
28 February 2024

Simberi Metallurgical Testwork Proceeding Following Drilling Completion

Highlights

- Assays received for the final four metallurgical diamond drill holes of the 14-hole, 1,856-metre program completed in January (refer ASX release *Simberi Resource Definition Drilling Update January 23, 2024*) including:
 - **SDH520: 28.6 m @ 1.4 g/t Au from 96.4 m;**
 - **SDH522: 60 m @ 2.6 g/t Au from 118m, including 4 m @ 10.3 g/t Au from 119 m, and 12 m @ 4.0 g/t Au from 140 m;**
 - **SDH527: 31 m @ 1.1 g/t Au from 0 m;**
 - **SDH528: 8 m @ 6.1 g/t Au from 0 m, including 2 m @ 13.4 g/t Au from 2 m.**
 - Sample material derived from the initial 10 holes has arrived in Canada for metallurgical testwork focused on three primary objectives:
 - Resolve assumptions for Sorowar ore competency which was previously classified as “medium” when all other ore types were classified as “extremely soft” which has a significant impact on the capacity of any grinding circuit design,
 - Determine whether lower flotation mass recovery can be achieved than indicated in previous testwork to better scale the flotation circuit without adversely impacting gold recovery, and
 - Test potential of ultra-fine grinding and leaching of concentrate to deliver a more capital efficient project design with attractive recovery outcomes.
 - The second and final batch of sample material is now in transit from Simberi to Canada which provides the sample mass requirements and grade variability ranges for the full testwork program.
-

St Barbara Limited (“**St Barbara**” or the “**Company**”) (ASX: SBM) is pleased to announce that all assay results have been returned for the 14-hole, 1846-metre metallurgical diamond drill program at the Simberi Operations in Papua New Guinea (PNG). This has allowed the collection and dispatch of 2,434kg of sulphide ore for the planned comprehensive metallurgical testwork program in Canada.

Managing Director and CEO Andrew Strelein said “*The receipt of remaining assay results for the metallurgical diamond drill program is another important milestone for the 2023/24 campaign. This has allowed the finalisation of the second batch of sample material now in transit to the selected laboratory in Canada.*”

Assay results for all 14 metallurgical diamond drill holes is set out below in Table 1.

Figure 1 below shows the location of the respective open pits on the main mining lease (ML 156) and Figure 2 shows the locations of the planned and completed diamond drill holes including both resource definition and metallurgical sample holes.



Assays for the last four metallurgical sample diamond holes included:

- **SDH520: 28.6 m @ 1.4 g/t Au from 96.4 m;**
- **SDH522: 60 m @ 2.6 g/t Au from 118 m, including 4 m @ 10.3 g/t Au from 119 m, and 12 m @ 4.0 g/t Au from 140 m;**
- **SDH527: 31 m @ 1.1 g/t Au from 0 m;**
- **SDH528: 8 m @ 6.1 g/t Au from 0 m, including 2 m @ 13.4 g/t Au from 2 m.**

Figure 4 provides a cross-section with the results of diamond hole 522 in the Pigiput pit. Figure 3 shows where this cross-section sits relative to the current and future planned pit outline for Pigiput.

Figures 6, 7 and 8 provide cross-sections with the results of holes 527, 528 and 520 respectively. Figure 5 shows where these three cross-sections sit relative to the current and future planned pit outlines for Sorowar and Pigiput.

The metallurgical diamond holes were targeted in well understood areas of the current pits to provide samples for testwork indicative of low, medium and high-grade sulphide ore ranges expected to be processed during the Sulphide phase of operations.

In addition to providing better coverage of ore type variability and ore grade profiles than has been achieved previously, the comprehensive testwork program is focused on three primary objectives:

- Resolve assumptions for Sorowar ore competency which was previously classified as “medium” competency when all other ore types were classified as “extremely soft” which has a significant impact on the capacity of any grinding circuit design,
- Determine whether lower flotation mass recovery can be achieved than indicated in previous testwork to better scale the flotation circuit without adversely impacting gold recovery, and
- Test potential of ultra-fine grinding and leaching of concentrate to deliver a more capital efficient project design with attractive recovery outcomes.

The first batch of sample material derived from the initial 10 holes arrived in Canada for metallurgical testwork on 9 February 2024. A second and final batch of sample material derived from the final four metallurgical holes and from two suitable resource definition holes is now in transit from Simberi to Canada. In total 656 one metre PQ or HQ half diamond core weighing 2,434 kilograms will be available for the testwork.



