2025 EXPLORATION LICENCING ROUNDS

The Sukhaybarat – As Safra Gold Region

The Al Nuqrah VMS Belt

The Nabitah – Ad Duwayhi Gold Belt

Contents

1. Sukhaybarat – As Safra Gold Region

The Sukhaybarat-As Safra Gold Region extends approximately 275 km south-southwesterly through the Al Habla and Humaymah areas, the Sukhaybarat and Bulghah Mines and the Jabal Mawan area. In total, the Sukhaybarat-As Safra Region covers 122 prospects. Many more prospects might however also be included at the fringes of the zone. The belt ends just south of the Thurb and As Safra gold- and base metals prospects where it is terminated by the Sukhaybarah Fault, a major NW-trending Najd structure.

The Sukhaybarat – As Safra Gold Region has been subdivided into two separate entities based on the underlying geological terrane and distinct mineralization styles encountered.

The Sukhaybarat - Shabah Gold District is defined predominantly by Intrusion-Related Gold Systems (IRGS) hosted within the meta-sedimentary Murdama Group.

The Nuqrah-As Safra VMS and Orogenic Gold Belt, located in the west of the region, is defined by the Nabitah Suture Zone that hosts several orogenic- and shear-zone-related gold deposits located within the volcano-sedimentary Hulayfah Group.

The historical Ma'aden Exploration Licences of Shabah, Jardawiyah and Miskah covered large areas within this region.

1.1. Sukhaybarat – Shabah Gold District

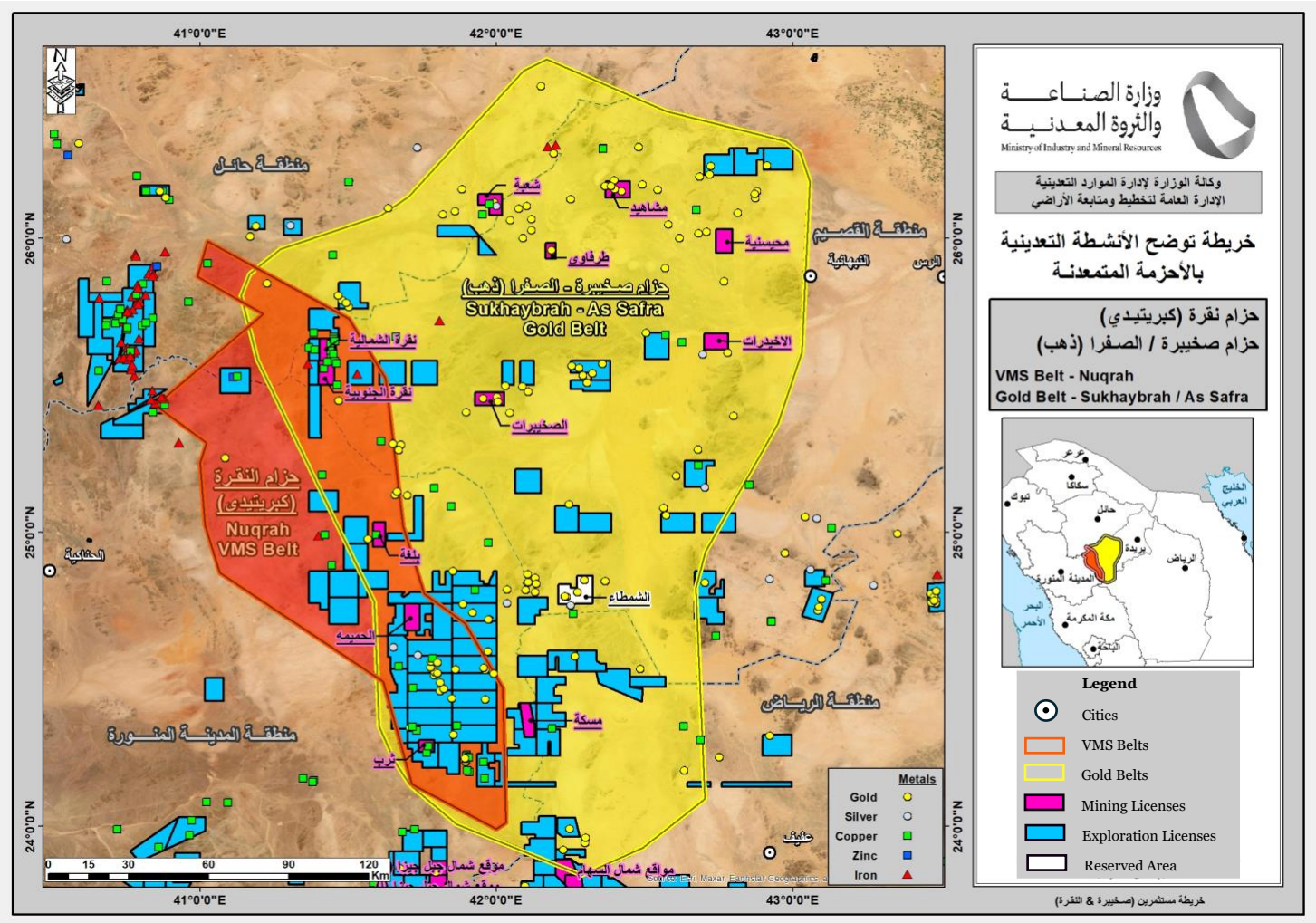
The region hosts the Sukhaybarat gold mine, the Red Hill satellite deposit and several gold projects at various stages of development of which Shabah is the most advanced.

1.1.1. Location and Regional Geology

The Sukhaybarat – Shabah Gold District is located within the northern part of the Afif tectonostratigraphic Terrane. It is mostly underlain by Neoproterozoic volcanic- and sedimentary rocks that have been intruded by relatively undeformed granitoid and gabbroid rocks. Ages range between ~700 Ma and ~570 Ma.

The layered Dhiran meta-andesite-sediment and the intrusives of the Suwaj Suite are interpreted to be the oldest rocks that have formed by partial melting of subducted oceanic lithosphere between 700Ma to 670 Ma.

Figure 1. Location Map



Much of the terrane is unconformably overlain by thick clastic deposits of the Murdama Group which were derived from erosion of the orogenic uplift and were deposited in the fault-bounded and subsiding Murdama- and Maraghan marine basins. This was followed by a period of widespread erosion and regional extension that produced shallow marine and subaerial basins that rapidly filled with volcanic and volcaniclastic deposits of the Jardawiyah Group.

Murdama Group sediments have been intruded by Idah Suite intermediate intrusions composed of granodiorite, diorite and tonalite of late Proterozoic age (~625 to 615Ma).

1.1.2. Historical Exploration Work

Multi-phase regional- and more detailed prospect-scale historical exploration programs have been completed in the region from the 1960's until the early 2000's by the BRGM, USGS, Riofinex and the SGS The Ma'aden exploration work commenced more recently, from the late 1990's until the present time.

Work included historical geological mapping on a regional-, district- and prospect scale. Regional- and infill grab rock- and soil geochemical surveys completed historically by the USGS covered some of the

quadrangles in the region. Ma'aden completed several conventional soil sampling programs between approximately 2003 and 2020 and more recently a large, regional ionic soil programs from 2013-2015.

Regional- and detailed airborne geophysical surveys include historical airborne EM 'INPUT' surveys flown during the late 1960's. Regional, Shield-scale, airborne magnetic- and radiometric surveys were conducted for the SGS during the 1980's and 1990's. A Helicopter airborne magnetic and electro-magnetic survey (ZTEM) that covered large portions of the district was completed by Ma'aden between 2010 and 2012. Detailed, prospect scale, ground geophysical follow-up programs included historical Self Potential and TURAM EM surveys (BRGM) and magnetic- and induced polarization (I.P.) surveys. Common remote sensing techniques utilized in regional mineral alteration studies included multi-spectral ASTER, Landsat and Sentinel imaging.

1.1.3. Mineralization and Prospectivity

In addition to the Sukhaybarat gold mine the Sukhaybarat – Shabah Gold District hosts several advanced Intrusion-Related Gold projects, including from west to east:

- Shabah – Advanced Gold Project - Indicated and Inferred Resource Stage – Au.
- At Tarfawi – Advanced prospect – Au.
- Meshaheed – Advanced Gold Project – Inventory Stage - Au.
- Musiniya'ah – Advanced Gold Project – Inventory Stage – Au.
- Raha – Prospect - Au

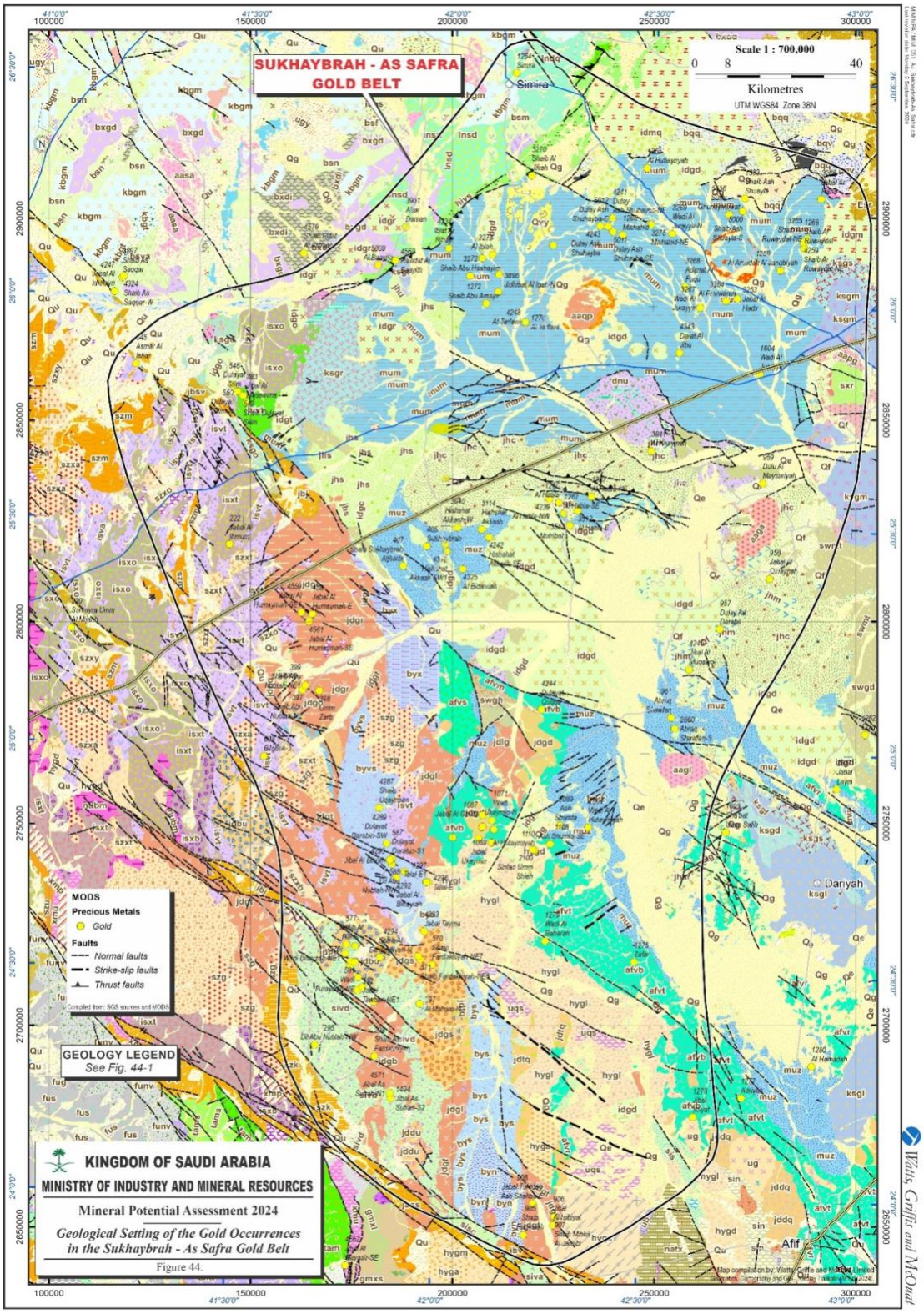
Examples of additional prominent gold occurrences and prospects scattered throughout the district and of a similar mineralization style include:

- An Najadi – Prospect – Au.
- Shiaila – Ar Rokaib - Prospect – Au.
- Habla North - Prospect – Au.
- Hayyas – Prospect – Au.
- Abraq Shawfan – Prospect – Au.
- Ashumta - Prospect – Au.

