Jokisivu

Alternative Names: Kujankallio, Arpola
Occurence type: deposit

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	15,5 t	6,44 t	9,06 t	Medium sized deposit

Easting EUREF: 264112,717
Northing EUREF: 6783763,038
Easting YKJ: 3264187
Northing YKJ: 6786611

Discovery year: 1985
Discovered by: Outokumpu
Province: Pirkkala (Au)
Comments: Discovered by boulder tracing to mineralised outcrop.
References: 15, 18, 23, 31, 33, 35, 36, 38, 40, 41, 42, 43, 48, 50, 51, 52, 60

Mineral deposit type

Group: Metallogenic deposit
Main type: Orogenic (metamorphic hydrothermal)
Comments: Sequence of mineralisation: I) magnetite-ilmenite-scheelite, II) arsenopyrite-loellingite-scheelite-pyrrhotite-arsenopyrite, and III) pyrrhotite-chalcopyrite-sphalerite-arsenopyrite-pyrite-gold: "main sulphide mineralisation stage", and IV) gold-aurostibite-ullmannite-costibite-galena-maldonite-arsenopyrite-joseite-B-hedleyite-native bismuth-pilsenite-tsumoite-altaite.
References: 54

Dimension

Expression: exposed
Form: discordant
Shape: irregular
Length (m): 400
Width (m): 200
Thickness (m): 8
Depth (m): 720
Area (ha): NA
Dip azim: 45
Dip: 70
Plunge azim: NA
Plunge dip: NA
Orientation method: NA
Dimension comments: Two main ore bodies: 1) Kujankallio Zone comprises 6 separate vein systems, 400 m along strike. Three of the vein sets are each 40-50 m along strike, >350 m down plunge and 4-8 m thick; dominant plung is about 60° to the NE. 2) The Arpola Zone consists of 8 vein systems over a strike lenght of >200 m and dip at about 70°. 2022 information: Kujankallio Zone is open at 720 m depth and Arpola at 410 m depth. Third possible ore body, Basin Zone, immediately to the west of Kujankallio.

Holder history

Current holder: Dragon Mining Oy
Years: 2004

Holding type: Mining concession (old law)

Previous holders:

Company	Years	Holding type	Comments
Polar Mining Oy	2003	NA	NA
Outokumpu Oy	1985-2003	NA	NA

EXPLORATION ACTIVITY

Dragon Mining Oy

Years	Activity type	Geologist	Exploration result	Ref
2007	core drilling	Petri Saarela, Neale Edwards	mineral resource defined	2, 3, 4, 5, 6, 7, 8, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 27, 28, 30, 31, 32, 46, 47, 60, 61, 62, 63, 68
	Ongoing diamond drilling. By the end of Septermber 2016, total 155 km drilled at Jokisivu; this includes the work done by previous operators, but most is by Polar Mining and Dragon Mining. 2018: 57 ug ddh drilled (total 12.1 km). 2019: 90 ddh, 11,034.9 m. 2020: drilled 129 diamond holes in total 14,942 m with discovery of another high-grade zone open at depth. October-December 2020: 60 underground holes drilled. 2021: 56 ug-holes 9396 m. 2022: 43 ug-holes, 7,658 m.			
	Intersections			
	HoleID	HU/JS-1025		
	From-To	156,8-160,4		
	Length	3,6m		
	gold	21,53ppm		
	Comments	*Underground drilling*		
	HoleID	HU/JS-1068		
	From-To	31,9-42,3		
	Length	10,4m		
	gold	21,39ppm		
	Comments	*Underground drilling*		
	HoleID	HU/JS-1132		
	From-To	30-34,1		
	Length	4,1m		
	gold	14,61ppm		
	Comments	*Arpola underground*		
	HoleID	HU/JS-1157		
	From-To	140,2-149,7		
	Length	9,6m		
	gold	2,48ppm		
	Comments	*Underground drilling*		
	HoleID	HU/JS-1163		
	From-To	171,3-177,4		
	Length	6,1m		
	gold	4,14ppm		
	Comments	*Underground drilling*		
	HoleID	HU/JS-1164		
	From-To	198-202,9		
	Length	4,9m		
	gold	44,31ppm		
	Comments	*Underground drilling*		
	HoleID	HU/JS-1290		
	From-To	NA		
	Length	4,5m		
	gold	16,14ppm		
	Comments	*Arpola extension at depth, ug drilling*		
	HoleID	HU/JS-1292		
	From-To	NA		
	Length	2m		

	gold	42,57ppm
	Comments	*Arpola extension at depth, ug drilling*
	HoleID	HU/JS-917
	From-To	39,3-45
	Length	5,8m
	gold	4,6ppm
	Comments	*Arpola footwall drilling*
	HoleID	HU/JS-920
	From-To	55,3-57,4
	Length	2,1m
	gold	35,17ppm
	Comments	*Arpola footwall drilling*
	HoleID	HU/JS-924
	From-To	67,7-68,8
	Length	1,1m
	gold	28,5ppm
	Comments	*Arpola footwall drilling*
	HoleID	HU/JS-930
	From-To	34,3-43,8
	Length	9,5m
	gold	6,78ppm
	Comments	*Arpola footwall drilling*
	HoleID	HU/JS-945
	From-To	27,3-32,1
	Length	4,9m
	gold	5,72ppm
	Comments	*Arpola footwall drilling*
	HoleID	NA
	From-To	NA
	Length	2,2m
	gold	22,98ppm
	Comments	*Basin Zones*
	HoleID	NA
	From-To	NA
	Length	2,1m
	gold	34,74ppm
	Comments	*Basin Zones*

Polar Mining Oy

Years	Activity type	Geologist	Exploration result	Ref
2003-2006	ore beneficiation tests	Pentti Grönholm	positive feasibility study	32, 34, 36, 37, 38, 39, 40, 41, 44, 49

2003-2006	core drilling	Pentti Grönholm	mineral resource defined	31, 34, 35, 37, 38, 39, 44
	Several tens of diamond-drill holes; 2004: 32 diamond-drill holes, total 4323 m.			
	Intersections			
	HoleID	HU/JS-218		
	From-To	69,1-73,3		
	Length	4,2m		
	gold	31,2ppm		
	Comments	*Kujankallio zone*		
	HoleID	HU/JS-218		
	From-To	80,6-85,9		
	Length	5,3m		
	gold	15,6ppm		
	Comments	*Kujankallio zone*		

	HoleID	HU/JS-227
	From-To	176,2-183,8
	Length	7,6m
	gold	17,1ppm
	HoleID	NA
	From-To	NA
	Length	2,8m
	gold	13,6ppm
	HoleID	NA
	From-To	NA
	Length	1,4m
	gold	16,1ppm
	HoleID	NA
	From-To	NA
	Length	1,9m
	gold	15,3ppm
	HoleID	NA
	From-To	NA
	Length	1,7m
	gold	14,3ppm
	HoleID	NA
	From-To	NA
	Length	10,3m
	gold	11,1ppm
	HoleID	NA
	From-To	NA
	Length	2,7m
	gold	21ppm
	HoleID	NA
	From-To	NA
	Length	3,8m
	gold	7,9ppm
	HoleID	NA
	From-To	NA
	Length	6,7m
	gold	5,8ppm
	HoleID	NA
	From-To	NA
	Length	11,3m
	gold	11,4ppm
	HoleID	NA
	From-To	NA
	Length	1,7m
	gold	16,6ppm
	HoleID	NA
	From-To	NA
	Length	11,7m
	gold	21,1ppm
	HoleID	NA
	From-To	NA
	Length	5,2m
	gold	32,4ppm

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1990-1990	regional geophysics	NA	key geological features	
	Low-altitude airborne magnetic, electromagnetic and radiometric survey			

