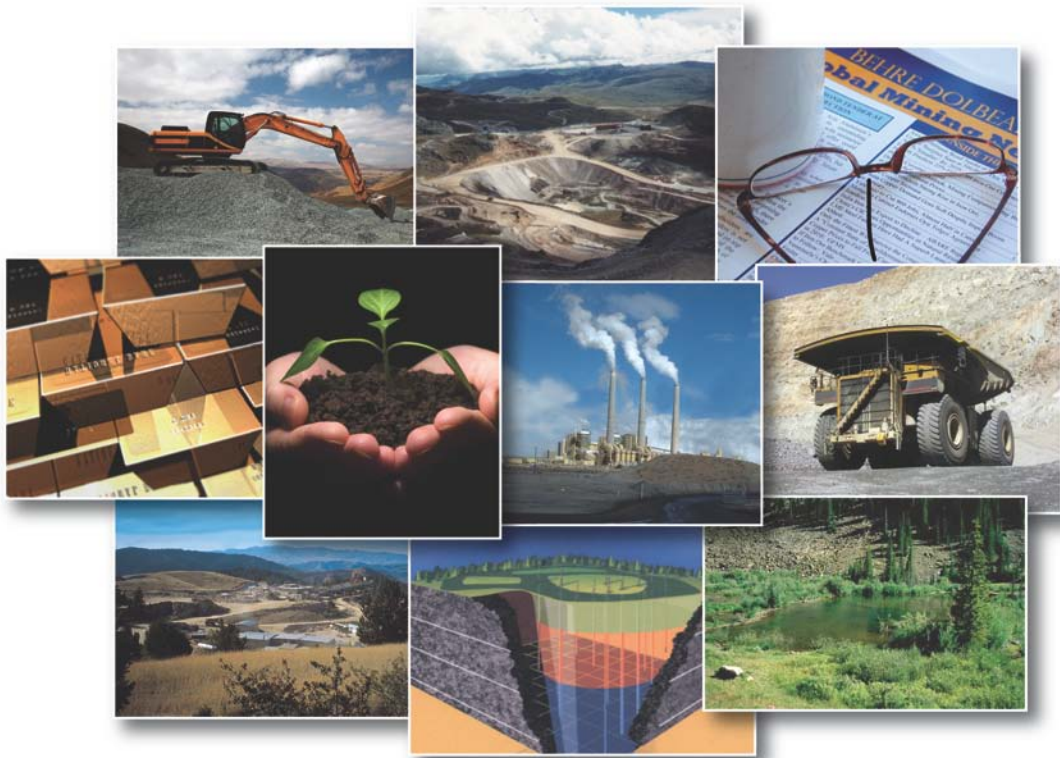


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**NI 43-101 TECHNICAL REPORT ON THE  
 FAWAKHIR/EL SID EXPLORATION CONCESSION AREA IN EGYPT  
 (BEHRE DOLBEAR PROJECT NUMBER J10-179)**



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## TABLE OF CONTENTS

1.0	SUMMARY .....	1
2.0	INTRODUCTION .....	5
2.1	TERMS OF REFERENCE AND CONSULTANT RELATIONSHIP.....	5
2.2	WORK CARRIED OUT.....	6
3.0	RELIANCE ON OTHER EXPERTS.....	6
4.0	PROPERTY DESCRIPTION AND LOCATION .....	6
5.0	ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY .....	9
6.0	HISTORY .....	12
6.1	MINING IN THE EASTERN DESERT .....	12
6.2	GOLD MINERALISATION IN THE EASTERN DESERT .....	14
6.3	LOCAL HISTORY – FAWAKHIR CONCESSION AREA.....	15
6.4	ATALLAH GOLD MINE.....	16
6.5	FAWAKHIR AND EL SID MINES.....	21
7.0	GEOLOGICAL SETTING .....	31
7.1	REGIONAL GEOLOGY OF THE EASTERN DESERT .....	31
8.0	DEPOSIT TYPES .....	34
9.0	MINERALISATION.....	35
10.0	EXPLORATION BY SMWG (2008 – 2010) .....	36
10.1	LOCAL GEOLOGY OF THE FAWAKHIR CONCESSION AREA.....	37
10.2	ATALLAH MINE AREA.....	40
10.3	FAWAKHIR – EL SID AREA.....	41
10.4	FAWAKHIR MINE AREA .....	43
10.5	EL SID MINE AREA (SMWG, 2009) .....	47
10.6	SOUTH EL SID AREA .....	51
11.0	DRILLING.....	52
12.0	SAMPLING METHOD AND APPROACH .....	53
13.0	SAMPLE PREPARATION, ANALYSES AND SECURITY.....	54
14.0	DATA VERIFICATION.....	56
15.0	ADJACENT PROPERTIES.....	58
16.0	MINERAL PROCESSING AND METALLURGICAL TESTING .....	58
17.0	MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES .....	59
18.0	OTHER RELEVANT DATA AND INFORMATION.....	63
19.0	INTERPRETATION AND CONCLUSIONS .....	63
20.0	RECOMMENDATIONS .....	65
21.0	REFERENCES.....	69
22.0	DATE AND SIGNATURE PAGE .....	71
23.0	CERTIFICATE AND CONSENT .....	72