Figure 1. Simberi Island Site Layout within Mining Lease

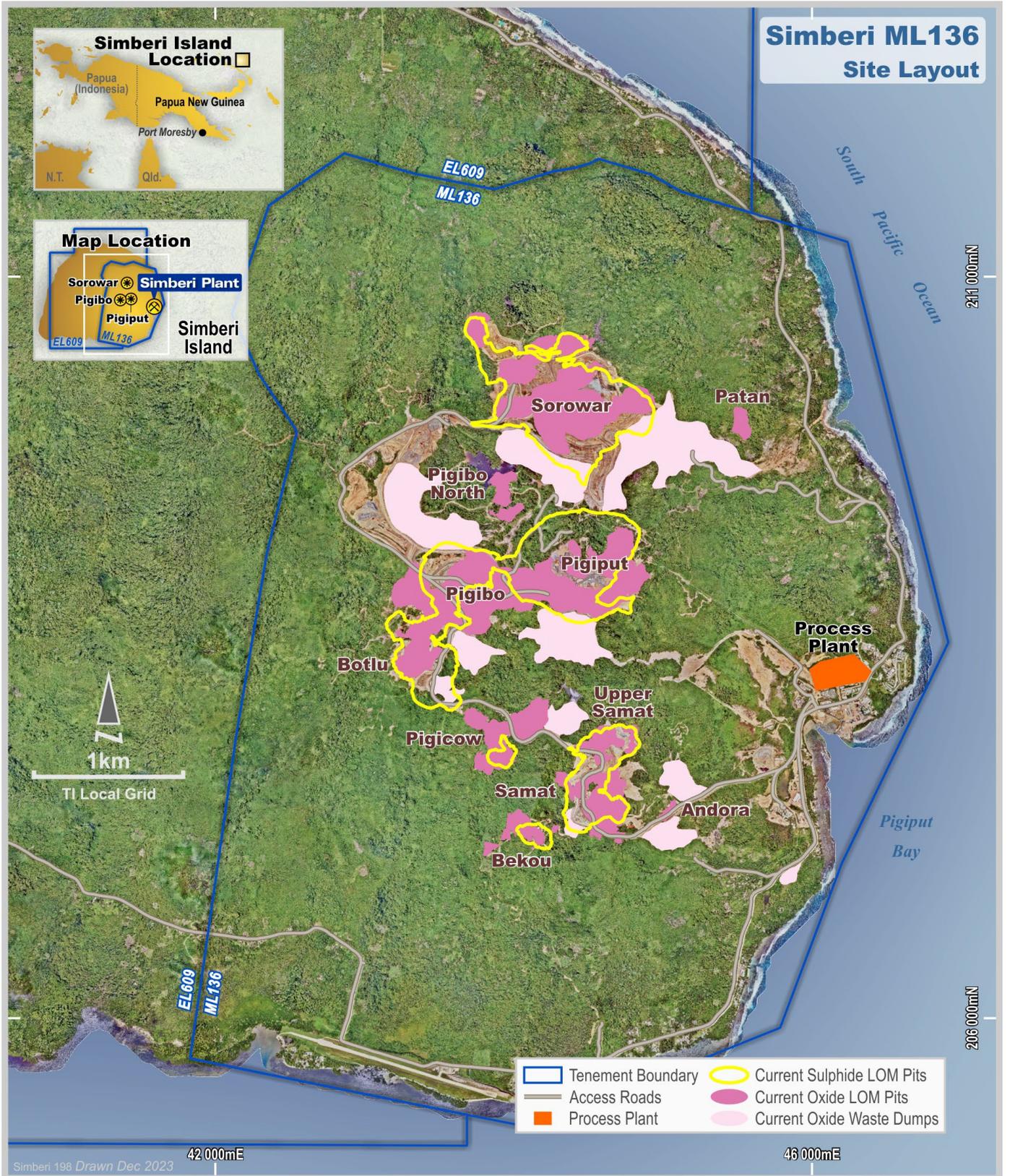




Figure 2. FY24 Completed and Planned Diamond Drilling, Simberi Island, Papua New Guinea

