Recent breakthroughs and challenges in the exploration of multiple high-grade epithermal gold deposits in Omu project, Hokkaido, Japan

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"Gold exploration in the circum-Pacific"

Photo courtesy of Peter Viljoen

Gold Mining in Japan

Japan’s tectonic setting

Affected by the interaction of 4 tectonic plates: Eurasian Plate, North American Plate (Okhotsk Microplate), Pacific Plate and Philippine Sea Plate

A product of complex tectonic processes since the Paleozoic which involves subduction, accretion, metamorphism, igneous activity, back-arc spreading and arc-arc collision (Wakita, 2013)

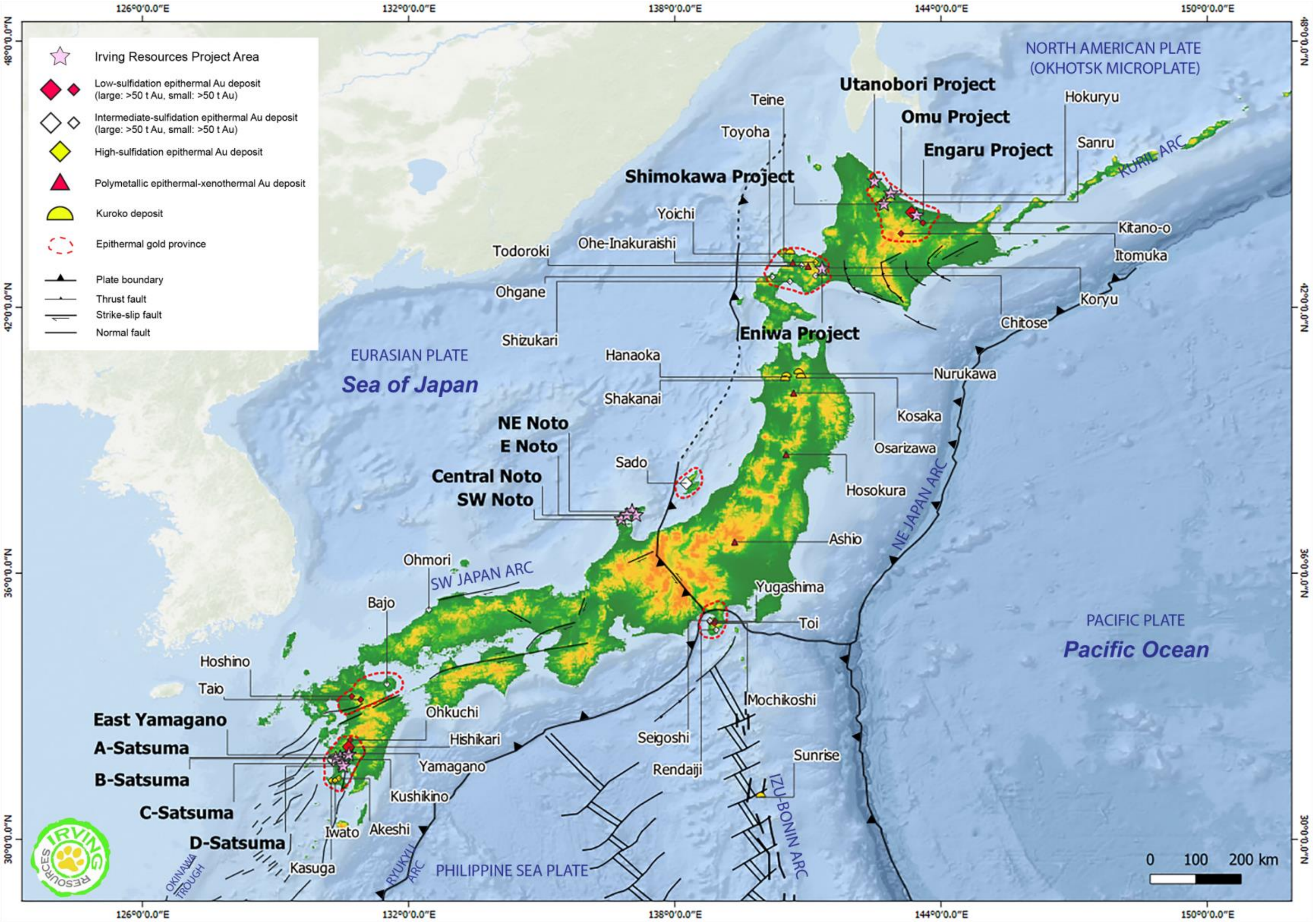
Epithermal gold deposits

The principal source of gold in Japan (Izawa and Watanabe, 2001)

- Low-sulfidation epithermal systems are associated with extensional settings that control bimodal basaltic-rhyolitic volcanism (Garwin et al., 2005)

The Hishikari Mine

- A world class deposit with exceptionally high gold grade (average grade of 30-40 g/t Au)
- Discovered in Kagoshima Prefecture in 1981
- Has produced 248.2 tons of gold (as of the end of March 2020) since it opened in 1985. (Sumitomo Metal Mining Co. Ltd., 2021)



Modified from Garwin et al. (2005)

The Company

Irving Resources Inc.

A Canadian-based mineral exploration company with a focus on gold in Japan.

Incorporated a 100% owned subsidiary named Irving Resources Japan GK in May 2016, which enables the Company to hold mining and exploration projects in Japan.

Newmont Corporation and Sumitomo Corporation are stakeholders in the company. Irving also holds a Joint Exploration Agreement with JOGMEC.

Has as a unique strategy to explore for and mine high-silica, high-grade epithermal gold and silver veins (suitable for use as smelter flux in the many operating base metal smelters throughout Japan)

Our projects

Hokkaido

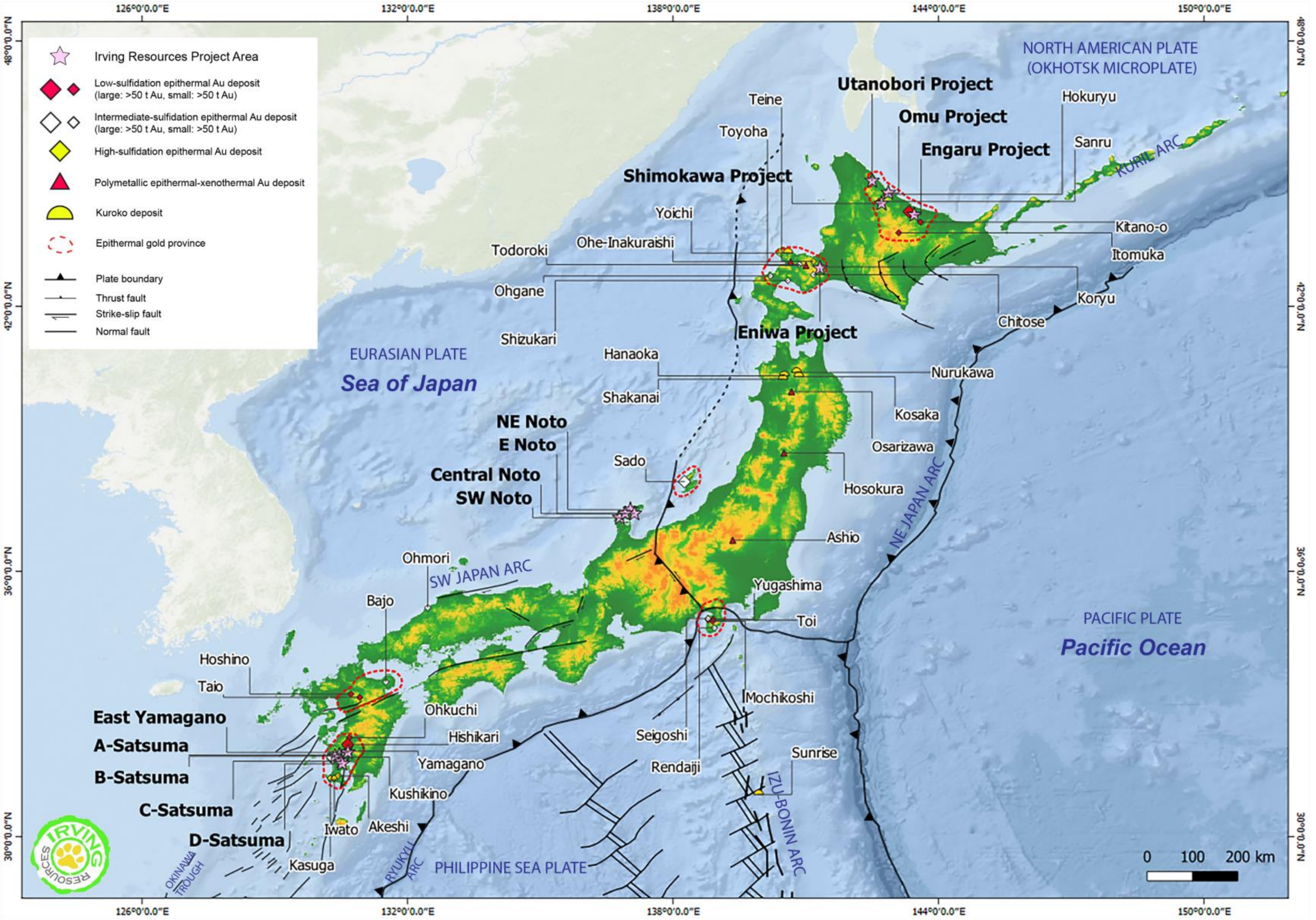
- Omu
- Utanobori
- Shimokawa
- Engaru
- Eniwa

Honshu

- Noto

Kyushu

- Yamagano
- Satsuma A, B, C, D



Modified from Garwin et al. (2005)

Kitami Metallogenic Province

Geology

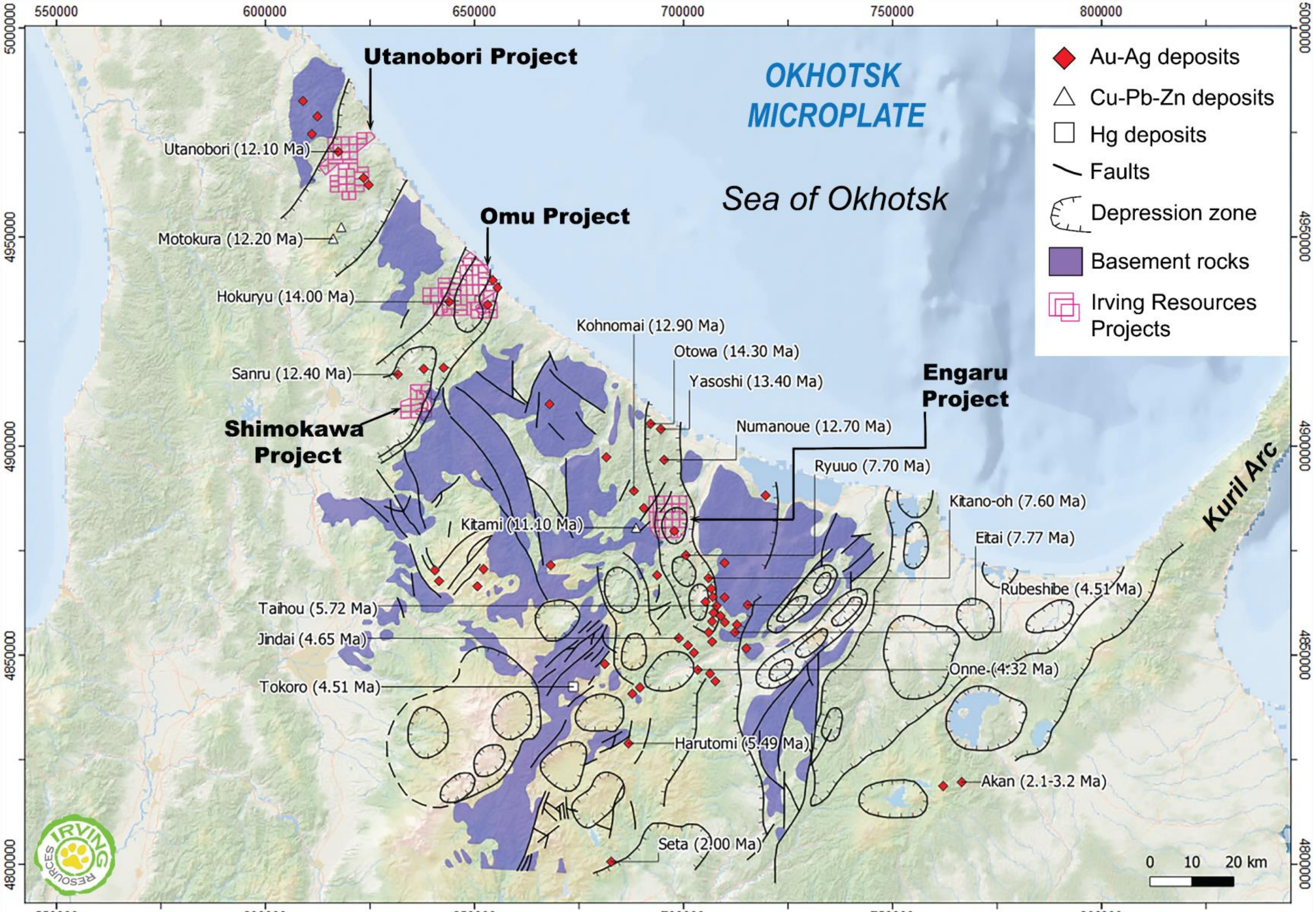
Underlain by Cretaceous to Paleogene sedimentary rocks of the Hidaka supergroup, and the Yubetsu Group and basaltic lavas of Nikoro Group (Yahata et al., 1988; Tajika and Yahata, 1991)

Subduction of the Pacific Plate along the Eurasian Plate and Okhotsk Plate started in the Eocene which formed the Kuril Arc (Jackson et al., 1975)

Bark-arc extension occurred during the middle to late Miocene (Kimura and Tamaki, 1986) and volcanism migrated from northwest to southeast from 14Ma to 6Ma (Watanabe, 1995; Watanabe, 1996)

- Hydrothermal activity was closely associated with felsic volcanism and resulted in the formation of low sulfidation epithermal deposits
- Ore deposits occur in and around the grabens (Ishihara et al., 2000)

Pliocene to Quaternary volcanism have occurred near the present arc front (Watanabe, 1995; Watanabe, 1996)



Modified from Ishihara (1998)

Kitami Metallogenic Province

Gold deposits

Located in the back-arc region of the present Kuril volcanic arc front (Watanabe, 1995)

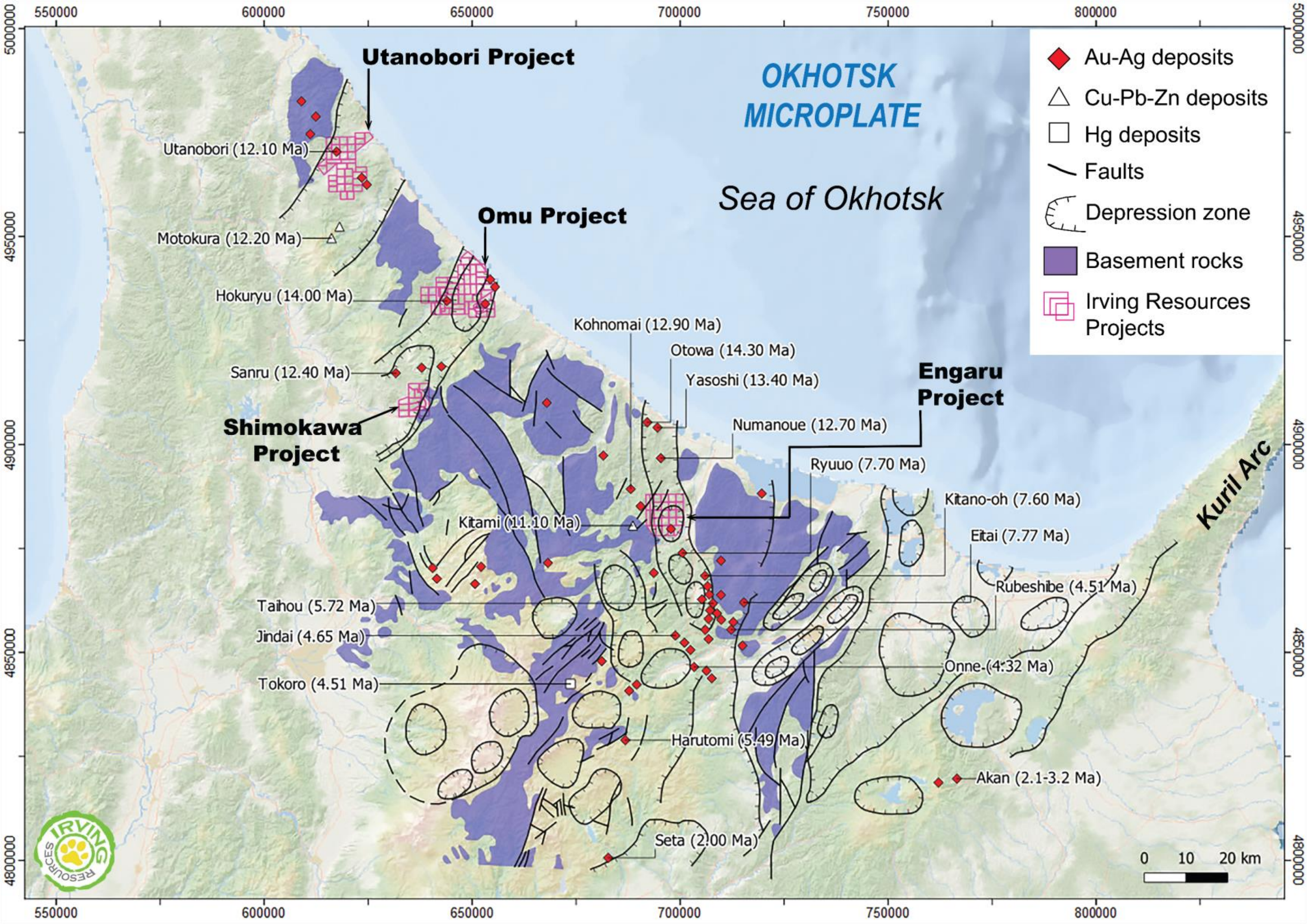
Ore deposits have K-Ar adularia and whole-rock alteration ages of 14.4-0.33 Ma (Watanabe, 1996; Yahata et al., 1996) ,

Historic precious metal production yielded a total of ~2.9 Moz Au and ~44.7 Moz Ag, (Watanabe, 1995) with minor base metal and mercury production (Maeda, 1997)

Metal mining was most active in the 1950s (Urashima, 1961)

The Kohnomai Mine

- 3rd largest Au producer in Japan (73.181t Au, 1243t Ag)
- Discovered in 1915, operating in 1917 until 1973
- More than 10 epithermal Au-Ag veins (1-10m thick, one vein extends up to 2.5km)
- Underlain by Cretaceous sedimentary rocks of the Hidaka supergroup
- Hosted in Miocene volcanic rocks
- Located in the western part of Monbetsu-Kamishihoro graben (Ishihara et al., 2000; Kondoh et al., 1967)



Modified from Ishihara (1998)

The Omu Project

The company's lead project is the Omu Project located in the town of Omu on Japan's northern island of Hokkaido.

The project is comprised of the 2.98 km^2 Omui mining license and 56 prospecting licenses covering an additional 171.38 km^2.

