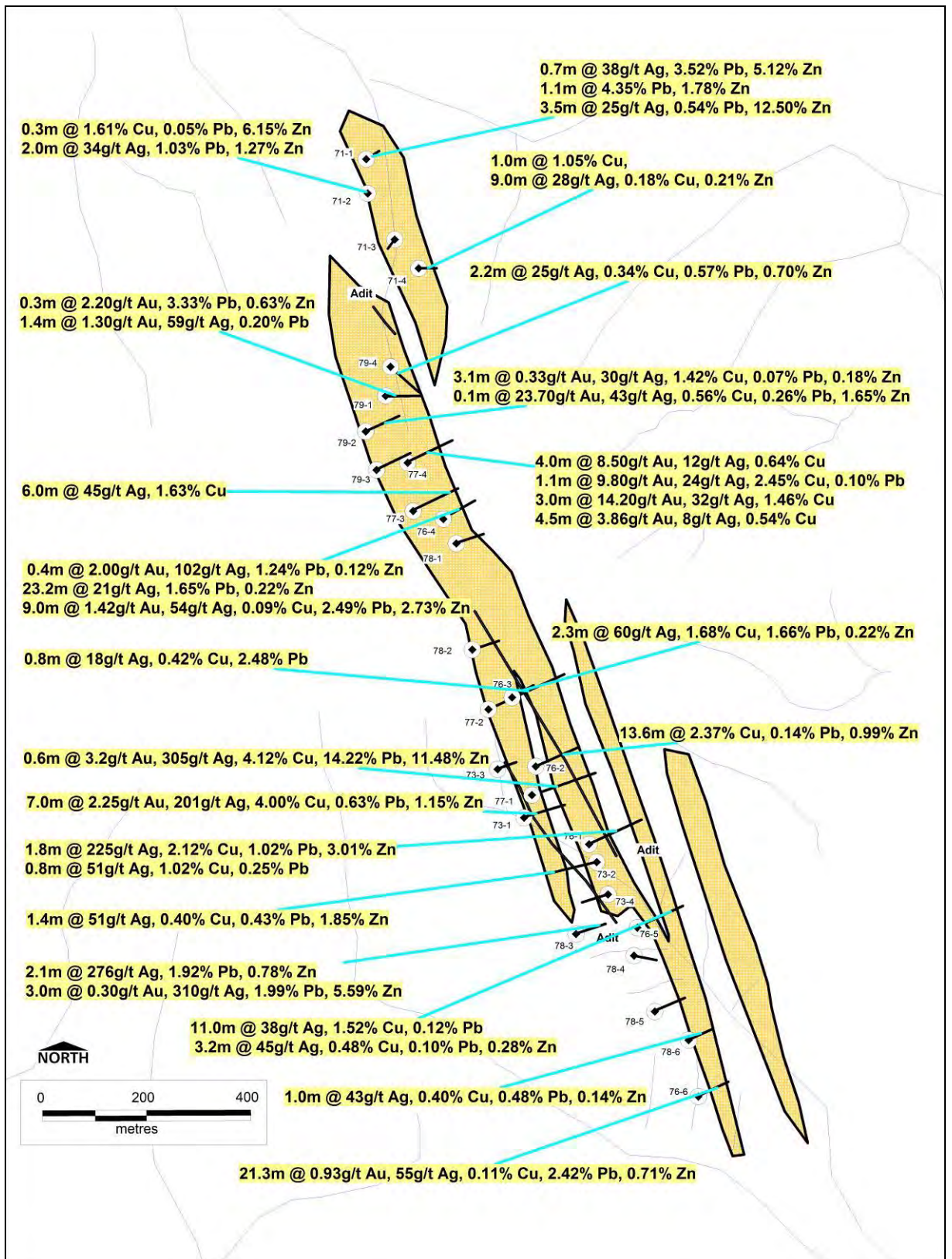


Figure 12. Dongil-Gunwi deposit drill plan showing KMPC drill intersections - plotted by Senlac.

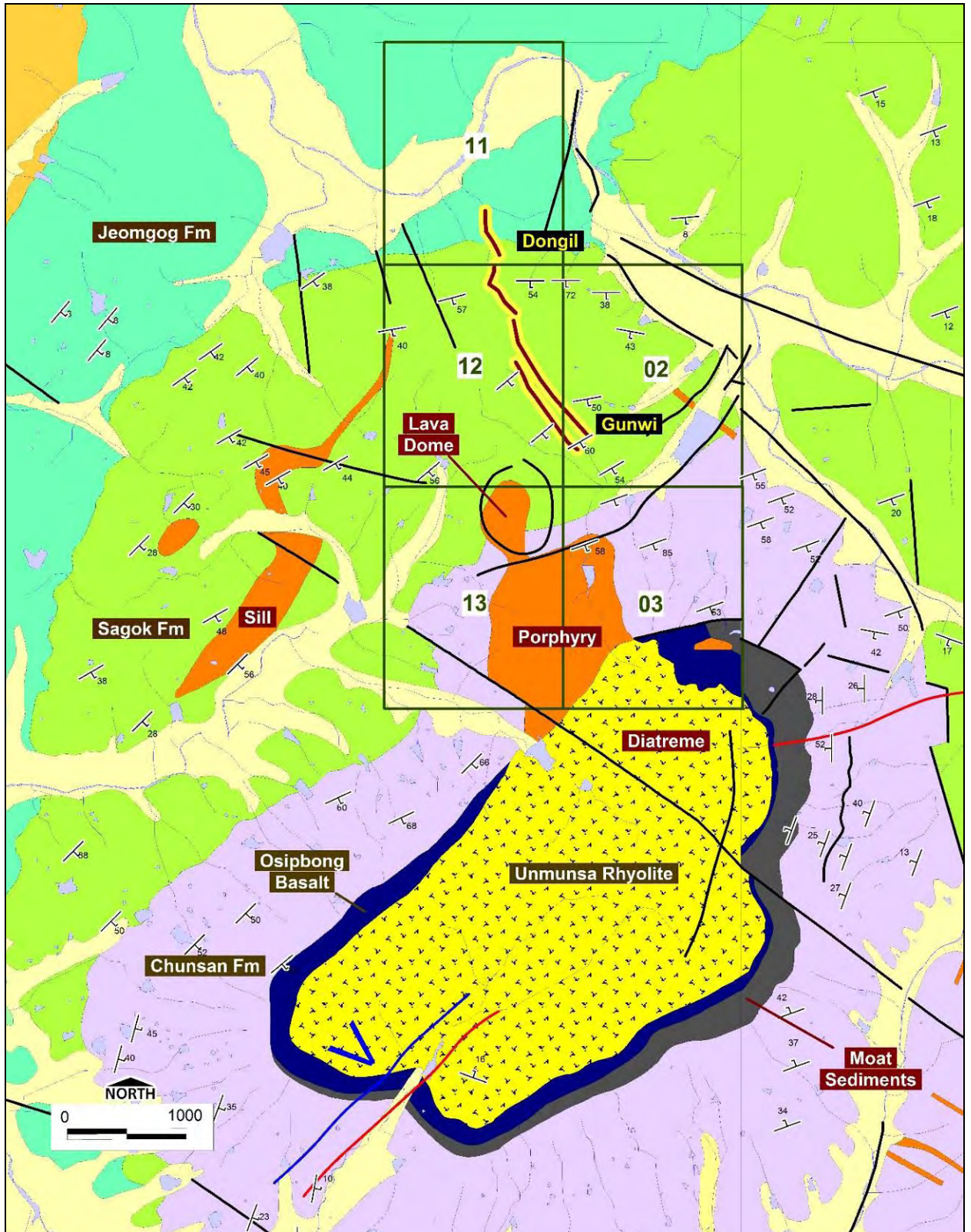


Figure 13. Geological map of the Dongil-Gunwi Mine area. The interpreted geomorphological features of the area are highlighted, including the rhyodacite sill, porphyry and lava dome intrusions and associated maar-diatreme complex infilled with moat sediments and pyroclastics.

### **6.1.8 DRILLING**

KME has not drilled in any of the Uiseong Project area. Historic drilling for minerals (see Section 6.1.2) was undertaken by KMPC during the 1970s and the KIER during the 1980s.

### **6.1.9 SAMPLING METHOD AND APPROACH - KME**

#### **6.1.9.1 Surveying**

KME used a Garmin GPS-60 hand-held GPS unit to locate sample sites. The GPS-60 is quoted to be accurate to within  $\pm 10.0$  m for locating sample positions.

#### **6.1.9.2 Sampling - General**

KME's sampling is of an acceptable industry standard. The majority was carried out by an experienced consultant with in excess of 34 years of experience. The entire bag of sample was despatched to the independent laboratory, which was responsible for all the sample preparation and analysis.

All sampling is completed using ticket books with the end tag going into the bag and the sample number is written in indelible marker on the bag. The ticket book also has the written GPS co-ordinates of that sample, as a back-up to the stored GPS readings that might fail.

Each type of sampling – soil, rock, stream etc, has their own sample numbers and separate sample number booklets. All the samples taken by KME are taken for the purposes of exploration. Most soil and stream exploration samples are taken to discover anomalies and therefore the importance of the analytical results are for comparative purposes rather than absolute values use. The sampling techniques and approaches are suitable for the purposes they are designed for.

#### **6.1.9.3 Stream Sediment Samples**

None was collected.

#### **6.1.9.4 Rock Chip Samples**

Rock chip samples are collected as a composite over the outcrop being examined or as a chip channel in the very rare case of a "wall" or pavement exposure.

Samples are always placed in marked calico bags, with an internal ticket.

### **6.1.10 SAMPLE PREPARATION, ANALYSES AND SECURITY - KME**

KME's sample preparation, analyses and security are of an acceptable industry standard. VWPL is not aware of any factors in the sampling procedures that could materially impact the accuracy/reliability of the results. None of the sample preparation and analyses was undertaken by KME staff or contractors but always by an independent laboratory.

### 6.1.11 Sample Transportation and Security

All samples for analysis were transported by field staff directly to DHL Air Express couriers in Seoul for air-freighting to Brisbane. Pulps from assays have been retained in storage at ALS Brisbane laboratory.

### 13.2 Laboratories

KME has used the Brisbane laboratory of the ALS Laboratory Group - Also known as ALS-Chemex ("ALS"). This group operates around the world and is a leading industry laboratory. The group is a "public testing service" company – Accreditation Number 825 and complies with the requirements of ISO/IEC 17025:2005. (Scope of Accreditation Report 17/09/2008).

ALS uses a wide range of analytical techniques including, but not limited to, Fire Assay, Atomic Absorption Spectroscopy (AAS), Inductively Coupled Plasma Atomic Emission Spectroscopy and Mass Spectroscopy (ICP-AES and ICP-MS), and X-Ray Fluorescence (XRF), to provide analysis of geological materials.

### 13.3 Rock samples

For all of KME's rock sampling, Au-AA26 and ME-MS61 (with GEO-4A01) methods were used.

Au-AA26 is a fire assay method of a sample weighing 50g, with ore grade analysis of gold using AAS to within 0.01 ppm accuracy limits.

ME-MS61 is an ICP multi-element method that uses a four-acid digest to ensure complete dissolution of the sample, in order to accurately determine 48 elements.

### 6.1.11 DATA VERIFICATION

Data is stored in Excel format. Back-ups of the databases are completed daily since the original system was introduced. The data has been backed up on various discs and hard-drives over the years.

Assay results are sent electronically by e-mail from ALS. PDF certificates are printed out and kept in folders as a hard copy.

The PDF copies are also kept on a file on the computer. Quality control certificates are filed on the computer only, and are not printed. CSV data format certificates are used as the format to transfer data by cut and paste into the database. The first entry into the database for any sample is the information from the ticket books. Coordinates are checked at this point with what is in the ticket book compared to the downloaded data from the GPS. Assay results are cut and pasted next to this information when it becomes available.

Sample ticket books are kept in the office of Senlac.

The author interviewed the Senlac consulting geologist who collected the samples. The author can find no reason to doubt the authenticity of the sample collection procedures.

ALS are recognised as one of the best mineral analytical laboratories in the county and internationally. The author can find no reason to doubt the authenticity of the sample analysis.

The author is satisfied that KME is presenting their projects responsibly as Exploration Targets in accordance with the JORC Code (2012).

Also, exploration geologist R Dawney, representing VWPL, visited some areas of the Uiseong Project. These included:

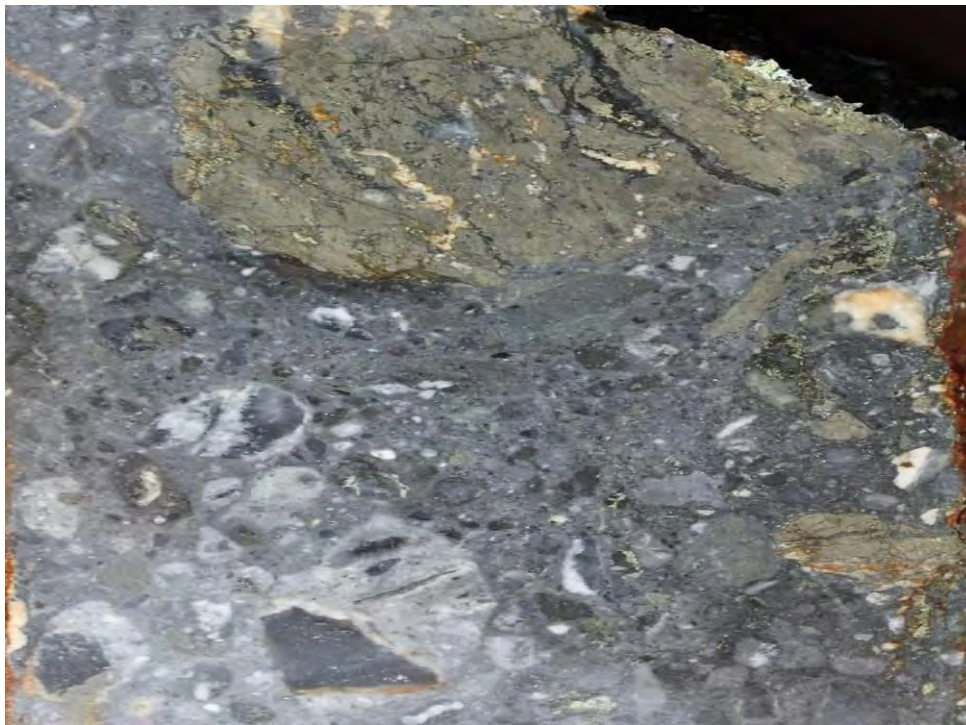
- The Dongil-Gunwi Mine area (western sector),  
In this area there was a rehabilitated tailings dam and mining area, a gated adit and fenced shaft on a hillside, abundant secondary copper minerals in wall rocks, and a couple of probable drill pads from the 1970s drilling campaigns.



**Photograph 1 View looking west of moderately-dipping, intensely altered and mineralized volcano-lithic sandstones and siltstones outcropping at the southern part of the Dongil-Gunwi Mine. The limonite-hematite oxidised iron staining is replacing disseminated and fracture-filling sulphides.**



**Photograph 2. Cut slab of hornfelsed siltstone with disseminated and very thin discontinuous fracture-filling base metal sulphide veinlets, collected from the northern part of the Dongil-Gunwi Mine. Sample No 242716; 27g/t Ag, 905ppm Cu, 1.59% Pb, 1.13% Zn, 0.45% As, 13 ppm Bi, 44ppm Sb and 6.08% Fe as pyrrhotite.**



**Photograph 3. Cut slab of mineralized hydrothermal breccia from the southern part of the Dongil-Gunwi Mine. Note the clasts of bedded massive sulphide (pyrrhotite-pyrite-chalcopyrite), sediments and quartz-carbonate veining, cemented in a finer matrix of rock flour, sulphides (pyrite, chalcopyrite) and comb quartz, clearly indicating multiple episodic phases of mineralization.**



**Photograph 4. Cut slab of breccia-veinlet stockwork in volcano-lithic sandstone from the southern part of the Dongil-Gunwi Mine. The sandstones contain abundant disseminated early stage ruby brown grains of sphalerite. The core of the breccia veins consist of pyrrhotite and chalcopyrite, with margin rims of the veins composed of galena and lesser black sphalerite (iron-rich species marmatite). Some of the chalcopyrite is being replaced by covellite-bornite. The orange coloration is an oxidation and feldspar alteration halo developed around the vein breccia composed of adularia. The observed mineralogy and alteration effects are consistent with reducing-oxidation interface conditions in a complex fluid mixing environment.**

- Jeonheung Mine area (central sector).  
Here there was an operating water treatment plant for acid mine drainage (AMD) and rehabilitated tailings dam, mullock dumps and plant site, and a capped, 200 m-deep shaft. The dumps contained common sulphidic lode rocks and one outcropping wall of rock had abundant secondary copper minerals and white sulphates on it.
- Kyungwha Mine area (central sector).  
At Kyungwha there were two collapsed adits and the core trays of two recent drill holes (KORES 2014) left on site. The dumps contained common epithermal banded sulphidic lode rocks with secondary copper minerals and white sulphates on them.

#### **6.1.12 ADJACENT PROPERTIES**

KME appears to have staked the most important known mines in the district but mineralization will occur outside the tenements. Activity by other parties has not been reviewed.

#### **6.1.13 MINERAL PROCESSING AND METALLURGICAL TESTING**

There has been no modern mineral processing or metallurgical testing in the Uiseong Project area. Metallurgical test-work on oxidized Pb-Zn-Cu ore from Jeonheung was conducted by the KMPC (Hwang and Yang 1977).

#### **6.1.14 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES**

There are no known resources on any of the KME mineral properties in the Uiseong Project apart from historical remnants at abandoned mines.

## 6.2 HAMAN POLYMETALLIC PROJECT

The Haman Cu-Co-Au-Ag Project is situated in the southern coastal region of the Korean Peninsula, approximately 300 km southeast of Seoul. The Haman district was the principal copper and cobalt producing region of South Korea up until the end of World War II. KME considers the area to be prospective for breccia-hosted iron oxide copper gold deposits, associated with a tonalite intrusion into sediments. The area has not been explored by modern western exploration methods and concepts.

KME has identified Exploration Targets for resource definition drilling at the Gunbuk and Ogok deposits. Additional exploration targets have been identified as requiring further investigation before resource drilling.

This report has been prepared in compliance with the JORC Code 2012 Edition of Reporting of Mineral Resources and Ore Reserves guidelines.

### 6.2.1: HISTORY OF MINING AND EXPLORATION

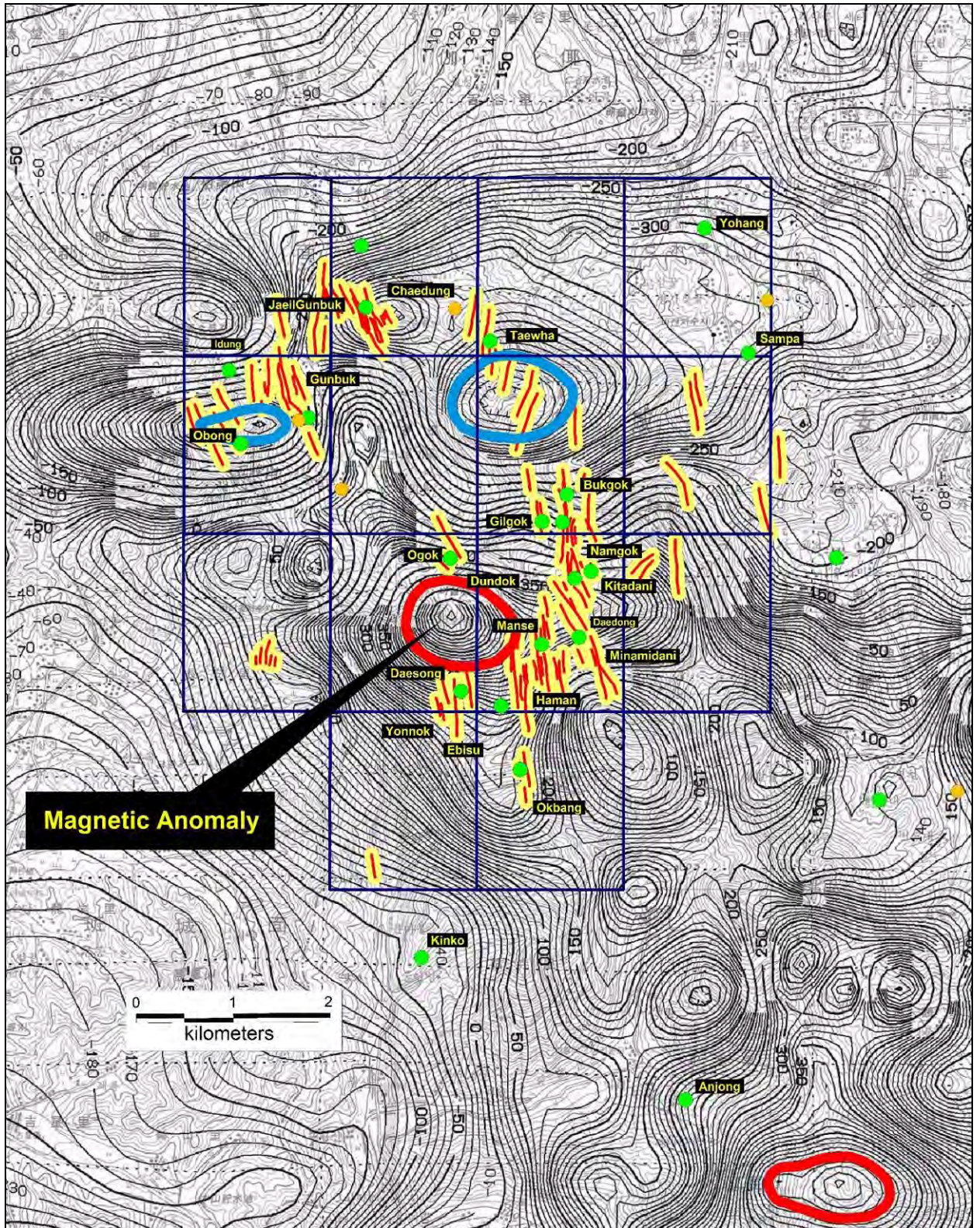
Previous exploration was conducted during 1968-1980 by the KMPC (1970s) and the KIER in co-operation with the United Nations Development Program (“UNDP”) during 1975-1976. Exploration activities included heliborne VLF-EM, soil geochemical surveys and several diamond drilling campaigns totalling 94 holes for 19,676 metres.

KIGAM conducted a combined magnetic-radiometric and airborne geophysical survey during 1989-1991 over the Gyeongsang Basin. For details of the survey see above 6.1.1. At the Haman Project, the granodiorite batholithic rocks tend to exhibit a broad elevated magnetic geophysical response, whilst smaller individual plugs and stocks typically display strong “bullseye” magnetic high anomaly responses, see Figure 14.

The KMPC (1979) conducted a Self Potential (SP) ground geophysical survey using four N-S orientated grids over the Haman Mine area during 1979. Several conductive anomalies coincide well with known vein mineralization and others were subsequently drill tested.

In 1975, the UNDP undertook an airborne electromagnetic geophysical survey over the Obongsan and Okbang areas using a helicopter (Bosschart, 1975 and Sander Geophysics, 1976). One of the ElectroMagnetic (EM) anomalies in the Okbang area was trenched and exposed a 2 m-wide sulphide vein which assayed 2% Cu (Pak and Bang, 1976). Ground follow-up of the EM anomalies was undertaken using VLF-EM and ground magnetometer surveys (Pak and Bang, 1977). These methods were able to accurately locate the airborne EM anomalies in the field.

KIGAM, 2001, conducted a country-wide stream sediment geochemical survey in 1971 to provide an excellent geochemical background database for the entire country, see above in 6.1.1. The association of a number of metals and some of the known mineralization is strong: a north northwest-trending Cu and Co anomaly, covering a 5 km by 2.5 km area. It corresponds to the numerous copper workings and a tonalite intrusion.



**Figure 14. Residual Magnetic Intensity Map of Haman Project. The prominent intense “bullseye” magnetic anomaly of >450 nT is indicated and outlined in red with the two intense magnetic low anomalies of <450 nT outlined in blue.**

KIGAM-UNDP carried out soil geochemical surveys over three grids established in the Okbang area (Kim et al, 1977). Sample spacing was 50 m by 20 m, with samples

Korean Metals Exploration Pty Limited  
 NI 43-101 Report.

VWPL May 2017

analysed for Cu, Pb, Zn, Co, Ni, Mo, As and Mn using AAS (Atomic absorption spectrophotometry). An orientation vegetation geochemical sampling program was also trialled, using tree leaves. Five elevated Cu soil geochemical anomalies were detected over the Okbang soil grids.

The KMPC and KIER carried out geophysical surveys and diamond drilled many of the deposits in the Haman field.

The sampling and assaying of the small diameter BQ size (36.5 mm diameter) drill core by the KMPC and KIER was sporadic, incomplete and selective in nature. Copper was only routinely analysed over selected intervals. Au and Ag were analysed to a lesser extent and Co and W only very rarely. There was no sampling outside of obvious mineralized zones and it is considered highly likely some subtle mineralized zones were not detected by this sampling. No drill core remains available for inspection.

### Gunbuk and Jaeilgunbuk Mine Areas

The KMPC (1975) conducted a Self Potential (SP) ground geophysical survey using five small grids over the Gunbuk and Jaeilgunbuk Mine area during 1973-1975. Conductive anomalies appear to coincide well with known mineralization at Jaeilgunbuk.

In 1975, the UNDP undertook an airborne electromagnetic geophysical survey over the Obongsan and Okbang areas using a helicopter (Bosschart, 1975 and Sander Geophysics, 1976).

Ground follow-up of the EM anomalies was undertaken using VLF-EM and ground magnetometer surveys (Pak and Bang, 1977). These methods were able to accurately locate the airborne EM anomalies in the field. Ground follow-up of several EM anomalies indicated the source was likely to be disseminated sulphides in andesite porphyry dykes related to mineralized veins (Bosschart, 1976).

KIGAM in co-operation with the UNDP undertook a soil geochemical survey over a grid established at Obongsan (Kim et al, 1977). Sample spacing was 50 m by 20 m, with samples analysed for Cu, Pb, Zn, Co, Ni, Mo, As and Mn using AAS. An orientation vegetation geochemical sampling program was also trialled, using tree leaves. This soil geochemical survey detected the small Pb soil geochemical Anomaly 'F' on the north face of Obongsan, which corresponds well to an adit.

There have been five drilling campaigns undertaken by the KMPC at the Gunbuk Mine, including:

- 6 holes drilled in 1969 for a total of 870 m, drilled from within underground adits (KMPC, 1969).
- 9 holes drilled in 1973-1974 for 1650 m (KMPC, 1973).
- 5 holes drilled in 1975 1350 m (KMPC, 1975).
- 2 holes drilled in 1978 for 400 m (KMPC, 1978).
- 8 holes drilled in 1979-1980 for 2091 m (KMPC, 1979).

Two drilling campaigns were undertaken by the KMPC at the Obong Mine, comprising:

- 5 holes drilled in 1975 for 700 m (KMPC, 1975). Drillholes 75-1 and 75-2 tested the two SP anomalies immediately west of the main Gunbuk Vein (KMPC, 1975).
- 3 holes drilled in 1977-78 for 827 m (KMPC, 1978).

The KMPC estimated a small mineral resource at the Gunbuk Mine of 60,498 t grading 6.07% Cu, 15.92 g/t Au, 78.7 g/t Ag, and 1% Co. This mineral resource estimate is historical and does not comply with current JORC Code or NI-43-101 reporting standards.

Three drilling campaigns have been undertaken by the KMPC on the western sector of the Jaeilgunbuk Mine, mainly testing the northern extension of the Daesin Vein, including:

- 3 holes drilled in 1969 for a total of 450 m (KMPC, 1969).
- 2 holes drilled in 1973 for 400 m (KMPC, 1973).
- 2 holes drilled in 1975 for 300 m (KMPC, 1975).

The KMPC estimated a mineral resource at Jaeilgunbuk of 60,847 t grading 1.07% Cu and 1% Co. It should be noted that this mineral resource estimate is historical and does not comply with current JORC Code or NI-43-101 standards.

The main vein system at the Jaeilgunbuk mine has not been drill tested.

## Ogok

Four drilling campaigns have been undertaken by the KMPC at the Ogok Mine, including:

- 2 holes drilled in 1973 for a total of 310 m (KMPC, 1974).
- 4 holes drilled in 1977 for 1200 m (KMPC, 1978).
- 4 holes drilled in 1978 for 950 m (KMPC, 1978).
- 2 holes drilled in 1980 for 1100 m (KMPC, 1980).

## Gilgok and Dundok

Four drilling campaigns were undertaken by the KMPC at the Gilgok and Dundok workings, including one hole drilled in 1970 for 130 m (KMPC, 1970), another three holes drilled in 1974 for 450 m (KMPC, 1974), one hole drilled in 1978 for 350 m (KMPC, 1978) and one hole drilled in 1980 for 180 m (KMPC, 1980).

The most significant mineralized drill intersections recorded included:

- 54.6 m grading 7 g/t Ag and 0.28 % Cu (Hole 78-5; 56.8-111.4 m).
- 1.4 m grading 0.70 g/t Au, 6 g/t Ag and 2.70 % Cu (Hole 79-3; 138.1-139.5 m).

## Namgok-Kitadani

Two drilling campaigns were undertaken by the KMPC at the Namgok-Kitadani workings, including four holes drilled in 1970 for a total of 620 m (KMPC, 1970) and another three holes drilled in 1978 for 785 m (KMPC, 1978).

The most significant mineralized drill intersections recorded included:

- 1.8 m grading 7 g/t Ag and 0.28 % Cu (Hole 78-6; 184.7-186.5 m).
- 0.2 m grading 3.00 g/t Au, 21 g/t Ag and 18.20 % Cu (Hole 78-7; 46.9-47.1 m).
- 6.9 m grading 0.30 g/t Au, 20 g/t Ag and 0.02 % Cu (Hole 78-8; 226.3-233.2 m).

### Haman and Ebisu

There have been four drilling campaigns undertaken by the KMPC at the Haman Mine, including:

- 2 holes drilled in 1970 for a total of 330 m (KMPC, 1970).
- 2 holes drilled in 1973 for 163 m (KMPC, 1973).
- 1 hole drilled in 1977 for 300 m (KMPC, 1978).
- 7 holes drilled in 1979 for 1,420 m (KMPC, 1980).