## LIST OF TABLES

Table 1	Inferred Mineral Resource Estimates at El Sid .....	2
Table 2	Summary of Exploration Targets in Fawakhir Concession.....	3
Table 3	List of persons providing information and advice .....	6
Table 4	Dump and Tailings Resources at the El Sid and Fawakhir Mines .....	23
Table 5	Comparative assay values - mineral zoning at El Sid mine .....	28
Table 6	Precambrian succession in the Eastern Desert of Egypt .....	32
Table 7	Summary of work on Fawakhir Concession Area (in 2008-10) .....	37
Table 8	The results of fire assay analysis – Fawakhir Zone 1 channel samples .....	44
Table 9	Fawakhir Zone 1 Exploration Target (assuming SG = 2.7 t/m <sup>3</sup> ).....	46
Table 10	Summary of channel sampling at Fawakhir – Zone 2 (Source: SMWG, 2009).....	46
Table 11	Results of fire-assay analysis - El Sid mine area .....	50
Table 12	Summary of Trench Channel Sampling and Rock Chip sampling .....	54
Table 13	Results of control samples sent to Al Amri SA Laboratory.....	57
Table 14	Inferred Mineral Resource Estimates at El Sid .....	61
Table 15	Summary of Exploration Targets in Fawakhir Concession.....	63
Table 16	Summary of Proposed Exploration Programme.....	65
Table 17	First stage of proposed drilling programme .....	66
Table 18	Summary of Estimated Exploration Costs .....	68

## LIST OF FIGURES

Figure 1	Location Map of the Fawakhir Concession area.....	7
Figure 2	Reduced Concession Area.....	7
Figure 3	Location and Infrastructure map of the SMWG Concession Areas.....	11
Figure 4	Historical gold production in Egypt.....	12
Figure 5	Geological Cross-section through the Sukari deposit .....	13
Figure 6	Map of known gold localities in the central Eastern Desert.....	15
Figure 7	Simplified geology map of Fawakhir Concession Area with known gold deposits.....	16
Figure 8	Geological map of the Atallah gold mine area.....	17
Figure 9	Plan of Atallah Mine .....	19
Figure 10	Long section through Atallah gold mine area .....	20
Figure 11	Location of the Fawakhir and El Sid mine sites.....	22
Figure 12	Fawakhir mine area showing ancient settlement.....	22
Figure 13	Main shaft at the El Sid mine site .....	24
Figure 14	Schematic NW-SE Cross-section through El Sid Deposit .....	24
Figure 15	Plan of the El Sid mine workings.....	25
Figure 16	Gold Treatment Plant at El Sid .....	26
Figure 17	Processing plant at the El Sid mine site. ....	26
Figure 18	Simplified geology and sample locations at El Sid gold mine.....	27
Figure 19	Plan of the El Sid underground mine workings with sample locations.....	29
Figure 20	Vertical E-W section through El Sid mine.....	30
Figure 21	Geology and gold deposits in Fawakhir Concession area.....	34
Figure 22	Relationship between the gold occurrences and the granite host.....	35
Figure 23	Gold-bearing quartz vein (1.1m thick) in El Sid mine .....	36
Figure 24	Landsat imagery of Fawakhir Concession area.....	38
Figure 25	Simplified Geology and Prospective areas for gold mineralisation .....	39
Figure 26	Geological and sampling plan of Atallah mine area .....	40
Figure 27	Atallah Geology and Mineralisation .....	41
Figure 28	Simplified Geological map of Fawakhir and El Sid mineralised areas.....	42
Figure 29	Simplified geology of the Fawakhir gold deposits.....	43
Figure 30	Surface extent of Fawakhir – Zone 1 mineralisation .....	44