The Omu Project

Omui Prospect

Elevation: ~150-220m asl

Includes the Old Omui Mine, which produced 0.34t Au and 8.5t Ag (8000t of ore at a grade of 15-20 g/t Au, 400-500g/t from the Honpi vein (Honko area) from 1925 to 1928 (Jones and Lu, 1995)

Hokuryu Prospect

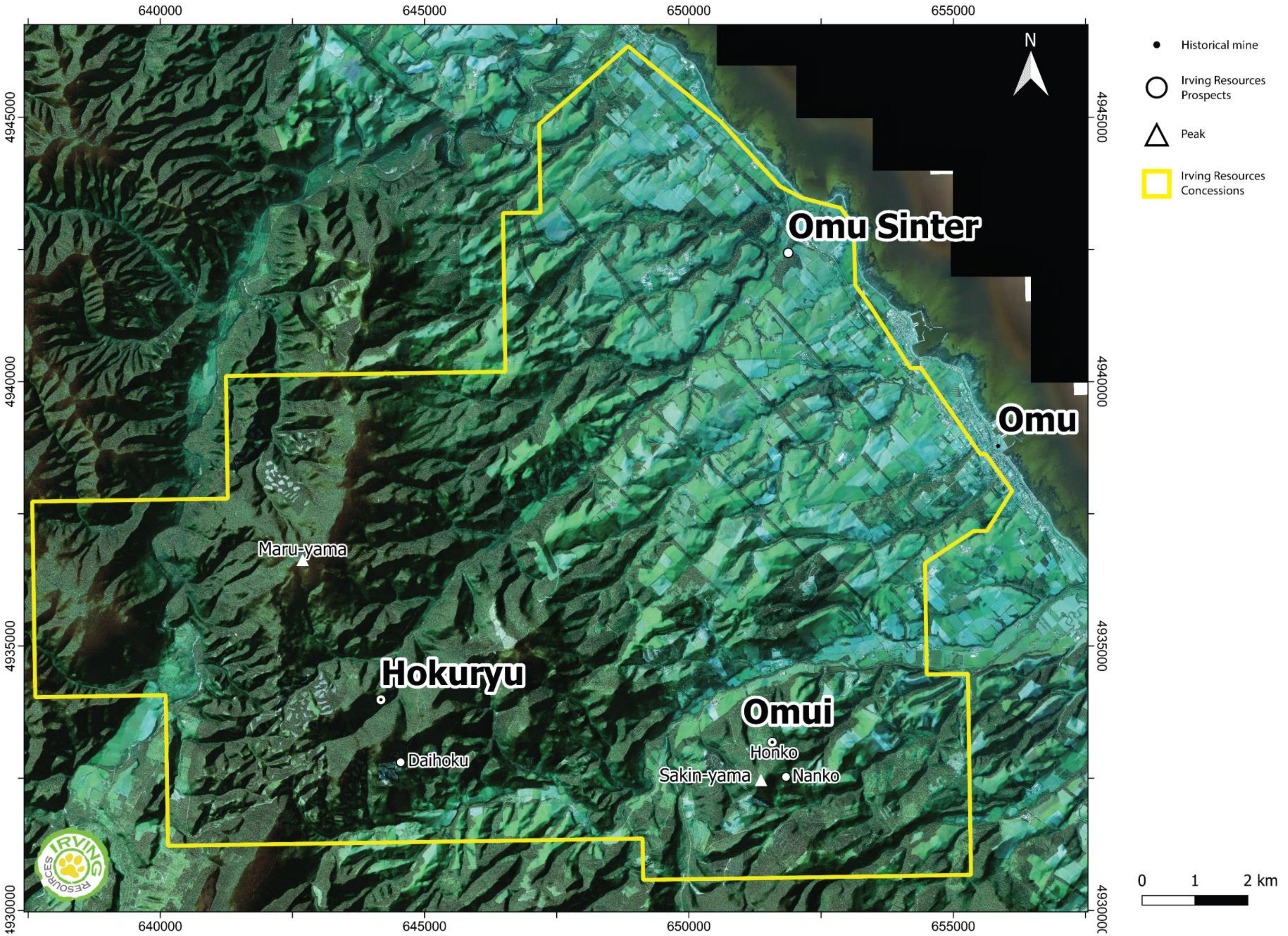
Elevation: ~150-485m asl

Includes the old Hokuryu Mine, which produced 2.2t Au and 11.8t Ag (300 kt of ore at a grade of 7.4 g/t Au, 32.4 g/t Ag) from 1928-1943 (Geological Society of Japan, 1980; Watanabe, 1995)

Omu Sinter Prospect

Elevation: ~10-35m asl

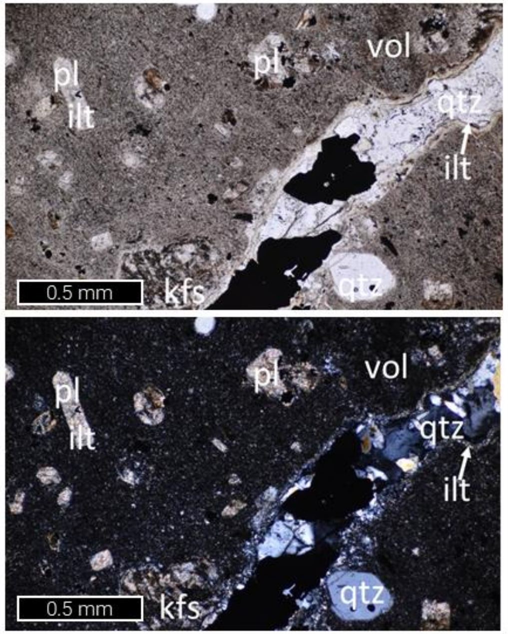
Au-bearing sinter discovered by Irving staff during district reconnaissance in 2016



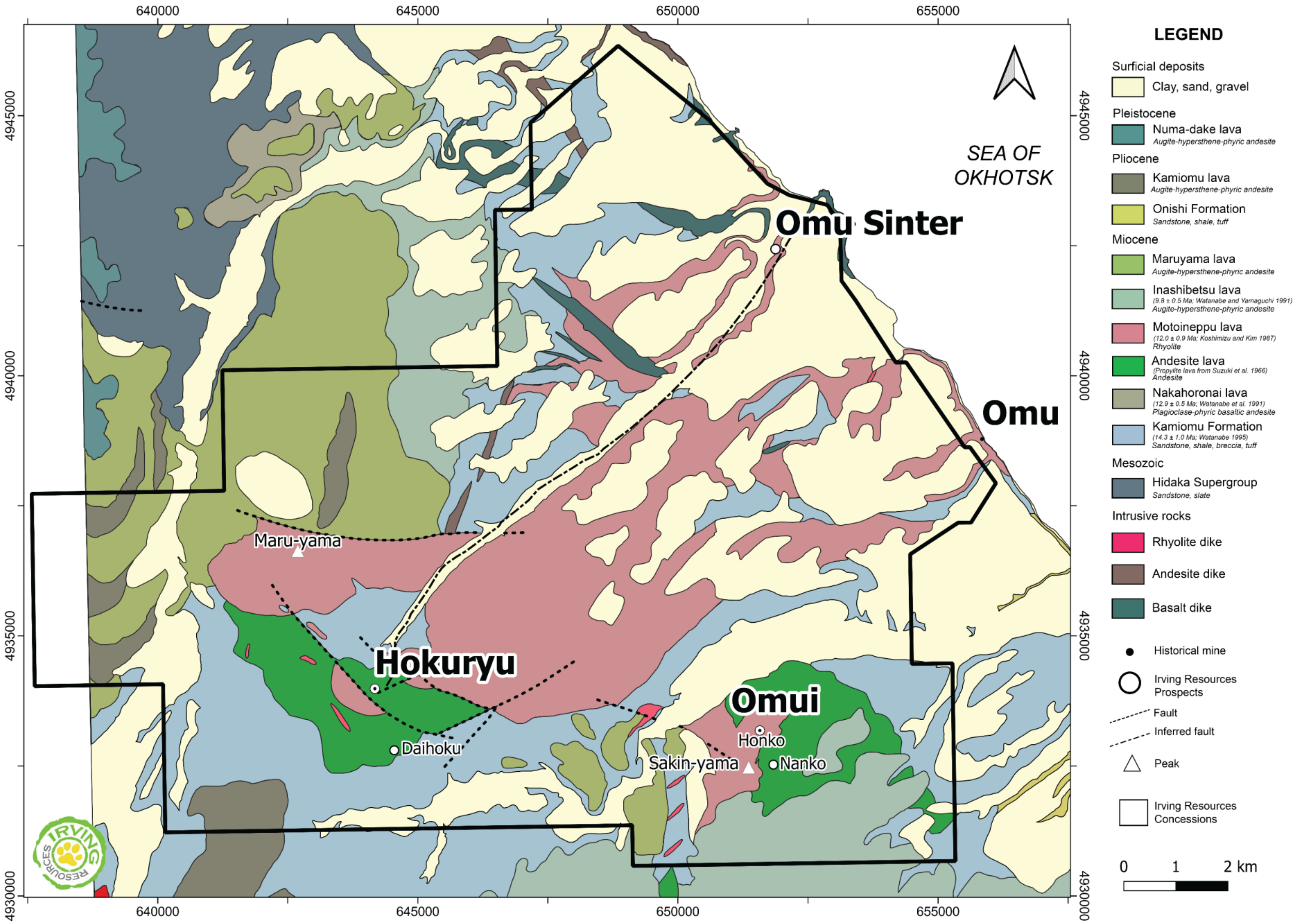
Geology

Host rocks

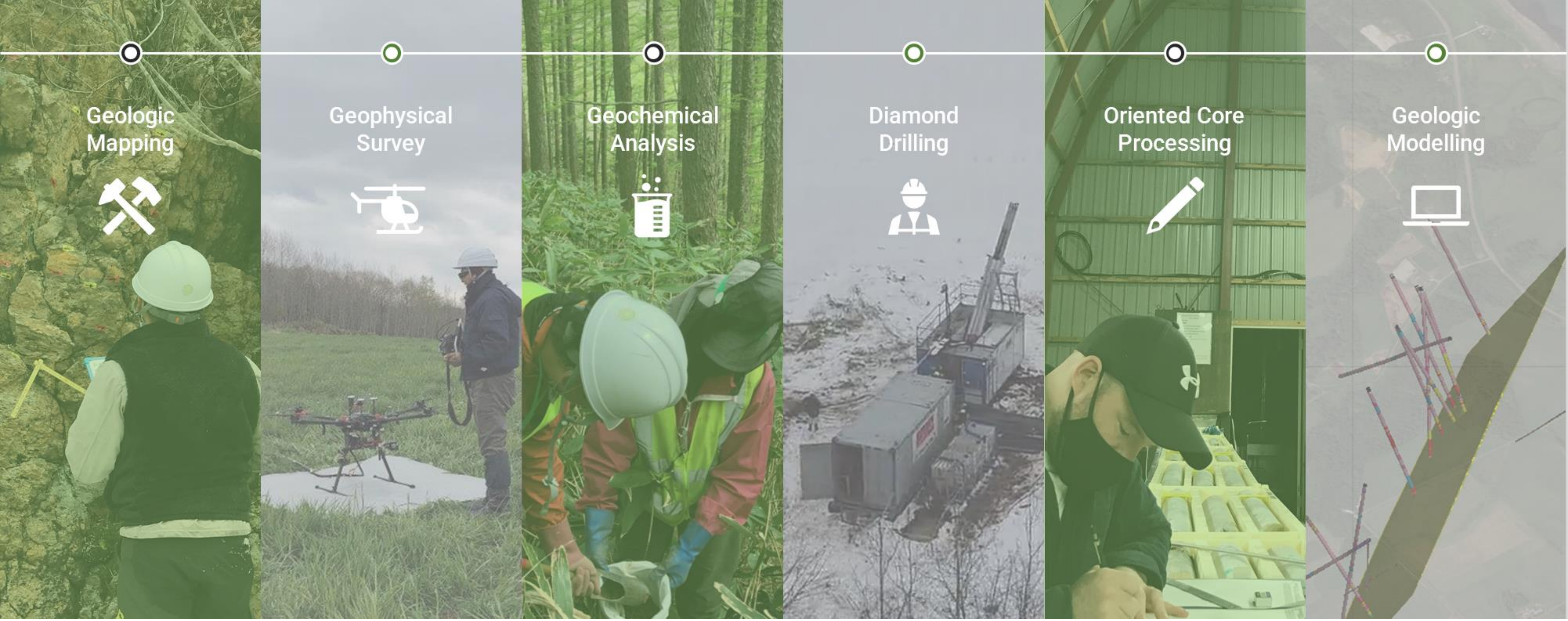
Epithermal mineralization is mainly hosted in rhyolitic flows of Motoineppu lava (Suzuki et al., 1966) and andesitic flows, referred to as Propylite lava (Suzuki et al., 1966)



Photomicrographs of rhyolite flow from Motoineppu Lava under PPL and XPL. Legend: qtz-quartz, pl-plagioclase, kfs-K-feldspar, ilt-Illite, lim-limonite, vol-volcanic glass (Analyzed by Dr. Ryohei Takahashi of Akita University)



Geologic map updated from company's geologic mapping and drilling results. Modified from Suzuki et al. (1966) and Zeeck et al. (2021)



Exploration Methods

Japan is an environmentally conscientious country. Exploration must be conducted in the utmost responsible manner, while building strong relations and trust with the local community, the academe, the mining and exploration industry, and the Japanese government.

Timeline of exploration activities

	Whole Property	Omu Sinter	Omui	Hokuryu
2016			**Rock chip sampling** 121 samples	**Rock chip sampling** 9 samples
2017	**Reconnaissance geological survey** **BLEG sampling** 104 samples **Gravity survey** 56 stations	**Rock chip sampling** 17 samples **Drone magnetics survey** 54 km	**Rock chip sampling** 248 samples **Soil sampling** 1722 samples **Gravity survey** 753 stations **Drone magnetics survey** 173 km	**Rock chip sampling** 53 samples

	Whole Property	Omu Sinter	Omui	Hokuryu
2018	**Supplementary BLEG sampling** 8 samples	**Rock chip sampling** 22 samples **Drone LIDAR survey** 0.31 km^2 **Drone magnetics survey**	**Rock chip sampling** 4 samples **Drone LIDAR survey** 3.13 km^2 **Drone magnetics survey**	**Rock chip sampling** 38 samples **Soil sampling** 47 samples
2019		**Rock chip sampling** 6 samples **Soil sampling** 965 samples **CSAMT survey** **Moving loop EM survey** **IP survey** **Gravity survey** **Diamond drilling (Phase 1)** 8 holes, 3388.4m	**Rock chip sampling** 50 samples **Trenching** 747.56m **CSAMT survey** **Gravity survey** **Diamond drilling (Phase 1)** 10 holes, 2257.8 m	**Rock chip sampling** 166 samples **Soil sampling** 2222 samples **CSAMT survey**

	Whole Property	Omu Sinter	Omui	Hokuryu
2020		**Diamond drilling (Phase 2)** 5 holes, 2132.7m	**Diamond drilling (Phase 2)** 9 holes, 4277.12m	**Gravity Survey**
2021		**Rock chip sampling** 81 samples **Diamond drilling (Phase 3)** 4 holes, 1318.7m	**Rock chip sampling** 13 samples **Soil sampling** 626 samples	**Rock chip sampling** 80 samples **Soil sampling** 592 samples
			Diamond drilling (Phase 3) 6 holes, 2350m	**Diamond drilling (Phase 1)** 8 holes, 4150m

Our facilities

Irving Office

Located in Omu Town in front of Omu Town Office

Core Cutting Room

Connected to Core Shed 1 and Core Shed 2 for streamlined drill core processing

Core Shed 1

Drill core processing and logging area

Core Shed 2

Drill core sampling and packing area

Large capacity electric drying oven for BLEG and soil samples

Our drilling partners

Omu Sinter

Contractor: Mitsui Mineral Development Engineering Co., Ltd. (MINDECO)

Drilling Company: Rodren Drilling Ltd.

Contract Period: 2019-Present

Drilling Season: Winter - Spring

Omui

Contractor: Mitsui Mineral Development Engineering Co., Ltd. (MINDECO)

Drilling Company: Rodren Drilling Ltd.

Contract Period: 2019-Present

Drilling Season: Early Spring- Early Winter

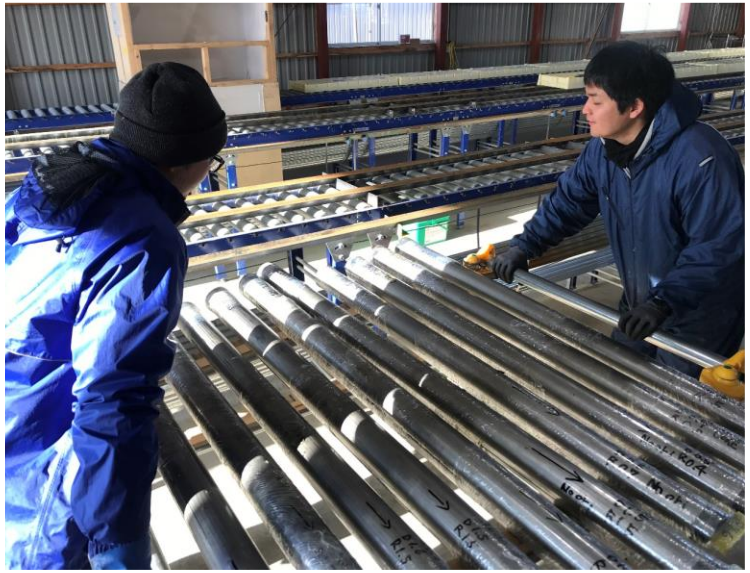
Hokuryu

Contractor: Sumiko Resources Exploration & Development Co., Ltd. (SRED)

Contract Period: 2021-

Drilling Period: Summer-Early Winter

Our core processing



Core orientation at the drilling site

Core orientation is meticulously done at the drilling site using a fully electronic core orientation technology which is specifically designed to orientate accurately and consistently in soft and broken ground.

Delivery from drilling site to core shed

To preserve the integrity of the core and the orientation mark drawn at the drilling site, the core is being delivered to the Omu Project core shed in split tubes where it will be processed and logged.

Core processing at the core shed

Mineralization is mainly hosted in veins which makes structural measurement a crucial factor in drillhole targeting. Geologists are able to observe the core in its pristine state before they are transferred to the core box for cutting and storage.

Regional Exploration Results

Regional surveys covering the three main prospects of the Omu Project involved regional geologic mapping, gravity and magnetics survey and stream sediment sampling (BLEG).

Regional Exploration

Silica Sinter

Mapping

Discovered a silica sinter outcrop in Omu Sinter Prospect in 2016

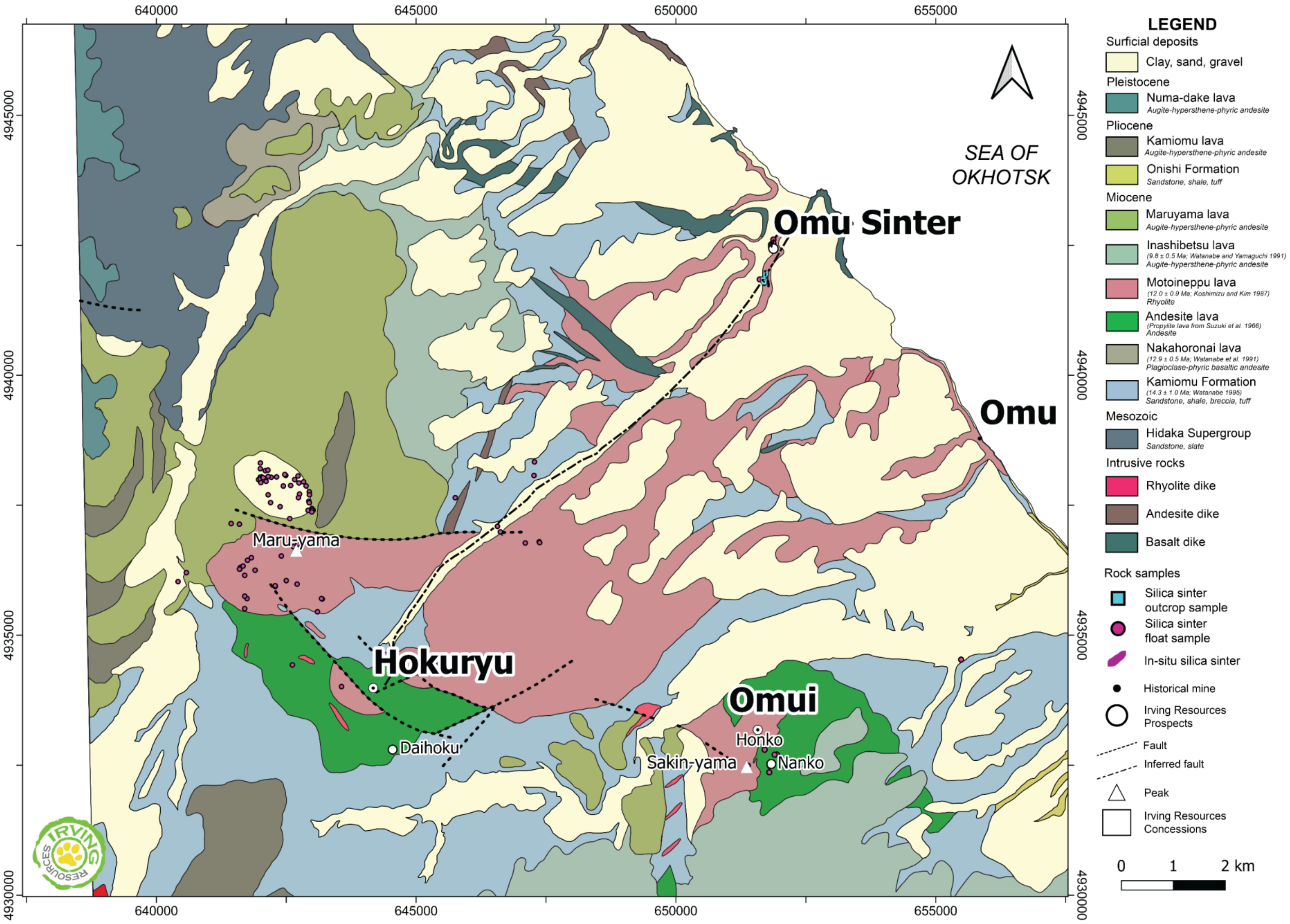
No silica sinter outcrop was mapped in Omui Prospect and Hokuryu Prospect, however, silica sinter float samples were found in several areas

A promising exploration tool

Mineralized with Au, Ag and other pathfinder elements (As, Sb, Hg)

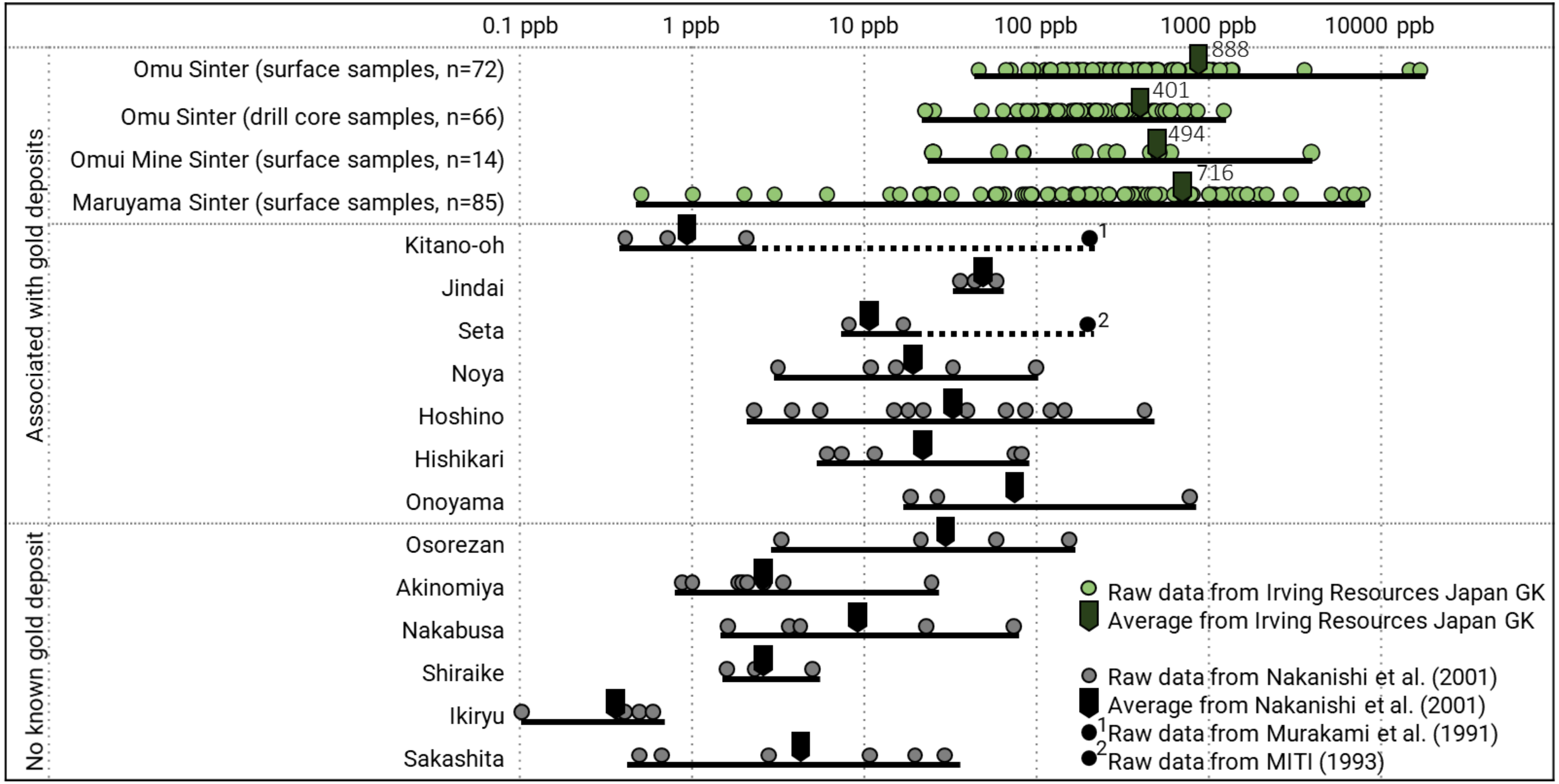
Exhibit several proximal to distal facies which can be used as paleosurface markers and determine zones of thermal fluid upflow and/or lateral outflow