The most significant mineralized drill intersections recorded, included:

- 0.8 m grading 2596 g/t Ag and 2.66 % Cu (Hole 79-6; 12.4-13.2 m).
- 2.8 m grading 506 g/t Ag and 0.52 % Cu (Hole 79-6; 159.2-162.0 m).
- 1.7 m grading 0.70 g/t Au, 10 g/t Ag and 2.52 % Cu (Hole 79-7; 203.3-205.0 m).

### Okbang

In 1976, KIGAM-UNDP drilled three 150 m holes at the Okbang "M" Vein and two 150 m holes at the Okbang "C" Vein (Kim and Kim, 1977). The drilling intersected narrow zones of sulphide-mineralized veins.

The KIGAM-UNDP drilling program (Kim and Kim, 1977) tested two of the Okbang soil geochemical anomalies at the "C" Vein and "M" Vein and this drilling established mineral resources, see below.

There has been no exploration conducted in the Haman district between 1980 and 2016 apart from a brief inspection of the Haman and Gunbuk workings by Sennitt and Kim (1997) as part of Indochina Goldfields Limited gold-focussed exploration program in Korea during the late 1990s.

## 6.2.2 HISTORICAL MINE PRODUCTION

The Haman district was the principal copper producing region of South Korea up until the end of World War II. Some of the copper deposits were mined initially during World War I and then intermittently during the 1920's and 1930's, but most of the production recorded was during 1938-1945. The Gunbuk Mine was the oldest and largest copper producer in the district, followed by the Haman and Chaedung mines.

According to Japanese smelter records (Gallagher, 1963), a total of 4,030 tons of copper metal, 680 kg (21,865 ounces) of gold and 3,831 kg (123,183 ounces) of silver

were produced from some 66,000 tons of concentrate shipped to Japan during 1938-45.

A 100 tpd capacity flotation mill was located at the Gunbuk Mine, with a 150 tpd capacity stamper battery and a 50 tpd flotation mill situated at the Haman Mine's Ebisu Adit. Two sulphide concentrate products were recovered, including a pyrite-chalcopryrite concentrate that averaged 9-10% Cu, 5-6 g/t Au and 125 g/t Ag and an arsenopyrite-chalcopryrite concentrate that averaged 2% Cu and 1% Co.

At the Yonnok and Gunbuk mines, cobalt-bearing arsenopyrite ore was milled separately. According to Japanese smelter records (Gallagher, 1963), about five tons of cobalt metal was recovered during 1943-1945 from concentrates shipped from Yonnok and another four tons from Gunbuk.

During 1963-1975, the Jaeilgunbuk Mine produced (KMPC, 1975) a total of 29,846 t at an average grade of 19.71 g/t Au, 90 g/t Ag and 7.19% Cu, for 19,610 oz (610 kg) gold, 89,375 oz (2,780 kg) silver and 2,146 t of copper.

Gallagher (1963) indicates Japanese records for the Haman Mine report that a total of 22,998 t of concentrates were shipped to smelters in Japan, and 1,597 t of copper, 4,572 oz (142 kg) of gold and 67,511 oz (2,100 kg) of silver metal recovered.

#### **6.2.2.1 HISTORICAL ESTIMATES - REMNANTS**

The following mineral resources were estimated at some of the historical copper workings by the KMPC and the KIER:

- 101,204 t grading 2.69% Cu, 1 g/t Au, 85 g/t Ag and 1% Co at the Haman Mine.
- 60,498 t grading 6.07% Cu, 15.92 g/t Au, 78.7 g/t Ag, and 1% Co at the Gunbuk Mine.
- 60,847 t grading 1.07% Cu and 1% Co at the Jaeil Gunbuk Mine.
- 34,920 t grading 0.89% Cu at the "C" Vein at the Okbang Mine.
- 77,992 t grading 0.83% Cu at the "M" Vein at the Okbang Mine.

It should be noted that these mineral resource estimates are historical and do not comply with current JORC Code or NI-43-101 standards.

#### **6.2.3 GEOLOGICAL SETTING - GEOLOGY OF THE GYEONGSANG BASIN**

The regional geologic setting has been described above, see 6.1.3, when discussing the Uiseong Project.

#### **6.2.4 PROSPECT GEOLOGY – HAMAN PROJECT**

Figure 15 provides the basic geology and the mineralization of the district. Interpreted caldera structures and intrusive centres (in red) are derived mainly from airborne geophysics. Figure 16 shows the project geology.

The Haman district was the principal historical copper producing region of South Korea. The area is dominated by an east northeast-striking, gently south-dipping conformable sequence of Cycle 2 Gyeongsang Basin sediments of the Hayang Group, comprising the Haman and Chindong Formations. The Haman Formation contains massive and bioturbated to thinly bedded purple or green mudstones, chert and thin intercalations of sandstone. The Chindong Formation conformably overlies the Haman Formation, and consists of dark grey-green mudstones and chert. Occasional thin interbeds of sandstone occur.

The Cycle 2 sedimentary sequence has been intruded at the contact of the Haman-Chindong Formations by biotite granodiorite, tonalite, diorite and andesite porphyry, and late-stage gabbro. North northwest-striking dykes are also mapped in the area, including dacite porphyry in the footwall of the Gunbuk vein and diorite porphyry in the footwall of the Okbang vein. Younger, late-stage basalt dykes are mapped in the Silla Conglomerate to the north of Haman.

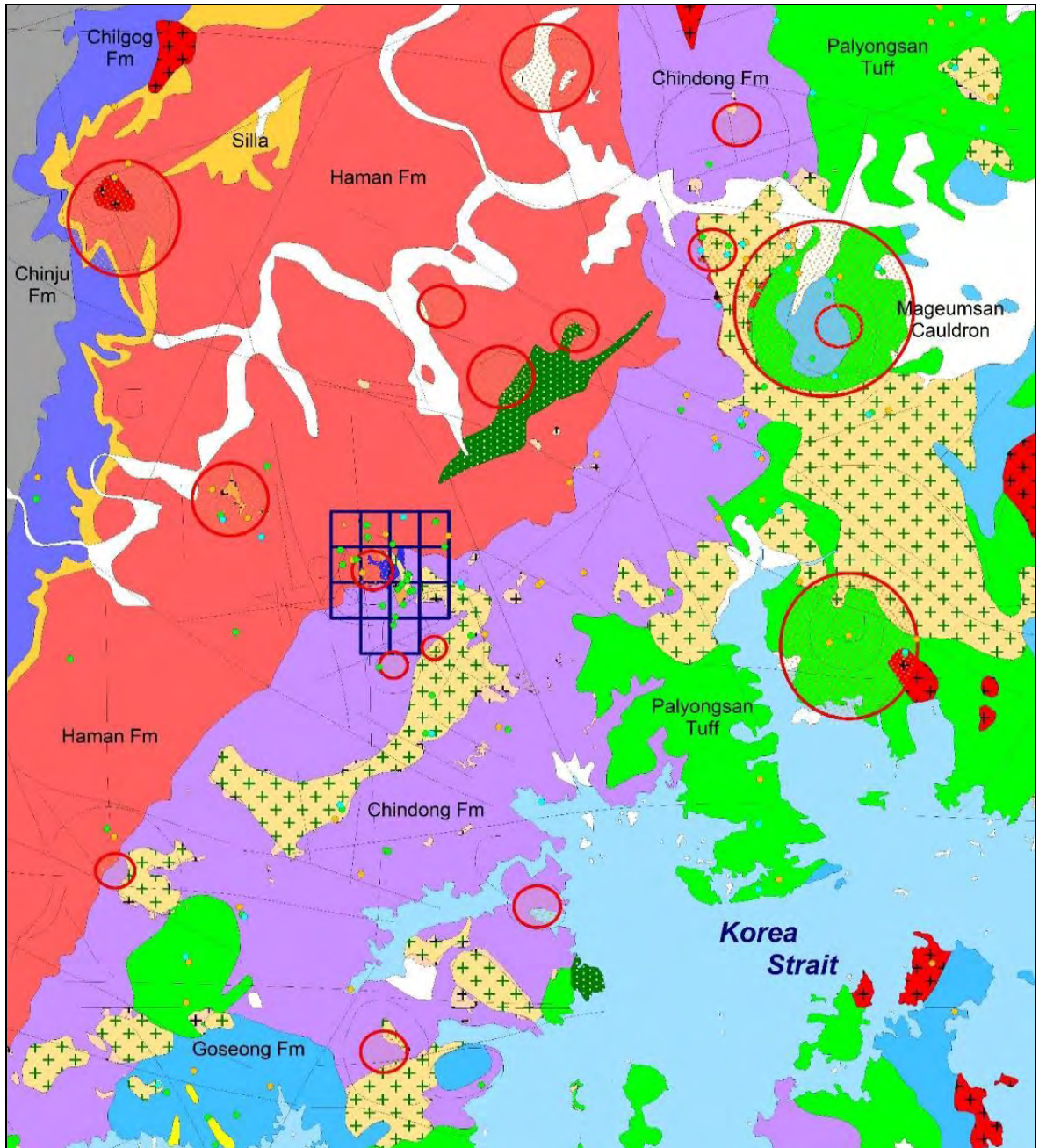


Figure 15. Simplified Regional Geology Map of the Haman district. Refer to Stratigraphic Column in 6.1.3 for legend.

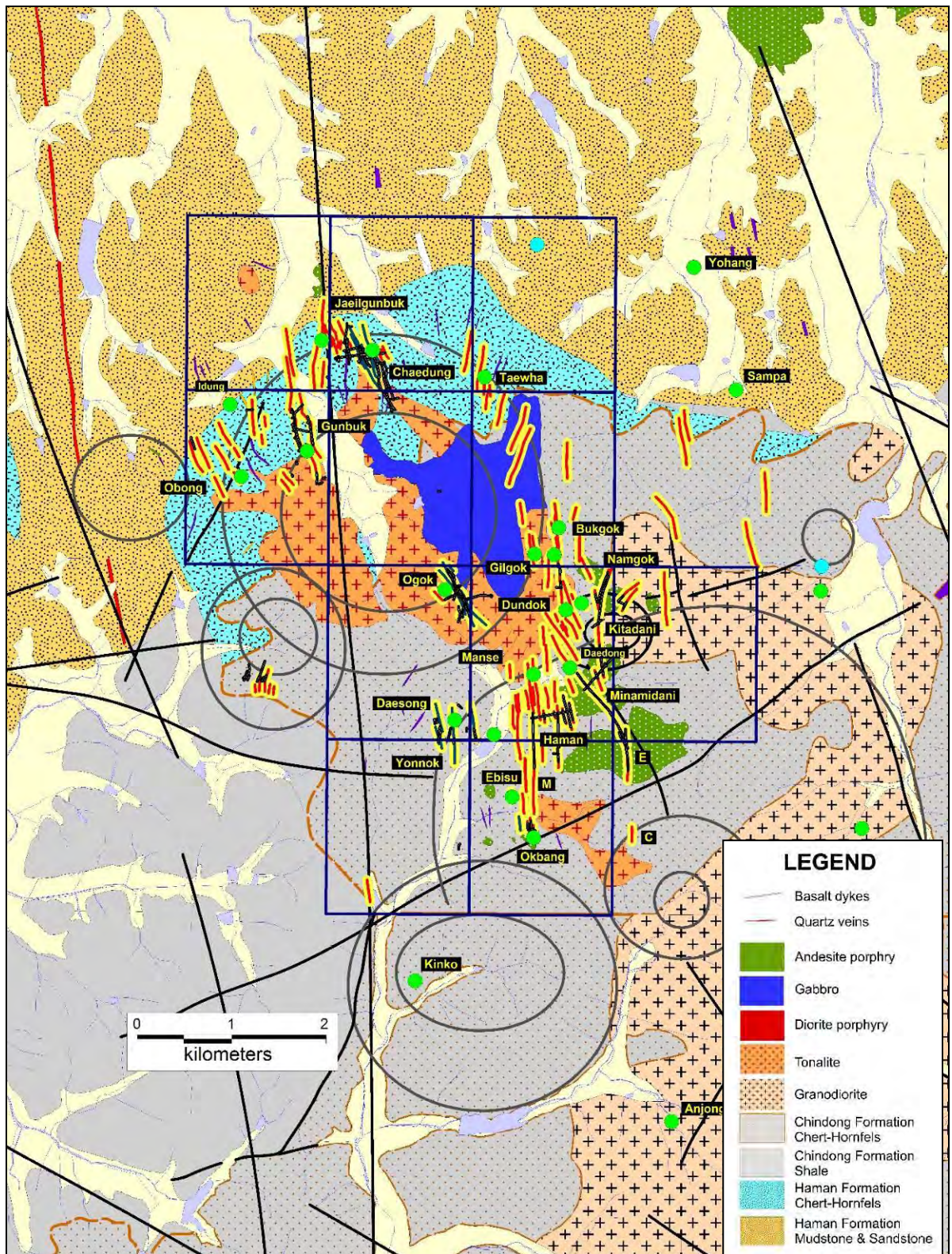


Figure 16. Geological Map of the Haman Project area. Mineral deposits are indicated as follows: Cu = green dots, Au = orange dots, Pb-Zn = light blue dots and Mo = dark blue dots. The vein structures are highlighted in red-yellow. The main fault structures and circular features derived from LANDSAT-7TM imagery are indicated.

## 6.2.5 DEPOSIT TYPES

The only recorded deposit types that are present in the Harman field are polymetallic (Au-Ag-Cu-Pb-Zn) mesothermal quartz veins, but Mo and Co may be in significant abundances. These are similar in style to those of the Uiseong Metallogenic Province, see 6.1.5 above. Both projects are in the Gyeongsang Basin with rocks of similar age, comparable intrusions and calderas and maar-diatreme development.

## 6.2.6 MINERALIZATION

The Au-Ag-Cu-Pb-Zn-bearing quartz veins of the Haman district generally strike north northwest or north northeast, occurring in a subparallel, en echelon, sheeted arrangement, dipping consistently steeply to the west. Individual vein widths vary from 5 cm up to 300 cm and tend to display 'pinch and swell' characteristics. Mineralization typically consists of fissure-filling, massive or banded comb quartz veins, with a sulphide-rich core composed of arsenopyrite-chalcopyrite-pyrite-magnetite. Vein-quartz textures observed include banded milky-grey cryptocrystalline-microcrystalline quartz, comb quartz and open cavity cockade quartz with calcite infill.

Sulphide minerals consist of chalcopyrite, pyrite and subordinate pyrrhotite and arsenopyrite, which are irregularly distributed as streaks, masses or disseminations. Cobalt occurs as cobaltite and as inclusions within arsenopyrite, particularly within veins hosted within tonalite (Gallagher, 1963). Minor scheelite, galena, sphalerite, molybdenite, native bismuth, stibnite and electrum are present. Silver typically occurs with bismuth. Gangue minerals consist of magnetite, specularite, hematite, tourmaline, quartz, scapolite, calcite, rhodochrosite, sericite and fluorite.

A three-stage paragenetic sequence was recognized by Park et al. (1985) and further detailed by Heo et al (2003).

### Stage I Early Vein

The early vein Stage I consists either of tourmaline-amphibole-barite-quartz with pyrite, or magnetite-quartz with pyrite, scheelite, chalcopyrite and cobaltite. Most of the iron oxide minerals, tourmaline and other silicate minerals were deposited in this stage.

A high-salinity (up to 60 wt% NaCl), high-temperature (550°C) brine is associated with the Stage I veining. Intermittent boiling is indicated by some of the inclusions in quartz. The Stage I veins were most likely derived from a proximal magmatic source.

An iron oxide alteration assemblage comprising hematite, specularite and magnetite accompanies this early saline vein fluid stage. A potassic alteration assemblage is also occasionally observed, comprising magnetite, chlorite and K-feldspar, surrounding the veins.

### Stage IIa Main Ore Vein

Stage II veining consists of comb quartz with chalcopyrite, pyrrhotite, galena, sphalerite, electrum, tetrahedrite, native bismuth, hessite and sulphosalts. Sericite-epidote alteration is observed on the margins of this vein stage. Fluid inclusions indicate this main ore vein stage had a low-moderate salinity (5.7-37.4 wt% NaCl), and a probably magmatically-derived moderate temperature fluid (170-373°C).

#### Stage IIb Late Breccia

The final vein Stage II is a breccia overpressure event that overprints the earlier vein stages, with resulting open spaces infilled by chalcopyrite accompanied by calcite, with lesser fluorite and rhodochrosite. Slabby breccia clasts of “rip and spall” chlorite-altered wall rock fragments are entrained in comb quartz.

Low-density vapour-rich inclusions and lower temperatures of formation (<290°C) are observed in this late stage breccia event, suggesting mixing of the magmatic-derived fluids with cooler, dilute, oxidizing meteoric fluids took place.

#### Stage III Late Vein

Calcite was deposited as the last vein filling phase and is barren.

Fluid inclusion studies conducted by Heo et al (2003) and Choi (2007) indicated copper was transported as a chloride complex and deposited at formation temperatures of 170-373°C, from fluids with salinities ranging between 5.7 to 37.4 wt% NaCl. There was evidence of both pH increase and intermittent boiling. The studies concluded that the early high temperature, high-salinity fluid was magmatically-derived (Choi, 2007) and later progressively mixed with cooler, more dilute meteoric hydrothermal fluids.

### 6.2.7 EXPLORATION

Interpretation of the Total Magnetic Intensity (TMI) and Residual Magnetic Intensity (RMI) data by Senlac indicates the following magnetic anomalies are present, see Figure 17:

1. A very intense “bullseye” magnetic high anomaly (>450 nT) coincides with the magnetite alteration zone identified by Senlac at the Ogok-Daesong-Manse mines and is interpreted to be caused by magnetite alteration.
2. Broad elevated magnetic response (>150 nT) of non-uniform pattern corresponding to the tonalite intrusion.
3. Broad subdued uniform low magnetic response (<150 nT) corresponding to sediments.
4. A prominent E-W-trending magnetic low anomaly (<450 nT) coinciding with the Gunbuk-Obong Mine. This anomaly is probably caused by magnetite-destructive argillic-phyllitic alteration.
5. A prominent circular “bullseye” magnetic low anomaly (<450 nT) coinciding with the layered gabbro intrusion and the Taewha-Bukguk mines. This anomaly is either caused by reverse-polarisation of the gabbro intrusion, or magnetite-destructive argillic-phyllitic alteration assemblages.
6. There are K-Channel anomalies of >50 cps corresponding with the Taehwa-Bukguk and Gunbuk-Obong mines.
7. There is a K-channel anomaly of >50 cps hosted in sediments south of the Ebisu and Okbang mines. This area has recessive eroded topography coincidental with a circular structure.
8. There is a Th-channel anomaly of >25 cps northwest of Obong.
9. There are U-channel anomalies of >16 cps coincidental with the Haman and Taewha-Bukguk mines.

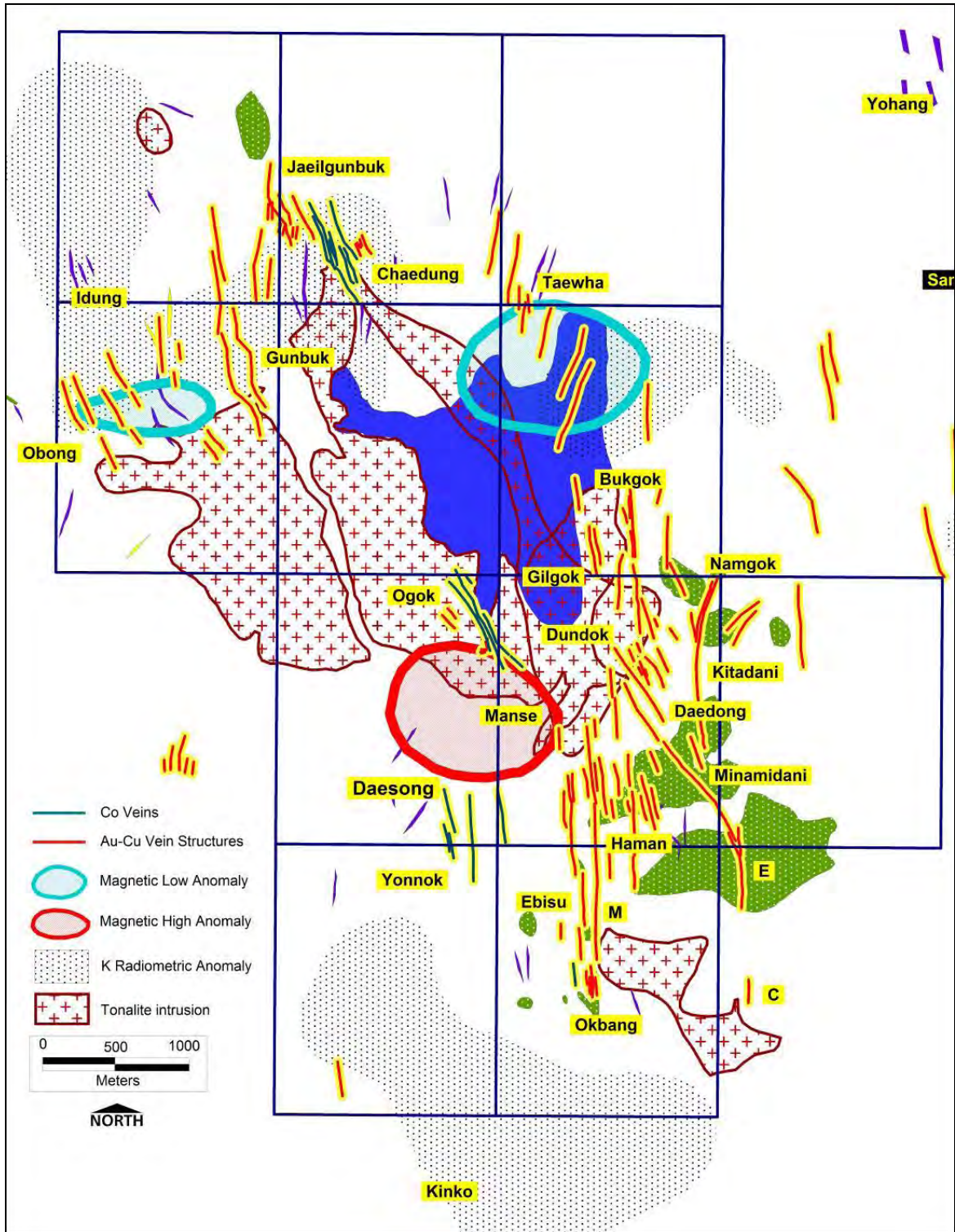


Figure 17. Compilation Map of Exploration Targets, Haman Project. Intense “bullseye” magnetic anomalies are outlined in red; Intense magnetic low anomalies are outlined in blue.

The various mine workings were visited and sampled in January 2016 by Senlac. A previous visit to the Haman district was made by Senlac in December 1997, as part of Indochina Goldfields Limited exploration program (Sennitt and Kim, 1997).

Senlac has reviewed the various mines and prospects of the Haman Project area and these are summarized below. They are described in sequence from north to south.

### Gunbuk - Obong

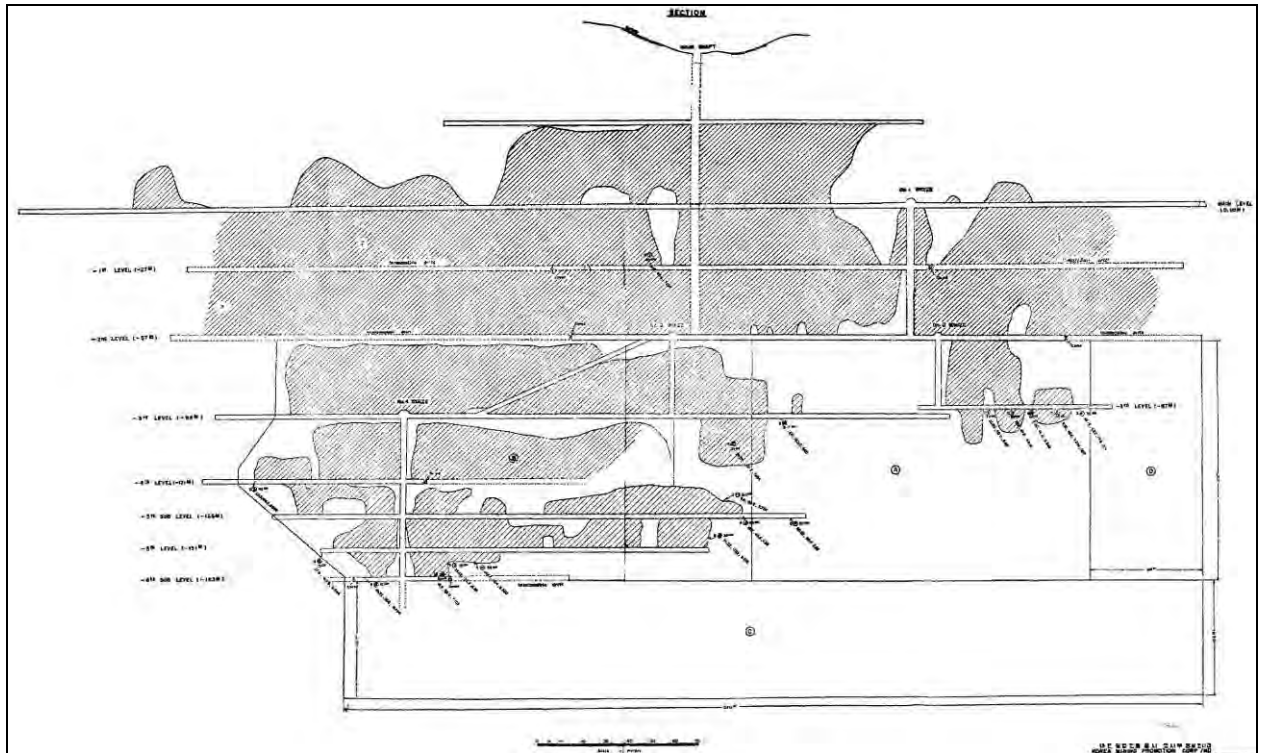
Mineralization at the Gunbuk Mine (also Gunpuku) and the Obong workings, situated 500 m to the west of Gunbuk, consists of at least 12 subparallel north northwest-striking quartz-sulphide veins. The eight veins at Gunbuk occur over an area of 1220 m strike length by 515 m wide. The four veins at Obong occur over an area of 790 m strike length x 365 m wide.

Gallagher (1963) reported the Main Vein at Gunbuk was 375 m long, 30 cm to 75 cm wide and worked down to a vertical depth of 200 m by means of the Main Shaft (165 m asl) and Main Adit (95 m asl), see Figure 18. The Main Vein was thought to have been mined out from surface (200 m asl) down to the 3<sup>rd</sup> Level (8 m asl), with some workings extending down to the 6<sup>th</sup> Level (-68 m asl). The following lateral mineral zonation patterns were observed in this vein:

- A central zone of the vein contained chalcopyrite with pyrite, pyrrhotite and minor arsenopyrite.
- The southern part of this vein was relatively poor in chalcopyrite but rich in cobaltiferous arsenopyrite as it continued to extend southwards into tonalite.
- The northern part of the vein was dominated by calcite and pyrrhotite.

The host rock is mainly chert of the Chindong Formation, with shales and mudstones of the Haman Formation outcropping in the northwest sector. Tonalite has intruded the sequence in the southern sector and the eastern flank of Obongsan mountain. Andesite porphyry dykes are associated with some of the vein structures.

Rock chip sampling of the mine dump at Gunbuk in 2016 by Senlac obtained significant results, including 0.19 g/t Au, 9 g/t Ag, 10.95% Cu, 235 ppm Co, and 472 ppm As.



**Figure 18. Longitudinal Section (Looking West) of the Main Vein at the Gunbuk Mine (KMPC, 1968). The section shows the extracted portions of the Main Vein from the Upper Level (128 m asl) worked down to the 6<sup>th</sup> Level (-68 m asl).**

Senlac compiled a drilling database from the historical drilling data, with significant drill intersections presented in Table 7a and 7b below. The surface projections of the drill intersections are illustrated in Figure 19.

From the surface projection of the mineralized structures, it is apparent that the Main Vein (West Vein) can be traced continuously over a strike length of 1260 m, varying in width from 0.7 m up to 9.4 m. The subparallel Daesin Vein (East Vein) can be traced continuously over a strike length of 700 m, varying in width from 0.4 m up to 10.2 m. The Daesin Vein possibly extends a further 500 m to the north, although the grade tends to decrease northwards.

Using the historical drill results, Senlac prepared a preliminary Exploration Target estimate compliant with the JORC Code (2012) for each vein structure, using several assumptions, including:

- True vein width was not estimated.
- Specific gravity of 2.75 g/cc.
- Length equals the estimated along strike influence for the intersection.
- Depth equals the vertical height of 200 m below the 3<sup>rd</sup> Level (1 m asl).
- No mining parameters were applied.
- Cutting of grades was not applied.

The Exploration Target for the Main Vein and Daesin Vein is 3.5 to 4.0 million t grading between 1.7 and 2.1 g/t Au, 65 to 75 g/t Ag and 3.9 to 4.1% Cu.

It is uncertain that evaluation and further work will result in the estimation of a Mineral Resource in accordance with the JORC Code (2012).