Two Porphyry-style Cu-Au prospects hosted within porphyritic granodiorite of the Suwaj Suite are located in the east of the region:

- Mibari – Prospect - Cu-Au porphyry.
- Al Ukhaydirat - Prospect – Au-Cu porphyry.

Figure 2. Geology and Mineral Occurrences of the Sukhaybarat – As Safra Gold Region.



Mineralization models include Intrusion-Related Gold Systems (IRGS) hosted within the Murdama Group and Cu-Au porphyry-style mineralization associated with the Suwaj Suite.

Meta-sedimentary basin-fill material of the Murdama Group is predominant within this region hosting intrusion-related gold mineralization at the Sukhaybarat and Red Hill mines associated with the Idah Suite. Similar- style gold mineralization occurs at several advanced projects, including Shabah, Tarfawi, Musiniya'ah and Meshaeed. Mineralization often consists of gold bearing quartz veins hosted in Idah Suite granodiorite and tonalite and pervasively altered wall rocks of sandstone and siltstone of the Murdama Group.

The Sukhaybarat gold deposit is situated in the Afif tectonostratigraphic Terrane in an area underlain by weakly metamorphosed, thinly bedded sandstone, limestone and polymictic conglomerate of the Murdama Group. These layered rocks are intruded by ldah Suite plutonic rocks comprising granodiorite and lesser diorite, granodiorite porphyry, tonalite and granite. Gold mineralization is intrusion-related at the contact between the Idah Suite diorite and tonalite and altered meta-sediment of the Murdama Group. Mineralization is associated with elongated, en-echelon quartz veins hosting minor sulphide of arsenopyrite and pyrite.

Measured, Indicated and Inferred Resources at Sukhaybarat mine were estimated to total 19.96 Mt averaging 1.15 g/t Au for a total resource of 729,000 ounces of contained gold (SRK, 2022).

The Shabah advanced gold project was estimated to contain an Indicated Mineral Resource of 21 Mt averaging 1.49 g Au/t and an Inferred Resource of 10 Mt averaging 0.98 g Au/t for a combined estimate of 31 Mt averaging 1.33 g/t for a total contained gold resource of 1.345 Moz (SRK, December 2016). The gold mineralization has been described as "refractory".

The Mibari Cu-Au porphyry prospect is located in the south-east of the region. Mineralization is hosted within a porphyritic granodiorite pluton of the Suwaj Suite that intrudes Dhiran meta-andesite. Average grade from historical R/C drilling estimated at 80Mt @ 0.18 g/t Au & 0.12% Cu (BRGM).

Table 1: Summary of Major Orogenic and Disseminated- Intrusion Related Gold Deposits in the Arabian Shield including those located within the Sukhaybarat – Shabah Gold District (WGM – 2024).

Mine/Deposit (date of resources)	Deposit Type	Status	Mineral Resources		Mineral Reserves		Au	Contained Ounces	Notes
			Mt	g Au/t	Mt	g Au/t	US$/oz		
Sukhaybarat Mine	D	A	10.63	1.79	16.73	1.08	?	1,192,647	throughput of 700,000 t.p.a. to 2024 – current mineral resources do not included mined ore
Bulghah North (Dec-2023)	D	A	2.573	0.9	0	0	1,550	74,450	New open pit operation
Ad Duwayhi Mine (Dec-2023)	V	A	8.017	1.8	20.077	1.7	1,700	1,561,262	hosted in sheared intrusive and volcanosedimentary rocks along a NE-striking thrust. Reserves & Resources do not include mined ore.
Mansourah (Dec-2022)	V	A	52.551	2.9	0	0	1,550	4,899,624	hosted in altered intrusive and country rocks in the Bi'r Tawilah (Nabitah age) Shear Zone forming the thrusted border between the Murdama Gp to the east and Siham Gp. to the west. Adjacent diorite & granodiorite may be the heat engine.
Mahd (Dec-2023)	V&D	A	21.694	2.37	0	0	1,700	1,652,996	Low sulphidation epithermal mineralisation mostly in quartz veins and some stockworks, and disseminated in agglomerate host rocks. Also 13.94 g/t Ag and 0.35% Cu. Excludes all Mahd adh Dhahab mine production to date
Masarah (Dec-2022)	V	A	9.931	4.1	0	0	1,550	1,309,063	as above - Masarrah is open at depth
Jabal Guyan (Oct-2022)	V	A	3.077	2.41	3.573	1.8	1,800	445,183	excludes 822,236 t mined in 2021-22 at 1.78 g Au/t.
As Suq Mine (Dec-2023)	V	S	3.8	1.7	0	0	1,700	207,690	Au-bearing quartz veins developed along complex N to NNE-trending, E-dipping shear zones and reverse faults cutting metasedimentary rocks & diorite pluton; averages 3.68 g Ag/t (excludes >5 Mt mined). Potential resource in wireframes totals 16.51 Mt @ 1.40 g Au/t and 1.96 g/t Ag.
Thurb (June-2023)	V	PP	35.25	0.57	0	0	1,700	645,978	Au associated with Qtz-Sulphide veins & dissem sulphide in basalt & dolerite with pervasive chl-ser-carb alteration. Sulphides - Py, Aspy, Ga, Sph, Po & Cpy. Miskah and Thurb are about 25 km apart
Red Hill (June-2023)	V	PP	0.297	2.21	0	0	1,550	21,102	Multiple NE-striking, shallowly SW-dipping planar quartz veined shear zones within granite. Shallow-dipping quartz veins have K-feldspar-pyrite alteration halos. Zone is adjacent to the Sukhaybarat Mine.
Humaymah (Dec-2021)	V	PP	37.6	0.87	0	0	1,550	1,051,698	hosted in diorite-tonalite near Ad Dafinah Fault, but associated with NNE-trending shears
Ghadarah (March-2017)	V	PP	9.7	1.1	0	0	1,300	343,043	Gold hosted in carbonate rich listwaenite and sheared granodiorite bodies in Nabitah thrust fault/shear zone. High-grade associated with chl-gph-Py-Aspy veins in fractures & bxd quartz
As Siham (Dec-2019)	V	PP	6.5	1.04	0	0	1,450	217,335	hosted in mylonitized and altered (sulphide-carbonate-silica-ser) Murdama siltstone, sandstone and andesite strata along a N-S shear zone offset across a NW-trending Najd Fault.
Bi'r Tawilah (Dec-2019)	D	PP	49	0.85	0	0	1,300	1,339,056	gold associated with Aspy and hosted in sheared and hydrothermally altered (silicified) granite and diorite with a generally unmineralized serpentinized footwall.
Ash Shakhtaliyat (Oct-2019)	V	PP	54.4	0.66	0	0	n.a.	1,154,321	Monzonite and andesite country rock cut by gold-bearing quartz veins along altered shear zones with disseminated pyrite

LEGEND: Deposit Type (V=vein; D=disseminated) - Status (A=active; S=suspended, PP=pre-production; AD=advanced; C=closed) - Au (US$/oz = gold price used to support estimate)

Table Continues Next Page.

Mine/Deposit (date of resources)	Deposit Type	Status	Mineral Resources		Mineral Reserves		Au	Contained Ounces	Notes
			Mt	g Au/t	Mt	g Au/t	US$/oz		
Ar Rjum (see detail below)	V	PP	100.3	1.56	0	0	1,700	5,030,478	shearing, potassic-altered diorite and country rock associated with quartz veining and disseminated pyrite.
Ar Rjum Wasemah (June-2023)	V	PP	65.5	1.64	0	0	1,700	3,453,575	Mostly vein-type gold mineralization in shears
Ar Rjum Umm Naam (June-2023)	V	PP	33.4	1.41	0	0	1,700	1,514,082	gold disseminated in altered bodies and vein stockworks
Shabah (Nov-2017)	V	PP	31	1.33	0	0	1,300	1,325,553	bxd Qtz vein zones dipping 40-50º NW hosted by Maragahan Fm (Murdama Gp) metaclastic rocks intruded by coarse-grained to porphyritic Idah Suite granodiorite. Associated with Py, Po, Aspy & Sb with silica, carb, ser & chl alteration
Shabah / Muhsiniyah (Dec-2018)	V	PP	42.06	1.1	0	0	n.a.	1,487,461	Au with Qtz-Carb veining & hydrothermal alteration along hematized NNW-NW shear zones in metasedimentary rocks & adjacent Idah Suite granodiorite. Some high Sb, Mo & W.
Jabal Qutman (2023)	V	AD	28.46	0.8	0	0	?	731,996	in sheared and altered rock in or near the Nabitah Zone
Shaib al Qalt (Al Aqiq) (Oct-2022)	V	AD	0.484	1.71	0.293	1.66	1,800	42,246	Gold occurs in narrow quartz-sulphide veinlets hosted by pyritic, intensely sericitized sheared diorite and tonalite. The veins assay 1-5 g Au/t and altered rocks, extending as much as 5-7 m outwards from the veins, generally assay less than 1 g Au/t.
Khutianah (Oct-2022)	V	AD	0.693	1.8	0	0	1,800	40,104	advanced project
Maham (August-2022)	V	AD	5.34	2.9	0	0	1,550	497,878	Gold in quartz veins in S to SSW trending shear zones along competency contrasts in fold in granite & in volcano-sedimentary host rocks. Unclassified gold inventory of 51.52 Mt at 0.76 g Au/t.
Meshaheed (Nov-2018)	V	AD	6.715	0.96	0	0	n.a.	207,253	Gold (+Mo, Sb, As) in brecciated Qtz-Carb veins & dissem in hydrothermal alteration in NE-ENE shears cutting meta-sed & granodiorite. Mineralization is an inventory not a resource. Estimated to contain 1300 tonnes of antimony (gross value of $17 million)
Miskah (June-2023)	V	AD	11.7	1.07	0	0	1,700	402,488	hosted in 20-25 m wide silicified shear cutting Idah Suite diorite/tonalite/granodiorite/granite & Nuiqrah Fm volcano-sedimentary rocks. Clay & potassic alteration. Miskah and Thurb are about 25 km apart
Zalim East	V	AD	3.98	2.4	0	0	?	307,099	hosted in sheared granite to gabbro pluton rocks
Ghazal (June-2023)	V	AD	1.3	1.6	0	0	1,700	66,872	large single composite vein system
Bulghah Main (Dec-2023)	D	C	53.186	1.05	0	0	1,700	1,795,438	Mineralization associated with arsenopyrite, pyrite and minor chalcopyrite with qtz-carb-chl-ser alteration along veins in shears cutting Idah Suite tonalite. From 1991-2013 production averaged 69,935 oz/yr.