Brecciated samples which contain adularia-altered clasts suggest hydrothermal eruption



Geologic map updated from company's surface mapping and drilling results. Modified from Suzuki et al. (1966) and Zeeck et al. (2021)

Gold content of silica sinter



Trace element composition of silica sinter in New Zealand and Japan

	Deposit	Au	Ag	As	Sb	Hg	Li	Cs	Rb	Mn
Miocene Silica Sinters of Coromandel Volcanic Zone, New Zealand	Black Jack	0.007	0.024	14.70	28.60	1.08	19.00	0.37	0.31	13.30
	Kohuamuri	0.003	1.335	4.59	86.00	0.09	151.50	10.45	6.43	35.30
	Diggers Creek	<0.001	0.075	3.93	4.66	0.02	2.90	0.10	0.44	67.80
	Kaitoke	0.001	0.109	0.88	5.49	0.07	22.50	0.79	0.72	18.80
	Big Kaitoke	0.009	0.012	8.37	216.00	0.01	30.60	1.31	0.65	57.20
	Pine	0.023	0.133	8.43	75.20	0.18	139.00	8.18	5.94	31.50
	Parihaka	<0.001	0.013	109.50	2.47	0.02	1.20	0.24	0.89	20600.00
	Ascot	<0.001	0.878	14.60	129.00	0.20	4.60	1.10	1.32	18.80
	Onemana	0.204	2.070	14.75	49.10	0.32	15.00	14.90	13.60	92.40
	Newton	<0.001	0.021	5.39	1.04	0.08	8.00	0.80	0.67	84.00
	Dalmeny	<0.001	0.124	71.80	29.40	0.23	106.00	17.10	8.02	291.00
	Hepburn	<0.001	0.451	1.68	24.70	0.13	4.40	1.01	0.64	11.50
	Puketui	<0.001	0.061	94.70	54.90	0.43	121.00	7.60	8.04	54.40
	Sky Farm	0.002	0.095	110.50	50.00	0.06	78.70	8.79	7.51	30.40
	Silver Stream	<0.001	0.668	5.60	15.95	2.40	2.30	0.16	0.55	17.00
	Alderman Islands	0.001	0.415	5.51	52.00	2.21	85.00	2.79	1.60	9.10
	Broken Hills	0.595	12.100	4.89	76.60	0.36	80.90	8.18	15.50	16.80
	Favona	0.335	0.988	3.59	135.00	>100	55.80	3.87	3.16	4.30
The Omu Project, Japan	Omu Sinter (surface samples, n=72)	0.888	12.028	73.82	148.89	11.62	128.78	9.96	40.68	138.29
	Omu Sinter (core samples, length=46.12m)	0.401	11.772	11.920	198.291	N. A.	34.652	4.455	5.663	151.027
	Omui Mine Sinter (surface samples, n=14)	0.494	9.312	150.11	145.64	6.40	67.44	5.80	34.64	127.07
	Maruyama Sinter (surface samples, n=85)	0.716	8.338	52.61	38.67	2.78	74.95	6.43	12.80	153.54

Note: All values are in ppm. N.A. means not analyzed.
Table revised from Hamilton et al. (2016)

Gravity survey

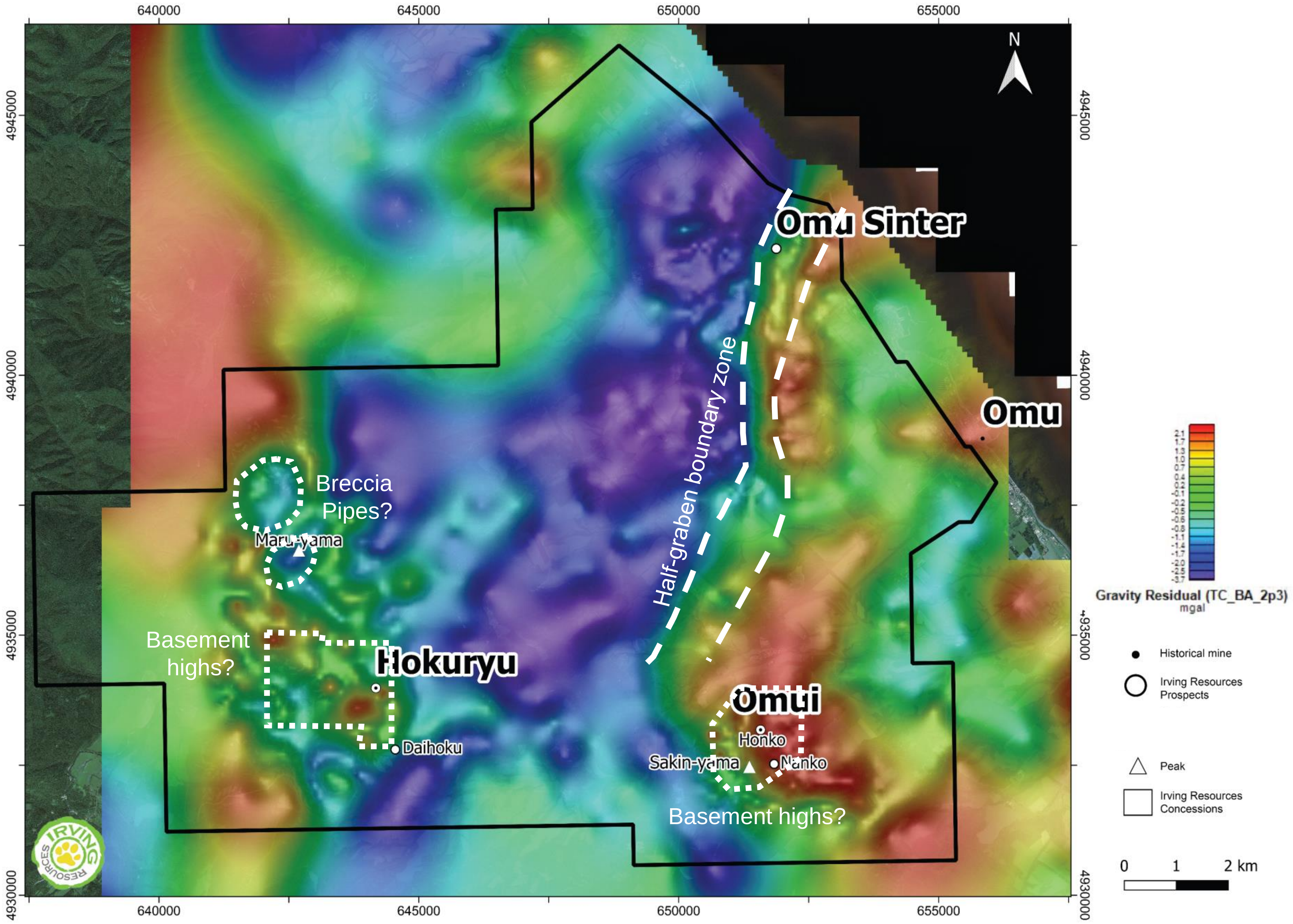
Graben-bounding structures

3 prospects sit atop or on the edges of gravity highs

- Reflect shallowly buried dense basement rocks

Bouguer gravity horizontal gradient clearly highlights graben-bounding structures

- NE-trending gravity low extending across the area reflecting a graben filled with low density volcanic rocks
- Omui and Omu Sinter are connected along faults defining the eastern margin of the graben
- Hokuryu sits astride faults defining the western margin



Horizontal gradient of the regional Bouguer anomaly (Bouguer correction density = 2.30 g/cm^3)

Regional Exploration

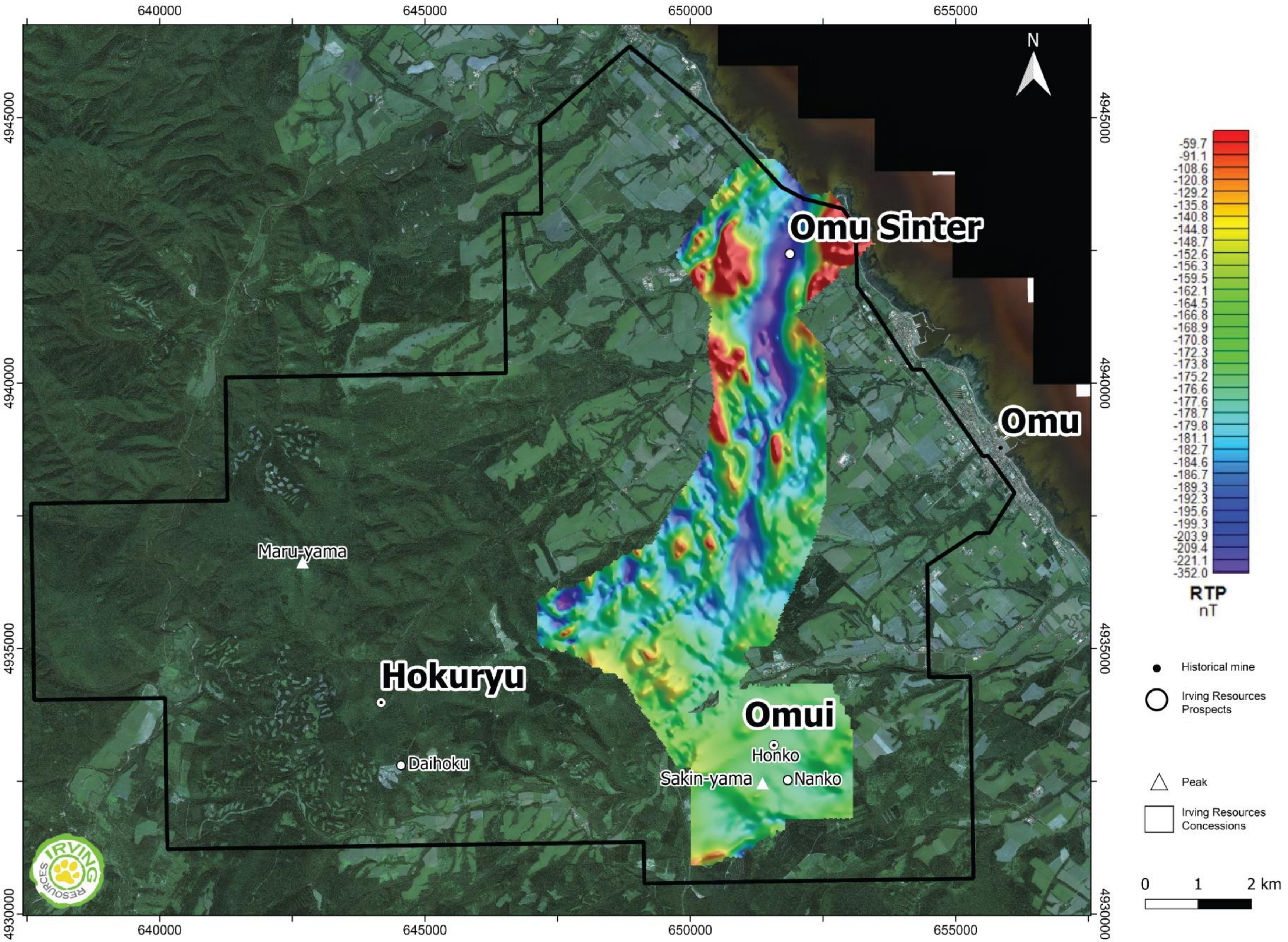
Magnetics survey

Terrain

After recognizing the challenge of undertaking surface survey in dense vegetation, MINDECO completed the engineering and construction of a drone-based magnetics system

Hydrothermal alteration

A 9km long NNE-trending low magnetic zone is interpreted as hydrothermal alteration which also coincides with the prominent gravity gradient interpreted as graben-bounding structures underlying the area



Drone-borne magnetics survey (RTP)

Regional Exploration

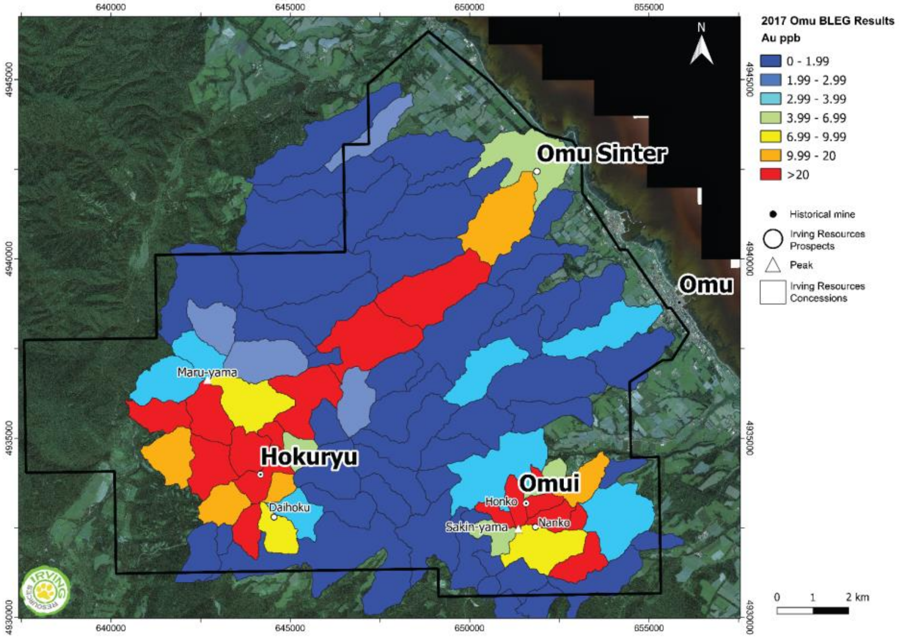
BLEG survey

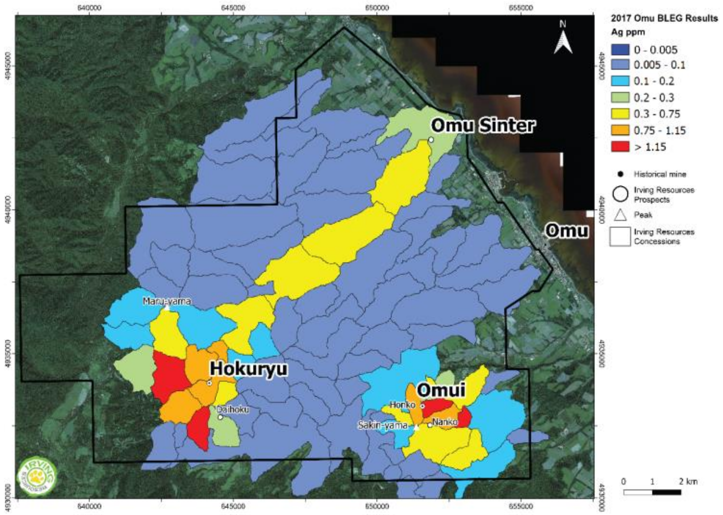
Au, Ag, As, Hg, Sb anomalies

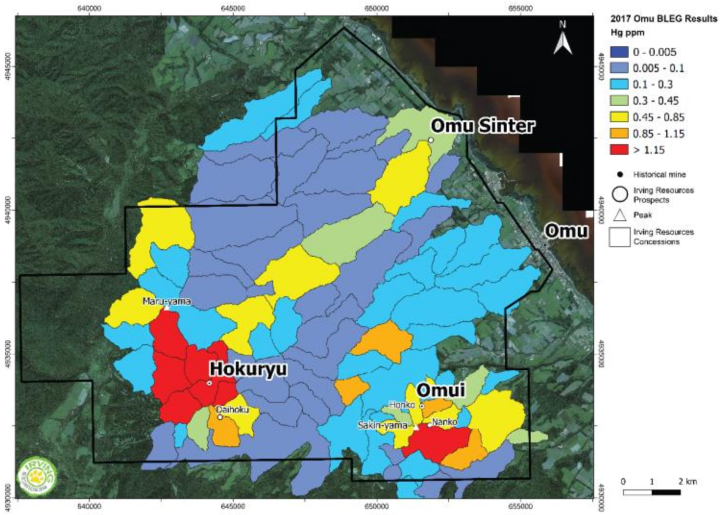
Omui Mine and Hokuryu Mine display well-defined Au, Ag, As, Hg and Sb anomalies

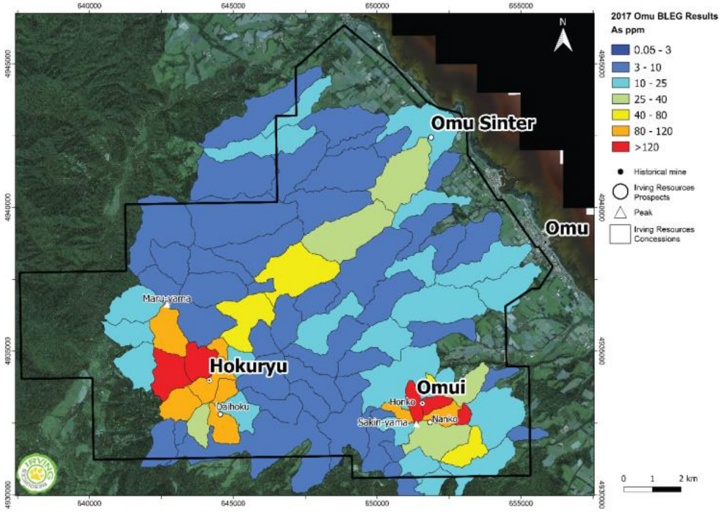
Au anomalies in Hokuryu extend over a wide area while in Omui, they appear to be open to the east and southeast

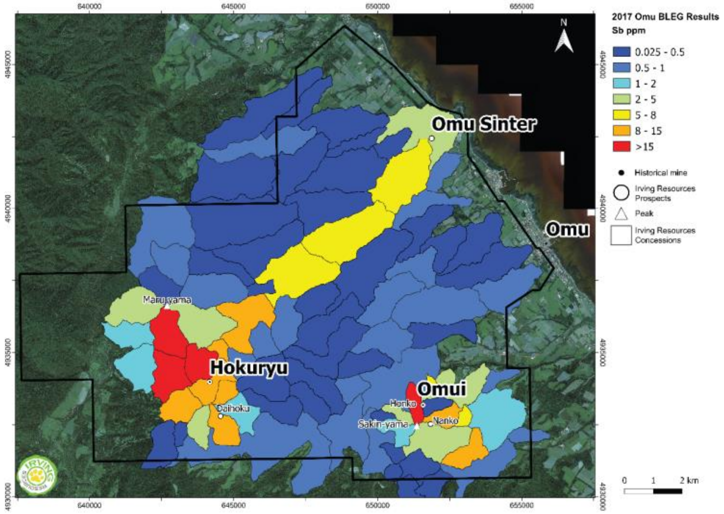
Residual downstream anomalies are observed from Hokuryu to Omu Sinter







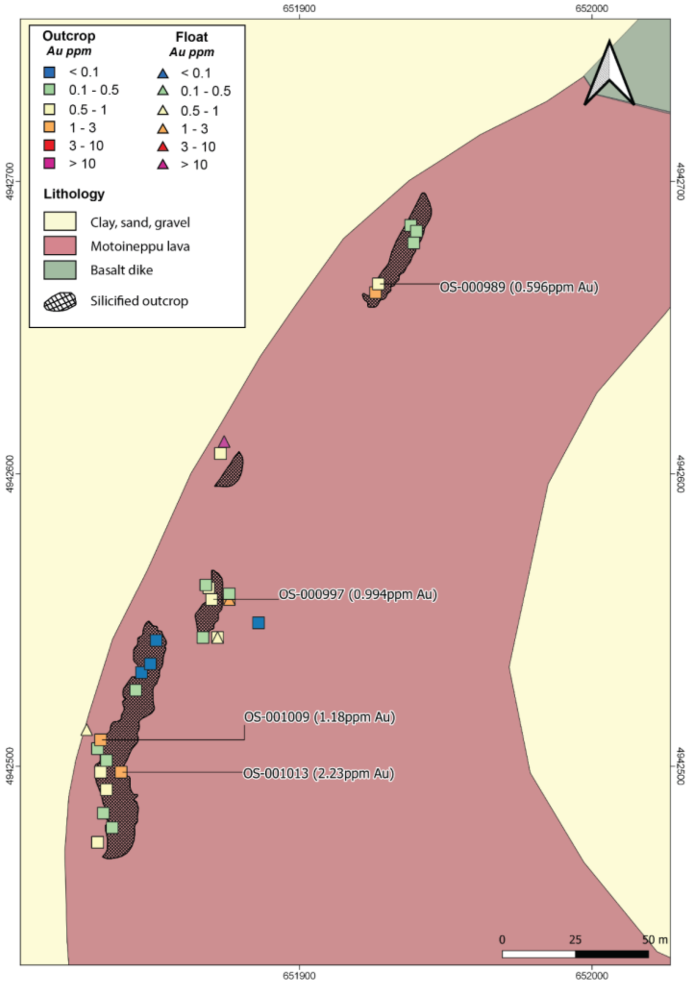




Omu Sinter

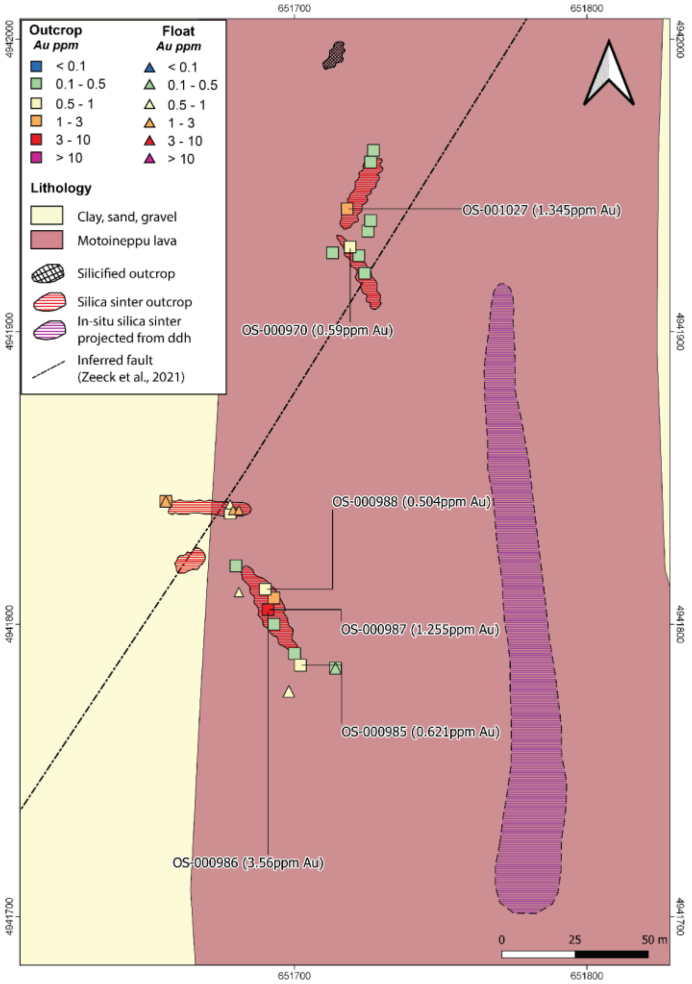
The Omu Sinter prospect was discovered by Irving Resources in 2016 during a district reconnaissance along a 1km-long steep slope on the eastern margin of a NE-trending valley. Recent exploration efforts aim to find the related epithermal mineralization to this outcropping mineralized sinter.