Figure 31	N-S cross-section through Fawakhir Zone 1 mineralisation .....	45
Figure 32	Fawakhir-Zone 1 Exploration Target based on adit and trench samples .....	45
Figure 33	Geological map of Fawakhir Zone 1 and 2 areas.....	47
Figure 34	El Sid mine area showing geology and mineralisation .....	48
Figure 35	El Sid Zone 1 sampling results.....	49
Figure 36	El Sid Zone 2 with sampling results .....	49
Figure 37	Cross section through the El Sid deposit (looking east).....	50
Figure 38	Geological map of the South El Sid area (SMWG, 2010) .....	52

## 1.0 SUMMARY

In 2007, SMW Gold Ltd (“SMWG”) was granted an Exploration/Mining Concession at Fawakhir/El Sid, in the Eastern Desert region of Egypt. The original area of 886.83 km<sup>2</sup> was subject to a statutory 27% reduction to 640.75 km<sup>2</sup> in 2008.

In September, 2010, SMWG signed a letter of intent with Abenteuer Resources Corp. (“Abenteuer”), a corporation incorporated in Alberta, Canada, to undertake a transaction whereby Abenteuer will acquire SWMG’s 100% interest in the El Fawakhir/El Sid Concession area by acquiring all of the issued and outstanding share capital of SWMG. In October, 2010, Abenteuer requested that Behre Dolbear prepare an updated report in NI 43-101 format for submission to the TSX Venture Exchange, a Canadian stock exchange on which Abenteuer’s common shares currently trade.

The key aspects of the agreement with the Egyptian Mineral Resources Authority (“EMRA”) were:-

- A production sharing agreement between SMW Engineering (subsequently transferred to SMWG) and EMRA, signed in October 2007.
- 5 year exploration period.
- A minimum expenditure commitment of US\$ 1 million required in the first year and then a further US\$ 5 million expenditure.
- 20-year exploitation lease with option for a 10-year extension.
- 4% royalty on gold (and other minerals) produced.
- 50:50 production-sharing after expense recovery.
- tax exemption from income and withholding taxes on extraction, production, export and transportation of minerals.

The main objective of this report is to assess whether the results of this first exploration stage expenditure (Table 7) were sufficiently encouraging to justify proceeding with the \$5million second stage evaluation programme.

**History** - The Fawakhir Concession Area covers 3 historic gold mines, Atallah, Fawakhir and El Sid, as well as other known auriferous zones that are located on or close to the western margin of the Fawakhir granite that forms a N-S trending elongated mass.

**Geology** - The results of systematic geological mapping and geochemical sampling in the Concession area by SMWG, has resulted in new insights into the extent and distribution of these ancient gold mining activities and into the geological controls of the gold mineralisation. The key result was the recognition that most of the ancient gold mining activity was confined to a narrow NNW – SSE trending “corridor” (as shown on figure 25). This gold bearing “corridor” coincides with a series of lenticular granite intrusions that are similar to that which hosts the Sukari gold deposit about 100km to the south. Mapping indicated that the ancient gold mining activity in the Fawakhir Concession area appears to be related to E-W trending quartz veins intruded into tension fractures along the western margin of these granite intrusions.

**Mineralisation** - The Fawakhir and El Sid mines, as well as other known auriferous zones, consist of quartz vein stockworks, located on or close to the western margin of a biotite-granite intrusion that forms a N-S trending elongated mass, about 7 km in length and from 2 to 3 km wide. The wall-rocks include a faulted and locally foliated melange of mafic volcanics, metagabbro and serpentinite (Marten, 1986). The Atallah mine further north occurs on the western margin of a similar granite intrusion about 5km long and 3 km wide.

**The Atallah gold mine**, about 15 km north of El Sid, comprises one main quartz vein about 250m in length and 0.35m wide, and several smaller and thinner parallel quartz veins in a granite host rock. The main vein was worked during the period 1914 to 1918 and produced a few thousand tonnes of ore

at an average grade of about 30 g/tonne. At a later date (1930's), about 5,000 tonnes of ore were treated by cyanidation. The small size of the Atallah deposit suggests that it may be too small to justify commercial development on its own, but it could have potential for development as a low-grade, open-pit satellite operation to a larger mining operation close by.

**At the Fawakhir mine**, about 2 km north of El Sid, the two main mineralised zones consist of individual high-grade quartz veins interspersed within a much wider (30 to 40m) zone of shearing and hydrothermal alteration which carries low-grade (1 g/t) gold values. Sampling indicated that one of these mineralised zones is, on average, about 20m wide and averages about 1.53 g/t Au. This substantial body of low-grade gold mineralisation indicates that Fawakhir may have potential for the discovery of a possible low-grade open-pit gold deposit.