LEGEND: Deposit Type (V=vein; D=disseminated) - Status (A=active; S=suspended, PP=pre-production; AD=advanced; C=closed) - Au (US$/oz = gold price used to support estimate)

Table 2: Summary of Orogenic and Disseminated- Intrusion Related Gold Deposits and Prospects in the Sukhaybarat – As Safra Gold Region (WGM – 2024).

MODS	New Name	Old Name	Main Commodity	Location		Nearest Town	Potential Ranking *	Geometry
				Longitude	Latitude			
1264	Simira	Samirah	Gold	42.1500000	26.5166670	Sumaira'a	VL	v
1265	Al Hubayriyah	Hebairiah	Gold	42.4793890	26.3096110	Sumaira'a	VL	v
3270	Shaib Al Jifrah	Khidar	Gold	42.1931110	26.2879170	Sumaira'a	Med	v
3266	Jabal Ar Raha	Jabal Ar Raha	Gold	42.9120830	26.2469440	Sumaira'a	Med	v
1383	Shaib Ash Shuayla	Shaib Ash Shuayla (Shiaila)	Gold	42.7224440	26.2457220	Sumaira'a	Med	v
5000	Shaib Ash Shuayla-S	Shiailah Center	Gold-Silver	42.7176110	26.2171670	Sumaira'a	Med	dd, v
5156	Sumr Ghunaymuwat	Sumr Ghunaymuwat	Gold	42.6841940	26.2092500	Sumaira'a	Low	uncertain
4241	Dulay Ash Shuhayba-NE	Jabal Al Khiraysha-SW	Gold	42.3955830	26.1965560	Sumaira'a	Med	v
4251	Jabal ar Rukayb	Ar Rokaib (Shaila)	Antimony-Gold	42.8578890	26.1956670	Sumaira'a	VL	v
3275	Mishahid-NE	Asha-N	Gold	42.4916670	26.1833330	Sumaira'a	Undefined	v
4243	Dulay Ash Shuhayba	Wadi Alawiin-E	Gold	42.3655830	26.1779440	Sumaira'a	VL	v
5012	Dulay Ash Shuhayba-E	Meshaheed Pluton W/Sw	Gold	42.3855280	26.1776110	Sumaira'a	Med	v
3901	Abar Daman	Tulqah	Gold-Silver	41.8833330	26.1666670	Sumaira'a	Med	v
5011	Dulay Ash Shuhayba-SE	Meshaheed Pluton Se	Gold	42.3975830	26.1656940	Sumaira'a	Med	v
3269	Wadi Al Jurayyir-N	Jurrayir-N	Gold	42.5437220	26.1640280	Sumaira'a	VL	v
1266	Mishahid	Meshaheed	Gold	42.4215280	26.1593330	Sumaira'a	Med	v, stockwork
3265	Shaib Ar Ruwaydat-NE	Rouydat-N	Gold	42.8781940	26.1584720	Sumaira'a	VL	v
4259	Shaib Ar Ruwaydat-NE	Rouydat-N	Gold	42.8700000	26.1499440	Sumaira'a	VL	v
1268	Shaib Ar Ruwaydat	Jerayer	Gold	42.8716390	26.1361670	Sumaira'a	VL	v
1599	Ash Shabbakiyah	Niece	Gold	42.2500000	26.1333330	Sumaira'a	VL	v
4234	Iblat Ar Rihayl	Wadi Sha'Bah-NE	Gold-Silver	41.9916940	26.1215000	Sumaira'a	Med	v
3273	Al Iblah	Wuday	Gold	42.1003330	26.1093330	Sumaira'a	Med	v
4235	Iblat Ar Rihayl-S	Wadi Sha'Bah-E	Gold	41.9983330	26.1091670	Sumaira'a	Med	v
5010	Al Iblah-SW1	Wuday-W	Gold	42.0747220	26.1007780	Sumaira'a	Undefined	v
4569	Rawdat Al Baayith	Rawdat Al Baayith	Gold-Silver	41.8599170	26.0906940	Sumaira'a	Med	v
1269	Al Amudah Al Janubiyah	Wagt	Gold	42.8135000	26.0858890	Al Dulaymiya	VL	v
5009	Al Baayith	Al Baayith	Gold	41.8176390	26.0800830	Sumaira'a	Med	v
3896	Jidhibat Al Iqab-N	Agob-N	Gold	42.1172780	26.0652220	Sumaira'a	Med	v
3272	Shaib Abu Hsahayim	Ar Rahail	Gold	42.0458060	26.0607780	Sumaira'a	VL	uncertain
3268	Adanat Al Fuqu	Jurrayir-SE	Gold	42.5786940	26.0459440	Sumaira'a	Med	v
1271	Jidhibat Al Iqab	Agob	Gold	42.1163060	26.0262780	Sumaira'a	Med	v
3263	Jabal Al Hadir	Hadhir	Gold	42.7081110	26.0215560	Al Dulaymiyah	VL	v
3264	Al Fawwarah	Al Fawwarah	Gold	42.6805280	26.0157780	Al Dulaymiyah	VL	v
3267	Wadi Al Jurayyir	Wadi Jurrayir-SE	Gold	42.6166670	26.0000000	Al Dulaymiyah	VL	v
1272	Shaib Abu Amayir	An Najadi, Amayir Al Madan	Gold	42.0876390	25.9996110	Al Dulaymiyah	Med	v
4956	Al Mohsoniyah NE	Al Muhsiniyyah NE	Antimony-Gold	42.7851110	26.0053060	Al Dulaymiyah	Med	v
4952	Al Mohsoniyah	Al Muhsiniyyah	Antimony-Gold	42.7718890	25.9906390	Al Dulaymiyah	Med	v
4248	At Tarfawi	At Tarfawi-NE	Gold	42.1855280	25.9595000	Al Dulaymiyah	Med	v
1270	At Tarfawi	Afra	Gold	42.1855280	25.9595000	Al Dulaymiyah	Med	v
4343	Darat Al Jibu	Darat Al Jibu	Gold	42.5675560	25.8982220	Al Dulaymiyah	Undefined	v
1604	Wadi Al Jurayyir	Wadi Al Jurayyir	Gold	42.7671390	25.8529440	Al Dulaymiyah	Undefined	dd, v
0545	Asmar Al Ishar	Jabal Al Achar	Gold	41.2255000	25.8459440	Al Nuhaiteyah	Undefined	v
0550	Dulayat Silim-N	Al Musamah	Gold-Silver	41.4664720	25.8046390	Al Nuhaiteyah	Undefined	v
0546	Dulayat Silim	Jabal Al Musamah	Gold	41.4782220	25.7892500	Al Nuhaiteyah	Undefined	v

MODS	New Name	Old Name	Main Commodity	Location		Nearest Town	Potential Ranking *	Geometry
				Longitude	Latitude			
0549	Shaib Dulayat Silim	Jabal Al Musamah	Gold-Silver	41.4923330	25.7804720	Al Nuhaiteyah	Undefined	v
0383	Jibal Al Musamma	Jibal Al Musamma	Gold	41.5006390	25.7650280	Al Nuhaiteyah	Low	v
3941	Al Khaymah	Al Khaymah	Gold	42.5028890	25.6777780	Al Dulaymiyah	Undefined	V
0959	Dulu Al Maysariyah	Umm Jirfan	Gold	42.7787220	25.6093890	Al Dulaymiyah	Undefined	V
1287	Al Habla-NE	Al Habla-NE	Gold-Silver	42.3575830	25.5730280	Uglat Asugour	Undefined	v
4239	Al Habla-NW	Al Habla-NW	Gold-Silver	42.2540000	25.5660000	Uglat Asugour	Undefined	v
1286	Al Habla	Al Habla	Gold-Silver	42.2777780	25.5583330	Uglat Asugour	Undefined	v
3512	Al Habla-E	Al Habla-E	Gold-Silver	42.3234720	25.5408890	Uglat Asugour	Low	v
1267	Al Habla-SE	Al Habla-- SE-Central	Gold-Silver	42.2903060	25.5337780	Uglat Asugour	Med	v
3513	Mutribah	Al Madraba	Gold-Silver	42.3052220	25.5076390	Uglat Asugour	Undefined	v
3940	Hishshat Akkash-W	Akkash-W	Gold-Silver	42.0290560	25.4977220	Uglat Asugour	Undefined	v
3114	Hishshat Akkash	Sukhaybarat-NE	Gold-Silver	42.0874170	25.4946390	Uglat Asugour	Undefined	v
4242	Hishshat Akkash-SE	Jabal Akkash-SW	Gold-Silver	42.1061110	25.4772220	Uglat Asugour	Med	v
0406	Sukhaybrah-E	Sukhaybarat Ash Sharqiyah	Gold	42.0000000	25.4591670	Uglat Asugour	Very high	v
0405	Sukhaybrah	Sukhaybarat Al Gharbiyah	Gold	41.9541670	25.4541670	Uglat Asugour	Undefined	v
0222	Jabal Al Ihmum	Jabal Al Aymum	Gold	41.4681670	25.4475000	Uglat Asugour	Low	v, stockwork
4342	Hishshat Akkash-SW1	Sukhaybarat-SE	Gold	42.0042220	25.4438610	Uglat Asugour	Med	v
0407	Shaib Sukhaybrah Aljharbi	Shaib Sukhaybrah Aljharbi	Gold	41.8972220	25.4083330	Uglat Asugour	Undefined	v
4325	Al Bidawiah	Sukhaybarat-SE	Gold	42.0443890	25.4052220	Uglat Asugour	Undefined	v
0958	Jabal Al Qinaynah	Jarrar	Gold	42.7991390	25.3956670	Hedban	VL	v
4559	Jabal Al Humaymah-SE1	Jabal Jumayah Mideast	Gold	41.6492780	25.2993890	Hedban	Med	v
0408	Jabal Al Humaymah-E	Jabal Jumaymah-E	Gold	41.6766390	25.2965000	Hedban	Undefined	v
0957	Dulay Ad Darabil	Ad Dirabi	Gold	42.6793330	25.2810280	Hedban	VL	v
4561	Jabal Al Humaymah-SE	Jabal Jumayah Central	Gold	41.6690000	25.2794720	Hedban	Undefined	uncertain
0220	Sumayra Umm Al Mijarib	Sumayra Umm Al Mijarib	Gold	41.0849440	25.2522780	Hedban	Low	v
4245	Jibal Al Muqawqi	Jibal Al Muqawqi	Gold	42.6055560	25.1902220	Hedban	VL	v
0399	Shaib Abu Nubtah-NE1	Jabal Mawan-NE	Gold	41.6642500	25.1369170	Hedban	Undefined	v
0397	Shaib Abu Nubtah-NE	Jabal Mawan-SW	Gold	41.6568060	25.1273610	Hedban	Med	v
0398	Umm Zarib	Umm Zarib	Gold	41.6980280	25.1254720	Hedban	Undefined	v
4244	Dulayat Quqqa	Wadi Jarir-W	Gold	42.2443610	25.0943610	Hedban	VL	v
2660	Abraq Shawfan-S	Abraq Shawfan-S	Gold	42.5724720	25.0576940	Hedban	Undefined	v
0608	Bulghah-3	Bulghah	Gold	41.5661110	24.9766940	Hedban	VL	dd, v
4287	Shaib Uqayriban	Al Bihrah	Gold	41.8519720	24.8676670	Hedban	VL	dd, v
1067	Jabal Al Ghulb	Gulb-N	Gold	42.1053610	24.8562780	Talal	Med	dd, v
1071	Wadi Ukaymin-N	Al Kwaimeen-N	Gold	42.1292220	24.8442780	Talal	VL	dd, v
2099	Ash Shumta	Ashumta	Gold	42.2958610	24.8365280	Talal	Med	dd, v
1084	Wadi Al Hutaymiyah	Al 'Aitiyah-N	Gold	42.3653610	24.8329440	Talal	Med	dd, v
1070	Jabal Al Ghulb-SE	Gulb	Gold	42.1059170	24.8296110	Talal	VL	dd, v
1066	Jabal Al Kawm-E	Al Koom-E	Gold	42.1036390	24.8284440	Talal	Med	v
1072	Jabal Ukaymin	Al Kwaimeen-N	Gold	42.1334170	24.8240000	Talal	VL	dd, v
1083	Jabal Al Kawm-W	El Koom-W	Gold	42.0340000	24.8045280	Talal	Med	dd, v
1068	Jabal Ukaymin	Al Kwaimeen-SW	Gold	42.0966670	24.8025000	Talal	VL	dd, v
1069	Jabal Ukaymin	Al Kwaimeen-SE	Gold	42.1288330	24.7948060	Talal	VL	dd, v

