ASTUTEMETALSNL

30 June 2025

NEEDLES GOLD-SILVER PROJECT: DATA REVIEW IDENTIFIES PRIORITY DRILL TARGETS

Four high-priority targets identified, with initial drilling planned for Q3 2025

Key Highlights

- **Holistic review of Needles Project, including new data, reveals an underexplored epithermal gold-silver system**
- **Most drilling is shallow, with alteration and pathfinders indicating the most prospective area has not been tested**
- **High priority drill targets identified:**
  - **Rock-chip samples of up to 33g/t Au and 622g/t Ag at the Eastern Shaft prospect – remains untested**
  - **Historical Arrowhead Mine is a 107m-deep 4-level mine with along-strike intersections including 3.42m @ 2.92g/t Au and 905g/t Ag – untested beneath mine**
  - **200m-long trend at the Tomahawk Mine, with assays up to 5.54g/t Au and 406g/t Ag – not tested by drilling**
  - **Strong pathfinder anomalism above elevated IP chargeability and downward alteration vector at the Whopper Junior prospect – only shallow drilling**
- **Next steps to conduct a systematic soil sampling grid and magnetic survey, with the aim of rapidly progressing to drilling in Q3 2025.**
- **Work to be conducted in tandem with Red Mountain drilling, leveraging cost and management synergies**

Astute Metals NL (ASX: ASE) ("ASE", "Astute" or "the Company") is pleased to report that a technical review of historical data and newly-acquired ASTER imagery from its 100%-owned Needles Gold Project ("Needles") in Nevada, USA, has identified a series of high-priority gold-silver targets.

The **Needles Project hosts a large epithermal system**, with recently acquired ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) data showing a large 3km x 2km zone of kaolinite and illite alteration.

This **epithermal system is fertile for gold and silver**, as demonstrated by historical high-grade mines as well as widespread geochemical anomalism, with rock chip results of **up to 33g/t Au and 1,115g/t Ag**.

Existing drilling is mostly shallow, and alteration mineralogy and pathfinder geochemistry suggests that this drilling is high up in the 'cap' of the epithermal system, indicating **the most prospective exploration space is yet to be tested**.

The project is not only **prospective for high-grade vein-style mineralisation**, but porous tuffaceous rocks indicate additional **potential for bulk tonnage disseminated-style mineralisation**.

The recent AngloGold Ashanti 16Moz+[7] Silicon-Merlin discovery, also located in Nevada, was discovered through exploration drilling beneath the alteration 'cap' of an epithermal deposit, indicating the discovery potential in drilling the deeper parts of epithermal systems and a pathway to value creation underpinned by recognition of untested potential.

The Company has identified a number of high-priority drill targets to test for both vein-style and disseminated styles of mineralisation at Needles, as well as the opportunity to refine these targets through an airborne magnetic survey and a grid-scale soil sampling campaign. These work programs can be progressed quickly, to advance to drill testing of these high-potential targets in Q3 of this year.

Astute Chairman, Tony Leibowitz, said:
"This review of the Needles Gold Project has brought a fresh set of eyes to this under-explored project at a time of record gold prices and accelerating gold-silver exploration in Nevada as one of the premier jurisdictions for gold exploration and mining globally.

"The review indicates outstanding prospectivity for epithermal gold-silver mineralisation, with the recently acquired ASTER imagery indicating that historical drilling has never successfully tested the most prospective zones. We now plan to get boots on ground as soon as possible to undertake soil sampling and a magnetic survey, with the aim of commencing drilling at Needles during the September Quarter.

"This is an exciting addition to Astute's 2025 exploration campaign alongside our ongoing drilling at the Red Mountain Lithium Project, which is rapidly emerging as one of North America's standout lithium clay deposits."

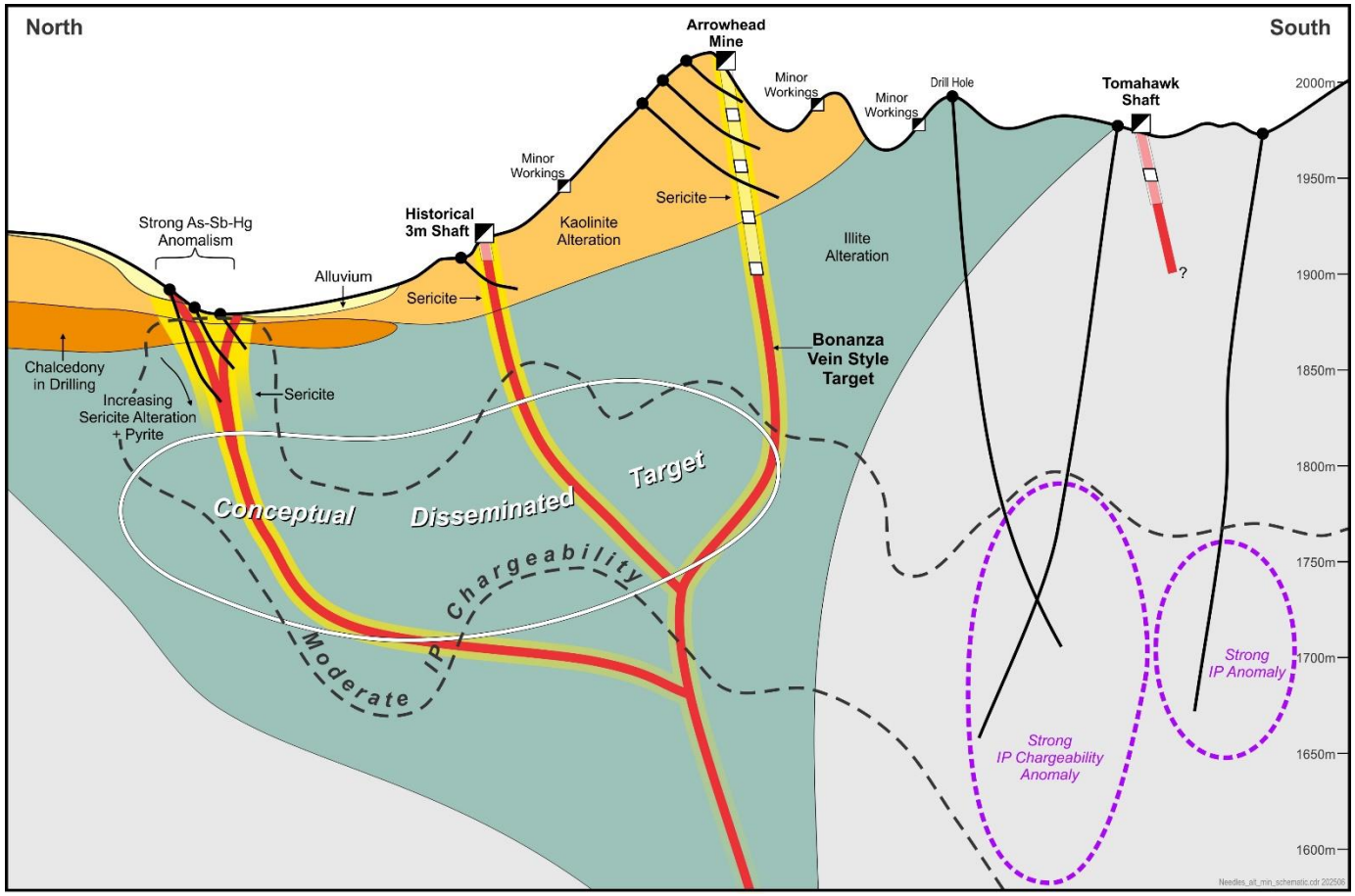

Figure 1. Needles Project north-south conceptual cross-section with epithermal target styles, and geological features from historical and recent exploration results

Background

The Needles Project comprises 216 unpatented lode mining claims covering an area of 18km^2 and lies 92km east of the mining town of Tonopah in Nye County, Nevada, USA (Figure 12). The project was acquired due to its geological similarities with bulk-tonnage gold operations in Nevada such as the 20Moz+ Round Mountain mine[6].

Previously known as the Arrowhead district (Figure 2), the project includes numerous historical gold-silver workings dating from the early 1900's to 1920's, with some of notable scale. While historical records are sparse, the Arrowhead Mine is recorded as an incline shaft to 350ft (106.7m) with drifting on four levels, and the Arrowhead Extension Mine was a 150ft (45.7m) two-compartment shaft with two working levels. These operations mined bonanza-style epithermal vein gold and silver mineralisation.

The current project area has seen a number of previous explorers including Newcrest (2002-04), Taranis

Resources (2002-07), Excalibur Resources (2007-09) and Greenock Resources, amongst others. Exploration and associated exploration data quality/availability has to a large extent been summarised in a 2010 NI 43-101 Technical Report for Greenock Resources authored by MPH Consulting[1].

Revisiting Needles

Astute decided to undertake a renewed assessment of the Needles Gold Project after applying a fresh perspective to the project and taking into consideration the compelling investment environment in the gold sector, with the gold price currently trading at record levels.

The last exploration work was undertaken at Needles by previous configuration of the Company, under its previous name Astro Resources NL when the Company had no in-house technical and geological expertise.

The proximity of Needles to the Company's flagship Red Mountain Lithium Project provides for synergies such as the conducting of work on both projects contemporaneously, reducing the cost and time involved in advancing exploration activities across both assets.

Astute's strategy is to focus on projects with the potential to create significant long-term value for its shareholders. Both Red Mountain and Needles offer that potential and, accordingly, the Board has decided to reactivate exploration activity at Needles given that the project was neglected by the previous management team

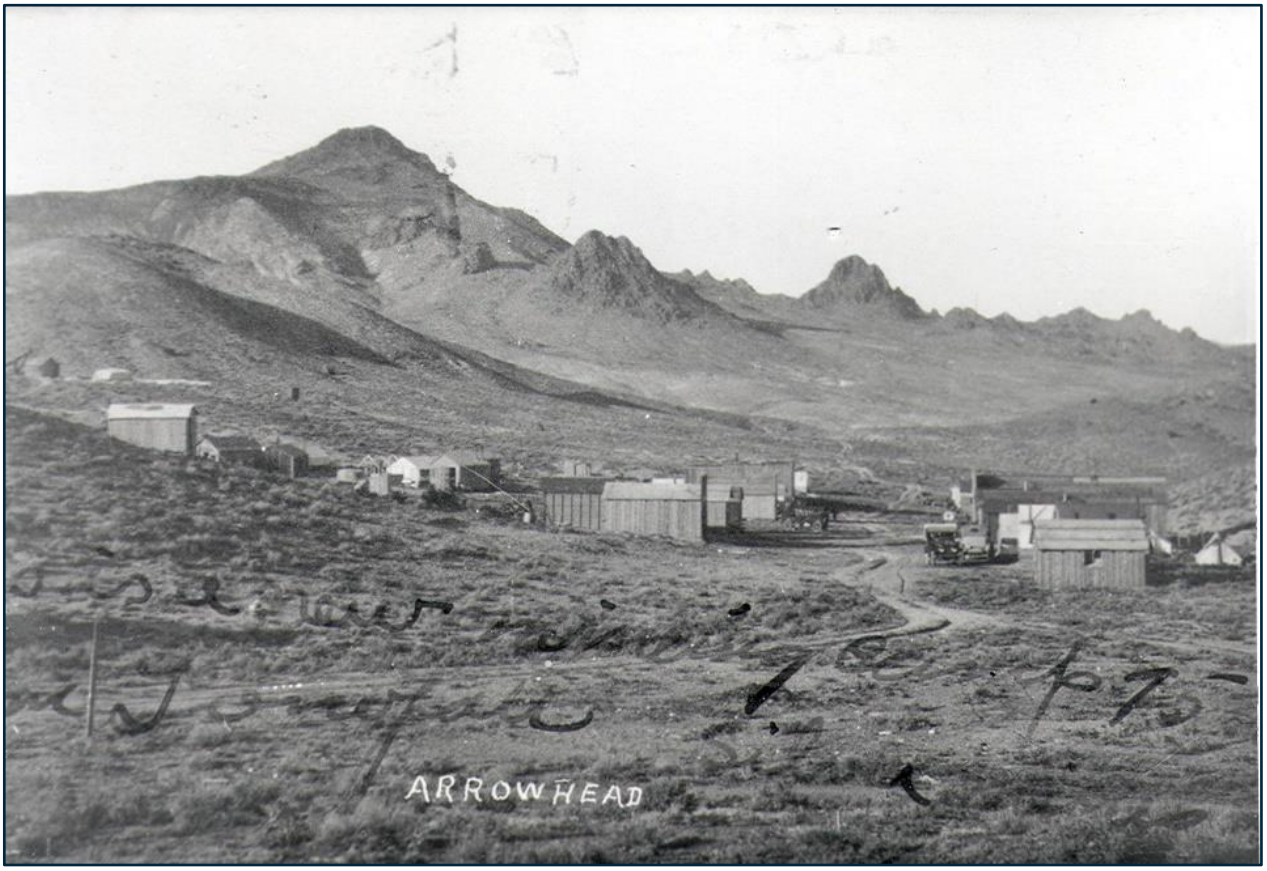

Figure 2. Arrowhead mining district, within the Needles Gold Project, approximately 1919.

Project Geology

The Needles Project geology is dominated by tertiary-aged volcanic and volcaniclastic rocks including oligocene to Miocene tuffs, oligocene andesite, and lesser intrusive rocks such as rhyodacitic and dacitic sills and plugs (figure 4). Mineralised epithermal gold-silver veins are observed mainly in rhyodacitic and tuffaceous rocks at the project. Tuffs at Needles display varying degrees of compaction ranging from weak to strong[3]. Weakly compacted tuffs are interpreted to have potential as a host-rock for disseminated style mineralisation, such as that observed at the 20Moz Round Mountain deposit, which is located approximately 100km northwest of the Needles Project.

Strong hydrothermal alteration of outcropping host rocks is observed at Needles, particularly with respect to kaolinite and illite, suggesting that outcropping rocks are relatively high in the epithermal system, and that the conceptual prospective zone extends below. Alteration minerals identified in drill samples at Needles are typical of epithermal gold deposits, and include kaolinite, illite, chalcedony and sericite.

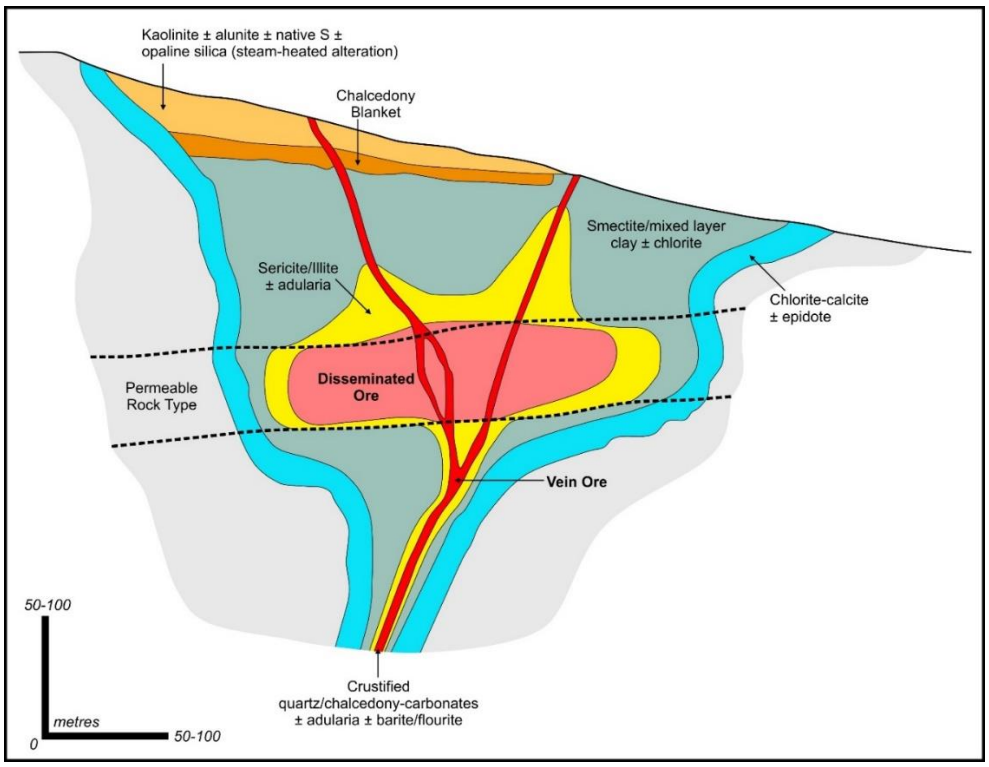

Figure 3. Schematic cross-section showing vein and disseminated types of epithermal mineralisation (simplified after Hedenquist, 2000[2])