Omu Sinter Prospect



Omu Sinter North

Features several outcrops of intensely silicified rhyolite, breccia and volcaniclastic deposit



Omu Sinter South

With several outcrops of alternating layers of laminated and brecciated silica sinter

Surface Geology

Intensely silicified outcrops

Features several outcrops of intensely silicified rhyolite, breccia and volcaniclastic deposits (shallow silicification, about the same elevation as the sinter in the south)

Fine fractures found in the rocks can be conduits for silicification

Matrix of brecciated intervals sometimes contain brown-black chalcedonic silica with fine pyrite

Bladed calcite filling in the matrix may indicate boiling

Silicified spherulitic rhyolite outcrop

Silicified (and brecciated) outcrop

Bladed quartz after calcite
(21OS-SF-OC062, 0.166ppm Au)

Silicified spherulitic rhyolite
(21OS-SF-OC064, 0.114ppm Au)

Silicified mineralized breccia
(21OS-SF-OC056, 2.23ppm Au)

Omu Sinter South

Surface Geology

Silica sinter outcrops

Several outcrops of alternating laminated and brecciated silica sinters (similar to McLaughlin) correspond to multiple events of sealing and pressure-build up (Hedenquist, pers. comm, 2020)

- Step-like features (terracettes) indicate fluid flow
- Sinter clast breccias have siliceous sinter matrix which forms from (1) fragmentation from high-energy water flow, (2) intermittent drying out of sinter apron followed by (3) reintroduction of geothermal fluids (Jones et al., 2007; Hamilton et al., 2018)
- Hydrothermal breccias contain silica sinter clasts and hydrothermally altered material derived from depth surrounded by siliceous matrix which form from hydraulic fracturing at depth and release of pressure (Browne and Lawless, 2001; Hedenquist and Henley, 1985)

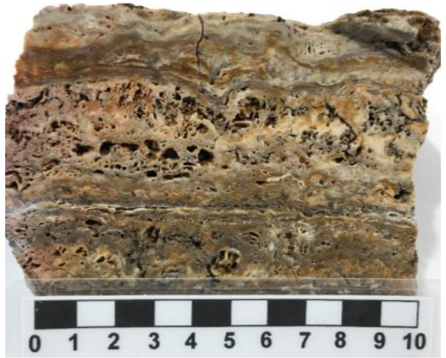
Exhibit other silica sinter textures indicating distance to source

- Proximal sinter lithofacies (finely laminated sinter, spicular geyserite)
- Middle apron lithofacies (bubble mat texture)
- Distal facies (petrified wood)

Silica sinter outcrop with terracettes

~4m high silica sinter outcrop with 16 alternating layers of laminated silica sinter and sinter clast breccia (NE-trending, 10-14°SE dip)

Step-like feature of terracettes (21OS-SF-OC016, 0.38ppm Au)



Finely laminated with bubble mat (21OS-SF-OC023, 0.233ppm Au)

Sinter clast breccia (21OS-SF-OC011, 0.448ppm Au)

Finely laminated sinter (21OS-SF-OC007, 0.487ppm Au)

Soil Geochemistry and Magnetics Survey

Hydrothermal alteration

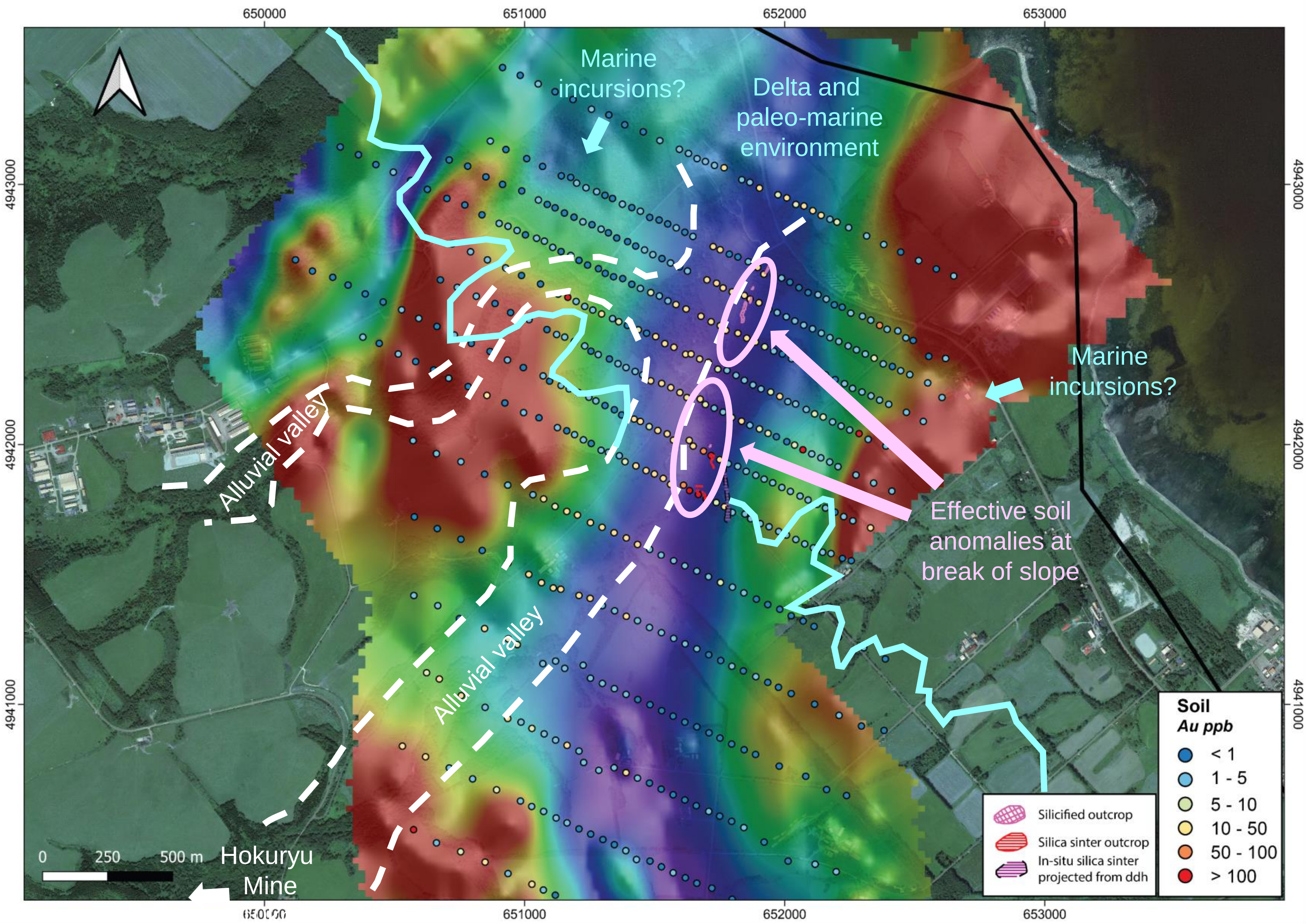
A plot of residual magnetic intensity shows a profound NNE-trending zone of low magnetism where hydrothermal alteration has obliterated traces of magnetite in volcanic rocks.

Complex soil geochemical anomaly

Flat coastal plains immediately adjacent to Omu Sinter (5-30m ASL) is believed to have a thin veneer of marine sedimentation which obscures underlying volcanic,

The incised alluvial valley (1-5m ASL) immediately west of outcropping Omu Sinter mineralisation contains extensive precious metal and LS epithermal pathfinder element anomalism directly attributed to downstream dispersion from the historic Hokuryu workings.

The net result for Omu Sinter prospect is that the only place where soils are considered effective is in the steep slopes linking the flat planes and the incised alluvial valley – where the Omu Sinter auriferous sinters crop out.



CSAMT/AMT Survey

Omu Sinter North

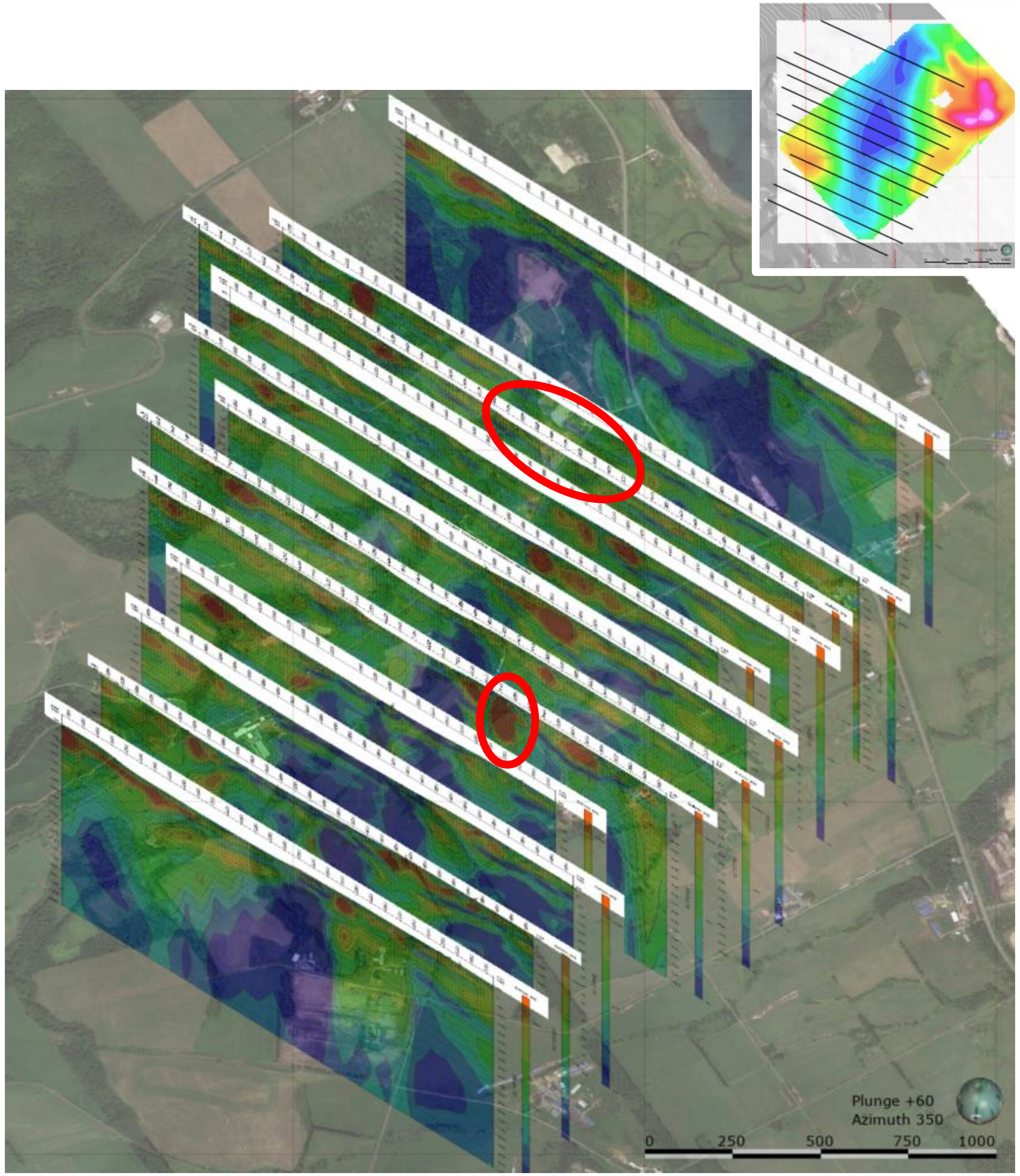
Beneath the silicified outcrop at the northern part of the prospect

- Coinciding with a broad magnetic low
- Features a broad conductive zone
- Initially interpreted as (1) a zone of clay-alteration, (2) a zone of silicification with extensive clay alteration overprinting or (3) a less resistive lithology

Omu Sinter South

Beneath the silica sinter outcrop at the southern part of the sinter

- Coinciding with magnetic low, Au-Ag-As-Hg-Sb soil anomalies
- Features a well defined and vertically consistent resistivity structure
- Initially interpreted as (1) a possible zone of silicification, (2) quartz veining or (3) hydrothermal brecciation underneath the sinter



Omu Sinter Prospect

Geology

Omu Sinter North

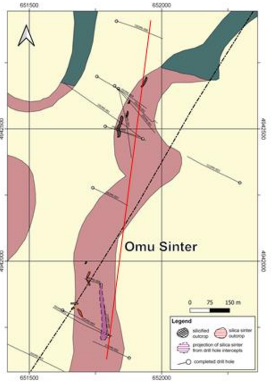
Drilled under the silicified rock outcrops within low magnetic and broad conductive zone

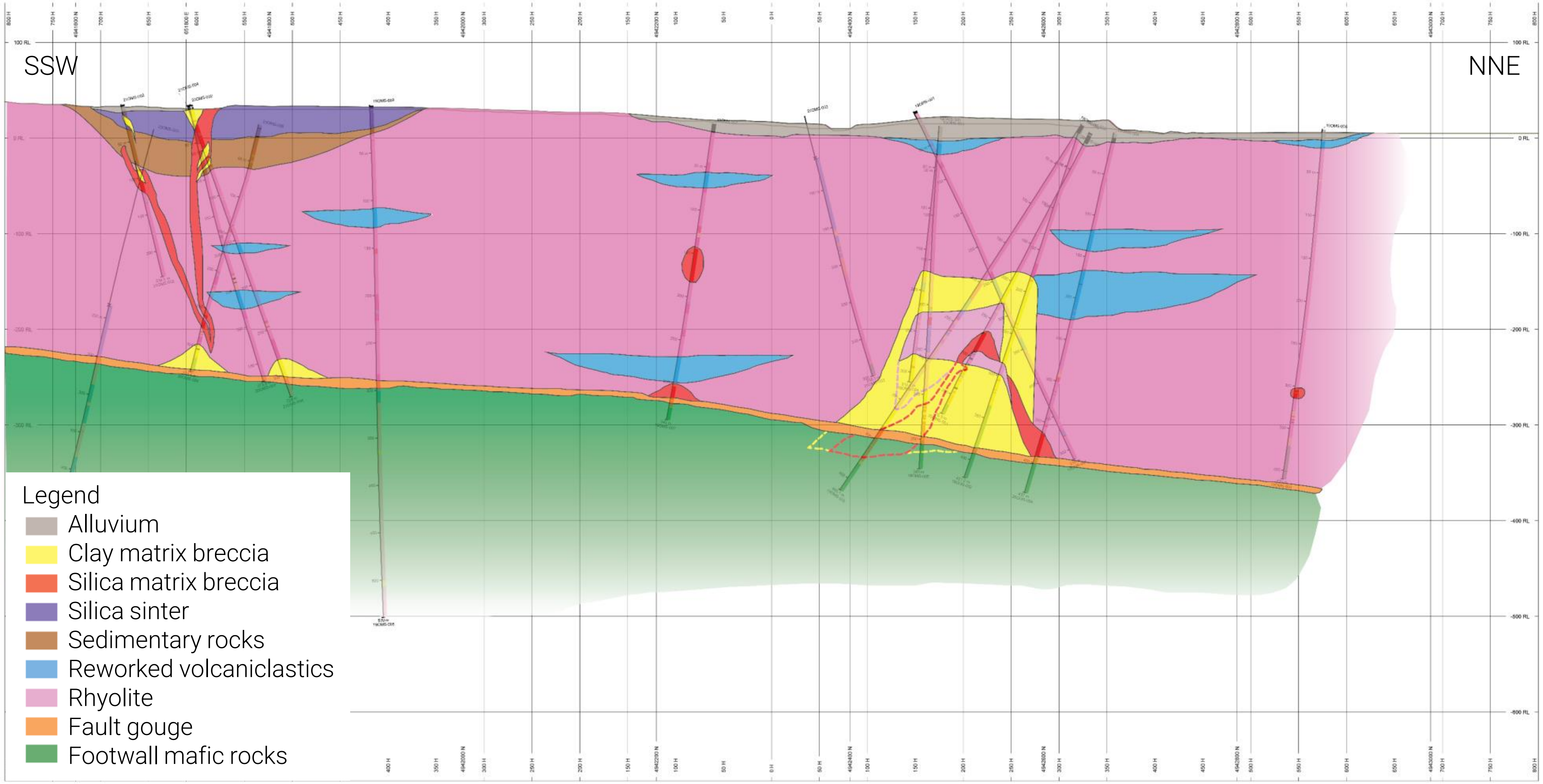
Intersected a (1) ~140m-thick variably silicified and/or kaolinite ± smectite-altered rhyolite flows (2) mineralized silica –clay matrix breccia body, (3) several post-brecciation quartz veins at depth, and (4) post-mineralization fault zone.

Omu Sinter South

Drilled under the sinter outcrops within low magnetic zone and high resistivity zone

Intersected (1) variably silicified and/or kaolinite ± smectite-altered sedimentary rocks and rhyolite flows below (2) the ~35m-thick silica sinter, (3) post-sinter silica matrix breccias, and (4) post-mineralization fault zone.





Omu Sinter Prospect

Mineralization

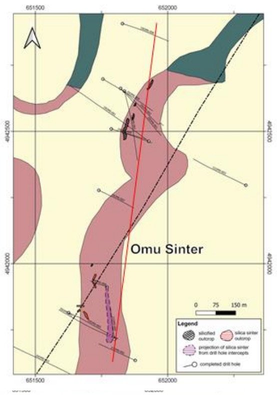
Omu Sinter North

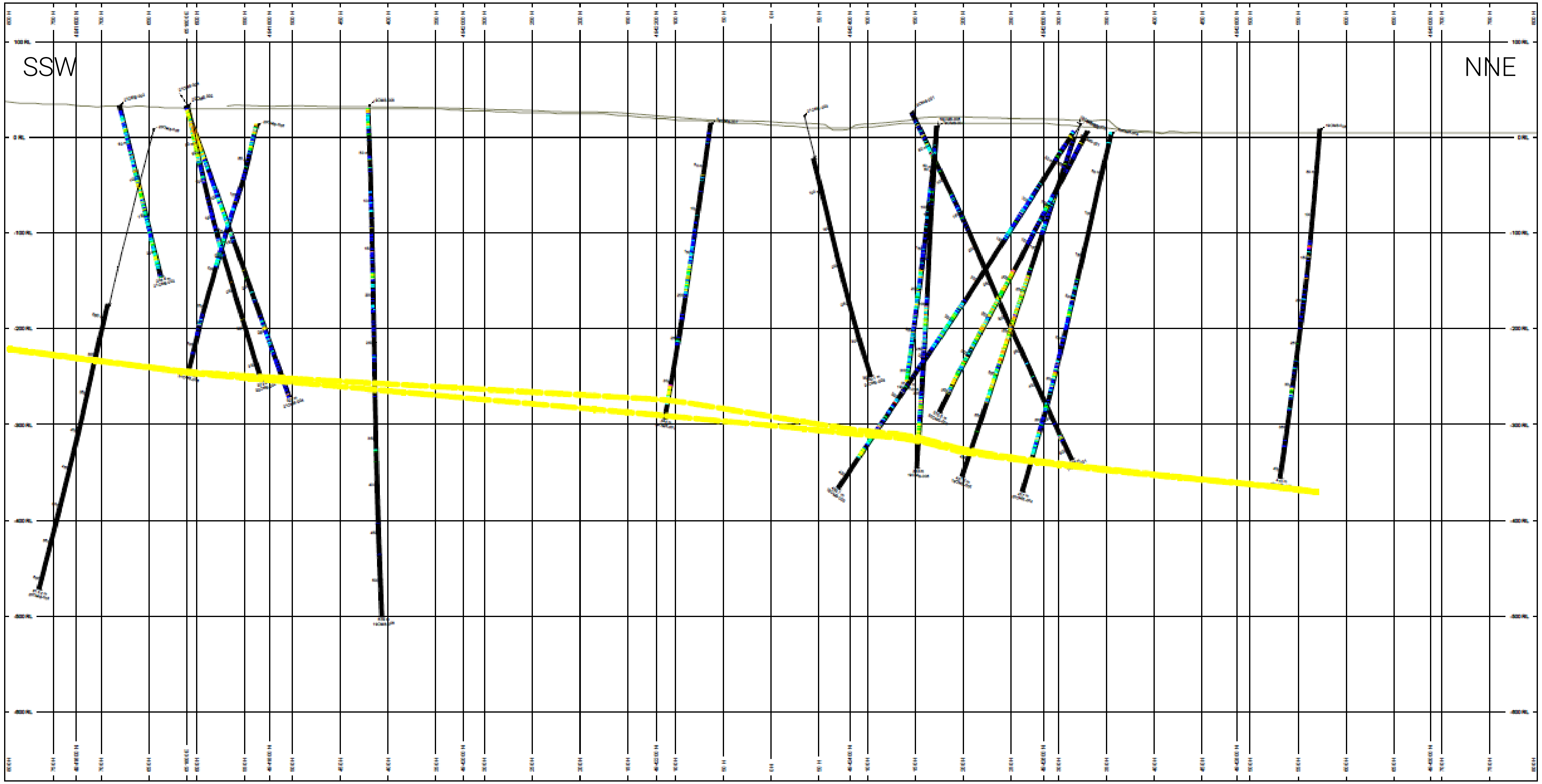
Mineralization is hosted in silica-clay matrix breccias containing quartz-sulfide vein fragments (up to 14.55 g/t Au), possible remnant of what was blown apart by hydrothermal activity or structure-related?