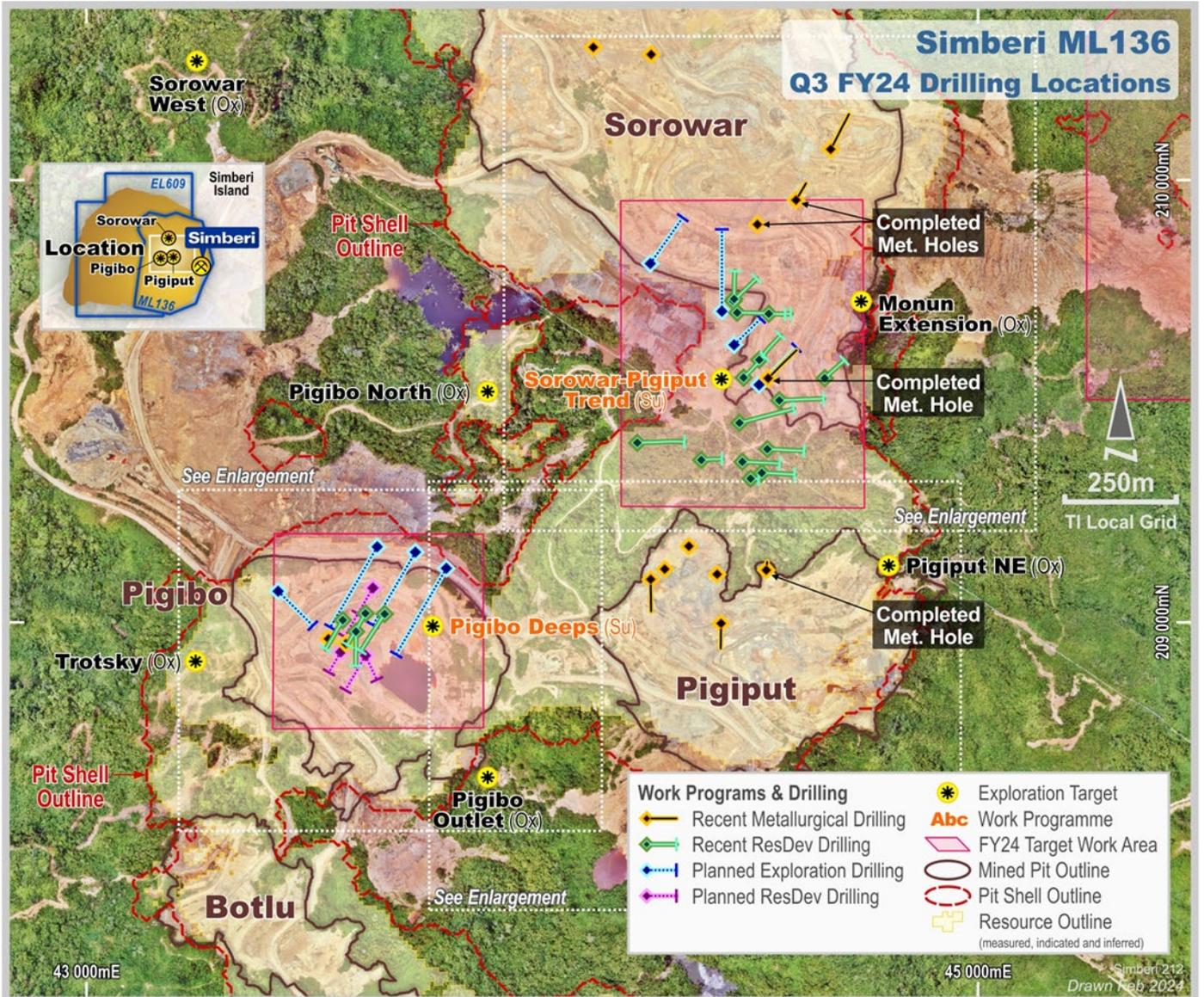




Figure 3. FY24 Completed and Planned Diamond Drilling, Pigiput, Simberi Island

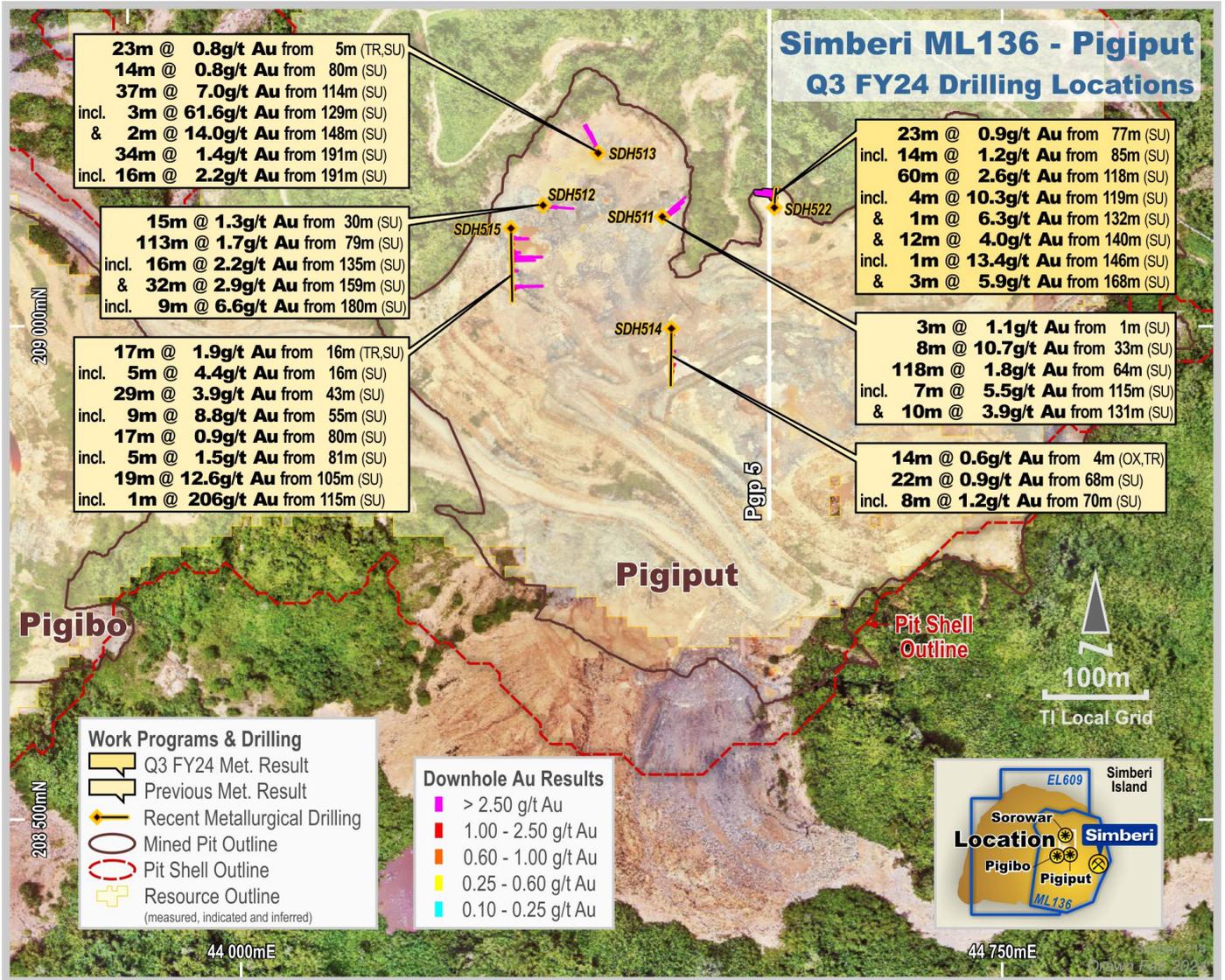




Figure 4. Drill Cross Section Pgp 5: 44,520 mE (View Looking West), Pigiput, Simberi Island