**At the El Sid mine**, there is a broad zone of quartz veining within sheared and hydrothermally altered rocks adjacent to the granite contact. The mine, which closed in 1960, produced about 100,000 tonnes at an average grade of 30 g/t Au. Surface sampling indicated there is low-grade (1 g/t) gold mineralisation in the altered wall-rock between the individual quartz veins. This low-grade mineralisation forms closely-spaced parallel bodies, Zones 1 – 5. Surface data indicates the potential for the discovery of a low-grade, open-pit deposit, but no drilling has been done to test this low-grade mineral potential.

Due to the limited underground sampling data from the El Sid and Fawakhir mines, and the preliminary nature of the exploration work at El Sid and Fawakhir carried out by SMWG, the estimation of the grade of this mineralisation is to a large extent dependent on surface sampling. The disturbed nature of the surface at some locations, together with the removal of all or most of the gold bearing quartz veins from the near surface during previous mining activity, results in the surface sampling possibly being not fully representative of the in-situ mineralisation. This results in two possible sources of bias in the surface sample data. Firstly, the removal of the gold bearing quartz veins to leave only the low-grade mineralisation in the altered wall rocks, results in a possible negative bias in the gold assay values. Secondly, the disturbance of the surface by previous mining activity may have dispersed the gold values over a wider area than the source mineralisation, possibly resulting in a positive bias in the width of the mineralisation. For these reasons, it would be unreasonable to apply complex or sophisticated methods for the resource estimation. Therefore, they were estimated manually using the traditional polygonal method based on vertical long-sections drawn along the strike length of the vein.

The Mineral Resources at El Sid were estimated on the basis of the surface extent, defined in terms of width and strike length by the 0.3 g/t Au contour and projected down dip to the extent of the known underground workings, as follows:-

**Table 1 Inferred Mineral Resource Estimates at El Sid**  
(assuming SG = 2.7 t/m<sup>3</sup> and 0.3 g/t Au cut-off)

El Sid Mineralised Zone	Length along strike (m)	Average surface width (m)	Length down dip (m)	Volume, m <sup>3</sup>	Million Tonnes	Average grade (g/t Au)	Contained Gold (kg)
1	200	35	400	2800000	7.56	0.60	4536
2	400	45	400	7200000	19.44	0.95	18468
3	450	25	250	2812500	7.59	1.02	7745
4	400	25	250	2500000	6.75	1.16	7830
5	130	7	70	63700	0.17	0.71	122
<b>Total El Sid</b>				<b>15376200</b>	<b>41.52</b>	<b>0.93</b>	<b>38701</b>

This Table indicates that the gold potential at El Sid may exceed 1.2 million ounces. The estimated gold content does not include any consideration of mining, mineral processing, or metallurgical recoveries. **Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration.** Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable the evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.

Some of the many other mineralised zones located in the Fawakhir / El Sid Concession area appear to have potential for low-grade open-pit mineralisation, but have not yet been mapped or sampled in sufficient detail to enable their resource potential to be quantified. The JORC Code suggests that such mineralisation should be described using the term “Exploration Results” or “Exploration Target” and requires that such mineralisation be expressed as a range of values so as to emphasis the level of uncertainty involved. On this basis, the following Exploration Targets have been identified:-

**Table 2 Summary of Exploration Targets in Fawakhir Concession**

Location	Length along strike (m)	Width at surface (m)	Length down dip (m)	Average grade at surface (g/t Au)
Fawakhir Zone I	175 - 225	20-22	40-60	1.3 - 1.7
Fawakhir Zone II	150 - 250	5 - 31	50 - 100	0.9 - 1.65
Fawakhir Zone III	250 - 500	5 - 15	50 - 100	0.5 - 1.5
Atallah mine	250 - 350	10 - 50	50 - 100	0.5 - 1.5
El Sid South	100 - 300	10 - 50	50 - 100	0.3 - 1.0

**The potential quantity and grade of these Exploration Results is conceptual in nature, as there has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.**

## CONCLUSIONS

### Atallah mine

1. The Atallah gold deposit consists of several small, widely-spaced quartz veins intruded into sheared granite. The historical underground mining operation was restricted to a single vein which was mined over a strike length of about 200m to a depth of about 150m.
2. The individual quartz veins are too small and too low-grade to support an underground mining operation, but the presence of quartz-vein stockworks in some places suggests there may be some potential for the discovery of a low-grade (c. 1g/t Au) open-pit type deposit. Such a discovery would require a substantial drilling programme to be implemented.
3. The probability that such a discovery at Atallah would justify a “stand-alone” development appears low and the most likely development scenario would be as a “satellite” operation to a larger operation at El Sid/Fawakhir.