Also hosted in post-breccia quartz-sulfide veins (maximum grade of 118.5 g/t Au in 0.32m interval)

Omu Sinter South

Mineralization is hosted in silica sinter (up to 1.22 g/t Au), silicified sedimentary rocks (up to 3.13 g/t Au) and silica matrix breccia (up to 2.91 g/t Au)

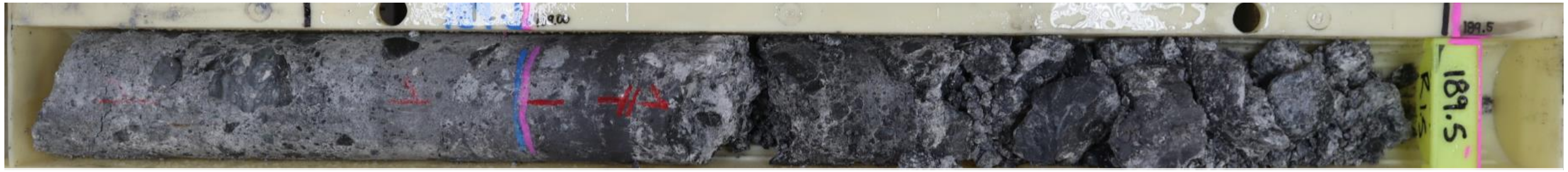




Mineralization

Clay Matrix Breccia

Composed of silica matrix breccia clasts, quartz vein clasts, altered lithic clasts surrounded by clay matrix (possibly structure-related)



Clay matrix breccia in 20OMS-001 from 189.00-189.5m (14.55ppm Au, 213 ppm Ag, 281ppm As, 196.5ppm Sb)

Silica Matrix Breccia

Composed of silicified or clay-altered lithic clasts, quartz vein clasts surrounded by hydrothermal silica matrix

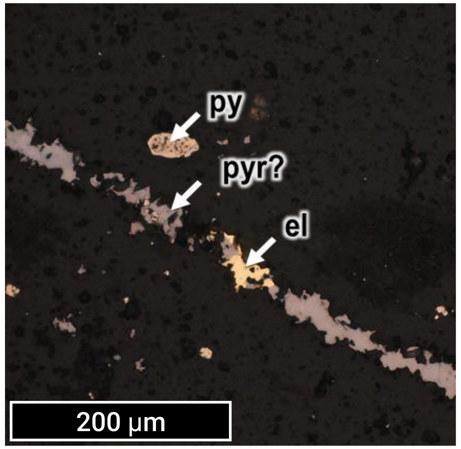
Silica matrix breccia in 20OMS-004 from 373-374m (1.165ppm Au, 13.15ppm Ag, 2530ppm As)

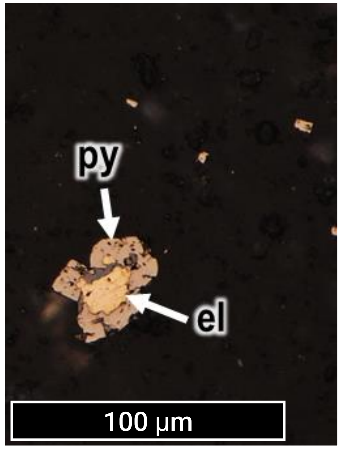
Post-breccia quartz veins

With crustiform, colloform and massive texture (maximum grade of 118.5 g/t Au in 0.32m interval)

With ginguro, electrum, pyrite, pyrrhotite and marcasite

Crustiform quartz vein with ginguro cutting through altered breccia in 19OMS-002 from 184.93-185.25m (118.5ppm Au, 1410ppm Ag, 425ppm As, 551ppm Sb, 297ppm Se);





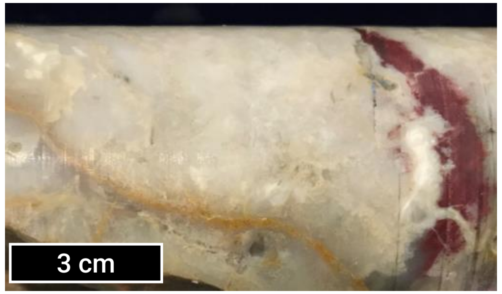
Electrum occurs with pyrargyrite and pyrite. Legend:
el –electrum,
py – pyrite,
pyr – pyrargyrite
(Analyzed by Dr. Ryohei Takahashi of Akita University)

Omu Sinter South

Mineralization

Silica Sinter

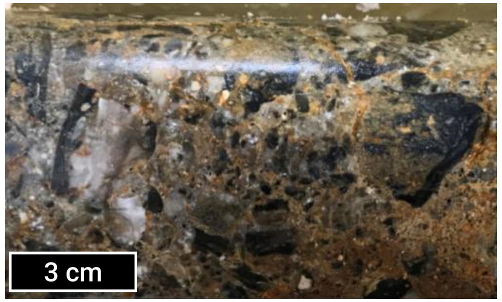
Usually finely laminated, sometimes with cinnabar

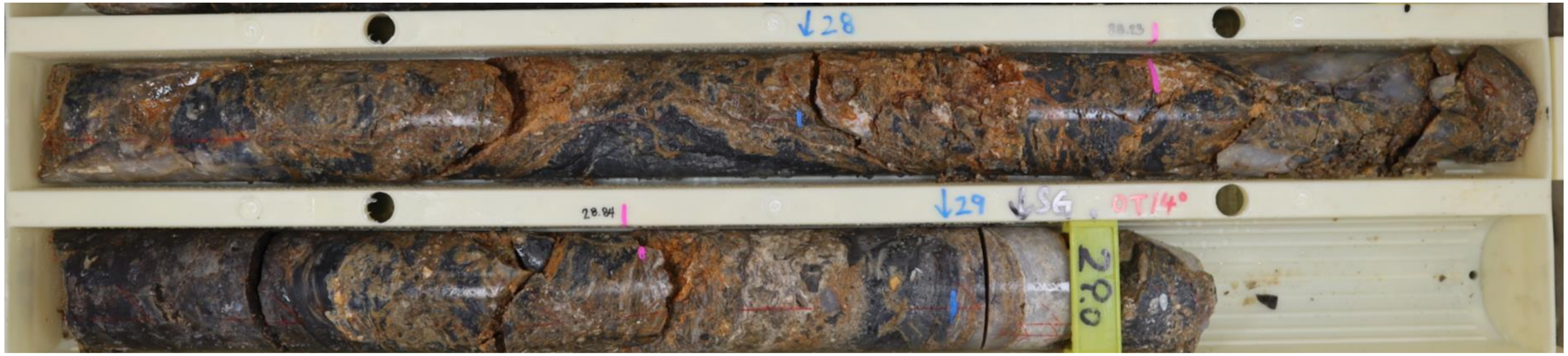


Finely laminated silica sinter in 20OMS-002 from 34.23-34.45m (1.025ppm Au, 9.72ppm Ag, 236ppm Sb), from 34.45-35.05m (0.969ppm Au, 6.78ppm Ag, 345ppm Sb)

Silica Matrix Breccia

Composed of silica sinter clasts, altered rhyolite and sedimentary rock clasts (derived at depth), surrounded by dark gray-brown silica matrix





Silica matrix breccia with altered rhyolite clasts and silica sinter clasts surrounded by dark gray silica in 21OMS-004 from 28.23-28.84m (1.35ppm Au, 200ppm Ag, 1185ppm Sb)

Omui

The Omui prospect includes the historical Omui Mine, Sakinyama placer deposit and its surrounding vicinity.
Recent exploration efforts aim to find extensions of the Honpi vein network in Honko, as well as other mineralized veins and hydrothermal breccias in Nanko and Sakinyama located southeast and southwest of Honko, respectively.

Omui Prospect

Historical Mine

Placer gold was first recognized on the property in the early 1890's. Early miners, discovered a Au-bearing vein outcropping on the ridge to the east of Shimonosawa Creek placer workings (Honpi vein)

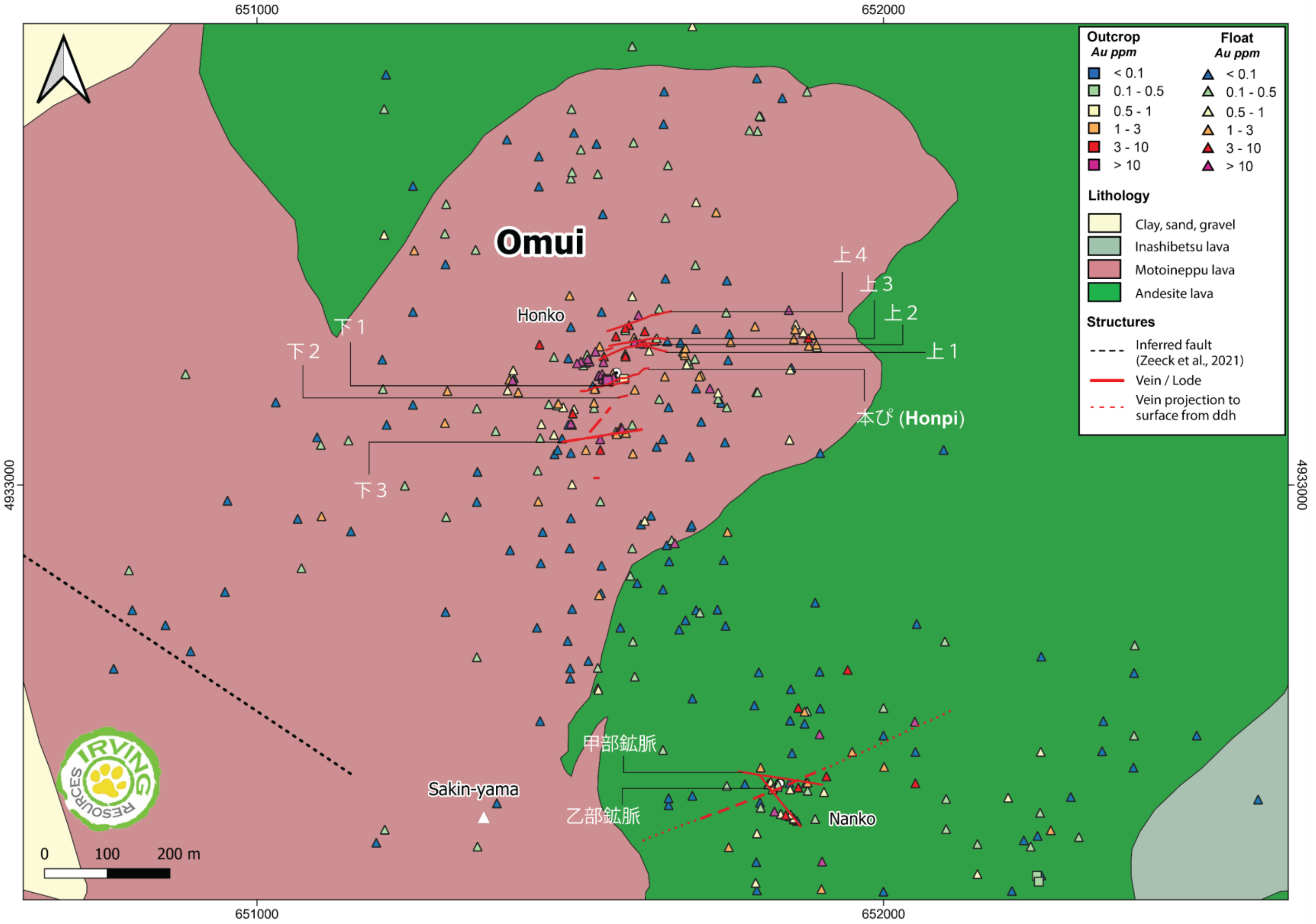
In 1921, an adit was driven to test this vein.

In 1925 Fujita Mining Co., acquired the mining rights, then developed a small mine on the Honpi vein (120m strike length) until mining ceased in 1928. (Jones and Lu, 1995)

Omui prospect

Located 9.5km from Omu Sinter

8 reported east trending veins in Honko (dipping 80°N) and 2 veins in Nanko are hosted in rhyolite flows of Motoineppu Lava and andesite flows of Propylite lava (Suzuki et al., 1966)



Geologic map updated from company's geologic mapping and drilling results. Modified from Suzuki et al. (1966) and Zeeck et al. (2021)

Omui Prospect

Mineralization

Honpi-style veins

With brecciated texture, composed of small subangular black to brown banded quartz vein clasts(up to few cm) surrounded by tan to gray/white silica matrix

Ore minerals (electrum, ginguro, stephanite) are found in both clast and matrix

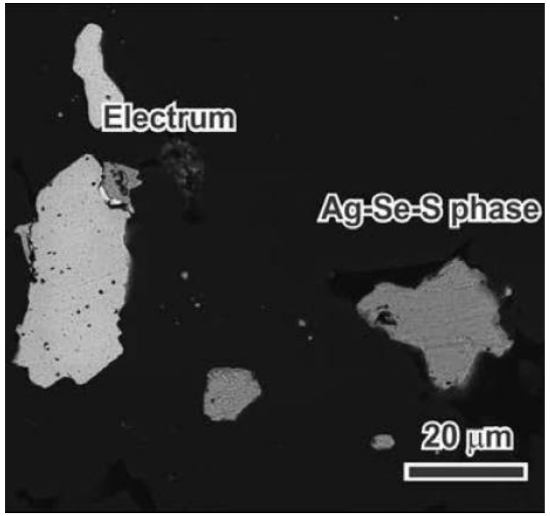
Sugary white quartz vein

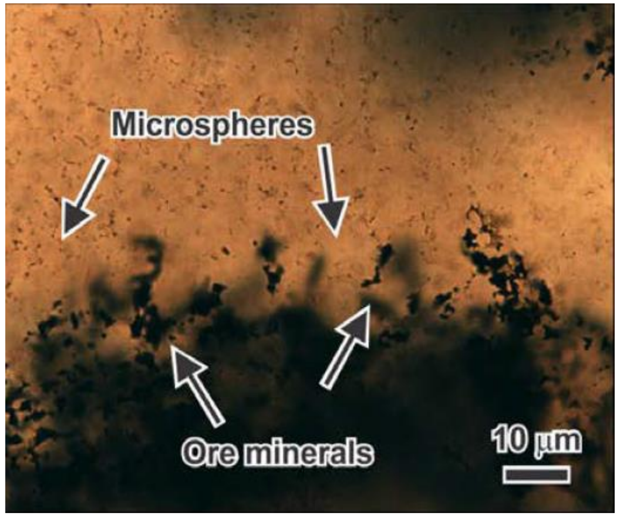
With variable Au and Ag content

May exhibit massive, crustiform/colloform, and lattice bladed textures

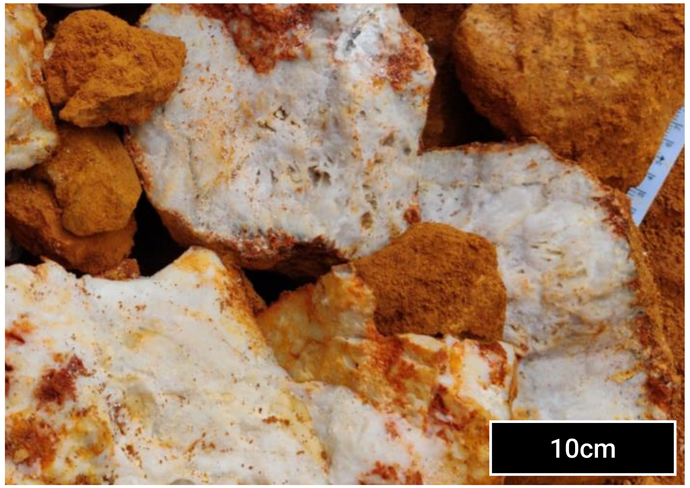
Commonly found crosscutting Honpi-style veins

Honpi-style vein float, electrum and ginguro in the clast & matrix (16OM-012, 480ppm Au, 9660ppm Ag)





Back-scattered electron image of ore minerals and high-magnification image of colloform bands containing ore minerals in 16OM-012 (Analyzed by L. Zeeck, Colorado School of Mines)



Sugary white quartz vein with lattice bladed texture at Trench 3 (19OMRC-049, 0.532ppm Au)

Sugary white quartz vein float (19OMRC-GS-004, 39.7ppm Au, 256ppm Ag)

Honpi-style vein breccia cut by sugary white quartz vein (19OMRCT2-SY006)

Trenching

Limited outcropping mineralization

Four trenches totaling 453.13m was developed across Honko and Nanko

Pit excavated by local prospector, Mr. Masaru Nanjo, exposing the high grade ore veins (2 or more mineralized vein over a span of 6m)

Trench 3 at Honpi (looking South)

Trench 4 at Nanko (looking South)

Milky white quartz vein at Trench 3 from 78.75-81.25m (~2.5m wide, N80°E 90°, up to 1.29ppm Au, 59.7ppm Ag)

Milky white quartz vein at Trench 4 from 95.0-96.0m (~1m wide, EW 80°N, 0.75ppm Au)

Omui Prospect

Soil Geochemistry and Magnetic Survey

Complex network of low magnetic intensity

Corresponding to magnetite-destruction due to hydrothermal alteration

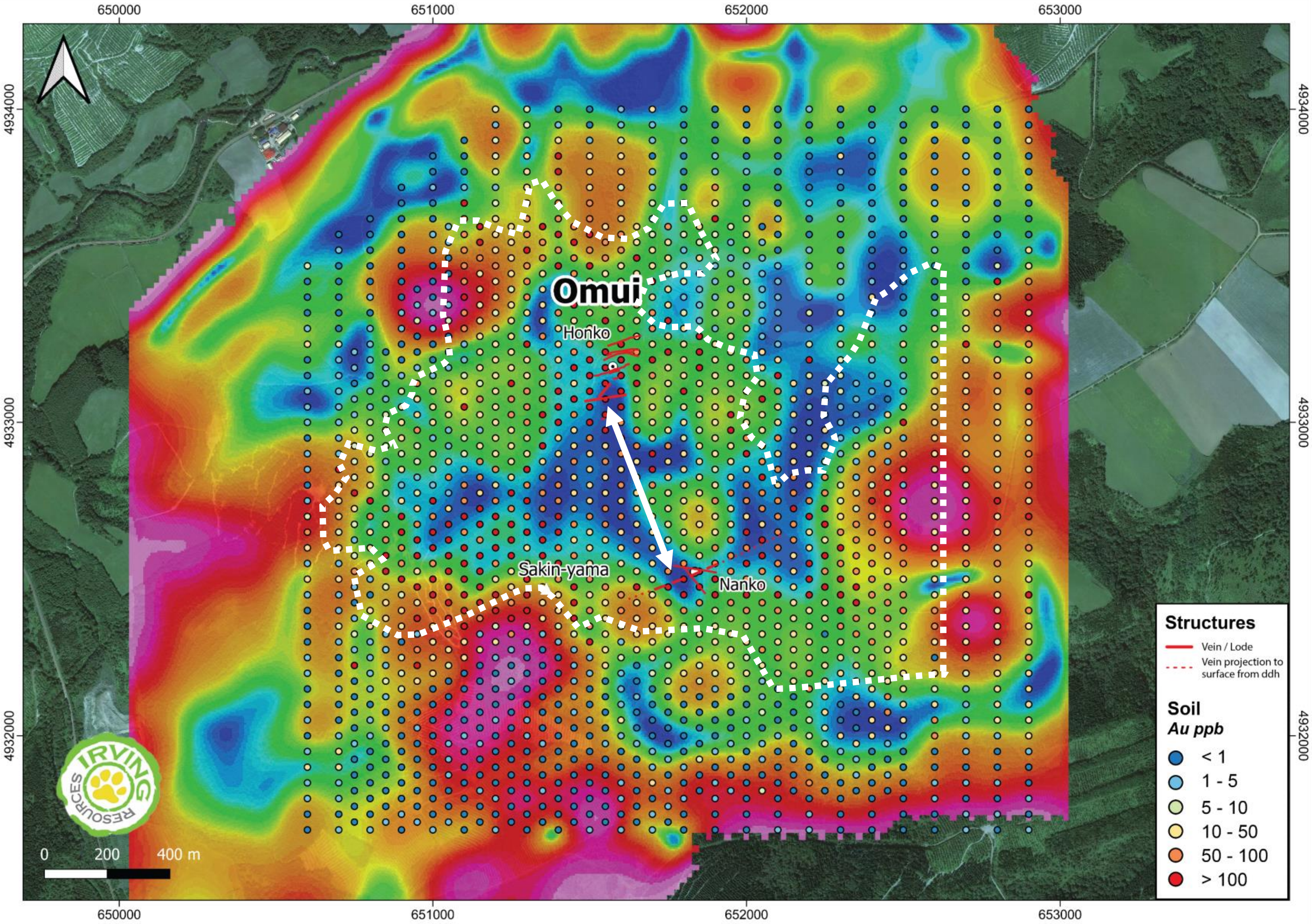
NW-trending low magnetic zone from Nanko to Honko is parallel to the gravity gradient highlighting a graben-bounding fault

Au anomalies open to the east

Soil Au anomalies are prevalent within the prospect and extends to the east

In 2021, Irving extended its soil sampling to the SE of the property (awaiting assay results)

Quartz veins (5.54ppm Au) hosted in the sandstone bedrock along the Tofutsu river, ~3.2 km SE of the Omui Mine. Vein trend varies from N31-71°E, 80°NW



CSAMT/AMT Survey

Honko

Old Omui workings which trace the main Honpi vein coincide with low resistivity zone