**Table 7a. Gunbuk - Drill intersections - Main (West) Vein.**

| Hole ID                | Intersection (m) | Grade Au (g/t) | Grade Ag (g/t) | Grade Cu (%) | Length (m) | Depth (m)  | Volume (m <sup>3</sup> ) | SG (g/cc)   | T (t)            |
|------------------------|------------------|----------------|----------------|--------------|------------|------------|--------------------------|-------------|------------------|
| 69-3                   | 1.00             |                | 45             | 0.15         | 136        | 200        | 27,200                   | 2.75        | 74,800           |
| 75-1                   | 0.40             |                |                | 1.35         | 106        | 200        | 8,480                    | 2.75        | 23,320           |
| 69-2                   | 1.60             |                | 32             |              | 58         | 200        | 18,560                   | 2.75        | 51,040           |
| 75-2                   | 0.60             |                |                | 0.78         | 202        | 200        | 24,240                   | 2.75        | 66,660           |
| 75-2                   | 0.80             |                |                | 2.84         | 154        | 200        | 24,640                   | 2.75        | 67,760           |
| 75-2                   | 0.50             |                |                | 1.27         | 154        | 200        | 15,400                   | 2.75        | 42,350           |
| 73-5                   | 3.10             | 2.40           | 53             | 1.18         | 50         | 200        | 31,000                   | 2.75        | 85,250           |
| 76-1                   | 9.40             |                |                | 0.83         | 100        | 200        | 188,000                  | 2.75        | 517,000          |
| 76-2                   | 1.80             |                |                | 1.11         | 120        | 200        | 43,200                   | 2.75        | 118,800          |
| DH-2*                  | 0.30             |                | 21             | 0.30         | 100        | 200        | 6,000                    | 2.75        | 16,500           |
| DH-1*                  | 2.00             | 2.04           | 199            | 7.57         | 108        | 200        | 43,200                   | 2.75        | 118,800          |
| 74-9                   | 0.70             |                |                | 5.00         | 39         | 200        | 5,460                    | 2.75        | 15,015           |
| 79-1                   | 0.90             |                | 35             | 3.54         | 37         | 200        | 6,660                    | 2.75        | 18,315           |
| DH-3*                  | 0.90             | 1.90           | 166            | 7.51         | 21         | 200        | 3,780                    | 2.75        | 10,395           |
| DH-4                   | 2.00             | 4.50           | 334            | 11.15        | 146        | 200        | 58,400                   | 2.75        | 160,600          |
| 78-1                   | 1.90             | 0.53           | 9              | 1.27         | 116        | 200        | 44,080                   | 2.75        | 121,220          |
| 78-1                   | 0.30             |                | 46             | 8.17         | 116        | 200        | 6,960                    | 2.75        | 19,140           |
| 78-2                   | 0.90             | 3.50           | 41             | 3.72         | 80         | 200        | 14,400                   | 2.75        | 39,600           |
| 78-2                   | 0.60             | 15.00          | 25             | 5.22         | 105        | 200        | 12,600                   | 2.75        | 34,650           |
| <b>Averages/totals</b> |                  | <b>1.19</b>    | <b>59</b>      | <b>2.84</b>  |            | <b>200</b> | <b>582,260</b>           | <b>2.75</b> | <b>1,601,215</b> |

NOTES \* = Underground drill hole

**Table 7b. Gunbuk - Drill intersections – Daesin (East) Vein.**

| Hole ID                | Intersection (m) | Grade Au (g/t) | Grade Ag (g/t) | Grade Cu (%) | Length (m) | Depth (m)  | Volume (m <sup>3</sup> ) | SG (g/cc)   | T (t)            |
|------------------------|------------------|----------------|----------------|--------------|------------|------------|--------------------------|-------------|------------------|
| 80-2                   | 13.30            | 2.03           | 94             | 6.40         | 156        | 200        | 414,960                  | 2.75        | 114,140          |
| 80-2                   | 2.30             |                | 13             | 0.70         | 156        | 200        | 71,760                   | 2.75        | 197,340          |
| 73-6                   | 3.50             | 3.20           | 10             | 3.70         | 103        | 200        | 72,100                   | 2.75        | 198,275          |
| DH-7*                  | 3.50             |                | 71             | 1.51         | 102        | 200        | 71,400                   | 2.75        | 196,350          |
| DH-8*                  | 0.10             |                | 102            | 4.94         | 115        | 200        | 2,300                    | 2.75        | 6,325            |
| 73-7                   | 7.60             | 5.50           | 124            | 5.25         | 94         | 200        | 142,880                  | 2.75        | 392,920          |
| 80-3                   | 0.40             | 4.70           | 85             | 3.65         | 135        | 200        | 10,800                   | 2.75        | 29,700           |
| <b>Averages/totals</b> |                  | <b>2.43</b>    | <b>82</b>      | <b>4.94</b>  |            | <b>200</b> | <b>660,447</b>           | <b>2.75</b> | <b>2,162,050</b> |

NOTES \* = Underground drill hole



The Ogok Vein was 30 cm-130 cm wide, striking north northwest and dipping steeply to the west and traced over a strike length of 750 m. The Ogok Vein was mined on six levels between 70-183 m asl and is probably the northern extension of the Manse Vein. An extract from the underground geological and sampling map (KMPC, 1968) of Ogok is reproduced in Figure 20 below. This map indicates the presence of numerous narrow sheeted, subparallel, magnetite-chalcopyrite-pyrite-quartz veinlets exposed in the 70 m adit. Cobalt was also recorded in the vein. KME is proposing to investigate the potential for bulk, low-grade mineralization in the Ogok area.

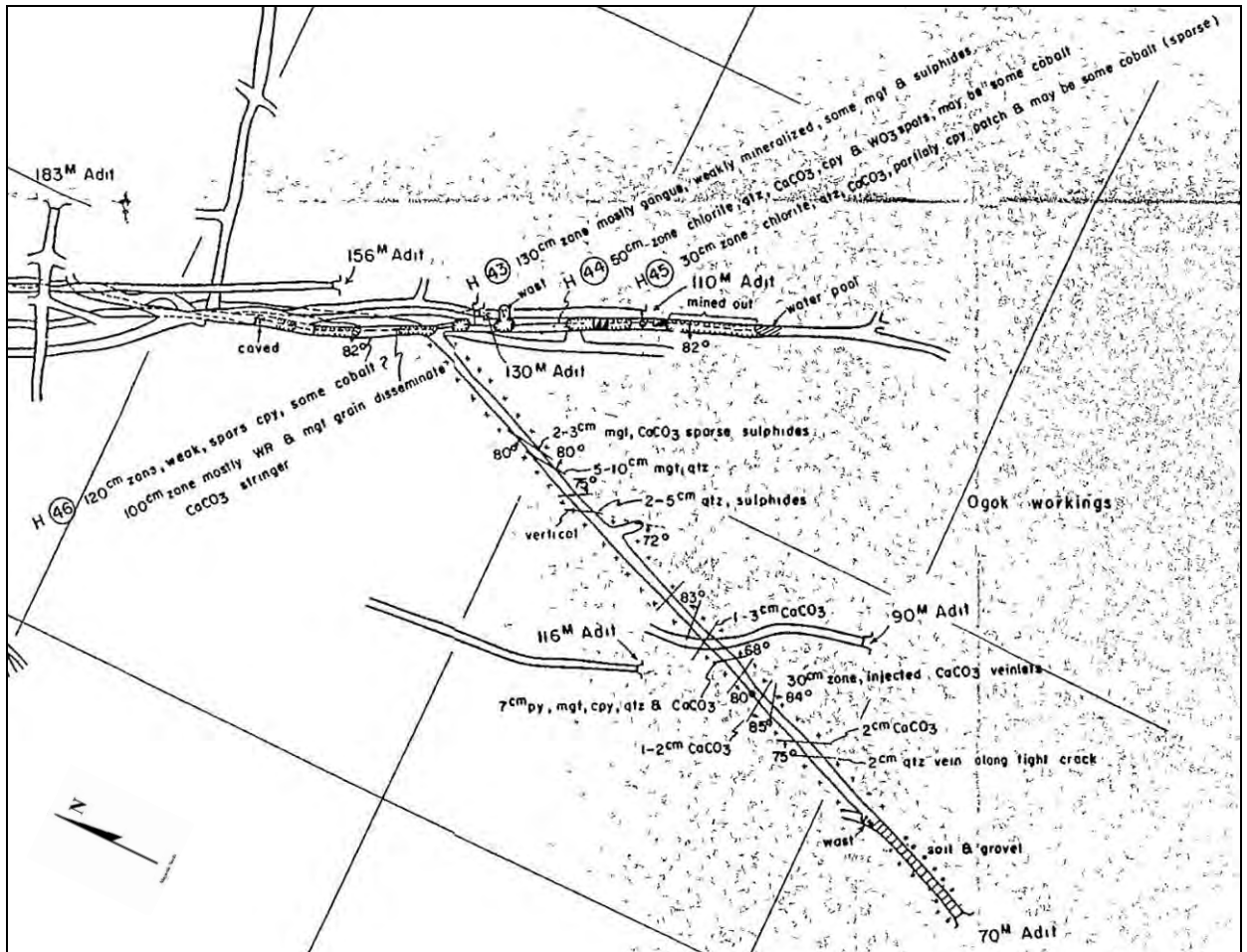


Figure 20. Partial extract from the underground sampling and geological map of the Ogok Mine workings (after KMPC, 1968). Grid line spacing is 100 m.

Historical mineralized intersections recorded are presented in Figure 21 below. Drill intersections indicate at least three subparallel north northwest-striking vein structures over a strike length of 750 m.

Extensive rock chip sampling of the sheeted magnetite veinlets exposed along a 4WD access road near the Ogok Mine was undertaken in 2016 by Senlac. Highly significant results were obtained, with maximum assays of 1.47 g/t Au, 15 g/t Ag, 0.38% Cu, 118 ppm Co, 0.11% As, 0.15% Ba, 60 ppm Bi, 89 ppm Mo, 670 ppm W, and 19.8% Fe as magnetite recorded.

Senlac compiled a drilling database from the historical drilling data, with significant drill intersections presented in Table 8 below. The surface projections of the drill intersections are illustrated in Figure 21.

**Table 8. Drill intersections - Ogok Vein.**

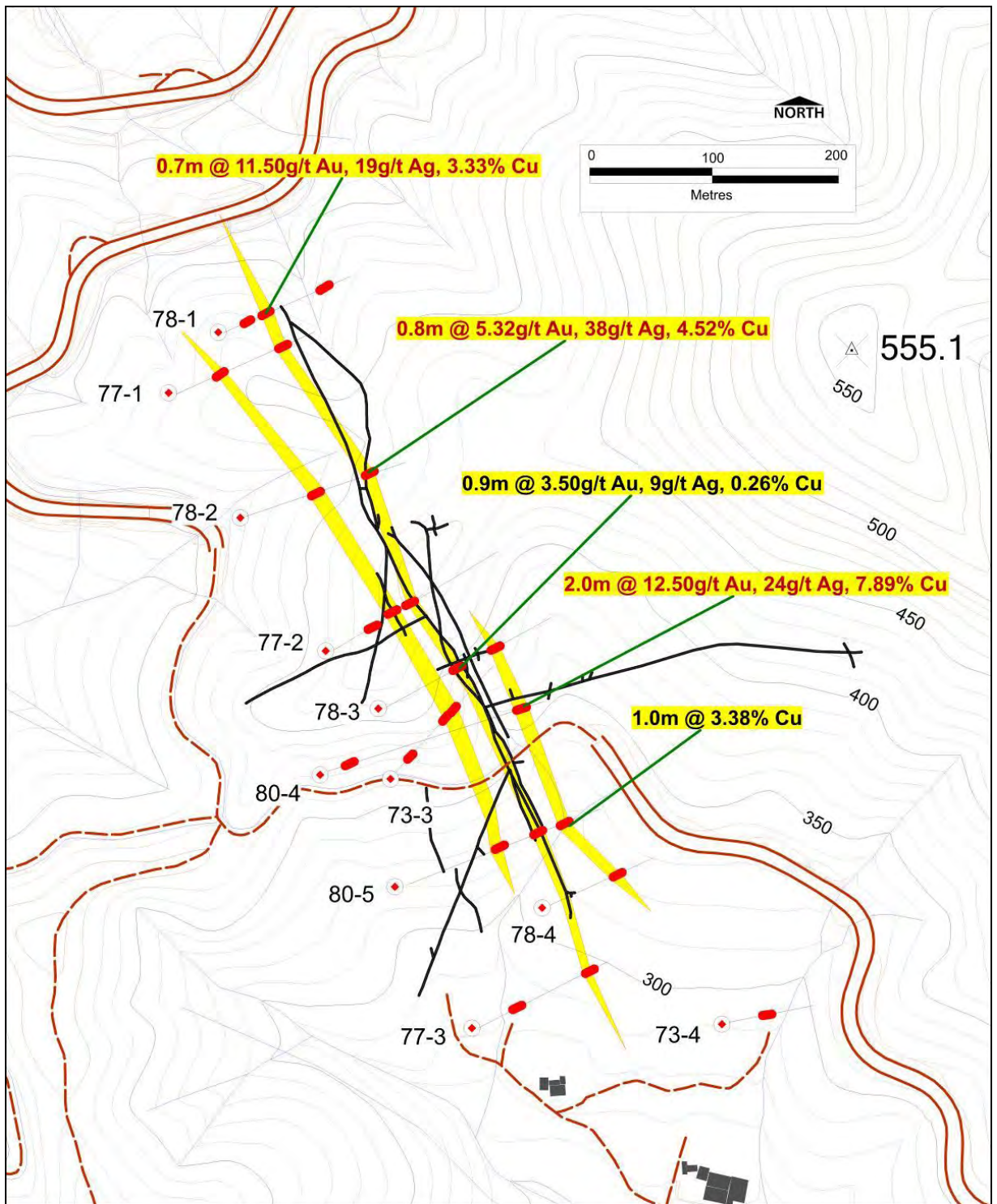
| Hole ID                | Intersection (m) | Grade Au (g/t) | Grade Ag (g/t) | Grade Cu (%) | Section influence (m) | Depth (m)  | Volume (m3)    | SG (g/cc)   | T (t)          |
|------------------------|------------------|----------------|----------------|--------------|-----------------------|------------|----------------|-------------|----------------|
| 78-1                   | 0.7              | 11.50          | 19             | 3.33         | 178                   | 200        | 24,920         | 2.75        | 68,530         |
| 78-2                   | 0.8              | 5.32           | 38             | 4.52         | 174                   | 200        | 27,840         | 2.75        | 76,560         |
| 78-3                   | 0.9              | 3.50           | 9              | 0.26         | 111                   | 200        | 19,980         | 2.75        | 54,945         |
| 80-4                   | 2.0              | 12.50          | 24             | 7.89         | 140                   | 200        | 56,000         | 2.75        | 154,000        |
| 80-5                   | 1.0              |                | 3              | 3.38         | 150                   | 200        | 30,000         | 2.75        | 82,500         |
| <b>Averages/totals</b> |                  | <b>7.59</b>    | <b>20</b>      | <b>4.77</b>  |                       | <b>200</b> | <b>191,437</b> | <b>2.75</b> | <b>436,535</b> |

Using the historical drill results, Senlac prepared a preliminary Exploration Target estimate compliant with the JORC Code (2012) for the Ogok Mine, using several assumptions, including:

- True vein width was not estimated.
- Specific gravity of 2.75 g/cc.
- Length equals the estimated along strike influence for the intersection.
- Depth equals the vertical height of 200 m below the 3<sup>rd</sup> Level (1 m asl).
- No mining parameters were applied.
- Cutting of grades was not applied.

Senlac estimates an Exploration Target for the Ogok Vein of between 0.4 and 0.5 million tonnes grading between 6.0 and 9.0 g/t Au, 15 to 25 g/t Ag and 4.5 to 5.0% Cu.

It is uncertain that evaluation and further work will result in the estimation of a Mineral Resource in accordance with the JORC Code (2012).



**Figure 21. Surface Projection of Drill Intersections of the Ogok Mine with KMPC intersections, plotted by Senlac.**

## Jaeilgunbuk

The Jaeilgunbuk Mine consisted of a series of at least seven subparallel, en-echelon, sheeted north northeast-striking, steeply-dipping veins hosted in hornfelsed siltstones of the Haman Formation. The veins occur over an area of 960 m strike length by 300 m wide and appear to merge/coalesce with the Chaedung Vein system. A swarm of narrow basic dykes has been emplaced along the same fissure structures as the veins and a genetic relationship is likely.

During 1963-1975, mining activities at the Jaeilgunbuk mine recommenced. Underground mining was developed using the Main Level, Paeknyeon, Samsin, Notachi, Ilkwang and Whang Adits, all accessed from the north-eastern flank of the hill at Jaeilgunbuk. The veins worked were known as the No 1 Vein, No 2, No 3, No 4, No 5, No 6 and No 7 Veins, sequentially from east to west.

Jaeilgunbuk reportedly produced a total of 29,846 t at an average grade of 19.71 g/t Au, 90 g/t Ag and 7.19% Cu, for total metal output of 19,610 oz gold, 89,375 oz silver and 2,146 t of copper (KMPC, 1975).

The maps of the underground adit workings of Jaeilgunbuk show the 7 Veins (Nos 1-7 Veins), as partially reproduced in Figure 27 below (after Moon et al, 1968). However, closer detailed inspection of this map indicates the presence of numerous narrow sheeted, subparallel,  $\text{CuCO}_3$  (malachite-azurite) and chalcopyrite/pyrite veinlets (<5cm wide), exposed in the adit walls between the 7 vein structures. These veinlets highlight the potential for significant bulk tonnage, low grade Cu-Au-Ag sheeted stockwork mineralization at the Jaeilgunbuk mine.

Rock chip sampling of neotocite-malachite stained, gossanous vein material exposed in the portal area of the Jaeilgunbuk adit in 2016 by Senlac obtained significant results, including maximum assays of 0.48 g/t Au, 8 g/t Ag, 0.25% Cu, 960 ppm W, 0.22% As, 0.2% Ba, and 56 ppm Mo.

The underground adit map indicates the four main north northwest-striking vein structures (No 1, 2, 3, and 4 Veins) contain chalcopyrite, scheelite along with magnetite, pyrite, pyrrhotite, tourmaline, and quartz. The map also indicates the presence of abundant sheeted stockwork veinlets of carbonate with chalcopyrite between the main vein structures.

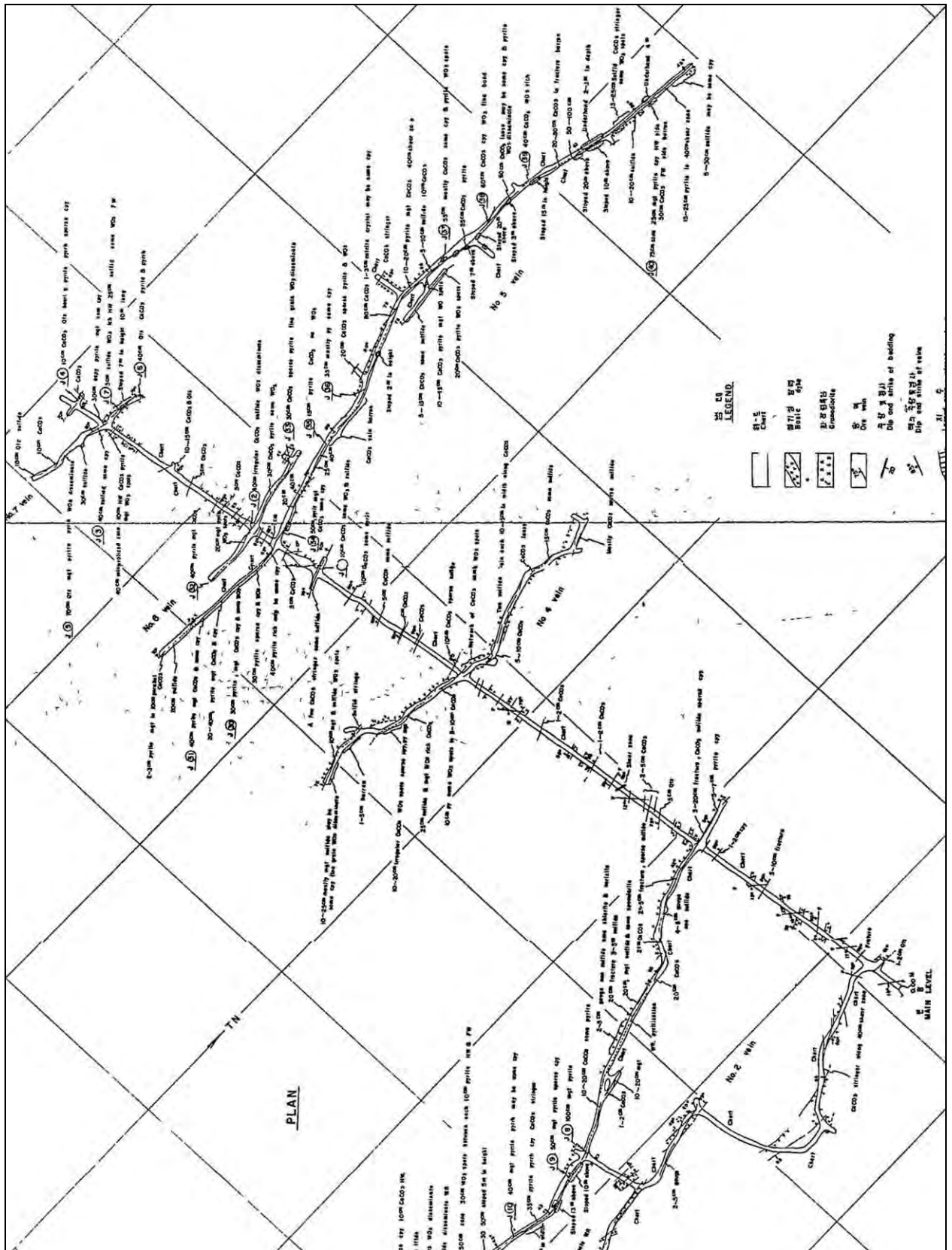


Figure 22. Partial extract from the underground sampling and geological map of the Jaeilgunbuk Mine workings (after KMPC, 1968). Grid line spacing is 100 m.

## Chaedung

The Chaedung (also Saita) Mine consists of at least four north northwest-striking, steeply-dipping fissure veins, shears and breccia zones, hosted in hornfelsed siltstones and mudstones of the Haman Formation. The veins occur over an area of 890 m strike length and 330 m in width. Gallagher (1963) indicates the largest ore shoot within the main vein was 30 m long and worked down to 100 m depth. Average grades were reported to be about 1.0% Cu and <1.0 g/t Au. The ore consisted of chalcopyrite-pyrite with minor arsenopyrite-sphalerite, cemented in a gangue of calcite-quartz and chlorite.

Rock chip sampling of banded quartz-calcite-chalcopyrite vein material from the Chaedung in 2016 by Senlac obtained 3.12 g/t Au, 21 g/t Ag, 0.12% Co, 15.20% Cu, >10% As, 710 ppm W, 23.4 ppm Bi, 78 ppm Mo, and 33 ppm Sb.

## Taewha

The Taehwa Vein system consists of a series of eight subparallel, en echelon, sheeted, north northeast-striking, steeply-dipping veins hosted in argillic and propylitic altered siltstones and mudstones of the Haman Formation. The veins occur over an area of 1600 m in strike length and 1000 m in width.

Rock chip sampling of magnetite vein material with malachite staining exposed in a road cutting from the vicinity of the Taewha Mine in 2016 by Senlac obtained 307 ppm As, 178 ppm Co, 0.36% Cu, and 10.70% Fe as magnetite.

## Dundok – Gilgok

From Dundok to Gilgok, there is a tonalite intrusion exposed along a concrete paved road. Sheeted magnetite and quartz veinlets are developed within the albitised tonalite, which is jarosite and limonite stained after sulphides.

The gabbro intrusion has been emplaced along the contact between tonalite and sediments of the Chindong Formation. On the margin of the gabbro, proximal-contact magnetite-pyroxene skarn is developed. Away from this contact zone, sulphide-rich, steeply-dipping metasediments are developed, indicating significant structural disruption has occurred in this area, as well as contact metasomatism replacing reactive lithologies and minerals along bedding planes within the sediments.

At the Dundok Mine, at least six subparallel north northwest-striking veins are mapped in a crosscut within the Dundok Adit. At the Gilgok mine, at least four subparallel north northwest-striking veins are mapped.

Extensive rock chip sampling was undertaken of the tonalite and magnetite-pyroxene skarn exposed along the 4WD logging track, in January 2016, by Senlac. The tonalite recorded best assays of 0.20 g/t Au, 830 ppm Cu, 680 ppm Ba and 5.40% Fe as magnetite. However, only low values were recorded from the proximal contact magnetite-pyroxene skarns, with maximum assays of 600 ppm Ba and 237 ppm Cu.

## **Bukgok – Namgok - Kitadani**

The Bukgok, Namgok and Kitadani veins are hosted in argillic clay-altered siltstones and mudstones of the Chindong Formation, in proximity to the contact margin of the tonalite intrusion. Diorite porphyry/andesite porphyry dykes were noted intruding the sequence and are Au-Cu mineralized, with numerous subvertical N-S-striking sheeted magnetite veinlets observed cutting the sediments. Supergene copper minerals including neotocite were also observed.

Extensive rock chip sampling was undertaken of magnetite veinlets exposed along a 4WD logging track near the Bugok and Namgok Mines undertaken in January 2016, by Senlac. Highly significant results were obtained, with maximum assays of 1.31 g/t Au, 7 g/t Ag, 0.63% Cu, 140 ppm Co, 720 ppm W, 229 ppm As, 25.2% Fe as magnetite, 0.15% Ba, 74 ppm Mo, 15 ppm Bi, and 16 ppm Sb recorded.

A 5 m channel sample of magnetite-tourmaline veinlets in supergene copper (neotocite)-limonite stained, argillic clay-altered diorite/andesite porphyry along the logging track assayed 0.13 g/t Au, 0.27% Cu, 9.56% Fe, 480 ppm W, 0.15% Ba, and 144 ppm As.

KME is proposing to investigate the potential for bulk, low-grade mineralization in the Bukgok – Namgok - Kitadani area.

## **Haman (Manse and Ebisu)**

The Haman Mine was the oldest and second largest copper producer in the district. During the Japanese occupation period, the Haman Mine was also known as the Kanan Mine. Haman consists of five separate workings (Ebisu, Manse, Dundok, Daesong and Minamidani) developed on at least twenty subparallel, fissure-filling N-S-striking veins, hosted in hornfelsed shales and siltstones of the Chindong Formation. The veins are located near the southeastern margin of the tonalite stock.

The Ebisu No 1 Vein was 225 m long, about 1 m wide and worked to a depth of 100 m (Gallagher, 1963) and reportedly averaged 1% Cu and 0.2 g/t Au.

At the Manse mine immediately north of Ebisu, at least fourteen subparallel north northwest-striking veins are mapped within the underground workings, covering an area of 600 m strike length x 500 m wide, known as the No 1 Vein to No 14 Vein sequentially west to east. The main adit portal of the Manse mine is still in good condition and probably provides access to the mine.

Rock chip sampling from Haman in 2016 by Senlac recorded significant results, including maximum assays of 3.32 g/t Au, 59 g/t Ag, 294 ppm Co, 4.06% Cu, 0.16% As, 0.11% Ba, and 44 ppm Mo.

## **Daesong and Yonnok**

The Daesong (also Daisei) Mine consisted of four north northeast-striking, steeply-dipping veins. The Yonnok Mine was also known as Enoki during the Japanese occupation period. The Yonnok Vein is hosted by tonalite and is characterized by abundant tourmaline, magnetite, cobaltiferous-arsenopyrite and only minor amounts

of calcite (Gallagher, 1963). A field inspection of the Daesong and Yonnok Mines was not made by Senlac.

## Okbang

The Okbang Vein is probably the southern extension of the Ebusu No 1 Vein at Haman. The Okbang Vein system consists of four north northeast-striking, steeply-dipping fissure veins, hosted in hornfelsed sediments/cherts of the Chindong Formation. The grey-white coloured cherts strike northeasterly, dipping gently to the southeast. The sediments have been intruded by granodiorite and several andesite porphyry dykes.

Subsequent geological mapping conducted by the Korea Institute of Geoscience and Mineral Resources ('KIGAM') in co-operation with the United Nations Development Program (UNDP) located some 16 vein outcrops in the Okbang area (Pak and Bang, 1977). The main Okbang Vein is traceable over a strike length of 560 m. Most of the other veins occur in an en-echelon sheeted arrangement around this vein structure.

Rock chip sampling from Okbang in 2016 by Senlac obtained highly significant results, including maximum assays of 10.05 g/t Au, 0.21% Co, 414 ppm Cu, 7.63% As, 0.13% Ba, 24 ppm Bi, and 60 ppm Sb.

### Geophysical Surveys

In 1975, the United Nations Development Program (UNDP) undertook an airborne EM geophysical survey over the Obongsan and Okbang areas using a helicopter (Bosschart, 1975 and Sander Geophysics, 1976).

One of the EM anomalies in the Okbang area was trenched and this exposed a 2 m wide sulphide vein which assayed 2% Cu (Pak and Bang, 1976).

Ground follow-up of the EM anomalies was undertaken using VLF-EM and ground magnetometer surveys (Pak and Bang, 1977). These methods were able to accurately locate the airborne EM anomalies in the field.

There is a K-channel anomaly of >50 cps hosted in sediments south of the Okbang Mine. This area has recessive eroded topography coincidental with a circular structure.

### Soil Geochemical Survey

The KIGAM-UNDP undertook soil geochemical surveys over three grids established in the Okbang area (Kim et al, 1977). Sample spacing was 50 m by 20 m, with samples analysed for Cu, Pb, Zn, Co, Ni, Mo, As and Mn using AAS. An orientation vegetation geochemical sampling program was also trialled, using tree leaves.

Significant Cu soil geochemical anomalies were detected in the Okbang soil grids, including:

- Okbang North area, where two anomalies 'A' and 'B' were indicated.
- At Okbang South two possibly connected narrow anomalies were outlined over 350 m strike length and called the "C" Vein.
- At Okbang Northeast, a large Anomaly 'E' was outlined, orientated N-S over a 300 m x 80 m area.

Rock chip sampling from Okbang in 2016 by Senlac obtained highly significant results, including maximum assays of 10.05 g/t Au, 0.21% Co, 414 ppm Cu, 7.63% As, 0.13% Ba, 24 ppm Bi, and 60 ppm Sb.

### **6.2.8 DRILLING**

KME has not drilled on any of the project areas. Historic drilling for minerals (see Section 6.2.1) was undertaken by the KMPC during the 1970s and the KIER during the 1980s.

### **6.2.9 SAMPLING METHOD AND APPROACH - KME**

Refer to 6.1.9

#### **6.2.9.1. Surveying**

Refer to 6.1.9.1

#### **6.2.9.2. Sampling - General**

Refer to 6.1.9.2

#### **6.2.9.3. Stream Sediment Samples**

Refer to 6.1.9.3

#### **6.2.9.4. Rock Chip Samples**

Refer to 6.1.9.4

### **6.2.10 SAMPLE PREPARATION, ANALYSES AND SECURITY - KME**

Refer to 6.1.10

#### **6.2.10.1 Sample Transportation and Security**

Refer to 6.1.10.1

#### **6.2.10.2. Laboratories**

Refer to 6.1.10.2

#### **6.2.10.3. Rock samples**

Refer to 6.1.10.3

#### **6.2.10.4. Stream sediment samples**

Refer to 6.1.10.4

Korean Metals Exploration Pty Limited  
NI 43-101 Report.