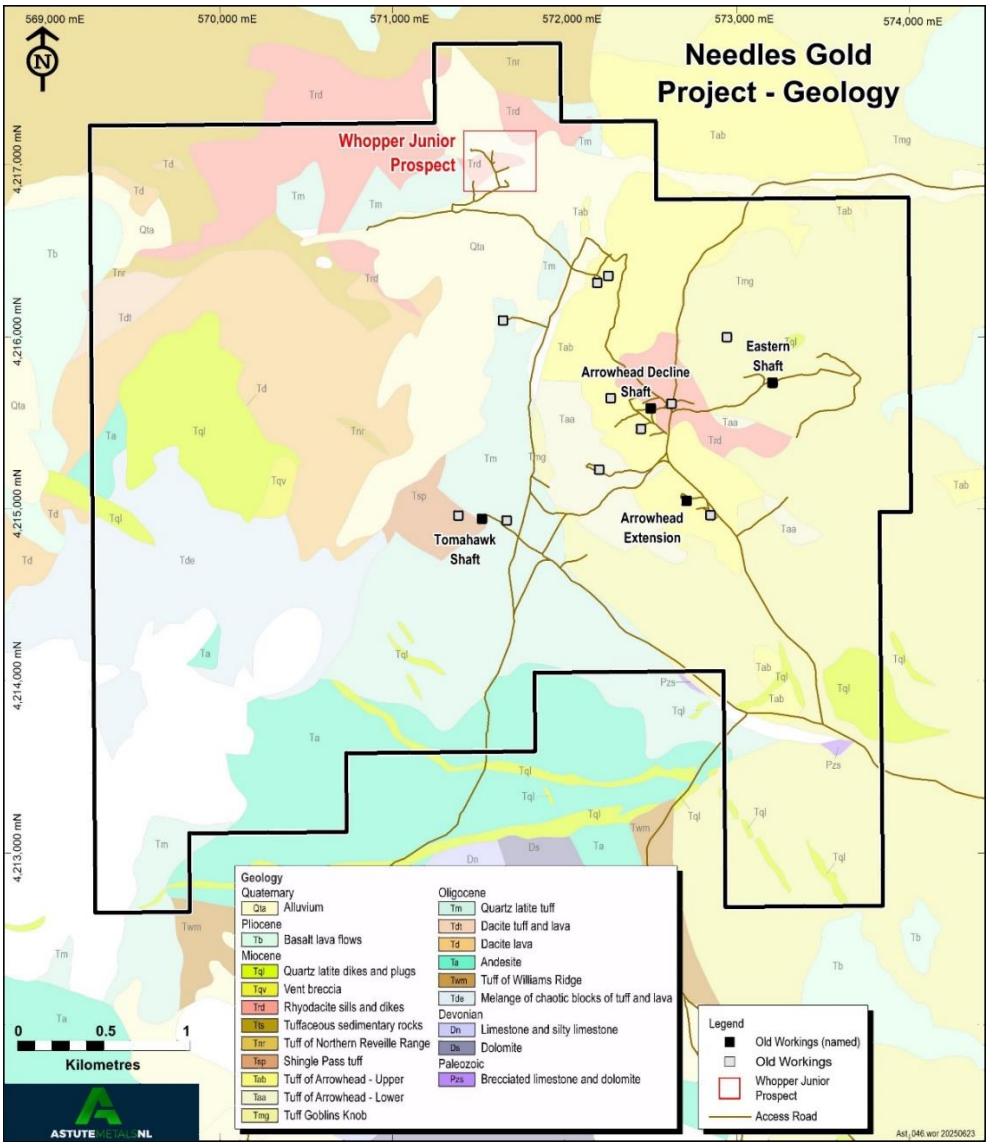

Figure 4. Needles Gold Project geology.

Epithermal Gold-Silver Mineralisation

Low-sulphidation epithermal gold-silver deposits are generated by large-scale systems of heat and convective fluids generated from intrusive magmas at depth. The fluids carry gold, silver and other metals, which are deposited as veins and/or as disseminated deposits. The fluids interact with adjacent rocks, resulting in characteristic patterns of alteration mineralogy, which diminish with distance from structures and rock types carrying fluids (Figure 3). Mineralisation styles include vein-type and disseminated-type.

ASTER Satellite Data

One important geological feature that occurs in epithermal deposits is the presence of a zone of kaolinite (clay mineral) alteration in the top of deposits – see the orange 'cap' in Figure 4. ASTER satellite technology detects spectral patterns reflected from minerals on the Earth's surface. This can be used for exploration purposes, where spectral data particular to certain minerals on the Earth's surface, including kaolinite, may be mapped. ASTER data that was recently acquired for the Needles Project shows the presence of a large alteration system of approximately 3x2km, dominated by kaolinite alteration, nested within a zone of illite alteration (Figure 5).

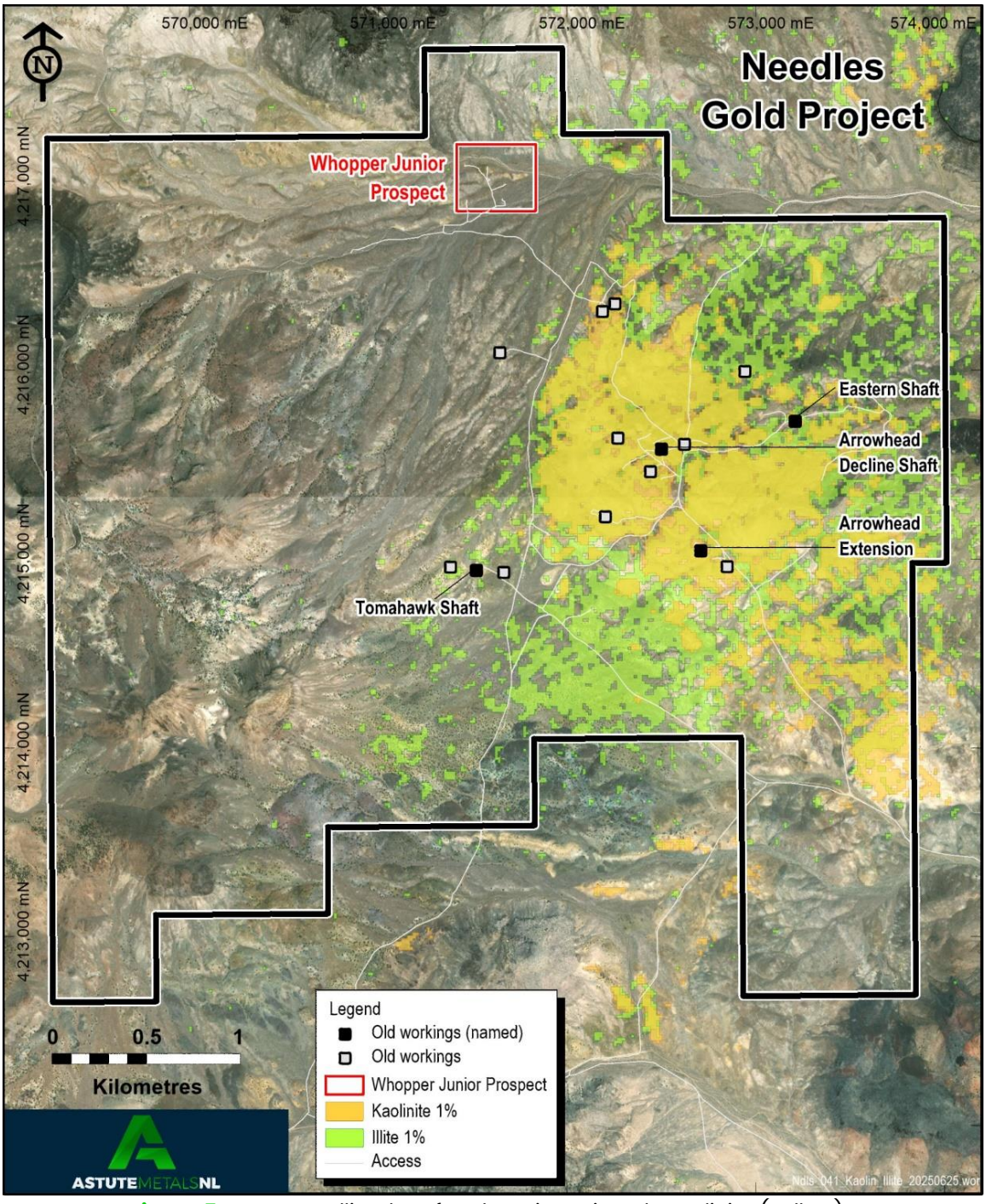

Figure 5. ASTER satellite data for alteration minerals Kaolinite (yellow) and Illite (green) at Needles with main prospect areas

Rock Chip Sampling

A number of surface sampling campaigns have been undertaken at Needles. Historical rock chip sampling campaigns were undertaken by Taranis (127 samples) and Barrick (93) (Table 1). These have been plotted along with the 113 samples taken by the Company[9,10] and are displayed in Figures 6 (silver) and 7 (gold). Original assay files have been located for all but 10 of the Taranis samples. The Barrick surface sample dataset appears to be an extract from a surface sample database, containing method information for many elements, however not for gold or silver. No QAQC data is available for the Taranis or Barrick rock chip data.

Company	Year	Samples	Assay Methods
Taranis	2003-06	127	Fire Assay Au and ICP-AES
Barrick	Unknown	93	ICP-MS, Au-unknown
Astro Resources	2017	16	Fire Assay Au and Aqua-regia AAS Ag
Astro Resources	2020	97	Fire Assay Au and ICP-AES

Table 1. Rock chip sampling campaigns

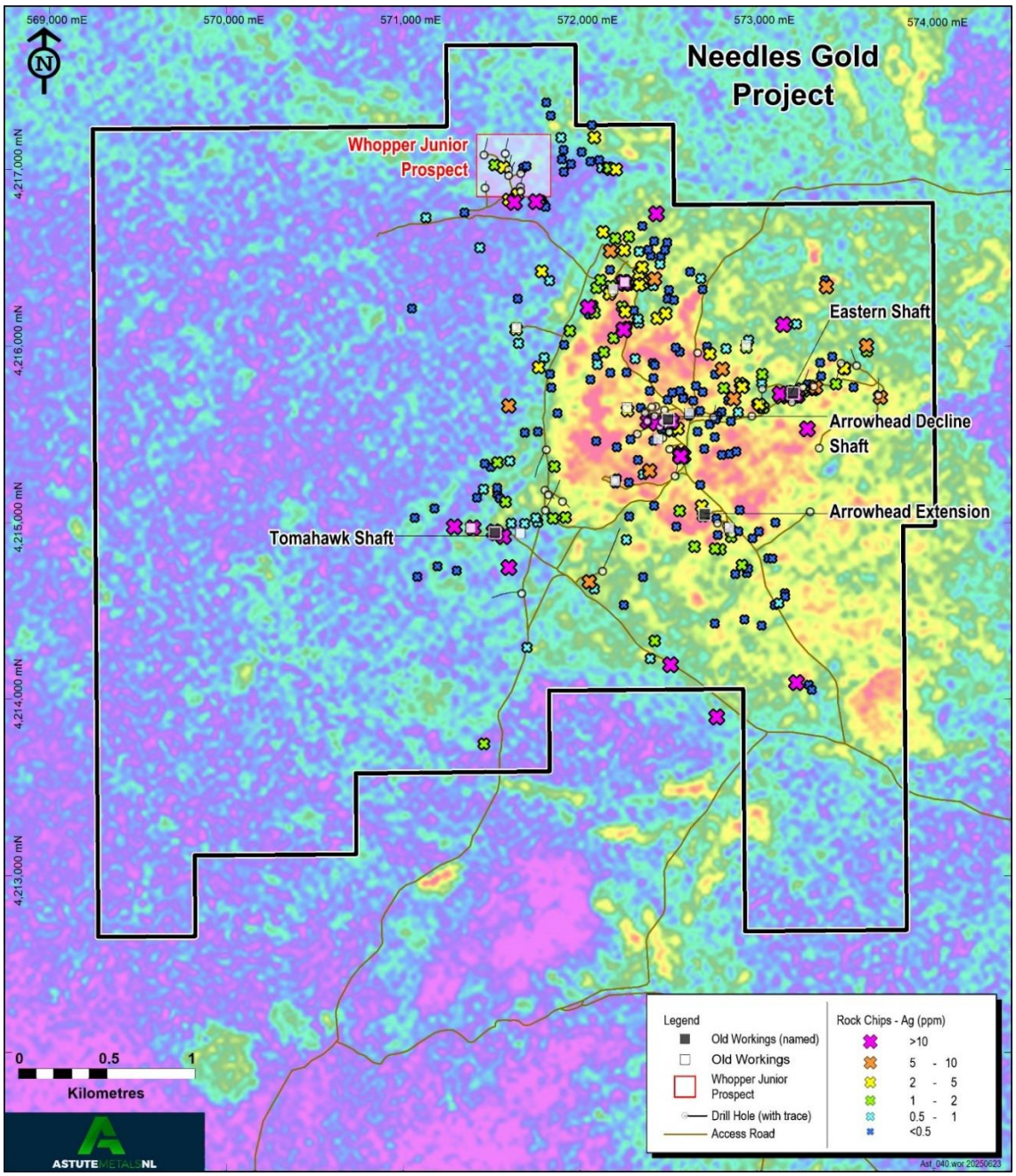

Figure 6. Needles Project rock chip sample silver geochemistry over ASTER kaolinite-alunite imagery

Point locations from the various sampling campaigns commonly sample the same veins in close proximity, due to different parties targeting the same outcropping zones of alteration and veining. Some samples have been taken from dumps of mineralised material that can be relatively distant from the source workings (e.g. samples ND-1 through ND-8).

Generally, the historical results have been corroborated with comparable results from rock chip sampling campaigns undertaken by the Company, providing confidence in historical data despite some shortcomings in record keeping. Rock chip geochemistry in gold and silver is typically elevated in trends of north-east oriented sampled veins and around historical workings.

The substantial rock chip sample geochemistry dataset provides an excellent record of the presence of gold and silver mineralisation at surface, and of the presence of pathfinder elements. Some spectacularly high grades results of up to 33g/t Au (Eastern Shaft) and 1,115g/t Ag (Arrowhead Mine dump). Trends in higher-grade samples tend to trace outcropping veins that have been sampled by the various parties, often near historical workings. Notable rock chip results include those from the Eastern Shaft, Tomahawk Shaft and Whopper Junior prospect areas.

Results - Eastern Shaft

A cluster of ten high-grade rock chips have been taken from outcrop and mineralised dumps proximal to the Eastern Shaft. These samples, which were collected in two campaigns by the Company, and by Barrick, range in grade from 1.4 –33.0g/t Au and 12.2 – 622g/t Ag (Figures 3 and 4). The prospect has been inadequately tested by drilling.

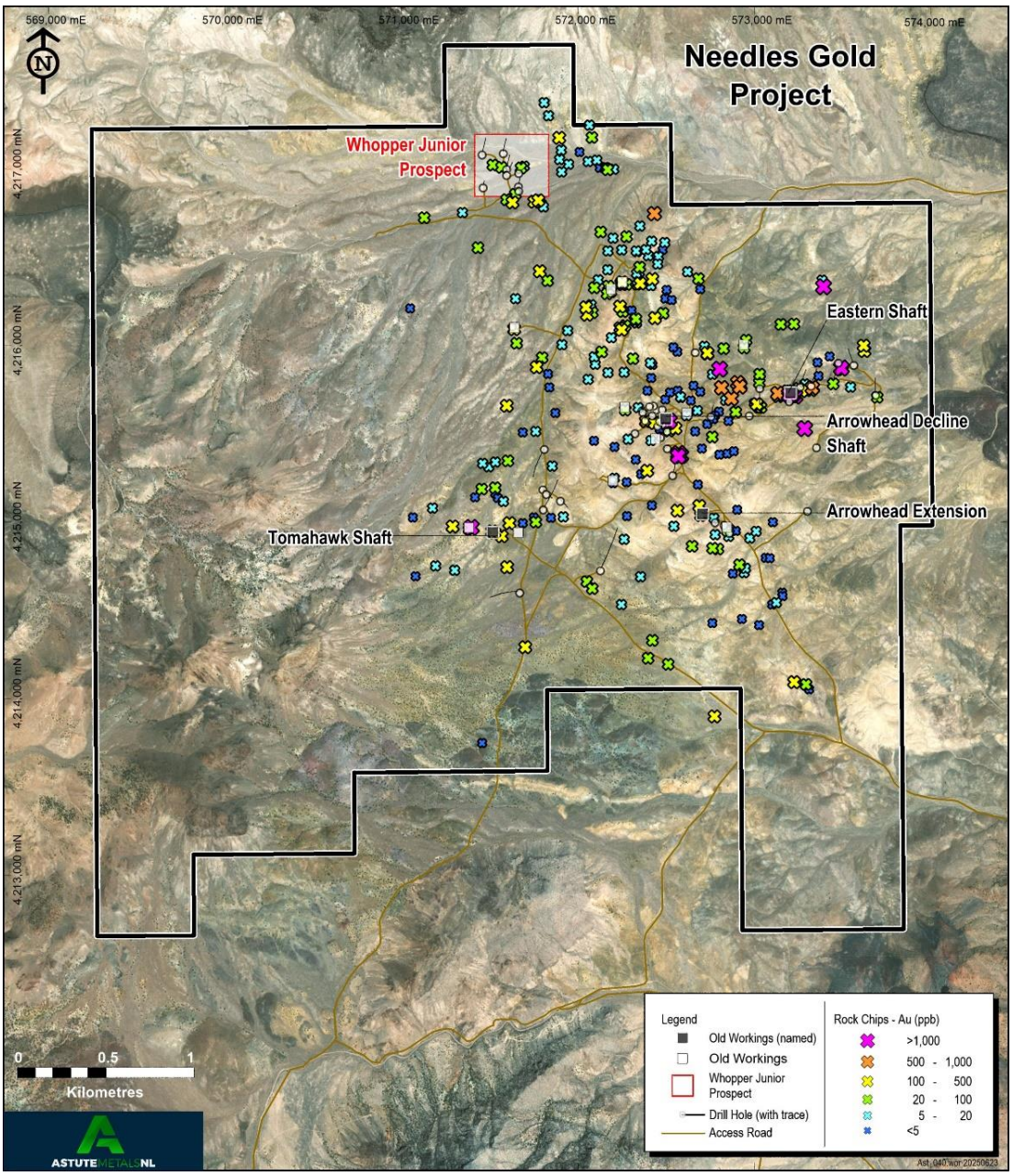

Figure 7. Needles Project rock chip sample gold geochemistry over aerial imagery

Results - Tomahawk Shaft
The Tomahawk Shaft area is defined by a ~200m east-west trend of high-grade rock chip samples and includes the main Tomahawk Shaft and another <15m deep historical mine shaft. Rock chips here were taken by the Company and Barrick, including dump samples from the Tomahawk Mine itself and, apart from a single low-grade sample of 17ppb Au and 0.4g/t Ag, the remaining five samples range from 0.31 – 5.54g/t Au and 10.6g/t – 406g/t Ag. No drill holes have tested these results.