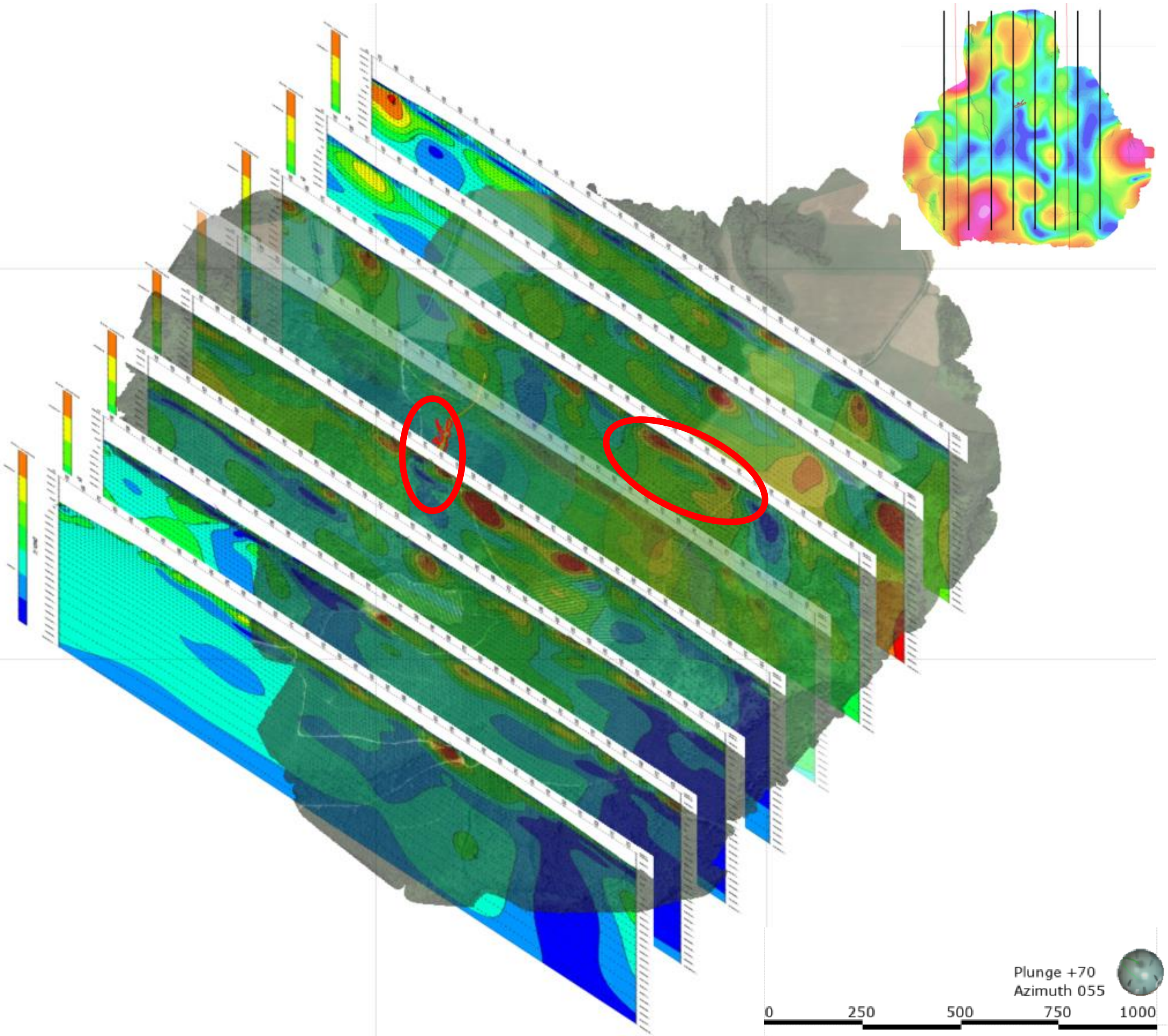
Vein zones and hydrothermal breccia zones mapped in Trenches 1-3 coincide with well-defined high resistivity features

Nanko

Trench 4 at Nanko coincides with several well-defined high resistivity features. There are also several other targets for drilling.

Sakinyama

High resistivity features are less pronounced



Omui-Honko

Geology

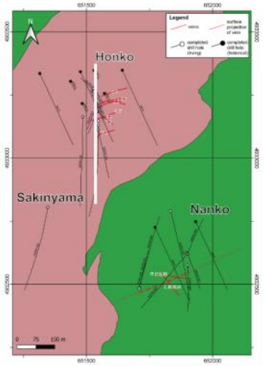
Host rocks

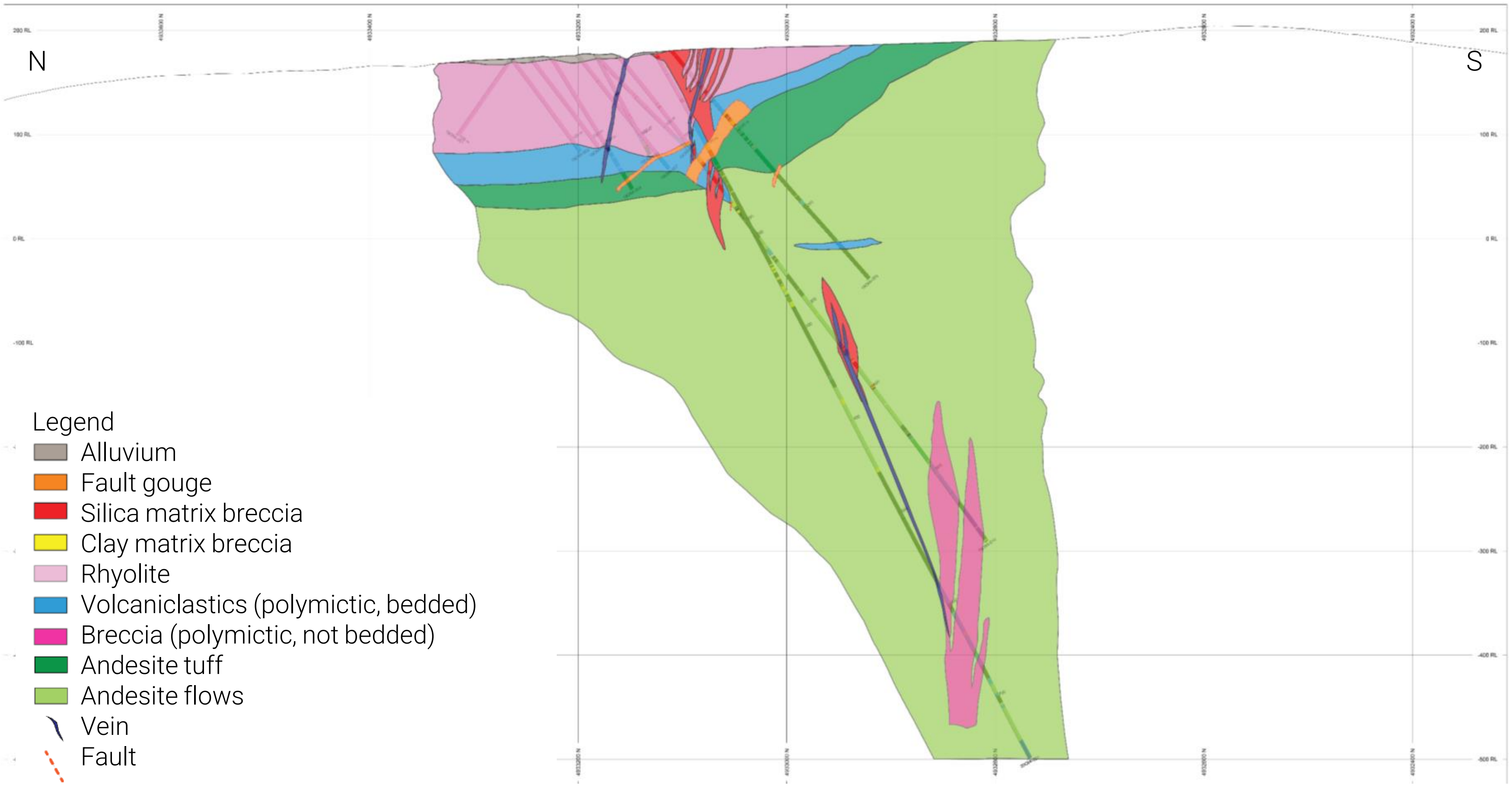
7 shallow drillholes (less than 150m) were drilled towards the north of the Honko to test the extension of the main Honpi vein and the 7 other reported veins

3 deep drillholes (up to 768.70m) were drilled towards the south of Honko to test the mineralization towards Nanko and at deeper levels

A volcaniclastic layer and several layers of andesitic tuff and andesite flow underlie the quartz-eye rhyolite.

Alteration at the shallow level is dominated by kaolinite ± illite ± smectite and transitions to illite ± smectite ± chlorite ± carbonate in the deeper levels



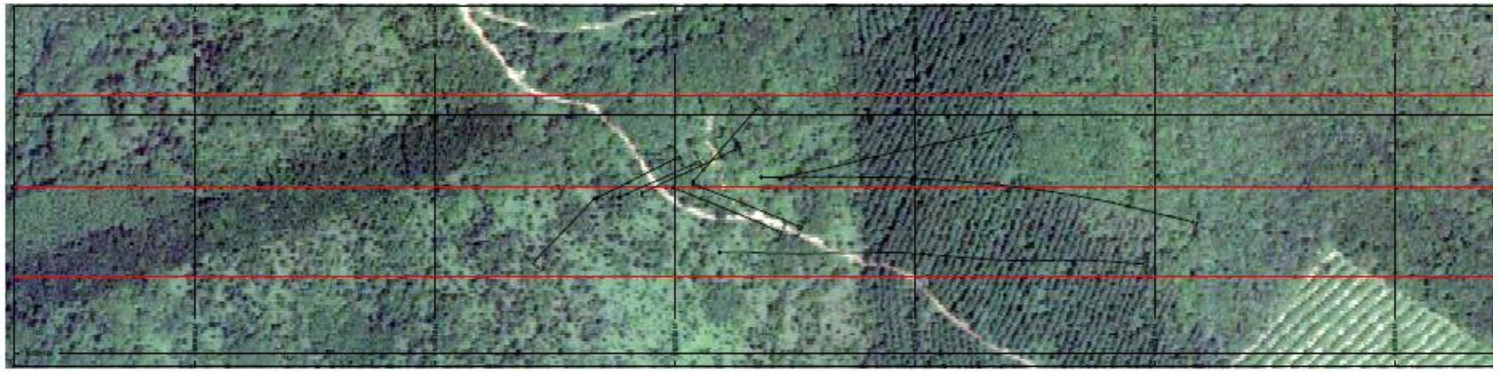


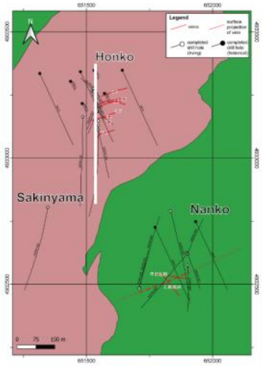
Omui-Honko

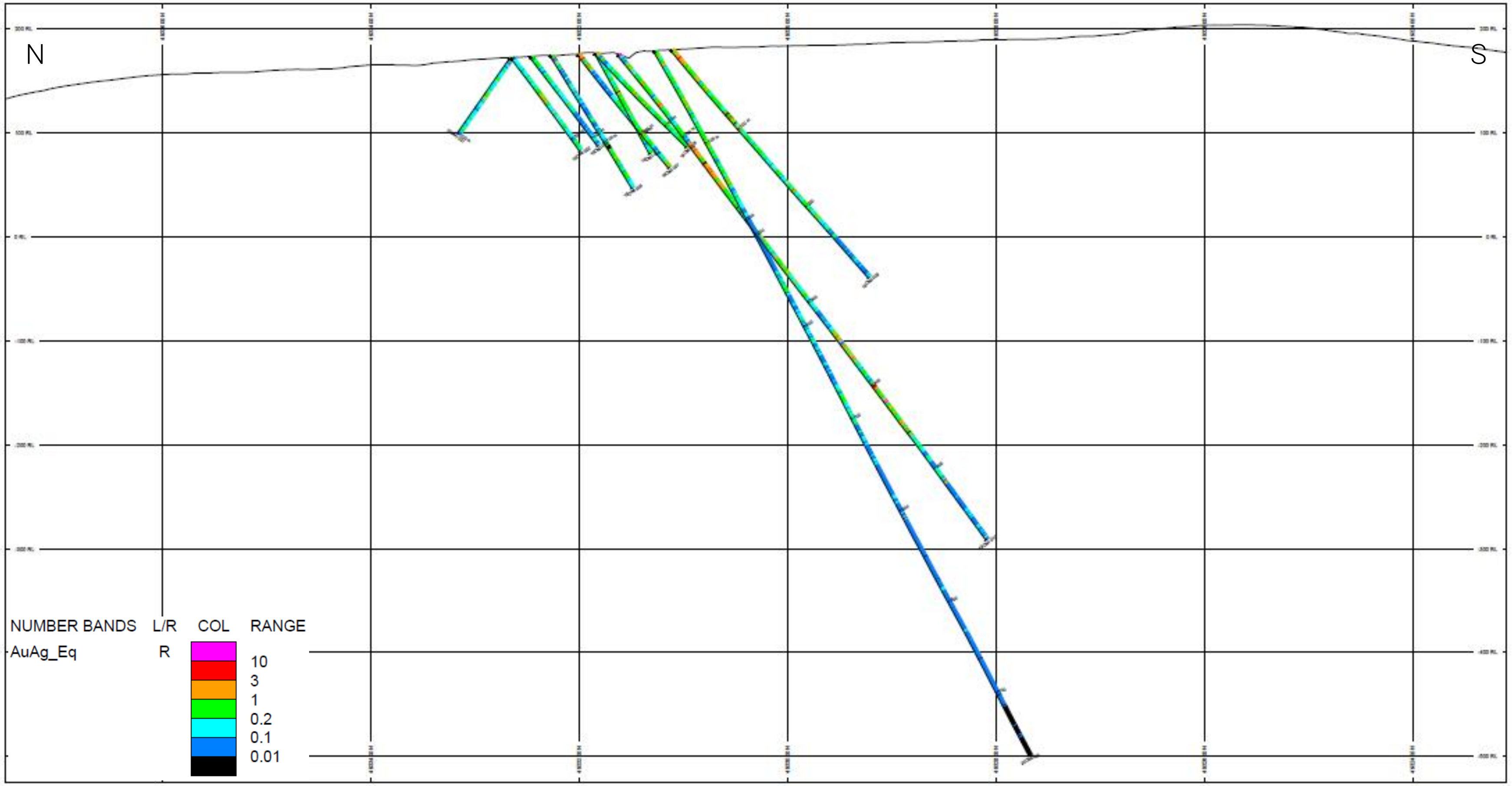
Mineralization

Veins and silica matrix breccias

Mineralization is observed in both shallow and deeper levels



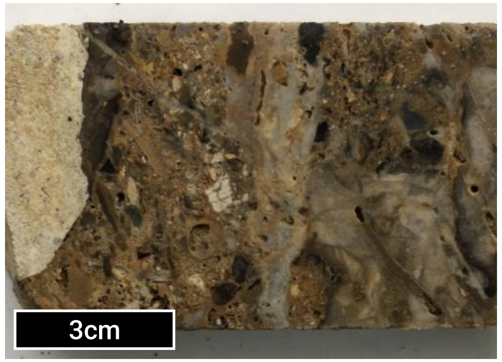




Mineralization

Quartz veins and silica matrix breccias

Mineralization in the shallower levels is dominated by ginguro- and electrum-bearing massive, lattice-bladed, crustiform quartz-FeOx veins (up to 125g/t Au) and multiphase silica matrix breccias (up to 9.3 g/t Au)



Polymictic and chaotic texture (19OMI-009 15.70m)

Honpi-style quartz vein in 19OMI-009 from 9.35-10.2m (2.2ppm Au, 24.70ppm Ag), 10.2-11m (2.87ppm Au, 24.1ppm Ag), 11-11.95m (4.84ppm Au, 49.3ppm Ag)

Crustiform quartz vein in 19OMI-006 from 59.64-60.20m (19.3ppm Au, 1240ppm Ag)

Crustiform quartz vein in 19OMI-009 from 101.6-102.15m (5.21ppm Au, 102ppm Ag, 109.5ppm As,),102.15-102.4m (1.51ppm Au, 145ppm Ag)

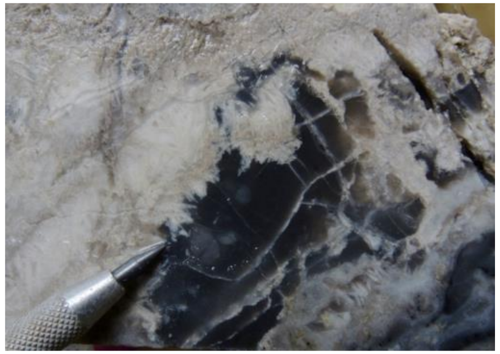
Mineralization

Carbonate-silica veins and carbonate matrix breccias

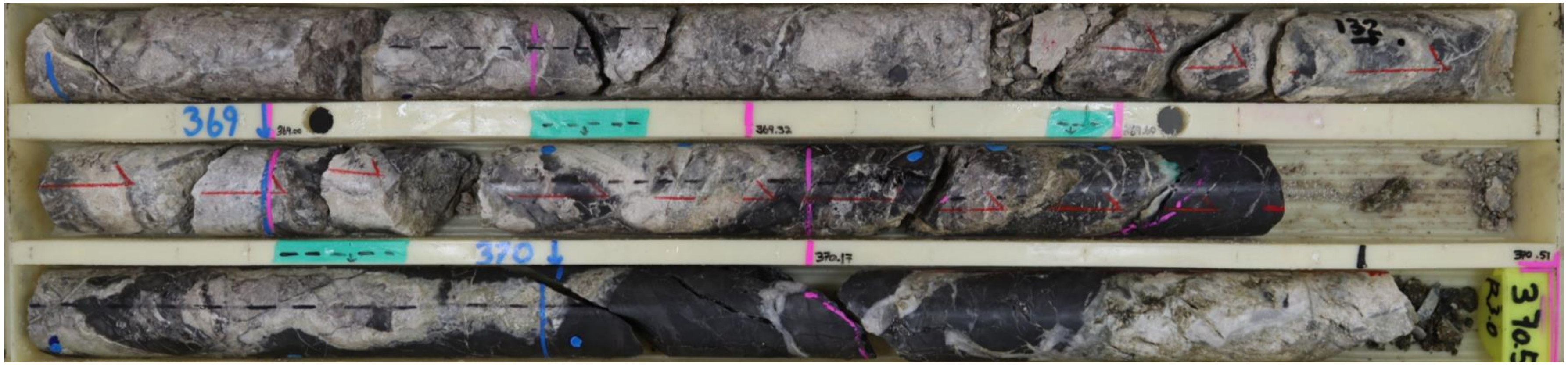
Lattice-bladed to crustiform silica-replaced carbonate veins (up to 9.17 g/t Au) and barren carbonate stringers were intersected in deeper levels.