VWPL May 2017

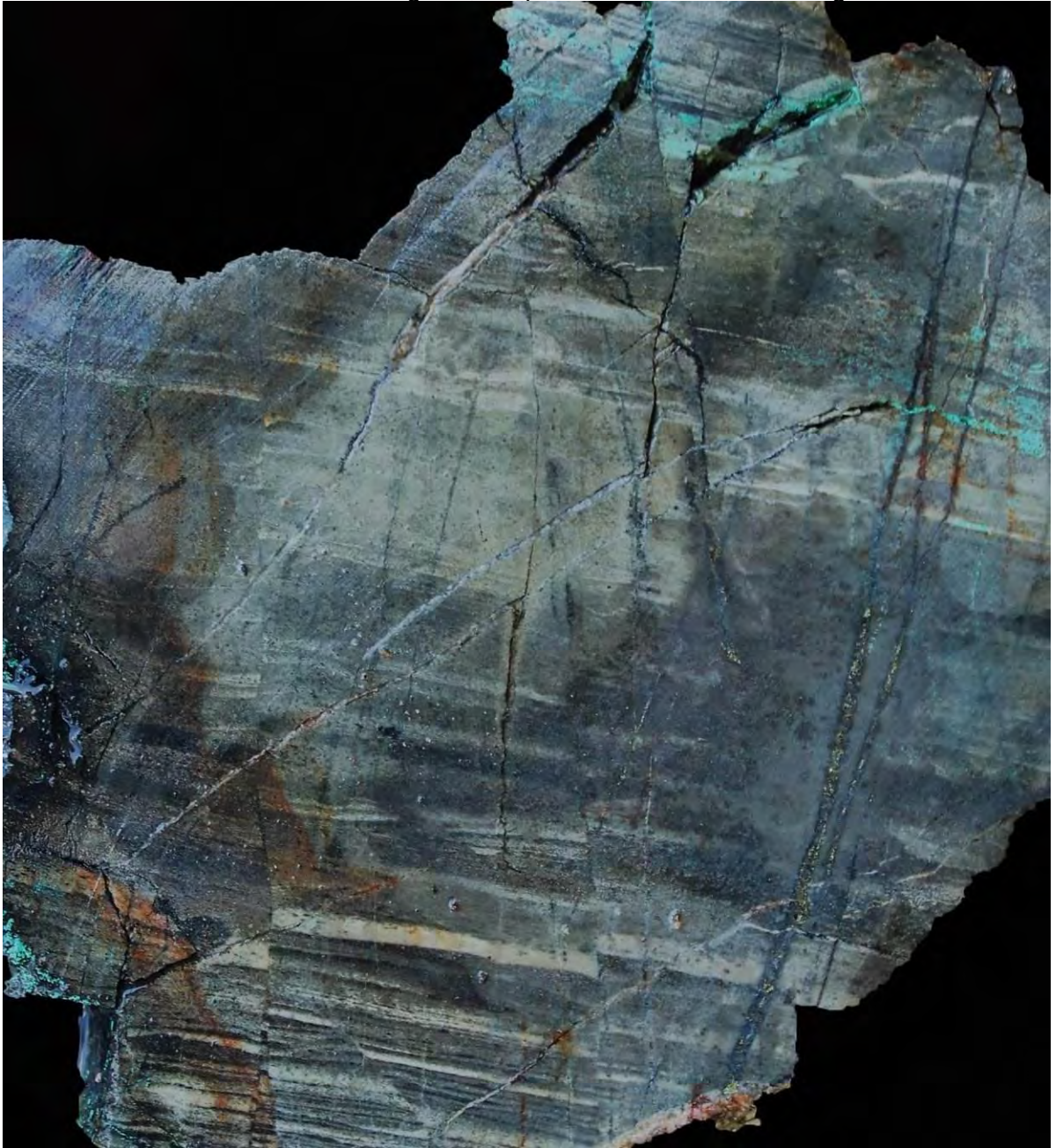
### 6.2.11 DATA VERIFICATION

Refer to 6.1.11.

Exploration geologist R Dawney, representing VWPL, visited some areas of the Haman Project. These included:

- The Gunbuk Mine area

In this area there was an old mining slot, old plant foundations and tailings.



**Photograph 5. Malachite stained fractures, and sulphide and quartz veinlets hosted within intensely hydro-fractured/micro-faulted, tremolite-magnetite altered hornfelsed fine-grained sediments of the Haman Formation, collected**

Korean Metals Exploration Pty Limited  
NI 43-101 Report.

VWPL May 2017

from the Gunbuk Mine dump. Sample 243403: 235ppm Co, 1.10% Cu, 230ppm As and 5.72% Fe.

- The Oguk Mine area  
Here there was a partly collapsed, gated adit into a 1.5 m wide sulphidic lode with remnant gossanous veinlets with some magnetite.



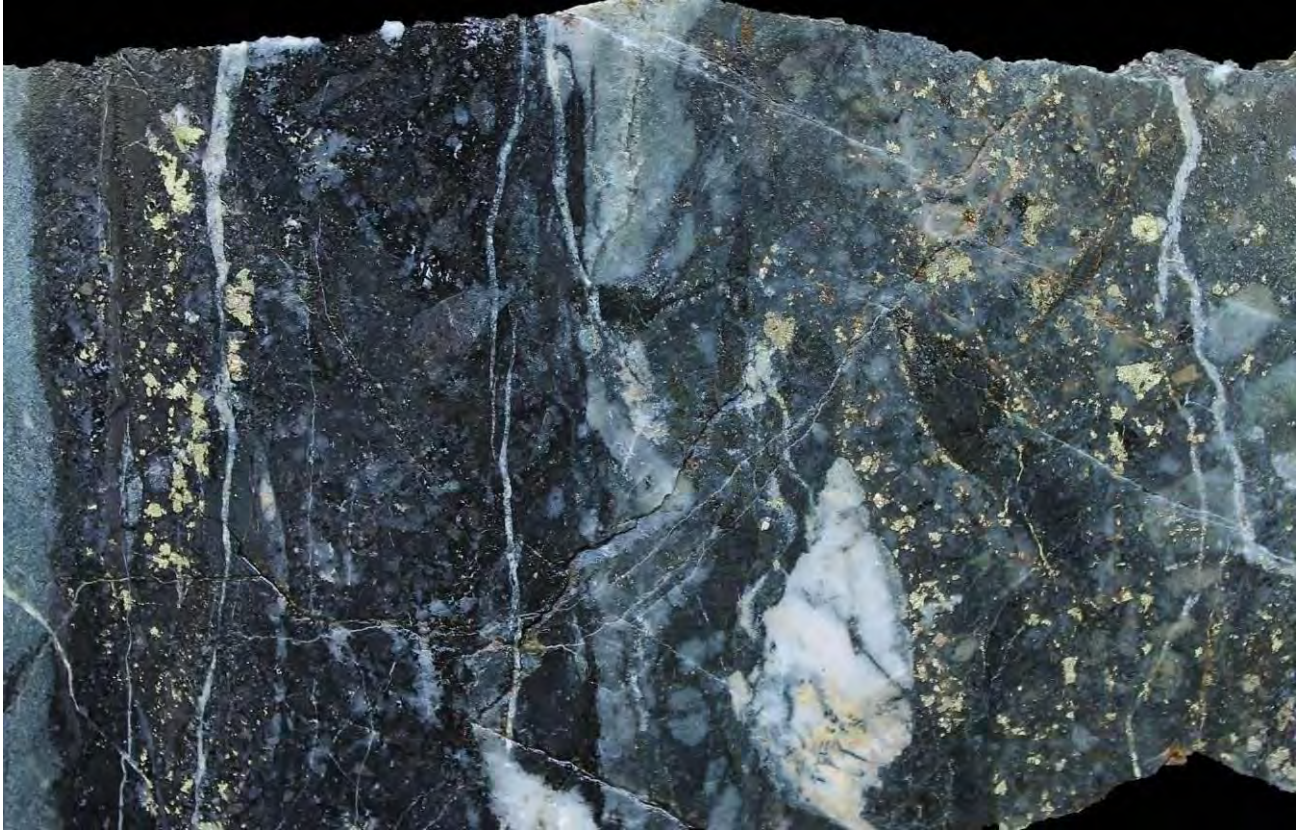
**Photograph 6. Outcrops of extensively magnetite-argillic altered, highly fractured tonalite, exposed along the 4WD access road in the vicinity of the Oguk Mine.**

- The general Bukgok-Gilgok area  
Here there was abundant evidence of widespread hydrothermal alteration and mineralization outside the lode zones, with sericitic and argillic alteration along with quartz-magnetite veins, quartz-tourmaline veins, sulphides and abundant secondary iron minerals after sulphides.



**Photograph 7. Outcrops of limonite stained, silica-pyrite altered/hornfelsed siltstones of the Chindong Formation, with quartz veinlet stockworks, exposed along the 4WD logging track at Bukgok. Sample 243360; 0.27g/t Au, 7g/t Ag, 0.38% Cu, 74ppm Mo**

- The Haman Mine area  
Here were observed the old mine offices area with some derelict buildings still standing and an old tailings dam now used for water storage.



**Photograph 8. Cut slab of Stage IIb Breccia overprinting Stage IIa Main ore, collected from the Haman Mine dump. Sample 243319: 1.99g/t Au, 9g/t Ag, 294ppm Co, 1.10% Cu, 508ppm As, 186ppm Bi, 71ppm Mo and 7.52% Fe.**

#### **6.2.12 ADJACENT PROPERTIES**

KME appears to have staked the most important known mines in the district but mineralization will occur outside the tenements. Activity by other parties has not been reviewed

#### **6.2.13 MINERAL PROCESSING AND METALLURGICAL TESTING**

There was no modern mineral processing or metallurgical testing in the Haman Project area.

#### **6.2.14 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES**

There are no known resources on any of the KME mineral properties in the Haman Project apart from historical remnants at abandoned mines.

## 6.3 MIWON V-U-MO PROJECT

The Miwon V-U-Mo Project is situated 150 km southeast of Seoul and 21 km east of Cheongju City, located in Chungcheonbuk-Do Province in the western central region of the Korean Peninsula. Travel time from Seoul to Miwon is approximately 2 hrs, sequentially using the Jungbu Expressway 35 to Cheongju City, then by local roads to the prospect area.

### 6.3.1: HISTORY OF MINING AND EXPLORATION

Previous exploration for uranium in South Korea during 1975-1985 by KIER discovered numerous low-grade uranium-vanadium-molybdenum deposits, mainly situated in the Cambrian Ogchon Basin, and associated with graphitic black shales of the Guryongsan Slate.

Some 13 deposits in the Ogchon Basin were evaluated by diamond drilling (335 drill holes for 65,286 m of core) and total combined resources of 115,516,000 t grading 0.034% U<sub>3</sub>O<sub>8</sub> inferred (KIER, 1985).

These uranium deposits were not developed because of the prevailing uranium prices, relatively low uranium grades and geopolitical considerations associated with the Korean Peninsula. However, studies were advanced to the stage of completion of environmental and detailed engineering studies on a conventional uranium processing plant and selection of a suitable site at Gottbong/Goesan.

A combined airborne magnetometer and radiometric geophysical survey was flown by the KIER over the entire country during 1982-1991. Hughes 500 and Bolkow BK117 helicopters were used in the airborne geophysical surveys. Flight Line spacing was 1 km and orientated east-west, with north-south-orientated tie lines every 5 km. The terrain clearance of the helicopter was 100-200 m depending on local topography restrictions. The aircraft was fitted with a Geometrics G813 proton magnetometer and a GR-800B multi-channel spectrometer (1024 CI), collecting data on Total Count, U, Th and K. The airborne magnetometer data was processed by levelling the data at 300 m by upward or downward continuation (KIGAM, 2008). The published 1:50,000 Magnetic Anomaly Maps (KIGAM, 2008) and the Th, K and U radiometric channel imagery for the Chungju 1:50,000 scale sheet was purchased from the KIGAM library/bookshop in Daejeon. Each sheet was scanned as a high-resolution JPEG file and registered in the MAPINFO™ GIS database, using the map sheet coordinates.

The KIGAM, in 2001 conducted a country-wide stream sediment geochemical survey in 1971. This survey provides an excellent geochemical background database for the entire country. The data was primarily used for lithological characterisation and environmental background purposes, but can also be used for mineral exploration purposes.

Stream sediment samples were collected at a density of one sample per about 3.5km<sup>2</sup> area on a province-wide basis. Samples were collected from the active fine sand fractions and sieved in the field to -100 mesh (-150µm). Each sample weighed approximately 70-100 g. A total of 2,032 stream sediment sites were sampled in Chungcheongbuk-Do Province, providing for a very large number for robust and meaningful statistical analyses. Elements analysed included Ba, Be, CaO, Co, Cr, Cu,

Fe<sub>2</sub>O<sub>3</sub>, K<sub>2</sub>O, Li, Mg, Na<sub>2</sub>O, Ni, Pb, Rb, Sb, Sr, Ti, V, Zn, Zr, together with conductivity (eH) and acidity (Ph).

Previous exploration in the Miwon area was conducted during 1977-1985 by KIER (1983 and 1986) and included radiometric and VLF-EM geophysical surveys, geological mapping and limited drilling. Drilling by KORES and KIER outlined resources - see 6.3.2.

Conventional leaching metallurgical studies were undertaken on the Ogchon Belt V-U black shale-hosted mineralization by KIER (1981 and 1984) see 6.3.13. Metallurgical studies using bacteriological leaching were undertaken on the Ogchon Belt V-U-Mo black shale-hosted mineralization by KIER and KIGAM (1981 and Choi et al, 2005) - see 6.3.13.

### 6.3.2 HISTORICAL MINE PRODUCTION AND EXPLORATION

No production has been recorded.

#### 6.3.2.1 HISTORICAL ESTIMATES

Guimanri (Yongyuri) deposit - an inferred resource of 1,602,000 t grading 0.20% V<sub>2</sub>O<sub>5</sub> and 0.050% U<sub>3</sub>O<sub>8</sub> for 7.05 million lb of contained vanadium and 1.76 million lb of contained uranium (KIER, 1986).

Miwon (Isikri-Jukeumri) deposit – an inferred resource of 1,670,000 t grading 0.50% V<sub>2</sub>O<sub>5</sub> and 0.034% U<sub>3</sub>O<sub>8</sub> for 18.37 million lb of vanadium and 1.25 million lb of uranium (KIER, 1986).

### 6.3.3 GEOLOGICAL SETTING - GEOLOGY OF THE OGCHON BELT

The Ogchon Belt, see 6.1.3, Figure 7 is a northeast-trending fold-and-thrust belt, bounded by the Gyonggi Massif to the northwest and the Yongnam Massif to the southeast. The Ogchon Belt can be divided into the Ogchon Basin to the southwest and the Taebaeksan Basin in the northeast, mainly on the basis of lithology and metamorphic grade. Rocks of the Ogchon Basin consist of non-fossiliferous, low to medium-grade metasedimentary and metavolcanic rocks of Cambrian age in contrast to the fossiliferous, weakly metamorphosed sediments of the Cambro-Ordovician Taebaeksan Basin.

The Ogchon Basin is an elongate basin that extended northeast-wards from Mogpo to Jechon over a distance of 150 km, in a belt about 30 km wide. Evidence indicates it was a shallow marine geosynclinal basin that resulted from the evolution of a “Rift Valley” model, involving subsidence of down-faulted troughs and an accompanying rise of subjacent mantle diapirs. A deeper marine shelf environment would appear to be present in the northeast, represented by the Taebaeksan Basin that was probably open to the deeper ocean.

The sequence is overturned and folded.

Basement rocks of the Ogchon Belt consist of the Jirisan Complex, comprising the Yongjuri Gneiss Complex and the Cheon-An Gneiss. Basement is mainly composed of porphyroblastic gneiss, augen gneiss, migmatite, minor schist and amphibolite. Metamorphic assemblages indicate high temperature-pressure metamorphism of an original granitic basement has occurred.

#### Hwanggangri and Pugnori Formation

Unconformably overlying basement, The Hwanggangri and Pugnori Formations are believed to be equivalent to the Iwonri and Suhangri Formations of historical Korean nomenclature. They consist of pelitic phyllite and two thick pebbly mudstone horizons.

#### Changri Formation

The Changri Formation consists of grey-dark grey calcareous phyllite and chlorite schist, with thin psammitic and quartzite units. Some thick ortho-amphibolite horizons and a thin limestone bed are interbedded within the unit, as described below.

#### Amphibolite

Amphibolite is believed to be interbedded within the phyllite as well as interpreted by the author as being emplaced as sills, particularly below the inferred major thrust "ramp" fault structure at the base of the Cambro-Ordovician limestones of the Great Limestone Series. The amphibolite was probably originally a tholeiitic basalt, as pillow structures indicate extrusion into a subaqueous environment. Granophyre is also reported and may represent that mineral differentiation crystallization layering occurred during cooling of the magma at the top of sills. The amphibolite was dated as Precambrian at 680±90 Ma.

#### Guryongsan Slate

The Guryongsan Slate is a 200 m thick horizon recognised between the Changri and Munjuri Formations. Syngenetic stratabound V-U-Mo-P-Ba mineralization is restricted to the Guryongsan Slate, comprising graphitic, pyritic carbonaceous black shales. It is described in more detail in a later section.

#### Bibong Limestone

A thin white crystalline dolomitic limestone/marble bed is distributed intermittently throughout the Changri and Munjuri Formations of the Ogchon Basin and can probably be reliably used as a diagnostic marker horizon (Lee, 1987). It is known variously as the Geumgang, Hansu and Bibong Limestone. Chough and others (2002) indicate the limestone has been dated as Cambrian and early Ordovician.

#### Munjuri Formation

The Munjuri Formation consists of grey-dark grey calcareous phyllite and chlorite schist, with thin psammitic units.

#### Hwajeonri and Kounri Formation

The Hwajeonri and Kounri Formations consist of limestone and calcareous slate. The units can probably be readily correlated with the base of the Great Limestone Series, represented in the Taebaeksan Basin by the Pungchon Limestone.

#### Midongsan and Taehyangsan Quartzite

The Midongsan and Taehyangsan Quartzite are names for a laterally extensive thin quartzite horizon which can be readily used as a "marker horizon". The quartzite

remains a mappable unit forming prominent continuous outcrops. It can probably be readily correlated with the Dongjeum Quartzite unit of the Taebaeksan Basin.

#### Ungyori and Baegbongri Formation

The Ungyori and Baegbongri Formations form the top of the sedimentary sequence of the Ogchon Basin. The formations are mainly composed of biotite-muscovite-chlorite sandy phyllite.

#### Jurassic Daebo Intrusives

The Yonjuri Gneiss Complex and Cheon-An Gneiss basement metamorphic complexes have been domed by diapiric granite batholith intrusion during the Jurassic Daebo orogeny. The batholith comprises a suite of granitoids which have been emplaced into the margins of the Ogchon Basin along northeast-southwest-striking fault corridors.

This intrusive suite consists of foliated porphyroblastic biotite granite, schistose and gneissic granite which were probably emplaced syn-tectonically and syn-kinematically. Two-mica granite is present which apparently contains accessory uraninite, and leucogranite is believed to be the youngest phase.

#### Cretaceous Bulgugsa Intrusives

Cretaceous Bulgugsa Series intrusive rocks have been emplaced as stocks, plugs and dykes into the Ogchon Basin along orthogonal transfer fault structures. The intrusive suite comprises hornblende-biotite granite of the Hongjesa Granite, as well as subvolcanic porphyries, including quartz-eye rhyolite porphyry. Thin lamprophyre and mafic dykes are also mapped throughout the area.

### 6.3.4 PROSPECT GEOLOGY – MIWON

The Miwon Project consists of four Mining Rights covering an 8 km continuous strike length of 5-15 m thick, grey-black graphitic schist horizons of the Guryongsan Slate, which hosts the Miwon-Isikri-Jukeumri, Gyewonri, and Yongyuri-Guimanri V-U-Mo deposits..

The stratigraphic sequence in the Miwon district strikes north northeast and dips at 60-80° to the northwest. The sequence comprises debris-flow conglomerates of the Hwanggangri and Iwonri Formations, calcareous pelite, phyllite of the Changri Formation, carbonaceous shale of the Guryongsan Slate, ortho-amphibolite and quartzite of the Changri Formation, crystalline limestone of the Bibong Limestone, sericite schist of the Hwasonri Formation and phyllite and schist of the Munjuri Formation. East of the Miwon Project area, the sequence has been intruded by a large zoned Jurassic Daebo Granite Series intrusion comprising biotite granite, alkali granite, porphyritic leucogranite and granite porphyry. The intrusion geology/morphology is highly suggestive of a multi-phase, fractionated igneous magma.

The KIER, in 1986 estimated a resource of 1,602,000 t grading 0.20% V<sub>2</sub>O<sub>5</sub> and 0.050% U<sub>3</sub>O<sub>8</sub> for 7.05 million lb of contained vanadium and 1.76 million lb of contained uranium at the Guimanri (Yongyuri) deposit, based on seven drill holes (total 1,102 m).

Another resource of 1,670,000 t grading 0.50%  $V_2O_5$  and 0.034%  $U_3O_8$  for 18.37 million lb of vanadium and 1.25 million lb of uranium was inferred at Miwon (Isikri-Jukeumri) deposit by KIER (1986) based on five drill holes (total 688 m).

No resources were estimated for the Gyewonri deposit. These deposits must be considered highly prospective for additional resources of vanadium-uranium-molybdenum, as at least two V-U-Mo-Ba-Zn-Cu-Ni mineralized horizons have been mapped within the Guryongsan Slate, each varying in thickness from 2-15 m, the mineralization is open along strike, open at depth, and only limited, wide-spaced drilling has been undertaken to date.

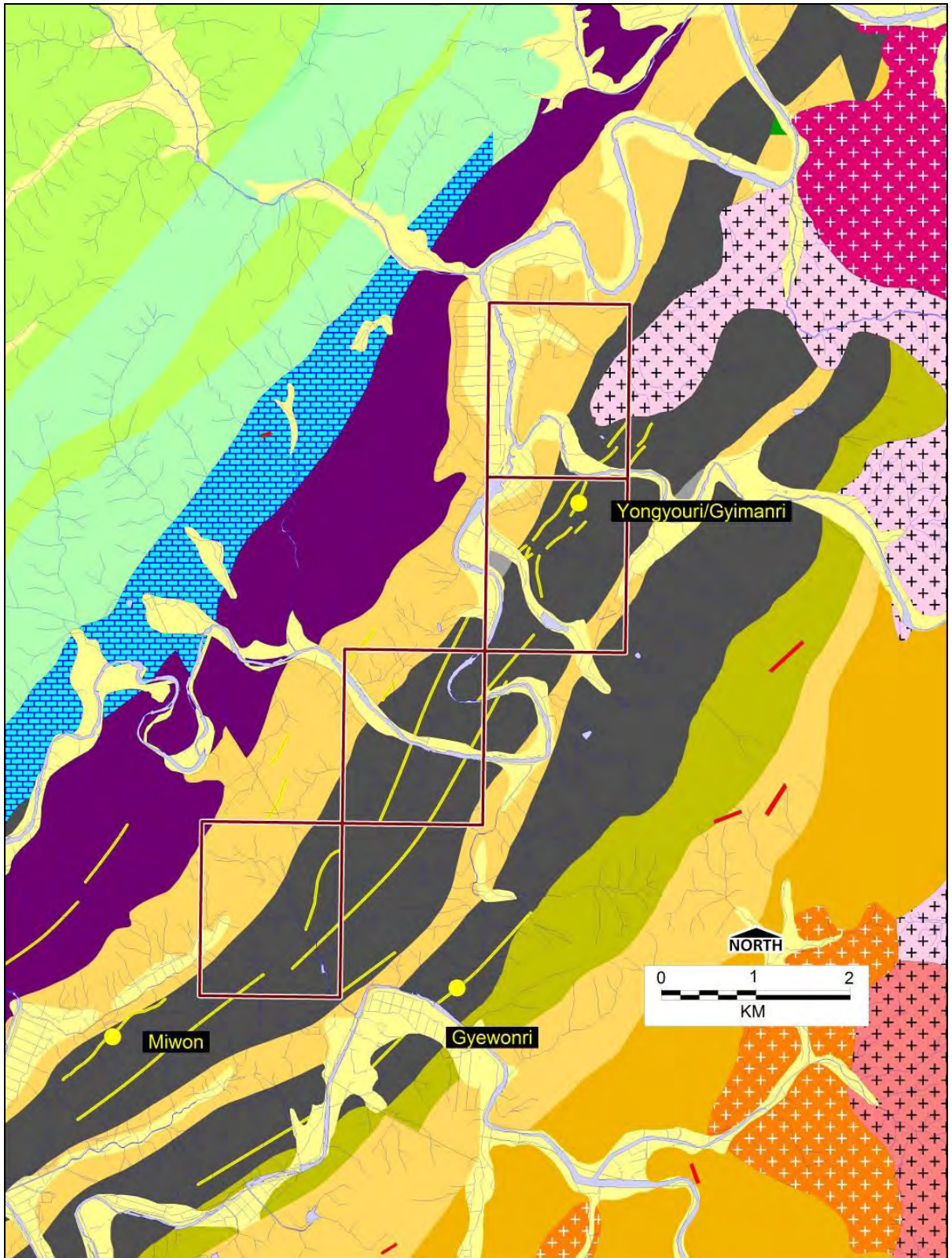


Figure 23. Geological Map of the Miwon Project

### 6.3.5 DEPOSIT TYPES

The Guryongsan Slate is considered to be an example of syngenetic metal-rich black shale, which is comparable to the uranium-bearing metal-rich shales of the Devonian Chattanooga Shale of the southeastern United States and the Cambrian Alum shale of southern Sweden.

Weathering of surrounding Precambrian igneous rock highland terrains rimming the Ogchon Basin has probably contributed the uranium and accompanying vanadium, molybdenum, zinc, copper and other trace metals to ground waters which fed into the marine environment.

The graphitic, pyritic carbonaceous black shales and V-U-Mo-P-Ba mineralization association suggests that the uranium concentrated by adsorption either onto living or decaying organisms, or was directly precipitated in an anaerobic environment by  $H_2S$  generated during bacterial sulphate reduction.

In most black shales, such as the Chattanooga Shale and related shales of the eastern interior United States, increased metal and metalloid contents are generally related to increased organic carbon content, decreased sedimentation rate, organic matter type, or position in the basin. In areas where the stratigraphic equivalents of the Chattanooga Shale are deeply buried and the organic material is thermally mature, metal contents are essentially the same as in unheated areas and correlate with organic C or S contents. This paradigm does not hold for the Cambrian Alum Shale Formation of Sweden where increased metal content does not necessarily correlate with organic matter content nor is metal enrichment necessarily related to land derived humic material because this organic matter is all of marine source. In south central Sweden the elements U, Mo, V, Ni, Zn, Cd and Pb are all enriched relative to average black shales but only U and Mo correlate to organic matter content. Tectonically disturbed and metamorphosed allochthonous samples of Alum Shale on the Caledonian front in western Sweden have even higher amounts for some metals (V, Ni, Zn and Ba) relative to the autochthonous shales in this area and those in southern Sweden (Leventhal 1991).

### 6.3.6 MINERALIZATION

Vanadiferous and uraniferous black shales of the Guryongsan Slate occur in a continuous 100 km long northeast-southwest-striking sequence in the Ogchon Basin.

These pyritic, carbonaceous shales contain highly carbonized kerogen and graphite, which resembles coaly shale or anthracite. Individual graphitic carbonaceous slate, shale, schist and phyllite beds vary in thickness from 1-40 m and contain average uranium grades ranging from 0.01%  $U_3O_8$  up to 0.05%  $U_3O_8$ .

Graphite, quartz, calcite, phosphate nodule, pyrrhotite, haematite, pyrite and aluminosilicate porphyroblasts and secondary uranium minerals are identified visually. Heavy minerals include tourmaline, zircon and apatite. In addition, feldspar, vanadium-mica, biotite, chlorite, tremolite, apatite, uraninite, Ti-oxides, barite, Fe-oxides, sphalerite and chalcopyrite are identified microscopically. Coal occurs mostly as masses of small black particles or as coatings on other mineral constituents.

The uranium minerals are disseminated on the minor fractures developed in the coaly matrix and are loosely held on the coal surfaces, with only minor concentrations in the fine-grained matrix.

Colloform pitchblende is believed to have been originally precipitated syngenetically in black mud. Autoradiographs (Kim, 1989) of shale from Dukpyong show clear images of primary uranium associated with graphite, apatite nodules and some oolite. Further evidence for the syngenetic origin of uranium is provided by a uranium-rich mud dyke injected into a uranium-poor silt layer during soft sediment compaction.

Kim (1989) conducted a geochemical study on 369 uranium bearing samples from the Guryongsan Slate, finding the average chemical composition to be as follows:

| ELEMENT | ppm   | ELEMENT                        | ppm    |
|---------|-------|--------------------------------|--------|
| U       | 245   | C                              | 196400 |
| V       | 3200  | SiO <sub>2</sub>               | 400000 |
| Mo      | 360   | Al <sub>2</sub> O <sub>3</sub> | 115400 |
| Zn      | 1700  | Fe <sub>2</sub> O <sub>3</sub> | 77400  |
| Ni      | 620   | MgO                            | 17900  |
| Cu      | 200   | CaO                            | 24400  |
| Cr      | 280   | S                              | 23200  |
| Pb      | 110   | P                              | 2700   |
| Cd      | 270   | TiO <sub>2</sub>               | 2500   |
| Sr      | 270   | Na <sub>2</sub> O              | 2200   |
| Ag      | 3     | K <sub>2</sub> O               | 21200  |
| Ba      | 13000 | PGM + Au                       | 0.3    |

### 6.3.7 EXPLORATION

#### Miwon Project - Airborne Geophysical Survey Interpretation

Interpretation by Senlac of the regional airborne geophysical survey colour plots for the Miwon area has discerned the following features:

- There is a strong “magnetic low” anomaly coincidental with the V-U-Mo-Ba mineralized Guryongsan Slate horizon.
- There is a series of intense “magnetic high” anomalies coincidental with the Changri Formation stratigraphic sequence overlying the Guryongsan Slate, which are probably caused by magnetite-rich ultramafic sills, probably ortho-amphibolite.
- There is a series of “magnetic high” anomalies coincidental with the stratigraphic sequence underlying the Guryongsan Slate. These could indicate ortho-amphibolite sills within the Changri Formation, or even possibly magnetite skarn related to the contact of the Jurassic Daebo Granite Series intrusion.
- The U-channel radiometric map indicates there are moderate-strong U anomalies coincidental with the Guryongsan Slate horizon, particularly over the area of the Dukpyeong uranium deposits.
- The Th-channel radiometric map indicates moderate-high Th anomalies coincide with the Guryongsan Slate horizon.