MODS	New Name	Old Name	Main Commodity	Location		Nearest Town	Potential Ranking *	Geometry
				Longitude	Latitude			
1108	Ash Shumta-SE	Ash Shumta-SE	Gold	42.2721670	24.7946390	Talal	Med	v
4289	Dulayat Darabin-SW	Jabal Zarabin-SE prospect	Gold	41.8721670	24.7877500	Talal	VL	v
2100	Sinfan Umm Shieh	Umm Shieh	Gold	42.2305560	24.7805560	Talal	Med	dd, v
1110	Al Hutaymiyah	Al Hitaimiyah	Gold	42.2347780	24.7788330	Talal	VL	v
0587	Dulayat Darabin-S1	Jabal Zarabin-SE	Gold	41.8858610	24.7539170	Talal	VL	dd, v
4291	Jibal Al Bihrah-SW	Al Burhah	Gold	41.8810000	24.7514720	Talal	VL	v
4290	Jibal Al Bihrah	Al Burhah	Gold	41.8816110	24.7490830	Talal	VL	v
4288	Dulayat Darabin-S	Jabal Zarabin-SE prospect	Gold	41.8866110	24.7415280	Talal	Med	v
0588	Dil Abu Nubtah-NW2	Jabal Burhah-E	Gold	41.9180280	24.7251110	Talal	VL	dd, v
4292	Jabal Al Bihayrah	Al Buhairah	Gold	41.8983330	24.7116390	Talal	VL	undetermined
0595	Humaymah (also 0596-598)	Humaymah (Makhruqah)	Gold	41.7181810	24.7094110	Talal	High	dd, v
4297	Talal-E1	Talal	Gold	41.9722220	24.7030560	Talal	VL	v
4296	Talal-E	Talal	Gold	41.9763890	24.7027780	Talal	VL	v
4295	Talal	Talal	Gold	41.9713890	24.7027780	Talal	VL	v
4293	Jabal Tayma	Jabal Tayma	Gold	41.9695670	24.5929170	Talal	Med	dd, v
1279	Wadi Al Baharah	Al Boharah	Gold	42.2643890	24.5767500	Talal	VL	v
0577	Jidhib Al Hamir	Al Nayzah	Gold	41.7795830	24.5598060	Talal	VL	dd, v
0579	Dulay Al Ubayd-W	Al Obaid	Gold	41.8007780	24.5563060	Talal	VL	dd, v
0576	Wadi Unayzah-NE1	Al Nayzah-SE	Gold	41.7775560	24.5395280	Talal	VL	dd, v
0572	Shaib Fardakhiyah-NE8	Wadi Al Furdukhiyah	Gold	41.9559720	24.5373610	Talal	VL	dd, v
1275	Zafar	Zafar	Gold	42.4833330	24.5333330	Talal	VL	dd, v
4294	Shaib Al Fardakhiyah-N	Al Furdukhiyah	Gold	41.8619720	24.5325280	Talal	VL	dd, v
0571	Shaib Fardakhiyah-NE6	Wadi Al Furdukhiyah	Gold	41.9610000	24.5302220	Talal	VL	dd, v
0574	Wadi Furaydikh-N	Wadi Al Nayzah	Gold	41.7913330	24.5229440	Talal	VL	dd, v
0581	Wadi Furaydikh-NE	Al Obaid-SE	Gold	41.8007500	24.5203890	Talal	VL	stratiform
0570	Shaib Fardakhiyah-NE7	Wadi Al Furdukhiyah	Gold	41.9897220	24.5188890	Talal	VL	dd, v
0573	Wadi Furaydikh-SE	Wadi Al Nayzah	Gold	41.7894720	24.5130830	Talal	VL	dd, v
0391	Jabal Tawban-NE3	Jabal Thuban-N	Gold	41.8095830	24.4869720	Talal	VL	dd, v
0393	Jabal Tawban-NE2	Jabal Thuban-N	Gold	41.8215000	24.4660560	Talal	VL	dd, v
0392	Jabal Tawban-NE1	Jabal Thuban-N	Gold	41.8086940	24.4581670	Talal	VL	dd, v
0296	B'ir Tawan	B'ir Tawan	Gold	41.8491670	24.4336110	Talal	VL	dd, v
0297	Al Maham-N	Al Maham-N	Gold	41.9615000	24.4306940	Talal	Med	v
0295	Dil Abu Nubtah-NW	Jabal Umenupta	Gold	41.7073890	24.3339170	Talal	VL	dd, v
0298	Shaib Al Fardakhiyah	Wadi Al Furdukhiyah-SE	Gold	41.8537780	24.3113060	Tharb	VL	dd, v
4571	Jibal As Sufrah-N1	As Safra Gold prospect	Gold	41.8937780	24.2296110	Tharb	Med	dd, v
1494	Jibal As Sufrah-S2	As Safra	Gold	41.8958060	24.2178610	Tharb	Med	dd, v
1278	Jibal Ikliyat	Akliyah	Gold	42.6332500	24.1890280	Tharb	Med	dd, v
0908	Jabal Tukhfah Ash Shahba-E	Jabal Tukhfah-E	Gold	42.2467500	23.9893610	Tharb	VL	dd, v
0907	Shaib Mibhil Al Janubi	Jabal Al Usaybiyat-W	Gold	42.3003610	23.9602780	Tharb	Med	dd, v
0906	Jibal Al Isibiyat	Jabal Al Usaybiyat-W	Gold	42.2977500	23.9416670	Tharb	Undefined	dd, v
0905	Shaib Rughwah	Jabal Tukhfah-SE	Gold	42.2252500	23.9181670	Tharb	Med	dd, v

NOTES: (1) Ranking according to MODS: VL = Very Low; Med = Medium. (2) dd = disseminated; v = veins

The remainder of the gold deposits and occurrences located within the broader The Sukhaybarat – As Safra Gold Region are grouped with The Nuqrah-As Safra VMS and Orogenic Gold Belt is defined by the Nabitah Suture Zone.

1.1.4. Mineral Potential Assessment

	Mt	g Au/t	Ounces
Sukhaybrah - As Safra gold belt	390	1.46	18,325,899
Gross in-situ resource value* (USD Bn)	$36.7		

**Based on 10% confidence level*

2. Al Nuqrah VMS Belt

The Nuqrah VMS Belt (also known as the Nuqrah-As Safra VMS and Orogenic Gold Belt) is located in the western portion of the Afif Terrane that trends in a north-north-westerly direction along a distance of approximately 170 kilometres. The belt is bounded on the north by the NW-trending Halaban-Zarghat Fault Zone and in the south by the Sukhaybarah Fault, a major NW-trending Najd structure located to the south of the Thurb- and As Safra gold- and base metals prospects. The Belt is hosted within the northern extension of the Nabitah Suture Zone.

In addition to VMS-style mineralization the Nuqrah-As Safra Belt hosts several orogenic- and shear-zone-related gold deposits.

The western margins of the historical Ma'aden Exploration Licences of Shabah, Jardawiyah and Miskah was located within this belt.

2.1. Location and Regional Geology

The Nabitah orogenic belt represents the most prominent crustal-scale structure in the Arabian Shield. Most known gold deposits and occurrences are located within or within proximity to this north-south trending structure and associated second order splays. The Nuqrah – As Safra belt is hosted within the northern extension of the Nabitah Suture Zone.