Results - Whopper Junior Prospect
A total of 14 rock chip samples, collected by Taranis and the Company, from the Whopper Junior Prospect reveal trace to anomalous gold (up to 0.39g/t Au) and silver (up to 72g/t), but also elevated pathfinders such as arsenic (As, up to 4,800ppm), antimony (Sb, up to 87ppm) and mercury (Hg, up to 4ppm). Exploration drill results at Whopper Junior have reflected this same geochemistry, with elevated gold and silver and strong pathfinder geochemistry over broad zones.

Geophysical Surveys

Geophysical surveys undertaken at Needles have been tabulated below. No raw data has been located for the 2003 combined ground magnetic-VLF survey, nor the 2003-04 IP survey, both undertaken by Taranis, with only images locatable in historical data.

Results
The Taranis IP survey imagery identified elevated IP chargeability characteristics both west of the Arrowhead Mine and at the Whopper Junior prospect in the north of the project area. These observations were affirmed by the results of the 2021 IP survey (line locations in Figure 10), however in the recent survey the amplitude of chargeability was higher to the west of the Arrowhead Mine than that observed at the Whopper Junior prospect (Figures 8 and 9).

Figure 8 shows a 2D inversion of IP chargeability in line 5 from the 2021 Zonge survey. Moderate IP chargeability is observed at a number of mineralised locations: the Whopper Junior Prospect; Tomahawk Mine; beneath a shallow un-named historical shaft; and adjacent to two minor workings mid-project. The strongest IP chargeability anomaly identified from the survey was tested later that year with drilling intersecting mostly unmineralised pyritic andesite and pyritic andesite breccia.

Company	Year	Survey Type	Equipment	Comments
Taranis	2003	Ground magnetic	Scintrex ENVI Mag/VLF system	50ft readings on survey grid lines for 46.8 line km
Taranis	2003	VLF-Electromagnetics		Cutler Maine transmitting station (NAA-24.0 kHz)
Taranis	2003-04	Inductive Polarisation (IP)	Scintrix IPR12 Receiver. Dipole-dipole array	26 lines/21.99 line km. Line orientation varied but mostly north-south. Transmitter unknown.
Astro Resources	2018	Inductive Polarisation (IP)	Zonge model GDP-3224 multipurpose receiver and GGT-30 transmitter	Six-line/19.2 line km, north-south orientation
Astro Resources	2021	Inductive Polarisation (IP)		Ten-line/27.8 line km north-south orientation
Astro Resources	2021	Seismic survey	Seistronix EX-6 recording system and Sunfull 14 B geophones	Five-line /10.16 line km seismic reflection survey. United Service Alliance AF-450 hammer with 700lbs gas pressure. Hammer locations every 20ft between stations

Table 2. Needles geophysical surveys

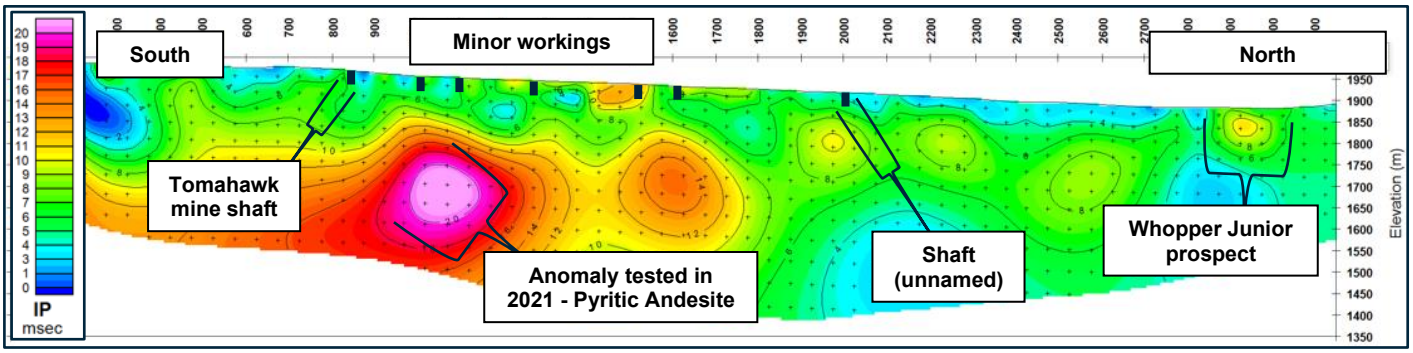

Figure 8. IP Chargeability 2D inversion, proximal historical workings and prospects (Line 5, 2021 Zonge Survey)

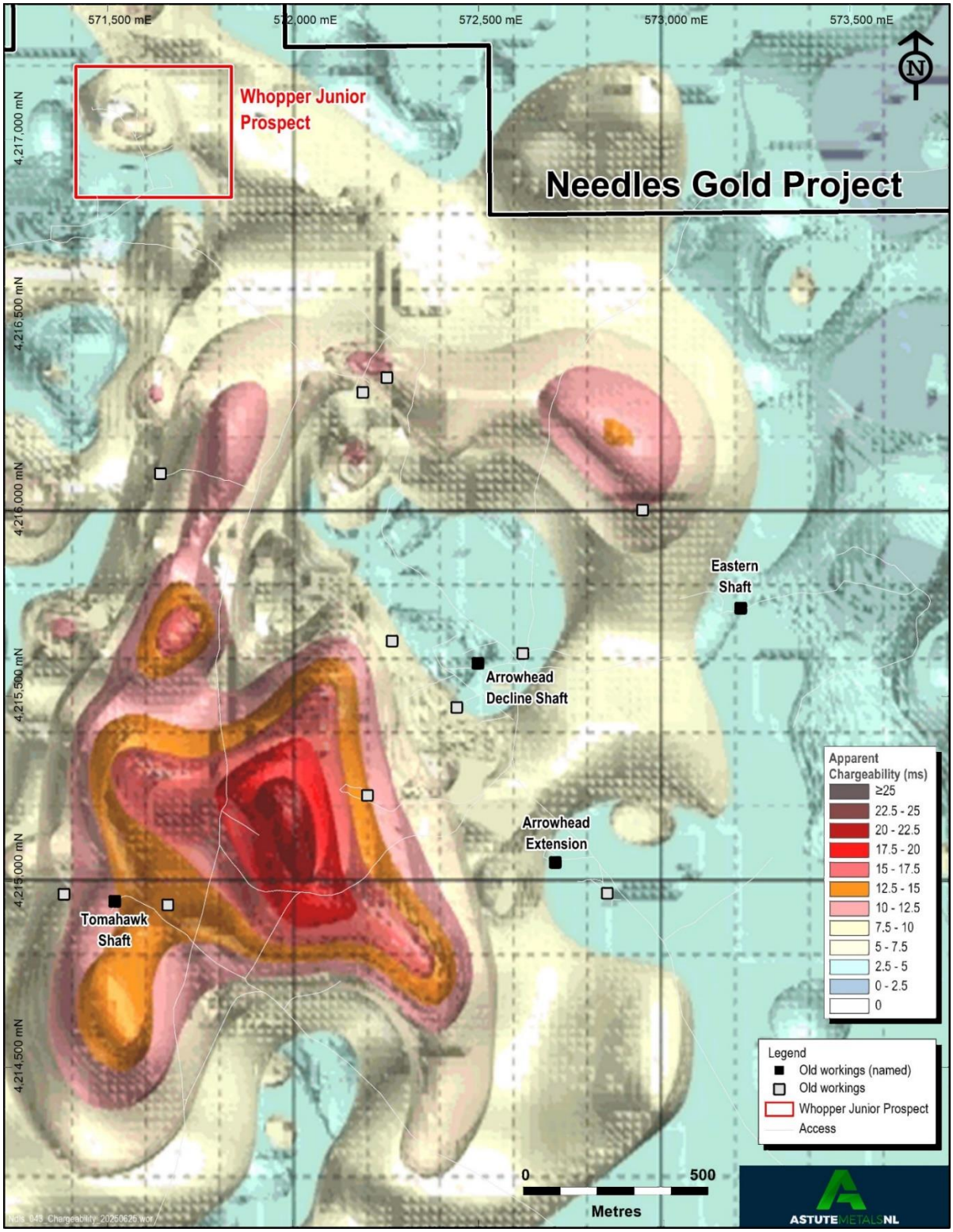

Figure 9. 2021 Zonge IP chargeability surfaces and main prospect areas

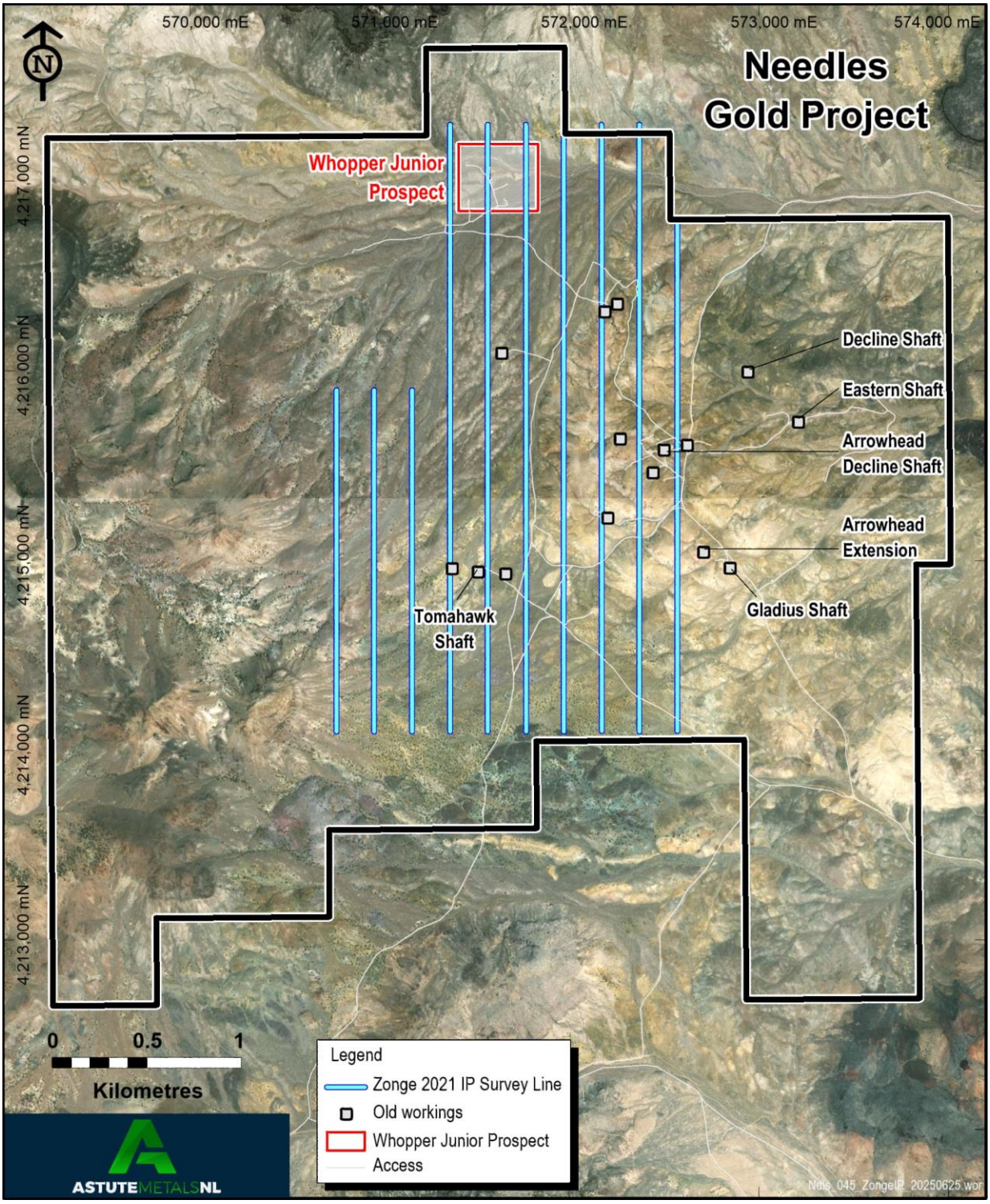

Figure 10. 2021 Zonge IP survey lines

Exploration Drilling

Exploration drilling at Needles has been conducted by three parties to date, mostly using diamond drilling methods with the exception of a single campaign of RC by Astro Resources in 2019. Drill collar locations for historical campaigns have been validated with aerial imagery. Drillhole orientation data has been located for all holes, including setup orientations and downhole surveys. Summary geological logging data is complete, however copies of original drill logs are missing for the Taranis and Excalibur drill campaigns. No data has been located for the Newcrest drilling in 2002/03.

The historical record for drill sample assays is also incomplete. Summary drill interval and assay spreadsheet contains assembled assay data for all the Taranis drill holes, however the ability to validate the assay results is limited due to a number of missing or corrupted lab assay files. Lab assay files that have been located have validated the corresponding assay data in the summary spreadsheets, providing a degree of confidence in the full data set. Assay data files have been located for 792 assay records (approximately 32%) of the 2,439 records that constitute the full drill sample assay spreadsheet.

Analytical methods employed for drill samples, by drilling campaign, are tabulated below. These methods are considered appropriate, particularly with respect to gold and silver. For multi-element analyses, two-acid digest is only partial for some other elements (e.g. Zr, Ti), and thus may underestimate the actual grades of these elements.

Results

Where gold and silver have been intersected at Needles, mineralisation has tended to be anomalous to low-grade in nature. Some holes however have intersected higher-grade mineralisation, typically associated with veins of mineralisation associated with historical workings. Intersections quoted here are limited to those for which a lab assay file has been located. Drill results at the Needles Project include the following, all drilled near to the historical Arrowhead Mine (Figure 11):

- Needles-63 intersected 3.42m @ 2.92g/t Au and 905g/t Ag from 25.54m
- Needles-28 intersected 6.5m @ 0.95g/t Au and 235g/t Ag from 26.2m
- Needles-27 intersected 1.4m @ 1.7g/t Au and 528g/t Ag from 31.2m
- Needles-11 intersected 1.6m @ 3.8g/t Au and 546g/t Ag from 17.6m
- Needles-7 intersected 6.1m @ 1.46g/t Au and 424g/t Ag from 26m

Tables of drill collar details and assay results for quoted intersections are provided in Appendix 2 and 3.