- The Th-channel radiometric map indicates there is a very high Th anomaly response coincidental with the porphyritic leucogranite intrusion.
- The K-channel response indicates some K anomalies coincide with the Guryongsan Slate horizon.
- The K-channel radiometric map indicates there is a moderate- high K anomaly response coincidental with the porphyritic leucogranite intrusion.

### **6.3.8 DRILLING**

KME has not drilled on any of the project areas. Historical drilling for minerals (see Section 6.3.1) was undertaken by the KIER during the 1975 through to the 1980s.

### **6.3.9 SAMPLING METHOD AND APPROACH - KME**

Refer to 6.1.9

#### **6.3.9.1. Surveying**

Refer to 6.1.9.1

#### **6.3.9.2. Sampling - General**

Refer to 6.1.9.2

#### **6.3.9.3. Stream Sediment Samples**

Refer to 6.1.9.3

#### **6.3.9.4. Rock Chip Samples**

Refer to 6.1.9.4

### **6.3.10 SAMPLE PREPARATION, ANALYSES AND SECURITY - KME**

Refer to 6.1.10

#### **6.3.10.1 Sample Transportation and Security**

Refer to 6.1.10.1

#### **6.3.10.2. Laboratories**

Refer to 6.1.10.2

#### **6.3.10.3. Rock samples**

Refer to 6.1.10.3

#### **6.3.10.4. Stream sediment samples**

Refer to 6.1.10.4

### 6.3.11 DATA VERIFICATION

Refer to 6.1.11.

### 6.3.12 ADJACENT PROPERTIES

The Guryongsan Slate also hosts the Yopyong, Gottbong, Dukpyong, Jungdaejun, and Okseong uranium deposits (KIER, 1983 and 1986) along strike to the northeast from the Miwon Project. Similarly, the Gwebongsan, Yangsuri, Iwonri and Jogokri uranium deposits (KIER, 1983 and 1986) are situated along strike to the southwest of the Miwon Project.

### 6.3.13 MINERAL PROCESSING AND METALLURGICAL TESTING

Conventional leaching metallurgical studies were undertaken on the Ogchon Belt V-U black shale-hosted mineralization by KIER (1981 and 1984). Recoveries of 90% U and V were achieved using sulphuric acid (H<sub>2</sub>SO<sub>4</sub>) under atmospheric conditions over four days. More recent intense leaching studies were undertaken by KIGAM (Kim et al, 2014) which indicated the optimum leach conditions for vanadium were:

- Particle size of 300µm (-48 mesh).
- Concentration of 2.0M H<sub>2</sub>SO<sub>4</sub>.
- Leaching time of 2hrs.
- Pulp density of 50 wt%
- Temperature of 60°C (80°C for uranium).

Recovery rates under these optimum leach conditions were 72% for vanadium and 90% for uranium.

Metallurgical studies using Bacteriological Leaching were undertaken on the Ogchon Belt V-U black shale-hosted mineralization by KIER and KIGAM (1981 and Choi et al, 2005). These bioleaching studies used the microbe *Acidithiobacillus ferrooxidans*, which is endemic to Korea and well suited to the prevailing climate and environmental conditions. These studies demonstrated recoveries of 80% of U and V achieved over three days.

Many factors influence bacterial leaching, including:

- Properties of the mineral species.
- Surface area of the gangue minerals.
- Particle size.
- Water availability.
- Temperature.
- pH.
- Redox potential.
- Oxygen supply.
- Carbon dioxide supply.
- Supply of other nutrients e.g. nitrogen compounds, phosphate.
- Toxic substances.
- Light.

- Formation of secondary minerals (jarosites).

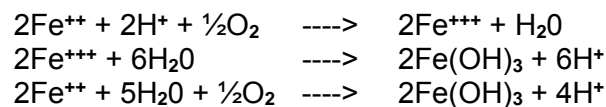
There are currently about 40 operating bioleach facilities in industrial use for Cu, Au, Zn, Co and U worldwide, and include the Ni-Cu-Co-Zn Talvivaara Mine in Finland (Talvivaara Mining Company, 2010). These operations have shown the most important leaching parameters are particle size and low pH. Acidity is controlled by the addition of H<sub>2</sub>SO<sub>4</sub>. Mineral oxidation is driven by chemistry rather than biology. The microbes provide the most efficient reaction space for bioleaching to occur.

The benefits of bioleaching are:

- No oxidant is required. The microbes produce the leaching chemicals and do the work.
- Low capital and operating costs. Ideal for low-grade ores.
- No SO<sub>2</sub> emissions. Cleaner and more environmentally friendly.

#### *Acidithiobacillus ferrooxidans*

Bioleaching studies by Korean researchers have used the microbe *Acidithiobacillus ferrooxidans*, which is endemic to Korea and well suited to the prevailing climate and environmental conditions. In addition to the oxidation of sulfur and sulfur compounds *Acidithiobacillus ferrooxidans* is able to oxidize ferrous to ferric iron and so derives its energy from this exergonic reaction. In this reaction hydrogen ions are consumed and so the pH of the medium should rise. But at pH values higher than 2, the ferric iron precipitates as ferric hydroxide, jarosites or similar compounds and this results in the formation of hydrogen ions, so that the pH of the medium is lowered as is the case with oxidation of sulphur compounds:



### 6.3.14 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

The historical resources discussed in Sections 6.3.1 and 6.3.2 are modern enough to be reliable but they cannot be estimated in accordance with the JORC Code (2012). As such they constitute Exploration Targets in accordance with the JORC Code (2012). It is uncertain that evaluation and further work will result in the estimation of a Mineral Resource in accordance with the JORC Code (2012).

## 6.4 GOSEONG POLYMETALLIC PROJECT

The Goseong Cu-Au-Ag±Pb-Zn-Co project is situated in the southern coastal region of the Korean peninsula, approximately 310km southeast of Seoul. Travel time from Seoul to the Goseong Interchange is approximately five hours.

The Goseong mining district was a significant copper-producing region in South Korea up until the end of World War II and again during the 1970-1980s. The district is situated within the Jinju Sub-basin of the Cretaceous Gyeongsang Basin.

Senlac considers the area to be prospective for breccia pipe hosted copper-cobalt-gold-silver deposits, associated with Iron Oxide Copper Gold style mineralization. The area has yet to be explored by modern western exploration methods and concepts.

This report has been prepared in compliance with the JORC Code 2012 Edition of Reporting of Mineral Resources and Ore Reserves guidelines.

### 6.4.1: HISTORY OF MINING AND EXPLORATION

The Goseong mining district is situated south-west of the Haman district, the principal copper producing region of South Korea up until the end of World War II.

#### *Mining Activities*

Some of the copper deposits were mined initially during World War I and then intermittently during the 1920s and 1930s, but most of the production recorded was between 1938 and 1945. The fissure-vein deposits were selectively mined by the shrinkage stoping method and occasionally by a combination of glory-holing and caving.

Within the Goseong mining district, the Goseong and Buyeong mines were worked intermittently on a small scale between 1925 and 1940. From 1941 to 1945, these mines were worked continuously until the end of World War II.

Post-war, the Jinheung and Sambong mines were the largest producers in the district; these together with the Samsan, Samsan-Jaeil, Daedun and Samjeon mines, were operated during the late 1970s and 1980s. Most mining operations had ceased before 1985, when only the Sambong mine was active and this mine had closed by 1992.

The veins form four main groups, each containing several abandoned mines. The veins all strike in a north-north-westerly direction, see Figure 25 and Figure 26 and dip steeply, sometimes to the east but also to the west. They are mainly important for copper and gold but lead and zinc is quite rich in a few veins.

**Goseong Group** Comprising the Goseong (Kojo, Moonyang), Samjeon and Buyeong (Changchi) mines.

**Sambong Group** Comprising the Sambong, Samsan (Sansan), Seongji and SamsanJaeil No.2 mines.

**Jinheung Group** Comprising the Jinheung (Bongwahsan), Daedun and Dupo mines.

**Samsan-Jaeil Group** Comprising the Leedang and Samsan-Jaeil mines.

#### *Goseong Group*

According to Gallagher (1963), a 50 tpd flotation mill was erected at Goseong in 1944 and presumably was used to process all the mined ores from some of the other workings in the Goseong mining district.

The Goseong mine (also Kojo, Myonyang) was focused on a single copper-bearing vein, near the village of Pup-ri in Sangri-myeon (Gallagher, 1963).

Mining resumed immediately after World War II at Goseong (Moonyang Adit in 1946 for a brief period. Approximately 250 t of hand-sorted ore was produced grading 10g/t Au, 300 g/t Ag and 10% Cu from stopes above the lowest adit (Gallagher, 1963).

Mining activities resumed at Goseong between 1947-1949 and 1955-1967, with a lull due to the Korean War. incomplete records indicate approximately 8,320 tonnes @ 7.12% Cu, 2.87g/t Au and 116g/t Ag were mined, producing 596 tonnes of copper metal, 774 ounces of gold and 31,092 ounces of silver (KMPC, 1968).

The vein was traced over a strike length of 400m and worked down to a depth of 100m. Ore grades reportedly averaged 4-5% Cu.

The KMPC (1968, 1973, 1974, 1975, 1976, and 1979) conducted exploration over the Goseong mine during 1974 to 1980. Exploration included a Self Potential geophysical survey in six small grids.

Several additional 30-100 cm wide veins off the main structures were mapped. These veins were tested by 15 holes (total 2302 m), drilled to 100 m to 150 m depth. The drilling recorded maximum assays of 1.2% Cu, 3.00g /t Au, 96 g/t Ag and 10% Pb-Zn.

The Buyeong mine (also Changchi) worked three veins near the village of Jangchi-ri in Samsan-myeon. The veins were 30-60 cm wide with grade of 0.75% Cu (Gallagher, 1963).

The KMPC (1974, 1980) conducted exploration over the Buyeong mine during 1974 - 1980. Exploration included a limited Self Potential geophysical survey which located several anomalies. These anomalies were tested in several drilling campaigns (including drill holes 75-1 (150m), 75-2 (150m), 76-3 (500m), 76-4 (150m), 76-5 (150m), 77-6 (130m) and 77-7 (120m). The drilling intersected 80-120 cm wide veins grading 1.55% Cu, 2.63 g/t Au and 50-64 g/t Ag.

The Samjeon mine was active from 1935, with production mainly from the Jangbong and Bon Adits up until 1971. After 1971, only exploration was conducted (KMPC, 1975).

The KMPC (1985) excavated a 150 m long exploration adit about 1300m south-east of the Samjeon mine, driving westerly, and designed to intersect two subparallel 250m long veins, dipping steeply to the west. Underground sampling obtained maximum assays of 2.00% Cu, 201 g/t Ag, and 0.3 g/t Au from 50-120 cm wide veins. Approximately 180 t of ore grading 2.89% Cu was milled (KMPC, 1985).

Korean Metals Exploration Pty Limited  
NI 43-101 Report.

VWPL May 2017

### *Sambong Group*

The Sambong group of workings is in the centre of the Goseong mining district and consists (from north to south) of the SamsanJaeil No 2, Sambong, Samsan and Seongji mines. The Sambong group of mines comprises at least fifteen subparallel, veins, developed over an area 3,500 m long and 900 m wide.

The Sambong mine was one of the largest producers in the district, and operated during the late 1970s and 1980s. Mining operations closed around 1992.

Detailed investigations of the Sambong group of mines was conducted by So et al (1985), Lee (1992), Choi et al (1994), and Choi (2007).

Two veins are mapped at the Seongji mine. So et al (1985) indicated that mining operations at the Seongji mine had ceased prior to 1985.

The Samsan (also Sansan) mine located at Yonghho-dong near Miryong-ri village was noted by Gallagher (1963) as a gold mine during the Japanese occupation, but production was probably negligible.

The Samsan mine was acquired in 1969 by the Kwangyang Industry Co, Ltd company and a 100 tpd flotation mill erected. According to incomplete KMPC records (1975), 53,153 tonnes @ 1.5% was milled during 1973-1975, producing 1,718 tonnes of flotation concentrates grading 13% Cu. So et al (1985) indicated all mining operations had ceased prior to 1985.

Three main veins (No 1 Vein, No2 Vein, & No 3 Vein) were worked at the Samsan mine. Another two subparallel veins were reported by KMPC (1975) that were not mined.

A limited Self Potential geophysical survey was conducted along strike to the north from the No 2 Vein, locating a chargeability anomaly. This anomaly was then tested by tunneling, which confirmed a 100 cm wide vein assaying 4% Cu, 3g/t Au and 300g/t Ag (KMPC, 1975). This indicated the No 2 Vein continued to extend a further 400m to the north. The No 3 Vein was about 20-30 m to the west of the No 2 Vein and appears to do the same.

The Sambong mine consisted of at least four subparallel quartz veins, which ranged in thickness from 20-200 cm and exhibited pinching and swelling. The Sambong mine was owned by Mr Kim U-Su from 1969 (KMPC, 1975). By 1985, the No 1 Vein was the only vein structure still being worked at the Sambong mine (So et al, 1985), the other veins were inaccessible and had closed by then. Average ore grades at Sambong were reported as 2.30% Cu by Choi et al (1992).

The KMPC (1978, 1979, 1980, 1982) conducted exploration over the Sambong mine area during 1974-1982. Exploration included a limited Self Potential geophysical survey which located several anomalies coinciding with vein structures.. Drilling in 1978 tested the No 2 Vein (three holes) and a new vein structure (five holes).

Production from the No 1 and No 2 Veins of the Sambong mine was significant and reported as follows:

- ❖ 1967-1986. 31,400 t grading 1.4-5.8% Cu (KMPC, 1982).
- ❖ 1976-1979. 3,800 t grading 200 g/t Ag and 9,900 t grading 0.5-9.96% Cu (KMPC, 1979).
- ❖ 1979-1982. 1,231 t grading 15-25% Cu (KMPC, 1982).

The Sambong mine contains historical mine reserves<sup>1</sup> of 31,735 t @ 2.30% Cu and 218 g/t Ag (Lee, 1992). A resource of 38,075 t @ 1.89% Cu, 186 g/t Ag and 0.94 g/t Au was previously reported by the KMPC (1978).

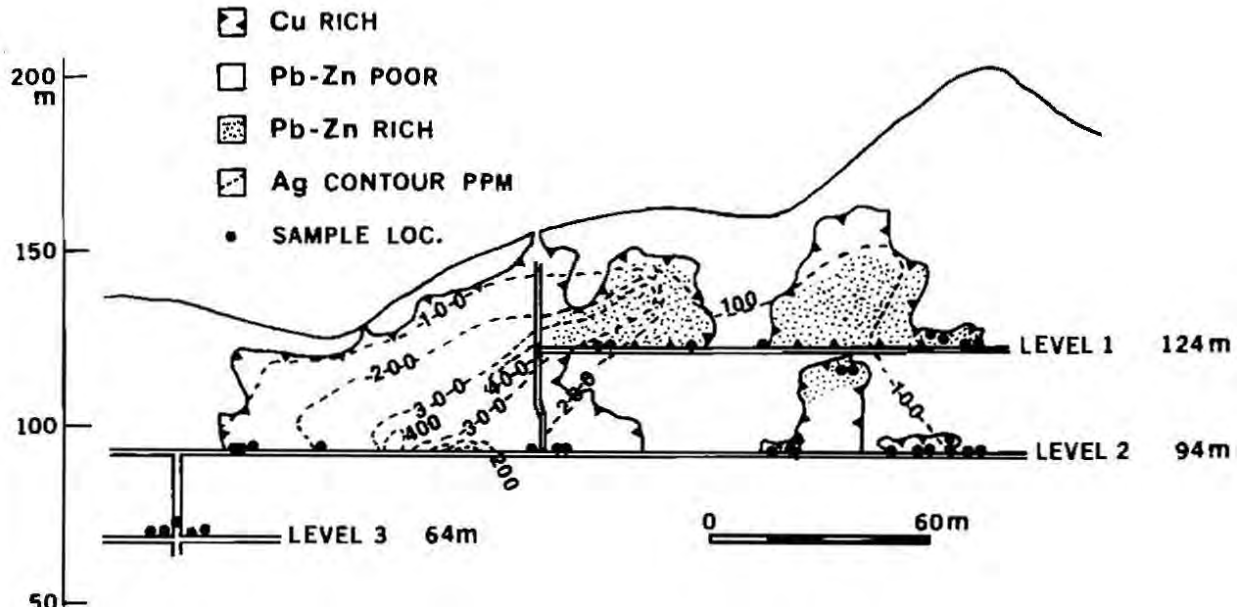


Figure 24. Longitudinal Section of the stoped out portions of the No 1 Vein at the Sambong mine (So et al, 1985). The silver grade zonation is shown as contours, along with defined ore types based on Cu and Pb-Zn content.

The Samsan-Jaeil No 2 mine consists of three) subparallel veins that are up to 300m in strike length. No further information is known about the mine.

### *Jinheung Group*

The Jinheung group of workings is situated in the southern coastal sector of the Goseong mining district. At least 19 subparallel, vein systems are developed over a 1,200 m long by 2,000 m wide area. The Sam-A Mine Co, Ltd acquired the Jinheung mine in 1967 and operated a 100 tpd flotation mill plant. The mill reportedly produced at least 8,318 tonnes of flotation concentrate grading 15% Cu, between 1971-1975 (KMPC, 1975). Mining operations closed around 1992 (Lee. 1992).

Investigations of the vein mineralization of the Jinheung and Daedun mine workings was conducted by Lee (1992), Choi et al (1994), and Choi (2007).

<sup>1</sup> Cautionary Statement: These Mineral Resource estimates are Historical and do not comply with current NI-43-101 or 2012 JORC Code reporting requirements.

At the Dupo Adit, situated immediately west of the Jinheung mine, There are two veins mapped by Park et al (1983). The veins can be traced over a strike length of 500 m. no further details are known.

The Daedun mine is composed of two subparallel veins, situated on a small peninsular approximately 1500 m SW of Jinheung mine. The veins are up to 100 cm in width, and occur together with numerous thin subparallel veins in a sheeted stockwork arrangement, developed over a 400 m long and 200 m wide zone (Choi et al, 1994).

The Jinheung (also Bongwahsan) mine was the largest copper producer in the southern sector of the Goseong mining district and had the highest average grades of 5% Cu, 2.3 g/t Au and 500 g/t Ag, almost double the grades of the other mining operations in the district.

At least 19 subparallel, sheeted quartz veins were reported at Jinheung mine by Choi et al (1994) The veins had strike lengths of 110-400m and widths ranging from 40-100 cm. The vein density mapped at Jinheung (Bonghwasan) is sufficient to constitute a sheeted vein or stockwork deposit.

The KMPC (1975 & 1980) conducted exploration over the Jinheung mine during 1974-1980. Exploration included a Self Potential geophysical survey conducted over a small grid and mapping of vein structures and underground workings. These veins were partially tested by numerous drill holes, down to 200 m depth.

### *Samsan-Jaeil Group*

The Samsan-Jaeil group of mines, comprising the Leedang and Samsan-Jaeil workings, is situated in the northeastern sector of the Goseong mining district, separated from the Sambong group of workings by a fault. At least 16 subparallel vein structures are mapped over an area of 5,000 m long by 3,000m wide. Japanese interests started mining at Samsan-Jaeil in 1916, mainly comprising the northern workings on a 600m long, 30 cm-200 cm wide vein, although no production figures are available.

The Samsan-Jaeil mine was later acquired by Mr Jung Hu-Jae in 1968, who erected a 130 tpd flotation mill on site. The KMPC (1975) reported this mill produced 6,587 tonnes of flotation concentrates grading 15.8% Cu during 1968-1973.

The KMPC (1975) indicate the northern hill at Samsan-Jaeil contained "bonanza" ores, comprising 200-300 cm wide veins with grades of 5-10% Cu, surrounded by disseminated sulphides. The vein was worked down to a depth of 350 m and most of the post-war production came from this vein.

The southern hill of the Samsan-Jaeil mine comprised three subparallel quartz veins (Lee, 1992). The veins were traced over a strike length of 1,300 m, 1,000 m and 200 m and ranged from 20-230 cm in width. The southern No 1 Vein was developed initially and mined over 400 m strike and worked down to a depth of 150 m. Average ore grades were reported as 2.50% Cu by Choi et al (1992).

The southern No 2 and No 3 Veins were explored by drilling five drill holes and partly by tunneling, exposing 20 cm to 150 cm wide veins grading 0.50% to 3.5% Cu. The KMPC (1975) indicated these resources were open and further exploration was

required. Investigations of the vein mineralization of the Samsan-Jaeil mine workings was conducted by Lee (1992), Choi et al (1992) and Choi (2007).

The Leedang mine is referred to in Park et al (1983). A total of six subparallel veins are mapped in the mine area.

In 1974, the KMPC (1980) conducted exploration over the Leedang mine during 1974-1978 in conjunction with the Jinheung mine exploration program. Exploration included a Self Potential geophysical survey conducted over a small grid, which failed to detect any anomalies. Drilling included three holes each to 150 m depth. No other information is available.

### *Smelting and Refining*

Prior to 1937, the output of hand-sorted ore mined in the Goseong district was shipped either directly to smelters in northern Korea (Chinnampo) or to Japan for refining.

In 1936, the *Samsung Mining Company* established a smelter at Changhang (also Janghang), near the port of Gunsan (located on the central-west coast of South Korea). From 1937 onwards, all flotation concentrates and hand-sorted ores mined in South Korea were sent to this smelter for refining and subsequent shipment to Japan. Although no records remain, this smelter had a capacity of 4,800 tpa of blister copper, copper anode, and crude lead (Gallagher, 1963). The electrolytic refining capacity of the plant was estimated to be 1,680 tpa of copper metal.

Copper and lead were required for the war effort in Japan, but zinc was not needed, and so most bi-product zinc production remained unsold and left on site. Gold mines in Korea were closed down by Japanese government decree in 1943, in order to divert manpower and equipment to higher priority copper-lead production.

### *Modern Exploration*

Previous exploration was conducted during 1968-1980 by the KMPC (1970s) and the KIER, in co-operation with the United Nations Development Program ("UNDP") during 1975-1976. The British Geological Survey seconded staff to assist with these efforts (Fletcher, 1976). Exploration activities included helicopter VLF, soil geochemical surveys and several diamond drilling campaigns.

On behalf of the UNDP, Sillitoe (1980) reviewed some of the porphyry Cu-Mo prospects in the Gyeongsang Basin.

Significant university research has been undertaken on the mineralization of the Goseong district, including Park et al (1983), Chi (1984), So et al (1985), Lee (1992), Choi et al (1992 & 1994) and Choi (2007).

There has been no exploration conducted in the Goseong district since 1985.

## **6.4.2 HISTORICAL MINE PRODUCTION AND EXPLORATION**

The combined mine production records for the Goseong mining district are presented in Table 9, indicating at least 6,369 tonnes of copper metal was recovered. However, the production records are incomplete and must be regarded as the minimum production figures. The figures include concentrates without recorded head grade and production from unnamed mines.

**Table 9. Historical Mine Production of the Goseong Mining District.**

| YEAR        | MINES       | Tonnes Ore (t) | Grade Cu (%) | Grade Au (g/t) | Grade Ag (g/t) | Metal Cu (t) | Metal Au (oz) | Metal Ag (oz) |
|-------------|-------------|----------------|--------------|----------------|----------------|--------------|---------------|---------------|
| 1919 - 1945 | Goseong     | NR             | NR           | NR             | NR             | 457.0        | NR            | NR            |
| 1946        | Goseong     | 250            | 10.00        | 10.00          | 300            | 25.0         | 80            | 2,412         |
| 1947        | Goseong     | 103            | 3.40         | 3.80           | 65             | 3.5          | 13            | 214           |
| 1948        | Goseong     | 151            | 7.00         | 7.80           | 191            | 10.6         | 38            | 930           |
| 1949        | Goseong     | 109            | 2.60         | 1.20           | 178            | 2.8          | 4             | 625           |
| 1955        | Goseong     | 424            | 5.30         | 2.50           | 92             | 22.5         | 34            | 1,255         |
| 1956        | Goseong     | 1,004          | 7.10         | 2.50           | 141            | 71.3         | 81            | 4,552         |
| 1957        | Goseong     | 286            | 4.40         | 1.60           | 71             | 12.5         | 15            | 649           |
| 1958        | Goseong     | NR             | NR           | NR             | NR             | NR           | NR            | NR            |
| 1959        | Goseong     | 31             | 7.50         | 1.50           | 161            | 2.3          | 2             | 162           |
| 1960        | Goseong     | 336            | 5.60         | 5.20           | 155            | 18.8         | 56            | 1,673         |
| 1961        | Goseong     | 377            | 7.70         | 1.40           | 80             | 29.0         | 17            | 970           |
| 1962        | Goseong     | 573            | 8.50         | 1.90           | 105            | 48.7         | 35            | 1,903         |
| 1963        | Goseong     | 1,781          | 6.00         | 2.10           | 77             | 106.8        | 120           | 4,409         |
| 1964        | Goseong     | 1,175          | 6.60         | 4.70           | 88             | 77.6         | 178           | 3,325         |
| 1965        | Goseong     | NR             | NR           | NR             | NR             | NR           | NR            | NR            |
| 1966        | Goseong     | NR             | NR           | NR             | NR             | NR           | NR            | NR            |
| 1967        | Goseong     | 2,020          | 9.36         | 2.80           | 160            | 189          | 182           | 10,392        |
| 1968        | Samsanjaeil | 450            | 8.00         | 1.10           | 429            | 36           | 16            | 6,207         |
| 1969        | Samsanjaeil | 663            | 12.40        | 1.50           | 640            | 82           | 32            | 13,644        |
| 1970        | Samsanjaeil | 392            | 14.30        | 2.10           | 568            | 56           | 26            | 7,159         |
| 1971        | Jinheung    | 22,540         | 1.50         | NR             | NR             | 338          | NR            | NR            |
|             | Samjeon     | 6,700          | 3.00         | NR             | 175            | 201          | NR            | 37,701        |
|             | Samsanjaeil | 539            | 16.20        | 1.60           | 473            | 87           | 28            | 8,198         |
| 1972        | Jinheung    | 14,432         | 1.50         | NR             | NR             | 216          | NR            | NR            |
|             | Samjeon     | 12,500         | 3.00         | NR             | 175            | 375          | NR            | 70,338        |
|             | Samsanjaeil | 1,985          | 15.90        | 1.50           | 397            | 316          | 96            | 25,339        |
| 1973        | Jinheung    | 25,916         | 1.50         | NR             | NR             | 389          | NR            | NR            |
|             | Samjeon     | 73             | 5.00         | NR             | NR             | 418          | NR            | NR            |
|             | Samsan      | 33,430         | 1.25         | NR             | NR             | 404          | 165           | 32,160        |
|             | Samsanjaeil | 2,558          | 15.80        | 2.00           | 391            |              |               |               |
| 1974        | Samsan      | 19,723         | 1.25         | NR             | NR             | 247          | NR            | NR            |
|             | Samsanjaeil | 13,300         | 1.50         | NR             | NR             | 200          | NR            | NR            |
| 1975        | Samsan      | 2,040          | 15.00        | NR             | NR             | 306          | NR            | NR            |
|             | Samsanjaeil | 14,000         | 2.00         | NR             | NR             | 280          | NR            | NR            |
|             | Sambong     | 31,400         | 3.50         | NR             | NR             | 1,099        | NR            | NR            |
| 1976        | Sambong     | 1,200          | 1.50         | NR             | NR             | 18           | NR            | NR            |
| 1977        | Sambong     | 2,100          | 1.50         | NR             | NR             | 32           | NR            | NR            |
| 1978        |             |                |              |                |                |              |               |               |
| 1979        | Sambong     | 840            | 1.30         | NR             | NR             | 11           | NR            | NR            |
| 1980        | Sambong     | 214            | 15.00        | NR             | NR             | 32           | NR            | NR            |
| 1981        | Sambong     | 468            | 15.00        | NR             | NR             | 70           | NR            | NR            |

| YEAR          | MINES   | Tonnes Ore (t) | Grade Cu (%) | Grade Au (g/t) | Grade Ag (g/t) | Metal Cu (t) | Metal Au (oz) | Metal Ag (oz)  |
|---------------|---------|----------------|--------------|----------------|----------------|--------------|---------------|----------------|
| 1982          | Sambong | 249            | 15.00        | NR             | NR             | 37           | NR            | NR             |
| 1983          |         |                |              |                |                |              |               |                |
| 1984          |         |                |              |                |                |              |               |                |
| 1985          | Samjeon | 180            | 2.89         | NR             | NR             | 5            | NR            | NR             |
| <b>TOTALS</b> |         | <b>216,512</b> | <b>2.94</b>  | <b>0.17</b>    | <b>34</b>      | <b>6,369</b> | <b>1,216</b>  | <b>234,249</b> |

REFERENCES: *Gallagher (1963) and KMPC (1968, 1975, 1979, 1982, 1985)*

NR = Not Reported

Gallagher (1963) as part of the United States Overseas Mines team inspected most of the major mines and historical mining archives of South Korea after the Second World War. Individual mine production records are not available until 1941. A total of 457 tonnes of copper metal were recovered during 1941-1945, from concentrates shipped to Japan from Goseong. Production figures were not reported from the district for gold, silver, lead and zinc.

A scoping study was undertaken by the KMPC on the coordinated regional economic development of copper mining in the Goseong, Haman, Changwon and Ilkwang mining districts of the Gyeongsang Basin (UK, 1973). Following this study, production resumed in the Goseong mining district at the Sambong, Samsan, Seongji and Jinheung mines probably during the 1960s. By 1985, production at these mines had ceased, apart from the Sambong mine. Production figures for the 1970-1985 period are unavailable.

#### 6.4.2.1 HISTORICAL ESTIMATES

Previous exploration by the KMPC has reported historical mine reserves<sup>2</sup> at several mines in the Goseong mining district, as in Table 10, below.

The combined historical mineral resources total 616,485 t @ 5.45% Cu, 1.53 g/t Au and 349 g/t Ag, for a total contained 33,624 t of copper metal, 30,294 oz gold and 6,916,688 oz silver.