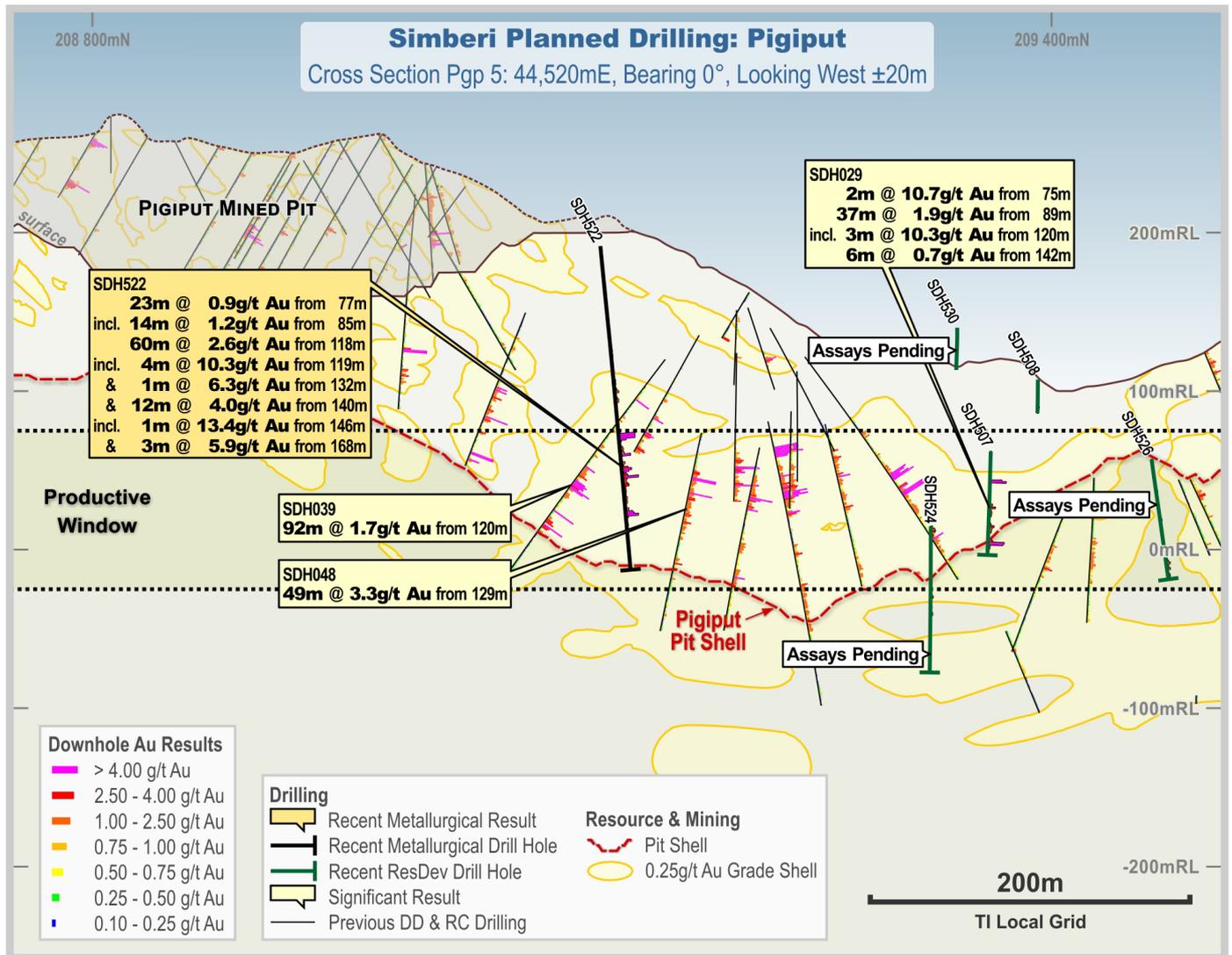




Figure 5. FY24 Completed and Planned Diamond Drilling, Sorowar, Simberi Island

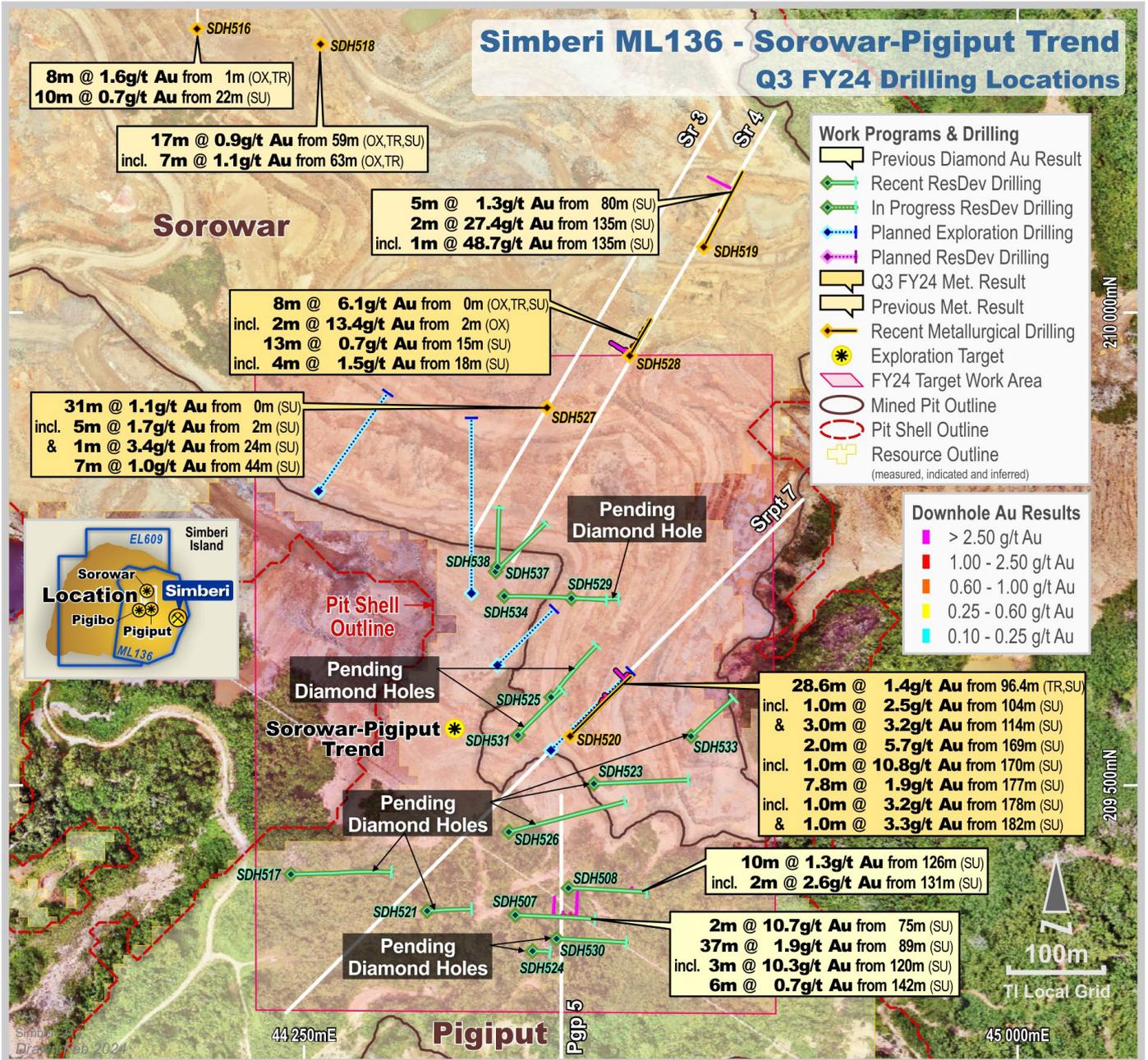




Figure 6. Drill Cross Section Sr 3 (View Looking Northwest), Sorowar, Simberi Island

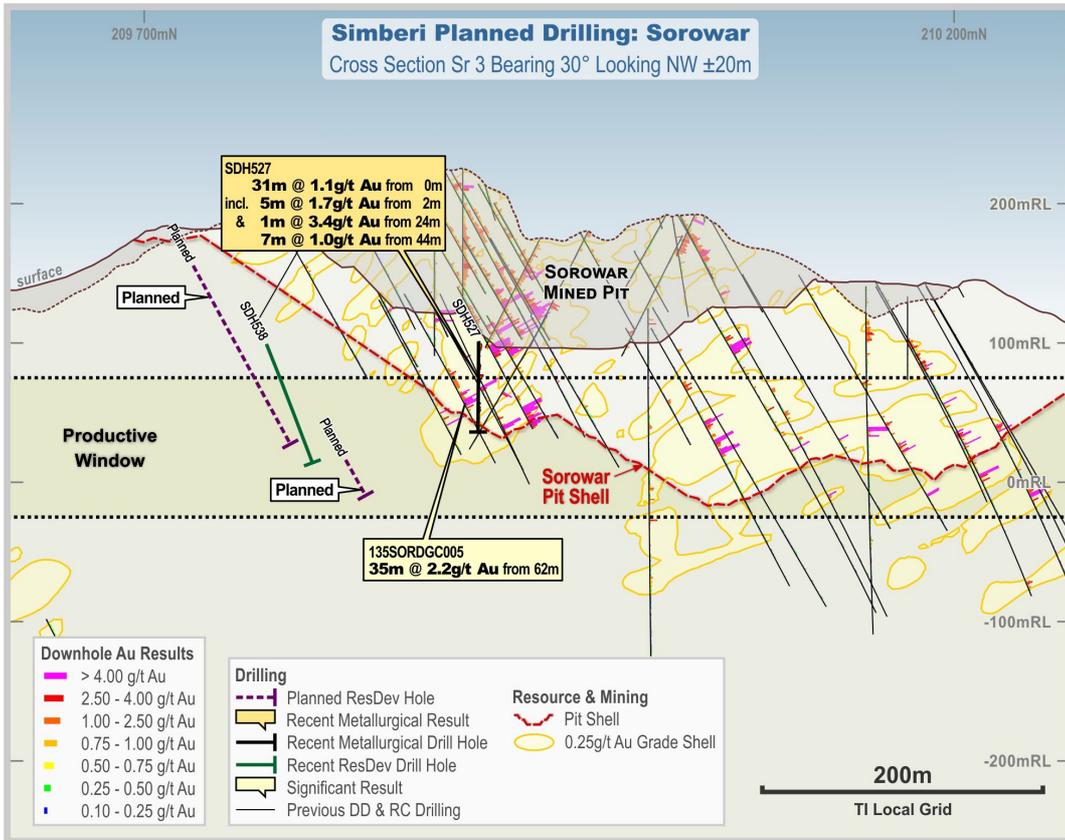


Figure 7. Drill Cross Section Sr 4 (View Looking Northwest), Sorowar, Simberi Island