Some intervals contain lattice-bladed carbonate crystals with silica precipitating in between carbonate crystals

Carbonate matrix breccias can have polymictic clasts surrounded by carbonate matrix



Bladed calcite vug filled by cryptocrystalline silica (19OMI-010 369m)



Carbonate-silica vein zone in 19OMI-010 from 368.58-369m (4.75ppm Au, 44.6ppm Ag), 369-369.32m (9.17ppm Au, 137ppm Ag)

Carbonate-silica vein zone in 19OMI-010 from 358.2-358.9m (1.025ppm Au, 3.22ppm Ag), 358.9-359.2m (1.32ppm Au, 7.3ppm Ag)

Omui-Nanko

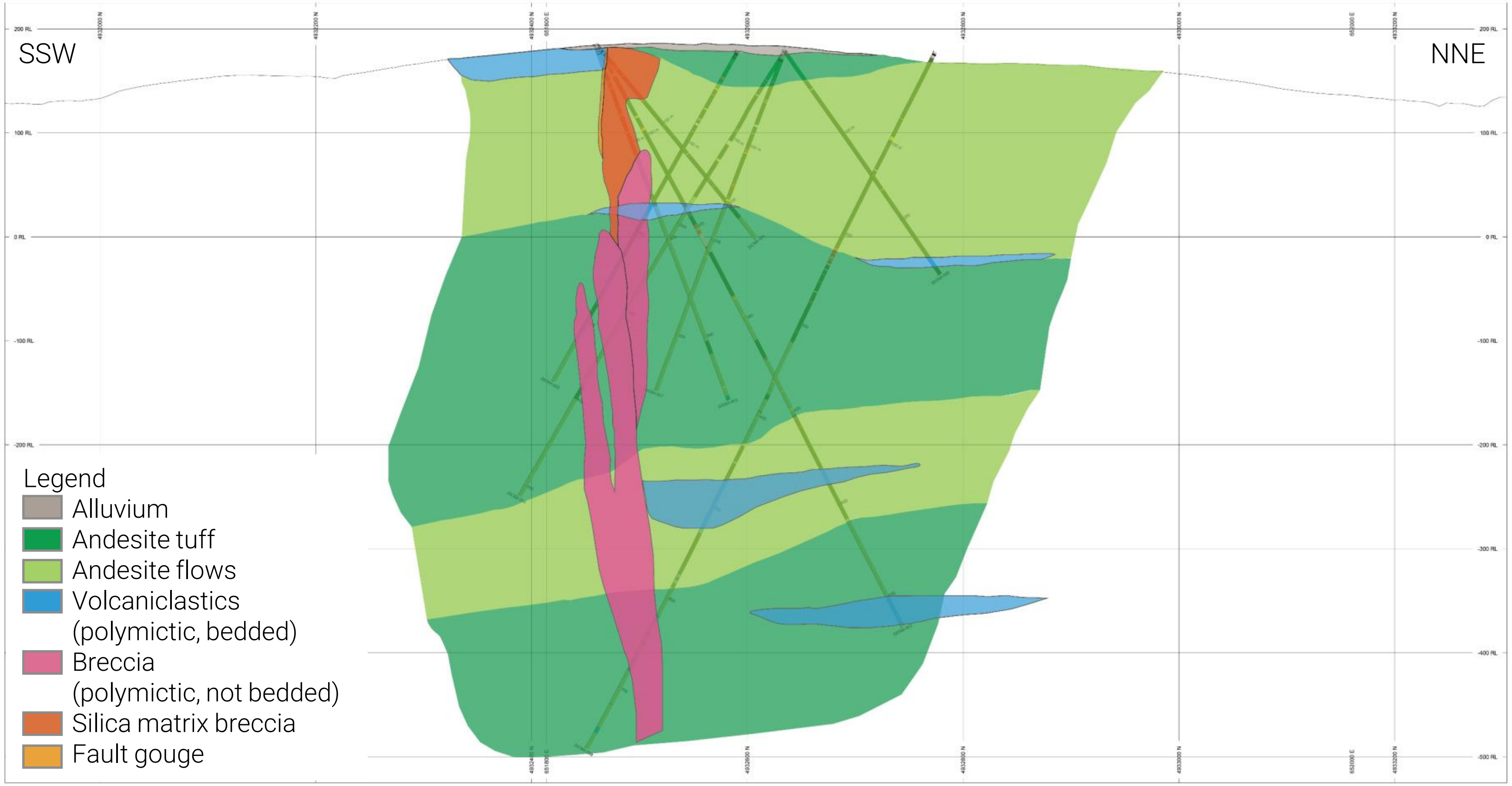
Geology

Host rocks

The area is overlain by volcaniclastic rocks which is underlain by sequences of andesitic tuff and andesite flows

Flowbanding in andesite flows and bedding in volcaniclastic rocks are subhorizontal to moderately dipping

Alteration at the shallow level is dominated by kaolinite ± illite ± smectite and transitions to illite ± smectite ± chlorite ± carbonate in the deeper levels

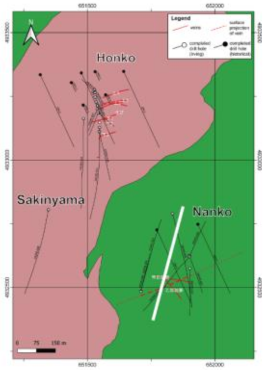


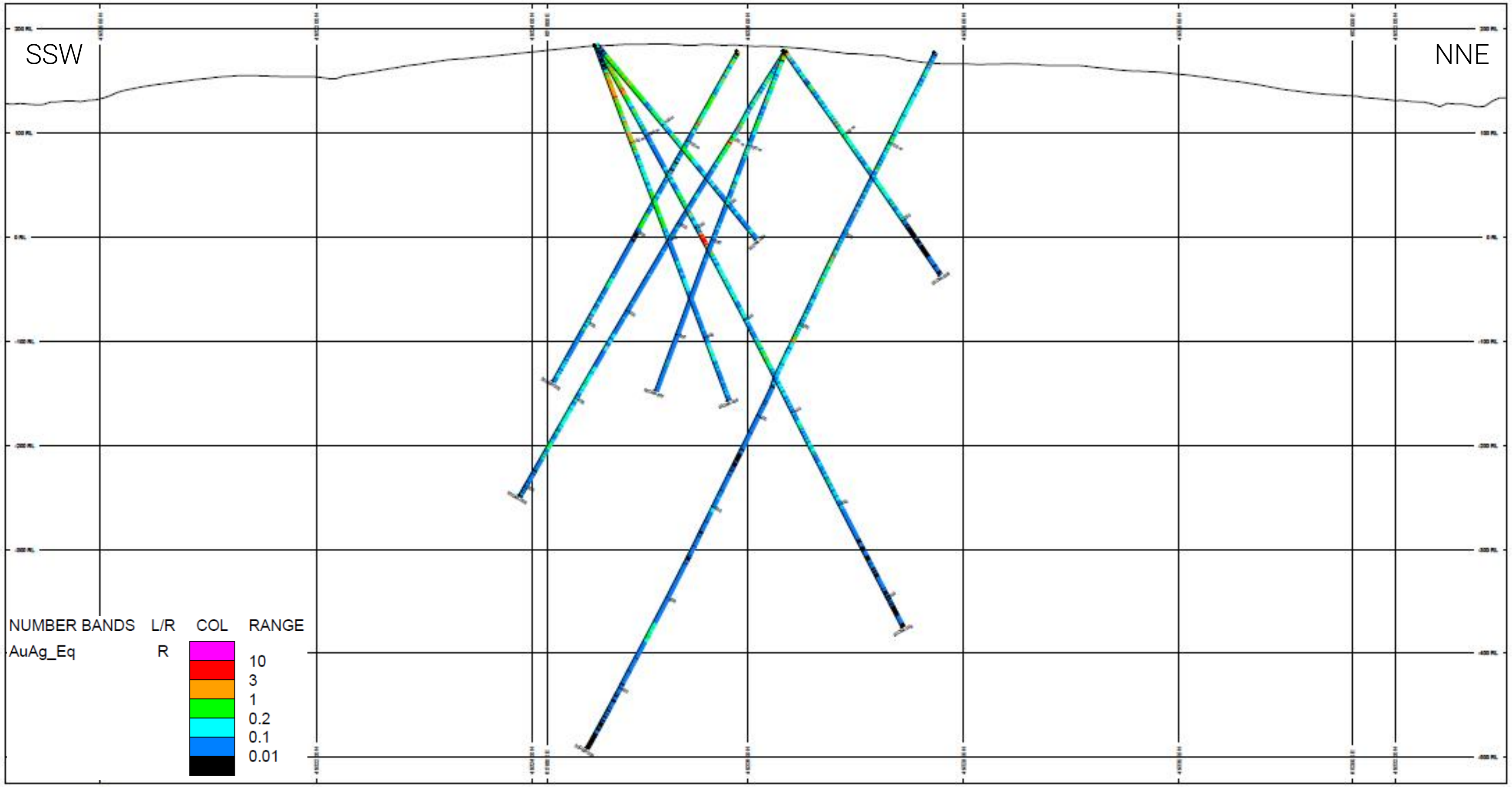
Omui-Nanko

Mineralization

Veins and silica matrix breccias

Mineralization is observed in both shallow and deeper levels



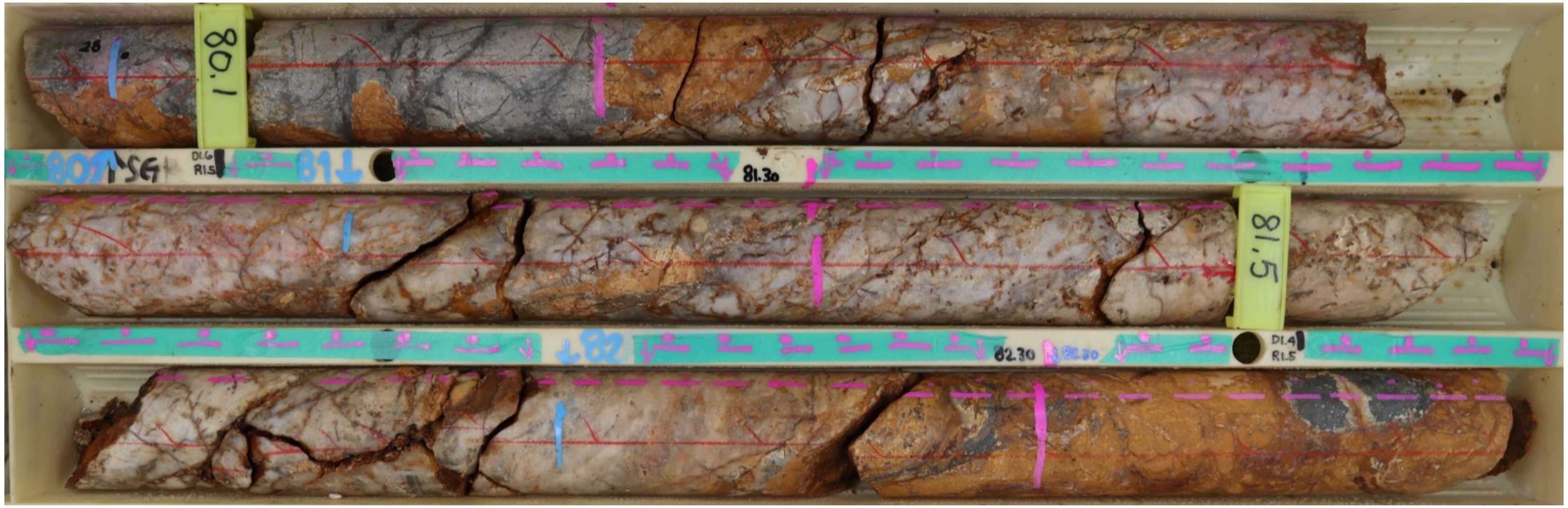


Mineralization

Quartz veins

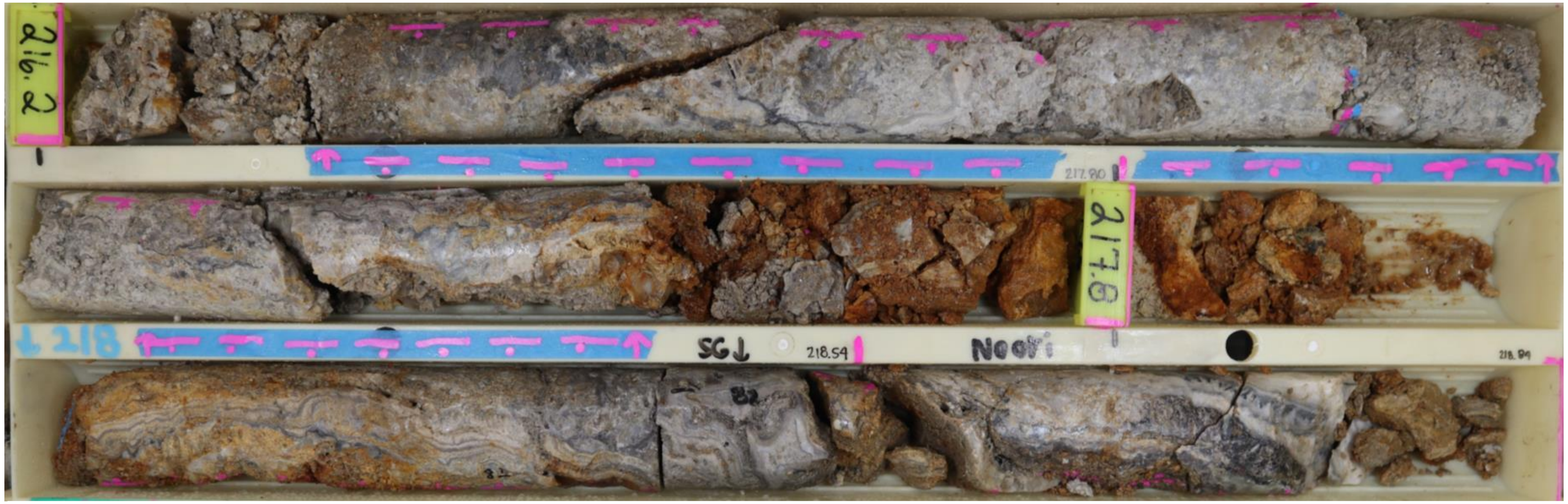
Mineralization in the shallower levels is dominated by ginguro- and electrum-bearing massive, lattice-bladed, crustiform quartz-FeOx veins (up to 20.5g/t Au, 572 g/t Ag)

A thick crustiform/colloform quartz vein was intersected in 20OMI-003 from 208-220m (up to 12.75 g/t Au, 698 g/t Ag)



Crustiform quartz vein in 20OMI-002 from 81.3-82.3 (18.15ppm Au, 109ppm Ag)

Close-up of crustiform texture in quartz vein (21OMI-003 218m)



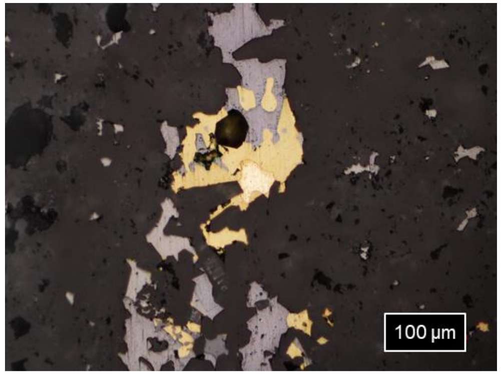
Crustiform quartz vein in 20OMI-003 from 218.54-218.84m (12.75ppm Au, 698ppm Ag, 208ppm Sb, 25ppm Se)

Mineralization

Silica matrix breccia

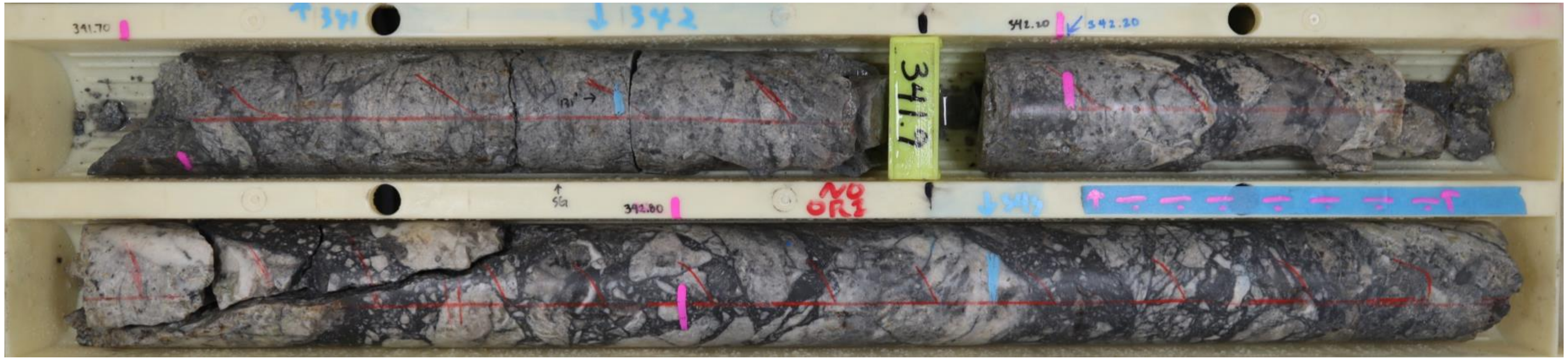
Multiphase silica matrix breccias (up to 56.1 g/t Au, 1435 g/t Ag)

May contain quartz vein clasts, altered lithic clasts, surrounded by dark gray silica matrix

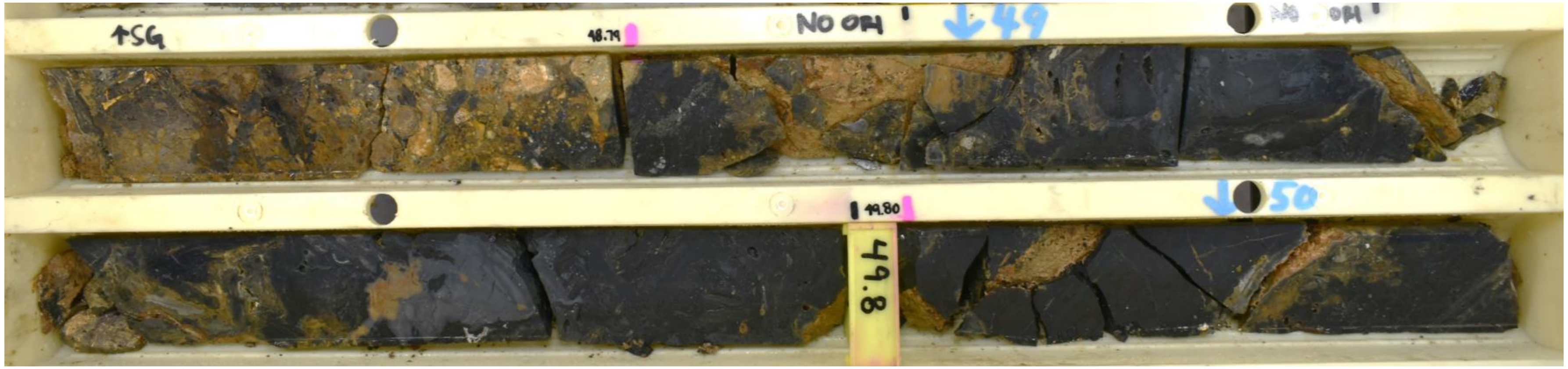


Ore minerals in silica matrix breccia (20OMI-003 342.2-342.8m) Analyzed by Y. Fukuda, Akita University

Stibnite crystals after core was cut (21OMI-003 51.40m)



Silica matrix breccia with quartz vein clasts in 20OMI-003 from 342.2-342.8m (56.1ppm Au, 1435ppm Ag)



Silica matrix breccia with stibnite-rich clasts surrounded by dark gray silica matrix in 20OMI-003 from 48.79-49.8m (4.9ppm Au, 30.8ppm Ag, 141.5ppm As, 4110ppm Sb)

Hokuryu

The Hokuryu prospect hosts a robust hydrothermal system with great potential for a widespread high-grade gold mineralization coinciding with the historical Hokuryu Au-Ag Mine and its vicinity, Maruyama and Daihoku prospects.

Hokuryu Mine

Historical Mine

Located 12km southwest of Omu Town

Discovered in 1918 by Ryosuke Segawa of Sapporo who obtained drilling rights (MMIJ, 1990)

Kuhara Mining Co. (later Nihon Mining Co.) started exploration work in 1926, bought exploration rights in 1927, and began full scale operations in 1928. Mining rights were acquired in 1930. They set up an 80t/month cyanide smelting plant which extended to 110t/month in 1939.

The mine was closed in 1943 as part of the nationwide Japanese government order.

After the war, mining rights were transferred to Teikoku Mining, but was returned to Nihon Mining Co. in 1950, who conducted drilling from 1965-1974. (Barett et al., 2019)

Photo courtesy of Nihon Kougyou Kabushiki Gaisha
Hokuryu Mine (Office)

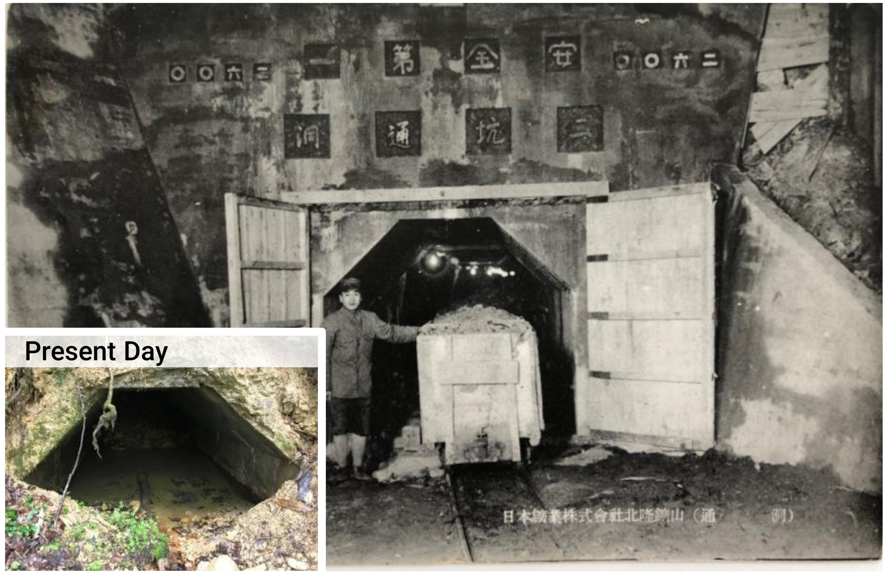


Photo courtesy of Nihon Kougyou Kabushiki Gaisha
Hokuryu Mine (Tunnel)

Photo courtesy of Nihon Kougyou Kabushiki Gaisha
Hokuryu Mine (Inside the Tunnel)

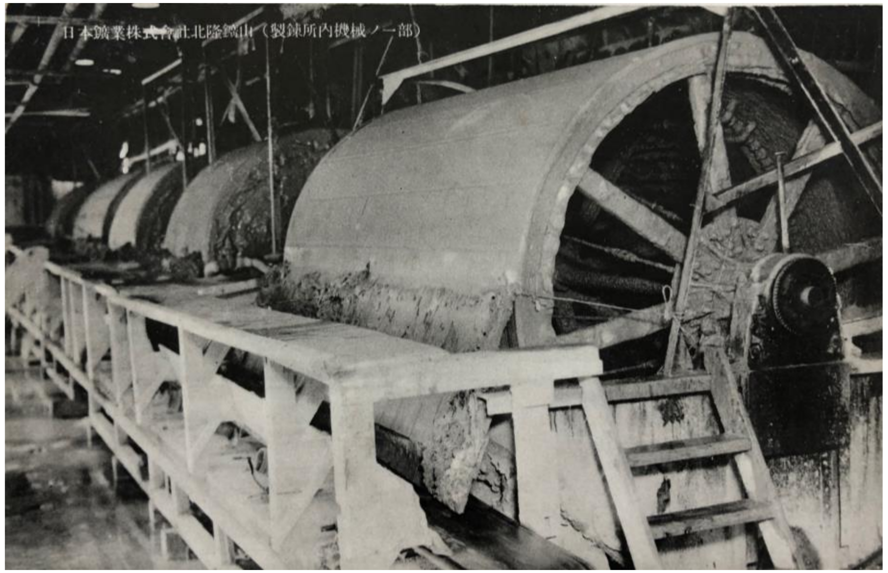


Photo courtesy of Nihon Kougyou Kabushiki Gaisha
Hokuryu Mine (Smelter)

Hokuryu Prospect

Hokuryu Mine

Includes the old Hokuryu mine and the immediate vicinity

Mineralization is hosted in parallel quartz veinlets

- C vein: trending NE-SW, extending 240m along strike , more than 210m down dip (7-29 g/t Au)
- No. 1 vein: trending E-W, extending 320m along strike, 160m down dip (10-30g/t Au) (Barett et al., 2019)

Maruyama

Located 3 km northwest of the historical Hokuryu mine

In 1940, 3 adits were excavated with one revealing 10-20cm wide quartz veins (MMIJ, 1990)