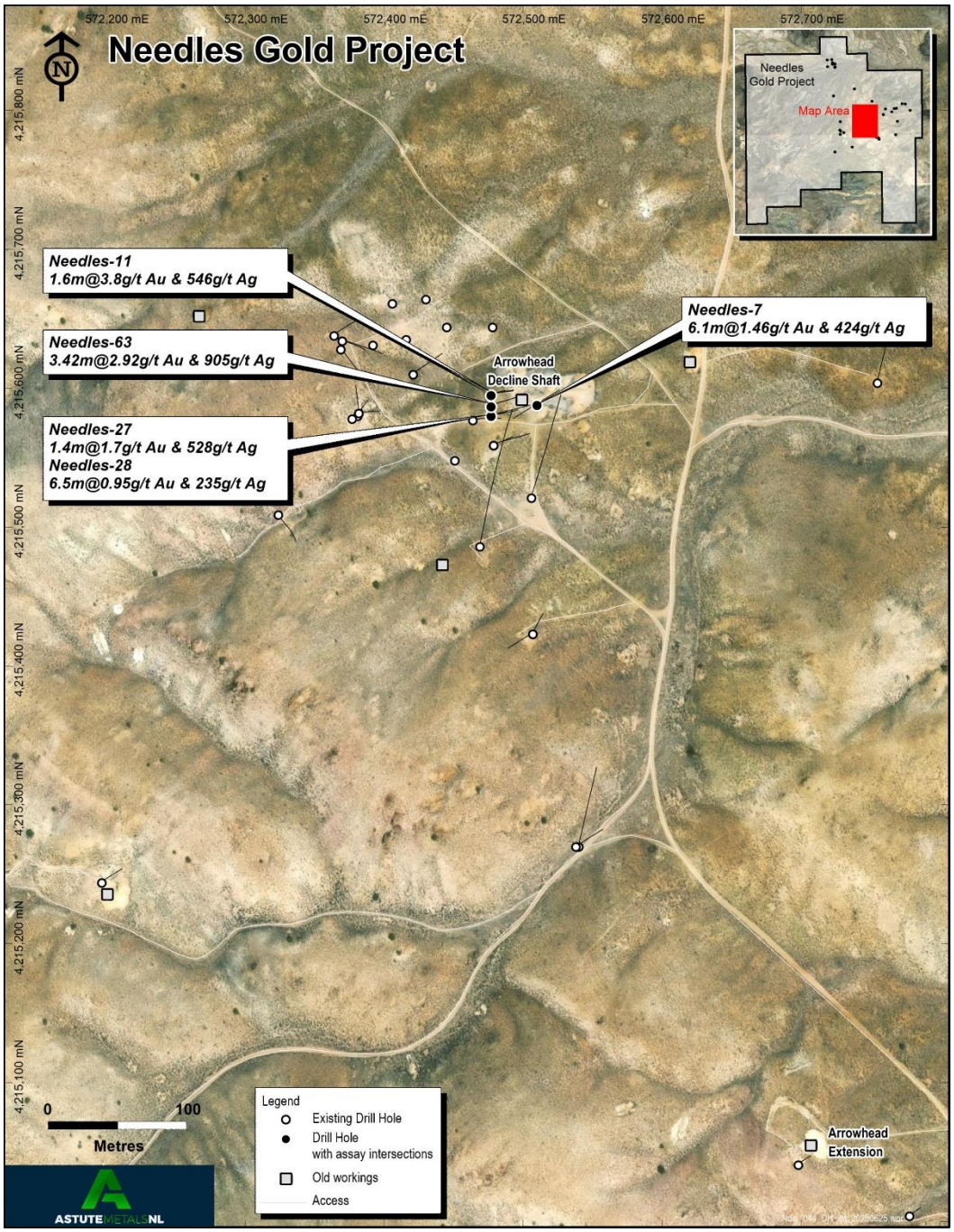

Figure 11. Arrowhead mine drill intersections and nearby historical workings

A number of drill holes are interpreted to have inadequately tested targets, either by being too shallowly drilled or poorly oriented with respect to the potential dip of mineralised structures.

Other notable results include the strongly anomalous presence of pathfinder elements arsenic, antimony and mercury at the Whopper Junior prospect (Needles-5 intersected 23.5m @ 3875ppm As, 36.7ppm Sb and 1.48ppm Hg). Arsenic and antimony are well-established pathfinder elements in epithermal gold-silver systems, and mercury is typically found above the gold-bearing zone, as its volatility causes its upward migration to the near surface where it is deposited. Arsenic, and to a lesser extent antimony, display anomalism in a number of drill holes across the project, however mercury is low in drill results across the whole project with the notable exception of the Whopper Junior prospect.

In 2021 under previous management, the Company undertook a 4-hole diamond drilling campaign targeting strong IP chargeability anomalies located southwest of the Arrowhead Mine. The holes intersected pyritic andesite and brecciated andesite in the vicinity of the IP chargeability highs, which were deemed to have caused the strong anomalies. Geochemical anomalism in pathfinder elements was observed in tuffs in the top 110m (As, Sb) of 21ND_001; between 10-57m (As, Sb, elevated Au) in 21ND_004; and in altered andesite breccia from 517-545m (As, Sb, elevated Au) in 21ND003. These results were announced previously between February and July 2022[4,5,6].

Company	Year	Drilling Completed	Assay Methods	Comments
Taranis	2003-06	NQ Diamond x 51 (3,016.4m)	Fire Assay Au and 2-acid ICP-AES. Gravimetric method for Ag >100g/t	Sampled to geological boundaries or up to 1.5m. No CRMs or Blanks employed
Excalibur	2006-08	NQ Diamond x 23 (1,589.3m)		No CRMs or Blanks employed
Astro Resources	2019	5.5" RC x 11 (1,932.5m)	Fire Assay Au and ICP-MS	Riffle split 5-foot samples. CRMs duplicates and blanks used
Astro Resources	2020-21	HQ Diamond x 4 (1,755.8m)	Fire Assay Au and ICP-MS	5-foot half-core sampling. CRMs and blanks used

Table 3. Needles drilling campaigns

Petrography

In 2005 petrographical work was conducted on 21 drill samples from drill holes Needles-1, Needles-11, Needles-20 and Needles-21, all of which were within the general vicinity of the Arrowhead Mine, and Needles-5, which was drilled at the Whopper Junior Prospect. Petrographical polished thin sections were generated from the drill samples, with observations made by transmitted and reflected light by Geoconsult.

Conclusions of the report include:

- Mineralised rocks in the sample suite are porphyritic rhyolites, rhyodacites and dacites
- Volcanic rocks are pervasively altered, with most of the primary minerals destroyed by secondary minerals, including sericite, clays, chalcedony and prismatic quartz.
- The rocks are generally sulphide-poor.
- The Needles prospect represents the upper part of a volcanic-hosted low-sulphidation epithermal system.
- The N-5 (Whopper Junior) samples differ from the remaining samples in the suite, comprising agglomerate and chaotic breccias which have been silicified, sericite-carbonate altered and pyritized.
- Carbonate and chalcedony at Whopper Junior decrease with depth, while sericite and pyrite increase with depth.

- **Figure 12.** Location of Needles Gold Project, and active Nevada gold mines.

Interpretation of Results

The review of previous exploration results at Needles has resulted in the following conclusions:

- The Needles Project clearly hosts a large 3x2km hydrothermal alteration system with epithermal gold-silver deposit characteristics.
- Alteration mineralogy at surface, geochemistry and petrological observations indicate that the current surface is relatively high, or in the 'cap' of the conceptual epithermal model.
- Most drilling undertaken at the project has been shallow, and therefore a significant prospective volume of rocks sits untested beneath the extents of much of the historical drilling.
- High-grade epithermal gold-silver veins persist to surface, and this style of mineralisation warrants further targeting, particularly in light of the shallow and sometimes ineffective historical drilling.
- There remains conceptual potential for disseminated-style mineralisation beneath the extents of historical drilling, if porous host rocks (such as weakly compacted tuff) are present and have been mineralised by hydrothermal fluids.

The conceptual cross-section in figure 1 shows the relevant geological features identified through existing exploration along with conceptual exploration targets the Project is prospective for.

The recent AngloGold Ashanti Silicon-Merlin discovery highlights the discovery potential in drilling beneath the high level 'cap' in epithermal systems. This project, which now contains over 16Moz, was optioned by Anglogold Ashanti in 2017 following their recognition of the geological features characteristic of an epithermal surface 'cap' and, following substantial exploration drilling, has since become one of the great exploration success stories of recent times.

The Company recognises similar high-level epithermal system features at Needles and that most drilling appears to have drilled within the 'cap' and not tested prospective zones below. An excellent opportunity exists to test both high-grade vein style mineralisation, as well as potential for disseminated style mineralisation at Needles.

Four near-term drill target areas have been identified through the review – the Arrowhead Mine, Eastern Shaft, Tomahawk Mine and the Whopper Junior Prospect. The former three are prospective for high-grade vein-type gold-silver mineralisation and have either been inadequately drill tested or not drill tested at all. The Whopper Junior prospect exhibits broad zones of pathfinder anomalism and alteration mineralogy beneath thin alluvial cover and directly above a zone of moderate IP chargeability. The sulphide poor nature of gold-silver mineralisation at Needles may indicate that mineralisation has lower chargeability characteristics than previous interpreted.

Next Steps

The review of historical data at Needles has indicated the absence of two fundamental exploration datasets – magnetic survey and a systematic soil sampling grid and associated assay data. While the Company has identified prospective targets that are effectively drill-ready, a prudent approach requires that these fundamental surveys are completed prior to exploration drilling, as the additional information will allow for more effective vectoring toward mineralisation.

The Company intends to conduct a magnetic survey and soil sampling campaign on the ground as soon as possible, with a view to using these results to refine initial targets for drilling in Q3 of 2025.

1 March 2010, Technical Report on the Needles Gold Silver Property Arrowhead Mining District Nye County, Nevada, MPH Consulting Limited
2 2000, Hendenquist, J.,, Exploration for Epithermal Gold Deposits, SEG Reviews Vol. 13, p245-277
3 ASX: ARO 1 Dec 2020 'Mapping results confirm Needles Project as a viable gold exploration project'
4 ASX: ARO 25 Feb 2022 'Drilling update assays for holes 21ND_001 and 21ND_002'
5 ASX: ARO 26 May 2022 'Drilling update assays for holes 21ND_003'
6 ASX: ARO 25 July 2022 'Drilling update assays for holes 21ND_004'
7 2016, Howell, S., Formation of disseminated epithermal gold ore at Round Mountain, GSA Annual Meeting in Denver, CO, USA - 2016
8 TSX: TFPM April 2025 Expanded Silicon 1% NSR Gold Royalty Acquisition
9 ASX: ARO 18 Dec 2017 'Update on Needles Exploration Project'
10 ASX: ARO 1 Dec 2020 'Mapping results confirm Needles as a viable exploration gold Project'

Authorisation

This announcement has been authorised for release by the Board of Astute.

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Competent Persons

The information in this report is based on information compiled by Mr. Matthew Healy, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy (AusIMM Member number 303597). Mr. Healy is a full-time employee of Astute Metals NL and is eligible to participate in a Loan Funded Share incentive plan of the Company. Mr. Healy has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr. Healy consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

APPENDIX 1 - JORC Code, 2012 Edition – Table 1

Section 1 - Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialisedindustry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheldXRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling. Include reference to measures taken to ensuresample representivity and the appropriate calibration of any measurement tools or systems used. Aspects of the determination of mineralisation thatare Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation 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, more explanation may be required, suchas where there is coarse gold that has inherentsampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	Taranis rock chips were collected on a 2-5kg basis using a hammer and chisel. Rock exposures and (mine) dump samples were collected as part of the campaigns. See Appendices for details. No details on sampling methods for the Barrick campaign of rock chips. Astro Resources rock chips and drilling previously announced incl. JORC Table 1 (see footnotes) Taranis & Excalibur drilling using NQ diamond methods and half-core sampling. .
Drilling techniques	Drill type (e.g. core, reverse circulation, open-holehammer, 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.).	NQ drilling methods employed by Taranis and Excalibur. HQ methods employed by Astro, which were previously announced.
Drill sample recovery	Method of recording and assessing core andchip sample recoveries and results assessed. Measures taken to maximise sample recoveryand ensure representative nature of the samples. Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gainof fine/coarse material.	No formal recovery records are available for the Taranis or Excalibur drilling. Poor drill core recovery is to be expected near surface as a function of rock weathering.
Logging	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. Whether logging is qualitative or quantitative innature. Core (or costean, channel, etc.) photography. The total length and percentage of the relevantintersections logged.	Drill core/percussion chips for the entire hole was logged for lithology by contract/staff geologists for the Taranis, Excalibur and Astro drilling campaigns Logging is mostly qualitative with some numerical estimates of notable minerals Photography of drill core was undertaken systematically for the Astro diamond holes

APPENDIX 1 - JORC Code, 2012 Edition – Table 1

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken. If non-core, whether riffled, tube sampled, rotarysplit, etc. and whether sampled wet or dry. For all sample types, the nature, quality and appropriateness of the sample preparationtechnique. Quality control procedures adopted for all sub-sampling stages to maximise representivityof samples. Measures taken to ensure that the sampling isrepresentative of the in-situ material collected,including for instance results for field duplicate/second-half sampling.	Taranis and Excalibur drill core was sampled to a mximum of 1.5m length or to geological boundaries. Drill core was marked up on site, and appears to have been half-cored off site. Astro Resources Drilling announced previously (see footnotes)
Quality of assay data and laboratory tests	Whether sample sizes are appropriate to the grain size of the material being sampled. The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial ortotal. For geophysical tools, spectrometers, handheldXRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc. 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 precisionhave been established.	Assay method detailss for rock chips and drill samples with associated comments tabulated in body text. Most assays were fire assay for gold, and four-acid and ICP-MS or ICP-OES finish. Some samples employed a 2-acid digest and ICP finish. Assay methods employed for historical work are appropriate, particularly for the main metals of interest – gold and silver. Some digests employed (esp. 2-acid) are partial in nature and therefore concentrations of some elements may be underestimated.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel. The use of twinned holes. Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. Discuss any adjustment to assay data.	Sample intervals were assigned a unique sample identification number prior to sample despatch. No duplicate sample IDs exist across historical explorers. Most historical exploration does not appear to have used CRMs and/or blanks for QAQC. While there are some apparent CRM results in historical assays, there is no record of QAQC details and/or assessment.
Location of data points	Accuracy and quality of surveys used to locatedrill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. Specification of the grid system used. Quality and adequacy of topographic control.	Drill collar and sample locations determined using hand-held GPS with location reported in either WGS84, NAD27 or NAD83 UTM Zone 11. Expected hole location accuracy of +/- 10m. Drill hole locations were validated by using aerial imagery, which indicated no issues. Downhole survey data collected for all holes with the exception of some vertical drill holes.

APPENDIX 1 - JORC Code, 2012 Edition – Table 1

Criteria	JORC Code explanation	Commentary
Data spacing and distribution	Data spacing for reporting of Exploration Results. Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the MineralResource and Ore Reserve estimation procedure(s) and classifications applied. Whether sample compositing has been applied.	Drill spacing is appropriate for early exploration purposes. Rock chip sampling is appropriate for exploration purposes. Geophysical IP data is at a suitable line spacing for reliable interpretations 1.5m sample intervals, or to geological boundaries where appropriate, widely adopted as standard practice in drilling in the USA.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. 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.	Typical mineralised structure orientations at Needles are east-northeast or north-northwest. There is some evidence of other orientations, which would not be unusual in an epithermal environment. Drill holes appear to have attempted to target structures at right angles
Sample security	The measures taken to ensure sample security.	Samples stored at secure yard and shed located in township of Currant until delivered by staff or contractors to the core processing contractors at Elko, and then to ALS lab at Elko, NV
Audits or reviews	The results of any audits or reviews of samplingtechniques and data.	Not applicable

APPENDIX 1 - JORC Code, 2012 Edition – Table 1

ASTUTEMETALSNL

Section 2 - Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	Red Mountain Claims held in 100% Astute subsidiary Needles Holdings Inc. Claims located on Federal (BLM) Land Drilling conducted on claims certified by the Bureau of Land Management (BLM)
Exploration done by other parties	Acknowledgment and appraisal of exploration byother parties.	No known previous lithium exploration conducted at Red Mountain Exploration conducted elsewhere in Nevada by other explorers referenced in announcement body text
Geology	Deposit type, geological setting and style of mineralisation.	The principal target deposit style is claystone hosted lithium mineralisation. Claystone hosted lithium deposits are thought to form as a result of the weathering of lithium-bearing volcanic glass within tertiary-aged tuffaceous lacustrine sediments of the mapped Ts3 unit. Lacustrine environments formed as a result of extensional tectonic regime that produced 'basin and range' topography observed across the stateof Nevada. Inputs of lithium from geothermal sources have also been proposed.
Drill hole Information	A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: ◦ easting and northing of the drill hole collar ◦ elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar ◦ dip and azimuth of the hole ◦ down hole length and interception depth ◦ hole length. 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.	Drillhole locations, orientations and drilled depths are tabulated in body report
Data aggregation methods	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. 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 some typical examples of such aggregations should be shownin detail. The assumptions used for any reporting of metal equivalent values should be clearly stated.	Intersections, where quoted are weighted by length. Lengths originally recorded in feet are quoted to the nearest 10cm. Rounding is conducted to 3 significant figures A 500ppm Li cut-off was used to quote headline intersections, with allowance for 10ft of internal dilution by lower grade material. Low grade mineralisation (300-500ppm Li) is present outside of the quoted intersections Intersections are quoted in both lithium ppm and as wt% Lithium Carbonate Equivalent (LCE). LCE is calculated as LCE = Li (ppm) x 5.323 / 10,000, as per industry conventions.

Section 2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results. If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. 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 notknown').	Insufficient information available due to early exploration status, although interpretation to date is that intersections in this hole approximate true width.
Diagrams	Appropriate maps and sections (with scales) andtabulations 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.	Included in ASX announcement
Balanced reporting	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.	This release describes all relevant information
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysicalsurvey 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.	This release describes all relevant information
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions orlarge-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Drill results demonstrate further work at the Red Mountain project is warranted.