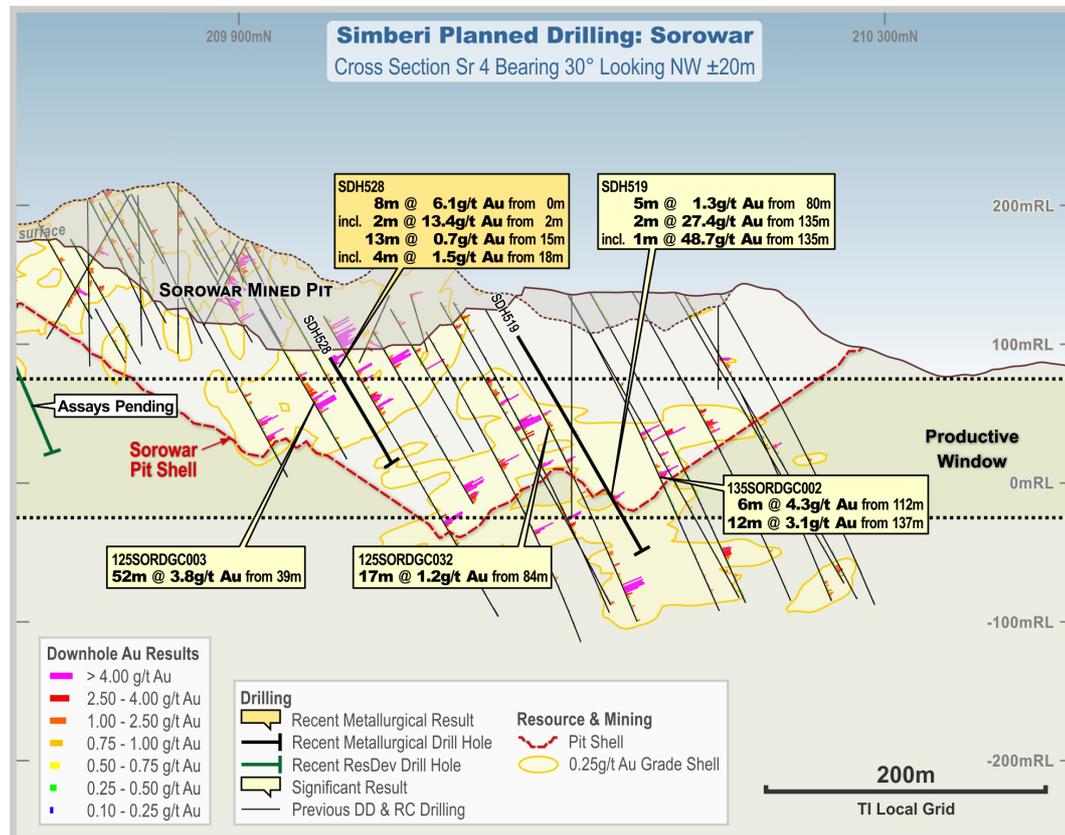




Figure 8. Drill Cross Section Srpt 7 (View Looking North), Sorowar, Simberi Island

