



26<sup>th</sup> April 2017

# Large altered porphyry system with enhanced copper-gold potential confirmed at the Nankivel Prospect

Investigator Resources Limited (ASX: IVR, Investigator) announces that four widely-spaced diamond drill holes in the recent program at Nankivel intersected the prospective core of a large multi-phase porphyry mineral system. The potential for copper and gold discoveries has been significantly enhanced.

The newly interpreted porphyry core has a diameter of at least 800m under less than 20m of cover and is located 4km southeast of the 42Moz Paris Silver Project. Both prospects are within the Company's 100% held Peterlumbo tenement underlain by pastoral leases near Kimba on the northern Eyre Peninsula of South Australia.

The four inclined holes were drilled over the past month into IP chargeability targets to follow-up 2016 scout drilling that intersected the interpreted rim of a porphyry system which Investigator has predicted as a new deposit style in South Australia.

The new inclined holes, averaging around 400m downhole depth, intersected potassic-altered monzodiorite, a prospective porphyry rock, from as shallow as 4m under surface soil and gravel cover. The drill core variously demonstrates typical porphyry alteration, brecciation, veining and zonation. Disseminated and vein-hosted zinc and lead sulphides graduate to copper sulphide (chalcopyrite) at depth. An overprinting phase of intrusion, alteration, brecciation and mineralisation has demonstrated the potential for younger porphyry deposits and high-grade epithermal deposits within the Nankivel system.

Managing Director, John Anderson, said he took great pleasure in announcing the results from the broadspaced drill tests. **"With coarse first-pass drilling mostly on a 400m spacing, Investigator Resources has established beyond any doubt the presence of a large, very prospective copper-mineralised porphyry system. We consider Nankivel is the same age as Olympic Dam, making it one of the oldest geologically in the world with potential for world-class copper discoveries.** 

"The discovery of an economic copper-gold porphyry at Nankivel or nearer to Paris would be transformational for Investigator. Major companies are scouring the world for such opportunities, mostly at depth near known deposits in established porphyry belts around the Pacific. At Paris-Nankivel, Investigator has targets starting just below the surface in a new epithermal-porphyry province associated with the Olympic Dam mineralising mega-event, with the bonus of being in an OECD country."

Mr Anderson said that the levels of visible chalcopyrite were not yet expected to achieve economic grades, but there was excellent potential within such an extensive copper mineralised system for copperrich shells between, beneath and beyond the first-pass holes. The geology and amount of sulphide were also prospective for associated gold, which would be tested with the first batch of assays, expected in early May.

He said the alteration also observed in the drill core strongly inferred potential for shallow, high-grade gold-silver-copper deposits, which are common over the top of porphyry systems. Indications of such a high-sulphidation target were intersected as high-level alteration and veins in the collars of two adjacent holes and are supported by an adjacent 400m long geophysical conductor.

"The new targeting parameters learned from the drilling greatly enhanced the exploration potential of the 50km<sup>2</sup> Paris-Nankivel field, for both shallow high-grade silver and gold targets analogous to the Paris silver project, and multiple targets for world-class porphyry copper-gold deposits.

"Investigator has the first-mover advantage of initial discovery and development opportunities at Paris-Nankivel. We acknowledge the assistance of the State Government's collaborative drill program in making the breakthrough for South Australia's mineral potential," Mr Anderson said.



**Photograph of core trays for interval 59m to 65m of hole PPDH157:** Potassic-altered monzodiorite (reddish pink areas) including magnetite & minor biotite. Original potassic alteration is overprinted by patchy phyllic alteration (grey area), fracture vein sets and aplite intrusives, all indicative of an active porphyry system. Core is HQ size with a diameter of 64mm.

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#### **Recent Drilling**

A 1,632m drilling program of four diamond core holes PPDH154–157 was completed at Nankivel in March-April. The holes followed 2015 and 2016 scout drilling that demonstrated a propylitic rim to a predicted copper-gold prospective potassic core of a porphyry system (Figure 1).

An undrilled magnetic low of 1.5km by 800m dimensions was interpreted as the demagnetised porphyry target. A broad Induced Polarisation (IP) survey was undertaken over the target area on 400m spaced survey lines in late 2016. The new drilling tested a selection of IP chargeability anomalies also on the broad 400m spacing (Figure 3). The last hole PPDH157 was drilled 100m behind PPDH155 to follow up positive results with structural and deeper data.

