

# Iso-Rehvi

**Occurrence type:** occurrence

| Commodity | Rank | Total measure | Total production | Total resource | Importance |
|-----------|------|---------------|------------------|----------------|------------|
| gold      | 1    | 0,16 t        | NA               | 0,16 t         | Occurrence |
| cobalt    | 2    | 20 t          | NA               | 20 t           | Occurrence |
| copper    | 3    | 40 t          | NA               | 40 t           | Occurrence |

Easting EUREF: 594111,529

Northing EUREF: 7345211,543

Easting YKJ: 3594322

Northing YKJ: 7348284

**Discovery year:** 1988

**Discovered by:** Geological Survey of Finland

**Province:** Kuusamo-Kuolajärvi (Co, Au)

**District:** Kuusamo (Co, Au)

**Comments:** Found by GTK: exploration targeted into a weak ground-magnetic and -electric anomaly

**References:** 6, 12

## Mineral deposit type

**Group:** Metallogenic deposit

**Main type:** Orogenic (metamorphic hydrothermal)

**Sub type 1:** Au-Co-Cu

**Comments:** The auriferous fluids were transported along deep, rift-tectonic faults up to the greenschist-metamorphic environment, concentrated on the antiform; the metals precipitated in structurally controlled sites close to impermeable dolerites and metavolcanic units or, rather, in the more competent sericite quartzite units between the more plastic mafic units.

**References:** 7, 8, 9, 10, 11, 13, 16

## Dimension

**Expression:** exposed

**Area (ha):** NA

**Form:** discordant

**Dip azim:** NA

**Shape:** NA

**Dip:** NA

**Length (m):** 200

**Plunge azim:** NA

**Width (m):** 50

**Plunge dip:** NA

**Thickness (m):** NA

**Orientation method:** NA

**Depth (m):** 100

**Dimension comments:** Iso-Rehvi comprises gold-rich zones within a wider envelope of Cu-Co mineralisation, is hosted by quartz-carbonate veins and chlorite-amphibole-albite-carbonate rocks. The deposit is open at the depth of 100 m.

## Holder history

**Current holder:** EMX Finland Oy

**Years:** 2022-2024

**Holding type:** Reservation

**Previous holders:**

| Company                      | Years     | Holding type                       | Comments   |
|------------------------------|-----------|------------------------------------|--|
| Latitude 66 Cobalt Oy        | 2018      | Application for exploration permit | NA   |
| Kuusamo Gold Oy              | 2015-2018 | Application for exploration permit | application for exploration permit transferred from Dragon in 2015 |
| Dragon Mining Oy             | 2014-2015 | Application for exploration permit | NA   |
| Polar Mining Oy              | 2010-2010 | Claim reservation (old law)        | NA   |
| Belvedere Resources Ltd      | 2004-2005 | Claim (old law)                    | NA   |
| Otutkumpu Oyj                | 1993-1996 | Claim (old law)                    | NA   |
| Geological Survey of Finland | 1988-1989 | Claim (old law)                    | NA   |

## EXPLORATION ACTIVITY

### Belvedere Resources Ltd

| Years  | Activity type                         | Geologist    | Exploration result          | Ref  |
|--|---------------------------------------|--------------|-----------------------------|------|
| 2005-2005  | core drilling                         | Toby Strauss | mineralized zone identified | 3, 4 |
| <i>Core drilling (reconnaissance drilling): 6 diamond-drill holes, in total 481 m.</i> |                                       |              |                             |      |
| <i>Intersections</i>   |                                       |              |                             |      |
|  | HoleID                                | ISR003       |                             |      |
|  | From-To                               | 34,1-53,4    |                             |      |
|  | Length                                | 19,3m        |                             |      |
|  | gold                                  | 1,07ppm      |                             |      |
|  | cobalt                                | 96ppm        |                             |      |
|  | copper                                | 0,22%        |                             |      |
|  | HoleID                                | ISR005       |                             |      |
|  | From-To                               | 117,8-127,4  |                             |      |
|  | Length                                | 9,6m         |                             |      |
|  | gold                                  | 0,51ppm      |                             |      |
|  | cobalt                                | 500ppm       |                             |      |
|  | copper                                | 0,27%        |                             |      |
| 2004-2004  | detailed geophysics                   | Toby Strauss | geophysical anomaly         | 4    |
|  | <i>Ground TEM and magnetic survey</i> |              |                             |      |