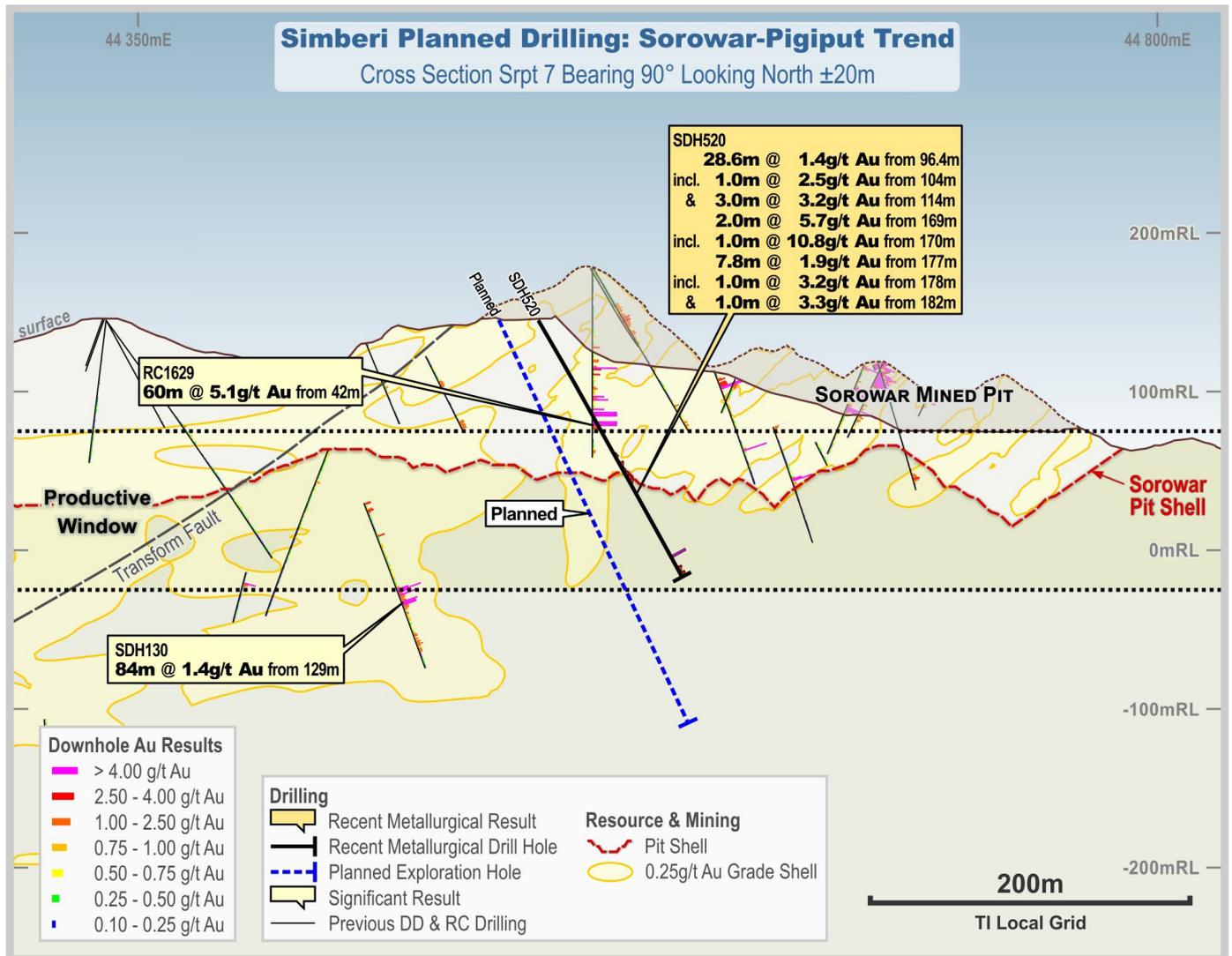




Figure 9. FY24 Completed and Planned Diamond Drilling, Pigibo, Simberi Island

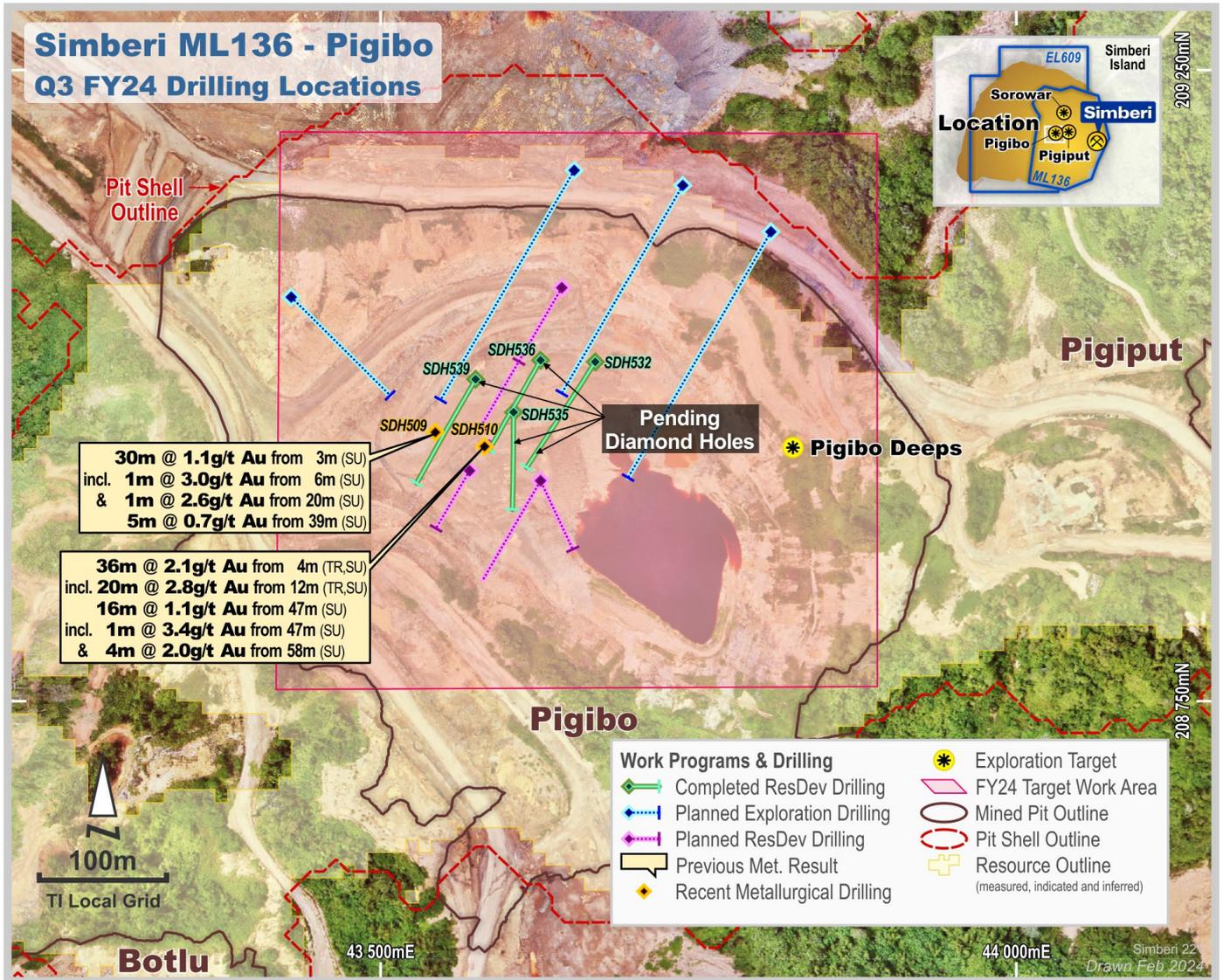




Table 1: Simberi Diamond Drilling Significant Intercepts – Simberi Island, Papua New Guinea

Hole Id	North	East	RL	Dip/ Azimuth	Total Depth	Ore Type	Down-hole Mineralised Intersection			
	m	m	m	degrees	m		From	To	Interval	Gold grade
							m	m	m	g/t Au
SDH509	208,963	43,543	160.6	-89 / 047	45.0	SU	3.0	33.0	30.0	1.1
<i>including</i>						SU	6.0	7.0	1.0	3.0
<i>and</i>						SU	20.0	21.0	1.0	2.6
						SU	39.0	44.0	5.0	0.7
SDH510	208,952	43,582	165.0	-89 / 135	70.0	TR,SU	4.0	40.0	36.0	2.1
<i>including</i>						TR,SU	12.0	32.0	20.0	2.8
						SU	47.0	63.0	16.0	1.1
<i>including</i>						SU	47.0	48.0	1.0	3.4
<i>and</i>						SU	58.0	62.0	4.0	2.0
SDH511	209,109	44,415	154.7	-89 / 151	186.0	SU	1.0	4.0	3.0	1.1
						SU	33.0	41.0	8.0	10.7
<i>including</i>						SU	37.0	39.0	2.0	38.8
						SU	64.0	182.0	118.0	1.8
<i>including</i>						SU	91.0	92.0	1.0	3.3
<i>and</i>						SU	115.0	122.0	7.0	5.5
<i>and</i>						SU	131.0	141.0	10.0	3.9
<i>and</i>						SU	162.0	163.0	1.0	12.2
<i>and</i>						SU	170.0	171.0	1.0	2.8
<i>and</i>						SU	181.0	182.0	1.0	3.9
SDH512	209,120	44,297	149.8	-90 / 358	201.1	SU	20.0	23.0	3.0	1.0
						SU	30.0	45.0	15.0	1.3
<i>including</i>						SU	35.0	37.0	2.0	3.5
						SU	79.0	192.0	113.0	1.7
<i>including</i>						SU	135.0	151.0	16.0	2.2
<i>including</i>						SU	145.0	151.0	6.0	3.0
<i>and</i>						SU	159.0	191.0	32.0	2.9
<i>including</i>						SU	162.0	166.0	4.0	3.4
<i>including</i>						SU	180.0	189.0	9.0	6.6
						SU	182.0	183.0	1.0	34.0
SDH513	209,172	44,351	135.4	-89 / 071	233.0	TR,SU	5.0	28.0	23.0	0.8
<i>Including</i>						SU	9.0	14.0	5.0	1.0
						SU	80.0	94.0	14.0	0.8
<i>Including</i>						SU	80.0	83.0	3.0	2.1
						SU	114.0	151.0	37.0	7.0
<i>Including</i>						SU	129.0	132.0	3.0	61.6
<i>and</i>						SU	148.0	150.0	2.0	14.0

NOTES:

OX: oxide, SU: sulphide, TR: transitional material

Previously reported intercepts (23/01/2024) are displayed as normal text and new intercepts are highlighted in bold text.