**Table 10. Historical Mineral Resources of the Goseong Mining District.**

| MINE          | TONNES (t)     | GRADE Cu (%) | GRADE Au (g/t) | GRADE Ag (g/t) | REFERENCES                    |
|---------------|----------------|--------------|----------------|----------------|-------------------------------|
| Jinheung      | 345,000        | 8.18         | 2.30           | 546            | Lee (1992); Choi et al (1994) |
| Samsan-Jaeil  | 110,000        | 2.54         | NR             | 77             | Lee (1992)                    |
| Samsan        | 45,500         | 2.23         | NR             | 194            | So et al (1985); Lee (1992)   |
| Sambong       | 38,075         | 1.89         | 0.94           | 186            | Chi (1984) & So et al (1985)  |
| Buyeong       | 35,000         | 0.60         | NR             | NR             | Gallagher (1963)              |
| Buyeong-2     | 42,910         | 1.55         | 2.63           | 55             | KMPC (1980)                   |
| <b>TOTALS</b> | <b>616,485</b> | <b>5.45</b>  | <b>1.53</b>    | <b>349</b>     |                               |

NOTE: NR = Not Reported, but probably present.

<sup>2</sup> Cautionary Statement: These Mineral Resource estimates are Historical and do not comply with current NI-43-101 or 2012 JORC Code reporting requirements.

### 6.4.3 GEOLOGICAL SETTING - GEOLOGY OF THE GYEONGSANG BASIN

The regional geologic setting has been described above, see 6.1.3, when discussing the Uiseong Project.

### 6.4.4 PROSPECT GEOLOGY – GOSEONG

The polymetallic quartz veins of the Goseong Project area are hosted within the Goseong Formation and overlying tuffs of the Palyongsan Tuff which are intruded by co-magmatic dykes of the Jusasan Andesite.

#### Basement - Chindong Formation

The Chindong Formation outcrops in the western sector of the project area, and effectively forms the basement for the project area. This unit consists of dark grey-green mudstones and chert, with occasional thin interbeds of sandstone. Common sedimentary features observed include ripple marks, ripple cross-bedding and mudcracks. Occasionally worm trails are observed and dinosaur tracks have been preserved on some bedding planes.

#### Goseong Formation

The Goseong Formation unconformably overlies the Chindong Formation and dominates the geology of the project area. The unit strikes NE to EW, dipping gently at 10-20° to the south. The unit is sequentially composed of a basal green tuffaceous, volcanoclastic conglomerate, fine-medium grained green-grey tuffaceous sandstone and an upper unit consisting of red tuffaceous shale, with thin interbeds of green tuff (Soi et al, 1985).

The tuffaceous volcanoclastic sandstone is composed of rounded to sub-rounded grains of quartz, feldspar and andesite rock fragments, set in a fine-grained matrix of muscovite mica, calcite and iron oxides. The feldspars and andesitic rock fragments are altered to chlorite, sericite and pyrophyllite.

The tuffaceous shale occurs as thin 5-10cm thick beds and consists of angular grains of quartz, feldspar, muscovite, and andesite rock fragments, set in a matrix of iron oxides. The thin interbedded green tuff layers are composed of glass shards and volcanic rock fragments which have been altered to chlorite.

#### Jusasan Andesite

The Jusasan Andesite was probably intruded-extruded during deposition of the Goseong Formation and consists of andesite lava and co-magmatic intrusive andesite porphyry (So et al, 1985).

Andesite porphyry occurs as intrusive co-magmatic dykes into the lapilli tuff and extrusive lavas. The lavas are generally <10m thick and occur in several layers. The andesite contains phenocrysts of pyroxene and lath-shaped plagioclase with amygdaloidal and distinct serrated texture. The matrix consists of fine-grained quartz and laths of plagioclase, together with iron oxides, augite and glass shards.

#### Palyongsan Tuff

Conformably overlying the Goseong Formation and co-magmatic with the Jusasan Andesite is a sequence of andesitic tuffs, comprising a basal andesitic lapilli tuff and an upper welded tuff unit (So et al, 1985).

Dark green-grey andesitic lapilli tuff forms the lowest unit and consists of aphanitic andesite and vitric tuff fragments set in an andesitic matrix. Individual fragments range in size from 2-6cm diameter, with upward decreasing size observed. Plagioclase phenocrysts are 2mm long and is set in a groundmass of epidote, calcite and iron oxides, indicative of widespread propylitic alteration.

The upper unit is a dark grey welded tuff which is relatively localized and not widespread. The welded tuff has poor internal layering and flow structure and comprises fragments of quartz, plagioclase and glass shards set in a matrix of irregularly-shaped glassy fragments. Quartz grains are commonly fractured, corroded and flattened. The plagioclase crystals have been strongly altered to sericite and chlorite.

#### Granodiorite

Quartz diorite and granodiorite of the Bulgugsa Series occurs as stock-like exposures in the northern and western sectors of the project area, probably intruding the older Chindong Formation, but the Goseong Formation appears to be younger and rests on the granodiorite. The granodiorite is fine-medium grained and composed of quartz, plagioclase, hornblende, biotite and magnetite, with rare muscovite and apatite. The granodiorite was dated at  $105 \pm 5$  Ma by So et al (1985).

#### Quartz Porphyry

Slightly younger quartz porphyry dykes intrude the sequence.

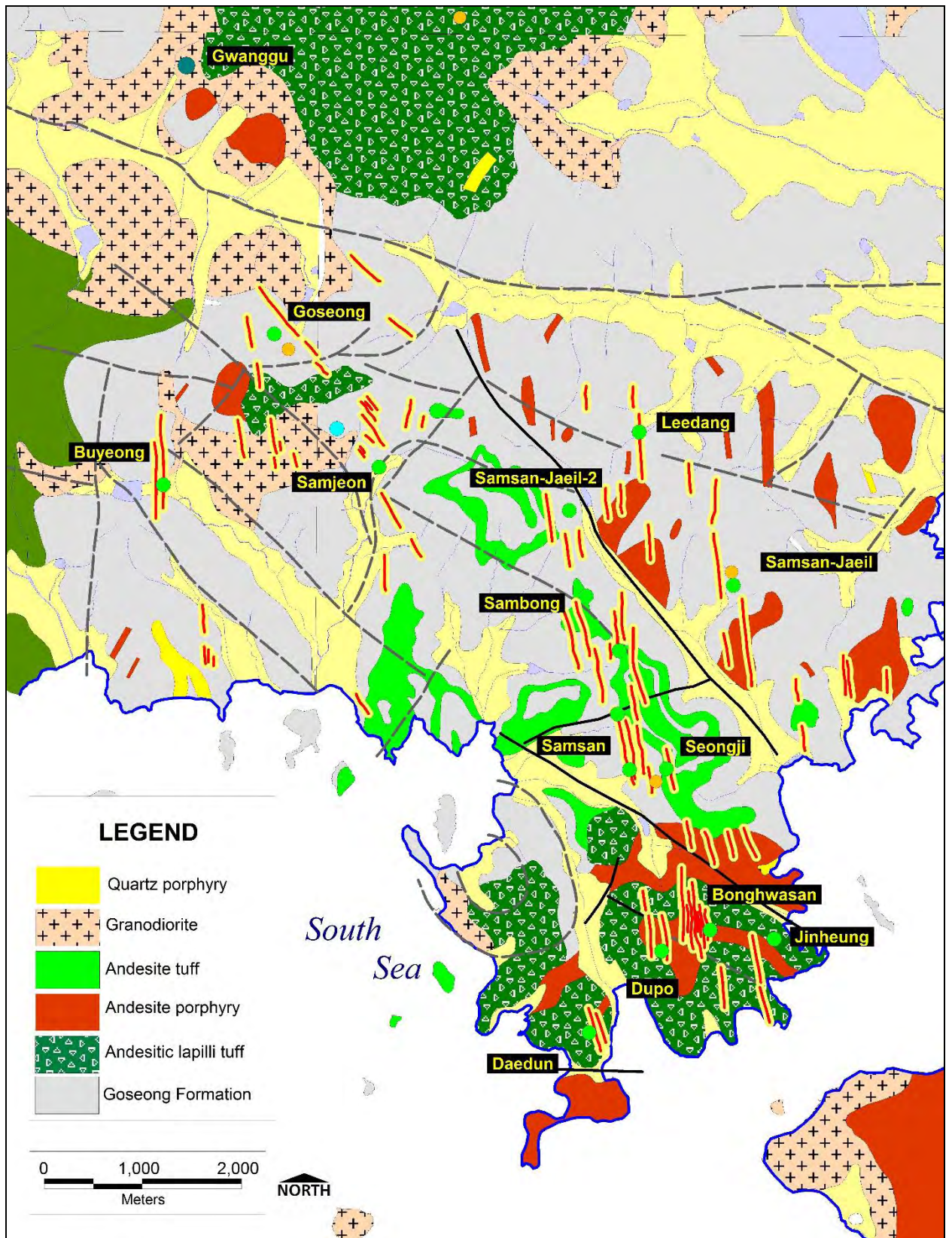


Figure 25. Geological Map of the Goseong project area (after Chang et al, 1983. Cungmu 1:50,000 scale Geological Map sheet). The mapped vein structures are highlighted by red-yellow lines and the various mine workings are indicated.

#### 6.4.5 DEPOSIT TYPES

The only recorded deposit types that are present in the Goseong field are polymetallic (Au-Ag-Cu-Pb-Zn) mesothermal quartz veins, but Mo and Co may be in significant abundances. These are similar in style to those of the Uiseong Metallogenic Province, see 6.1.5 above. Both projects are in the Gyeongsang Basin with rocks of similar age – although the Goseong Formation is younger, comparable intrusions and calderas and maar-diatreme development.

#### 6.4.6 MINERALIZATION

The Goseong Project area covers a series of subparallel, north-north-westerly striking, sheeted quartz vein systems, developed over a 7 km long by 6 km wide area, (Figure 26).

A total of 78 individual vein structures of >10 cm width have been mapped by previous investigations in the Goseong mining district. The strike lengths of individual vein structures range from 100 m up to 2000 m. Veins range in thickness from 5 cm up to 300 cm in some breccia zones, tending to display 'pinch and swell' characteristics (So et al, 1985).

The vein systems are all hosted within sediments of the Goseong Formation, andesite porphyry dykes of the Jusasan Andesite and associated co-magmatic andesitic tuffaceous rocks of the Palyongsan Tuff.

The Goseong Project area consists of four (groups/clusters of vein systems based on proximity and tenor, hosting 13 recorded historical copper mine workings, as listed above under 6.4.1: HISTORY OF MINING AND EXPLORATION and shown on Figure 26.

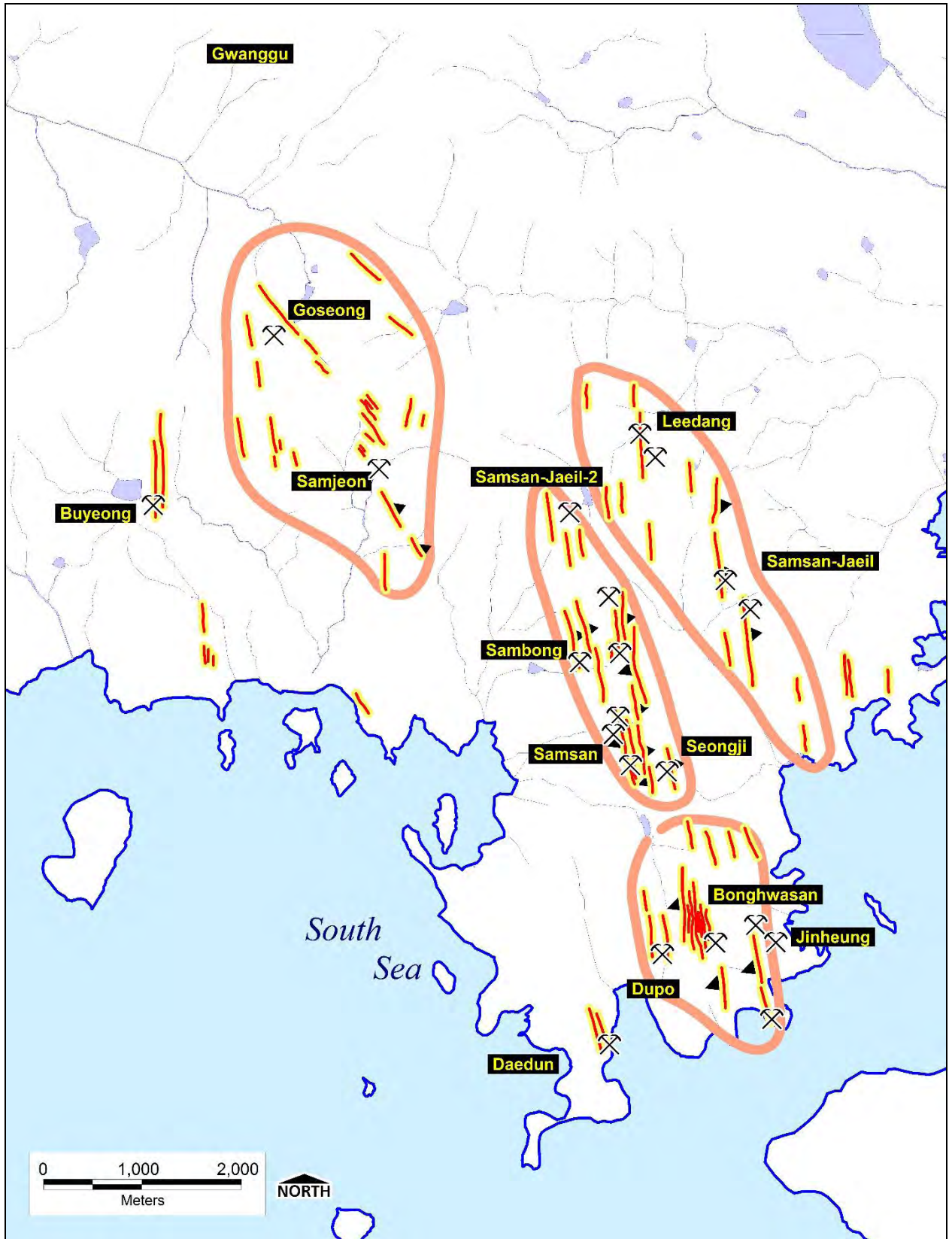


Figure 26, Vein Distribution Map of the Goseong mining district. The veins are identified by red and yellow lines. The veins have been grouped into clusters referred to in this report based on proximity and overall tenor, as outlined in pink. The dip orientation of vein structures is indicated in black when known.

## *Mineralization and Paragenesis*

The mineralogy and paragenesis are consistent among the various mines in the area (Choi et al, 1994). A three-stage paragenetic sequence is recognized by Choi et al (1993), with Stage II the main copper-bearing stage. Fluid inclusions were studied in detail by Choi et al (1994) at the Jinheung, Samsan and Daedun mines, Choi et al (1993) at the Sambong, Samsan-Jaeil and Samjeon mines, Lee (1992), and Park et al (1983) at the Goseong, Sambong and Seongji mines.

### *Stage I Early Vein*

Stage I Early Veining consists of very early low-temperature grey-coloured chalcedony veins which have been overprinted and largely obliterated by fine-grained milky to clear quartz and lesser purple amethyst quartz, typically associated with higher temperatures.

Quartz exhibits several textural varieties, including crustification, brecciation, comb and open vugs. Sulphide minerals associated with the early Stage I veining include enargite, pyrite, arsenopyrite, cobaltite and chalcopyrite. Magnetite occurs as massive aggregates near vein margins and is commonly intergrown with early sphalerite within pyrite grains.

A propylitic alteration assemblage is associated with the Stage I Early Vein Stage, comprising chlorite and epidote. Pale green epidote is often associated with dark green chlorite and both occur as disseminations or as aggregates with sulphides within the vein.

### *Stage IIa Main Ore Vein*

Stage IIa veining consists of clear comb quartz and frequently displays breccia textures with later infill. Druzy clear euhedral quartz is observed lining the occasional open vuggy cavities found in these veins.

Economic quantities of chalcopyrite were introduced during the Stage II Main Ore fluid phase, along with pyrrhotite, marcasite, cubanite, digenite, sphalerite, galena, tetrahedrite and electrum. Iron oxide as magnetite initially and then specularite (hematite) accompanies the middle and late vein fluid stages of Stage II.

Sericite and chlorite alteration is observed on the margins of this vein stage.

### *Stage IIb Late Breccia*

The final vein Stage IIb is a breccia overpressure event that overprints the earlier vein stages, with resulting open spaces infilled by further deposition of chalcopyrite.

### *Stage III Carbonate Vein*

Stage III veins contain mainly calcite and minor barite and is barren. The calcite consists of rhombohedral crystals and late scalenohedral forms. calcite is white to clear and infills cavities remaining in the earlier vein stages. It is best developed at the Sambong mine.

### *Replacement Stage*

Chalcocite, covellite, bornite and goethite were observed as supergene alteration and weathering products of sulphide minerals.

Weathering and supergene replacement sulphate minerals were identified as white and blue precipitates on rock surfaces, downstream of the historical mine dumps at Samsan-Jaeil and Sambong mines by Cho et al (2006).

### Sulphide Mineralogy

#### Pyrite

Pyrite ( $\text{FeS}_2$ ) is the earliest sulphide mineral. It occurs as euhedral to subhedral grains (<2mm diameter) intergrown and replaced by minor amounts of pyrrhotite, cobaltite, arsenopyrite, chalcopyrite, sphalerite and galena. The early pyrite is brecciated and cemented by these later minerals, indicating localized fracturing occurred at an early stage.

#### Arsenopyrite

Arsenopyrite ( $\text{AsFeS}$ ) occurs as euhedral to subhedral grains. It was observed in the Sambong and Samsan veins but not in veins at the Samsan-Jaeil and Jinheung mines (Lee, 1992), possibly indicating geochemical zonation.

#### Chalcopyrite

Chalcopyrite ( $\text{CuFeS}_2$ ) is the principal ore mineral. It occurs as irregular masses, disseminated fine-grained anhedral grains and is also intergrown with the other sulphides, sulphosalts and specularite. Chalcopyrite contains rare inclusions of pyrite, sphalerite and cosalite.

#### Cobaltite

Cobaltite is observed infilling fractures in chalcopyrite of Stage I Early veins.

#### Sphalerite

Sphalerite ( $\text{ZnFeS}$ ) is present throughout the Stage II main ore phase, taking several forms with a range of iron content

#### Galena

Galena ( $\text{PbS}$ ) is commonly coarse-grained (>5mm in diameter) and occurs as polycrystalline aggregates of anhedral grains, intergrown with sphalerite and pyrite. Galena is observed replaced by covellite along fracture cracks.

#### Tetrahedrite

Tetrahedrite ( $(\text{Cu,Fe,Ag,Zn})_{12}\text{Sb}_4\text{S}_{13}$ ) occurs intergrown with chalcopyrite, sphalerite and early galena ( $\text{PbS}$ ) along fractures. Argentian tetrahedrite occurs as inclusions within galena.

#### Electrum and Sulphosalts

These occur as minor phases

#### Iron minerals - Specularite

Iron oxide as specularite (hematite) is a characteristic feature of the mineralization of the Goseong district. Specularite accompanies the middle and late vein fluid stages of Stage II, suggesting a distinct change in fluid conditions took place, perhaps associated with the influx and mixing of oxidizing fluids. Specularite occurs as euhedral crystals interstitial to euhedral quartz crystals near vugs.

#### Gangue minerals

Calcite is associated with Stage III Carbonate Vein phase, minor barite is present as the last deposition phase overgrowing calcite in the Stage II Carbonate vein phase, chlorite is associated with Stage I Early veins and surrounding alteration zone. A propylitic alteration assemblage is associated with the Stage I Early Vein Stage, comprising chlorite and epidote.

#### Alteration

Alteration related to the hydrothermal-vein mineralization of the Goseong district was investigated in detail by Park et al (1983) and Lee (1992). In general, the degree of alteration is more intense in the andesitic rocks rather than the sediments of the Goseong Formation.

Using geothermometry of the identified chlorite species, Lee (1992) and So et al (1985) calculated the formation temperatures to range from about 290 to 350 °C at all the mines studied. The geothermometry results confirm low-pressure conditions of <200 bars, consistent with depths of formation of <1300 m, as for the fluid inclusion data.

Relatively weak phyllic and kaolinitic alteration has been observed.

#### Age of Mineralization

Using sericite alteration around vein mineralization, Koh et al (2003) obtained ages of  $84.8 \pm 2.1$  Ma for the Sambong mine. An age of  $81.8 \pm 1.8$  Ma was obtained by Lee (1992) from sericite alteration at the Samsan mine. The age dates correspond closely with those obtained from the Jusasan Andesite.

The age dates possibly indicate the hydrothermal system at Goseong was active over a period of about 3 million years during the Santonian period of the Late Cretaceous. The hydrothermal system was probably related to the intrusive andesitic volcanic activity.

#### Geochemistry

Typical average ore grades reported from the mines of the Goseong mining district were 2.3% Cu, 0.7g/t Au and 100g/t Ag (Choi et al, 1993). However, Jinheung has notably higher grades of Cu (8%), Au (2.3g/t) and Ag (550g/t). Typical grades of Pb and Zn were not reported.

Choi et al (1993) recognized vertical zonation patterns in mineralization at the Sambong mine, with galena-sphalerite concentrated in the upper levels and chalcopyrite increasing with depth.

### 6.4.7 EXPLORATION

KME has not carried out any field work on the Goseong Project and VWPL has not visited the project.

#### Exploration Targets

A review of the historical exploration data has identified several Exploration Targets in the Goseong mining district. These targets are discussed in the following sections and indicated on the accompanying map below, Figure 27.

## Geochemical Targets

Stream sediment geochemistry results indicate the following targets:

- An intense copper anomaly covers the Goseong mining district, with peak anomalism (>122ppm Cu) developed over the Jinheung, Seongji, Samsan and Samsan-Jaeil workings.
- A moderately elevated Co anomaly is developed in the southern sector of the Goseong district, particularly Jinheung and Daedun workings. This anomaly is interpreted as representing an early higher-temperature zone of the hydrothermal mineralizing system in the Goseong mining district.
- A moderately elevated Pb anomaly is developed over the Goseong district, peaking between the Samsan and Jinheung workings.
- A moderately elevated Zn anomaly drains the western sector of the Goseong mining district, particularly the Buyeong mine workings. This anomaly is interpreted as a more distal sector of the hydrothermal mineralizing system in the Goseong district. Copper grades could potentially be expected to increase in depth in these workings.

A vertical zonation pattern was recognized by So et al (1985) in vein mineralization at the Sambong mine, with galena-sphalerite above chalcopyrite, indicating Pb-Zn decreases with depth and Cu increases with depth.

The lead and zinc grades of the mines of the Goseong district are not reported and were historically considered uneconomic. However, sphalerite and galena are a major component of the mineralization in petrographic studies and it is concluded significant grades of Pb and Zn can be expected. Current metal prices suggest the economic potential of Pb and Zn accompany the Cu-Au-Ag veins of the Goseong district could be significant.

Studies of distribution of gold in IOCG deposits by Zhu (2015) made the following conclusions:

- There is a positive correlation of Cu with Au. Gold distribution is controlled by gold content in host rocks, cooling, fluid-wall rock interaction and fluid mixing.
- Exploration should focus on gold-enriched host rocks, prospective depositional mechanisms and low-temperature zones.

In the nearby Haman district north-east of Goseong, vein structures containing cobaltian arsenopyrite are hosted within tonalite and form a high-priority target for cobalt exploration (Sennitt, 2016). Within the Goseong district, the Goseong and Samjeon mines lie at the contact with mapped granodiorite of similar age to the tonalite, host mineralized vein structures and potentially may be targets for Co enrichment. The Jinheung and Daedun mines are considered priority targets for Co mineralization on the basis of Co stream sediment geochemistry and slightly higher vein formation temperatures conducive for cobalt deposition.

Soil geochemistry surveys can be employed using Co, As, Cu, Au, and Fe as vectors to help target exploration drilling.

## Geophysical Targets

Airborne geophysical surveys have identified the following anomalies:

- An intense magnetic high anomaly (> 200nT) coinciding with mapped granodiorite in the Goseong mine area. This magnetic anomaly could potentially be caused by a more mafic diorite intrusion or magnetite alteration and warrants field checking.
- A K-Channel radiometric anomaly of >50cps occurs in a NNW striking zone that includes the main mine workings. This anomaly is interpreted as being caused by sericitic phyllic alteration assemblages associated with the mineralizing hydrothermal system.

## Geological Targets

A circular resurgent dome feature is possibly identified from SPOT (Satellite Pour l'Observation de Terre) satellite imagery in the eastern sector of the district. A single 600m long north-north-west-striking vein passes through the middle of this feature. Field checking of this feature is warranted.

A concentric ring feature with recessive topography is recognized on SPOT satellite imagery. This feature is interpreted as a possible alteration zone developed above a 'blind' intrusion at depth, although radiometrics do not support this concept.

Abandoned mines are always key exploration targets, and several should be drilled. There is considerable merit in drilling beneath old workings and investigating extensions of mineralised shoots. The high-grade Cu-Ag-Au resource in vein mineralization at the Jinheung mine in particular is a high-priority Exploration Target (345,000 tonnes grading .8.18% Cu, 2.30 g/t Au and 546 g/t Ag). Previous exploration, mainly by KPMC, reports remaining historical mine reserves<sup>3</sup> in the Goseong district, as listed in Section 6.4.2.1 HISTORICAL ESTIMATES. The plans and sections of various deposits are not always informative but KME will be able to identify targets with further research. The depth extent of many abandoned mines is often less than 200 m and often not far below aditing levels, so there is great scope to drill for mine extensions. The Longitudinal Section of the stoped out portions of the No 1 Vein at the Sambong mine (Figure 24, Section 6.4.2.1) is a good example.

The combined resources amount to about 617,000 tonnes grading 5.45% Cu, 1.53 g/t Au and 349 g/t Ag and contain 33,624 tonnes of copper metal, 30,294 oz gold and 6,916,688 oz silver

The potential for a bulk tonnage copper and precious metal deposit is considered significant and warrants modern exploration. The presence of hydrothermal breccias, splays and small stringers, and vein stockworks around the main vein structures present targets for bulk mineralisation.

Stockwork zones have been identified at the following mines and constitute high-priority Exploration Targets:

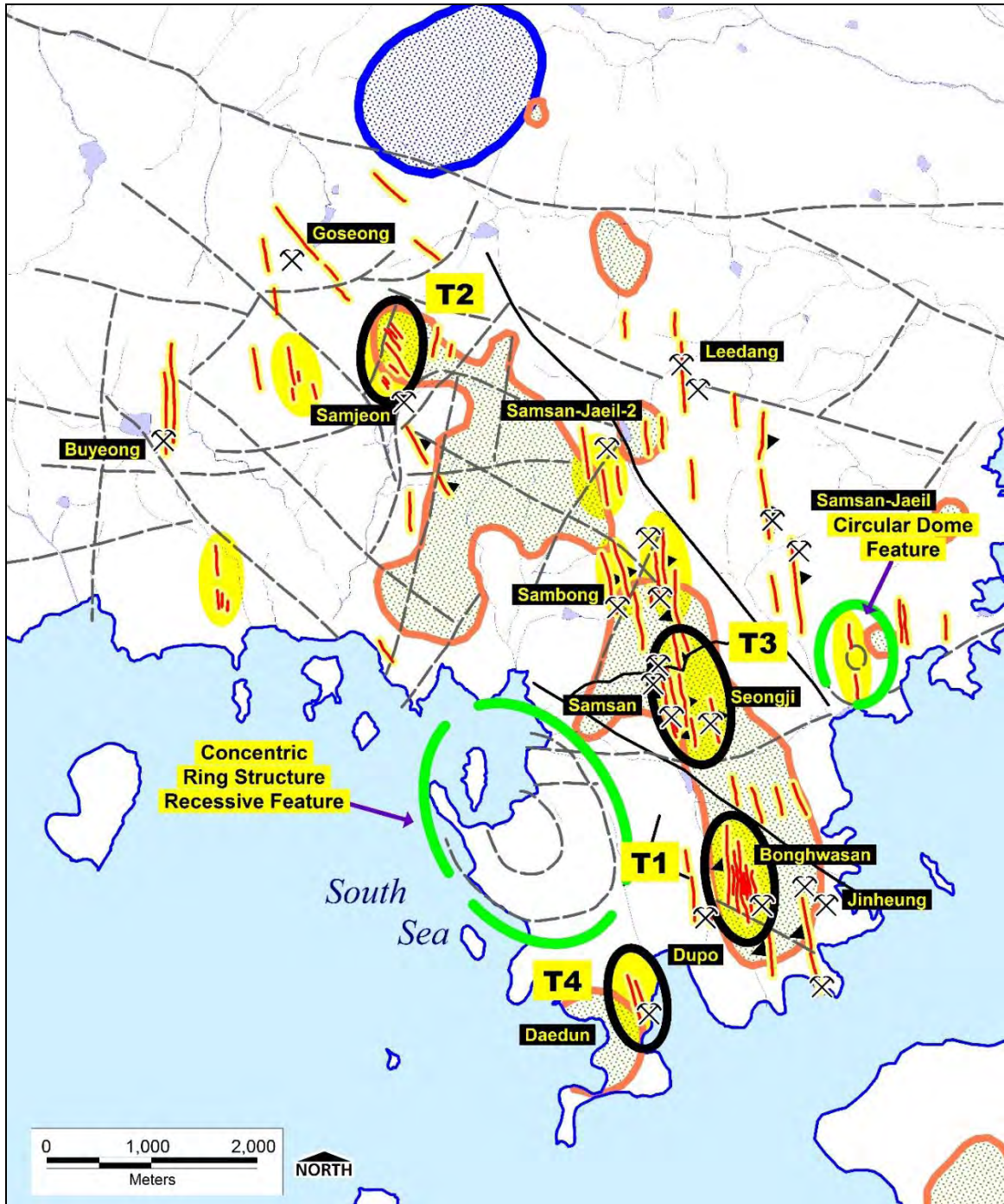
- ❖ **T1 Target.** Jinheung mine.
- ❖ **T2 Target.** Samjeon mine.

---

<sup>3</sup> **Cautionary Statement: These Mineral Resource estimates are Historical and do not comply with current NI-43-101 or 2012 JORC Code reporting requirements.**

- ❖ **T3 Target.** Samsan-Seongji mines.
- ❖ **T4 Target.** Daedun mine.

Significant grades of Pb and Zn can be expected to accompany the Cu-Ag-Au mineralization.