APPENDIX 2 – Needles Drilling Sample Assay Table

ASTUTEMETALSNL

Hole ID	From (m)	To (m)	Au (g/t)	Ag (g/t)
Needles-7	26	27.3	388	428
Needles-7	27.3	28.2	90	43
Needles-7	28.2	28.9	3974	1249
Needles-7	28.9	29.8	1658	448
Needles-7	29.8	30.4	40	13
Needles-7	30.4	31	696	124
Needles-7	31	31.6	5020	912
Needles-7	31.6	32.1	1192	168
Needles-11	17.6	18.6	894	52
Needles-11	18.6	19.2	8640	1370
Needles-27	31.2	32.3	2114	653
Needles-27	32.3	32.6	204	71
Needles-28	26.2	26.7	7666	2053
Needles-28	26.7	27.3	860	225
Needles-28	27.3	27.7	1862	408
Needles-28	27.7	28.3	286	41
Needles-28	28.3	28.7	14	5
Needles-28	28.7	29.3	400	57
Needles-28	31.4	32.7	534	107
Needles-63	25.54	26.85	1928	967
Needles-63	26.85	27.74	1013	226
Needles-63	27.74	28.35	3386	1320
Needles-63	28.35	28.96	7380	1350

Hole ID	From (m)	To (m)	As (ppm)	Sb (ppm)	Hg (ppm)
Needles-5	44.1	44.4	82	0.90	0.28
Needles-5	44.4	45	104	1.00	0.34
Needles-5	45	45.5	73	1.00	0.21
Needles-5	45.5	45.6	241	3.40	0.16
Needles-5	45.6	46.5	308	2.70	0.77
Needles-5	46.5	47.4	131	2.10	0.39
Needles-5	47.4	47.9	196	1.90	0.67
Needles-5	47.9	48.4	148	1.90	0.55
Needles-5	48.4	48.8	28	0.60	0.10
Needles-5	48.8	49.3	264	2.20	0.87
Needles-5	49.3	50.1	376	3.20	1.18
Needles-5	50.1	50.3	2039	12.80	8.20
Needles-5	50.3	51.1	511	3.90	2.01
Needles-5	51.1	51.6	162	1.80	0.61
Needles-5	51.6	52.2	194	1.60	0.57
Needles-5	52.2	52.6	201	1.80	0.80
Needles-5	52.6	53.2	435	3.90	1.48
Needles-5	53.2	53.9	232	2.50	0.87
Needles-5	53.9	54.2	388	3.40	1.23
Needles-5	54.2	55.2	333	5.60	1.01
Needles-5	55.2	55.9	200	2.40	0.87
Needles-5	55.9	56.4	284	3.70	0.99
Needles-5	56.4	56.9	265	2.70	1.00
Needles-5	56.9	57.4	390	3.40	1.33
Needles-5	57.4	58	471	3.90	1.66
Needles-5	58	59	247	2.70	0.86
Needles-5	59	59.7	529	4.10	1.52
Needles-5	59.7	60.4	320	3.10	1.23
Needles-5	60.4	61.3	256	2.40	0.77
Needles-5	61.3	62.5	142	2.40	0.55
Needles-5	62.5	62.5	145	2.00	0.53
Needles-5	62.5	63.5	134	1.90	0.53
Needles-5	63.5	64	206	2.60	0.64
Needles-5	64	64.6	156	2.10	0.55
Needles-5	64.6	65.1	226	3.40	0.92
Needles-5	65.1	65.7	182	2.70	0.87
Needles-5	65.7	66.3	175	2.50	0.63
Needles-5	66.3	66.8	203	3.10	0.90
Needles-5	66.8	67.4	83	1.40	0.40
Needles-5	67.4	68.6	181	2.20	0.77
Needles-5	68.6	69	175	2.50	0.64
Needles-5	69	70	153	2.40	0.54
Needles-5	70	71	207	2.40	0.68
Needles-5	71	71.7	279	2.80	0.94
Needles-5	71.7	72.9	262	3.20	1.00

APPENDIX 2 – Needles Drilling Sample Assay Table

ASTUTEMETALSNL

Hole ID	From (m)	To (m)	As (ppm)	Sb (ppm)	Hg (ppm)
Needles-5	72.9	73.9	376	3.00	0.97
Needles-5	73.9	75.2	463	2.40	1.07
Needles-5	75.2	76.2	200	1.70	0.46
Needles-5	76.2	77.3	188	2.10	0.59
Needles-5	77.3	77.9	218	2.00	0.63
Needles-5	77.9	78.6	370	2.70	1.24
Needles-5	78.6	79.9	212	2.50	0.81
Needles-5	79.9	80.9	228	3.20	1.37
Needles-5	80.9	81.9	112	1.90	0.75
Needles-5	81.9	82.5	222	2.60	1.19
Needles-5	82.5	83.7	1060	10.50	1.16
Needles-5	83.7	84.6	1026	11.00	0.55
Needles-5	84.6	85.7	2624	20.80	0.92
Needles-5	85.7	86.7	3462	34.70	1.32
Needles-5	86.7	87.7	1222	7.60	0.94
Needles-5	87.7	88.9	1603	5.60	1.63
Needles-5	88.9	90.2	2680	20.10	0.70
Needles-5	90.2	90.7	2745	17.20	0.62
Needles-5	90.7	92.1	2096	17.10	0.62
Needles-5	92.1	93.1	4622	44.80	1.50
Needles-5	93.1	94.2	4185	44.40	1.08
Needles-5	94.2	95.2	6593	63.90	1.37
Needles-5	95.2	96.8	4482	36.10	1.71
Needles-5	96.8	98.1	5105	39.60	1.84
Needles-5	98.1	99.6	3932	40.00	1.71
Needles-5	99.6	100.8	3613	36.60	2.48
Needles-5	100.8	101.3	6322	58.00	2.57
Needles-5	101.3	102.4	4985	45.30	2.24
Needles-5	102.4	104.4	7831	87.90	2.38
Needles-5	104.4	106	4635	52.60	1.52
Needles-5	106	106.6	611	8.30	1.53

APPENDIX 3 – Needles Drilling Collar Details Table

ASTUTEMETALSNL

Hole ID	East_WGS84	North_WGS85	Elevation (m asl)	Depth (m)	Azi (°)	Dip (°)
Needles-1	572468.9	4215486.9	1921	197.1	11.0	-59.5
Needles-2	572505.9	4215521.9	1915	99.8	17.4	-39.8
Needles-3	571628.9	4216116.0	1911	32.8	133.5	-43.0
Needles-4	571628.9	4216116.0	1911	37.3	136.3	-66.0
Needles-5	571595.9	4217007.0	1878	106.6	14.0	-45.0
Needles-6	571664.9	4216984.0	1876	64.7	58.3	-55.0
Needles-7	572509.9	4215588.9	1915	35.1	238.0	-55.0
Needles-8	571802.9	4215190.9	1943	112.1	136.0	-45.9
Needles-9	571901.9	4215126.9	1946	81.7	136.0	-44.7
Needles-10	572476.9	4215595.9	1917	22.5	79.4	-42.3
Needles-11	572476.9	4215595.9	1917	32.8	81.1	-61.5
Needles-12	572369.9	4215634.9	1930	48.1	108.0	-49.9
Needles-13	572369.9	4215634.9	1930	55.4	114.0	-70.7
Needles-14	572420.9	4215610.9	1923	36.1	56.7	-45.1
Needles-15	572420.9	4215610.9	1923	37.3	56.5	-71.0
Needles-16	572420.9	4215610.9	1923	38.9	136.2	-88.4
Needles-17	572363.9	4215638.9	1931	35.9	57.8	-49.4
Needles-18	572368.9	4215628.9	1930	43.4	143.7	-49.4
Needles-19	572391.9	4215631.9	1926	28.0	206.4	-87.9
Needles-20	572415.9	4215635.9	1923	28.2	175.4	-89.2
Needles-21	572444.9	4215644.9	1918	28.2	266.3	-88.6
Needles-22	572477.9	4215644.9	1914	28.2	291.1	-86.8
Needles-23	572429.9	4215664.9	1920	22.1	138.0	-87.7
Needles-24	572405.9	4215661.9	1923	37.3	239.2	-88.3
Needles-25	572476.9	4215595.9	1917	32.8	76.8	-70.3
Needles-26	572476.9	4215595.9	1917	52.7	278.6	-89.2
Needles-27	572476.9	4215580.9	1917	52.6	76.7	-44.6
Needles-28	572476.9	4215580.9	1917	40.3	83.0	-60.0
Needles-29	572476.9	4215580.9	1917	45.1	80.5	-71.5
Needles-30	572476.9	4215580.9	1917	47.0	116.7	-85.4
Needles-31	572478.9	4215559.9	1916	39.0	73.8	-45.5
Needles-32	572478.9	4215559.9	1916	42.0	73.6	-59.7
Needles-33	572478.9	4215559.9	1916	48.1	71.8	-71.7
Needles-34	572478.9	4215559.9	1916	64.0	287.6	-88.1
Needles-35	572450.9	4215548.9	1920	96.3	262.3	-89.1
Needles-36	572509.9	4215588.9	1915	35.6	13.0	-90.0
Needles-37	572509.9	4215588.9	1915	33.4	58.0	-55.0
Needles-38	572381.9	4215582.9	1930	18.4	38.0	-55.0
Needles-39	572381.9	4215582.9	1930	19.8	38.0	-65.0
Needles-40	572381.9	4215582.9	1930	25.1	38.0	-85.0
Needles-41	572381.9	4215582.9	1930	27.6	353.0	-45.0
Needles-42	572380.9	4215580.9	1930	29.8	38.0	-80.0
Needles-43	572376.9	4215578.9	1931	33.5	38.0	-80.0
Needles-44	572381.9	4215582.9	1930	20.6	88.0	-45.0

APPENDIX 3 – Needles Drilling Collar Details Table

ASTUTEMETALSNL

Hole ID	East_WGS84	North_WGS85	Elevation (m asl)	Depth (m)	Azi (°)	Dip (°)
Needles-45	571463.9	4216902.0	1884	100.5	13.0	-70.0
Needles-46	571457.9	4217088.0	1881	159.4	13.0	-55.0
Needles-47	571595.9	4217007.0	1878	135.0	13.0	-60.0
Needles-48	571576.9	4217097.0	1877	139.9	13.0	-55.0
Needles-49	571802.9	4215190.9	1943	30.8	133.0	-65.0
Needles-50	571802.9	4215190.9	1943	30.3	133.0	-85.0
Needles-51	572323.9	4215509.9	1945	327.4	157.0	-85.0
Needles-52	572463.9	4215577.9	1918	40.5	88.0	-60.0
Needles-53	571821.9	4215163.9	1943	35.5	316.0	-45.0
Needles-54	572841.9	4214970.9	1911	58.5	58.0	-80.0
Needles-55	572777.9	4215004.9	1914	55.8	58.0	-80.0
Needles-56	572538.9	4215270.9	1922	64.0	58.0	-70.0
Needles-57	572697.9	4215041.9	1924	61.9	58.0	-80.0
Needles-58	572828.9	4214988.9	1912	57.2	13.0	-90.0
Needles-59	572858.9	4214942.9	1908	56.0	58.0	-80.0
Needles-60	572196.9	4215244.9	1946	100.7	58.0	-80.0
Needles-61	572476.9	4215587.9	1917	26.0	73.0	-45.0
Needles-62	572476.9	4215587.9	1917	29.1	73.0	-60.0
Needles-63	572476.9	4215587.9	1917	33.3	73.0	-75.0
Needles-64	572476.9	4215587.9	1917	54.3	360.0	-90.0
Needles-65	572754.9	4215604.9	1895	87.8	13.0	-45.0
Needles-66	572539.9	4215270.9	1922	81.6	13.0	-45.0
Needles-67	572537.9	4215270.9	1922	61.3	13.0	-90.0
Needles-68	572506.9	4215423.9	1923	61.3	238.0	-70.0
Needles-69	572187.9	4216306.0	1897	51.2	28.0	-70.0
Needles-70	572506.9	4215423.9	1923	60.6	28.0	-75.0
Needles-71	571595.9	4216972.0	1879	151.8	28.0	-60.0
Needles-72	571665.9	4216884.0	1876	55.4	13.0	-60.0
Needles-72A	571662.9	4216907.0	1876	152.4	13.0	-70.0
Needles-73	571665.9	4216884.0	1876	153.3	360.0	-90.0
NRC001	572666.0	4215968.0	1902	140.2	360.0	-90.0
NRC002	572971.0	4215610.0	1892	182.9	360.0	-90.0
NRC003	573031.0	4215765.0	1889	198.1	180.0	-60.0
NRC004	573199.0	4215690.0	1880	141.7	320.0	-60.0
NRC005	573260.0	4215772.0	1886	195.1	20.0	-60.0
NRC006	573322.0	4215778.0	1883	195.1	20.0	-60.0
NRC007	573477.0	4215909.0	1852	195.1	195.0	-60.0
NRC008	573564.0	4215896.0	1858	189.0	340.0	-60.0
NRC009	573688.0	4215727.0	1859	176.8	0.0	-60.0
NRC010	573353.0	4215429.0	1872	182.9	0.0	-90.0
NRC011	573302.0	4215070.0	1882	135.6	0.0	-90.0
21ND_001	571805.0	4215077.0	1955	383.7	33.5	-59.4
21ND_002	571809.0	4215420.0	1943	464.8	205.4	-65.6
21ND_003	572128.0	4214732.0	1971	500.0	28.0	-58.7
21ND_004A	571670.0	4214606.0	1974	407.2	269.9	-61.0

APPENDIX 4 – Needles Rock Chip Sample Table

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
5201	Astro 2020	572403	4216527	0.007	<0.2	silic s comp-weld tuf tuff, no qz phenos, wispy lt gray silica flooding, tr py, tr qz vnlts to 2mm
5202	Astro 2020	572496	4216602	0.007	<0.2	st welded and compacted tuff, no qztz phenos, 1% dis py and py pseudos, 1mm qtz vnlts
5203	Astro 2020	572460	4216521	0.008	0.20	st weled tuff, crusts of goethite 1cm thick in clay alt rk, minor silicification
5204	Astro 2020	572456	4216479	0.015	0.60	mod comp-weld rhy tuff; select sample from 2 cm wide goethite coated joint
5205	Astro 2020	572338	4216550	0.01	0.60	wkly silic bleached (sericite and clay) qtz pheno bearing tuff, select goethite frac coatings
5206	Astro 2020	572278	4216636	0.022	1.20	select comb quartz and clear masses of crystalline qtz matrix breccia, minor py, scoradite?
5207	Astro 2020	572355	4216694	0.009	0.20	st silicified tuff, white and clear qtz vnlts
5208	Astro 2020	572251	4216560	0.015	3.30	crudely banded gray and white qtz vn, gray qtz vnlts cut white qtz, st goethite + jarosite
5209	Astro 2020	572423	4216395	0.13	9.00	st silic tuff w/ 15-20% gray qz vnlts and fillings, qtz supported fault breccia
5210	Astro 2020	572354	4216370	0.314	2.40	mod silic st weld tuff, st goethite, select breccia pieces cemented by 5% qtz
5211	Astro 2020	572256	4216364	0.045	2.00	strongly broken brecciated qtz matrix breccia, cemented w/ white late stage qtz, 2 events
5212	Astro 2020	572188	4216323	0.02	0.40	select silic goethite stained tuff w/ minor qtz fillings and massive gray qtz, tr scoradite?
5213	Astro 2020	572085	4216204	0.045	1.60	silicified rhyolite rib, tr py, mod goethite, tr apple grn stain Ag?
5214	Astro 2020	572314	4215944	0.057	0.60	select goethite stained sheeted pieces from unexposed structures
5215	Astro 2020	572174	4215864	0.007	0.20	strongly alt rhyolite (sericite?) silica flooded w/ 2% py pseudos
5216	Astro 2020	572266	4215865	0.011	<0.2	strongly alt rhyolite, opaline silica vnlts
5217	Astro 2020	572414	4215919	0.012	0.40	wkly altered rhyolite, mninor opaline silica fillings in voids
5218	Astro 2020	572585	4215727	0.008	<0.2	5m wide zone, select goethite stained pieces, white al rhyolite, opaline silica and gray qtz
5219	Astro 2020	572620	4215620	0.006	0.40	Rusty rhyolite tuff and minor qtz vn, select from less mineralized dump,
5220	Astro 2020	572521	4215534	0.05	1.30	40cm zone of MnOx stained fracture zone w/ clear qtz vnlts cut by miro comb qtz fillings
5221	Astro 2020	572554	4215550	0.112	2.10	strongly alterted mod goethite stained rhyolite, minor opaline silica, 60cm wide zone
5222	Astro 2020	572465	4215544	0	0.30	fract 1m wide w 20 cm vein, rusty st goethite stained tuff frags cemented by micro xtaline qtz, tr grn Ag stain?
5223	Astro 2020	572417	4215480	0.012	0.40	10 or 12 rusty sructues in silic outcrop of rhyolite, silicified goethite zones 1-10cm, minor grn dendritic mineral
5224	Astro 2020	572330	4215370	<0.005	<0.2	select MnOx stained fractures across 10m zone, rib of silic rhyolite
5225	Astro 2020	572209	4215442	<0.005	<0.2	mod welded non qz pheno bearing tuff, st goethite, 10m shaft
5226	Astro 2020	572288	4215487	0.007	0.30	Rusty boulders of fault breccia cemented by opaline silica and mior gray fg qtz, unseen in outcrop or float
5227	Astro 2020	572388	4215589	0.183	66.60	30cm zone of breccia, rholite frags cemented by 30% quartz, vnlts and fillings, abundant micro-comb qtz
5228	Astro 2020	572510	4215586	1.35	405.00	hi-grade portion of dump? Quartz vn, alterd wall rk breccia, 5% py, minor vnlts of late gray qtz w/ py, scoradite?
5229	Astro 2020	572510	4215592	0.013	0.60	best looking core on dump; strongly altered white welded tuff w/ 5% py, Nearby box lids N58 and N59
5230	Astro 2020	572270	4215652	0.028	4.20	20' decline, rhyolite tuff, select qtz suported breccia, late qtz vnlts to 1cm, MnOx stains,