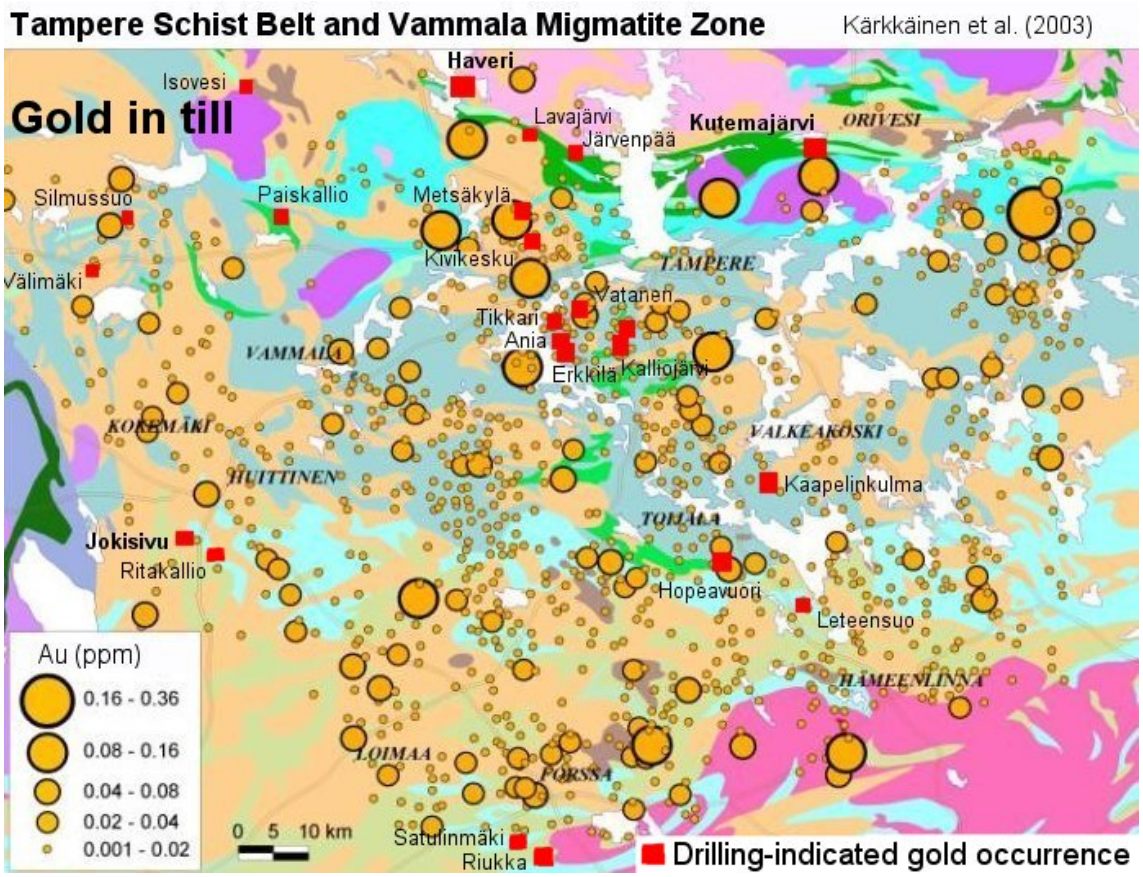
Outokumpu Oy

Years	Activity type	Geologist	Exploration result	Ref
1985-2003	detailed geophysics	Martti Kokkola, Pentti Grönholm	key geological features	54
	IP and magnetic surveys. The ore bodies showed no response by IP or magnetic methods.			
1985-2003	regional geophysics	Martti Kokkola, Pentti Grönholm	NA	1, 53, 55, 56, 59
1985-1994	core drilling	Martti Kokkola, Pentti Grönholm	mineral occurrences	56
	64 diamond-drill holes, total 2592 m; from surface to 50 m depth until end of 2002: about 10 km of diamond drilling.			
1985-2003	detailed geochemistry	Martti Kokkola, Pentti Grönholm	geochemical anomaly	53
	The deposit is within a till Au anomaly extending for several kilometres from the deposit.			
1985-2003	mining pilot	Martti Kokkola, Pentti Grönholm	NA	1, 53, 55, 56, 59
1985-2003	detailed geology	Martti Kokkola, Pentti Grönholm	mineral occurrences	1, 53, 55, 56, 59
	Au-rich boulder was found in 1982, this led to further investigations by Outokumpu and discovery of the deposit. Trenching and channel sampling after the discovery.			
1985-2003	excavation	Martti Kokkola, Pentti Grönholm	NA	1, 53, 55, 56, 59

Figures

Drilling at Jokisivu in May 2004
www.dragon-mining.com.au/pdf/June04_DragonNewsletter.pdf

Secondary anomaly:



Test pit at Jokisivu in 17 June 2004.
Photo Pasi Eilu.

Test pit at Jokisivu in 17 June 2004. Weakly rusty material in mid-photo is one of the lodes. Photo Pasi Eilu.

RESOURCES AND RESERVES

Most recent

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2022	31.12.2022	JORC code	29
	Comments: Mineral resources are reported inclusive of ore reserves and stockpiles				
	Category:	**Measured mineral resource**			
	Tonnage:	**0,36 Mt**			
	gold	3,8 ppm			
	Cutoff:	**NA**			
	Category:	**Measured mineral resource**			
	Tonnage:	**0,24 Mt**			
	gold	4,2 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**0,55 Mt**			
	gold	2,9 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**0,64 Mt**			
	gold	3,2 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**0,13 Mt**			
	gold	1,9 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**0,64 Mt**			
	gold	2,5 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**0,46 Mt**			
	gold	2,6 ppm			
	Cutoff:	**NA**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**3,02 Mt**			
	gold	3,001 ppm			
	Cutoff:	**NA**			

Previous calculations

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Dragon Mining Oy	2022	31.12.2022	JORC code	29
	Comments: Mineral resources are reported inclusive of ore reserves				
	Category:	**Proved ore reserves**			
	Tonnage:	**0,4 Mt**			
	gold	2,4 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**0,96 Mt**			

	gold	2 ppm
	Cutoff:	**NA**
	Category:	**Proved and probable ore reserves**
	Tonnage:	**1,36 Mt**
	gold	2,118 ppm
	Cutoff:	**NA**

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2021	31.12.2021	JORC code	24
	Comments: Mineral resources are reported inclusive of ore reserves and stockpiles				
	Category:	**Measured mineral resource**			
	Tonnage:	**0,38 Mt**			
	gold	3,9 ppm			
	Cutoff:	**gold 1,3 ppm**			
	Category:	**Measured mineral resource**			
	Tonnage:	**0,16 Mt**			
	gold	4,9 ppm			
	Cutoff:	**gold 1,3 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**1,2 Mt**			
	gold	3,2 ppm			
	Cutoff:	**gold 1,3 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**0,56 Mt**			
	gold	4 ppm			
	Cutoff:	**gold 1,3 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**0,12 Mt**			
	gold	2 ppm			
	Cutoff:	**gold 1,3 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**0,43 Mt**			
	gold	3,4 ppm			
	Cutoff:	**gold 1,3 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**0,34 Mt**			
	gold	3,1 ppm			
	Cutoff:	**gold 1,3 ppm**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**3,19 Mt**			
	gold	3,48 ppm			
	Cutoff:	**gold 1,3 ppm**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Dragon Mining Oy	2021	31.12.2021	JORC code	24
	Comments: Mineral resources are reported inclusive of ore reserves				
	Category:	**Proved ore reserves**			
	Tonnage:	**0,34 Mt**			
	gold	2,5 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**1,2 Mt**			
	gold	2,2 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**1,54 Mt**			
	gold	2,266 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2018	31.12.2018	JORC code	16

	Comments: Inclusive of stockpiles and ore reserves.				
	Category:	**Measured mineral resource**			
	Tonnage:	**615000 t**			
	gold	4,4 ppm			
	Cutoff:	**gold 1,8 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**1223000 t**			
	gold	3,8 ppm			
	Cutoff:	**gold 1,8 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**300000 t**			
	gold	4,5 ppm			
	Cutoff:	**gold 1,8 ppm**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**2138000 t**			
	gold	4,071 ppm			
	Cutoff:	**gold 1,8 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Dragon Mining Oy	2018	31.12.2018	JORC code	16
	Comments: Ore reseves are included in resources.				
	Category:	**Proved ore reserves**			
	Tonnage:	**520000 t**			
	gold	2,3 ppm			
	Cutoff:	**NA**			
	Comments: underground				
	Category:	**Probable ore reserves**			
	Tonnage:	**864000 t**			
	gold	2,6 ppm			
	Cutoff:	**gold**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**1384000 t**			
	gold	2,487 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Dragon Mining Oy	2017	30.9.2017	JORC code	14
	Comments: Mineral Resources are reported inclusive of Ore Reserves. Kujankallio and Arpola bodies have been reported separately in the reference document.				
	Category:	**Measured mineral resource**			
	Tonnage:	**504000 t**			
	gold	4,5 ppm			
	Cutoff:	**gold 1,9 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**1180000 t**			
	gold	4,2 ppm			
	Cutoff:	**gold 1,9 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**396000 t**			
	gold	4,4 ppm			
	Cutoff:	**gold 1,9 ppm**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**2080000 t**			
	gold	4,311 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Dragon Mining Oy	2017	30.9.2017	JORC code	13
	Comments: Mineral Resources are reported inclusive of Ore Reserves.				
	Category:	**Proved ore reserves**			

	Tonnage:	**172000 t**
	gold	2,8 ppm
	Cutoff:	**NA**
	Category:	**Probable ore reserves**
	Tonnage:	**841000 t**
	gold	2,9 ppm
	Cutoff:	**NA**
	Category:	**Proved and probable ore reserves**
	Tonnage:	**1013000 t**
	gold	2,883 ppm
	Cutoff:	**NA**

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2016	31.12.2016	JORC code	8
	Comments: 31.12.2016 *Mineral resources include ore reserves.* *Kujankallio and Arpola are separately described in the reference document.*				
	Category:	**Measured mineral resource**			
	Tonnage:	**504000 t**			
	gold	4,4 ppm			
	Cutoff:	**gold 1,5 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**1265000 t**			
	gold	4 ppm			
	Cutoff:	**gold 1,5 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**743000 t**			
	gold	3 ppm			
	Cutoff:	**gold 1,5 ppm**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**2512000 t**			
	gold	3,784 ppm			
	Cutoff:	**gold 1,5 ppm**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Dragon Mining Oy	2016	NA	JORC code	8
	Comments: 31.12.2016 *Mineral resources include ore reserves.*				
	Category:	**Proved ore reserves**			
	Tonnage:	**176000 t**			
	gold	3,5 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**324000 t**			
	gold	3,6 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**500000 t**			
	gold	3,565 ppm			
	Cutoff:	**gold**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2015	NA	JORC code	7
	Comments: 1.9.2015. Mineral resources are inclusive of ore reseves.				
	Category:	**Indicated mineral resource**			
	Tonnage:	**681000 t**			
	gold	4,5 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**445000 t**			
	gold	4,5 ppm			