### Outokumpu Oy

| Years                   | Activity type         | Geologist      | Exploration result | Ref |
|-------------------------|-----------------------|----------------|--------------------|-----|
| 1993-1993               | detailed geophysics   | Jarmo Lahtinen | NA                 | 5   |
| <i>magnetic + VLF-R</i> |                       |                |                    |     |
| 1993-1993               | detailed geochemistry | Jarmo Lahtinen | NA                 |     |

### Geological Survey of Finland

| Years  | Activity type         | Geologist       | Exploration result  | Ref                        |
|--|-----------------------|-----------------|---------------------|----------------------------|
| 1989-1989  | regional geochemistry | NA              | NA                  |                            |
| <i>Regional till geochemical survey</i>  |                       |                 |                     |                            |
| 1988-1989  | excavation            | Erkki Vanhanen. | mineral occurrences | 1, 7, 8, 9, 10, 12, 14, 16 |
| <i>three trenches about 300 m north from the occurrence</i>  |                       |                 |                     |                            |
| 1988-1989  | detailed geophysics   | Erkki Vanhanen  | geophysical anomaly | 15                         |
| <i>Exploration targeted by a weak ground-magnetic and -electric anomaly. Mineralisation-related anomalies defined by IP and VLF-R.</i> |                       |                 |                     |                            |

|           |                  |                 |                         |                               |
|-----------|------------------|-----------------|-------------------------|-------------------------------|
| 1988-1989 | detailed geology | Erkki Vanhanen. | key geological features | 1, 7, 8, 9, 10, 12, 14,<br>16 |
|-----------|------------------|-----------------|-------------------------|-------------------------------|

|   |               |                 |                             |        |
|---|---------------|-----------------|-----------------------------|--------|
| 1988-1989   | core drilling | Erkki Vanhanen. | mineralized zone identified | 12, 14 |
| <i>Core drilling (reconnaissance drilling): 8 diamond-drill holes, total 974 m, drilled in six profiles 50 m apart.</i> |               |                 |                             |        |
| <b>Intersections</b>  |               |                 |                             |        |
|   | HoleID        | R363            |                             |        |
|   | From-To       | NA              |                             |        |
|   | Length        | 1m              |                             |        |
|   | gold          | 5,4ppm          |                             |        |
|   | HoleID        | R366            |                             |        |
|   | From-To       | NA              |                             |        |
|   | Length        | 2m              |                             |        |
|   | gold          | 16ppm           |                             |        |
|   | HoleID        | R366            |                             |        |
|   | From-To       | NA              |                             |        |
|   | Length        | 1m              |                             |        |
|   | gold          | 14ppm           |                             |        |

|  |                     |    |                         |                               |
|--|---------------------|----|-------------------------|-------------------------------|
| 1982-1982  | regional geophysics | NA | key geological features | 1, 7, 8, 9, 10, 12, 14,<br>16 |
| <i>Low-altitude airborne magnetic, electromagnetic and radiometric survey.</i> |                     |    |                         |                               |

## RESOURCES AND RESERVES

### Most recent

| Type:            | Company:                     | Year:                            | Date: | Calc Method:                    | Reference: |
|------------------|------------------------------|----------------------------------|-------|---------------------------------|------------|
| Resource         | Geological Survey of Finland | 1991                             | NA    | Non-compliant resource estimate | 12, 14     |
| <b>Category:</b> |                              | <b>Inferred mineral resource</b> |       |                                 |            |
| <b>Tonnage:</b>  |                              | <b>0,04 Mt</b>                   |       |                                 |            |
| cobalt           |                              | 0,05 %                           |       |                                 |            |
| gold             |                              | 4 ppm                            |       |                                 |            |
| copper           |                              | 0,1 %                            |       |                                 |            |
| <b>Cutoff:</b>   |                              | <b>NA</b>                        |       |                                 |            |

## GEOLOGY

**Host rock:** Mafic volcanic rock, Quartz-Albite-Calcite Hydrothermal rock, Chlorite-Calcite-Amphibole Hydrothermal rock  
**Wall rock:** Dolerite