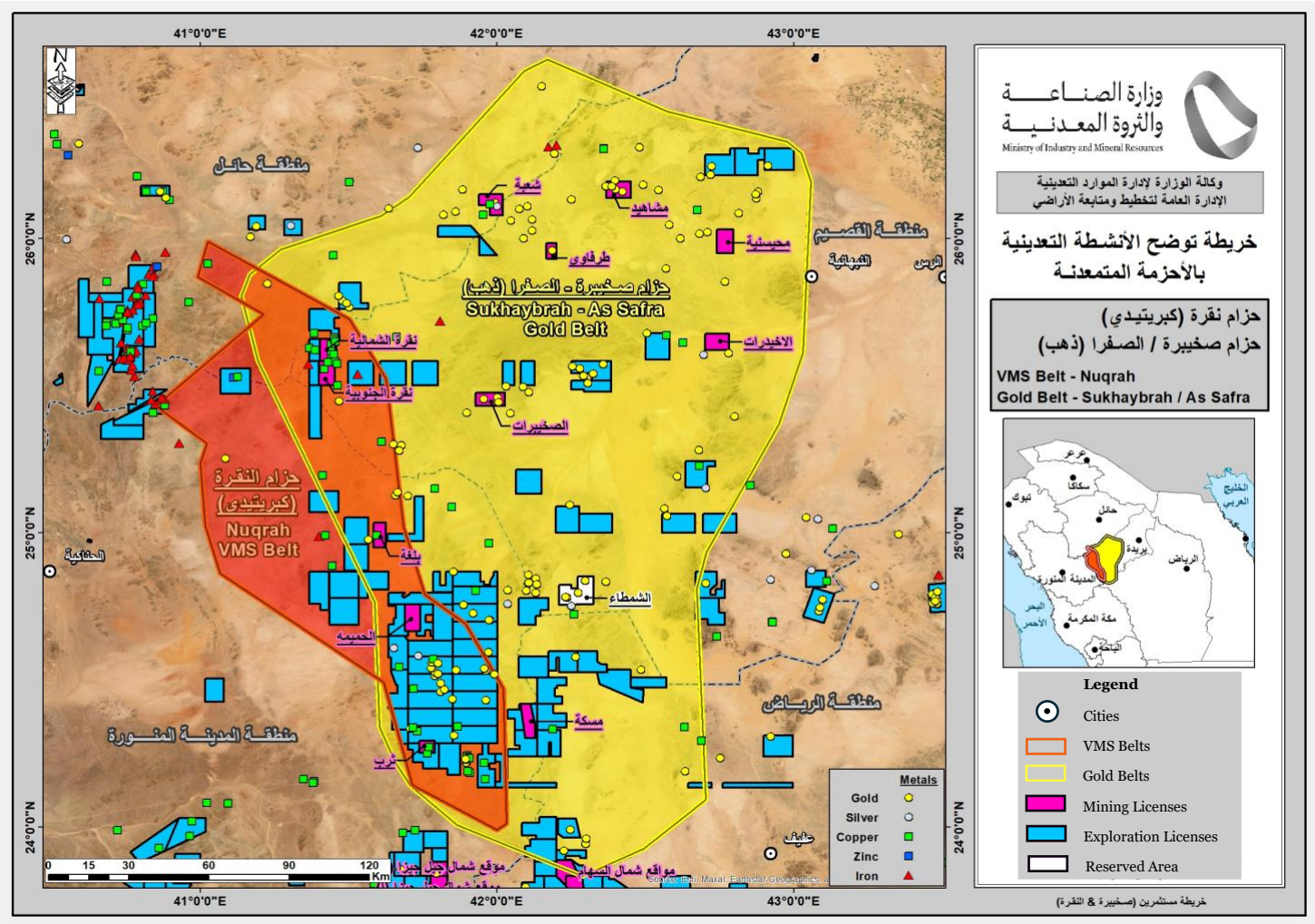
The northern Arabian Shield is underlain by Precambrian units distributed along several northwest-trending belts. The Nuqrah-As Safra VMS and orogenic gold belt is predominantly underlain by the Neo-Proterozoic Hulayfah Group that rests upon an older ophiolitic complex with a slight unconformity. It consists mainly of a basic, intermediate, and acidic volcanic suite of island-arc or continental margin type (740-650 Ma) with related pyroclastics and sediment.

The Hulayfah Group comprises of volcano-sedimentary rocks folded and metamorphosed to greenschist facies. The lower Afna Formation consists predominantly of andesitic and basaltic flows and pyroclastics. The overlying Nuqrah Formation (also known as the pyroclastic Halaban Formation) is characterized by rhyolitic tuff, andesitic tuff and breccia, graphitic shale, marble, jasper, chert with intercalated lenses of massive sulphide. Together with diorite, granodiorite and granite intrusives it forms part of the Precambrian Hulayfah Group. Late porphyritic diorite - and andesite dykes occur occasionally.

The belt is bounded several kilometers to the east by an older granitic basement, dated to the mid-Proterozoic, with large enclaves of granitized gneiss and amphibolite, and several belts and massifs of layered gabbro and serpentinized peridotite of ophiolitic complexes. A large granitic body intrudes the rocks of the Hulayfah Group In the center of the belt. It has been interpreted as an older basement largely remobilized during to Hulayfah Group volcanism.

The Hulayfah Group rocks were subsequently intruded by granite and diorite and overlain by the Murdama Group which consists of thick polygenic conglomerates with several rhyolite flows (~637 Ma), followed by

Figure 3. Location Map



alternating conglomerate and volcanic sandstone. These rocks were folded during the subsequent Ar Rimah orogenic phase which occurred in several stages between 600 and 535 Ma. during which large batholiths of calc-alkalic granite (557 Ma) were emplaced. Deposition of the Murdama Group occurred after 677 Ma. This constrains its formation to a period from 677 to 631 Ma, thus synchronous with the development of the gneiss domes and Najd Faults. Other basins formed at approximately the same time include the Bany Ghayy -, Arfan -, Furayah -, Thalbah -, Hadiyah – and Ablah basins.

The Nuqrah – As Safra belt is further characterized by intersections of the NW-trending Najd Fault system that was the final major deformational phase of cratonization of the Arabian Shield and related to extensional tectonics.

The last Precambrian unit, the Jibalah Group, located in synclinally-folded and faulted belts along the major northwest-trending Najd fault system, consists of polygenic conglomerate, cherty limestone, shale, sandstone and basic and intermediate alkali volcanism (520 Ma) giving the Jibalah Group the character of a graben-type deposit.

2.2. Historical Exploration Work

Multi-phase regional- and more detailed prospect-scale historical exploration programs have been completed in the region from the 1960's until the early 2000's by the BRGM, USGS, Riofinex and the SGS. The Ma'aden exploration work commenced more recently, from the late 1990's until the present time.

Work included historical geological mapping on a regional-, district- and prospect scale. Regional- and infill grab rock- and soil geochemistry surveys completed by Ma'aden includes conventional soil sampling programs between approximately 2003 and 2020 and more recently a large, regional ionic soil programs from 2013-2015.

Regional- and detailed airborne geophysical surveys include historical airborne EM 'INPUT' surveys flown during the late 1960's. Regional, Shield-scale, airborne magnetic- and radiometric surveys were conducted for the SGS during the 1980's and 1990's. Fixed-wing (FTEM) and helicopter (HeliTEM) airborne magnetic and Electro-Magnetic surveys that covered the belt was completed by Ma'aden between 2010 and 2012. Detailed, prospect scale, ground geophysical follow-up programs included historical Self Potential and TURAM EM surveys (BRGM) and magnetic- and induced polarization (I.P.) surveys.

Common remote sensing techniques utilized in regional mineral alteration studies included multi-spectral ASTER, Landsat and Sentinel imaging. A fixed-wing, HyVista Hyperspectral survey, that covered the Nuqrah – As Safra belt, was completed by Ma'aden during 2010.

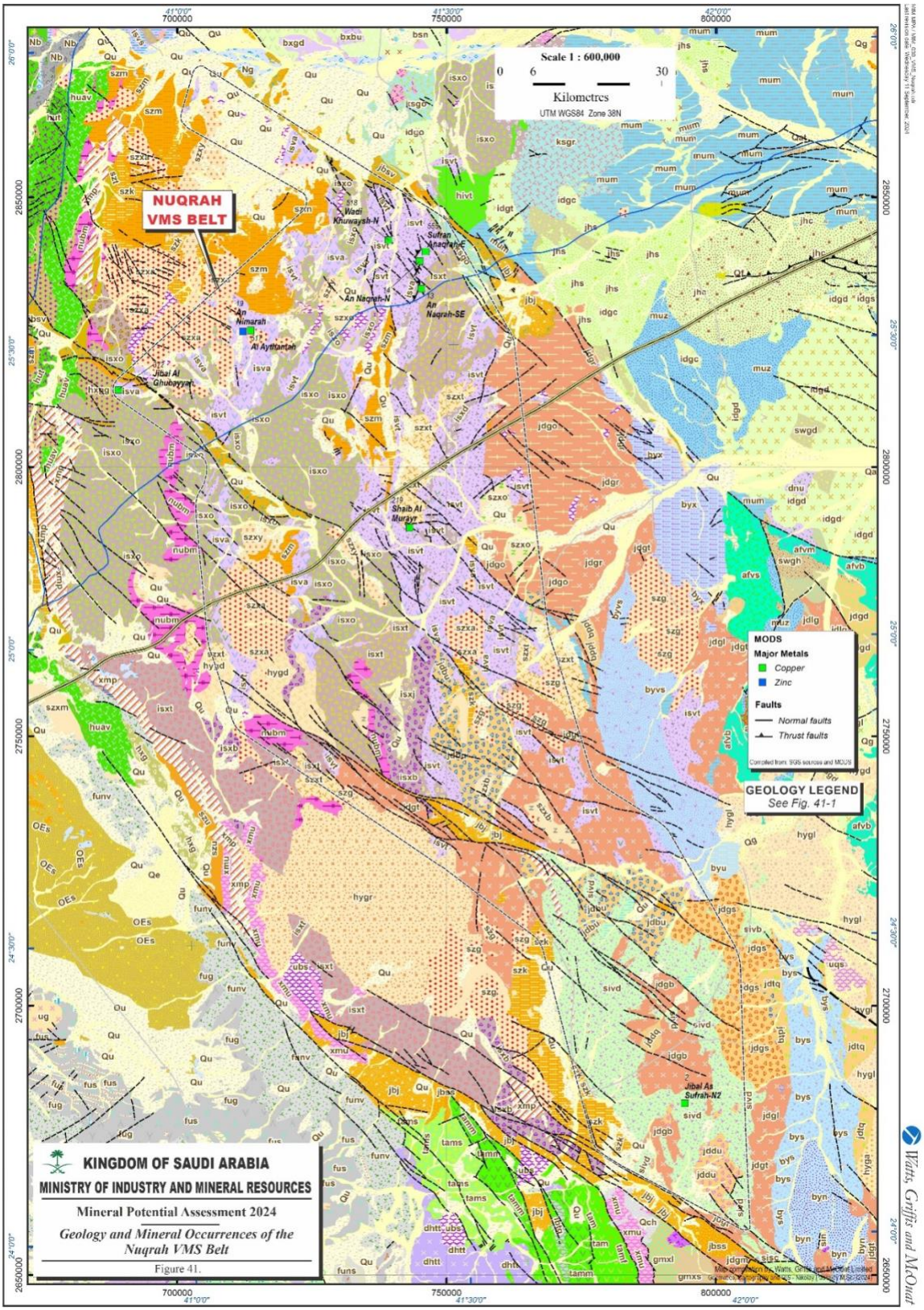
Historical and more recent drilling programs included Post Hole-, Rotary Air Blast (RAB)-, Air Core, Reverse Circulation (R/C) and diamond drilling (D/D) techniques.

2.3. Mineralization and Prospectivity

The Nuqrah-As Safra Mineralized Belt extends from NNW to SSE along a distance of approximately 170 kilometres. In addition to the Bulgah gold mine the volcano-sedimentary Hulayfah Group hosts several advanced gold and base metal projects, including from north to south:

- Nuqrah North and South VMS deposits – Au-Ag-Cu-Pb-Zn.
- Bulgah Gold Mine – Orogenic – Au.
- Jabal Mardah prospect – Ni.
- Humaymah Gold Project – Feasibility stage – Au.
- Maham Advanced Gold Project – Inferred Resource Stage – Au.
- Thurb Advanced Gold Project – Inferred Resource Stage – Au.
- Miskah Advanced Gold Project – Inferred Resource Stage – Au.
- As Safra prospect – Shear-Zone-Hosted and carbonate replacement or skarn-type – Cu-Au.