	Cutoff:	**gold 2 ppm**
	Category:	**Measured, indicated and inferred mineral resource**
	Tonnage:	**1480000 t**
	gold	4,7 ppm
	Cutoff:	**gold 2 ppm**
	Category:	**Measured, indicated and inferred mineral resource**
	Tonnage:	**354000 t**
	gold	5,1 ppm
	Cutoff:	**gold 2 ppm**

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Dragon Mining Oy	2015	NA	JORC code	5
	Comments: 01.01.2015				
	Category:	**Proved ore reserves**			
	Tonnage:	**19000 t**			
	gold	3,8 ppm			
	Cutoff:	**gold 3,6 ppm**			
	Category:	**Probable ore reserves**			
	Tonnage:	**290000 t**			
	gold	3,8 ppm			
	Cutoff:	**gold 3,6 ppm**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**309000 t**			
	gold	3,8 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Dragon Mining Oy	2015	NA	JORC code	30
	Comments: 1.9.2015. Mineral resources are inclusive of ore reserves.				
	Category:	**Proved ore reserves**			
	Tonnage:	**140000 t**			
	gold	3,4 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**121000 t**			
	gold	3,5 %			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**261000 t**			
	gold	3,5 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Dragon Mining Oy	2014	NA	JORC code	6
	Comments: 31.12.2014				
	Category:	**Measured mineral resource**			
	Tonnage:	**268000 t**			
	gold	5,6 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**572000 t**			
	gold	4,8 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**541000 t**			
	gold	4,7 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**1381000 t**			
	gold	4,916 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2013	NA	JORC code	3
	Category:	**Measured mineral resource**			
	Tonnage:	**188000 t**			
	gold	4,7 ppm			
	Cutoff:	**gold 3 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**575000 t**			
	gold	6,1 ppm			
	Cutoff:	**gold 3 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**389000 t**			
	gold	5,8 ppm			
	Cutoff:	**gold 3 ppm**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**1152000 t**			
	gold	5,77 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Dragon Mining Oy	2013	NA	JORC code	4
	Category:	**Proved ore reserves**			
	Tonnage:	**20000 t**			
	gold	2,8 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**140000 t**			
	gold	4,7 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**160000 t**			
	gold	4,462 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Polar Mining Oy	2010	31.12.2010	JORC code	2
	Category:	**Measured mineral resource**			
	Tonnage:	**23600 t**			
	gold	6,3 ppm			
	Cutoff:	**gold**			
	Category:	**Measured mineral resource**			
	Tonnage:	**38000 t**			
	gold	6,1 ppm			
	Cutoff:	**gold**			
	Category:	**Measured mineral resource**			
	Tonnage:	**61600 t**			
	gold	6,177 ppm			
	Cutoff:	**gold**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**590800 t**			
	gold	5,3 ppm			
	Cutoff:	**gold**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**152000 t**			
	gold	5,2 ppm			
	Cutoff:	**gold**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**742800 t**			
	gold	5,28 ppm			
	Cutoff:	**gold**			

	Category:	**Inferred mineral resource**			
	Tonnage:	**750300 t**			
	gold	5,6 ppm			
	Cutoff:	**gold**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**271900 t**			
	gold	7,3 ppm			
	Cutoff:	**gold**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**1022200 t**			
	gold	6,052 ppm			
	Cutoff:	**gold**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**1826600 t**			
	gold	5,742 ppm			
	Cutoff:	**gold**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Polar Mining Oy	2005	NA	NA	44, 45
	Category:	**NA**			
	Tonnage:	**0,983 Mt**			
	gold	6,8 ppm			
	Cutoff:	**NA**			
	Category:	**NA**			
	Tonnage:	**0,49 Mt**			
	gold	6,8 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Polar Mining Oy	2005	NA	NA	43, 50
	Category:	**NA**			
	Tonnage:	**1,474 Mt**			
	gold	6,8 ppm			
	Cutoff:	**gold 2 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Polar Mining Oy	2004	NA	NA	36, 38, 39, 41
	Category:	**NA**			
	Tonnage:	**1,246 Mt**			
	gold	7,7 ppm			
	Cutoff:	**gold 2 ppm**			

MINING

Jokisivu

Easting EUREF: 264112,717
Northing EUREF: 6783763,038
Status: Operating
Operating years: 2009-2022
Years in production: 14
Total ore mined: 2698926 t

Total production:

Product	Product measure
gold	6,44 t

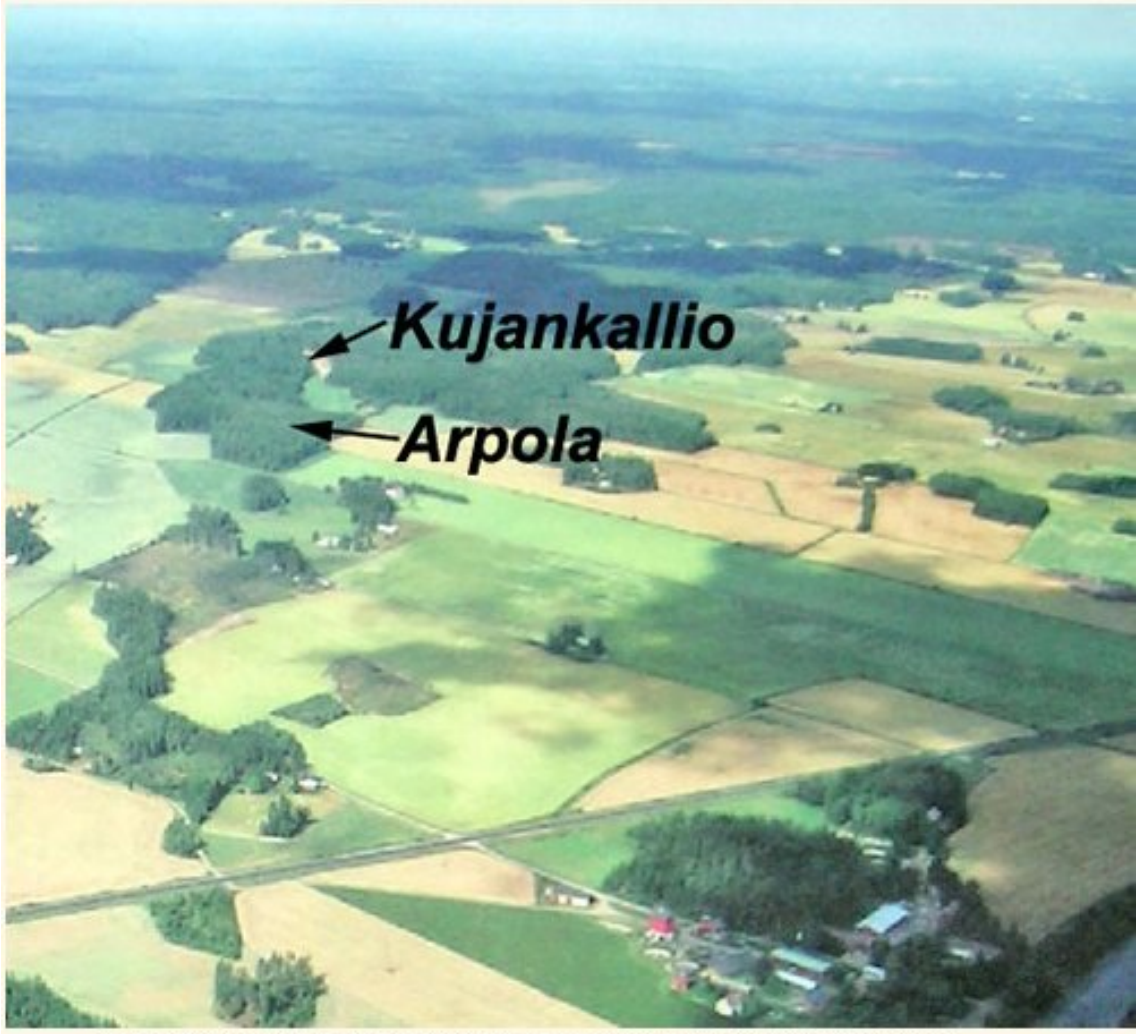
Other materials:

Material type	Material measure
Waste rock	2091783 t

Mining activity:

Year	Ore mined	Ore processed	Activity type	Production	Other material
2022	319535 t	324940 t	underground mining		
				gold 654 kg	Waste rock 11266 t
2021	339330 t	339330 t	underground mining		
				gold 680 kg	Waste rock 0 t
2020	288641 t	288641 t	underground mining		
				gold 630 kg	Waste rock 62287 t
2019	256199 t	256199 t	underground mining		
				gold 660 kg	Waste rock 25829 t
2018	264679 t	273500 t	underground mining		
				gold 620 kg	Waste rock 56646 t
2017	244383 t	244383 t	underground mining		
				gold 540 kg	Waste rock 148355 t
2016	232870 t	223459 t	underground mining		
				gold 586 kg	Waste rock 191115 t
2015	160090 t	163526 t	underground mining		
				gold 535,5 kg	Waste rock 64966 t
2014	125844 t	125844 t	underground mining		
				gold 384 kg	Waste rock 10000 t
2013	94320 t	109626 t	open-pit and underground mining		
				gold 235 kg	Waste rock 69332 t
2012	166919 t	141443 t	open-pit and underground mining		
				gold 287 kg	Waste rock 234358 t
2011	104445 t	79017 t	open-pit and underground mining		
				gold 204 kg	Waste rock 455186 t
2010	65725 t	77495 t	open-pit mining		
				gold 278 kg	Waste rock 380170 t
2009	35946 t	36720 t	open-pit mining		
				gold 148 kg	Waste rock 382273 t

Figures



Aerial view of the Kujankallio deposit area, SW Finland.
View to the NW. From Goode (2004).