**Figure 27. Exploration Target Compilation Map of the Goseong mining district.** The mapped vein structures are indicated as red-yellow lines. The fault-fracture patterns recognized from satellite imagery are indicated by grey lines. Exploration Targets are labelled T1 – T4.

Key Exploration Target features include:

- ❖ Stockwork sheeted vein targets are highlighted in yellow.
- ❖ The “K-channel” anomalies (>50cps) are outlined in green shading (inferred phyllic alteration zones).
- ❖ Intense magnetic high anomaly is highlighted in blue (diorite intrusive inferred at depth). A concentric zoned ring structure with recessive topography, is evident on SPOT satellite imagery and is highlighted in green (interpreted as altered eroded volcanic/intrusive center).

#### **6.4.8 DRILLING**

KME has not drilled on any of the project areas. Historical drilling for minerals (see Section 6.3.1) was undertaken by the KIER during the 1975 through to the 1980s.

#### **6.4.9 SAMPLING METHOD AND APPROACH - KME**

Refer to 6.1.9

##### **6.4.9.1. Surveying**

Refer to 6.1.9.1

##### **6.4.9.2. Sampling - General**

Refer to 6.1.9.2

##### **6.4.9.3. Stream Sediment Samples**

Refer to 6.1.9.3

##### **6.4.9.4. Rock Chip Samples**

Refer to 6.1.9.4

#### **6.3.10 SAMPLE PREPARATION, ANALYSES AND SECURITY - KME**

Refer to 6.1.10

##### **6.4.10.1 Sample Transportation and Security**

Refer to 6.1.10.1

##### **6.4.10.2. Laboratories**

Refer to 6.1.10.2

##### **6.4.10.3. Rock samples**

Refer to 6.1.10.3

#### **6.4.10.4. Stream sediment samples**

Refer to 6.1.10.4

#### **6.4.11 DATA VERIFICATION**

Refer to 6.1.11.

#### **6.4.12 ADJACENT PROPERTIES**

#### **6.4.13 MINERAL PROCESSING AND METALLURGICAL TESTING**

#### **6.4.14 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES**

The historical resources discussed in Sections 6.4.1 and 6.4.2 are modern enough to be reliable but they cannot be estimated in accordance with the JORC Code (2012). As such they constitute Exploration Targets in accordance with the JORC Code (2012). It is uncertain that evaluation and further work will result in the estimation of a Mineral Resource in accordance with the JORC Code (2012).

## 7.0 OTHER RELEVANT DATA AND INFORMATION

### 7.1. Company Management and Technical Expertise

Mr Christopher M. Sennitt of Senlac Geological Services Pty Limited and Managing Director of KME is a consulting geologist with 35 years' mineral exploration experience throughout Australia, including 13 years in Australia and 22 years in Asia (Korea, China, Thailand, Laos, Vietnam and Myanmar). He has operated in Korea since 1994. Mr Kim Wan Joong is a geologist with 20 years of experience in mineral exploration and tenure management in Korea.

Mr Sennitt has managed exploration programs for many mineralization styles, including: epithermal Au-Ag, sediment-hosted Au, intrusive-hosted Au, porphyry Mo, W-Mo skarns (Sangdong W-Mo mega-skarn deposit in South Korea), porphyry Cu-Au, sediment hosted Cu and graphitic slate-hosted U. He is well suited to supervise the exploration at Uiseong, Haman, Goseong and Miwon Projects.

A comprehensive geological database on Korea has been systematically acquired and built up over 18 years by Senlac since 1994. The mineral occurrence database includes some 800 gold deposits and 125 base metal deposits. The database is in a Geographic Information System (GIS) format using MAPINFO™ software. The map projection used for the GIS is WGS-84, zone 52 North UTM, although South Korea uses Tokyo Grid.

Senlac has over 22 years operational mineral exploration experience in South Korea, whilst engaged by Indochina Goldfields Ltd, Oriental Minerals Inc, Stonehenge Metals Ltd and Lamboo Resources Limited. Mr Sennitt has visited a large number of mineral deposits representing a wide range of mineralization styles in Korea.

## 8.0 INTERPRETATION AND CONCLUSIONS

Historical investigations of the mines in the Uiseong and Haman Projects by the KMPC, KORES and KIER provide a useful database for target generation. Reconnaissance geological mapping, rock chip sampling and interpretation of the drilling database by KME have identified drill-ready Exploration Targets at the Dongil-Gunwi Mine in the Uiseong Project and at the Gunbuk and Oguk Mines in the Haman Project.

KMPC and KIER diamond drilling of these mines in the 1970s produced only small diameter BQ size drill core which might be expected to achieve poor recovery in mineralized and altered rocks. Sampling was incomplete and reliant on visual identification of base metal-rich veins.

In the 1970s, gold was not a sought-after commodity; more commonly gold mines were closing globally. As a consequence, KMPC and KIER analysed their samples primarily for Pb and Zn whilst Cu, Au and Ag were analysed to a lesser extent.

VWPL concludes that the drill results of KMPC and KIER do not accurately reflect the gold content of the deposits because of selective sampling and assaying and potential low core recovery. Gold mineralization not associated with visually strong veins and base metal minerals may have been missed entirely. The quality of the assaying is unknown but will not have included check and umpire assaying required for reporting under the current JORC Code and NI-43-101 guidelines. Therefore, the Exploration Targets will require re-drilling before resources can be estimated. The KMPC and KIER work is not entirely wasted as geological structure and lode continuity has been established.

On the Uiseong Project, mineralization and alteration at Dongil-Gunwi, Keumdong Chilbo, Ogsan, Kyungwha, Keumhak and Jeonheung mines require investigation for Au-Cu-dominant exploration targets. Ag-Pb-Zn-dominant mineralization at the Keumbong, Cheonsong, Dopyung, and Daesung mines is a secondary target at this stage.

In the Haman field, mineralization and alteration at the Gunbuk and Oguk mines, the Dundok-Gilgok workings, the Bukguk-Namgok-Taehwa workings, the Okbang Mine, the Haman (Manse & Ebisu) Mine and the Jaeilgunbuk Mine require investigation for Cu and Au in both high-grade veins and bulk low-grade gold zones, where sheeted vein systems and stock-works have been recorded. KME are also going to investigate the strong Cu-Co mineralization recorded at the Haman Mine (2.69% Cu, 1 g/t Au, 85 g/t Ag and 1% Co), the Gunbuk Mine (6.07% Cu, 15.92 g/t Au, 78.7 g/t Ag, and 1% C.) and the Jaeil Gunbuk Mine (1.07% Cu and 1% Co).

At the Goseong Project exploration targets for high-grade veins (Cu-Au-Ag) and bulk tonnage deposits have been identified at the Jinheung mine, Samjeon mine Samsan-Seongji mines and the Daedun mine: sheeted veins, horsetail splays, breccias and stockworks hosting both gold and base-metals.

KME recognises that the geology of the Gyeongsang Basin is similar in age, tectonic setting and geology to the Andes mountain chain of South America. The deposits are

all interpreted to be “intrusive-related” and might be hosted in a number of settings and associated with a number of processes: volcanic stockworks and breccias above intrusives, diatreme-maar veins and breccias, limestone replacement mineralization, flow dome veins and breccias, caldera related epithermal venation. KME considers that both Mexican-style epithermal gold-silver-polymetallic and iron-oxide-copper-gold models may be applied in parts of the Gyeongsang Basin and it will investigate further geological, magnetic and radiometric features which might be caused by major concealed deposits.

At the Miwon Project, KIER has established historical inferred resources at the Miwon (Isikri) and Guimanri (Yongyuri) deposits of vanadium and uranium. No suitable Competent Person has examined the resource estimates to classify them in accordance with the JORC Code and NI-43-101 requirements. The historical resources are quoted as follows:

- Guimanri (Yongyuri) deposit - an inferred resource of 1,602,000 t grading 0.20%  $V_2O_5$  and 0.050%  $U_3O_8$  for 7.05 million lb of contained vanadium and 1.76 million lb of contained uranium (KIER, 1986).
- Miwon (Isikri-Jukeumri) deposit – an inferred resource of 1,670,000 t grading 0.50%  $V_2O_5$  and 0.034%  $U_3O_8$  for 18.37 million lb of vanadium and 1.25 million lb of uranium (KIER, 1986).

KME will need to ratify the resources before proceeding with preliminary scoping studies. Should vanadium and/or uranium become viable and sought after, there is clearly great opportunity to explore for more.

## 8.1 Company Strategies and Plans

KME intends to focus its exploration strategy to advance its priority projects into commercial production as rapidly as possible. Evaluation drilling is the key activity and KME are intending to complete 3000 m of HQ drilling in the first year and a similar amount in the second year of operations. The company has formulated an exploration program and budget with the following sequential project ranking and priorities:

### Dongil-Gunwi Au-Ag-Cu-Pb-Zn Mine (Uiseong Project)

1. Airborne EM geophysical survey.
2. Resource definition drilling.
3. Metallurgical testwork.
4. Preliminary economic assessment.
5. Mine engineering studies.
6. Bankable feasibility study.
7. Mapping and drill testing of nearby satellite deposits.

The initial goal is to have JORC compliant Indicated and Inferred Resource estimates on the Dongil project by the end of the first year. Metallurgical testwork will have commenced.

In the second year, the goal is to have completed metallurgical testwork and a preliminary economic assessment (scoping study) on Dongil-Gunwi Mine. Measured and Indicated Resource estimates will be completed by end of year. Social and Environmental “baseline studies” will be completed over a 12-month period, taking into account the four climate seasons.

### **Gunbuk and Oguk Au-Ag-Cu-Co mines (Haman Project)**

1. Airborne EM geophysical survey.
2. Resource definition drilling.
3. Metallurgical testwork.
4. Preliminary economic assessment.
5. Mine engineering studies.
6. Preliminary feasibility study.

### **Haman Au-Ag-Cu-Co Project**

1. Mapping, sampling and drill testing of bulk-tonnage Exploration Targets.

### **Goseong Cu-Au-Ag Project**

1. Airborne EM geophysical survey.
2. Further research and exploration targeting at abandoned mines.
3. Drill testing of geological, geochemical and geophysical targets.

### **Miwon V-U-Mo Project**

1. Mapping and sampling of the Guryongsan Slate.
2. Acquisition of adjacent deposits.

## 9.0 RECOMMENDATIONS

VWPL recommends that KME proceeds with evaluation drilling of the most appealing vein systems in the Uiseong and Haman Project areas using NQ (47.6 mm) or HQ (63.5 mm) diameter core. Assaying should take place at a NATA (National Association of Testing Authorities) certified laboratory in Australia or Canada.

At this time, we suggest that the Haman Au-Cu-Co bearing veins are the most interesting targets and that small resources of high grade mineralization established at mines within a few kilometres of each other might be viable using a centralised treatment plant.

KME has already prepared a drill campaign for the Dongil-Gunwi Mine. KME considers the historical drill results from the Dongil-Gunwi Mine indicate the presence of consistent gold-silver-polymetallic mineralization in sheeted veins, over 7-20 m thicknesses for a strike length of 2100 m, down to depths of greater than 200 m. The potential for a modest, open-pit commercially-viable mining operation will be examined, but underground mining is possible.

### 9.1. Future Exploration Programs and Budgets

This Report refers to US dollars – (\$US/\$Canadian = 1.37- 8<sup>th</sup> May 2017).

KME has allocated approximately US\$5 million budget for the first year of operations to be followed by approximately US\$6 million in the second year. Activities include 5400 m of drilling at Haman, 2700 m at Goseong and 18,000 m at Dongil, and a feasibility study at the Dongil Mine, Uiseong Project. The company has formulated an exploration program with sequential priorities as outlined in the company strategies, see above, Section 8.1.

KME desires to raise and apply funds as follows:

| Allocation of Funds (over 2 years)         |            |      |
|--------------------------------------------|------------|------|
| Feasibility – Dongil                       | 4,097,800  | 27%  |
| Exploration - Dongil                       | 2,209,850  | 15%  |
| Exploration – Haman                        | 1,816,800  | 12%  |
| Exploration – Goseong                      | 1,268,000  | 8%   |
| Contingency                                | 1,886,500  | 13%  |
| Fees of the offer                          | 500,000    | 2%   |
| Business development, transaction expenses | 630,000    | 4%   |
| Overheads                                  | 2,758,400  | 9%   |
| Total                                      | 15,000,000 | 100% |

## 10.0 SOURCES OF INFORMATION AND FORMAL REFERENCES

### 10.1 General published (and unpublished public domain) references

- Dong, G., Morrison, G., & Jaireth, S., 1995. Quartz textures in eothermal veins, Queensland – classification, origin and implication, *Econ. Geol.*, 99, 1541-1556.
- Leventhal J.S., 1991. Comparison of organic geochemistry and metal enrichment in two black shales: Cambrian Alum Shale of Sweden and Devonian Chattanooga Shale of United States *Mineralium Deposita* April 1991, Volume 26, Issue 2, pp 104–112.
- Pearson, M.F., Clark, K.F., and Porter, E.W., 1988. Mineralogy, fluid characteristics, and silver distribution at Real de Angeles, Zacatecas, Mexico, *Econ. Geol.*, 83, 1737-1759.
- Ponce, B.F. and Clark, K.F., 1988. The Zacatecas Mining District: A Tertiary caldera complex associated with precious and base metal mineralization, *Econ. Geol.*, 83, 1668-1682.
- Reedman, A J and Um, S H, 1975. The Geology of Korea, *Korea Inst Energy and Res*, Seoul, 139 pp.
- Shelton, K.L., So, C.S., Haeussler, G.E., Chi, S.J., & Lee, Y.Y., 1990. Geochemical Studies of the Tongyoung Gold-Silver deposits, Republic of Korea: Evidence of meteoric water dominance in a Te-bearing epithermal system, *Econ. Geol.*, 85, 1114-1132.
- Sillitoe, R.H., 1973. The tops and bottoms of porphyry copper deposits, *Econ. Geol.*, 68, 799-815.
- \_\_\_\_\_, 1980. Evidence for porphyry-type mineralization in southern Korea, *Mining Geology Special Issue*, 8, 205-214.
- \_\_\_\_\_, 1984. Volcanic Landforms and Ore Deposits, *Econ. Geol.*, 79, 1286-1298.
- \_\_\_\_\_, 2003. Iron oxide-copper-gold deposits: an Andean view, *Mineralium Deposita*, 38, 7, 787-812.
- So, C.S., Chi, S.J., Shelton, K.L., and Skinner, B.J., 1985. Copper-bearing hydrothermal vein deposits in the Gyeongsang Basin, Republic of Korea, *Econ. Geol.*, 80, 43-56.
- Williams, P.J., Barton, M.D., Johnson, D.A., Fontbote, L., De Haller, A., Mark, G., Oliver, N., & Marschik., R., 2006, Iron oxide copper gold deposits: geology, space-time distribution, and possible modes of origin, *Econ. Geol.*, 100<sup>th</sup> Anniversary Volume, 371-405.
- Yang, K.H. and Bodnar, R.J., 1994. Magmatic-hydrothermal evolution in the “Bottoms” of porphyry copper systems: Evidence from silicate melt and aqueous fluid inclusions in granitoid intrusions in the Gyeongsang Basin, South Korea, *International geology Review*, 36, 608-629.

## 10.2 Internal KME Reports

Haman Co-Au-Ag-Cu Project, South Korea, February 2017. Compiled by Christopher M. Sennitt (Senlac Geological Services Pty Limited).

Uiseong Au-Ag-Cu-Pb-Zn Project South Korea, February 2017. Compiled by Christopher M. Sennitt (Senlac Geological Services Pty limited).

Miwon and Gumsan V-U-Mo-Ba-Zn-Cu Insitu Bioleach Project, South Korea., 5th July 2016. Compiled by Christopher M. Sennitt (Senlac Geological Services Pty Limited).

Goseong Cu-Au-Ag Project South Korea, March 2017. Compiled by Christopher M. Sennitt (Senlac Geological Services Pty Limited).

## 10.3 Selected Historical Reports and Journal papers

### 10.3.1 Uiseong Project

Chi, S.J., Doh, S.J., Choi, S.G., and Lee, J.H., 1989. Geochemistry of Cu-Pb-Zn-Ag deposits from the Uiseong mineralized area, *Journal of Korean Institute of Mining Geology*, 22, 253-266.

\_\_\_\_\_, and Koh, Y.K., 1991. Gold-silver mineralization of the Uiseong area, *Journal of Korean Institute of Mining Geology*, 24, 2,151-165.

Choi, S.G. Lee, J.H. Yun, S.T., and So, C.S., 1992. Mineralogy and geochemistry of the Jeonheung and Oksan Pb-Zn-Cu deposits, Uiseong area, *Journal of Korean Institute of Mining Geology*, 25, 417-433.

Hwang, D.H., Kim, M.S., Oh, M.S. and Park, N.Y., 1990. Study on geology and mineralization for metallic mineral deposits in Korea, *Korea Inst. Energy and Resources*, Rept No KR-90-2A.

KIER, 1984. Studies on Geophysical Prospecting for Metallic Mineral Orebodies, *Korea Institute of Energy and Resources*, 67-92.

KIGAM, 2001. Study on the data-base and assessment of domestic mineral resources, Area of 1:250,000 Pusan and Andong Geological Sheets, *Korea Institute of Geoscience and Mineral Resources*, Rept No 2000-R-TI02-P-03, 90pp.

KIGAM, 2002. Andong Magnetic Anomaly Map 1:250,000 scale Map Sheet NJ52-14, *Korea Institute of Geoscience and Mineral Resources*.

KMPC, 1976. Mine Production and Development Report, Daesung Mine, *Korean Mining Promotion Corporation*, Annual Rept., 33-34.

KMPC, 1977. Exploration Activities Report, Cheonji Mining Claims 119 and 120, *Korean Mining Promotion Corporation*, Annual Rept., 136-137.

KMPC, 1979. Exploration Activities Report, Jeonheung Mine, Mining Claim 109, *Korean Mining Promotion Corporation*, Annual Rept., 152-154.

KMPC, 1980. SP Geophysical Survey Report - Cheonji 116 Mining Claim, *Korean Mining Promotion Corporation*, Annual Rept., 466-468.

KMPC, 1981. Exploration Activities Report, Jeonheung Mine, Mining Claim 109, *Korean Mining Promotion Corporation*, Annual Rept., 178-179.

KMPC, 1987. Exploration Activities Report, Cheonji 88 Mining Claim, *Korean Mining Promotion Corporation*, Annual Rept., 849-850.

Lee, D.S., 1987. *Geology of Korea*, Geol. Soc. Korea, Kyohak-Sa, 514pp.

- Lee, S.Y., Choi, S.G., So, C.S., Ryu, I.C., Wee, S.M., and Heo, C.H., 2003. Base-metal mineralization in the Cretaceous Gyeongsang Basin and its Genetic Implications, Korea: the Haman-Gunbug-Goseong (-Changwon) and the Euseong Metallogenic Provinces, *Econ. Environmental Geology*, 36, 4, 257-268.
- Park, H.I., Park, H.I. (eds.), 1994. Metallogenic epochs and provinces of the Gyeongsang Basin, *Processes of Formation of Metallic and Nonmetallic Mineral Deposits in the Gyeongsang Basin*, 9-75.
- Sennitt, C.M. and Kim, W.J., 1997. Base metal skarn deposits of South Korea, *PACRIM 99, AusIMM, Bali*, 247-254.
- Se Woo Mining Co. Limited, 2008. Cheongsong Pb-Zn Mine, *Unpubl. Co. Rept., Se Woo Mining Co Ltd.*
- Se Woo Mining Co. Limited, 2008. Daesung Pb-Zn Mine, *Unpubl. Co. Rept., Se Woo Mining Co Ltd.*
- Se Woo Mining Co. Limited, 2008. Keumbong Cu Mine, *Unpubl. Co. Rept., Se Woo Mining Co Ltd.*
- Se Woo Mining Co. Limited, 2008. Keumdong Chilbo Pb-Zn Mine, *Unpubl. Co. Rept., Se Woo Mining Co Ltd.*
- Se Woo Mining Co. Limited, 2008. Ogsan Pb-Zn Mine, *Unpubl. Co. Rept., Se Woo Mining Co Ltd.*
- Se Woo Mining Co. Limited, 2008. Oksan-Geumhag Pb-Zn Mine, *Unpubl. Co. Rept., Se Woo Mining Co Ltd.*
- Yu, S.H., Hwang, J.S., Min, K.D., and Woo, I., 2005. Subsurface Geology and Geological Structure of the Euseong Basin using Gravity, Magnetic and Satellite Image Data, *Econ. Environmental Geology*, 38, 2, 143-153.
- Yun, S.T., Choi, S.H., and So,, C.S., 1996. Complex geochemical evolution of hydrothermal fluids related to polymetallic Cu-Zn-Pb mineralization of the Namseon Mine, Gyeongsang Sedimentary Basin, Korea, *Neues Jahrbuch fur Mineralogie Monatshefte and Abhandlungen*, 170, 127-153.

### 10.3.2 Haman Project

- Bosschart, R.A., 1975. Preliminary evaluation report on an airborne electromagnetic and magnetic survey in South-east Korea, *Unpubl. Rept., United Nations Development Program.*
- Bosschart, R.A., 1976. Flight path recovery and preliminary ground follow-up results of an airborne geophysical survey in Korea, *Unpubl. Rept., United Nations Development Program.*
- ESCAP, 1987. *Atlas of mineral resources of the ESCAP Region, Volume 3, Republic of Korea*, explanatory brochure, United Nations Economic and Social Commission for Asia and the Pacific, 51pp.
- KIGAM, 2001. Geochemical Atlas of Korea (1:700,000), Series 1-7, *Korea Institute of Geoscience and Mineral Resources.*
- KIGAM, 2009. Magnetic Anomaly Maps of Korea, 1:100,000 scale, *Korea Institute of Geoscience and Mineral Resources.*
- Kim, S.E. and Kim, Y.D., 1977. Geology and ore deposits of In Annual Report on Geoscience and Mineral Resources 1977, *Korea Institute Geoscience and Mineral Resources*, 2, 5-22.
- \_\_\_\_\_. and Hwang, D.H., 1983. *Metallogenesis in Korea – Explanatory Text for the Metallogenic Map of Korea*, Kor. Inst. Energy Resources, 16-23.
- Kim, S.J., Kim, Y.K., and Noh, J.H., 1990. Mineralogy and genesis of hydrothermal deposits in the southeastern part of Korean Peninsula: (1) “Napseok” deposits in Yangsan Area, *J. Miner. Soc. Korea*, 3, 44-57.
- Kim, W.K., Kim, S.W., Won, J.S., Min, K.D., and Kim, J.W., 2000. Geological application of lineaments from satellite images – A case study of Euseong Sub-basin, *Jour. Korean Soc. Remote Sensing*, 16, 1, 25-26.
- KMPC, 1969. Drilling activities at the Jaeilgunbuk Mine, *Korean Mining Promotion Corporation, Annual Report 1969*, 115-128.

- KMPC, 1970. Drilling activities at the Haman Mine, *Korean Mining Promotion Corporation*, Annual Report 1970, 93-113.
- KMPC, 1973. Drilling activities at the Jaeilgunbuk Mine, *Korean Mining Promotion Corporation*, Annual Report 1973, 232-263
- KMPC, 1974. Drilling activities at the Haman Mine, *Korean Mining Promotion Corporation*, Annual Report 1974, 234-269.
- KMPC, 1975. SP Geophysical Survey at the Gunbuk and Jaeilgunbuk Mines, *Korean Mining Promotion Corporation*, Annual Report 1975, 192-199.
- KMPC, 1976. Drilling activities at the Obong Mine, *Korean Mining Promotion Corporation*, Annual Report 1976, 214-216.
- KMPC, 1976. Drilling activities at the Gunbuk Mine, *Korean Mining Promotion Corporation*, Annual Report 1976, 211-213.
- KMPC, 1978. Drilling activities at the Gunbuk Mine, *Korean Mining Promotion Corporation*, Annual Report 1978, 177-178.
- KMPC, 1978. Drilling activities at the Haman Mine, *Korean Mining Promotion Corporation*, Annual Report 1978, 174-177.
- KMPC, 1978. Drilling activities at the Obong Mine, *Korean Mining Promotion Corporation*, Annual Report 1978, 169-170.
- KMPC, 1979. Drilling activities at the Gunbuk Mine, *Korean Mining Promotion Corporation*, Annual Report 1979, 114-116.
- KMPC, 1979. Geophysical prospecting activities at the Haman Mine, *Korean Mining Promotion Corporation*, Annual Report 1979, 278-284.
- KMPC, 1980. Drilling activities at the Haman Mine, *Korean Mining Promotion Corporation*, Annual Report 1980, 139-143.
- Koh, S.M., Ryoo, C.R., and Song, M.S., 2003. Mineralization characteristics and structural controls of hydrothermal deposits in the Gyeongsang Basin, South Korea, *Resource Geology*, 53, 3, 175-192.
- Koo, M.O. and Kye, J., ?. The Geology and ore deposits of the Kyongnam Area, Southeast Korea, ?.
- Lee, D.S., 1987. *Geology of Korea*, Geol. Soc. Korea, Kyohak-Sa, 514pp.
- Lee, S.Y., Choi, S.G., So, C.S., Ryu, I.C., Wee, S.M., and Heo, C.H., 2003. Base-metal mineralization in the Cretaceous Gyeongsang Basin and its genetic implications, Korea: the Haman-Gunbuk-Goseong (-Changwon) and the Euseong Metallogenic Provinces, *Eco. Environ. Geology*, 36, 4, 257-267.
- Moon, C.U., Kim, M.W., Lee, J.H., and Choi, C.J., 1968. Geological Investigation Report of Copper Deposits on the Haman-Kunbuk District, *Korea Inst. Energy Resources*, 3-33.
- \_\_\_\_\_, 1970. Geology and Ore Deposits in the Haman-Kunbuk Copper District, *Jour. Korean Inst. Mining Geol.*, 3, 2, 55-71.
- Park, H.I., Choi, S.W., Chang, H.W., Chae, D.H., 1985. Copper Mineralization at Haman-Gunbuk Mining District, Kyeongnam Area, *Jour. Korean Inst. Mining Geol.*, 18, 2, 107-124.
- \_\_\_\_\_, and Lee, M.S., 1983. Genesis of the copper deposits in Goseong district, Gyeongnam Area, *Jour. Korean Inst. Mining Geology*, 16, 135-147.
- Sennitt, C.M., and Kim, W.J., 1997. Reconnaissance Prospecting Activities, December 1997, Republic of South Korea, *Internal Co. Rept. (Indochina Goldfields Limited)*.
- \_\_\_\_\_, 2010. Mineralization Potential, Haman District, Gyeongsang Basin, South Korea, *Internal Co. Rept. (Senlac Geological Services Pty Limited)*.
- \_\_\_\_\_, 2010. Epithermal sediment-hosted gold-silver mineralization, Gyeongsang Basin, South Korea, *Internal Co. Rept. (Senlac Geological Services Pty Limited)*.

So, C.S., and Shelton, K.L., 1983. A sulfur isotope and fluid inclusion study of the Cu-W-bearing tourmaline breccia pipe, Ilkwang Mine, Republic of Korea, *Econ. Geol.*, 78, 326-332.

### 10.3.3 Miwon Project

ESCAP, 1987. *Atlas of mineral resources of the ESCAP Region, Volume 3, Republic of Korea*, explanatory brochure, United Nations Economic and Social Commission for Asia and the Pacific, 51pp.

Fitches, W.R., and Zhu, G., 2006. Is the Ogcheon metamorphic belt of Korea the eastward continuation of the Nanhua Basin of China ?, *Gondwana Research*, 9, 1-2, 68-84.

KIER, 1980. Chubu Uranium Deposit, *Korean Institute of Energy Resources*.

KIER, 1980. Studies on Geophysical Uranium Exploration in Korea – Gwesan area, *Korean Institute of Energy Resources*.

KIER, 1981. Studies on Leaching of Uranium Ores – Ogchon area, *Korean Institute of Energy Resources*.

KIER, 1983. Geological Investigation of Uranium Resources, *Korean Institute of Energy Resources*, 56pp.

KIER, 1984. Vanadium Metallurgical Testwork, *Korean Institute of Energy Resources*, Rept. KR-80a-13.

KIER, 1985. Studies on Geophysical Uranium Exploration in Korea – Gwesan area, *Korean Institute of Energy Resources*.

KIER, 1985. Geological Investigation of Uranium Resources: Kolnami Uranium Deposits, central part of Ogchon Folded Belt in the southeast of Daejeon, *Korean Institute of Energy Resources*, 85-23.

KIER, 1986. Geological Investigation of Uranium Resources: Uranium exploration drilling of Samgoe Soryong area, southeast of Daejeon, *Korean Institute of Energy Resources*, 85-23.

KIGAM, 2001. Geochemical Atlas of Korea (1:700,000), Series 1-7, *Korea Institute of Geoscience and Mineral Resources*.

Kim, J.H., 1989. Geochemistry and Genesis of the Guryongsan (Ogchon) Uraniferous Black Slate, *Jour. Korean Inst Mining Geol.*, 22, 1, 35-63.

Kim, K.H., 1986. Isotope Geochemistry of Uranium Ore Deposits in Okcheon Metamorphic Belt, South Korea, *Jour. Korean Inst Mining Geol.*, 19, 163-173.

Kim, O.J., 1977. Precambrian geology and structure of the central region of South Korea, *Jour. Korean Inst.*

Kim, J.S., Chung, K.W., Lee, H.I., Yoon, H.S. and Kumar, J.R., 2014. Leaching behavior of uranium and vanadium using strong sulfuric acid from Korean black shale ore, *Jour. Radioanal. Nuclear Chemistry*, 299, 89-87.

Koo, S.B., Cho, J.D., Koo, J.H., and Lee, T.S., 1985. Geophysical Exploration for Uranium of the Ogchon System, *Korean Institute of Energy Resources*.

KORES, 2003. Uranium Exploration of the Gwesan North area, *Korean Resources Corporation*.

Lee, D.S., Yun, S.Y., Lee, J.H. and Kim, J.T., 1986. Lithologic and Structural Controls and Geochemistry of Uranium Deposition in the Ogcheon Black-Slate Formation, *Jour. Korean Inst Mining*

Lee, M.S., 1978. Geochemical Study of Granite Intrusions in the Area of Uranium Bearing Formation of the Ogcheon System, *Jour. Geol. Soc. Korea*, 14, 3, 113-119.