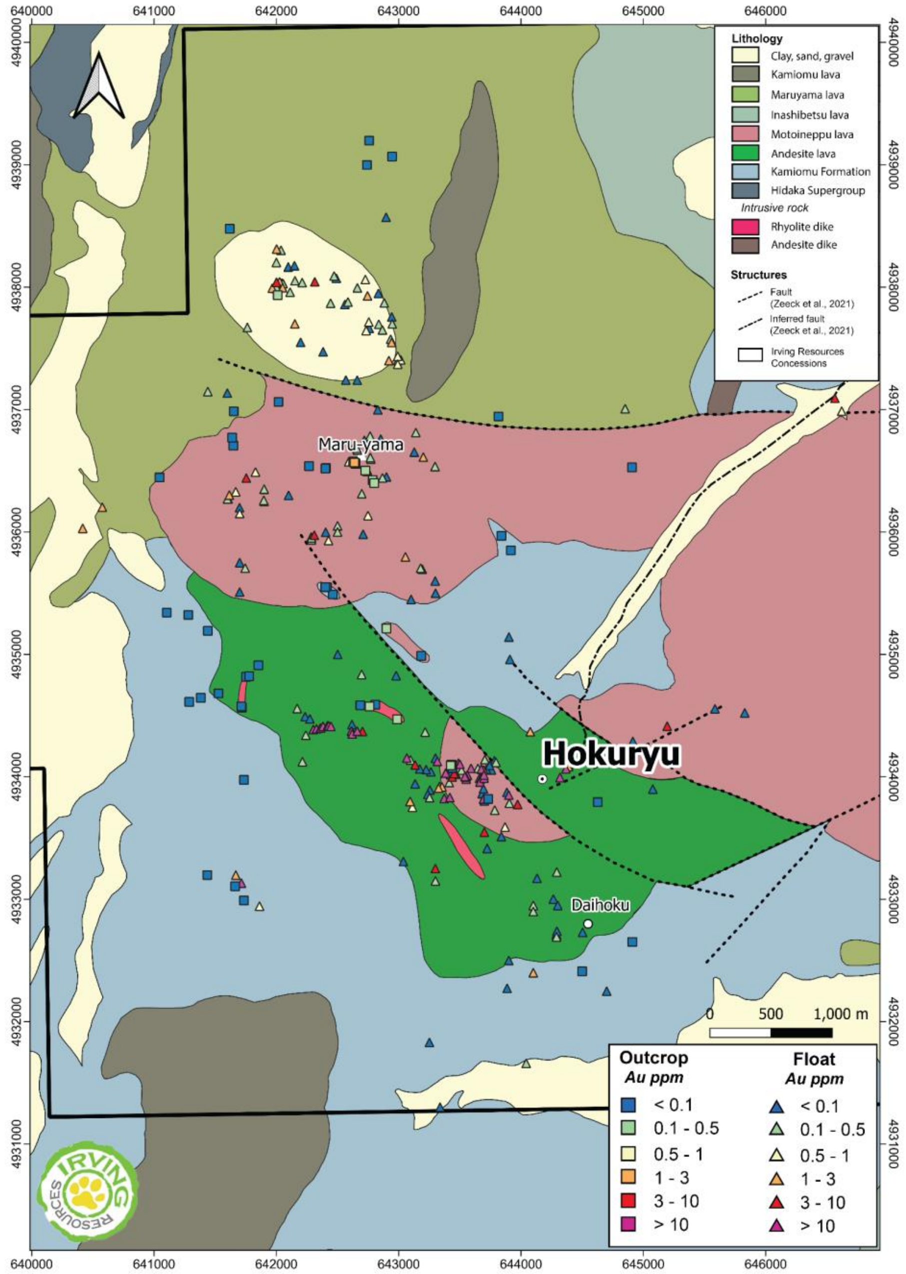
In 1973, exploration and drilling was conducted due to similarities with Omui prospect. Two 500m holes were drilled with significant high-grade intercepts (Barett et al., 2019)

Daihoku

Located 1km south of the historical Hokuryu mine

Prior to World War 2, Nippon Mining excavated an adit whilst prospecting for the lower silicification zone identified in the Hokuryu mine.

Subsequent sampling of discarded banded quartz material from the adit by an unknown party at an unknown time returned 26 g/t Au and 700 g/t Ag (Barett et al., 2019)



Geologic map updated from company's geologic mapping and drilling results. Modified from Suzuki et al. (1966) and Zeeck et al. (2021)

Geology

Host rocks

Hokuryu and Maruyama are underlain by thick sequences of altered flowbanded rhyolite

Current drilling in Hokuryu intercepted almost 135m of variably silicified flowbanded rhyolite with patches of spherulites

At the peak of Maruyama, several outcrops of silicified rhyolite are cut by veins/stringers or brecciation

Silica sinter floats

Silica sinter floats located north of the Maruyama peak exhibit finely laminated textures, some with plant remains

Rhyolite outcrop near the highest point of Mt. Maruyama

Logging area in Maruyama with several silica sinter float samples

Flowbanded rhyolite outcrop sample (OS-002405)

Silicified brecciated rhyolite outcrop sample (OS-002406, 1.495ppm Au, 10.1ppm Ag)

Laminated silica sinter float sample (OS-002597)

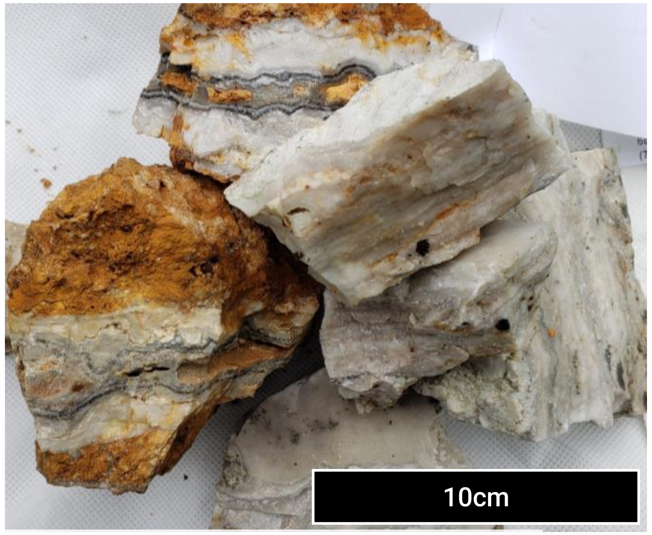
Silica sinter float sample (OS-002592, 2.99ppm Au, 18.4ppm Ag)

Mineralization

Quartz veins

Vein float samples were collected around the Hokuryu prospect, most of them exhibiting crustiform to colloform textures, with milky white to black bands (associated with ginguro)

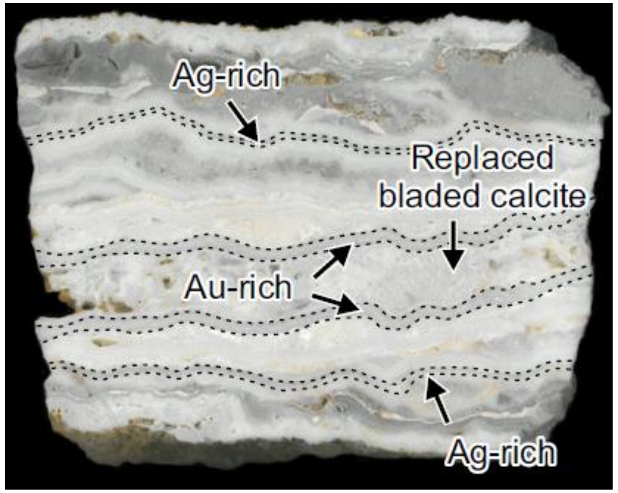
Crustiform quartz vein with ginguro (18OM-QH005, 44.7ppm Au, 274ppm Ag)

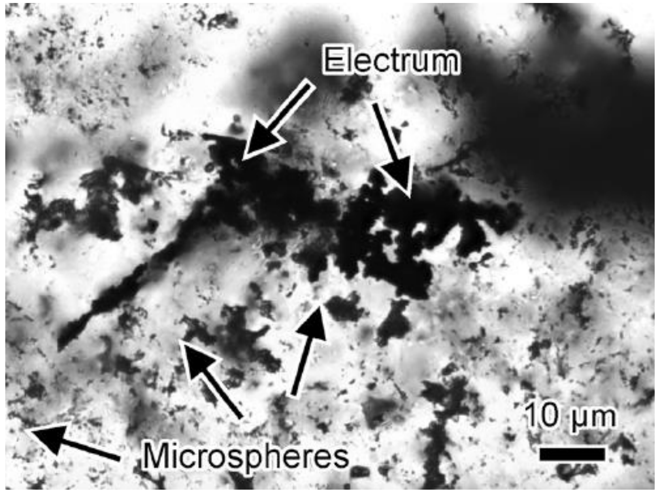


Crustiform quartz vein with ginguro (19HO-003, 23.7ppm Au, 226ppm Ag)

Crustiform quartz vein with ginguro (19HO-009, 41.7ppm Au, 182ppm Ag)

Crustiform quartz vein with ginguro (19OMHL-001, 206ppm Au, 3670ppm Ag)





Au and Ag-rich crustiform quartz vein with silica-replaced bladed calcite layer; High-magnification image of a wiry aggregate of electrum occurring in a microspherical colloform band (16OM-087, 31.4ppm Au 201 g/t Ag) (Analyzed by L. Zeeck, 2021)

Hokuryu Prospect

Soil Geochemistry and Gravity Survey

Hokuryu Mine

Widespread soil Au anomalies coinciding with gravity high features

Au anomalies are open northwards to Maruyama and southward to Daihoku

Maruyama

Widespread soil anomalies associated with breccia-pipe style gravity low features

Soil anomalies around Mt. Maruyama, where historic reports of low sulfidation epithermal veins and hydrothermal breccias were reported, sits atop of gravity low

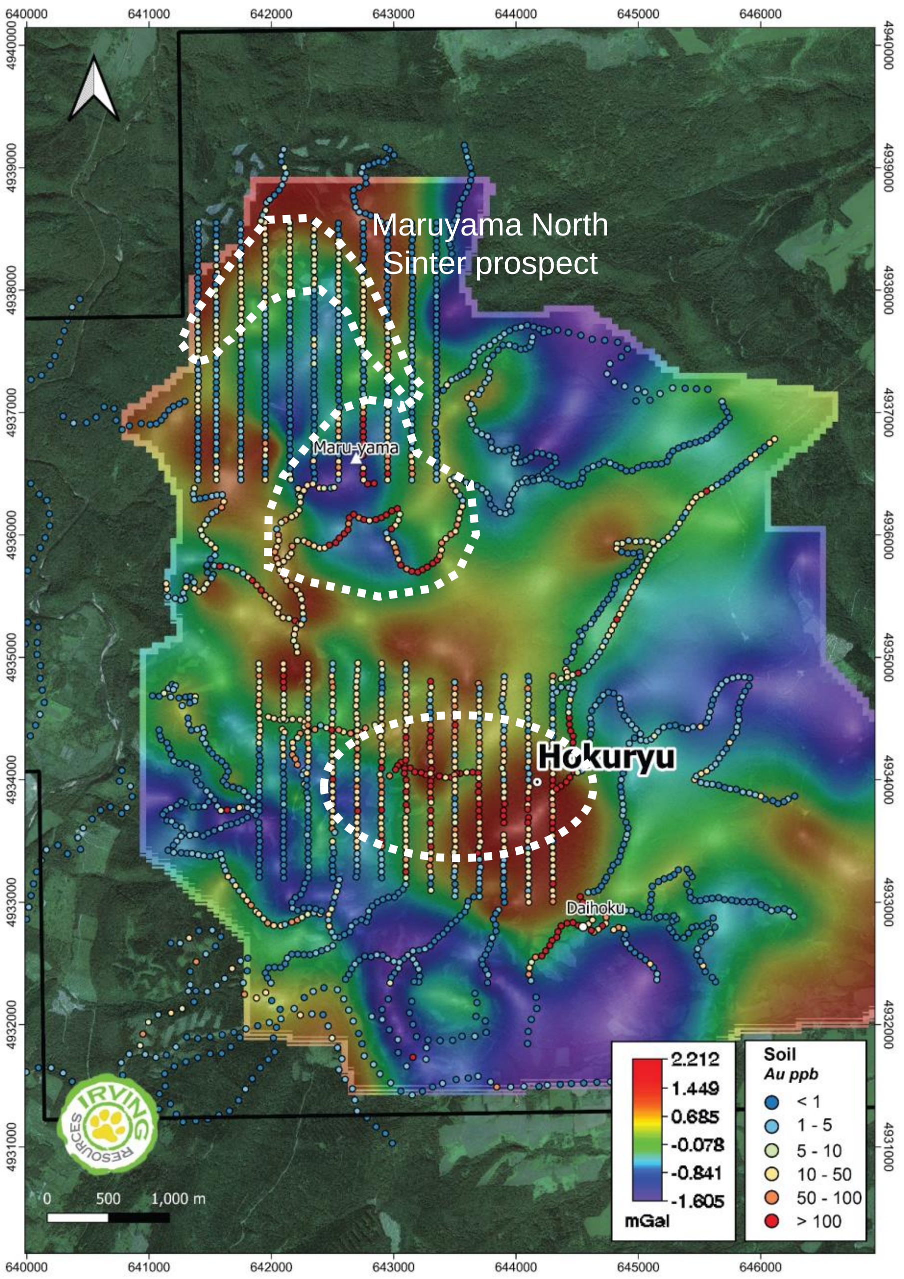
Soil anomalies within silica sinter float area located north of the Maruyama peak also coincide with gravity low feature

Daihoku

Soil sampling is limited to Daihoku road networks

Awaiting assay results from Spring 2021 gridded soil sampling campaign

Au anomalies are restricted to the logging road in the western part of Daihoku, coinciding with the margin of a low gravity zone



CSAMT/AMT Survey and Drilling

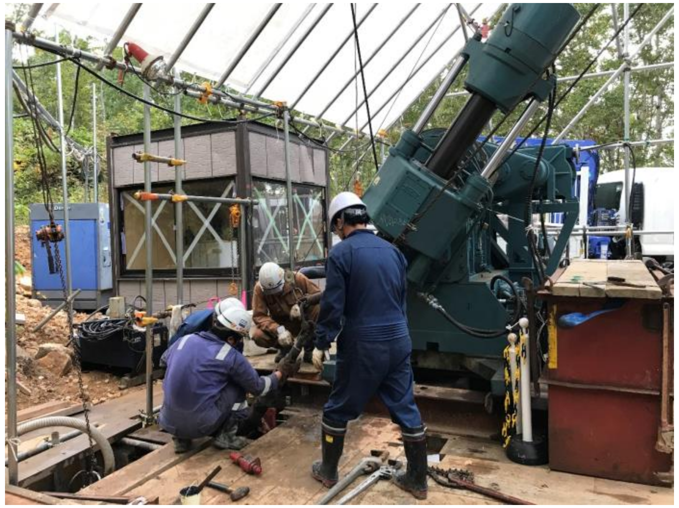
Hokuryu Mine

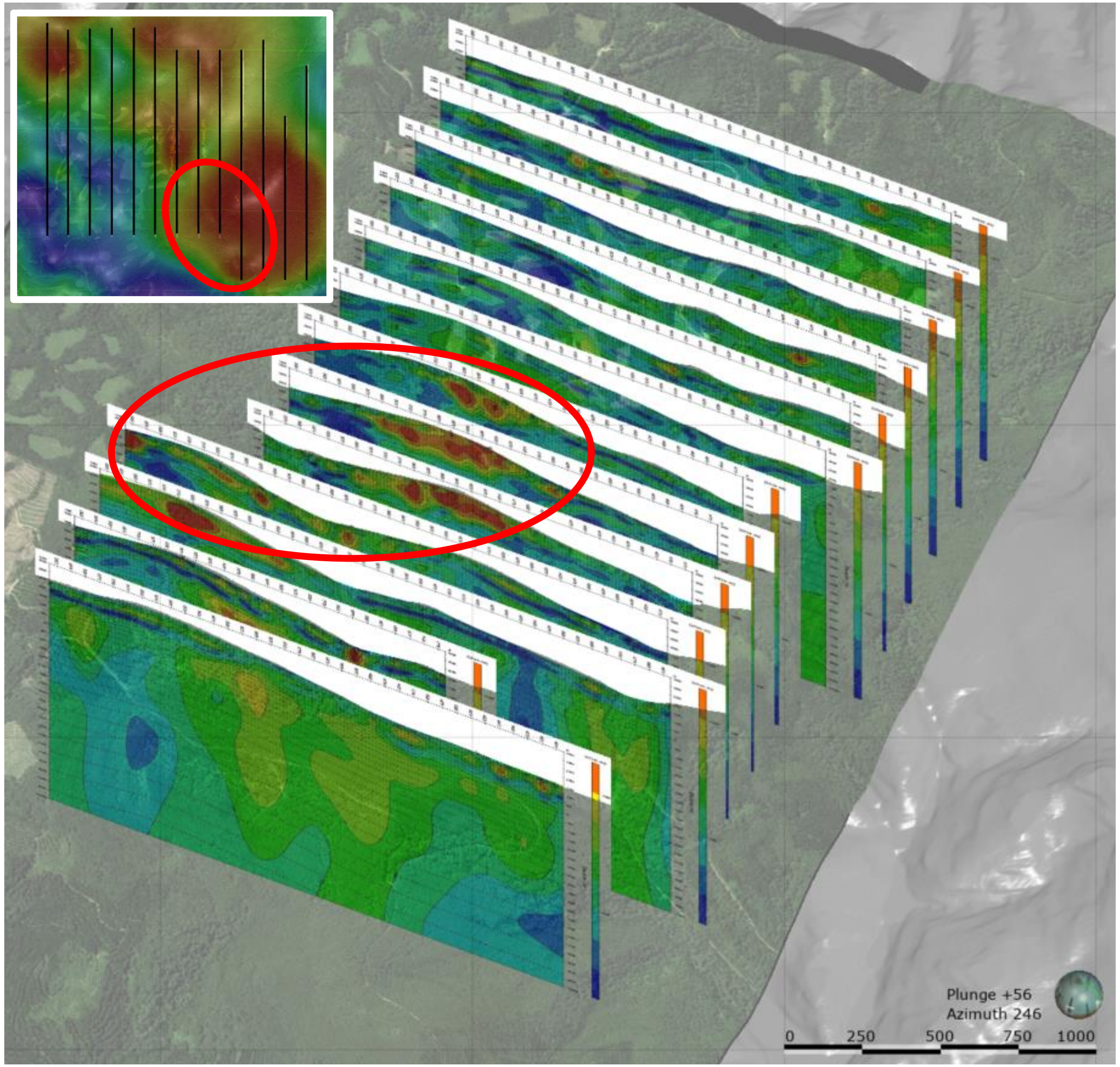
The only area in the Hokuryu prospect with CSAMT data (13 lines) and current drilling activity

A CSAMT resistivity section shows a feature similar to Omui, with a high-resistivity horizon, starting at the present surface and with a flat-lying base at ~180 m elevation (near the mine adit level); the high-resistivity zone has a lateral extent of ~450 m, and without a clear high (>1000 ohm-m) resistivity feeder.

The dominant CSAMT resistor trends right into the center of the high gravity anomaly.

Drilling commenced this September 2021 and will continue until the end of the year. Drilling will resume next year mid-Spring.





Future Work

2022

Whole Property

Omu Sinter

Diamond drilling (Phase 4)
Still in planning stage

Omui

Continuation of Diamond drilling (Phase 3)
6 holes, 2350m

Trenching

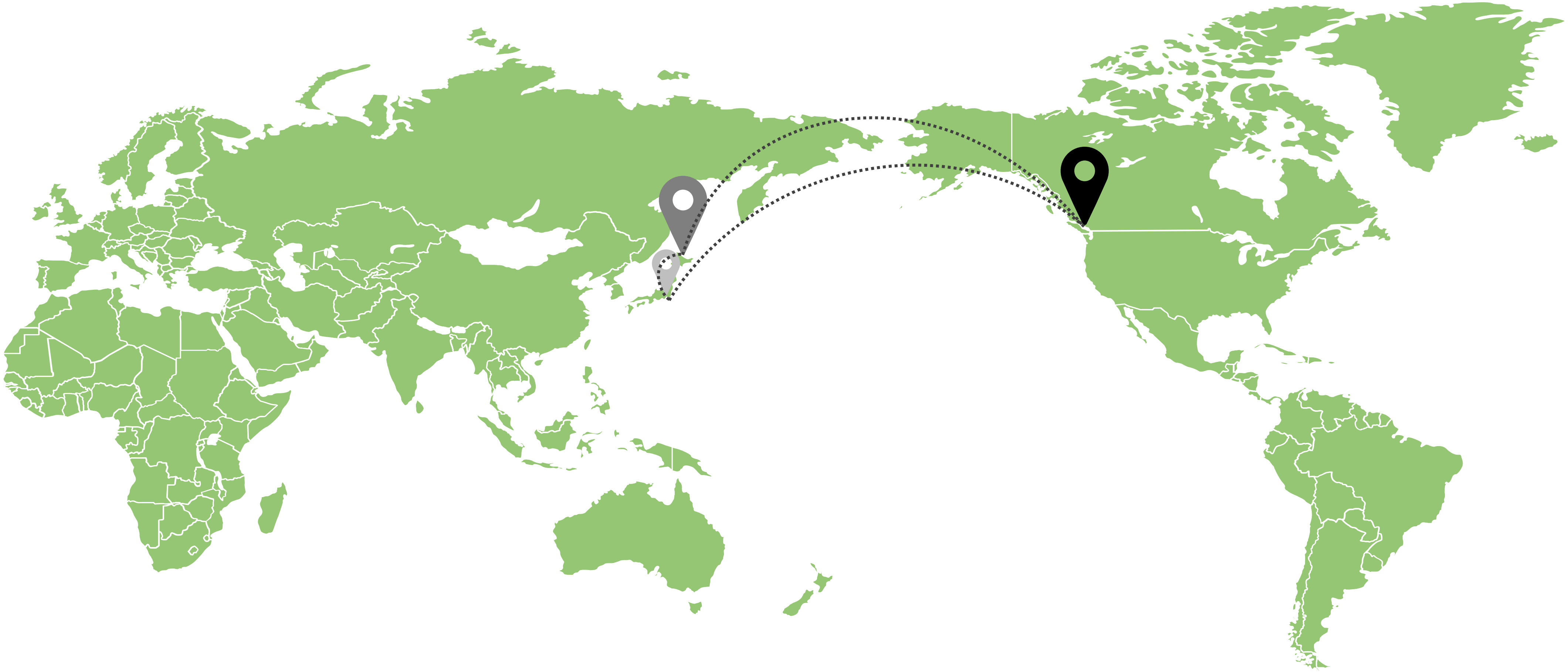
CSAMT survey

Hokuryu

Continuation of Diamond drilling (Phase 1)
8 holes, 4150m

CSAMT survey


Thank you.



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