### **Positive visual outcomes**

All four drill holes intersected potassic-altered porphyritic monzodiorite over the drilled area with fracturing, veining and multiple intrusives expected in a mineralised porphyry system (Photos pages 2 & 5). The potassic alteration variously shows the minerals expected in a porphyry - potash feldspar, biotite, magnetite and tourmaline. Hole PPDH155 intersected an intact zoning pattern typical of a porphyry (Figure 2) ranging from 30m of shallow advanced argillic alteration (kaolinite, illite, topaz, fluorite, pyrite and silver and copper chlorides), above 200m of intense phyllic alteration and brecciation (silica sericite pyrite carbonate fluorite lead and zinc sulphides), subsequently entering the potassic altered monzodiorite. A similar vertical zonation is seen in the sulphide mineralogy from trace to 1% galena (lead sulphide) and sphalerite (zinc sulphide) transitioning to chalcopyrite (copper sulphide) about 200m below the surface.



Figure 1: Nankivel epithermal/porphyry copper gold prospect: Interpretive geology and target plan

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Hole PPDH157 on the same cross section confirmed the zoning pattern (Figure 2). It only intersected a metre of argillic clay under about 15m of transported cover, then intersected potassic zones either side of the phyllic zone that contained steep dipping carbonate-pyrite-fluorite-chalcopyrite-veins at the interpreted position of the central mineralising structure. Fluorine-bearing minerals fluorite and topaz are common as prospective mineralisation indicators in and around the structure. The structure is interpreted to progress vertically from deeper carbonate-pyrite-fluorite-chalcopyrite brecciated veins in PPDH157 to mid-level chalcedonic breccias in PPDH155, then to the fluorite and topaz in the upper advanced argillic cap. The prospective structure is interpreted as projecting in plan from the advanced argillic and quartz vein outcrops on Nankivel Hill westerly past the strongly pyritic intersection in PPRC404, then through the breccias, veins and alteration of PPDH155/7 for a distance of at least 1.5km..

The copper mineralisation is estimated to be low to modest visually and is not expected to produce significant grades. The mineral zoning suggests that any higher-grade copper shell to a modelled late intrusive is at least 500m below the surface beneath current drilling. Although deep, there is alteration and intrusive evidence for multiple porphyry events at Nankivel that implies shallower ("telescoped") porphyry deposits.

Samples for PPDH155 have been submitted for assay with results expected mid-May. Cutting of the assay samples for the remaining holes is about to start.

The assays will also be used to assess vertical and lateral vectors to proximal porphyry and epithermal targets by the comparison of the multi-element data between holes.



Figure 2: Nankivel epithermal/porphyry copper gold prospect: Interpretive geology and target section

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#### DRILL CORE PHOTOGRAPHS showing examples of: POTASSIC ALTERATION & COPPER MINERALISATION



1. PPDH157/55m: Potash feldspar biotite magnetite haematite altered monzodiorite.



4. PPDH155/404m: Biotite alteration with disseminated fine chalcopyrite (not visible).

#### SHALLOW ARGILLIC CAP



7. PPDH156/55.2m: Kaolinite (possibly after pyrophyllite) gossan (oxidised sulphides) vein in altered monzodiorite.



2. PPDH155/157m: Remnant potash feldspar biotite alteration.



5. PPDH155/420m: Close up view about 5cm across of disseminated chalcopyrite in biotite alteration.



3. PPDH154/98m: Potassic altered monzondiorite with chalcopyrite mineralised veinlet.



6. PPDH157/494m: Scattered potash feldspar alteration & quartz veining. Disseminated sulphides are <1%.



8. PPDH155/40m: Kaolinite illite topaz fluorite pyrite alteration. Some of the dark minerals are silver & copper chlorides (SEM probe).



9. PPDH155/40m: SEM image of copper chloride mineral about 0.1mm long.

#### PHYLLIC ROOT ALTERATION / VEINING / STOCKWORKS & BASE METAL MINERALISATION



10. PPDH155/104m: Fine repetitive hairline fractures in sericite-altered monzodiorite.



11. PPDH155/132m: Altered monzodiorite with feldspar outlines preserved in sericite ground-mass, cut by multiple zoned pyrite veins.



12. PPDH155/143m: Carbonate vein with lead and zinc sulphides cutting altered monzodiorite.

**CENTRAL STRUCTURE - BRECCIA & VEINS WITH COPPER MINERALISATION** 



13. PPDH155/247m Brecciated chalcedony veins cutting intense sericite alteration.



14. PPDH155/266m Angular breccia of chalcedonic veins & altered monzodiorite with multiple vein phases.



15. PPDH157/423m: Brecciated pyrite fluorite carbonate chalcopyrite veins at high angle to core axis vertically beneath the chalcedonic breccia of PPDH155.

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## Further discovery opportunities

The drilling at Nankivel has opened up the following exploration opportunities:-

## Nankivel porphyry prospectivity

The discovery of potassic-altered porphyry with copper mineralisation, albeit at modest visual levels to date, over such a broad lightly drilled area offers good potential for shallower copper-rich shells around smaller late porphyry intrusives between or below the current drill holes at Nankivel.