### Mafic volcanic rock (Host rock)

**Rock type:** Host rock

**Proportion:** minor

**Grain size:** NA

**Color:** NA

**References:** 7, 10, 12

#### Metamorphic description:

| Type:    | Facies:                        | Degree:               | Relation to mineralization: | Min P- Max P (kbar) | Min T- Max T (°C) |
|----------|--------------------------------|-----------------------|-----------------------------|---------------------|-------------------|
| Regional | greenschist metamorphic facies | low metamorphic grade | NA                          |                     |                   |

#### Geological age:

| Geological era:                 | Max age - Min age (Ma): | Inferred age (Ma): | Age of mineralization: |
|---------------------------------|-------------------------|--------------------|------------------------|
| Paleoproterozoic (2500-1600 Ma) | 1600-2500               |                    | N                      |

### Quartz-Albite-Calcite Hydrothermal rock (Host rock)

**Rock type:** Host rock

**Proportion:** major

**Grain size:** NA

**Color:** NA

**References:** 7, 8, 9, 10, 12, 13, 14, 16

#### Other minerals:

| Mineral | Proportion | Mineral texture |
|---------|------------|-----------------|
| Albite  | present    |                 |
| Calcite | present    |                 |
| Quartz  | present    |                 |

| Alteration:        | Distribution: | Degree: | Relation to mineralization: |
|--------------------|---------------|---------|-----------------------------|
| albitic alteration | Pervasive     | Strong  |                             |

#### Metamorphic description:

| Type: | Facies: | Degree: | Relation to mineralization: | Min P- Max P (kbar) | Min T- Max T (°C) |
|-------|---------|---------|-----------------------------|---------------------|-------------------|
|       |         |         |                             |                     |                   |

|          |                                   |                          |    |
|----------|-----------------------------------|--------------------------|----|
| Regional | greenschist<br>metamorphic facies | low metamorphic<br>grade | NA |
|----------|-----------------------------------|--------------------------|----|

**Geological age:**

| Geological era:                                      | Max age - Min age<br>(Ma): | Inferred age (Ma): | Age of mineralization: |
|--|----------------------------|--------------------|------------------------|
| Paleoproterozoic (2500-1600 Ma)                      | 1800-2070                  |                    | Y                      |
| <i>Comments: Mineralisation between 2.07-1.8 Ga.</i> |                            |                    |                        |

**Chlorite-Calcite-Amphibole Hydrothermal rock (Host rock)****Rock type:** Host rock**Proportion:** major**Grain size:** NA**Color:** NA**References:** 7, 8, 9, 10, 12, 13, 14, 15, 16**Ore minerals:**

| Mineral           | Proportion | Mineral texture  |
|-------------------|------------|--|
| Chalcopyrite      | major      |  |
| Cobaltpentlandite | minor      |  |
| Gold              | present    |  |
|                   |            | <i>Native gold as inclusions and in fractures of silicates and carbonates.</i> |
| Ilmenite          | minor      |  |
| Magnetite         | minor      |  |
| Pyrite            | major      |  |
| Pyrrhotite        | major      |  |

**Other minerals:**

| Mineral    | Proportion | Mineral texture    |
|------------|------------|--------------------|
| Actinolite | present    | Alteration product |
| Albite     | present    | Alteration product |
| Amphibole  | present    |                    |
| Biotite    | present    | Alteration product |
| Calcite    | present    |                    |
| Chlorite   | present    | Alteration product |
| Chloritoid | present    | Alteration product |
| K-Feldspar | present    | Alteration product |
| Quartz     | present    |                    |
| Sericite   | present    | Alteration product |
| Talc       | present    | Alteration product |
| Tremolite  | present    | Alteration product |

| Alteration:   | Distribution: | Degree: | Relation to mineralization: |
|---|---------------|---------|-----------------------------|
| silification  | NA            | Strong  | Post                        |
| <i>Comments: strongest in quartz-ziblite-carbonate rock</i>   |               |         |                             |
| albitic alteration  | NA            | Strong  | Pre                         |
| <i>Comments: Locally intense Albitization of clastic sediments and spilitisation of volcanic units when the 2.206 Ga mafic sills and dykes heated the evaporite-bearing sequence and put hot brines into circulation.</i> |               |         |                             |
| sulphidation  | Disseminated  | Weak    | Syn                         |
| chloritic alteration  | Pervasive     | Strong  | Syn                         |
| <i>Comments: the most extensive alteration</i>  |               |         |                             |
| carbonate alteration  | Veins         | Strong  | Syn                         |
| <i>Comments: mostly in veins</i>  |               |         |                             |

|                    |    |        |     |
|--------------------|----|--------|-----|
| biotite alteration | NA | Weak   | Syn |
| amphibolitisation  |    | Strong |     |