Table 1 Cont: Simberi Diamond Drilling Significant Intercepts – Simberi Island, Papua New Guinea

Hole Id	North	East	RL	Dip/ Azimuth	Total Depth	Ore Type	Down-hole Mineralised Intersection			
	m	m	m	degrees	m		From	To	Interval	Gold grade
							m	m	m	g/t Au
SDH513	209,172	44,351	135.4	-89 / 071	233.0	SU	191.0	225.0	34.0	1.4
<i>including</i>						SU	191.0	207.0	16.0	2.2
						SU	194.0	196.0	2.0	9.7
SDH514	208,998	44,424	165.2	-59 / 181	113.0	OX,TR	4.0	18.0	14.0	0.6
						TR,SU	44.0	46.0	2.0	1.6
						SU	68.0	90.0	22.0	0.9
<i>including</i>						SU	70.0	78.0	8.0	1.2
<i>and</i>						SU	83.0	85.0	2.0	1.4
SDH515	209,097	44,266	155.4	-60 / 185	144.5	TR,SU	16.0	33.0	17.0	1.9
<i>including</i>						SU	16.0	21.0	5.0	4.4
						SU	43.0	72.0	29.0	3.9
<i>including</i>						SU	46.0	64.0	18.0	5.7
<i>including</i>						SU	55.0	64.0	9.0	8.8
						SU	80.0	97.0	17.0	0.9
<i>including</i>						SU	81.0	86.0	5.0	1.5
						SU	105.0	124.0	19.0	12.6
<i>including</i>						SU	114.0	122.0	8.0	29.0
<i>including</i>						SU	115.0	116.0	1.0	206
SDH516	210,300	44,137	127.1	-90 / 206	45.0	OX,TR	1.0	9.0	8.0	1.6
<i>including</i>						TR	4.0	5.0	1.0	2.6
						SU	22.0	32.0	10.0	0.7
SDH518	210,284	44,267	143.2	-90 / 064	100.0	OX,TR,SU	59.0	76.0	17.0	0.9
<i>including</i>						OX,TR	63.0	70.0	7.0	1.1
SDH519	210,069	44,670	105.9	-59 / 027	178.6	SU	80.0	85.0	5.0	1.3
						SU	135.0	137.0	2.0	27.4
<i>including</i>						SU	135.0	136.0	1.0	48.7
SDH520	209,552	44,529	144.4	-60 / 046	184.8	TR,SU	28.0	34.0	6.0	0.7
						TR,SU	96.4	125.0	28.6	1.4
<i>including</i>						SU	104.0	105.0	1.0	2.5
And						SU	114.0	117.0	3.0	3.2
						SU	169.0	171.0	2.0	5.7
<i>including</i>						SU	170.0	171.0	1.0	10.8
						SU	177.0	184.8	7.8	1.9
<i>including</i>						SU	178.0	179.0	1.0	3.2
and						SU	182.0	183.0	1.0	3.3

NOTES:

OX: oxide, SU: sulphide, TR: transitional material.

Previously reported intercepts (23/01/2024) are displayed as normal text and new intercepts are highlighted in bold text.



Table 1 Cont: Simberi Diamond Drilling Significant Intercepts – Simberi Island, Papua New Guinea

Hole Id	North	East	RL	Dip/ Azimuth	Total Depth	Ore Type	Down-hole Mineralised Intersection			
	m	m	m	degrees	m		From	To	Interval	Gold grade
							m	m	m	g/t Au
SDH522	209,118	44,525	191.2	-85 / 001	205.0	SU	65.0	70.0	5.0	0.7
						SU	77.0	100.0	23.0	0.9
<i>including</i>						SU	85.0	99.0	14.0	1.2
						SU	118.0	178.0	60.0	2.6
<i>including</i>						SU	119.0	123.0	4.0	10.3
<i>and</i>						SU	132.0	133.0	1.0	6.3
<i>and</i>						SU	140.0	152.0	12.0	4.0
<i>including</i>						SU	146.0	147.0	1.0	13.4
<i>and</i>						SU	168.0	171.0	3.0	5.9
SDH527	209,899	44,505	95.6	-89 / 180	65.0	SU	0.0	31.0	31.0	1.1
<i>including</i>						SU	2.0	7.0	5.0	1.7
<i>and</i>						SU	24.0	25.0	1.0	3.4
						SU	44.0	51.0	7.0	1.0
SDH528	209,954	44,592	90.4	- 60 / 030	87.9	OX,TR,SU	0.0	8.0	8.0	6.1
<i>including</i>						OX	2.0	4.0	2.0	13.4
						SU	15.0	28.0	13.0	0.7
<i>including</i>						SU	18.0	22.0	4.0	1.5

NOTES:

OX: oxide, SU: sulphide, TR: transitional material

Previously reported intercepts (23/01/2024) are displayed as normal text and new intercepts are highlighted in bold text.

**Authorised by**

Andrew Strelein
Managing Director and CEO

For more information**Investor Relations**

David Cotterell
*General Manager Business Development &
Investor Relations*

info@stbarbara.com.au

T: +61 3 8660 1959
M: +61 447 644 648

Media Relations

Paul Ryan / Michael Weir
Citadel-MAGNUS

M: +61 409 296 511 / +61 402 347 032

Competent Persons Statement

The information in this report that relates to Exploration Results is based on information compiled by Dr Roger Mustard, who is a Member of The Australasian Institute of Mining and Metallurgy. Dr Mustard is a full-time employee of St Barbara and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking 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'. Dr Mustard consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.



JORC Table 1 Checklist of Assessment and Reporting Criteria

Section 1 Sampling Techniques and Data – Simberi ML136 (Pigibo, Sorowar and Pigiput)