## High sulphidation gold-copper deposits

The advanced argillic alteration preserved near the surface implies potential for shallow high-grade gold and copper deposits within the Nankivel system. Such a potential high-sulphidation target is delineated as a 400m long conductive feature by a single airborne VTEM (Versatile Time Domain Electromagnetic) line flown across Nankivel by CSIRO for hydrological studies (Figures 1 & 3). This possible conductor lies along the interpreted western projection of the central structure and is adjacent to limited kaolinite gossan (oxidised sulphides) veins around 50m down hole PPDH156 that was drilled away from the target (Figure 1) into an alternative IP chargeability target.

The conductive feature is about 100m thick and flat-dipping to the west with depth to the bottom of the conductor ranging from 80m to 140m below the surface. This coincides with a similar deepening IP conductor in the IP data that may represent a one kilometre extension of the advanced argillic alteration intersected in PPDH155. This is shown as the yellow zone in Figure 1 and is interpreted in the IP conductivity data to deepen from 50m at PPDH155 to 200m deep at the western extension. The scenario is similar to Paris and may also follow the unconformity boundary between volcanics and basement as seen around Nankivel Hill.

## Other silver, copper and gold targets within the Paris-Nankivel epithermal-porphyry complex

Figure 4 shows a regional image of the magnetics overlain by the VTEM flight lines. It is noted that most of the known prospects show associated VTEM anomalies where crossed by the flight lines. The VTEM responses at Paris, previously interpreted as due to the graphitic wallrocks, requires review.

Figure 5 shows the targeting model for the Paris-Nankivel complex. The interpreted prospective connecting structures are based on geological, geophysical and geochemical factors and is an example of Investigator's use of integrated techniques for targeting. The distribution of low-level molybdenum is a good example of how Investigator's extensive research database is being used to apply pathfinder geochemistry to mapping prospective fairways and clusters of mineralisation.

In addition to Nankivel, three other areas are selected as having similar magnetic and molybdenum signatures with potential to be prospective porphyry centres – Nankivel Southwest, Nankivel East and Helen. The Nankivel high-sulphidation target is shown on Figure 5 connecting Nankivel Hill with Nankivel Southwest. Nankivel West extending from the Nankivel porphyry towards Paris is seen as another priority shallow gold target.

The Alexander and Ares silver targets will also be reviewed.

The entire area of Figure 5 has been heritage surveyed. Hills generally corresponding with silicified volcanics such as Nankivel Hill are now nominated as unavailable for drill access. Clearance under a prior heritage survey permitted drilling at Nankivel Hill in the past. All the nominated targets except Nankivel Hill are cleared for drill access.



## Figure 3:

Nankivel geophysical targeting Oblique view of IP chargeability & VTEM conductor profiles, plus projected drill holes with key holes labelled Black circled white dots are diamond holes & white circled black dots are RCP holes). Underlain by ground image for reference.



**Figure 4: TMI Magnetic image of Paris-Nankivel Mineral System** showing drill collars (small black dots with the four new holes shown as larger white centred dots), VTEM flight lines & selected VTEM conductor anomalies.

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## **Future work**

For the immediate Nankivel targeting, assays are awaited for the first batch of samples submitted for PPDH155. All the core is in Adelaide and cutting of assay samples for the remainder of the holes will resume soon, supported by petrological work including further spectral mineralogy.

Two levels of wider exploration work will proceed:-

- 1) Assessing the new and revised shallow silver and gold targets for potential synergies with the silver project at Paris. Priority will be given to advancing the Nankivel high-sulphidation target.
- 2) Seeking shallow tops to mineralised copper shells within the four nominated porphyry target areas.

Both strategies will benefit from assessment of the Company's drill geochemistry datasets with different elements being applicable to mapping structural connectors and porphyry versus epithermal signatures. This work is on-going.

Review of the VTEM data along with the undrilled Nankivel IP anomalies will be undertaken. Expanded IP and electromagnetic (EM) ground surveying will then be considered for both target strategies.



**Figure 5: Updated Target Plan for the Paris-Nankivel epithermal/porphyry complex** showing priority targets arising from the new results of the Paris Infill drilling and drill confirmation of the mineralised Nankivel porphyry.

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#### **Competent Person Compliance Statement**

The information in this presentation relating to exploration results is based on information compiled by Mr. John Anderson who is a full time employee of the company. Mr. Anderson is a member of the Australasian Institute of Mining and Metallurgy. Mr. Anderson has sufficient experience of relevance to the styles of mineralisation and the types of deposits under consideration, and to the activities undertaken, to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr. Anderson consents to the inclusion in this report of the matters based on information in the form and context in which it appears.