### Metamorphic description:

| Type:    | Facies:                        | Degree:               | Relation to mineralization: | Min P- Max P (kbar) | Min T- Max T (°C) |
|----------|--------------------------------|-----------------------|-----------------------------|---------------------|-------------------|
| Regional | greenschist metamorphic facies | low metamorphic grade | NA                          |                     |                   |

### Geological age:

| Geological era:                 | Max age - Min age (Ma): | Inferred age (Ma): | Age of mineralization: |
|---------------------------------|-------------------------|--------------------|------------------------|
| Paleoproterozoic (2500-1600 Ma) | 1600-2500               |                    | N                      |

## Dolerite (Wall rock)

**Rock type:** Wall rock

**Proportion:** minor

**Grain size:** NA

**Color:** NA

**References:** 7, 8, 9, 10, 12, 13, 16

**Comments:** Predates all alteration and gold mineralisation.

### Metamorphic description:

#### Other minerals:

| Mineral    | Proportion | Mineral texture |
|------------|------------|-----------------|
| Actinolite | major      |                 |
| Albite     | major      |                 |
| Epidote    | minor      |                 |
| Quartz     | present    |                 |
| Titanite   | present    |                 |

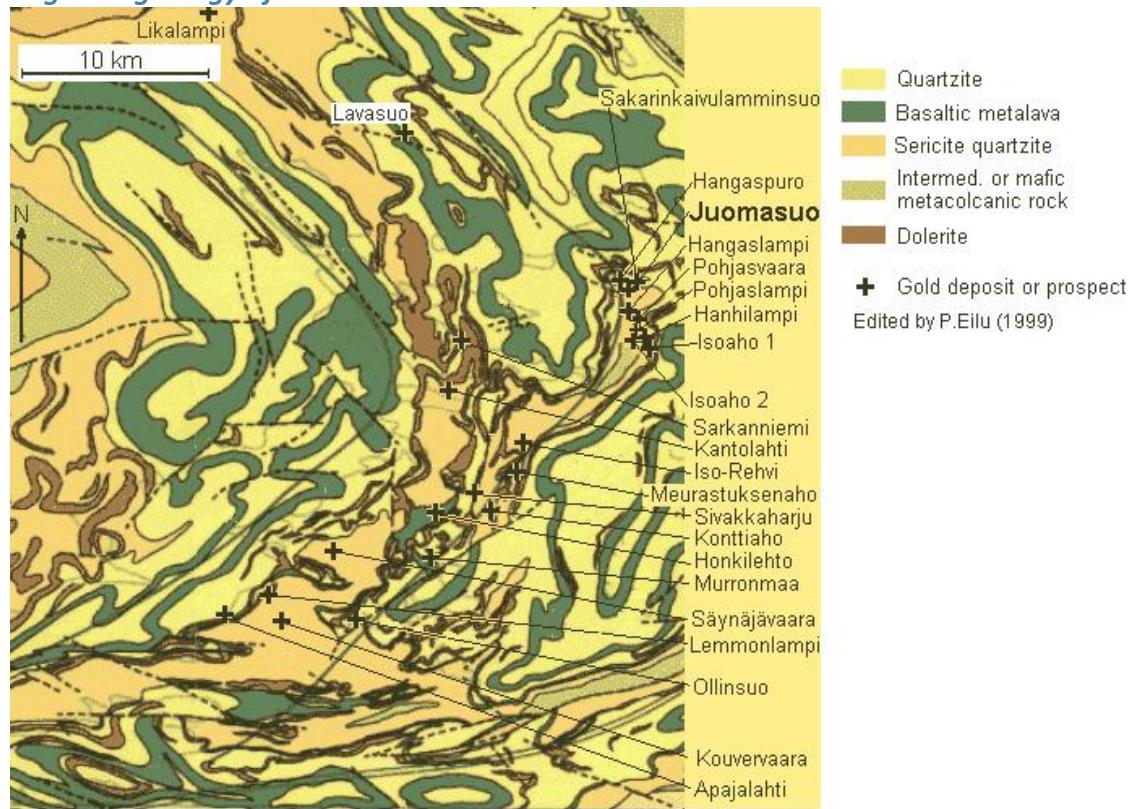
| Type:  | Facies:                        | Degree:               | Relation to mineralization: | Min P- Max P (kbar) | Min T- Max T (°C) |
|--|--------------------------------|-----------------------|-----------------------------|---------------------|-------------------|
| Regional   | greenschist metamorphic facies | low metamorphic grade | NA                          |                     |                   |
| <i>Comments: Assemblage: Albite-actinolitic hornblende-epidote-opaques ± titanite, quartz.</i> |                                |                       |                             |                     |                   |