Test pit, ore, at Jokisivu in 2003. View to the south. Photo Juhani Ojala.

Test pit, ore and wallrocks, at Jokisivu in 2003. View to the WSW. Photo Juhani Ojala.

Test pit at Jokisivu in 2003. Photo Juhani Ojala.

GEOLOGY

Host rock: Gabbro, Quartz vein, Diorite
Wall rock: Mafic volcanic rock

Gabbro (Host rock)

Rock type: Host rock
Proportion: major
Grain size: NA
Color: NA
References: 50, 54, 55
Comments: The gold mineralisation is in shear zones chiefly hosted by the gabbro-diorite.

Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	NA		
Comments: Plagioclase-hornblende ± quartz, garnet.					

Geological age:

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

Quartz vein (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 41, 53, 54, 55, 58
Comments: Quartz veins synchronous with shearing. The quartz veins occur only in the inner alteration zone and are boudinaged in places. The veins in three of the Kujankallio shoots typically are 2-4 m thick.

Diorite (Host rock)

Rock type: Host rock
Proportion: major
Grain size: NA
Color: NA
References: 36, 38, 39, 40, 42, 49, 50, 54, 55
Comments: The gold mineralisation is in shear zones chiefly hosted by the gabbro-diorite.

Structures

Sheared
Veined

Alteration:	Distribution:	Degree:	Relation to mineralization:
calcsilicate alteration	Shearing	Strong	NA
Comments: alteration is restricted to the shear zones, with calc-silicate alteration locally.			
silicification	Shearing	Strong	NA
Comments: alteration is restricted to the shear zones, with calc-silicate alteration locally.			
sulphidation	Shearing	Moderate	NA
Comments: alteration is restricted to the shear zones, with calc-silicate alteration locally.			
sericitic alteration	Shearing	Moderate	NA
Comments: alteration is restricted to the shear zones, with calc-silicate alteration locally.			
biotite alteration	Shearing	Strong	NA
Comments: alteration is restricted to the shear zones, with calc-silicate alteration locally.			

Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	NA		
Comments: Plagioclase-hornblende ± quartz, garnet.					

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Paleoproterozoic (2500-1600 Ma)	1600-2500		N
Comments: Mineralisation probably syn-peak metamorphic, between D2 and D3.			

Mafic volcanic rock (Wall rock)

Rock type: Wall rock
Proportion: major
Grain size: NA
Color: NA
References: 54, 55, 57

Ore minerals:

Mineral	Proportion	Mineral texture
Altaite	minor	
Arsenopyrite	minor	
Aurostibite	minor	
Chalcopyrite	minor	
Costibite	minor	
Galena	minor	
Gold	minor	
	Chiefly free gold in quartz veins, locally related to arsenopyrite, commonly with tellurides; minor amounts in aurostibite and tellurides	
Hedleyite	minor	
Ilmenite	minor	
Joséite-B	minor	
Löllingite	minor	
Magnetite	minor	
Maldonite	minor	

Marcasite	minor
Pilsenite	minor
Pyrite	minor
Pyrrhotite	major
Rucklidgeite	minor
Sphalerite	minor
Tellurobismuthite	minor
Tetradymite	minor
Tsumoite	minor
Ullmannite	minor

Other minerals:

Mineral	Proportion	Mineral texture
Amphibole	present	
Diopside	present	
Plagioclase	present	
Quartz	present	
Scheelite	present	

Structures
Lineation

Metamorphic description:

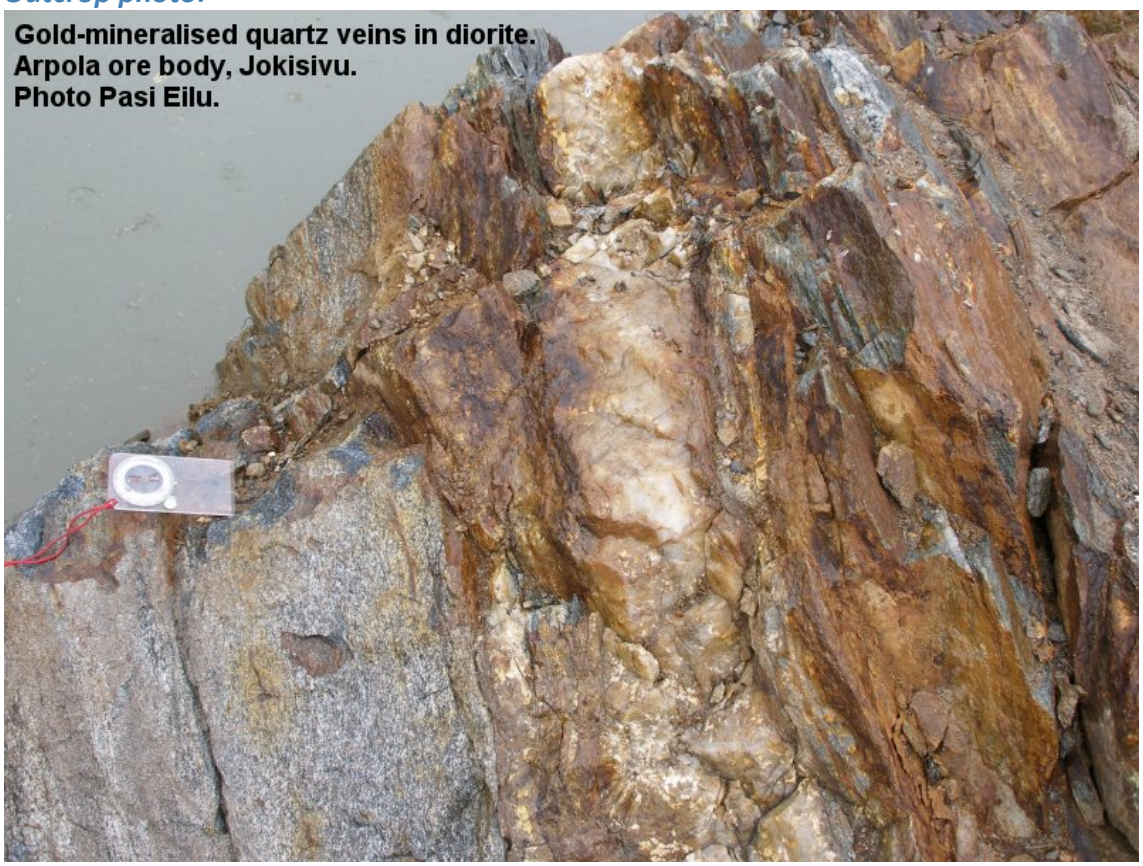
Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	NA		

Geological age:

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

Figures

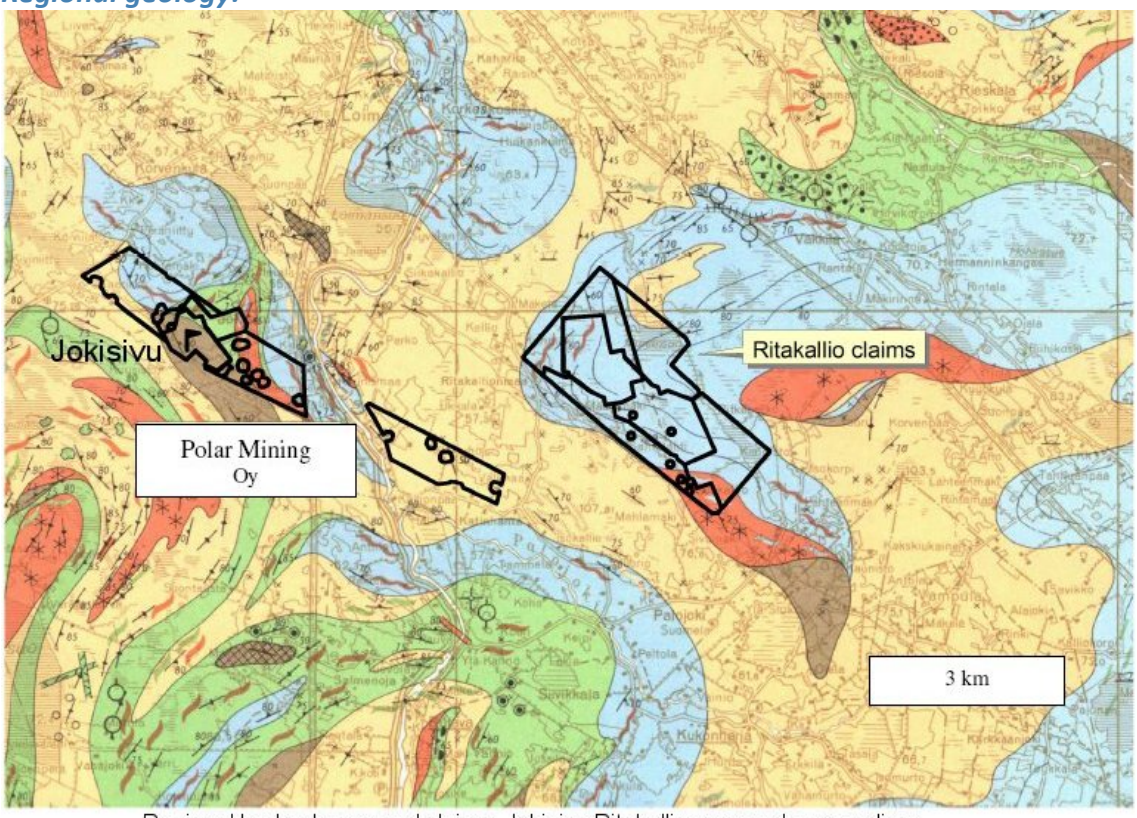
Outcrop photo:



Outcrop photo:

Gold-mineralised quartz vein in diorite. Kujankallio ore body, Jokisivu. Compass plate is 11 cm long. Photo Pasi Eilu.