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
5231	Astro 2020	572504	4215590	<0.005	0.70	67' core block nearby, Nearby box lids N58 and N59, friable ground up breccia of qtz and alt wall rk
5232	Astro 2020	572770	4215599	<0.005	<0.2	strongly altered rhyolite, contact of darkcolored less altered intrusive w/ qtz phenos
5233	Astro 2020	572695	4215756	<0.005	<0.2	rhyolite, liesingang banded, goethite stained
5234	Astro 2020	572764	4215500	0.03	0.40	ground up rhyolite, gopssanous fault breccia, tr qz fragments
5235	Astro 2020	572307	4216217	<0.005	<0.2	goethite stained clay algterd quartz bearihng tuff, wispy siulica vnlts and replacements, st comp-weld
5236	Astro 2020	571764	4215018	0.032	0.50	st alt rhyolite, small pieces of st goethite stained tuff coated and veined by opaline silica and 1.5 cm qtz xtals
5237	Astro 2020	571570	4214939	0.307	10.60	rusty small pieces of silic tuff, dark gray silica groundmass w/ dis py, minor apple grn stains Ag?
5238	Astro 2020	571528	4214960	0.33	88.80	Lobe of dump with unox gray fg qtz chunks to 20cm, tr py, lt jarosite
5239	Astro 2020	571516	4214965	0.381	66.20	Another lobe of dump similar to 5238, less weakly developed though
5240	Astro 2020	571305	4214744	0.006	<0.2	rhyolite tuff, minor gray qyz vnlts and mod to strong goethite
5241	Astro 2020	571196	4214769	0.005	0.30	goethite stained float, st welded tuff, wkly silicified, lt gray silica flooding wkly developed
5242	Astro 2020	571083	4214709	<0.005	<0.2	rusty float chips in train N80E, minor gray silica vnlts
5243	Astro 2020	571067	4215043	<0.005	<0.2	same as 5242 but N20E
5244	Astro 2020	571179	4215096	0.006	0.20	st argilized felsite, either dike or non qtz pheno bearing tuff, laced with goethite stained high angle fracs
5245	Astro 2020	571921	4215046	0.008	1.70	Altered tuff with crusts of goethite coated fractures with silicified selvage
5246	Astro 2020	571382	4214975	0.017	0.40	silicified breccia cemented w/ goethite and drusy qtz, conspiucuous brn-grn stain, scoradite?
5247	Astro 2020	571398	4214987	5.54	406.00	same as 5246, continuation of shaft structue
5248	Astro 2020	572850	4214969	0.022	0.40	Black MnOx breccia, multi stage qtz and opaline fillings, light gray silica-py zones along compaction planes
5249	Astro 2020	572854	4214973	0.007	0.30	Intensely altered rhyolite with total texture destruction, light gray zones of silica flooding and micro st wks
5250	Astro 2020	572857	4214937	0.016	1.00	silicified rhyolite in rib; lt gray silica flooded zones
5251	Astro 2020	572782	4214946	0.006	0.20	rhyolite , st goethite, laced with silica and quartz coatings on fracs
5252	Astro 2020	572946	4214731	0.019	0.20	fine grained tuff, no qtz phenos, hazy silica flooded zones, silica vnlts, mod goethite
5253	Astro 2020	572764	4214445	<0.005	<0.2	goethite stained rhyolite, wkly altered, argillic
5254	Astro 2020	572906	4215087	<0.005	<0.2	non quartz bearing tuff, laced w/ minor fg, lt gray silica-py vnlts
5255	Astro 2020	572774	4215040	0.005	<0.2	strongly welded tuff, st argillic, silica vnlts follow compaction planes
5256	Astro 2020	572697	4215055	0.039	1.20	select lt gray and clear qtz vn, silicified wall rk frags, st goethite, vuggy
5257	Astro 2020	572567	4215083	0.106	1.30	10cm lenses of qtz-breccia in joints in rhyolite tuff
5258	Astro 2020	572203	4215237	<0.005	<0.2	mod goethite stained wkly altered rhyolite, Not much mineralization on dump
5259	Astro 2020	572210	4215266	0.005	0.20	10 cm qtz vn in silic rhyolite with v strong goethite
5260	Astro 2020	572422	4215112	<0.005	<0.2	2-5cm FeOx stained joints w/ strong goethite and silica selvages in alt rhyolite

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
5261	Astro 2020	572689	4215109	0.117	2.00	10cm joints filled w/ broken silic wall rk fragments + 5% fg silica vnlts and fillings
5262	Astro 2020	572083	4217197	0.063	2.70	silicified rhyolite ash flow tuff, 2% dis py, lt gray quartz vnlts and fillings,
5263	Astro 2020	572068	4217266	0.006	0.40	silicified olive gray sugary quartz breccia w/ silic wall rk fragments, scoradite?
5264	Astro 2020	571812	4217393	0.011	0.30	strongly clay altered (kaolinite?) rhyolite tuff, st goethite, fractures filled w/ chalcedony
5265	Astro 2020	571837	4217320	0.007	<0.2	silicified tuff, white opaline-chalcedony replaced phenocryst cavities and fractures
5266	Astro 2020	571520	4217041	0.047	1.90	gossanous quartz vn, alt wall rk fragments, white crystalline qtz, broken and rehealed
5267	Astro 2020	571570	4217028	0.028	4.30	local bounlders, massive white and lt gray qtz, gray qtz w/ fg py
5268	Astro 2020	571680	4217025	0.02	0.20	lightly welded, lightly compacted rhyolite tuff, wkly silicified, clay altered, near qtz vn
5269	Astro 2020	571700	4217034	0.018	0.20	from prominent qz vn, grossly banded white and gray, qtz after calcite, brecciated in places
5270	Astro 2020	572132	4216662	0.025	2.10	silicified rhyolite rib, fractured and stained w/ mod goethite and minor silica vnlts
5271	Astro 2020	571052	4216228	<0.005	<0.2	Goethite stained lightly compacted, wkly welded rhyolite tuff
5272	Astro 2020	571132	4216742	0.03	0.90	wkly compacted mod welded tuff, st hematite and goethite in breccia zones
5273	Astro 2020	571349	4216770	0.008	<0.2	wkly compacted tuff, strong clay aleration, altered zone > 15m wide,
5274	Astro 2020	572626	4216436	0.015	0.40	select zone of crusty goethite coatings abnd silica flooded vnlts, minor gray qtz, tr py
5275	Astro 2020	572687	4216397	0.066	0.50	25 cm boulder quartz in prospect, vuggy white crystaline, posible pink k-spar, wk goethite
5276	Astro 2020	571599	4215677	0.103	8.60	select small pieces of lt welded tuff, minor vnlts of chalcedony
5277	Astro 2020	571640	4216111	0.137	4.90	lightly compact, wk welded tuff, white, clay altered, breccia suported by lt gray silica-py vnlts
5278	Astro 2020	571655	4216031	0.02	0.90	wk compact-weld tuff; silica flooded, lt gray vitreaous zones in white alt wall rk
5279	Astro 2020	571801	4215949	0.053	0.70	rusty siliceous zone in wk compact-weld tuff; nearby collapse block of non qz bearing tuff
5280	Astro 2020	571764	4215530	0.006	<0.2	mod compact-weld tuff, mod goethite stain, adjacent to 30cm calcite vn
5281	Astro 2020	571533	4215178	<0.005	<0.2	mod compact-weld tuff, abund white opaque and clear qtz fillings
5282	Astro 2020	571533	4215212	0.08	0.20	strongly altered, silicified and bleached , st compacted, mod welded, 20cm zone st shearing
5283	Astro 2020	571497	4215330	0.012	0.40	50 cm zone in mod compact-weld tuff, mod silicified, mod strong goethite
5284	Astro 2020	571463	4215349	0.005	<0.2	silic rhyolite tuff, dark, strong goethite, no qtz vn, minor pieces of gossan included
5285	Astro 2020	571606	4215365	0.022	0.60	White strongly clay altered rhy w/ strong goethite, fracs coated w/ drusy qtz coated w/ goethite
5286	Astro 2020	571703	4214310	0.126	0.80	Rusty roadbed, mod goethite-hematite stined st weld tuff w/ minor qtz xtals on fracs
5287	Astro 2020	572401	4214246	0.062	0.80	lightly bleacheed crowded porphyry, intrusive?, silicified, sgrongly altered, minor gry qtz vnlts,
5288	Astro 2020	572840	4215708	0.006	<0.2	strongly welded tuff, goethite stained joints w/ drusy qtz coatings
5289	Astro 2020	572920	4215798	0.267	1.90	tuff, minor silica selvages, scoradite stains (grn-brn)?
5290	Astro 2020	572807	4215885	1.105	5.40	mod comp-weld rhyolite tuff, silica flooded, sample is mostly gossan w/ some alt wall rk

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
5291	Astro 2020	572944	4216007	0.014	1.30	isolated 35X25cm chunk of gray suggary qtz vn, minor breccia class of gray translucent qtz
5292	Astro 2020	573212	4215739	1.435	46.80	typical dump, small FeOx stained pieces if st silicified tuff
5293	Astro 2020	573029	4215667	0.048	1.20	30cm zone of st altered tuff w/ strong goethite
5294	Astro 2020	572736	4215972	0.321	2.00	Intersection of 2 structures, silic tuff w/ gossan @ intersection
5295	Astro 2020	573228	4216140	0.064	0.60	Qtz outcrop and boulders of white qtz cut by gray py bearing qtz vnlts, brecciated
5296	Astro 2020	573395	4216352	1.16	6.00	st altered tuff in pit, select silic tuff W 20% white qtz cut by gray qtz vnlts
5297	Astro 2020	573388	4216388	0.009	0.40	1m wide outcrop of massive white and light gray crudely banded qz vn
AR-1	Taranis 2002	572585	4215396	5.98	681.00	Vuggy qtz. Vein material from main Arrowhead dump, pyrite +aspyrite? In aggregatres with associated abundant green\yellow feox.
AR-2	Taranis 2002	572574	4215407	2.09	371.00	Same as AR-1
ARW-1	Taranis 2002	571600	4214763	0.435	30.60	Silicified volcanics, with cross-cutting qtz veinlets. Fg., dark grey sulfides? in matrix. From Tomahawk shaft.
ARW-2	Taranis 2002	571548	4215153	<0.005	<0.2	Andesite, grey\green, weakly silicifed (?), with cross-cutting feox veinlets. From shaft.
ARW-3	Taranis 2002	571582	4215135	0.01	1.00	Volcanics, bleached, with strong brown feox veinlets cross-cutting rock matrix. Weakly brecciated. From pospect pit.
ARW-4	Taranis 2002	572053	4214680	0.025	8.00	Bleached volcanics, sample from iron oxide veins striking 315 AZ, dipping 60 degrees northeast, in outcrop.
AW-01	Taranis 2002	572805	4215400	<0.005	<0.2	Volcanic, intense FeOx alteration, coarse phenocrysts, NE of old Arrow Mine
AW-02	Taranis 2002	572850	4215404	<0.005	0.20	Very distinctive grey colored marble? - epithermal calcite vein. Old pit with intense FeOx in volcanics (calcite/barite?) - vein crosscut by small volcanic str's and dykes 1 cm wide.
AW-03	Taranis 2002	572887	4215418	<0.005	<0.2	Volcanic outcrop w intense FeOx fractures, Generally N-S trend, but very erratic. Leisengangue textures
AW-04	Taranis 2002	573288	4215548	6.42	101.00	Old vertical 80 degree inclined inclined shaft w dump, silicified volcanic, FeOx grey color, ~1,000 ton dump, lots of grey qtz stringers, 75, 55SW strike of veins in shaft
AW-05	Taranis 2002	573030	4215807	0.025	0.60	Old vertical shaft, felsic cg. Fragmental volcanic unit w bdt FeOx. Also banded calcite vein striking generally E-W. Local coarse calcite/ankerite and also chalcedonic grey qtz veins (Bx)
AW-06	Taranis 2002	573032	4215856	0.05	1.00	Small blasted pit 5' deep, white cg. Lithic volcanic w abd't FeOx, not very exciting
AW-07	Taranis 2002	572908	4215807	0.585	1.80	FeOx altered volcanics, bleached white with intense clay altered matrix, FeOx in fractures generally N-S
AW-08	Taranis 2002	572816	4215778	0.845	1.60	Old pit 12' deep, previously sampled with tags "6806" and A-57842" - banded ankerite vein - calcite in volcanics, vein almost 1' wide - 50% FeOx calcite/50% barren vein - vein vertical, strking NW?
AW-09	Taranis 2002	572767	4215855	0.01	<0.2	Old pit, 5' deep in bleached white volcanic. FeOx in fractures trending NNW, dipping 80 degrees to the East approx.

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ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
AW-10	Taranis 2002	572706	4215433	<0.005	<0.2	Old shaft, ~ 50 deep w ~ 300 tons of rock around it. Cg. White, lithic tuff w abd't FeOx, 2% f.g. pyrite, siclicified. Sample is FeOx fines in the dump.
AW-11	Taranis 2002	572668	4215530	<0.005	<0.2	Shaft ~ 50' deep, in white altered volcanics, bleched with abd't FeOx - green tinge
AW-12	Taranis 2002	572735	4215572	<0.005	<0.2	Pronounced FeOx weathering outcrop, NE-striking fracture w abd't FeOx, vertical dip - extends SW to Arrow Mine
AW-13	Taranis 2002	572658	4215790	<0.005	<0.2	Old trench, 30' long, 5' deep, FeOx volcanics - abd't clay alteration - nothing spectacular
AW-14	Taranis 2002	572497	4215712	<0.005	<0.2	White-grey volcanic with FeOx alteration - Pit 12' long, 5' deep, silicified along joint surfaces, crystalline, minor yellow color
AW-15	Taranis 2002	572397	4215762	<0.005	<0.2	Trench 10' long, 5' deep, white, clay altered volcanic w abdt FeOx and yellow color. Groundmass silicified, qtz eyes
AW-16	Taranis 2002	572346	4215665	0.005	0.40	Old pit trending NE, white bleached volcanic w abd't FeOx - weak yellow tinge, slicified grounmass
AW-17	Taranis 2002	572417	4215833	<0.005	<0.2	Trench along side of hill trending NNE, 90' long, barren? - white volcanic, fg, mn FeOx, weakly silicified, backhoe trench
AW-18	Taranis 2002	572425	4215907	<0.005	<0.2	Pit 5' deep, grey-white volcanic/FeOx. Silicified, mn yellow color, scree from hillside.
AW-19	Taranis 2002	572506	4216333	<0.005	<0.2	White, grey volcanic - FeOx. Pit 50' deep, now caved - lots of slumped scree material, dead looking. Small road leading in, very old.
AW-20	Taranis 2002	572498	4216283	<0.005	<0.2	Small pit, abd't chocolate brown FeOx along fracture surfaces. White, alt'd volcanic protolith, pit caved
AW-21	Taranis 2002	572533	4216276	<0.005	0.20	Small pit, white volcanic-argillized with FeOx and yellow tinge. Old, caved, lots of FeOx concentrated along fractures trending NE
AW-22	Taranis 2002	572327	4216162	0.025	0.80	Old Shaft, ~80 deep. Abd't FeOx caoted volcanic, silicified? Minor yellow color tinge, minor grey qtz. Stringers. Structure trending NNW, dipping 70 degrees West in shaft.
AW-23	Taranis 2002	572335	4216145	0.015	0.60	Slightly south of AW-22, intense bleached white-grey volcanics, abd't FeOx, minor yellow tinge, old pit 5' deep, caved
AW-24	Taranis 2002	572271	4216130	0.025	0.40	Old wooden shaft, vertical, depth ~100'. Dump mostly grey, FG. Volcanic. Numerous silica veins w abd't yellow oxide material, 6" wide biggest piece. Highly mineralized, yellow Bx - volcanic fresh, minor FeOx.
AR-03	Taranis 2002	572870	4215718	0.565	6.20	Float sample, qtz vein\gossan with strong black and red feox.
AR-04	Taranis 2002	572796	4214865	0.055	1.40	Quartz vein stockwork material from Arrowhead Ext.? dump, grey\green oxide moderate with diss. black Ag? oxide and very minor pyrite. .
AR-05	Taranis 2002	572918	4214776	0.025	1.00	Qtz vein stockwork with some silica replacement of volcnics, vfg diss. pyrite approximately 2-3%.
AR-06	Taranis 2002	572650	4214881	0.09	1.20	From trench. 40' long, qtz. stockwork veins strike AZ 30?. Well oxidized stockwork with strong feox.