### Fawakhir mine

4. The Fawakhir mine area consists of multiple, parallel, quartz veins intruded into a 200m wide shear zone in granite.
5. The individual veins were too small and too low-grade to support an underground mining operation, but the presence of quartz-vein stockworks in some places suggests there may be potential for the discovery of a low-grade (c. 1g/t Au) open-pit type deposit. Such a discovery would require a substantial drilling programme to be implemented.

6. The probability that such a discovery at Fawakhir would justify a “stand-alone” development appears low and the most likely development scenario would be as a “satellite” operation to a larger operation at El Sid.

#### **El Sid mine**

1. The El Sid mine area consists of a multiple quartz-vein system about 200 – 300m wide and about 1000m in strike length intruded into the contact zone between sheared and altered granite and mafic/ultramafic country rocks.
2. The contact is marked by a zone of graphitic schist that may have been a significant geological/geochemical control for the high-grade gold mineralisation that was previously mined at El Sid.
3. There are numerous parallel and conjugate vein sets at El Sid that offer potential for the discovery of a large, low-grade (c. 1g/t Au) open-pit type deposit. Such a discovery would require a substantial drilling programme to be implemented.
4. There is sufficient available space at El Sid for development of an open-pit mine, but suitable sites for waste dumps and tailings disposal may be a problem. Development of an open pit may impact on the existing bitumen road which might need to be realigned further north, possibly along the route of the former Roman road north of Bir Fawakhir.

**It is Behre Dolbear’s opinion that the results of the initial Exploration Phase expenditure justify proceeding with the \$5million expenditure commitment for the Evaluation Phase required by the Concession Agreement.**

#### **RECOMMENDATIONS**

Geological investigations at South El Sid, El Sid, Fawakhir and Atallah, should be continued along with appropriate sampling and analysis. This will be supported by satellite imagery interpretation, geological mapping and sampling, topographic surveying, drilling, mineralogical sampling and testwork, as appropriate, in order to provide a sound basis for mineral resource estimation. Ongoing exploration work should include:-

1. A search the ERMA archives for the old El Sid mine and assay plans and the Neubauer (1959) report.
2. Engage a Mining Engineer to carry out a survey of the El Sid underground workings in order to establish their extent and layout and to sample any exposed veins and any cross-cuts that might provide data on the gold or other mineral content of the wall-rocks between the veins.
3. Use the mine survey data to locate the initial drill-holes to test any un-mined portions of the auriferous veins and their strike and down-dip extensions.
4. Consider a programme of underground drilling to test the hanging and footwall rocks for potential bulk, low-grade mineralisation.
5. Use this data to plan a surface drilling programme to test for a low-grade, open-pit type deposit comprising widely spaced holes, along profiles located 160m apart. Distance between the drill holes along the profiles will initially be 40m. The objective of Stage 1 is to raise the Inferred Resources to Indicated Resource category to a depth of 100m below surface.
6. In the second phase of infill drilling in the zones of interest, the drill profiles will be closed up to 80m and eventually in selected areas to 40m. The objective of Stage 2 is to raise the Inferred Resources to Indicated Resource category to the full depth of a preliminary open-pit shell.

The total cost of this proposed exploration programme is estimated to be about US\$ 5 million, commensurate with the expenditure commitment in the Concession Agreement.



## 2.0 INTRODUCTION

### 2.1 TERMS OF REFERENCE AND CONSULTANT RELATIONSHIP

In December 2009, Mr R J Fletcher of Behre Dolbear International Limited (“Behre Dolbear”), carried out a review of the mineral exploration work carried out on the Fawakhir and Um Balad Concession areas held by SMW Gold Limited (SMWG), a private company incorporated in Cyprus. On the basis of technical data, published reports and technical studies provided by SMWG’s management and technical staff in Cairo, and by officers of the Egyptian Mineral Resources Authority (“EMRA”), formerly the Egyptian Geological and Mining Authority (“EGSMA”), and site visits to the main areas of interest in the Fawakhir and Um Balad Concession areas, the review was to cover:

- The licence areas - their tenure, terms and co-ordinates:
- The location of the projects within the licence areas:
- The work done on the projects, quantitatively and qualitatively:
- Geological descriptions and interpretations:
- Resource estimates and the basis for these:
- The potential for establishing further resources: and
- Any other appropriate comments based on professional judgement.