Figure 4. Geology and Mineral Occurrences of the Nuqrah – As Safra VMS and Gold Belt



Mineralization models include volcanogenic massive sulphide (VMS), orogenic intrusive – and shear zone related gold mineralization as well as strata-bound nickeliferous sulphide deposits.

The most prospective sequence for hosting gold and VMS-type gold and base metal mineralization is the volcanic-sedimentary Hulayfah Group. Most of the MODS mineral occurrences are hosted within these lithologies.

The Nuqrah North and South VMS deposits are located in the north of the belt. Mineralization at the polymetallic Nuqrah South deposit consist of Au+/-Ag+/-Cu+/-Pb+/-Zn. It is located within the Nabitah Suture Zone that separates the Hijaz terrane to the west from the Afif terrane to the east. Mineralization is hosted within the volcano-sedimentary Nuqrah Formation. The stratigraphic sequence consists of a thick homogenous unit of rhyolite and rhyolitic tuff with minor andesitic tuff. The uppermost part is strongly altered with sericite and chlorite alteration. This unit is overlain by alternating lenses of calcareous to dolomitic marble and brecciated marble, rhyolitic tuff, graphitic tuff, graphite and/or chlorite schist, and localized black jasper. In the upper part the sulphide mineralization is associated with graphitic and chloritic material. This unit is overlain by a porphyritic andesite which in turn is overlain by alternating reworked fine-grained rhyolitic tuff, sometimes graphitic and chloritic.

The sulfides at Nuqrah South are conformable with the host rocks striking NNE and dipping moderate to steeply to the west. The sulphide layer is located above the main marble bed. It comprises of a lens about 300 m long and 5-6 m thick composed of variable amounts of pyrite, chalcopyrite, galena, sphalerite. Based on the geological setting Nuqrah South has been interpreted as either a VMS- or SEDEX deposit.

During 2019, SRK Consulting completed a JORC compliant resource estimate for the An Nuqrah SE (Nuqrah South) Deposit calculating a total resource of 6.63 Mt grading 0.27% Cu, 0.52% Pb, 1.50% Zn, 58.98 g Ag/t and 0.94 g Au/t.

The As Safra shear-zone-hosted copper-gold prospect is located in the south of the belt along the Aramco Trans-Arabian pipeline. The ancient As Safra copper mine (+/- gold) has extensive artisanal workings along a NNE-trending shear zone hosted in rhyolitic tuff and carbonate with associated hydrothermal alteration that extends for approximately 2.5 kilometres over a width of 500 metres.

Hosted within the volcano-sedimentary package of the Hulayfah Group, lithologies from east to west include andesitic lava and tuff, layered carbonate and tuff, pyritic rhyolite tuff, massive bedded dolomitic limestone, intercalated felsic tuff with carbonate and andesitic lava and tuff. The prospect is dominated by a NNE-trending shear zone.

Two types of mineralization styles have been identified at the prospect. Shear-zone-related copper mineralization is hosted within brecciated quartz-carbonate lenses within a chlorite-sericite alteration zone. Disseminated pyrite is common at the surface grading into a stockwork of pyrite-chalcopyrite-galena-pyrrhotite at depth. A second style of gold and base metal mineralization is associated with the carbonate layer.

A preliminary resource for the shear-zone hosted mineralization was estimated to be 18 Mt at 1% Cu (Delfour,1981).

Table 3: Summary of VMS Occurrences in the Nuqrah – As Safra Belt (WGM – 2024)

MODS	Name New	Name Old	Main Commodity	Longitude	Latitude	Nearest Town	Potential Ranking	Geometry
0002	Jibal As Sufrah-N2	As Safra	Cu	41.8973610	24.2221670	Al Mahd	Medium	dd, stockwork v
0013	An Naqrah-SE	Nuqrah-SE	Cu	41.4430280	25.5943890	Riyad al Khabra	Medium	lenses
0014	An Naqrah-N	An Naqrah-N	Cu	41.4403890	25.6408060	Riyad al Khabra	Medium	lenses, bedded
0219	Shaib Al Murayr	Jabal Subhah	Cu	41.4127500	25.1946390	Riyad al Khabra	Low	v
0372	Jibal Al Ghubayyah	Jabal At Tuwalah	Cu	40.8807220	25.4330560	Riyad al Khabra	Low	stockwork v
0517	Al Aythamah	Al Aythamah	Cu	41.1263890	25.5298890	Riyad al Khabra	Medium	stratiform
0518	Wadi Khuwaysh-N	Wadi Al Abub	Cu	41.3837500	25.6771940	Al Hinakiyah	Medium	dd, v
0555	Sufran Anaqrah-E	Nuqrah	Cu	41.4518890	25.6568330	Al Hinakiyah	Low	undetermined
0019	An Nimarah	An Nimmar	Zn	41.1117780	25.5280830	Al Ghazalah	Medium	dd, lenses

NOTES: 1) ranking according to MODS 2) v = veins, dd = disseminated; bx = breccia; ms = massive

* classified as VMS based on limited descriptions – no resource estimates available

The shear-zone-hosted and intrusion-related Bulgah gold mine, the Humaymah advanced gold project and the Nuqrah VMS-related deposit are hosted within the Hulayfah Group. The Maham– and Thurb advanced gold projects are hosted within the Nuqrah Formation. The As Safra copper prospect hosting carbonate replacement or skarn-type mineralization is also located within the same formation.

The Bulghah gold mine is located approximately 65 km southwest of the Sukhaybarat Mine. Gold mineralization at Bulgah mine is hosted within a quartz-diorite intrusion, which strikes roughly north-south. The intrusion is fault/shear bounded towards the east and west. Mineralization occurs predominately within the intrusive body along quartz filled fractures zones, shears and joints and is associated with north-south striking and steeply dipping faults.

It should be noted that the Mineral Resources remaining at the end of 2022 total 48.49 Mt at an average grade of 0.97 g Au/t of which 43.97 Mt at 0.95 g/t was classified Measured and Indicated (SRK, 2022), after 23 years of mining. Only 4.52 Mt at 1.15 g Au/t was classified as Inferred. This estimate was based on a cut-off grade of 0.28 g Au/t.

The Humaymah deposit is located approximately 30 km SSE of the Bulgah gold mine and is hosted along the approximately north-south striking contact zone between a pluton consisting of tonalite-diorite-granodiorite-gabbro, the prevalent host rock, and country rocks comprising a layered volcano-sedimentary sequence of dacite, rhyolite, tuff, andesite, basalt, dolomitic-marble, graphite and slate of the Nuqrah Fm. The intrusion, interpreted to be structurally controlled, has been emplaced along a pre-existing fault.

The country rocks are carbonate-altered and silicified along the contact zone and in areas of mineralization. The mineralization in quartz-carbonate veins and stockworks dips steeply to the east and in close spatial association with a volcano-sedimentary unit at the footwall of the intrusive body. The thickness of mineralization ranges from a few meters in the central section to an excess of 100 metres in the south. The margins of the mineralized zone tend to be gradational and disseminated.

Ore Reserves and Mineral Resources estimate for the Humaymah North and South Zones totalled 25.79 Mt grading 0.86 g/t Au Ore reserves and Mineral Resources of 37.6 Mt averaging 0.87 g Au/t (SRK, 2021). Ma'aden is currently reporting a JORC-compliant Indicated Mineral Resource, based on a 0.5 g Au/t cut-off grade, of 17.0 Mt grading 0.94 g/t Au plus an Inferred Resource of 18.8 Mt grading 0.80 g Au/t (1.03 Moz gold).

The Maham gold project is located approximately 70 kilometres SSE of Bulgah mine and 40 kilometres SE of the Humaymah project. Gold mineralization at Maham is largely confined to folded quartz veins and stringers localized along the upper contact zone of an intrusive granite-gneiss pluton and a graphitic shale unit of the Nuqrah Formation (Hulayfah Group). Significant deformation of the host lithologies is evident including a foliated and stretched volcano-sedimentary package in the central part, gneiss with a strong lineation in the eastern and central part and late intrusive granite that lacks deformation in the west. Drilling by Ma'aden identified a mineralized envelope with a shallow plunge to the SSW and a general dip of foliation to the west.

Lower grade gold mineralization is hosted within the granite-gneiss. Higher-grade gold mineralization is predominantly associated with brecciated quartz veins hosted by highly deformed, foliated and sheared granite-gneiss in proximity to the contact with the deformed volcano-sedimentary package. The Maham deposit was estimated to contain an Inferred Mineral Resource of 5.34 Mt averaging 2.9 g Au/t based on a 0.65 g Au/t cut-off grade (SRK, 2022).

The Miskah gold project is located within the NNW-striking volcano-sedimentary Nuqrah Formation (Hulayfah Group) that consist of dacite, rhyolite, tuff, andesite and basalt, dolomitic-marble, graphite, and slate and subordinate Murdama Group sedimentary rocks. These sequences are intruded by the Miskah igneous suite comprising granite, diorite, gabbro and granodiorite. The intrusions were emplaced into an earlier fault system that channeled a zone of weakness. A major brittle-ductile shear zone developed along the contact between the intrusions and country rocks.

Gold mineralization is predominantly associated with NNW-striking, NE-dipping veinlets and stockworks along the major shears which are affected by clay, chlorite, carbonate and potassic alteration both within the granite and within the volcano-sedimentary assemblage. The deposit is estimated to contain an Inferred Mineral resource of 11.70 Mt averaging 1.07 g Au/t with approximately 402,400 contained ounces of gold (SRK, 2023).

The Thurb gold project is located approximately 80 kilometres SSE of Bulgah mine and 50 kilometres to the south of the Humaymah advanced project. No historical artisanal gold workings have been recorded in the area. Gold mineralization is hosted in a complex structural environment. It is predominantly associated with a primary set of NE-striking, SE-dipping quartz-carbonate veins hosted within a sequence of intensely altered volcanic andesite- and rhyolite tuff, intercalated with units of sandstone, graphitic shale and carbonate of the Nuqrah Formation (Hulayfah Group). A secondary mineralized trend is parallel to NW-striking Nadj faults that are widespread throughout the area. A strong correlation exists between gold, silver, arsenic, lead and zinc. The sulphides present in the veins include pyrite, arsenopyrite, galena, sphalerite, pyrrhotite and minor chalcopyrite. Pyrite and arsenopyrite are also found finely disseminated and along mm-scale fractures in the host rocks. Drilling failed to intersect an intrusive at depth.

A north-south trending ophiolite belt hosting characteristic listwaenite lenses occur immediately to the west of the main mineralized zone that is interpreted to be the southern extension of the Nabitah Suture Zone.

The Inferred Resource was estimated at 35.25 Mt with an average grade of 0.57 g/t Au (SRK, 2023).

(For reference, please refer to Table 1: Summary of Major Orogenic and Disseminated- Intrusion Related Gold Deposits in the Arabian Shield).