The information in this presentation that relates to Mineral Resources Estimates at the Paris Silver Project is extracted from the report entitled "Upgraded Paris resource estimate: 60% increase to 33Moz silver" dated 9 November 2015 and is available to view on the Company website <u>www.investres.com.au</u>. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

#### **Investigator Resources overview**

Investigator Resources Limited (ASX code: IVR) is a metals explorer with a focus on the opportunities for greenfields silver-lead, copper-gold and nickel discoveries offered by the emerging minerals frontier of the southern Gawler Craton on South Australia's northern Eyre Peninsula.

The Company announced a revised estimation for the Paris Silver Project Mineral Resource for its 2011 Paris silver discovery to 9.3Mt @ 139g/t silver and 0.6% lead, comprising 42Moz of contained silver and 55kt of contained lead, at a 50g/t silver cut-off. The resource has been categorised with an Indicated Resource estimate of 4.3Mt @ 163g/t silver and 0.6% lead for 23Moz contained silver and 26kt contained lead, and an Inferred Resource: 5.0Mt @ 119g/t silver and 0.6% lead for 19Moz contained silver and 29kt contained lead.

The Company is accelerating the development pathway for the Paris silver project with the preparation of a prefeasibility study.



**Figure 6: South Australian plan** showing the location of Investigator's tenements (light green), the Paris silver project and Nankivel copper-gold prospect and infrastructure.



# **APPENDIX 1**

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# TABLE 1: PETERLUMBO TENEMENT, NANKIVEL DIAMOND DRILLING VISUAL RESULTS, APRIL 2017 - JORC 2012

## **Section 1 Sampling Techniques and Data**

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	<ul> <li>Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>Aspects of the determination of mineralisation that are Material to the Public Report.</li> <li>In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'RC drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.</li> </ul>	<ul> <li>Diamond Drilling (DH):</li> <li>PQ3, HQ2 and NQ2 core has been drilled by the company.</li> <li>Limited sub sampling has occurred at present however longitudinal cutting of core on 1m intervals in areas of mineralisation is undertaken. Variable sampling on 1m mineralised intervals, otherwise 2m or 3m composite sampling with interval selection based on alteration levels and mineralisation indicators identified by field geologists.</li> <li>Core has been oriented down hole and cutting is undertaken to preserve down hole orientated core. Quarter core sampling is being undertaken.</li> <li>1m sample intervals had magnetic susceptibility readings taken utilising a KT-10 susceptibility meter. No calibration of this meter occurred as relative down hole intensity was sufficient.</li> <li>Hand held XRF measurements have been taken on an <i>ad hoc</i> basis to confirm mineralogy but are not referred to in this release.</li> <li>Selected samples for spectral or petrological analysis are taken as sub samples.</li> <li>Drill holes are referred to in this release that relate to previous diamond drilling (DH) and reverse circulation (RC) drilling by Investigator Resources Ltd (IVR) (holes prefixed PPRC and PPDH) have had sampling techniques and data released as part of previous ASX releases (refer to the IVR website: News and Reports) and are not discussed further.</li> </ul>
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Criteria	JORC Code explanation	Commentary
Drilling techniques	• Drill type (e.g. core, RC, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	<ul> <li>Titeline drilling were contracted to conduct diamond drilling at Nankivel prospect.</li> <li>Drilling was undertaken using PQ3 from surface until suitable rock competency allowed a change to HQ3 and NQ2 core diameters.</li> <li>Core was oriented on each run utilising a Coretell orientation tool, successive runs were manually oriented to check orientation accuracy.</li> </ul>
Drill sample recovery	<ul> <li>Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</li> </ul>	<ul> <li>Core recovery and geotechnical data were recorded on site as part of drill core logging.</li> <li>The drill contractor was provided with a scope of work and requirement to ensure maximum sample recovery. Diamond recovery was measured against driller recorded run returns for all holes.</li> <li>Drilling methods are chosen to ensure maximum recovery. Triple tube diamond drilling with large diameter core was used unless sufficient confidence in rock competency was identified. Drill runs were restricted to a maximum of 3m length.</li> <li>No assaying returned and as such no comment on relationship between grade and recovery. Recoveries were noted as being excellent and as such there is limited scope for bias.</li> </ul>
Logging	<ul> <li>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.</li> <li>The total length and percentage of the relevant intersections logged.</li> </ul>	<ul> <li>Entire holes are logged comprehensively and photographed whilst on site</li> <li>Qualitative logging includes lithology, colour, mineralogy, veining, description, marker horizons, weathering, texture, alteration, geotechnical, magnetic susceptibility, recovery and mineralisation.</li> <li>Quantitative logging includes magnetic susceptibility, structure, specific gravity, geotechnical parameters.</li> <li>All logging is completed over the entire length of the drill hole.</li> </ul>
Sub- sampling techniques and sample preparation	<ul> <li>If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.</li> <li>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> </ul>	<ul> <li>Diamond hole sampling is currently occurring and no analytical results are discussed for current drill holes.</li> <li>PQ3, HQ2 and NQ2 core is cut longitudinally in half using a diamond saw. If an orientation line is present the core is cut to preserve this orientation line by rotating core clockwise by approximately 10 degrees and marking a separate cut line. If an orientation is not present core is oriented as best possible to breaks and a cut line to provide the most representative sample is marked.</li> <li>1m samples in PQ3 and HQ2 are further cut so that quarter core is</li> </ul>