Regional geology:



Regional bedrock map and claims: Jokisivu-Ritakallio area and surroundings.
orange = granodiorite, blue = mica gneiss, green = mafic metavolcanites, red = granite
brown = gabbro). Geology from Matisto (1976). From Vuori et al. (2005)

Structure:

Lode contact at Jokisivu, lode to the right of the compass. Photo Juhani Ojala.

Structure:

Jokisivu. Altered and sheared wallrocks. Compass plate is 11 cm long. Photo Juhani Ojala.

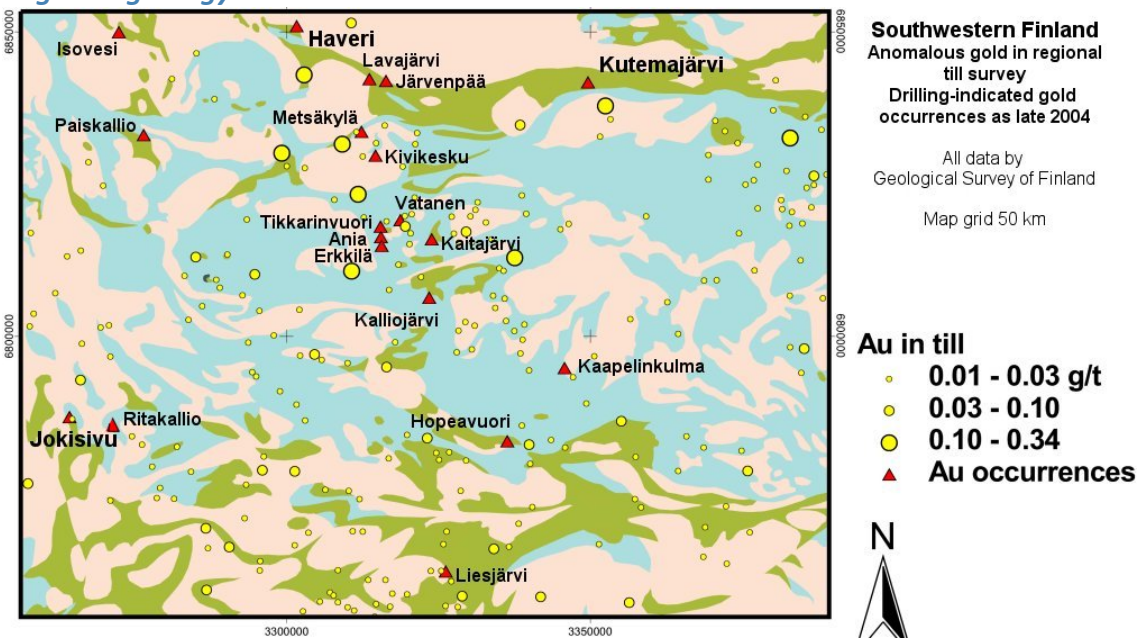
Structure:

Jokisivu. Altered and sheared wallrocks.
Compass plate is 11 cm long. Photo Juhani Ojala.

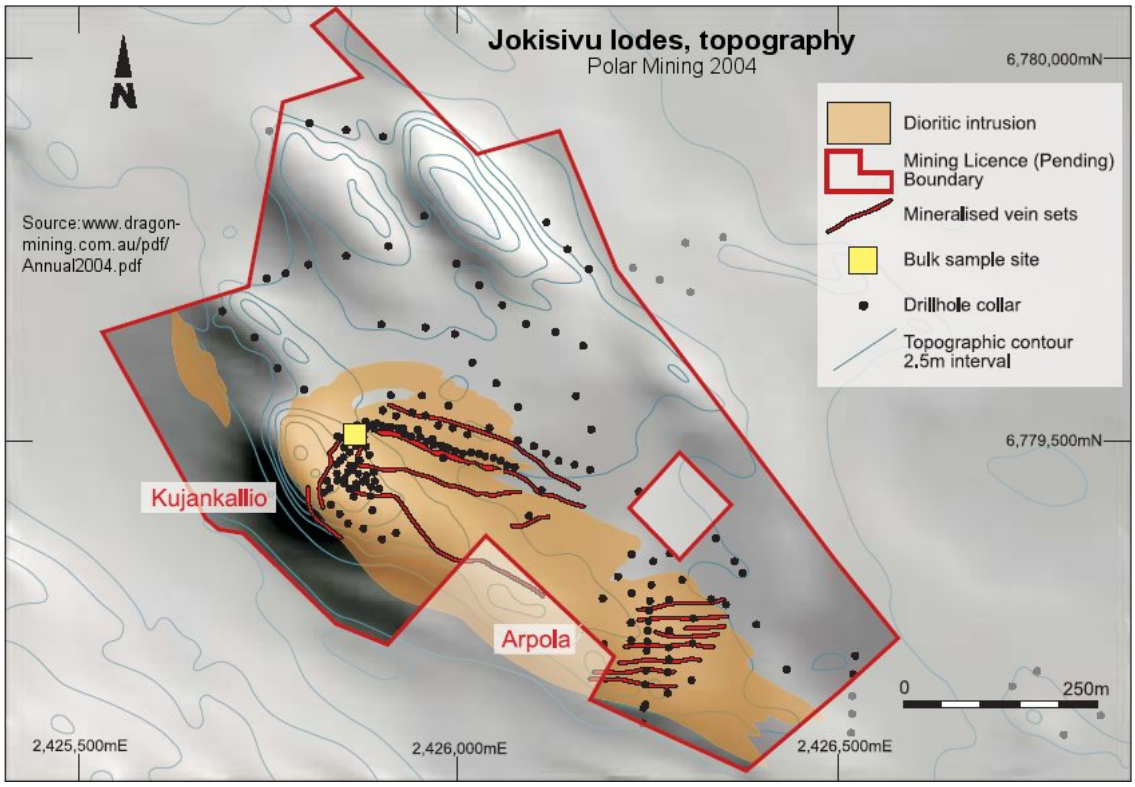
Structure:

Gold-mineralised quartz vein in diorite. Kujankallio
ore body, Jokisivu. View down plunge.
Compass plate is 11 cm long.
Photo Pasi Eilu.

Regional geology:



Plan view:



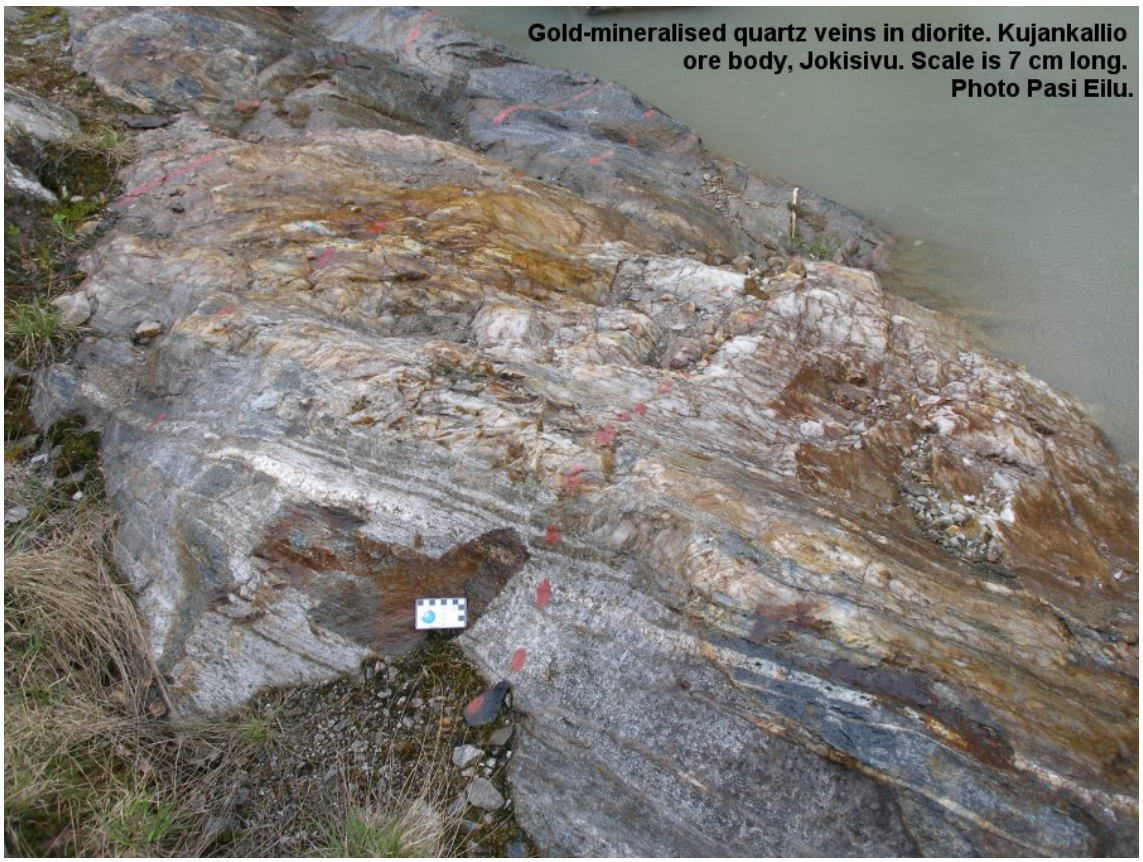
Vein:

Gold mineralisation. Quartz vein surrounded by a melting zone in diorite host rock. Arpola ore body, Jokisivu. The compass plate is 11 cm long. Photo Pasi Eilu.