An older, north-north-westerly-trending ophiolitic belt consisting of basalt, gabbro, chert, marble, serpentinite and altered carbonate rocks (listwaenite) outcrops along the western part of the belt.

The Jabal Mardah nickel belt is a 10-kilometre-long mineralized zone that contains several massive, disseminated and stockwork lenses of pyrite and millerite (NiS) hosted in greenschist-facies basaltic turbidites. It has been characterized as a syn-sedimentary nickel deposit associated with ophiolitic serpentinite (USGS, 1990). It is located approximately 18 kilometres to the SW of Bulgah gold mine.

The strata-bound nickeliferous sulphide deposits of Jabal Mardah were formed contemporaneously with sedimentation of an active spreading ridge. These rocks are stratigraphically underlain and overlain by pillow basalt of the Late Proterozoic Darb Zubaydah ophiolite.

2.4. Mineral Potential Assessment

	Contained metal					
	Resource	**Copper**	**Zinc**	**Lead**	**Gold**	**Silver**
	tonnes (millions)	**tonnes**	**tonnes**	**tonnes**	**Oz ('ooos)**	**Oz ('ooos)**
Nuqrah VMS Belt	96	960,000	4,032,000	19,200	1,667	124,691
Gross in-situ resource value* (USD Bn) (**$33.4 Bn total)**	-	$9.1	$16.1	$0.0	$3.8	$4.4

**Based on 10% confidence level*

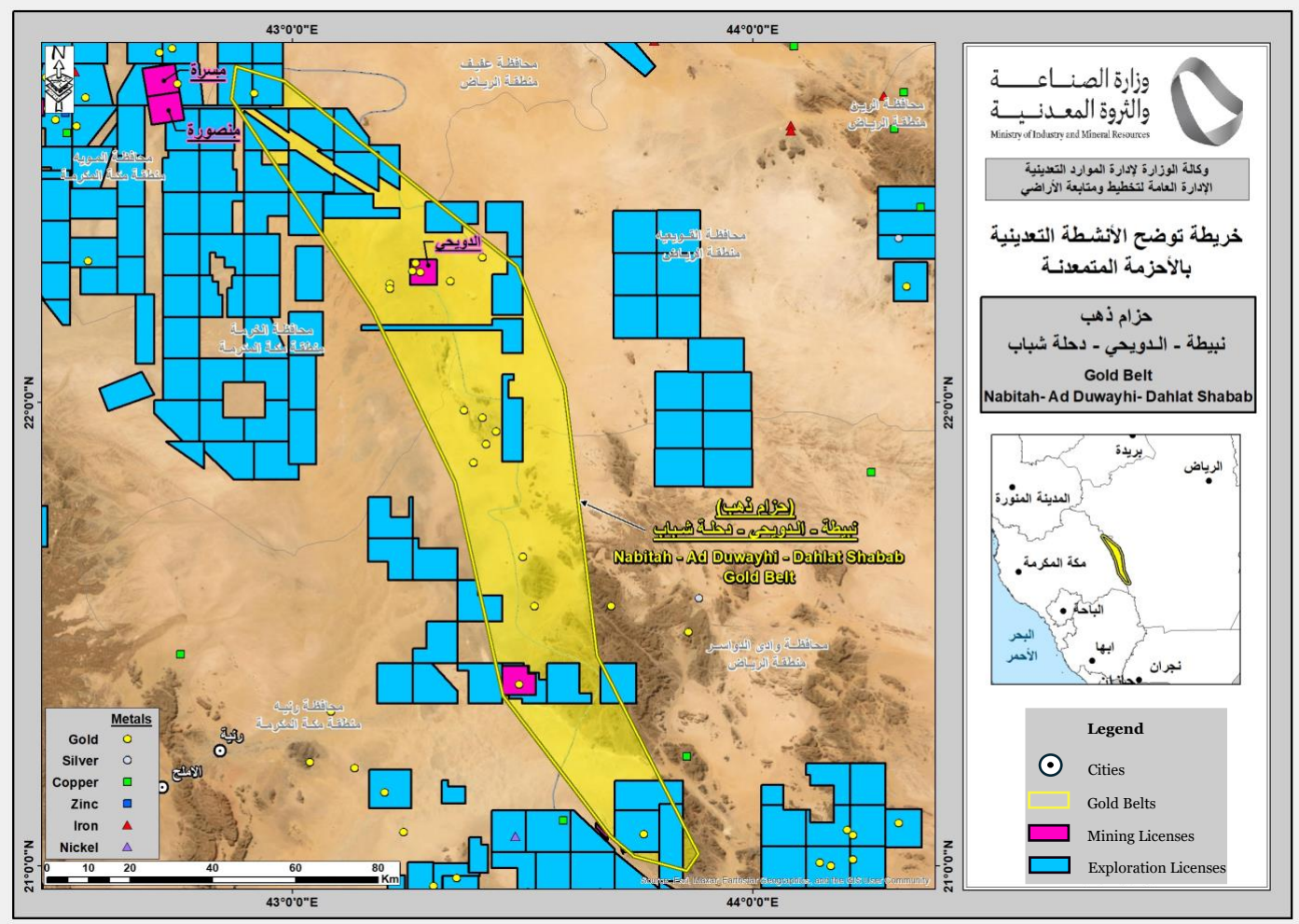
3. Nabitah – Ad Duwayhi Gold Belt

The Ad Duwayhi-Nabitah Gold Belt (also known as the Ad Duwayhi-Wurshah-Umm Matirah Belt) is located in the east-central part of the Arabian Shield in the southern Afif Tectonostratigraphic Terrane and hosts the Ad Duwayhi gold mine. The belt is approximately 165 km in length and strikes north-north-westerly between two major Najd Faults, the Ruwah Fault Zone in the south and the Ar Rika Fault Zone in the north.

The historical Ma'aden Exploration Licences of Ad Duwayhi and Wurshah covered large areas within this belt.

3.1. Location and Regional Geology

Figure 5. Location Map



The Ad Duwayhi-Wurshah-Umm Mattirah Belt, hosting the Ad Duwayhi gold mine, is located in the east-central part of the Arabian Shield, situated in the southern Afif tectonostratigraphic terrane, NE of the major NW-trending Ruwah fault zone and east of the Nabitah Suture Zone. The Wurshah and Umm Matirah gold prospects are respectively located approximately 50 km and 100 km SSE of the mine. The area is underlain by a sequence of NW-trending volcano-sedimentary- and intrusive rocks that are in contact with the Haml Batholith (~650Ma), a major granitoid terrane to the east.

The Southern Afif sub-terrane is coincident with a pre-cratonic basement complex of strongly metamorphosed schists and gneiss that is overlain by the volcanic and volcaniclastic Siham Group. These volcano-sedimentary rocks are unconformably overlain by the younger sedimentary Bani Ghayy- (Murdama Group equivalent) and Jibalah Groups and equivalents of the felsic volcanic Shammar Group.

The Jibalah group is restricted to basins along the major northwest-trending Najd faults. Intrusive rocks of various ages and compositions are widespread. The southern margin of the Afif terrane is defined by the Ruwah Fault Zone (part of the Najd fault system) that is composed of a broad (5-30km) belt of complexly

deformed schist, paragneiss, and orthogneiss that are characterized by strike-slip faults. The Ar Ruwah Fault Zone separates the Afif terrane to the north from the Assir tectonostratigraphic terrane to the south.

The Ad Duwayhi deposit is hosted primarily in a granodiorite-diorite intrusion hosted in the volcano-sedimentary Siham Group that were subsequently cut by felsic rhyolitic dykes and younger quartz porphyry. The sequence is overlain by the Bani Ghayy Group (632-620 Ma). Several faults crosscut the deposits, including NNE-trending and NW-trending that are parallel to the Najd fault system.

The Urghub Wurshah and Bir Wurshah prospects are also hosted within the the volcano-sedimentary Siham Group (Farthan Fm.) with exposures of the Bani Ghayy Group towards the north of Bir Wurshah.

The Umm Matirah project in the south is located at the contact between the Fartham Formation and orthogneiss and schist associated with the Ar Ruwah Fault Zone. The package is separated by a narrow unit of the Bani Ghayy Group (Arfan Fm.)

3.2. Historical Exploration Work

Multi-phase regional- and more detailed historical exploration programs have been completed in the region by the BRGM, USGS and Ma'aden more recently. Work includes geological mapping (regional and prospect scale), regional- and infill grab rock and soil geochemistry (conventional- and ionic soil), regional airborne geophysics (Fixed-wing magnetic and radiometric and helicopter ZTEM including magnetics and Electro-Magnetics), selected detailed ground geophysics (magnetics and I.P.) and drilling programs (post hole / rotary air blast, air core, reverse circulation and diamond drilling).

Multi-phase regional- and more detailed prospect-scale historical exploration programs have been completed in the region from the 1960's until the early 2000's by the BRGM, USGS, Riofinex and the SGS The Ma'aden exploration work commenced more recently, from the late 1990's until the present time.

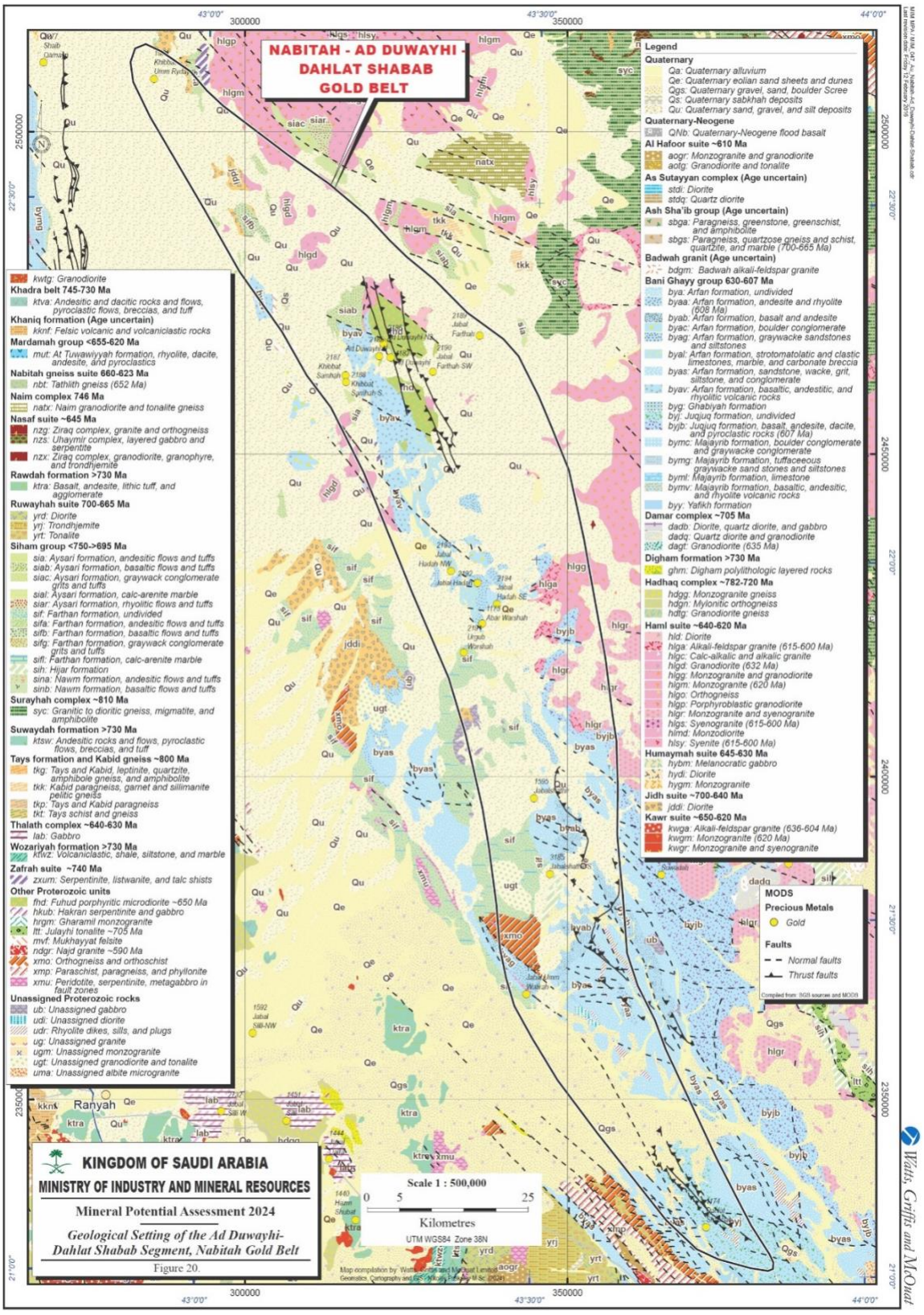
Work included historical geological mapping on a regional-, district- and prospect scale. Regional- and infill grab rock- and soil geochemistry surveys completed by Ma'aden includes conventional soil sampling programs between approximately 2003 and 2020 and more recently a large, regional ionic soil programs from 2013-2015.