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Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
AR-07	Taranis 2002	572281	4215051	<0.005	<0.2	Shaft collared in volcanics, from dump, massive vein\breccia, low-temp looking, weak feox.
AR-08	Taranis 2002	572278	4215243	<0.005	0.20	Silicified and brecciated volcanics, strong feox.
AR-09	Taranis 2002	572361	4215289	<0.005	0.60	Brecciated volcanics, strongly oxidized with minor stockwork veins, vfg sulfide visible, minor.
AR-10	Taranis 2002	572394	4215309	0.17	9.00	Qtz. Vein stockwork with sub parallel crustiform veins, strong feox on vein margeins + disseminated sufide casts.
AR-12	Taranis 2002	572438	4216175	0.12	2.00	From shaft dump, shear AZ 50, dip 80 NW, crustiform qtz veins with strong brown\black feox.
AR-13	Taranis 2002	572486	4216202	0.045	3.60	From pit exposing AZ N65E, dip vertical shear. Qtz vein and strockwork vein material with very strong black Ag? Oxide, nice stuff.
AR-14	Taranis 2002	572337	4216362	0.01	4.20	From shaft exposing shear AZ 353, dip 82 W. Qtz vein material with strong red and black feox, slickensides noted on qtz vein piece.
AR-15	Taranis 2002	572350	4216432	0.01	1.40	Siilcified breccia with muti-phase quartz veining, and internal crustiform texture, mod. Feox.
AR-16	Taranis 2002	572483	4216560	<0.005	<0.2	Brecciated and silicifed volcanics with crustiform quartz vein stockwork, strong black Ag? oxide locally, weak- moderate distinctive maroon oxide in matrix.
AR-17	Taranis 2002	572557	4215396	<0.005	0.60	Altered volcanics from prospect pit near main Arrowhead shaft. Very strong Feox\Mnox (?), in stockwork veinlets.
AR-18	Taranis 2002	572585	4215396	0.075	0.60	Altered volcanics from surface near main Arrowhead shaft. Very strong feox veins with gossan texture.
ND-1	Taranis	572572	4215392	0.126	26.10	Arrowhead Shaft, Quartz vein material w/ fg diss. py < 3%; minor FeO-staining.
ND-2	Taranis	572572	4215392	1.055	293.00	Arrowhead Shaft, Stockwork qtz veinlets in silicified volcanic tuff; strong FeO-staining.
ND-3	Taranis	572572	4215392	0.653	76.30	Arrowhead Shaft, Silicified tuff w/ X-cutting, vuggy white qtz and amethyst veinlets.
ND-4	Taranis	572572	4215392	2.57	1115.00	Arrowhead Shaft, FeO-stained, silicified tuff w/ fine X-cutting qtz veinlets & diss. py 1-2%.
ND-5	Taranis	572572	4215392	0.504	46.80	Tomahawk Mine, FeO-stained, silicified tuff w/ X-cutting quartz veinlets.
ND-6	Taranis	571600	4214763	0.005	0.30	Tomahawk Mine, Strongly altered (advanced argillic alteration) volcanic tuff.
ND-7	Taranis	571600	4214763	0.03	2.00	Prospect at North end of Gordo Claim Block, Strongly altered (advance argillic alteration) and oxidized hematite after pyrite veins/diss) volcanic tuff
ND-8	Taranis	572249	4216107	0.251	83.50	Arrowhead Shaft, FeO-stained, vuggy quartz vein material w/ fg py < 3%.
TK-01	Taranis	571768	4215897	0.119	2.90	Hammerhead Pit, intensely altered Tertiary Volcanic with stockwork of qtz stringers and sulfides (<1%)
TK-02	Taranis	571769	4215898	0.025	0.50	Azimuth 65, dip 78 degrrees Northwest, Hammerhead Pit?
TK-03	Taranis 2003	571858	4215335	0.007	1.30	Calcite vein from prospect pit, c.g. calcite with strong dark brown pervasive feox.
TK-04	Taranis 2003	572061	4215825	0.017	0.30	Bleached volcanic with fine Feox veinlets, wk argillic alteration.

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
TK-05	Taranis 2003	572101	4215912	0.008	0.80	F.g. low temp quartz vein with minor feox in fractures.
TK-06	Taranis 2003	572192	4216063	0.015	1.20	Quartz vein\silicified breccia with crustiform texture and mod feox in veinlets, remnant volcanic .texture.
TK-07	Taranis 2003	572331	4216169	0.025	0.80	Volcanic with quartz vein stockwork, light grey clear qtz veins, weak feox.
TK-08	Taranis 2003	572159	4217026	0.016	1.10	Volcanic with quartz vein stockwork, gossan texture locally, strong feox + Mn (?) ox and specular hematite.
TK-09	Taranis 2003	572171	4217014	0.022	1.30	Silicified volcanic with very strong feox, gossan locally + iron carbonate (siderite) veinlets.
TK-10	Taranis 2003	571754	4216834	0.282	16.60	Amorphous, low-temp quartz vein + silcified volcanic breccia, x-cutting qtz veinlets, mod FeO.
TK-11	Taranis 2003	571601	4216844	0.012	1.40	Quartzite with x-cutting qtz veinlets, bladed texture (qtz after calcite?), + mod FeO pervasive.
TK-12	Taranis 2003	571778	4216842	0.392	0.50	Qtz vein, massive, w/ moderate, feox locally, + Mn (?) ox? Originally thought to be qtzite, AZ 130, dip 50 SW.
TK-13	Taranis 2003	571899	4217071	0.009	0.20	Qtz vein/gossan, massive w/ dark oxide strong locally. Vein AZ 83, dip unkown.
TK-14	Taranis 2003	571896	4217196	0.173	0.70	Bleached volcanics w/ weak quartz vein stockwork, moderate feox. Prospect pit.Vein, AZ 130 , dip 80 NE.
TK-15	Taranis 2003	571909	4217125	0.007	<0.2	Dense quartz vein/silicified breccia w/ strong maroon feox, pervasive. Prospect pit.
TK-17	Taranis 2003	572053	4216194	0.451	0.20	Banded chalcedony vein. Green/grey w/ moderate feox locally. Prospect pit.
NDX1	Taranis 2003	572776	4213917	0.134	93.20	Quartz vein stockwork from pit, weak feox.
NDX2	Taranis 2003	573153	4216138	0.069	58.60	Description not found.
NDX3	Taranis 2003	572207	4217017	0.017	3.00	Float sample, silciified breccia with local strong feox.
NDX4	Taranis 2003	572241	4216120	0.022	1.20	Float sample taken near shaft, qtz vein stockwork, vuggy texture, moderate pervasive feox.
NDX5	Taranis 2003	572258	4216211	0.073	4.10	Float sample taken 200 feet north of shaft, silicified volcanic w\wk bx texture, minor crustiform qtz veinlets, mod. Maroon feox.
NDX6	Taranis 2003	572240	4216240	0.115	1.00	Qtz vein stockwork, brecciated volcanics, brown feox on veinlet rims.
NDX7	Taranis 2003	572333	4216554	0.005	<0.2	Qtz vein stockwork + pervasive maroon feox, crustiform veins, float sample.
NDX8	Taranis 2003	572389	4216562	0.005	0.20	Qtz vein stockwork + brown feox, crustiform, open-space texture, feox on veinlet margins.
NDX9	Taranis 2003	572422	4216608	0.005	<0.2	Qtz vein stockwork\silciified volcanic, crustiform veins with strong dark brown feox in cavities.
NDX10	Taranis 2003	571631	4216829	0.117	72.00	Massive qtz vein, OC, AZ 300, colloform texture, wk feox+ dark grey qtz (sulfides?). Composite sample.
NDX11	Taranis 2003	571647	4216875	0.045	3.40	Silicified brecciated volcanic, with moderate feox on fractures and matrix, float.
NDX12	Taranis 2003	572167	4217024	0.017	1.00	Silicified volcanic + qtz vein stockwork, float with weak feox.
NDX13	Taranis 2003	572335	4216426	0.019	2.20	Float sample, near shaft, Qtz vein stockwork, crustiform veins with maroon\brown feox, weak Mn, open space quartz.

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
NDX14	Taranis 2003	572352	4216463	0.023	2.20	Float, quartz vein stockwork, crustiform veins with black Mn oxides in open spaces, near shafts.
NDX15	Taranis 2003	571599	4216845	0.065	4.40	Taken from near TK-11 sample location. Pit, silicified breccia\volcanics, w\ moderate feox on clast rims, strong SiO2.
NDX16	Taranis 2003	571436	4216572	0.072	0.70	OC, Sugary quartz vein stockwork with dark brown feox, crustiform texture, AZ 30, dip vertical (?)
NDX17	Taranis 2003	571951	4217046	0.006	<0.2	Float, quartz vein stockwork + gossan, strong specular hematite on fractures and in veins.
NDX18	Taranis 2003	572096	4215954	0.005	0.20	OC, Quartz vein stokwork in feox stained volcanics, crustifrom veins with strong oxides (realgar?)
NDX19	Taranis 2003	572138	4215982	0.056	1.70	Massive quartz vein from pit, AZ 80. Green oxide + possible disseminated sulfides (?), Multiphase xcutting qtz veins
NDX20	Taranis 2003	571613	4215012	0.443	0.70	Pit, weak qtz vein stockwork with moderate feox, on NW fault.
NDX21	Taranis 2003	572359	4214708	0.005	0.20	Pit, silcified volcanic, light grey microcrystalline quartz vein in NW-striking structure.
NDX22	Taranis 2003	572766	4214869	0.023	1.10	Float near shaft, quartz vein stockwork, with strong feox locally, crustiform quartz veins.
NDX23	Taranis 2003	572978	4214926	0.016	<0.2	Quartz vein stockwork, crustiform veins with chocolate brown feox on vein margins.
NDX24	Taranis 2003	572084	4214641	0.044	0.50	Shaft dump, quartz vein stockwork, with crustiform veinlets, strong brown feox on vein margins.
NDX25	Taranis 2003	572514	4214212	0.054	15.80	Pit, drusy quartz veins with maroon\brown feox, stockwrok veins.
NDX26	Taranis 2003	572425	4214348	0.083	1.10	Laminar crustiform quartz veins with moderate feox on vein margins.
NDX27	Taranis 2003	572548	4214993	0.005	<0.2	OC, stron Mn oxides, weak feox, weak quartz vein stockwork, light grey.
NDX28	Taranis 2003	571650	4216283	0.005	0.20	Float sample, green laminar quartz vein with vocanic replacement texture, flourite (?) "Picture rock".
NDX29	Taranis 2003	571831	4216385	0.083	0.80	Description not found.
NDX30	Taranis 2003	572048	4216235	0.225	12.40	Float sample, crustiform qtz veins + moderate feox.
NDX31	Taranis 2003	572096	4216346	0.092	1.50	Light grey quartz vein stockwork+ strong feox, from pit.
NDX32	Taranis 2003	572434	4216765	0.661	13.00	Gossan with quartz veins, strong feox.
NDX33	Taranis 2003	572249	4214550	0.007	0.40	Pit, bleached feox, volcanics.
NDX34	Taranis 2003	572265	4214920	0.013	0.70	Bleached volcanics with light grey quartz vein stockwork, weak feox, from pit.
572680 4215648	Taranis	572680	4215648	0.01	0.30	Massive quartz vein with dissmenated sulfide casts + mod\strong pervasive feox.
571796 4216820	Taranis	571796	4216820	0.011	0.30	Massive chalcedony vein with minor Feox on fractures.
572011 4217114	Taranis	572011	4217114	<0.005	<0.2	Silicified breccia\quartz vein with abundant feox in matrix.
572172 4216446	Taranis	572172	4216446	0.011	0.40	Volcanic tuff with weak feox on fractures.
572061 4217060	Taranis	572061	4217060	0.012	0.20	Silicified breccia with strong feox in matrix. Also smoky "grey" quartz, possilbe f.g. (sulfides?)
571785 4216843	Taranis	571785	4216843	0.005	<0.2	Massive chalcedony vein with minor Feox on fractures, minor grey quartz.
572110 4217068	Taranis	572110	4217068	0.005	<0.2	Quartz vein stockwork\gossan with very strong feox\specular hematite, possibly manganese.

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
572417 4216357	Taranis	572417	4216357	0.007	0.50	Volcanic tuff with strong feox on fractures, veinlets.
572126 4217024	Taranis	572126	4217024	<0.005	0.70	Quartz vein stockwork\weak, with dark ox, possibly manganese.
571910 4217001	Taranis	571910	4217001	0.01	0.20	Quartz vein material. Well developed "colloform" texture, ("picture rock"), with strong red\maroon feox in matrix.
571773 4216843	Taranis	571773	4216843	0.01	<0.2	Massive quartz vein with moderate brown Feox on fractures.
571780 4216840	Taranis	571780	4216840	0.009	0.20	Massive quartz vein with moderate brown Feox on fractures, weak gossan texture.
571808 4216803	Taranis	571808	4216803	0.012	0.20	Massive chalcedony vein with minor Feox on fractures, minor grey quartz.
6700W 400S	Taranis	572094	4215478	<0.005	<0.2	Massive microcxtalline\low temp massive quartz vein with strong grey "smokey" quartz texture.
6500W 450 N	Taranis	571875	4215636	<0.005	<0.2	Massive microcxtalline\low temp massive quartz vein.
1000E 900N	Taranis	572898	4215642	0.02	0.90	Quartz vein material, with strong red\maroon feox in matrix.
2400W 500S	Taranis	571785	4216440	0.289	2.00	Chalcedony veins in stockwork, with mod\strong feox on margins.
N - L1	Taranis 2003	572255	4216375	0.061	24.40	intensely silicified volcanic with abundant hematite on outside of rock, rock virtually converted to qtz
N - L2	Taranis 2003	572251	4216376	0.358	99.00	Highly altered volcanic with abundant hematite, 3 percent vugs lined with quartz xtals, highly altered (mn green tinge, dense)
N - J1	Taranis 2003	572259	4216370	0.009	0.90	Intensely silicified volcanic with moderate hematite and minor brittle structures
N - J2	Taranis 2003	572247	4216371	0.022	5.10	Intensely silicified volcanic with moderate hematite
N - J3	Taranis 2003	572262	4216379	0.013	0.80	Highly silicified Volcanic, with 3 perc quartz veinlets and 3 percent vugs infilled with quartz crystals, brecciated
N - T1	Taranis 2003	572253	4216372	0.01	2.00	Massive qtz flooding producing rock entirely of grey-white colored quartz, abdt feox coating rock
N - T2	Taranis 2003	572242	4216380	<0.005	5.20	Volcanic, with essentially completely silcified groundmass, locally verging into qquartz vein, minor jarosite
E0757	Barrick 080315	572118.886	4216390.262	0.009	1.56	Altered; Fe-stained and silicified crystal tuff near lagged shaft
E2900	Barrick 080315	571459.838	4213764.491	<0.001	0.29	Densely crowded andesite porphyry w/ celadonite stained surfaces- Cu-Oxides?
F3574	Barrick 080315	571292.26	4214993.498	0.447	13.65	Silicified; goethite stained material from dump of small prospect pit
F3575	Barrick 080315	571419.42	4215156.399	0.004	0.32	Olive green goethite veins to 1 cm thick cutting lightly altered purplish lithic tuff. Veins strike 120; dip steeply SW
F3576	Barrick 080315	571457.321	4215205.439	0.069	0.90	Strongly goethite stained lithic tuff; with strong joint/shear fabric striking 119; dipping 45 SW
F3577	Barrick 080315	571535.621	4215357.599	0.019	1.47	White; clay altered; goethite veined tuff
F3579	Barrick 080315	571690.151	4215010.866	0.002	0.78	Bull quartz-like vein material from scrape in clay altered tuff
F3580	Barrick 080315	571752.592	4215042.146	0.003	0.58	Heavily clay altered white lithic tuff
F3581	Barrick 080315	571850.742	4215041.796	0.003	1.23	Goethite webwork in clay altered lithic tuff
F3582	Barrick 080315	571690.002	4215525.619	<0.001	0.06	Very coarse grained calcite vein at least 30 cm thick; orientation unknown; cuts clay altered tuff