Criteria	JORC Code explanation	Commentary
	<ul> <li>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</li> <li>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</li> <li>Whether sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>	<ul> <li>submitted for assay analysis. 1m samples in NQ2 are submitted as half core samples for assay analysis. 2m composite samples in HQ2 and 3m composite samples in NQ2 core are submitted as quarter core samples for assay analysis.</li> <li>Duplicate samples are taken on every 20<sup>th</sup> 1m sample. Duplicate samples were not taken for composite samples but will be included on any 1m resampling of mineralised intervals if encountered within composite intervals.</li> <li>No results on duplicate sample representivity are available as no assays have been returned.</li> <li>Sample sizes are regarded as appropriate for the grain size of material being sampled.</li> </ul>
Quality of assay data and laboratory tests	<ul> <li>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</li> <li>For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</li> <li>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</li> </ul>	<ul> <li>No assaying has been completed and reported for current drilling at Nankivel.</li> <li>Past RC and DH assaying by IVR in the area was completed by ALS Laboratories in accordance with industry standards. The preparation methods, and analytical methods employed allow for low level detection of a large suite of elements and are considered appropriate for the style of mineralisation being targeted.</li> <li>Four acid digest for multi-element geochemistry is a near total digest, however ALS laboratories note that depending on sample matrix, not all elements are quantitatively extracted such as for complex silicates (tourmaline, topaz, garnet <i>etc.</i>).</li> <li>Magnetic susceptibility measurements were taken on a 1m basis down hole and used as a guide to the relative magnetic intensity of the rock type with depth and comparison with modelled magnetics.</li> <li>Hand held XRF measurements were undertaken in the field to aid identification of mineralisation and select elements but are not reported.</li> <li>Field duplicate samples are submitted on every 20<sup>th</sup> sample interval as part of any 1m sub-sampling if this occurs.</li> <li>No standards or blanks were included to test for laboratory accuracy.</li> <li>Scanning Electron Microscope (SEM) analysis was undertaken on one unpolished, uncoated section of drill core utilising a FEI Quanta 600 scanning electron microscope at Adelaide Microscopy to characterise mineral grains using back-scatter electron imaging and energy dispersive x-ray spectroscopy (EDS). EDAX Genesis software was used to interpret results of EDS which is a standardless</li> </ul>

Criteria	JORC Code explanation	Commentary
		<ul> <li>qualitative method for identifying major elements and is meant as an indication only.</li> <li>Hylogger spectroscopic analysis of select samples was undertaken by the South Australian Geological Survey (South Australian Department of Premier and Cabinet) as part of a collaborative research agreement with IVR. The system undertakes continuous visible and infrared spectroscopy in addition to digital imaging to characterise and identify dominant mineral species at spatial resolutions of approximately 1cm (spectral data). TSG viewer software is utilised to interpret produced data.</li> <li>Additional spectral analysis of select samples was undertaken with the assistance of the South Australian Geological Survey using a field portable infrared spectrometer that operates in the short wave infrared range of the electromagnetic spectrum allowing for analysis of mineral species.</li> </ul>
Verification of sampling and assaying	<ul> <li>The verification of significant intersections by either independent or alternative company personnel.</li> <li>The use of twinned holes.</li> <li>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</li> <li>Discuss any adjustment to assay data.</li> </ul>	<ul> <li>Drilling:</li> <li>Significant intersections for major elements (gold, silver, copper, lead and zinc) are calculated within Micromine software. Reported intersections have the following lower cut-off grades for these elements: Gold (&gt;0.1ppm), Silver (&gt;10ppm), Copper (&gt;500ppm) Lead (&gt;1,000ppm), Zinc (&gt;1,000ppm). Three meters of internal dilution is allowed on composited (1m dilution where 1m sub sampling occurs), intervals and all intersections are calculated on a weighted average basis.</li> <li>Intersections are verified by the senior project geologist and selected intervals are cross checked by the IVR Managing Director.</li> <li>Holes are reconnaissance in nature and as such no hole twinning was required or undertaken.</li> <li>All qualitative data was recorded onto field iPad devices utilising an IVR proprietary database. All data was backed up on a daily basis to geological staff laptops and a separate hard drive for security of data.</li> <li>Upon importation of all data into the company's in house referential database a visual check to verify correct importation and formatting occurs. Further data integrity checks occur utilising Micromine software. All database imports and modifications have user ID and date time stamped changes automatically applied.</li> <li>Hard copy field logging sheets are retained and stored at the company's Adelaide office.</li> </ul>