In September, 2010, SMWG signed a letter of intent with Abenteuer, a corporation incorporated in Alberta, Canada, to undertake a transaction whereby Abenteuer would acquire all of the issued and outstanding share capital of SMWG in exchange for issuing to the SMWG shareholders an aggregate of approximately 53% of the issued and outstanding share capital of Abenteuer on a post-transaction basis. Accordingly, on completion of the transaction, SWMG would become a wholly-owned subsidiary of Abenteuer, and the current shareholders of SMWG would as an aggregate carry a majority interest of the issued and outstanding share capital of Abenteuer. In October, 2010, Abenteuer requested that Behre Dolbear prepare an updated report in NI 43-101 format for submission to the TSX Venture Exchange, a Canadian stock exchange on which Abenteuer’s common shares currently trade.

Behre Dolbear previously acted in an independent capacity as a consultant to SMWG and is currently acting in a similar capacity to Abenteuer and is receiving a pre-negotiated fixed fee for its services. Neither Behre Dolbear nor any professional working on this assignment has any ownership interest, financial interest, or any other pecuniary interest in SMWG, Abenteuer or the Fawakhir and Um Balad Concessions.

Behre Dolbear’s appraisal of the Fawakhir and Um Balad Concession areas in Egypt was conducted on a reasonableness basis and Behre Dolbear has noted herein where the provided information engendered questions. Except for the instances in which we have noted questions, Behre Dolbear has relied upon the information provided by SMWG as being accurate, reliable and suitable for use in this assessment.

This report has been prepared in accordance with the terms and definitions given in “Form 43-101F1 Technical Reports” and the “CIM Definition Standards for Mineral Resources and Mineral Reserves” adopted by the CIM Council on December 11, 2005, and the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC CODE) adopted by the AusIMM in December 2004.

## 2.2 WORK CARRIED OUT

The author (R J Fletcher) spent 5 days in Egypt between 3rd and 9th November 2009 and during this period carried out the following work:-

- One day in Cairo reviewing the Concession areas held by SMWG with SMWG's geological experts and officers and geological experts of EGSMA, to provide an historical perspective of previous work on the mineral deposits and independent confirmation of the information provided by SMWG;
- Two days spent in field visits to the main areas of interest within the Fawakhir Concession area, including most of the old mining sites;
- Two days spent in field visits to the main areas of interest within the Um Balad Concession area, including the old mining sites.

**Table 3 List of persons providing information and advice**

NAME	POSITION	ORGANISATION
Mark Lisnyanski	General Director	SMWG Company
Dr Vladimir Shashkin	Director of Geology	SMWG Company
Karim Matar	Managing Director	SMWG Company
Mohammed Hadi	Vice President	SMWG Company
Gayas Yusupov	Senior Geologist	SMWG Company
Dr Oleg Morazov	Geological Advisor	SMWG Company
Dr Abd El Aal Attia	General Director – Technical and Environmental Studies	Egyptian Mineral Resources Authority

As there has been no further significant field work by SMWG since the initial Behre Dolbear report was completed in December 2009, it was considered that another site visit was not justified. In October 2010, SMWG provided additional technical data and progress reports relating to exploration results that became available since the initial report was prepared. Of these latest 1400 samples analyzed, over 26% had a gold grade of more than 0.3 grams/tonne Au. These results have been incorporated into this revised report.

Details of the Um Balad Concession area are provided in a separate report.

## 3.0 RELIANCE ON OTHER EXPERTS

In consideration of all legal aspects relating to the Fawakhir / El Sid Concession, Behre Dolbear has placed reliance on the representations by SMWG that, as of 1 October 2010, the legal ownership of all mineral and surface rights has been verified; and no significant legal issues exist which would affect the continuing viability of the Concessionor the ownership and/or exploitation of the Mineral Resources or other exploration assets as reported therein.

## 4.0 PROPERTY DESCRIPTION AND LOCATION

### The Fawakhir Concession Area

The Fawakhir Concession Agreement is between the Arab Republic of Egypt represented by the EMRA and SMW Engineering Ltd. A Production sharing agreements was signed between SMW Engineering and the EMRA on October 1, 2007 after ratification by the Egyptian parliament. This agreement was later transferred to SMWG, who have a 100% ownership / interest in the Concession.