Regional- and detailed airborne geophysical surveys include historical airborne EM 'INPUT' surveys flown during the late 1960's. Regional, Shield-scale, airborne magnetic- and radiometric surveys were conducted for the SGS during the 1980's and 1990's. Sander Geophysics completed a fixed-wing magnetic and radiometric airborne survey that covered the northern part of the belt during 2006. A Helicopter airborne magnetic and electro-magnetic survey (ZTEM) that covered large portions of the belt was completed by Ma'aden between 2010 and 2012. Detailed, prospect scale, ground geophysical follow-up programs included historical Self Potential and TURAM EM surveys (BRGM) and magnetic- and induced polarization (I.P.) surveys.

Common remote sensing techniques utilized in regional mineral alteration studies included multi-spectral ASTER, Landsat and Sentinel imaging.

3.3. Mineralization and Prospectivity

Figure 6. Geology and Mineral Occurrences of the Ad Duwayhi - Wurshah Gold Belt.



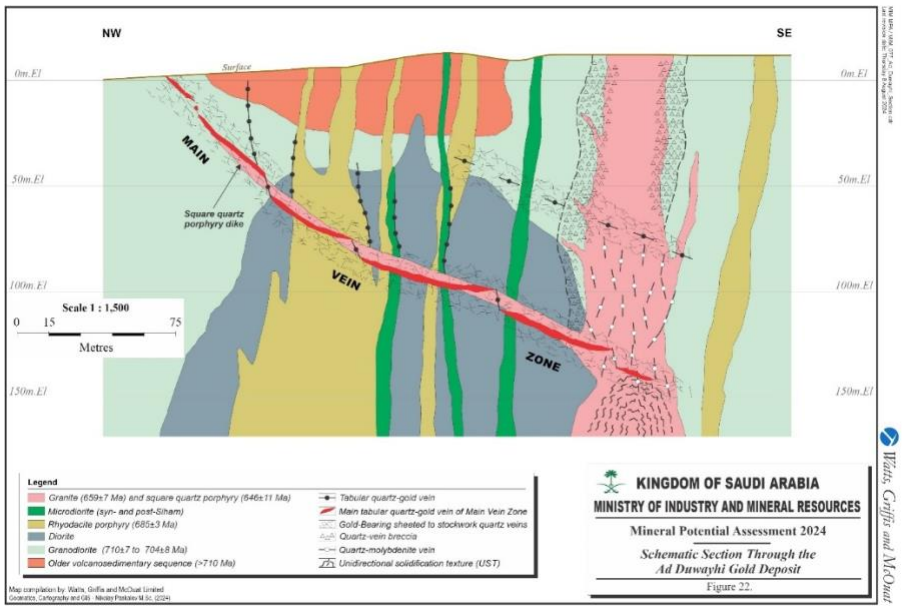
Ad Duwayhi is considered a shear (fault) zone hosted orogenic gold deposit that was formed contemporaneously with magmatism associated with the late Haml Suite (~650Ma) and post-date the Nabitah orogenic event.

The Ad Duwayah area is underlain by tightly folded, andesitic to dacitic metavolcanic rocks intruded by a variety of felsic to intermediate plutons and dykes. Quartz veins are common throughout the region, becoming most abundant at Ad Duwayah where they are controlled by intersecting fracture sets.

Gold mineralization at Ad Duwayhi is associated with several vein styles, including quartz vein breccia, quartz-bearing stockwork veins and shear and extensional veins. Mineralization crosscuts all major rock types in the deposit. North-east-striking and SE-dipping fault zones are the primary controlling structures for gold mineralization.

The principal rock types encountered are mesozonal intrusive rocks: granodiorite, diorite, rhyolite and micro-diorite. The granodiorite is believed to have been intruded by the diorite, which was in turn intruded by a swarm of NNE-trending, subvertical, rhyolite and micro-diorite dykes. Cutting across the older rock units is a porphyritic granite dike system that trends in a NW direction, nearly normal to the trend of the rhyolite and micro-diorite dike swarm. A closely related sill-like body, known as the “Square Quartz Porphyry”, occurs in the south-west of the deposit. Four major lithological units have been identified, including granite-granodiorite porphyry, diorite-micro-diorite, rhyolite-rhyolite porphyry and quartz-quartz stockwork. Although the quartz porphyry is the principal host for gold mineralization, the rhyolite is also believed to be associated with gold mineralization.

Figure 7. Schematic Section - Ad Duwayhi Gold Deposit.



Most recently, the combined open pitable and underground mineable Mineral Resource in all categories at Ad Duwayhi was estimated to be 13.99 Mt averaging 2.51 g Au/t (SRK, 2022).

Gold mineralisation at the Urghub Wurshah and Umm Matirah prospects are also structurally controlled. Mineralization at the Urghub Wurshah prospect is primarily linked to less deformed quartz-carbonate-pyrite veins with associated sericite alteration and bleaching of the host rock. Mineralization at the Bir Wurshah prospect is associated with sheared and brecciated quartz-pyrite veins with occasional sericite alteration.

The Umm Matirah prospect is located within a broad and structurally deformed belt referred to as the Ruwah fault zone. The primary mineralized zone at the Umm Matirah Main gold prospect consists of quartz veins and hydrothermal altered wall rock exposed over an area of about a square kilometre. Ancient workings have exploited most of the exposed veins throughout the area.

The gold bearing quartz veins and their associated wall rock alteration zones are hosted within volcanic and volcanoclastic rocks of the Arfan Formation. The principal vein zones trend approximately NE as is evident from the artisanal mining with a shallow to moderate dip to the NW. The veins are hosted in strongly fractured rock along NW-dipping brittle faults.

The Umm Matirah Main Prospect is distinguished from other projects and prospects in the terrane, e.g. Ad Duwahyi, Urghub Wurshah and Bir Wurshah by the elevated arsenic content.

Table 5: Summary of Occurrences in the Ad Duwayhi - Wurshah Gold Belt.

MODS	New Name	Old Name	Main Commodity	Location		Nearest Town	Potential Ranking *	Geometry *
				Longitude	Latitude			
1594	Khibbat Umm Rydaym	Jabal Ashaild	Gold	42.9166670	22.6666670	Ranyah	VL	dd, v
2189	Jabal Farthah	Jabal Farthah	Gold	43.4116670	22.3130560	Ranyah	Med	dd, v
2186	Ad Duwyhi-N2	Ad Duwyhi-N2	Gold	43.2677220	22.3015830	Ranyah	Med	dd, v
2297	Ad Duwyhi-N1	Ad Duwyhi-N1	Gold	43.2665560	22.2999440	Ranyah	Med	dd, v
2185	Ad Duwyhi-N	Ad Duwyhi-N	Gold	43.2606390	22.2828890	Ranyah	High	dd, v
1182	Ad Duwyhi	Ad Duwyhi	Gold	43.2778330	22.2815000	Ranyah	High	stockwork v,
2190	Jabal Farthah-SW	Jabal Farthah-SW	Gold	43.3420830	22.2618060	Ranyah	VL	dd, v
2187	Khibbat Samhah	Samhah	Gold	43.2105560	22.2558330	Ranyah	Med	dd, v
2188	Khibbat Samhah-S	Samhah	Gold	43.2116670	22.2461670	Ranyah	Med	dd, v
2193	Jabal Hadah-NW	Jabal Hathah-W	Gold	43.3722220	21.9833330	Ranyah	Undefined	v, uncertain
2192	Jabal Hadah	Jabal Hathah-E	Gold	43.4120560	21.9666390	Ranyah	VL	dd, v
2194	Jabal Hadah-SE	Quz Wurshah	Gold	43.4416670	21.9375000	Ranyah	VL	dd, v
1173	Abar Warshah	B'ir Warshah	Gold	43.4203330	21.9100000	Ranyah	Med	v
2191	Urgub Warshah	Urghub Wurshah	Gold	43.3926390	21.8695000	Ranyah	Med	dd, v
1595	Jabal Shathir	Jabal Ishata	Gold	43.5000000	21.6666670	Ranyah	Undefined	dd, v
3185	Jabal Shathir-S	Jabal As Simar	Gold	43.5250000	21.5605560	Ranyah	VL	undetermined
1172	Jabal Umm Watirah	Jabal Umm Matirah	Gold	43.4916670	21.3918890	Ranyah	Med	v
1174	Dahlat Shabab	Dahlat Shahab	Gold	43.7630280	21.0680000	Wadi Aldwasir	Med	dd, v

NOTES: (1) Ranking according to MODS: VL = Very Low; Med = Medium, VH = Very High; (2) dd = disseminated; v = veins; fracture fillings = ff

Table 6: Umm Matirah Mineral Resource statement (SRK - 31 December 2020)

Classification	Tonnage (Mt)	Mean Au Grade (g/t)	Contained Metal (koz)
Measured	-	-	-
Indicated	4.2	2.41	328
Measured + Indicated	**4.2**	**2.41**	**328**
Inferred	4.4	2.20	310
Measured + Indicated + Inferred	**8.6**	**2.30**	**639**

3.4. Mineral Potential Assessment

	Mt	g Au/t	Ounces
Nabitah Ad Duwayhi gold belt	210	1.38	9,323,703
Gross in-situ resource value* (USD Bn)	$18.6		

*Based on 10% confidence level