Criteria	JORC Code explana	ation	Commentary
			<ul> <li>Relogging of all field generated geological logs occurs subsequent to drilling as a further validation check.</li> <li>Assay data is adjusted prior to importation into IVR's in house database through formatting of supplied assay data files, with the following adjustments made: <ol> <li>Any below detection limit data has the prefix "&lt;" symbol searched for and replaced with a "-".</li> <li>Any over range assays reported as "&gt; upper limit" has the "&gt;" removed and a note field was added to record that the result was over limit (e.g. If Mn &gt;10,000, the result was recorded as 10,000, with annotation in notes field accompanying sample interval that was over range result copied to that element, and the over range analysis method recorded in the sample interval's notes field (e.g. Ag &gt;100ppm, &gt;100ppm was overwritten with the over range result, and Ag-OG62 recorded in notes). A sample dispatch field (SDS) is included which references the dispatch ID provided by IVR on submission of assays.</li> </ol> </li> </ul>
Location of data points	<ul> <li>Accuracy and quadown-hole survey used in Mineral R</li> <li>Specification of th</li> <li>Quality and adequination</li> </ul>	lity of surveys used to locate drill s), trenches, mine workings and c esource estimation. e grid system used. lacy of topographic control.	<ul> <li>Initial holes (collar and lother locations</li> <li>All coordinates are recorded in GDA 94 MGA Zone 53.</li> <li>All coordinates are recorded in GDA 94 MGA Zone 53.</li> <li>Initial hole location was completed utilising a Garmin hand held GPS unit with approximately ±5m horizontal error. Subsequent survey pickup of drill collars by IVR staff used a Trimble Pro XRT Differential GPS with Omnistar HP processing with an accuracy of ±10cm is yet to occur, however will be completed prior to reporting of assay results in the future.</li> <li>Topographic control uses a high resolution DTM generated by AeroMetrex 28cm survey (2012).</li> <li>Down hole surveys:</li> <li>Down hole surveys were conducted using a single shot down hole survey camera every 30m and at bottom of hole. It is noted that</li> </ul>
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Criteria	JORC Code explanation	Commentary
		some surveys were not reliable with respect to azimuth control at some depths given the presence of magnetic minerals in locations (magnetite, pyrrhotite). In these instances, the suspect azimuth readings were flagged by geologists and not utilised, with additional surveying undertaken to ensure adequate survey control. No significant changes in declination, and only minor changes in azimuth were noted in the hole.
Data spacing and distribution	<ul> <li>Data spacing for reporting of Exploration Results.</li> <li>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</li> <li>Whether sample compositing has been applied.</li> </ul>	<ul> <li>Drilling:</li> <li>DH holes in this program were reconnaissance in nature and of irregular spacing. Holes were selected based on geological, geophysical and geochemical information and designed to test modelled induced polarisation chargeability anomalies within a magnetic low.</li> <li>No resource estimation undertaken.</li> <li>No sample compositing has been applied and no assay sampling undertaken with respect to holes discussed in this release from recent drilling.</li> </ul>
Orientation of data in relation to geological structure	<ul> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</li> </ul>	<ul> <li>Drilling:</li> <li>Initial scout drilling only.</li> <li>Drilling of holes has predominantly been oriented to test IP geophysical anomalies and is oriented parallel to IP survey line orientation 020 – 200 degrees true.</li> <li>Limited drilling has not sufficiently characterised structural information and as such no comment on representivity of samples can be made at this time with accuracy.</li> <li>Drilling has intersected a number of fracture/vein sets in the locality which have variable orientations including a number of sets at high angle to core orientation. It is uncertain whether a relationship exists between these structures and mineralisation as assays have not been returned. Structural analysis of recorded data is yet to occur.</li> <li>Information from drilling cannot at this stage determine if sample representivity is unbiased.</li> </ul>
Sample security	The measures taken to ensure sample security.	<ul> <li>All drill samples are taken under the direction of an IVR geologist.</li> <li>Samples are placed in individually numbered calico bags which reference the interval being sampled. Calico bags are then placed in poly weave sacks and cable tied prior to transportation by IVR staff or field crew to the Adelaide based laboratory. A sample dispatch</li> </ul>

Criteria	JORC Code explanation	Commentary
		register recording intervals, date of transport and person responsible for transport is maintained.
		<ul> <li>Master pulps and coarse reject material is retained from the laboratory for potential re-analysis.</li> </ul>
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	No audits or reviews have been undertaken.