\_\_\_\_\_ and Chon, H.T., 1980. Geochemical Correlations Between Uranium and other Components in U-bearing Formations of Ogcheon Belt, *Jour. Geol. Soc Korea*, 13, 4, 241-246.

\_\_\_\_\_ and Kim, S.W., 1985. Uranium Distribution Patterns and U-mineral in the U-bearing Coaly Slate of Ogcheon System, *Jour. Korean Inst Mining Geol.*, 18, 2, 135-138.

- Lee, D.J., 1986. Mineralogy of Low-Grade Uranium Ores in the Black Slate of the Ogcheon Group, Korea, *Jour. Korean Inst Mining Geol.*, 19, 2, 133-146.
- Park, B.S. and So, C.S., 1980. Structural control, and Correlation of Uranium Distribution and Mineralogy of Meta-pelites in Ogcheon Terrain, Korea, *Jour. Geol Soc Korea*, 13, 4, 215-227.
- Roskill, 2013. *Vanadium: Global Industry Markets and Outlook*, 13<sup>th</sup> Edition, Roskill Information Services Limited.
- Sennitt, C.M. 2009. Geological Evaluation Uranium Projects, South Korea, *Internal Co. Rept. (Senlac Geological Services Pty Limited)*.
- So, C.S. and Kang, J.K., 1978. Mineralogy and Geochemistry of Uranium-bearing Black Slates in the Ogcheon Group, Korea, *Jour. Geol. Soc Korea*, 3, 93-102.
- \_\_\_\_\_ and Choi, C.S., 1984. Uranium Occurrences, and Process Development for Recovering Uranium and Vanadium from Uranium Ore in Coaly Meta-Pelites in Ogcheon Terrain, Korea, *Jour. Korean Inst Mining Geol.*, 17, 35-47.
- Stonehenge Metals, 2010. Stonehenge commences pre-scoping engineering study on Korean uranium deposit, ASX: SHE Press release 29 July 2010, *Stonehenge Metals Ltd*.
- Stonehenge Metals, 2010. Stonehenge gets outstanding uranium and vanadium results from recent sampling program and historical report translations, ASX: SHE Press release 2 August 2010, *Stonehenge Metals Ltd*.
- Yun, S, 1984. Mineralogical and Geochemical Studies of Uranium Deposits of the Okchon Group in Southwestern District off Taejon, Korea, *Jour. Korean Inst Mining Geol.*, 17, 4, 289-298.

#### 10.3.4 Goseong Project

- Chang, T.W., Hwang, S.K., Lee, D.W., Oh, I.S., Kim, H.C., & Kim, E.H., 1983. Chungmu 1:50,000 scale Geological Map Sheet, *Korea Institute of Geoscience and Mineral Resources*.
- Cheon, Y.B., Ha, S.M., Lee, Y.S., Ha, S.J., Lim, H.S., & Son, M., 2016. Formation mechanism of listric normal faults and calcite veins within the shale-dominant strata of the upper Jinju Formation in the Cretaceous Gyeongsang Basin, Korea, *Jour. Geol. Soc. Korea*, 52, 4, 373-388.
- Chi, S.J., 1984. Reflectance and Microhardness Characteristics of Sulfide Minerals from the Sambong Copper Mine, *Jour. Korean Inst. Mining Geol.*, 17, 2, 115-139.
- Cho, H.G., Chang, B.J., Kim, S.O., & Choo, C.O., 2006. The Preliminary Study of the Secondary Precipitates from Samsanjeil and Sambpng Mine, Goseong, Gyeongnam, *Jour. Miner. Soc. Korea*, 19, 3, 129-138.
- Cho, W.H., & Jwa, Y.J., 2004. Petrological and geochemical evidences for magma mixing in the Palgongsan Pluton, *Geol Soc. Korea*, 8, 4, 343-354.
- Choi, D.K., 1985. Spores and pollen from the Gyeongsang Supergroup, southeastern Korea and their chronologic and paleoecologic implications, *Jour. Paleontological Soc. Korea*, 1, 33-50.
- Choi, H.I., 1986. Sedimentation and evolution of the Cretaceous Gyeongsang Basin, southeast Korea, *Jour. Geol. Soc. London*, 143, 29-40.
- Choi, K., Kwon, H.J., Chung, H.K., Jang, J.Y., Hong, Y.C., Kim, D.S., Paek, D.H., Yang, W.H., Lee, H.M., Chung, I.J., & Kim, K.G., 2005. Heavy metal exposures among residents in an abandoned metal mine area, Goseong, Korea, *Korea Soc. Environmental Health*, Minamata Forum 2005.
- Choi, S.H., So, C.S., & Lee, J.H., 1993. Mineralogical, stable isotope and fluid inclusion studies of copper-bearing hydrothermal vein deposits in Goseong mining district, Gyeongsang basin, Korea, *Trans. Instn. Min. Metall*, 102, B123-B133.

\_\_\_\_\_, So, C.H., Kwon, S.H., & Choi, K.J., 1994. The Geochemistry of Copper-bearing hydrothermal vein deposits in Goseong mining district (Samsan area), Gyeongsang Basin, Korea, *Econ. Environ. Geology*, 27, 147-160.

\_\_\_\_\_, 2007. Geochemical evolution of hydrothermal fluids related to polymetallic mineralization in the Gyeongnam mineralized district, Korea, *N. Jb. Miner. Abh.*, 183, 2, 149-163.

Fletcher, C.J.N., 1976. Mineralization within the Gyeongsang Cretaceous Basin, Republic of Korea, (Anglo-Korean Mineral Exploration Group) *Korea Research Institute of Geoscience and Mineral Resources*, 136pp.

Heo, C.H., Yun, S.T., Choi, S.H., Choi, S.G., & So., C.S., 2003. Copper mineralization in the Haman-Gunbuk area, Gyeongsangnamdo Province: Fluid inclusion and stable isotope study, *Econ. Environ. Geology*, 26, 75-87.

Hong, S.K., Lee, Y.I., & Yi, S.H., 2012. Carbon isotope composition of terrestrial plant matter in the Upper Cretaceous Geoncheonri Formation, Gyeongsang Basin, Korea: Implications for Late Cretaceous palaeoclimate on the East Asian continental margin, *Cretaceous Research*, 35, 100-177.

Hwang, D.H., Kim, M.S., Oh, M.S. & Park, N.Y., 1990. Study on geology and mineralization for metallic mineral deposits in Korea, *Korea Inst. Energy & Resources*, Rept No KR-90-2A.

Jeon, Y.M. & Sohn, Y.K., 2003. Sedimentary characteristics and stratigraphic implications of the Kusandong Tuff, Cretaceous Gyeongsang Basin, Korea, *Geosciences Journal*, 7, 1, 53-64.

Jo, J.G. & Shin, D.B., 2015. Sulfur isotope variations of metallic ore deposits in the Gyeongsang Basin, South Korea, *Resource Geology*, 65, 3, 296-310.

Jwa, Y.J., Lee, Y.I., & Orihashi, Y., 2009. Eruption age of the Kusandong Tuff in the Cretaceous Gyeongsang Basin, Korea, *Geosciences Journal*, 13, 265.

Kamata, Y., Hisada, K.I. & Lee, Y.I., 2000. Late Jurassic radiolarians from pebbles of Lower Cretaceous conglomerates of the Hayang Group, southeastern Korea, *Geol. Soc. Korea*, 4, 3, 165-174.

Kang, H.C. & Park, I.S., 2013. Review on the geological ages of the formations in the Gyeongsang Basin, Korea, *Jour. Geol. Soc. Korea*, 49, 1, 17-29.

KIGAM, 1983. Chungmu Geological Map Sheet 6818-1 (1:50,000 scale), *Korea Institute of Geoscience and Mineral Resources*.

Kim, O.J. & Kim, K.H., 1974. A Study on Red Hill Copper Deposits of the Dongjeom Mine, *Jour. Korea Inst. Mining Geology*, 7, 157-174.

Kim, S.E. & Kim, Y.D., 1977. Geology and ore deposits of In Annual Report on Geoscience and Mineral Resources 1977, *Korea Institute Geoscience and Mineral Resources*, 2, 5-22.

\_\_\_\_\_. & Hwang, D.H., 1983. *Metallogenesis in Korea – Explanatory Text for the Metallogenic Map of Korea*, Kor. Inst. Energy Resources, 16-23.

\_\_\_\_\_, Park, J.G., Yu, S.N., Cho, J.D. & Kim, C.K., ?. Geology and ore deposits of copper on Kyongnam area, ?.

Kimura, T., 1999. Notes on the two Early Cretaceous floras in South Korea, *Geosciences Journal*, 4, 1, 11-14.

KMPC, 1968. Goseong mine, Mine Development and Production, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 259-268.

- KMPC, 1973. Goseong mine, Mine Development and Production, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 171-176.
- KMPC, 1974. Buyoung mine, Drilling, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 98-99.
- KMPC, 1975. Goseong mine, Mine Development and Production, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 151-167.
- KMPC, 1975. Jinheung mine, Drilling and Resources, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 110-111.
- KMPC, 1975. Samsan mine, underground workings, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 102-103.
- KMPC, 1976. Goseong mine, Mine Development and Production, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 35-42.
- KMPC, 1978. Sambong mine, Drilling, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 100-101.
- KMPC, 1979. Goseong mine, SP Geophysical Survey and Drilling, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 206-209.
- KMPC, 1979. Sambong mine, Underground Adit Sampling and Production, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 34-45.
- KMPC, 1980. Buyoung mine, SP Geophysical Survey and Drilling, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 244-245.
- KMPC, 1980. Jinheung mine, SP Geophysical Survey and Drilling, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 314-315.
- KMPC, 1980. Sambong mine, SP Geophysical Survey, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 324-325.
- KMPC, 1982. Sambong mine, Underground Production, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 27-33.
- KMPC, 1985. Samjeon mine, Underground workings, Annual Report on Exploration Activities, *Korean Mining Promotion Corporation*, 29-34.
- Koh, S.M., Ryou, C.R., & Song, M.S., 2003. Mineralization characteristics and structural controls of hydrothermal deposits in the Gyeongsang Basin, South Korea, *Resource Geology*, 53, 3, 175-192.
- Koo, M.O. & Kye, J., ?. The Geology and ore deposits of the Kyongnam Area, Southeast Korea, ?.
- Lee, D.S., 1987. *Geology of Korea*, Geol. Soc. Korea, Kyohak-Sa, 514pp.
- \_\_\_\_\_ & Lee, H.Y., 1976. Geological study on the rock sequences containing oily materials in southern coast of Korea, *Jour. Korean Inst. Min. Geol.*, 9, 45-74.
- Lee, J.H., 1992. Hydrothermal copper mineralization in the Goseong District, Korea, *Unpubl. PhD Thesis*, Korea Univ, 117pp.
- Lee, J.I., 1997. Trace and rare earth element geochemistry of granitic rocks, southern part of the Kyongsang Basin, Korea, *Geosciences Journal*, 1, 4, 167-178.
- \_\_\_\_\_. & Lee, Y.I., 2000. Provenance of the Lower Cretaceous Hayang Group, Gyeongsang Basin, Southeastern Korea: Implications for Continental-Arc Volcanism, *Jour. Sedimentary Research*, 70, 1, 151-158.

\_\_\_\_\_, 2003. Geochemistry and provenance of Lower Cretaceous Sindong and Hayang mudrocks, Gyeongsang Basin, Southeastern Korea, *Geosciences Journal*, 7, 2, 107-122.

Lee, K.C., Woo, K.S., Paik, K.H., Choi, S.J., 1991. Depositional Environments and Diagenetic History of the Panyawol, Hwasan, and Shinyangdong Formations, Kyongsang Supergroup, Korea – with Emphasis on Carbonate Rocks, *Jour. Geol. Soc. Korea*, 27, 5, 471-492.

\_\_\_\_\_, 1996. Lacustrine stromatolites and diagenetic history of carbonate rocks of Chinju Formation in Kunwi area, Kyongsangbukdo, Korea, *Jour. Geol. Soc. Korea*, 32, 4, 351-361.

Lee, S.M., 1972. Granites and mineralization in the Gyeongsang Basin: Memoirs in Celebration of the 60<sup>th</sup> Birthday of Prof. C.M. Son, 195-220.

\_\_\_\_\_, 1973. Applications of metamorphic facies and facies series to the tectonics of Korea, *Geol. Soc. Korea*, 9, 11-23.

\_\_\_\_\_, Kim, S.W., & Jin, M.S., 1987. Igneous activities of the Cretaceous to the early Tertiary and their tectonic implications in South Korea, *Jour. Geol. Soc. Korea*, 23, 338-359.

Lee, S.Y., Choi, S.G., So, C.S., Ryu, I.C., Wee, S.M., & Heo, C.H., 2003. Base-metal mineralization in the Cretaceous Gyeongsang Basin and its genetic implications, Korea: the Haman-Gunbuk-Goseong (-Changwon) and the Euseong Metallogenic Provinces, *Eco. Environ. Geology*, 36, 4, 257-267.

Lee, Y.I., 2009. Geochemistry of shales of the Upper Cretaceous Hayang Group, SE Korea: Implications for provenance and source weathering at an active continental margin, *Sedimentary Geology*, 215, 1, 1-12.

Lee, Y.N., 2003. Dinosaur bones and eggs in South Korea, *Memoir Fukui Prefectural Dinosaur Museum*, 2, 113-121.

Lee, Y.N., & Huh, M., 2002. Manus-only sauropod tracks in the Uhangri Formation (Upper Cretaceous), Korea and their Paleobiological implications, *Jour. Paleontology*, 76, 3, 558-564.

Lee, Y.N., 2002. Dinosaur faunas from the Gyongsang Supergroup (Cretaceous) in South Korea, *Abstracts Palaeontological Soc. Japan*, 2002, 13.

Lim, H.S. & Lee, Y.I., 2005. Cooling history of the Upper Cretaceous Palgongsan Granite, Gyeongsan Basin, SE Korea and its tectonic implication for uplift on the active continental margin, *Tectonophysics*, 403, 1, 151-165.

Min, K.D., Kim, O.J., Yun, S.K., Lee, D.S., & Joo, S.W., 1982. Applicability of plate tectonics to the post-late Cretaceous igneous activities and mineralization in the southern part of South Korea, *Jour. Korean Inst. Mining Geol.*, 15, 123-154.

Moon, C.U., Kim, M.W., Lee, J.H., & Choi, C.J., 1968. Geological Investigation Report of Copper Deposits on the Haman-Kunbuk District, *Korea Inst. Energy Resources*, 3-33.

\_\_\_\_\_, 1970. Geology and Ore Deposits in the Haman-Kunbuk Copper District, *Jour. Korean Inst. Mining Geol.*, 3, 2, 55-71.

Park, H.I., Choi, S.W., Chang, H.W., Chae, D.H., 1985. Copper Mineralization at Haman-Gunbuk Mining District, Kyeongnam Area, *Jour. Korean Inst. Mining Geol.*, 18, 2, 107-124.

\_\_\_\_\_, & Lee, M.S., 1983. Genesis of the copper deposits in Goseong district, Gyeongnam Area, *Jour. Korean Inst. Mining Geology*, 16, 135-147.

- Park, I.S., Huh, M., So, Y.H., Lee, J.E., & Kim, H.J., 2006. Traces of evaporites in Upper Cretaceous lacustrine deposits of Korea: Origin and palaeoenvironmental implications, *Jour. Asian Earth Sciences*, 30, 1, 93-107.
- Park, I.S. & Kim, H.J., 2006. Playa lake and sheetflood deposits of the Upper cretaceous Jindong Formation, Korea: Occurrences and palaeoenvironments, *Sedimentary Geology*, 187, 1-2, 83-103.
- Sennitt, C.M., & Kim, W.J., 1997. Reconnaissance Prospecting Activities, December 1997, Republic of South Korea, *Internal Co. Rept. (Indochina Goldfields Limited)*.
- \_\_\_\_\_, 2010. Mineralization Potential, Haman District, Gyeongsang Basin, South Korea, *Internal Co. Rept. (Senlac Geological Services Pty Ltd)*.
- \_\_\_\_\_, 2010. Epithermal sediment-hosted gold-silver mineralization, Gyeongsang Basin, South Korea, *Internal Co. Rept. (Senlac Geological Services Pty Ltd)*.
- \_\_\_\_\_, 2016. Haman Cu-Co-Au-Ag Project, South Korea, *Internal Co. Rept. (Senlac Geological Services Pty Ltd)*.
- Shimazaki, H., Sato, K., & Chon, H.T., 1981. Mineralization Associated with Mesozoic Felsic Magmatism in Japan and Korea, *Mining Geology*, 31, 4, 297-310.
- Shin, Y.S., Choo, C.O., Lee, Y.J., Lee, Y.T., & Koh, I.S., 2002. Controls on Diagenetic Mineralogy of Sandstones and Mudrocks from the Lower Hayang Group (Cretaceous) in the Daegu Area, Korea, *Jour. Korean Earth Science Soc.*, 23, 7, 575-586.
- So, C.S., Chi, S.J., Shelton, K.L., & Skinner, B.J., 1985. Copper-bearing Hydrothermal Vein Deposits in the Gyeongsang Basin, Republic of Korea, *Econ. Geol.*, 80, 43-56.
- \_\_\_\_\_, & Shelton, K.L., 1987. Fluid inclusion and stable isotope studies of gold-silver bearing hydrothermal vein deposits, Yeosu mining district, Republic of Korea, *Econ Geol*, 710, 1309-1318.
- Solano, B, 1991. Geology and mineralization of the La Encantada Mining District, Coahuila, in Salas, G P (ed.), Economic Geology, Mexico, *Geol Soc of America*, The Geology of North America, P-3.
- Tsusue, A., Mizuta, T, Watanabe, M., & Min, K.G., 1981. Jurassic and Cretaceous granite rocks in South Korea, *Mining Geology*, 31, 4, 261-280.
- Uk, K.S., 1973. A regional Study for Developments of Yeongnam Copper Metallogenic Province, *Korea Institute of Geoscience and Mineral Resources*.
- Wee, S.M., Kim, Y.J., Choi, S.G., Park, J.W., & Ryu, I.C., 2007. Adakitic Signatures of the Jindong Granitoids, *Economic and Environmental Geology*, 40, 2, 223-236.

## 11.0 CERTIFICATION OF AUTHOR - DATE AND SIGNATURE

I, Leslie William Davis, FAusIMM, CP Geo, FAIG, do hereby certify that:

1. I am an Independent Geological Consultant, operating through Veronica Webster Pty Limited at:  
7 O'Quinn Street  
Nudgee Beach,  
Queensland 4014, AUSTRALIA.

2. I graduated with a B.Sc. in Special Geology from Leicester University, UK in 1962.

3. I am a Fellow (Ruby Fellow) of the Australasian Institute of Mining and Metallurgy (FAusIMM) and I am an accredited Chartered Professional (Geology). I am a Fellow of the Australian Institute of Geoscientists.

4. I have worked as a geologist since graduation and have experience with precious metals, base metals, coal, shale oil, uranium and industrial minerals in exploration, project development and mining operations across a broad range of geological environments. My commodity experience includes gold, all base metals (includes several iron deposit types), platinum group metals, silver, tin, tungsten, molybdenum, nickel, cobalt, tantalite, uranium, chromite, heavy mineral sands, coal, shale oil and semi-precious stones. I have operated throughout Australia and also have overseas experience in South Africa, Zimbabwe, Ghana, China, South Korea, USA, Mexico, Fiji, Papua New Guinea and the Solomon Islands. I have attended many technical and commercial conferences and seminars, both in Australia and internationally.

5. I have read the definition of Qualified Person set out in National Instrument 43-101 (NI-43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI-43-101) and past relevant work experience, I fulfil the requirements to be a Qualified Person for the purposes of NI-43-101.

6. I am responsible for the preparation of the Technical Report titled "**NI-43-101 TECHNICAL REPORT ON EXPLORATION RESULTS AND POTENTIAL AT THE MINERAL PROPERTIES OF KOREAN METALS EXPLORATION PTY LIMITED, REPUBLIC OF KOREA (SOUTH KOREA)**", dated 09 May 2017. My associate, Mr R. Dawney, on behalf of VWPL visited the main project areas from 25<sup>th</sup> to 28<sup>th</sup> November 2016. Mr Dawney is an experienced exploration geologist with a Bachelor of Applied Science (Applied Geology) – Queensland University of Technology, 1977 and he is a Member of the Association of Applied Geochemists.

7. I have had an involvement in the project areas since November 2016. The nature of this involvement includes the technical report preparation, after researching previous investigations, carrying out due diligence on exploration methods with interpretation. I have reviewed the proposed exploration program and budgets.

8. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

9. I am independent of the issuer and vendor applying all of the tests in Section 1.4 of NI-43-101.

10. I have read National Instrument 43-101 and Form 43-101 F1, and the Technical Report has been prepared in compliance with that instrument and form.

11. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in public company files on their websites accessible by the public, of the Technical Report.

Dated 09 May 2017.



**Leslie William Davis F.Aus.I.M.M CP Geo F.A.I.G.**

**of VERONICA WEBSTER PTY LIMITED  
A.C.N. 010 299 224  
7 O'Quinn Street, Nudgee Beach, Qld 4014**

**Telephone 61 7 3267 3355**

## 12.0. ILLUSTRATIONS AND TABLES - GLOSSARY

Illustrations, Figures Photographs and Tables are within the relevant sections of the report.

### 12.1 Glossary of Technical Terms

Terms not included in this glossary are used in accordance with their definition in the well-known English dictionaries. VWPL has selected the following terms as being the most important.

#### Abbreviation Definition

|                  |                                       |
|------------------|---------------------------------------|
| asl              | Above sea level                       |
| cps              | Counts per second                     |
| g                | Grams                                 |
| g/t              | Grams per tonne                       |
| kg               | Kilograms                             |
| km               | Kilometres                            |
| lb               | Pounds                                |
| m                | metres                                |
| k m <sup>3</sup> | 1000 m <sup>3</sup>                   |
| Ma               | Millions of years before present      |
| mm               | Millimetres                           |
| No.              | Number                                |
| oz               | Ounces                                |
| ppm              | Parts per million. 10,000 ppm = 1.00% |
| %                | Percentage                            |
| µm               | Micron. 1000 microns = 1 mm           |
| t                | Tonnes                                |
| kt               | 1000 t                                |
| tpa              | Tonnes per annum                      |
| tpd              | Tonnes per day                        |

**AAS** atomic absorption spectrometry. A chemical analysis performed by vaporising a liquid in a flame and measuring the absorbance by wavelength of light.

**acid** an igneous rock having a silica component of >65 %.

**adit** a horizontal or near horizontal passage used as an entrance to an underground mine

**Ag** silver

**alluvial diggings** an area of past or present workings from which gold, transported thereto and deposited by river action, has been mined

**alteration** change in the physical or chemical composition of a rock commonly brought about by reactions with hydrothermal solutions.

**argillaceous** descriptive of rocks containing a clay component.

**As** arsenic

**Au** gold

**Ba** barium

**basement** the igneous and metamorphic crust of the earth, underlying sedimentary deposits.

**basic** an igneous rock having a relatively low silica content.

**Be** beryllium

**Bi** bismuth

**bulk leach (of sampling)** analytical method involving the chemical leaching of all or a large part of the collected sample, usually for gold. **BCL** bulk cyanide leach. **BLEG** bulk leach extractable gold

**bulk sample** a large sample designed to obtain a representative analysis of the material. Bulk samples can range from several kilograms to many tones.

**breccia** rock fragmented into angular pieces; often rock consisting of angular fragments in a finer-grained matrix; distinct from conglomerate.

**CaO** Calcium oxide

**Cd** cadmium

**conglomerate** sedimentary rock formed by the cementing together of water-rounded pebbles, distinct from breccia.

**contact** surface between two rock types.

**Carboniferous** a time period, approximately 360 to 290 million years ago.

**Chalcedony, chalcedonic** cryptocrystalline or microcrystalline silica. Sub-species of quartz.

**Co** cobalt

**Cretaceous** a time period approximately 140 to 70 million years ago.

**Cu** copper

**Cr** chromium

**diamond drilling** rotary drilling using diamond-impregnated bits, to produce a solid continuous core sample of rock.

**disseminated** descriptive of mineral grains which are scattered throughout the host rock.

**drill hole** in mineral exploration, a hole bored into prospective ground to recover cuttings indicative of rock types and grades of mineralization encountered in the hole.

**Devonian** the period of time between 360 and 408 million years ago.

**dip** the angle at which any planar feature is inclined from the horizontal.

**epithermal** a hydrothermal mineral deposit formed at a relatively low temperature near the Earth's surface, mainly in veins.

**Fe<sub>2</sub>O<sub>3</sub>** iron oxide

**fire assay** an assay procedure involving heating the sample in a furnace to ensure complete extraction of all the contained precious metal.

**gabbro** crystalline intrusive rock composed mainly of plagioclase and pyroxene.

**geochemical sampling** systematic collection of rock or soil samples in order to study variations in their chemistry.

**grab sample..**(to collect a) sample taken at random

**granitoid** rock similar to granite in texture and composition.

- already covered above

**host rock** the rock containing a mineral or an ore body.

**hydrothermal** pertaining to heated water, particularly of magmatic origin associated with the formation of mineral deposits or the alteration of rocks.

**ICP** inductively coupled plasma is a type of mass spectrometry that ionizes the sample with inductively coupled plasma and then uses a mass spectrometer to separate and quantify those ions.

**igneous rocks** rocks formed from molten lava.

**hematite (haematite)** a mineral composed of ferric iron oxide Fe<sub>2</sub>O<sub>3</sub>.

**indicated resource** a mineral resource sampled by drill holes, underground openings, or other sampling procedures at locations too widely spaced to ensure continuity but close enough to give reasonable indication of continuity, and where geoscientific data are known with a reasonable level of reliability.

**inferred resource** a mineral resource inferred from geoscientific evidence, drill holes, underground openings, or other sampling procedures where the lack of data is such that continuity cannot be predicted with confidence and where geoscientific data may not be known with a reasonable level of reliability.

**intrusion** the process of formation of an rock mass emplaced within surrounding rock

**intercept, intersection** the length of mineralization traversed by a drill hole.

**intermediate** an igneous rock that is transitional between basic and silicic, having a silica content between 54-65 %.

**intrusive** a rock mass emplaced within surrounding rock, usually a plutonic rock formed by intrusion of molten magma into a high level, below the surface, of the Earth's crust where it cooled and crystallised to form a solid rock.

**Jurassic** a time period approximately 140 to 200 million years ago.

**K<sub>2</sub>O** potassium oxide

**K-channel anomalies** radiometric measurements recorded from four energy channels/bands, with the K channel indicative of potassium (K) concentrations.

**laterite** a residual soil formed by the leaching of silica and by enrichment with aluminum and iron oxides, especially in humid climates

**leaching** the dissolution of mineral components from samples, rocks or ore by appropriate chemicals.

**Lenticular** shaped approximately like a double convex lens.

**Li** lithium

**limonite** a general term for a group of brown amorphous naturally occurring hydrous iron-oxide minerals.

**lineament** a linear feature usually of regional extent that is believed to reflect the Earth's crustal structure.

**mafic** descriptive of rocks composed dominantly of magnesium and iron rock-forming silicates.

**magnetite** a magnetic iron oxide mineral (Fe<sub>3</sub>O<sub>4</sub>).

**Mesozoic** an era of geologic time, from the end of the Paleozoic to the beginning of the Cenozoic, or from about 225 to about 65 million years ago.

**metamorphic** descriptive of a rock which has changed its structure and properties due to the effects of heat and/or increased pressure over time.

**mean** an arithmetic average of a series of values.

**meta** a prefix denoting a metamorphosed rock.

**Mg** magnesium

**mineralization** the concentration of metals and their chemical compounds within a body of rock.

**Mining right** the only form of mining title available in South Korea, comprising one minute by one minute square block, representing an area of 277 hectares or 2.77 km<sup>2</sup> in area.

**Mo** molybdenum

**Na<sub>2</sub>O** sodium oxide

**Ni** nickel

**oolite** a sedimentary rock made up chiefly of oolites cemented together.

**oolith** one of the small round or ovate accretionary bodies in a sedimentary rock, resembling the roe of fish, and having diameters of 0.25 to 2 mm (commonly 0.5 to 1 mm).

**ore** material which can be mined and/or treated at a profit.

**orebody** a solid and fairly continuous mass of ore.

**outcrop** the part of a rock formation which appears at the surface of the ground.

**oxidised** decomposed by exposure to the atmosphere and ground water.

**Paleozoic** an era of geologic time, from the end of the Precambrian to the beginning of the Mesozoic, or from about 570 to about 225 million years ago.

**Pb** lead.

**percussion** a type of drilling method whereby the rock is broken by a hammering action into small chips.

**Permian** a time period, approximately 290 million to 250 million years ago.

**petrology** study of formation of rock.

**porphyry** a rock with conspicuous crystals in a fine-grained groundmass.

**porphyry mineralization, porphyry style mineralization** mineralization with similarities to base and precious metal porphyry mineralization models developed from deposits studied in North America and the southwestern Pacific regions.

**pyrrhotite** a common iron sulphide mineral which is noticeably magnetic.

**quartz** a mineral composed of silicon dioxide SiO<sub>2</sub>.

**Quaternary** a time period approximately 0 to 2 million years ago.

**Rb** rubidium

**rhyolite** a lava, the extrusive equivalent of granite.

**rock-chip sampling** obtaining a sample, generally for assay, by breaking chips off a rock face

**Sb** antimony

**skarn** a thermally metamorphosed impure limestone.

**soil sampling** systematic collection of soil samples at a series of different locations in order to study the distribution of soil geochemical values.

**Sr** strontium

**sulphide** a general term to cover minerals containing sulphur and commonly associated with mineralization.

**syncline** a fold in rock strata that is concave upward with a core of younger rocks.

**Tertiary** first period of the Cenozoic era covering the time span from 2 to 65 million years ago.

**Th-channel anomalies** radiometric measurements recorded from four energy channels/bands, with the Th channel indicative of thorium (Th) concentrations.

**Ti** titanium

**trench** a long, narrow man-made excavation designed to expose mineralization.

**Triassic** a time period, approximately 250 million to 210 million years ago.

**U** uranium

**U-channel anomalies** radiometric measurements recorded from four energy channels/bands, with the U channel indicative of uranium (U) concentrations.

**Ultrabasic/ ultramafic** said of rocks with less than 35% silica, which are dense, composed of calcic feldspars and ferro-magnesian silicate minerals.

**V** vanadium

**Zn** zinc