Vein:

Gold-mineralised quartz veins in diorite. Arpola ore body, Jokisivu. Compass plate is 11 cm long. Photo Pasi Eilu.

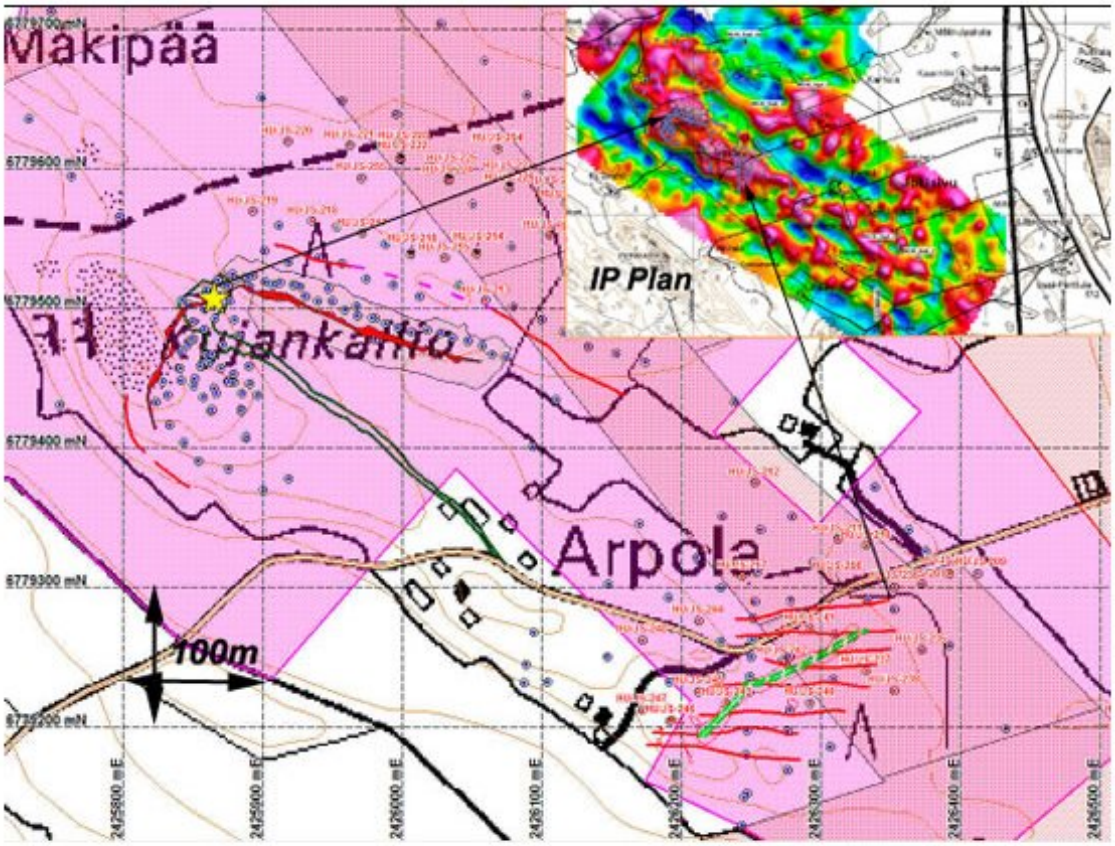
Vein:


Gold-mineralised quartz veins in diorite. Kujankallio
ore body, Jokisivu. Scale is 7 cm long.
Photo Pasi Eilu.

Garnet alteration in diorite surrounding quartz vein enveloped by a melting zone. Arpola ore body, Jokisivu. The compass plate is 11 cm long. Photo Pasi Eilu.

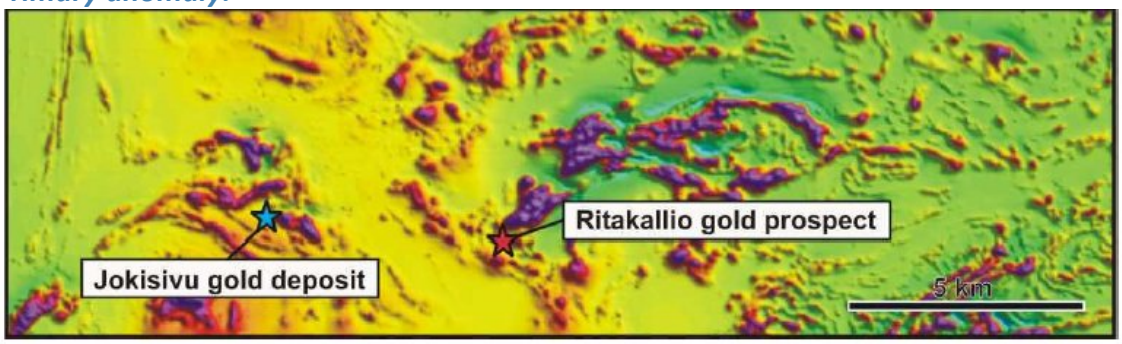
Garnet alteration in diorite surrounding quartz vein enveloped by a melting zone. Arpola ore body, Jokisivu. Photo Pasi Eilu.

Plan view:



Jokisivu deposit area, Huittinen, SW Finland. Exploration tenements in pink. North up. From Goode (2004).

Primary anomaly:

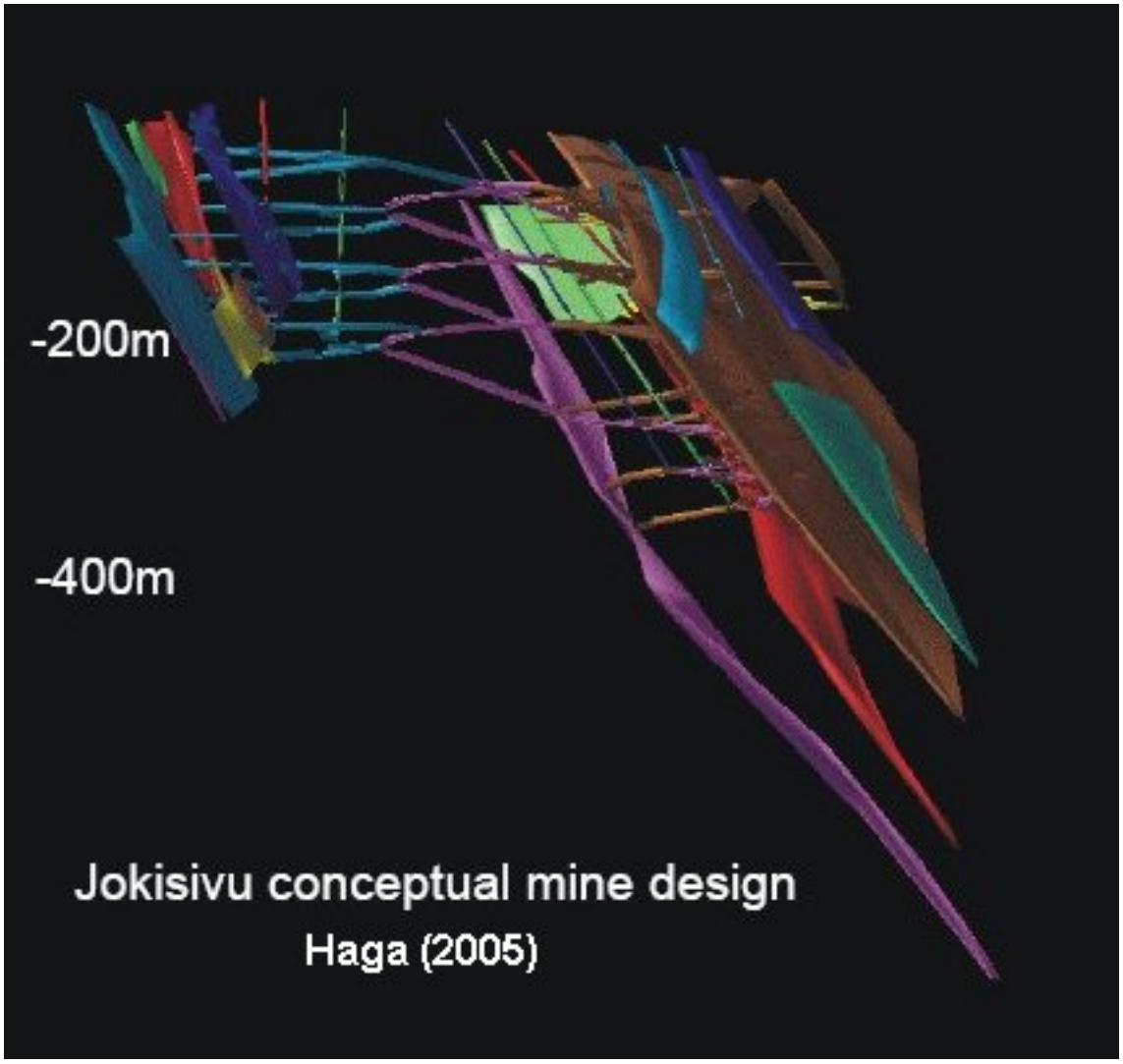


High-resolution aerogeophysical data, flight altitude 30 m, line-spacing 50 m, fixed-wings. Note the location of Ritakallio in a prominent NW-SE-oriented structure. North up. From Vuori et al. (2006).