# **Section 2 Reporting of Exploration Results**

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code expla	nation		Commentary
Mineral tenement and land tenure status	<ul> <li>Type, reference including agreed as joint ventures interests, histori environmental s</li> <li>The security of with any known in the area.</li> </ul>	e name/number, location and own ments or material issues with third s, partnerships, overriding royaltie ical sites, wilderness or national p settings. the tenure held at the time of repo impediments to obtaining a licend	ership d parties such es, native title bark and orting along ce to operate	<ul> <li>All results accompanying this TABLE 1, are derived from within EL5368 that was granted to Sunthe Uranium Pty Ltd a wholly owned subsidiary of Investigator Resources Limited ("IVR").</li> <li>IVR manages EL5368 (Peterlumbo tenement) and holds a 100% interest.</li> <li>EL5368 is located on Crown Land covered by several pastoral leases.</li> <li>An ILUA has been signed with the Gawler Range Native Title Group and the Peterlumbo tenement has been 'Culturally and Heritage' cleared for exploration activities. This ILUA terminated on 28 February 2017 however this termination does not affect EL5368 (or any renewals, regrants and extensions) as the explorer entered into an accepted contract prior to 28 February 2017. The Nankivel target has previously been excluded from advanced exploration activities, however a requested re survey in 2015 saw a modification to the heritage exclusion zone and allowed for drilling to occur.</li> <li>There is no registered Conservation or National Parks on EL5368.</li> <li>An Exploration PEPR for the entirety of EL5368 has been approved by the DSD (Department for State Development).</li> </ul>
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.		other parties.	<ul> <li>There has been limited exploration work on the tenement, by other parties.</li> <li>The Nankivel target tested in this program has had minor general exploration in the past; limited to mapping, spectral analysis of alteration in nearby outcropping areas, and rock chipping. MIM Ltd reported a historical rock chip assay of 1.6g/t gold from the nearby Nankivel Hills which was subsequently unable to be repeated. Recent IVR mapping and selective sampling identified a stock work veined corridor and returned anomalous sampling which replicated MIM Ltd.'s original rock chip assay (peak values of 1.37g/t gold, 94g/t silver, 300ppm copper, 0.63% lead were recorded).</li> <li>A number of shallow air core holes (generally with depths of 25m or less), were completed by Shell Ltd and Aberfoyle Ltd. An additional three RC drill holes were completed by MIM Ltd targeting the nearby Nankivel Hills which identified evidence of high sulphidation alteration.</li> </ul>
Geology	Deposit type, geological setting and style of mineralisation.		eralisation.	• Drilling targeted porphyry style alteration and mineralisation systems within the Nankivel intrusive system. The presence of a potential buried porphyry system has been interpreted from high sulphidation alteration on
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Criteria	JORC Code explanation	Commentary						
Drill hole	A summary of all information material to the understanding of	<ul> <li>nearby outcropping hills and historical MIM Ltd drilling targeting the outcropping alteration systems.</li> <li>Lithologies intersected in the area of drilling have been variably alter porphyrytic monzonites and monzodiorites with some limited metare pyroxenite xenoliths. Additional intrusives observed have included granodiorite and aplite. Limited calc silicate was also identified.</li> <li>Alteration identified within the area drilled has included potassic (k feldspar/biotite+/- magnetite), argillic, sericitic, chloritic and localise</li> <li>Sulphide species identified in drilling included pyrite (disseminated fracture/vein fill), pyrrhotite (disseminated and fracture fill), chalcop sphalerite and galena.</li> <li>Other notable gangue minerals accompanying sulphides include file rhodocrosite, carbonate, epidote, tourmaline, garnet, chlorite, sericite</li> <li>Veining where observed was of variable density and was predomir quartz-carbonate and/or carbonate veining with some sulphide veining/fracture fill also present.</li> </ul>			those altered eta- ded : (k lised silica. ted and copyrite, e fluorite, ericite. minantly			
Information	the exploration results including a tabulation of the following information for all Material drill holes:	collar location as follows:						
	<ul> <li>easting and northing of the drill hole collar</li> </ul>	Hole_ID	Easting	Northing	RL dtm	Total Depth	DIP	Azimuth
	<ul> <li>elevation or RL (Reduced Level – elevation above sea level in matrix) of the drill hale coller</li> </ul>	PPDH154	597762	6385506	202	336.8	-70	20
	<ul> <li>o dip and azimuth of the hole</li> </ul>	PPDH155	598490	6385118	220	432.47	-60	200
	<ul> <li>down hole length and interception depth</li> </ul>	PPDH156	598081	6385127	213	342.5	-60	20
	○ hole length.	PPDH157	598526	6385213	218	519.5	-60	200
	• If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	No mate	rial informa	tion is exclu	ded.			
Data aggregation methods	<ul> <li>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.</li> <li>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and</li> </ul>	<ul> <li>All intersections calculated for drill holes referenced in this release are using weighted averages with no upper cut-off and a maximum of 1 sample interval (3m for composites, 1m for sub sample resplits) dilution Major element lower cut-off for intersections are Silver (10ppm), Copper (500ppm), Gold (0.1ppm), Lead (1,000ppm), Zinc (1,000ppm).</li> <li>No metal equivalents are reported.</li> <li>No results are included for diamond holes currently drilled and forming part of this release as samples have not been submitted to the laborato</li> </ul>				ase are of 1 dilution. , Copper forming aboratory.		