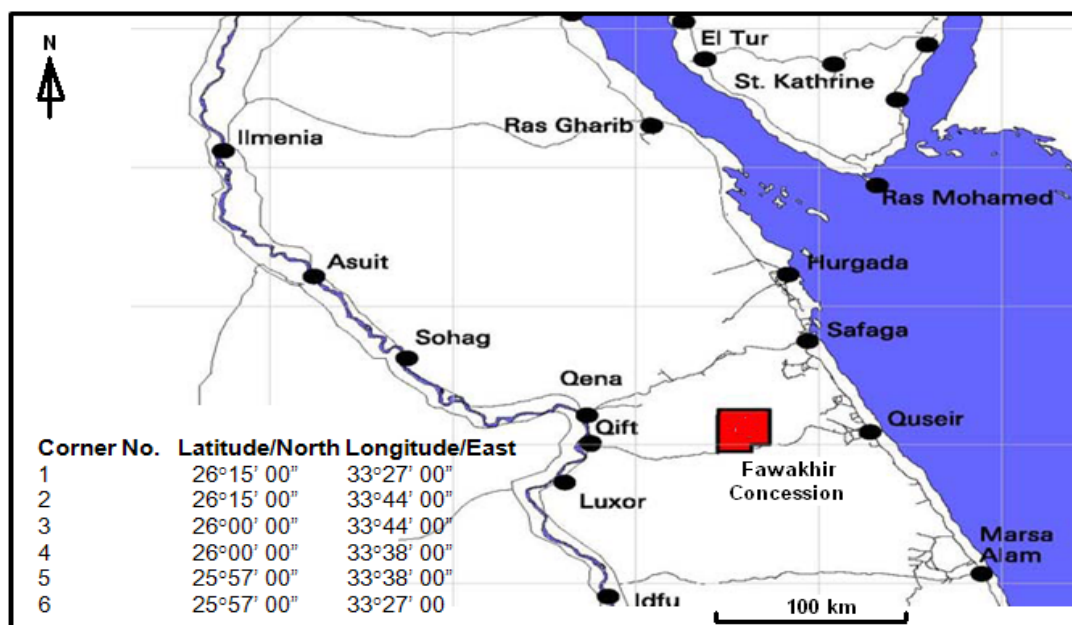
SMWG have agreed to form an association with Abenteuer Resources and transfer their 100% interest in the Concession.

**Boundary description of the concession area.**

The Fawakhir Concession Area is located about 500 km SSE of Cairo and is centred at 33°34'E/26° 3'N. The Concession Area initially covered about 950 km<sup>2</sup>.

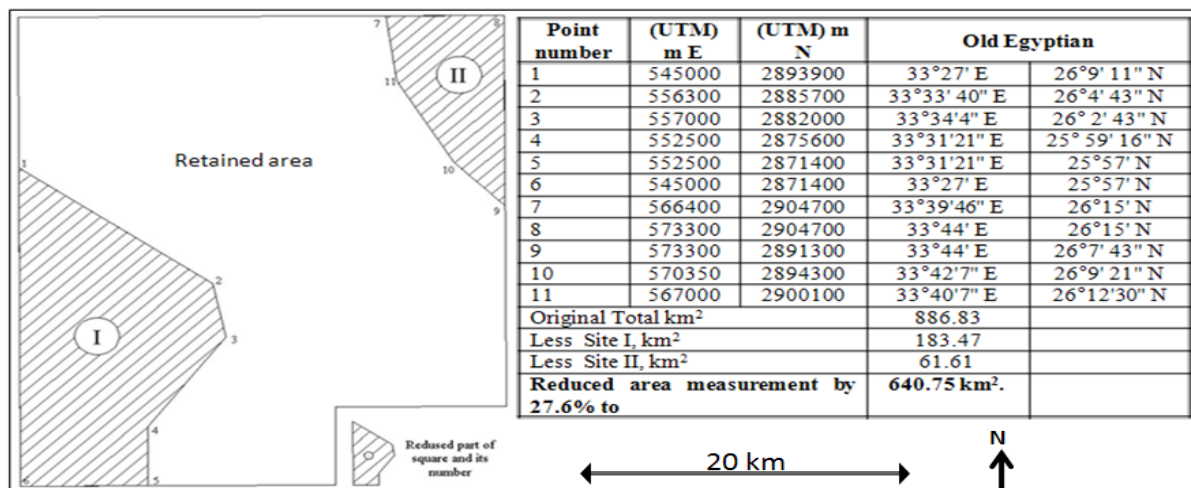
Coordinates of the boundaries and corner points of the Concession Area were determined by map coordinates in accordance with the Concession Agreement and the relevant Egyptian legislation, and are shown in Figure 1:-