### Geological age:

| Geological era:                    | Max age - Min age (Ma): | Inferred age (Ma): | Age of mineralization: |
|------------------------------------|-------------------------|--------------------|------------------------|
| Paleoproterozoic (2500-1600 Ma)    | 1600-2500               | 2050               | N                      |
| <i>Comments: 2050 Ma suggested</i> |                         |                    |                        |

## Figures

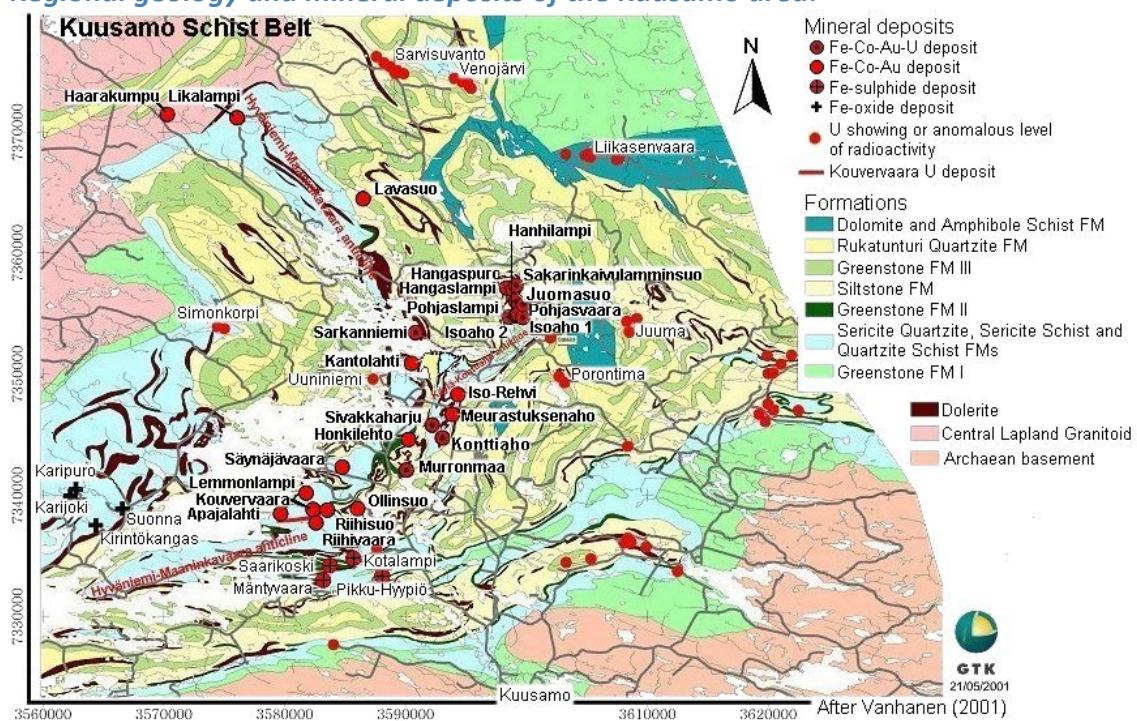
### Regional geology of the Kuusamo area:



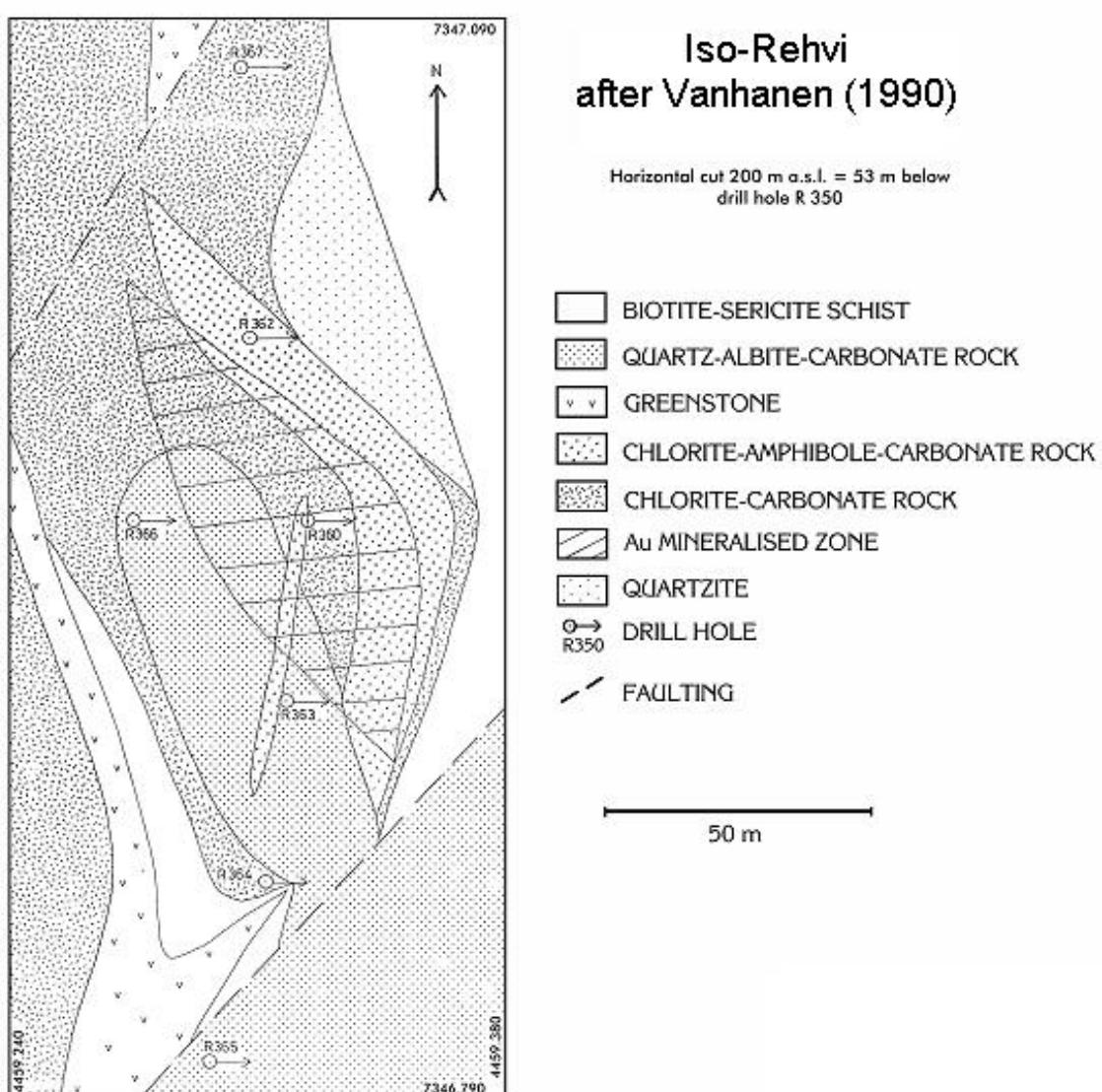
Deposits and prospects in the Kuusamo Schist Belt. Geology from Silvennoinen (1992).

Solid and dashed, curved lines indicate boundaries between lithological units, faults and shear zones

### Regional geology and mineral deposits of the Kuusamo area:



**Local geology:**



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