Criteria	JORC Code explanation	Commentary
	<ul> <li>some typical examples of such aggregations should be shown in detail.</li> <li>The assumptions used for any reporting of metal equivalent</li> </ul>	
	values should be clearly stated.	
Relationship between mineralisation widths and	<ul> <li>These relationships are particularly important in the reporting of Exploration Results.</li> <li>If the geometry of the mineralisation with respect to the drill</li> </ul>	<ul> <li>The geometry of any mineralisation in this system in relation to results reported is not sufficiently well known to comment on.</li> </ul>
intercept lengths	hole angle is known, its nature should be reported.	
	<ul> <li>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').</li> </ul>	
Diagrams	<ul> <li>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</li> </ul>	<ul> <li>See attached plan and section showing drill hole location, in the main body of the IVR ASX Release accompanying.</li> </ul>
Balanced reporting	<ul> <li>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</li> </ul>	<ul> <li>No new assay results are reported as part of this release.</li> </ul>
Other substantive exploration data	<ul> <li>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</li> </ul>	<ul> <li>Mineralisation is likely to be hosted within highly altered and variably fractured and veined intrusives; however skarn mineralisation and overprinting may also be present.</li> <li>There are a number of drill collars that are historical (non-IVR) within the Peterlumbo tenement. These include shallow air core drilling by Shell Ltd and Aberfoyle Ltd (generally less than 20m depth), and three RC holes by MIM Ltd drilled approximately 500m - 1,500m away from the Nankivel target. Assay results for these historical holes only record a restricted number of elements and are at differing analytical thresholds. Quality data is not available for these holes.</li> <li>Down hole geology intersected a porphyritic monzonite intrusive that is significantly different to other intrusives previously drilled around the Nankivel intrusive centre. This intermediate intrusive has exhibited strong alteration zonation including epidote/chlorite/sericite/potassic consistent with observed alteration assemblages in porphyry systems. Additional</li> </ul>

Criteria	JORC Code expla	nation		Commentary
				<ul> <li>indicator minerals of hydrothermal alteration include fluorite, rhodocrosite, epidote, chlorite, sericite.</li> <li>Recent DH and RC drilling at Nankivel by IVR was targeted around a high amplitude magnetic anomaly that was identified in early airborne magnetics and has since been refined by more detailed 50m spaced airborne magnetic surveying.</li> <li>Recent drill results and analysis of alteration within holes has led to a wider model where a demagnetized porphyry ring surrounding a more magnetic intrusive core may be present adjacent to the magnetic target drilled. Induced Polarisation surveying was completed to assess this zone, in addition to other potential structural targets nearby. Currently reported diamond drilling is focussed on evaluating IP targets, taking into account other geophysical data in the area including gravity, aero magnetics and VTEM surveys (all geophysical surveys referred to have previously been detailed in ASX releases, available on the IVR website, News and Reports).</li> <li>Partial leach soil sampling was incorporated in targeting of drilling. Historical soil sampling of a coarser fraction failed to identify copper/silver/gold in soil anomalism immediately above the Nankivel magnetic target; however a subsequent re survey at optimum size fraction of -80# (175 micron) successfully identified low level copper/gold and silver in soil anomaly over the main magnetic body at Nankivel – this -80# survey ing of the Nankivel intrusive region was completed in 2014 and was utilised in analysis of data. Detailed aeromagnetic surveying of the Nankivel intrusive region was los undertaken in 2015 and used in analysis of data.</li> <li>A single VTEM survey line was flown across the target area as part of a government funded regional hydrological survey in 2014. Data was collected and processed by CSIRO who employed Geoscience Australia's layered-earth sample-by-sample inversion (GA-LEI) to invert the VTEM max data. This algorithm, conceptualised by Lane <i>et al.</i>, (2004) was developed b</li></ul>
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Criteria	JORC Code explanation	Commentary
		generation of conceptual models. This field mapping identified a structural zone associated with evidence of stock work veining in outcrop proximal to the target, and within a zone of pyrophyllite alteration. Rock chipping of this outcropping area confirmed anomalism in gold, copper, silver and lead ((peak values of 1.37g/t gold, 94g/t silver, 300ppm copper, 0.63% lead were recorded).
Further work	<ul> <li>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</li> <li>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</li> </ul>	<ul> <li>Subject to Board approval further drilling and potential infill geophysical surveying to aid targeting may be undertaken.</li> </ul>