Criteria	Commentary
Sampling techniques	<ul style="list-style-type: none"> Diamond Drilling comprised PQ3 (83 mm) and HQ3 (61.1 mm) sized core collected using standard triple tubes. Half core was sampled on nominal 1 metre intervals with the lower or left half (looking downhole) of the core submitted for sample preparation and analysis. Competent core is half cored by an Almonte automated coresaw whereas broken or highly weathered core is manually half cored with a masonry chisel. Half core samples were fully prepared at the company's on-site sample preparation facility on Simberi Island with 150 g to 200 g pulps sent to ALS Laboratory in Townsville for further analysis. Pulp residues are stored in Townsville for six months following assay before disposal.
Drilling techniques	<ul style="list-style-type: none"> Diamond drilling comprised PQ3 (83 mm) and HQ3 (61.1 mm) core recovered using a 1.5 m barrel. Drilling was completed by Quest Exploration Drilling (QED). When ground conditions permit, an ACT Digital Core Orientation Instrument was used by the contractor to orientate the HQ3 core.
Drill sample recovery	<ul style="list-style-type: none"> Diamond drilling recovery percentages were measured by comparing actual metres recovered per drill run versus metres recorded on the core blocks. Recoveries averaged >98 % with increased core loss present in fault zones and zones of strong weathering/alteration.
Logging	<ul style="list-style-type: none"> Diamond holes are qualitatively geologically logged for lithology, structure and alteration and qualitatively and quantitatively logged for veining and sulphide mineralogy. Diamond holes are geotechnically logged with the following attributes qualitatively recorded - strength, infill material, weathering, and shape. Whole core and half core photography is completed on wet core. All holes are logged in their entirety and data recorded in templated excel workbook prior to being uploaded to the companies secure SQL database.
Sub-sampling techniques and sample preparation	<ul style="list-style-type: none"> All diamond drill core was half cored with the lower or left half (looking downhole) submitted for sample preparation and analysis. All drill samples are prepared at the company's on-site sample preparation facility. After oven drying for 12 hours, sample material undergoes initial crushing in a Terminator Jaw Crusher to achieve particle size <2mm. For samples weighing in excess of 1kg, a 0.8kg to 1.2kg sample split is taken using a riffle splitter. Crushed samples of ~ 1kg standardized weight are then completely pulverized in an Essa LM2 Pulveriser (90% passing 75 microns). Approximately 200g of pulverised material is retained for assaying using a metal scoop to transfer material into analytical envelopes (pulp packets) before being sent to the ALS lab in Townsville. All reported results are from analysis conducted by ALS. For internal reference, a second pulverized sub- sample (~ 100 grams) is analysed at the site lab using same QAQC reference materials as those sent to ALS lab. Quality control of sample material prepared on site consists of insertion of two (non-certified) blank control samples at the start of each hole, and between each sample, any pulverised residue in the LM2 is discarded and the bowl vacuumed and wiped clean. 150 g to 200 g pulp samples are then sent to ALS Laboratory in Townsville for assay via air freight. Pulp residues are stored in Townsville for six months following assay for re-assay if required.
Quality of assay data and laboratory tests	<ul style="list-style-type: none"> Pulps are analysed for Au via 50 g Fire Assay Atomic Absorption Spectroscopy (AAS) finish (Au-AA26 method) and multi-element (Ag, As, S, Fe, Cu, Pb, Zn, Mo and Sb) by Aqua Regia digest followed by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) instrument read (ME-ICP41S method). QC included insertion of certified reference material (1:20); insertion of in-house blank control material (2 at the start of each job); and the insertion of lab duplicates (1:20 split from the initial jaw crushed material prepared by the site lab. QAQC results were assessed as each laboratory batch was received and again at resource estimation cycles. Results indicate that pulveriser bowls were adequately cleaned between samples. ALS Townsville insert certified standards, replicates, lab repeats and complete sizing checks (1:40) or higher as part of their internal QAQC protocols.
Verification of sampling and assaying	<ul style="list-style-type: none"> Sampling data is recorded electronically which ensures only valid non-overlapping data can be recorded. Assay and downhole survey data are subsequently merged electronically. All drill data is stored in a SQL database on secure company server.
Location of data points	<ul style="list-style-type: none"> All metallurgical and resource definition drill collars were surveyed by company appointed surveyors using a DGPS in Tabar Island Grid (TIG) which is based on WGS84 ellipsoid and is GPS compatible. All diamond drill holes were downhole surveyed using a Reflex EZ track single shot camera with the first reading at 9, 12 or 18 m and one at 30 m and then approximately every 30 m increments to the bottom-of-the hole where an end of hole survey is also taken.
Data spacing and distribution	<ul style="list-style-type: none"> Metallurgical diamond drilling was not planned on any particular spacing, rather they were designed to target known mineralisation to return suitable quantities of fresh sulphide ore. Resource definition drilling to define Indicated Mineral Resources is completed on a nominal 30m * 40m pattern. This spacing is adequate to establish both geological and grade continuity for the Mineral Resource and Ore Reserve procedures. Sampling is typically based on one-metre intervals with no compositing applied.
Orientation of data in relation to geological structure	<ul style="list-style-type: none"> Drilling is orientated perpendicular to the major structures controlling the distribution of gold mineralisation. The orientation of the drilling ensures unbiased sampling of structures
Sample security	<ul style="list-style-type: none"> Only company personnel or approved contractors are allowed on drill sites; drill core is only removed from drill site to secure core logging/processing facility within the gated exploration core yard; core is promptly logged, cut, and prepped on site. The samples sent to ALS are stored in locked and guarded storage facilities until receipted at the Laboratory.
Audits or reviews	<ul style="list-style-type: none"> No audits or reviews of sampling protocols have been completed.



Section 2 Reporting of Exploration Results – Simberi ML136 (Pigibo, Sorowar and Pigiput)

Criteria	Commentary
Mineral tenement and land tenure status	<ul style="list-style-type: none"> SBM has 100 % ownership of the three tenements over the Simberi Islands; ML136 on Simberi Island, EL609 which covers the remaining area of Simberi Island, as well as Tatau Island and Big Tabar Island and 4 sub-block EL2462 which covers part of Tatau and Mapua Islands.
Exploration done by other parties	<ul style="list-style-type: none"> CRA, BHP, Tabar JV (Kennecott, Nord Australex and Niugini Mining), Nord Pacific, Barrick and Allied Gold have all previously worked in this area. Nord Pacific followed by Allied Gold was instrumental in the discovery and delineation of the 5 main oxide and sulphide deposits at Simberi.
Geology	<ul style="list-style-type: none"> The Simberi gold deposits are low sulphidation, intrusion related adularia-sericite epithermal gold deposits. The dominant host rocks for mineralisation are andesites, volcanoclastics and lesser porphyries. Gold mineralisation is generally associated with sulphides or iron oxides occurring within a variety of fractures, such as simple fracture in-fills, single vein coatings and crackle brecciation in the more competent andesite units, along andesite/polymict breccia contact margins as well as sulphide disseminations. Deeper holes in the area between Pigiput and Sorowar intersected up to 100m of semi continuous carbonate +/- quartz base metal / Au veining, similar in style to mineralization occurring on Tatau and Big Tabar islands to the south, which are also prospective for Porphyry Cu/Au deposits.
Drill hole Information	<ul style="list-style-type: none"> Drill hole information is included in intercept table outlining collar position obtained by DGPS pickup, hole dip and azimuth acquired from a downhole surveying camera as discussed in section 1, composited mineralised intercepts lengths and depth as well as hole depth.
Data aggregation methods	<ul style="list-style-type: none"> For gold only epithermal mineralisation, broad down hole intercepts are reported as length weighted averages using a cut-off of 0.6 g/t Au, minimum width of 2 m, and a minimum grade*length of 2.5 gmpt (gram metre per tonne). Such intercepts may include material below cut-off but no more than 5 sequential metres of such material and except where the average drops below the cut-off. Supplementary cut-offs, of 1.0 g/t and 2.5 g/t Au may be used to highlight higher grade zones and spikes within the broader aggregated interval. Single assays intervals are reported only where ≥ 5.0 g/t Au and ≥ 1 m down hole. Core loss is assigned the same grade as the sample grade; no high-grade cut is applied; grades are reported to one decimal figure and no metal equivalent values are used for reporting exploration results.
Relationship between mineralisation widths and intercept lengths	<ul style="list-style-type: none"> Down hole length was reported for all holes. Simberi lodes display high variability in orientation and complex geometries because of the interplay of veining, brecciation intensity, host lithology and oxidation fronts.
Diagrams	<ul style="list-style-type: none"> Included in the body of the report.
Balanced reporting	<ul style="list-style-type: none"> Details of all holes material to Exploration Results are reported in intercept tables. This report covers the final four holes of a 14-hole metallurgical drilling program. Assay results from the first 10 diamond drill holes are reported in Table 1 of the ASX release Simberi Resource Definition Drilling Update January 23, 2024.
Other substantive exploration data	<ul style="list-style-type: none"> Included in the body of the report.
Further work	<ul style="list-style-type: none"> Included in the body of the report.