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
G08301	Barrick 080315	572568.927	4215761.436	<0.001	0.15	Amorphous silica/ silicified vein in quartz eye tuff with jarosite; goethitic veins
G17032	Barrick 080315	572174.067	4216552.872	0.017	5.25	General dump grab- heavily goethite stained dump with lesser jarosite over silicified rhyolite tuff. Structure in shaft strikes N-S; dips 75-80 W. Sample includes some silica-sulfide breccia
G17033	Barrick 080315	572201.487	4216625.902	0.012	1.53	Dump grab of silicified tuff breccia. Less goethite and more hematite than next dump to the south; no silica sulfide material
G17034	Barrick 080315	572277.997	4216364.491	0.077	1.22	Goethite stained pale grey crystal tuff in dump from small; very rectangular shaft. Silicified with anastomosing quartz veins terminated in open space; some silica sulfide material
G17035	Barrick 080315	572436.876	4215580.606	0.365	98.00	Highly selective sample- most quartz veined and jarositic material in dump
G21732	Barrick 080315	572844.307	4214979.501	<0.001	0.20	Yellow and white (jarositic) crystal tuff from S-facing tipple; arrowhead (vertical) shaft
G21733	Barrick 080315	572855.027	4214977.711	0.001	0.09	Clayey jarositic altered crystal tuff from N-facing tipple; Arrowhead vertical shaft
G21734	Barrick 080315	572860.987	4214978.101	0.016	0.23	Purplish lithic tuff from W-facing tipple; Arrowhead vertical shaft
G21735	Barrick 080315	573013.367	4214965.48	0.017	0.27	Goethite coated altered crystal tuff
G21736	Barrick 080315	573107.988	4215016.15	<0.001	0.10	Goethite vein striking 335; near vertical; cutting altered crystal tuff
G21737	Barrick 080315	572898.457	4214966.89	0.001	0.42	White altered crystal tuff with goethite veins to 1 cm. several vein orientations but dominantly 335
G21738	Barrick 080315	572714.806	4215053.132	<0.001	0.09	Selected dump sample- 1 cm goethite veins in jato site stained white altered tuff
G21739	Barrick 080315	572682.606	4215230.503	<0.001	0.05	Altered lithic tuff with goethite vein lets; minor silicification?
G21740	Barrick 080315	572520.756	4215589.035	3.05	578.00	Silica vein material with sulfides- segregated material from loading area
G21741	Barrick 080315	572522.776	4215578.735	0.013	2.53	Grey heavily silicified and brecciated tuff (protolith uncertain) from NW corner of very large dump
E9491	Barrick 080315	573296.407	4214097.824	0.062	0.47	Very white argillized tuff with copious clear gypsum from dump
E9492	Barrick 080315	573313.157	4214069.464	0.002	0.15	Tuff with two cm feldspar megacrysts
E9493	Barrick 080315	573227.697	4214110.974	0.25	46.80	White to purple fg crystal biotite tuff; lightly silicified
E9497	Barrick 080315	573102.967	4214549.607	0.001	0.11	Fe stained lightly argillized tuff from small prospect pit
E9498	Barrick 080315	573127.507	4214561.807	0.008	0.72	Silicified and argillized tuff from deeper prospect pit. Fe stained and friable; pit also contained one jackrabbit and one Prince Albert tobacco can.
E9499	Barrick 080315	573162.007	4214597.407	0.001	0.40	Fresh-looking quartz crystal rhyolite tuff from prospect pit
E9500	Barrick 080315	573160.607	4214616.367	0.003	0.17	Fe stained lithic tuff
E9654	Barrick 080315	571459.838	4213764.491	<0.001	1.47	Densely crowded andesite porphyry-fresh
E9901	Barrick 080315	573029.186	4214433.877	<0.001	0.09	Lightly argillized tuff
E9903	Barrick 080315	572932.566	4214467.408	<0.001	0.09	Fg lithic-crystal tuff; pale tan on weathered surface; very white where freshly broken. Minor liesegang Fe staining.
E9904	Barrick 080315	572880.796	4214724.159	<0.001	0.07	Crystal lithic tuff with quartz eyes to 5 mm. Lithic frags altered to very pale greenish color.
E9905	Barrick 080315	572952.357	4214755.429	0.006	0.33	Very white argillized crystal tuff in prospect pit-light Fe staining

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
E9906	Barrick 080315	573066.907	4214815.049	<0.001	0.04	Crystal-lithos tuff with abundant 3-5mm reserved quartz phenos and sparse lithic fragments 0.5 to 3 cm
E9907	Barrick 080315	573089.477	4214812.139	<0.001	0.17	Fractures in fg white lithic tuff with 10-15 cm Fe stained selveges
E9909	Barrick 080315	572510.856	4215587.395	<0.001	0.08	Core sample from Arrowhead dump-abandoned core. Hole N71; around 57'. Altered crystal tuff; clay altered; with stock work/ pseudo-breccia texture
E9910	Barrick 080315	572167.046	4216311.161	0.028	2.02	Silica cemented polymict breccia at lagged vertical shaft. Clasts of various volcanics; mostly heavily clay altered.
E9917	Barrick 080315	572695.549	4216335.948	<0.001	0.15	Lightly altered tan-brown crystal tuff with goethite veining and liesegang banding
E9918	Barrick 080315	572566.897	4215981.927	0.003	0.33	Chip sample from trench- cream-white crystal tuff
E9919	Barrick 080315	572543.947	4216007.578	0.003	0.30	Creamy white crystal-lithic tuff
E9920	Barrick 080315	572735.418	4215976.556	0.29	1.56	Banded carbonate vein material from dump
E9921	Barrick 080315	572719.738	4216013.477	0.005	0.39	Pale greenish grey to creamy white crystal-lithic tuff; argillized; liesegang banded
E9922	Barrick 080315	572694.948	4215755.035	<0.001	0.09	Tan to white lithic crystal tuff with sedimentary rock clasts and quartz phenos to 3 mm
E9923	Barrick 080315	572643.107	4215706.415	<0.001	0.15	Highly altered sedimentary rock- not in place
E9924	Barrick 080315	572585.547	4215719.886	0.001	0.31	Creamy white crystal tuff from dump around 10 ft deep shaft
E9925	Barrick 080315	572523.617	4215750.736	<0.001	0.05	Tan brown tuff unit with euhedral quartz to 5 mm...Gardiner's LTD unit?
E9926	Barrick 080315	572629.887	4215635.055	0.003	0.37	Golden brown clay altered tuff with pieces of less altered grey crystal tuff with large euhedral quartz phenos
E9927	Barrick 080315	572616.827	4215624.405	0.001	0.41	Grey crystal tuff from dump
E9928	Barrick 080315	572770.608	4215600.804	<0.001	0.05	Crystal tuff with sparse; coarse quartz phenos
E9929	Barrick 080315	572780.258	4215620.424	0.001	0.09	Marble
E9930	Barrick 080315	572855.968	4215588.694	<0.001	0.20	Pale cream colored crystal tuff from small trench
E9931	Barrick 080315	572802.688	4215642.144	<0.001	0.07	Small pit in tan brown crystal tuff
E9932	Barrick 080315	573039.789	4215667.903	0.042	1.75	Pale cream crystal tuff with goethite; from small prospect pit
E9933	Barrick 080315	573019.209	4215683.363	0.492	4.26	Small shaft in tan-brown clay altered crystal tuff
E9934	Barrick 080315	572997.749	4215690.164	0.002	0.10	Grey fiamme tuff
E9935	Barrick 080315	572924.859	4215789.384	0.162	2.84	White tuff with abundant goethite; almost to the point of gossan. Strong clay alteration
E9937	Barrick 080315	573208.42	4215748.093	28.3	622.00	Segregated pile on dump- oxidized breccia material; tuff protolith
E9938	Barrick 080315	573334.151	4215782.182	0.301	5.55	Grey green; very altered; gusano-like material
E9939	Barrick 080315	573326.941	4215763.802	0.047	0.64	Purplish; very coarsly crystalline tuff
E9940	Barrick 080315	573450.011	4215800.312	0.089	1.52	Heavily clay altered tuff with quartz veins
E9941	Barrick 080315	573549.722	4215782.011	0.006	0.10	Altered Tuff
G08361	Barrick 080315	573188.32	4215759.433	0.111	1.21	Grey clay altered crystal tuff with goethite staining; quartz veins filled with porcelaneous amorphous silica
G08362	Barrick 080315	573254.07	4215772.013	0.371	4.21	Anastomosing quartz veins and quartz vein breccia in purplish crystal tuff; intersection of N75E and N25W trends
G08363	Barrick 080315	573365.511	4215844.363	0.003	0.17	Clay altered lithic tuff with limonitic fractures; on trend with quartz veined material in prospect pits but without anastomosing quartz veins

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
G08364	Barrick 080315	573360.431	4215921.553	<0.001	0.27	Crystal tuff with adularia overgrowths on feldspar phenocrysts; hematitic liesegang banding. Some quartz; goethite; jarosite
G08365	Barrick 080315	573428.531	4215956.013	0.001	0.15	Anastomsing 1mm quartz veins in 2-4 cm bands; cutting grey-purple pumaceous lithic tuff. Veins sets oriented N65-70E
G08366	Barrick 080315	573496.032	4215890.922	2.17	3.62	Large clear massive quartz vein (2-3cm thick) trending N-S; with mm scale cockscomb vein lets on parallel and N65E orientations
G08367	Barrick 080315	573495.172	4215889.032	0.017	0.10	N-s goethite sheeted vein lets cutting greyish purple pumaceous lithic tuff
G08369	Barrick 080315	573502.612	4215880.782	0.053	0.90	Anastomosing quartz vein lets with open space filled by chalcedonic silica; cutting tan-yellow crystal tuff with goethite and jarosite
G08370	Barrick 080315	573624.782	4215987.742	0.169	1.79	Selective sample- quartz vein material and oxidized; heavily clay altered lithic tuff with goethite and jarosite. Structure in small shaft strikes N45E; dipping steeply SE; approx 2 m wide
G08371	Barrick 080315	573621.713	4216017.562	0.17	7.59	Three meter wide zone if anastomosing quartz veins and vein breccia cutting strongly clay altered crystal tuff
G08372	Barrick 080315	573699.512	4215725.32	0.03	5.12	Dense swarm of anastomosing quartz veins to 2 cm wide; vein swarm and pervasive silicification of grey crystal tuff approx six meters wide. Goethite stock work veining outboard
G08373	Barrick 080315	573134.59	4215746.193	0.926	18.75	Goethite-jarosite-barite vein fill material with minor euhedral quartz on margins. Barite euhedral; rhombic; water-clear
G17025	Barrick 080315	571839.484	4215780.27	0.002	0.43	Dove grey crystal tuff; silicified; with yellow-brown jarosite/hematite coatings on fractures
G17026	Barrick 080315	571833.284	4215857	0.003	0.23	Prominent rib of silicified (+adularia?) crystal tuff
G17027	Barrick 080315	571912.344	4216021.261	0.012	0.37	Goethite veined and silicified clay altered white crystal tuff
G17028	Barrick 080315	571945.405	4216101.661	0.019	1.13	Jarosite stained clay altered white crystal tuff with irregular silicification
G17029	Barrick 080315	572078.106	4216249.091	0.017	0.44	Goethite stained breccia in small prospect pit- rounded pebble sized clasts; clay altered rhyolite infill; close spatial relationship to fault
G17030	Barrick 080315	572171.426	4216326.921	0.007	1.49	Silicified rhyolite clast breccia ledge above small prospect pit
G17031	Barrick 080315	572175.736	4216355.261	0.026	1.79	General dump grab- jarosite stained silicified yellow brown rhyolite tuff. Structure visible in shaft strikes N-S; dips steeply W
G21840	Barrick 080315	573210.26	4215749.003	18.6	157.00	Jarosite stained ; silicified segregated material on shaft dump; duplicate of E9937
G21841	Barrick 080315	573217.96	4215741.413	33	613.00	Different pile of segregated material on dump; less jarosite
G21842	Barrick 080315	573199.9	4215740.143	2.7	18.85	General dump grab
G21844	Barrick 080315	573220.32	4215742.213	2.08	106.00	More goethitic/hematitic altered tuff; some silicification; from small pile which may have been a tent foundation
G21845	Barrick 080315	573230.91	4215744.193	0.058	2.43	3 cm thick goethite vein in dump material- disproportionately heavy
G21846	Barrick 080315	573268.12	4215761.503	0.122	1.57	Sub cropping grey white altered tuff with. 2-5mn quartz veins and goethite staining

APPENDIX 4 – Needles Rock Chip Sample Table

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	Au (g/t)	Ag (g/t)	Comments
G21847	Barrick 080315	573289.79	4215799.533	0.015	0.21	Goethite stained crystal tuff
G21848	Barrick 080315	573232.33	4215732.663	1.03	8.31	Goethite stained silicified material in small prospect pit
G21849	Barrick 080315	573137.2	4215729.473	0.03	0.29	Goethite stained altered tuff with cock's comb quartz; in tiny scrape
ND-1001	Astro October 2017	573217.91	4215740.943	3.73	67.60	Twin of Barrick sample G21841 Dump grab at East Shaft of stg shattered; silic latite/trachyte dike w/micro qtz vnlts; brecciated qtz and open space druze. Hema dust on fracs; low sulfide. Shaft on N75E 70S qtz vein 20 cm thick along contact of latite and partially welded qtz latite/rhyolite tuff.
ND-1002	Astro October 2017	573208.91	4215743.943	6.64	148.00	Twin of Barrick E9937 Select of limonitic dump material. Stg limon in fault breccia w/vuggy qtz vein.
ND-1003	Astro October 2017	573201.91	4215739.943	1.1	16.90	Twin of G21842 General dump grab at East Shaft. Bleached; wk arg-limon latite w/silic stringers and qtz vnlts.
ND-1004	Astro October 2017	573266.91	4215765.943	0.03	0.70	Twin of Barrick G21846 Subcropping gray latite w/narrow druzy qtz vnlts and local breccia. At contact w/ partially welded rhyo tuff (qtz phenos prominent).
ND-1005	Astro October 2017	573231.91	4215725.943	0.08	0.50	Twin of Barrick G21848 At small prospect pit. Wk silic partially welded; qtz latite w/abundant qtz phenos and local druzy qtz vnlts.
ND-1006	Astro October 2017	573251.91	4215771.943	<0.01	0.20	Twin of Barrick G08362 Partially welded qtz latite tuff w/local silica flooding and limonitization. No real qtz veining here. Have alteration flooding w/leaching of feldspars.
ND-1007	Astro October 2017	573220.91	4215741.943	0.46	12.20	Twin of Barrick G21844 limon/goethitic latite dike and partially welded qtz latite tuff w/local qtz vnlts.
ND-1008	Astro October 2017	573137.91	4215728.943	0.08	5.50	Twin of Barrick G08373 Select sample of barite-qtz veining in limon qtz latite partially welded tuff. Stringer veins on S-side of latite dike.
ND-1009	Astro October 2017	573015.909	4215686.944	0.29	2.20	Twin of Barrick E9933 Stg. Limon partially welded tuff on S-side of latite dike. Mod arg alt along N30W 80NE shear w/local wk silic. Dike looks to cut shear and is unaltered.
ND-1010	Astro October 2017	573187.91	4215757.943	<0.01	0.20	Twin of Barrick G08361 Grab from subcrop of variably arg-silic partially welded tuff and latite dike w/local silica flooding in breccia. Sparse opaline vnlts.
ND-1011	Astro October 2017	573330.911	4215778.942	0.66	2.80	Twin of Barrick E9938 at prospect pit on 0.5m wide E-W 80S qtz vnlt zone w/greenish chlorite or smectite alt selvages in partially welded tuff.
ND-1012	Astro October 2017	572918.909	4215783.944	0.5	3.30	Twin of Barrick E9935 at prospect in stg arg poorly welded qtz latite tuff along contact with N35W 65NE flow-banded biot trachyte dike with stg limonitized dike margin. 2m cut across sheeted silic-arg shear w/stg goethite along contact.
ND-1013	Astro October 2017	572730.908	4215976.946	0.01	<0.2	Twin of Barrick E9920 Select grab of banded carbonate vein from dump at shallow shaft within stg bleached fg felsic tuff (?). Vein zone is 1.5m wide; strikes N40W vert.
ND-1014	Astro October 2017	572956.909	4216048.946	0.02	0.50	Areal at pit on N25W vert fractures in wk welded tuff w/local qtz pods and mod limon. Looks to be on N-edge of altered zone (or beneath alt cap ?)
ND-1015	Astro October 2017	572944.909	4216004.945	0.03	0.40	Dump grab at shaft (50m deep) on N50W vert fracture zone w/qtz-carbonate veining in arg-limon wk welded qtz latite tuff.
ND-1016	Astro October 2017	572828.909	4216001.946	0.05	0.60	Grab at prospect pit of N35W 70SW shear in arg wk welded qtz latite tuff w/wk qtz vnlts.

APPENDIX 4 – Needles Rock Chip Sample Table (Whopper Jnr Prospect)

ASTUTEMETALSNL

Sample ID	Campaign	Easting (NAD83)	Northing (NAD83)	As (ppm)	Sb (ppm)	Hg (ppm)
5266	Astro 2020	571520	4217041	4800	87	3.0
5267	Astro 2020	571570	4217028	116	5	0.0
5268	Astro 2020	571680	4217025	251	3	0.0
5269	Astro 2020	571700	4217034	41	0	0.0
NDX11	Taranis 2003	571647	4216875	827	16	4.0
TK-11	Taranis 2003	571601	4216844	968	29	1.0
NDX15	Taranis 2003	571599	4216845	3900	77	4.0
NDX10	Taranis 2003	571631	4216829	196	2	<1
TK-10	Taranis 2003	571754	4216834	567	8	2.0
571773 4216843	Taranis	571773	4216843	863	10	1.0
TK-12	Taranis 2003	571778	4216842	46	<2	<1
571785 4216843	Taranis	571785	4216843	9	3	<1
571808 4216803	Taranis	571808	4216803	120	<2	<1
571796 4216820	Taranis	571796	4216820	27	7	<1
571780 4216840	Taranis	571780	4216840	35	2	<1