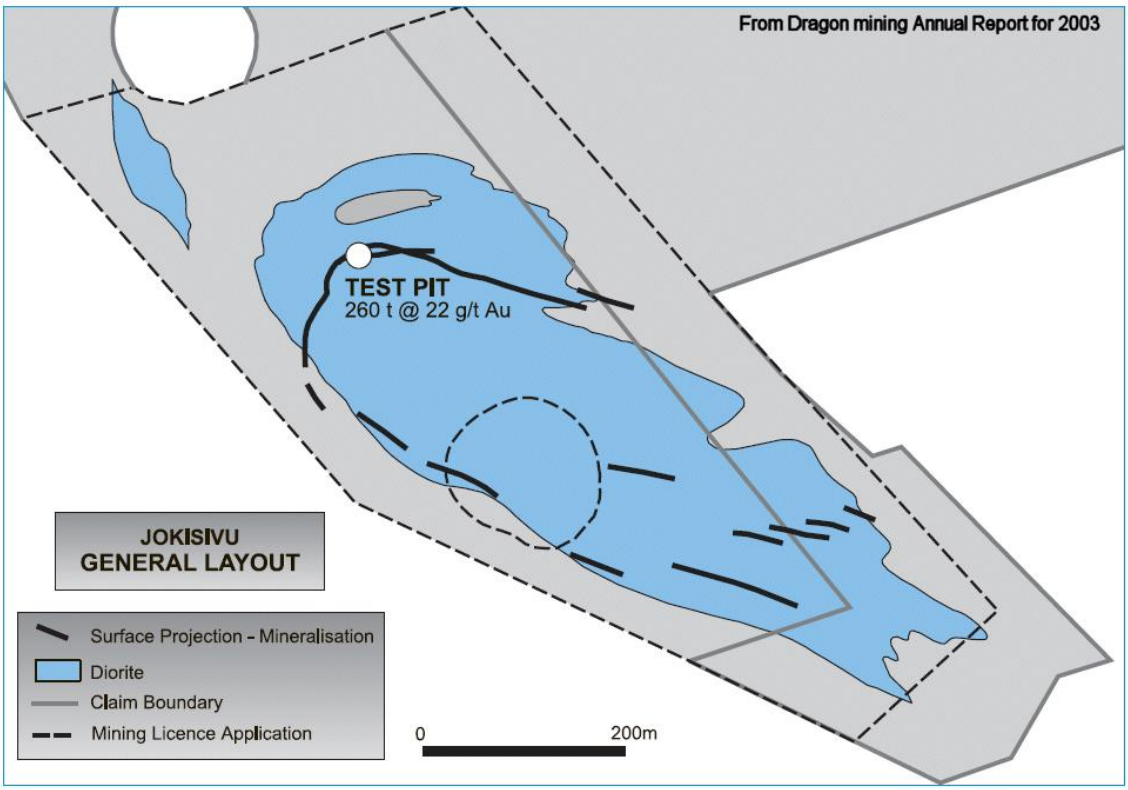
Visible gold in quartz vein. Arpola ore body, Jokisivu.
Scale in mm. Photo Pasi Eilu

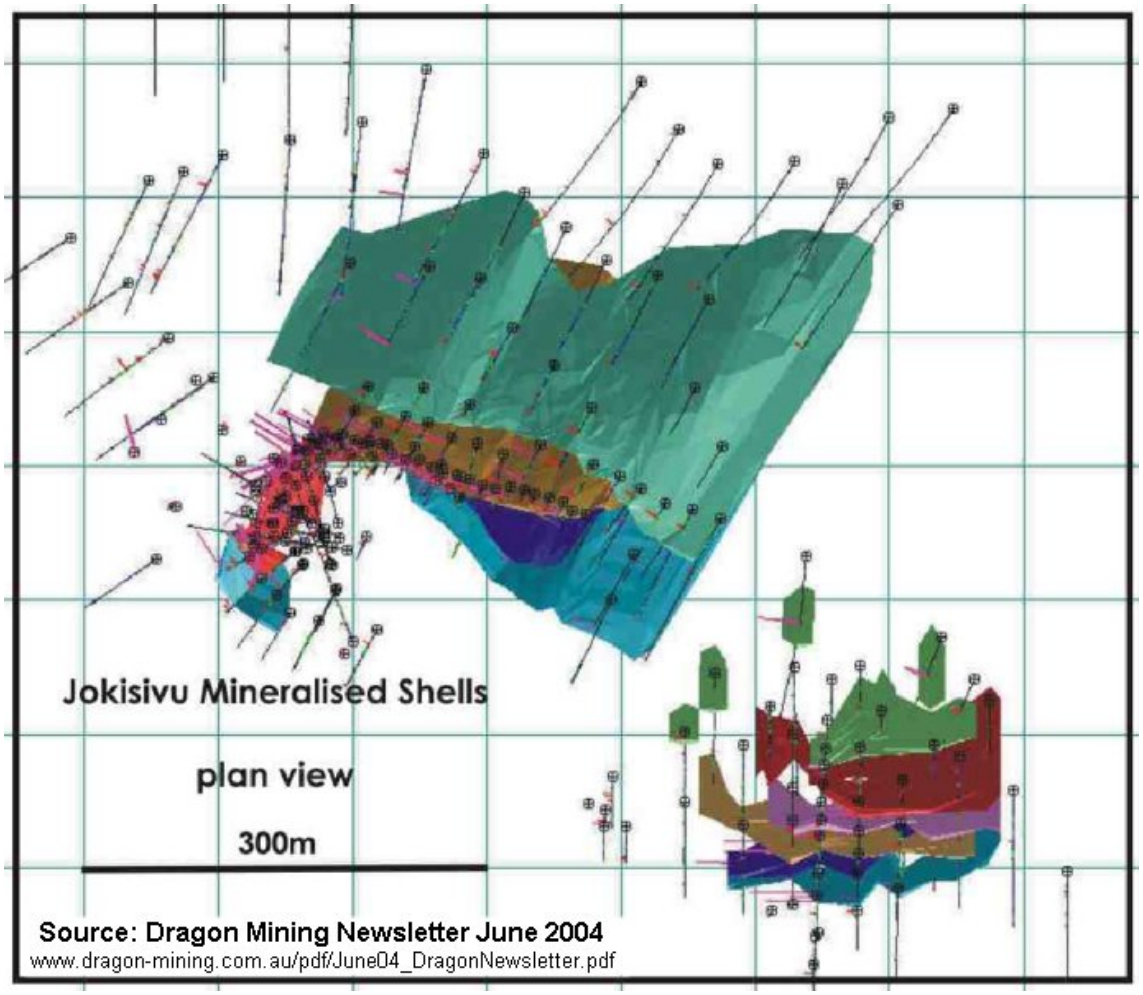
Outcrop photo:

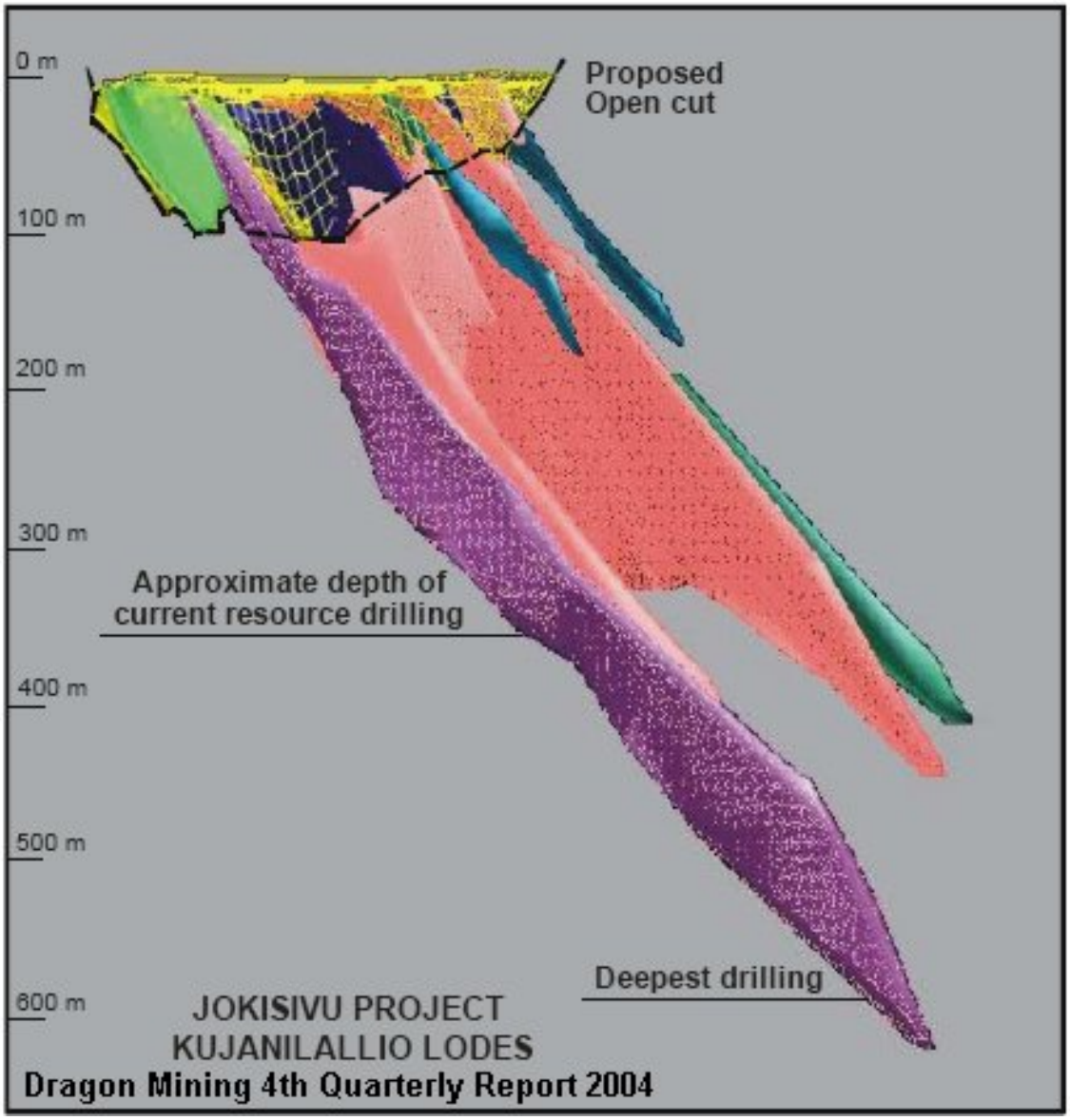
Jokisivu. Altered and sheared wallrocks. Compass plate is 11 cm long. Photo Juhani Ojala.

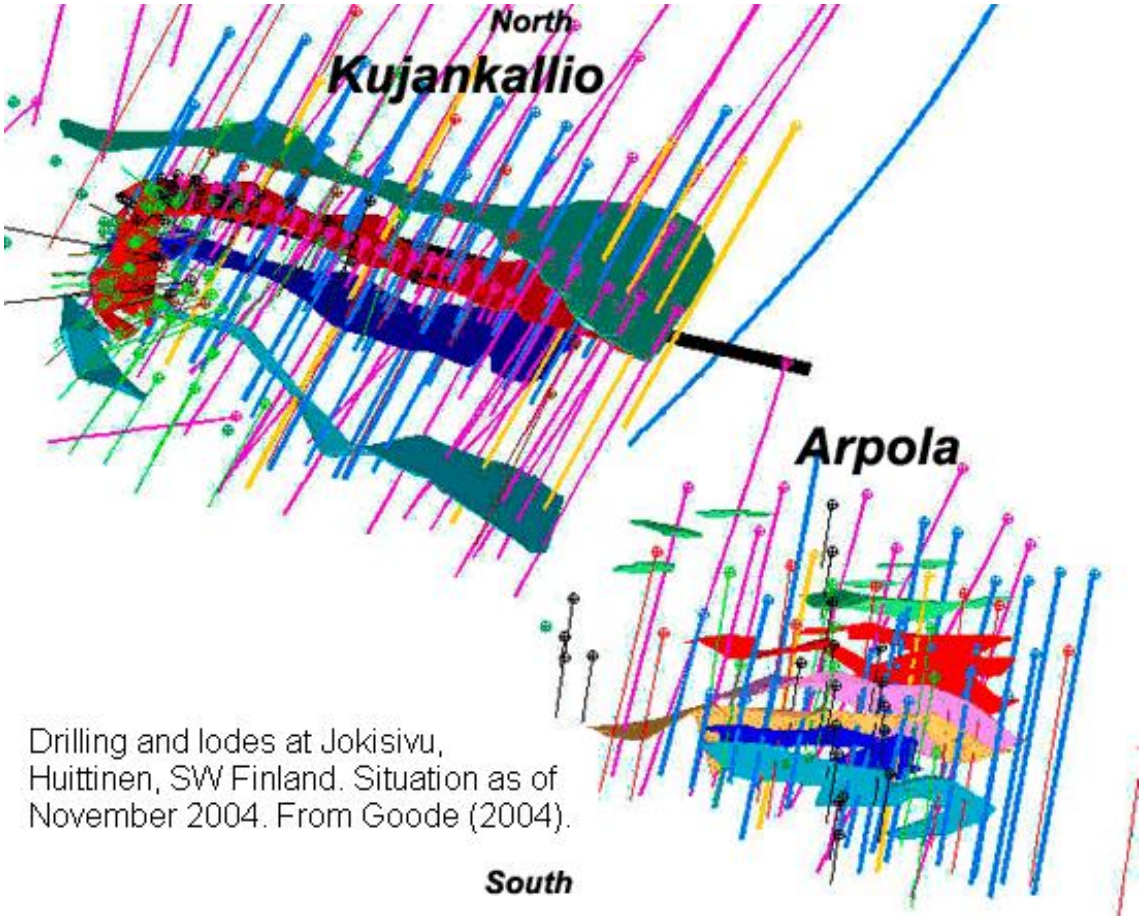

-200m
-400m
Jokisivu conceptual mine design
Haga (2005)

Plan view:


From Dragon mining Annual Report for 2003
TEST PIT
260 t @ 22 g/t Au
JOKISIVU
GENERAL LAYOUT
Surface Projection - Mineralisation
Diorite
Claim Boundary
Mining Licence Application
0
200m

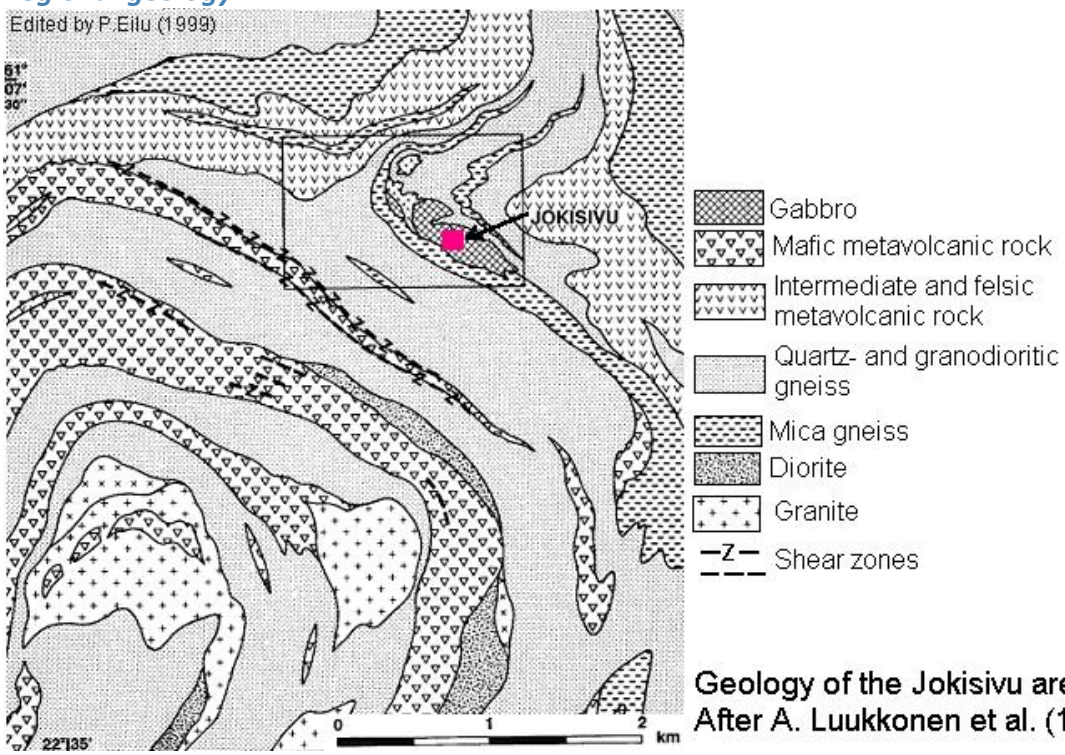

Jokisivu Mineralised Shells
plan view
300m
Source: Dragon Mining Newsletter June 2004
www.dragon-mining.com.au/pdf/June04_DragonNewsletter.pdf


0 m
100 m
200 m
300 m
400 m
500 m
600 m
Proposed
Open cut
Approximate depth of
current resource drilling
Deepest drilling
JOKISIVU PROJECT
KUJANILALLIO LODES
Dragon Mining 4th Quarterly Report 2004



Drilling and lodes at Jokisivu, Huittinen, SW Finland. Situation as of November 2004. From Goode (2004).

Regional geology:



Geology of the Jokisivu area. After A. Luukkonen et al. (1992)

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