**Figure 1 Location Map of the Fawakhir Concession area**



In accordance with the Concession Agreement, at the end of year 1 (2009) the Fawakhir Concession was subject to a minimum 25% reduction in area. The area was accordingly reduced by 27.6% to 640.75 km<sup>2</sup>, as shown in Figure 2 below:-

**Figure 2 Reduced Concession Area**



No part of the Concession Area has been relinquished since November 2009.

On 9<sup>th</sup> September 2010, SMWG's attorney in Egypt provided an Opinion Letter noting that SMWG had successfully completed the initial exploration period and that his office "considered that the Agreements are in good standing".

There were no reporting requirements between then and October 1, 2010 that were not fulfilled.

Key aspects of the agreement with EMRA were:-

- A production sharing agreement between EMRA and SMW Engineering (transferred to SMW Gold), signed in October 2007.
- 5 year exploration period.
- A minimum expenditure commitment of US\$ 1 million in the first year and then a further US\$ 5 million.
- 20-year exploitation lease with option for a 10-year extension.
- 4% royalty on gold (and other minerals) produced.
- 50:50 production-sharing after expense recovery.
- tax exemption from income and withholding taxes on extraction, production, export and transportation of minerals.

**Details of the nature and extent of the title including surface rights and the obligations that must be met to retain the property are summarised in the following section. There do not appear to be any legacy environmental liabilities.**

### **Exploration and Mining Agreements in Egypt**

The legal basis for exploration and mining in Egypt assumes that the government, through the Ministry, will be a major (50%) participant in the project. The terms of this participation are based on the "production sharing agreement" that has been widely accepted in the petroleum sector. These mining agreements were summarised (EGSMA, 2001, [www.egsma.gov.eg/web/prodshar.htm](http://www.egsma.gov.eg/web/prodshar.htm)) as follows:

#### **The Exploration Period**

- The initial exploration period may be one or two years, this may be extended for up to five years in total.
- In every exploration period, the investor shall submit to EGSMA a letter of Guaranty from an Egyptian Bank, guaranteeing the fulfilment of the investor's minimum exploration obligations.
- The exploration work programme and budget shall be submitted by the investor, to a joint committee which shall review and give advice with respect to the proposed work programme and budget.
- The investor may, voluntarily, during any period relinquish all or any part of the original area. Also, at the end of any exploration period, if the investor chooses to proceed to the next phase he shall relinquish a minimum of 25% of the original area.
- The investor shall be permitted to import equipment and machinery needed for exploration. He shall be exempted from customs, taxes and duties and from any other taxes and from the importation rules.
- All geological, geophysical or chemical analyses shall be made in Egypt, if suitable facilities are available. Special studies and analyses can be made in special centres abroad.
- The investor shall supply EGSMA after each calendar quarter year with a statement of exploration activity. While the Agreement is in force, all data shall be kept strictly confidential.

- During the exploration period the investor will take reasonable precautions to control the effects of harmful pollution and contamination according to international environmental regulations.

#### **After Commercial Discovery**

- If the investor discovers an ore deposit worthy of being developed and exploited commercially, the investor shall present to EGSMA a detailed feasibility study concerning the deposit.
- Following this, EGSMA and the investor shall meet to review the terms of the study and all appropriate data with a view of approving and agreeing upon the existence of a Commercial Discovery.
- Promptly following the commercial discovery, EGSMA and the investor shall form in Egypt an operating company to act as the agency through which EGSMA and the investor carry out and conduct the development, exploitation and marketing operations.
- The exploitation period shall be thirty (30) years from the date of commercial discovery. The exploitation may be renewed for a further period on the basis of reasonable commercial justifications.
- The operating company shall have the right and responsibility to market and sell all the products within or outside Egypt.
- With the start of commercial production, the Government shall be entitled to a royalty in cash or in kind from the ore, or partly in cash and partly in kind.
- Out of the remaining Sales Revenue (excluding the royalty) the investor shall recover:- (i) All current operating expenses. (ii) Exploration costs (max. 33.3%/year). (iii) Exploitation capital costs (max. 33.3%/year).
- If in any financial year, the above costs exceed the Sales Revenue, the excess shall be carried forward for recovery in the next succeeding financial year or years.
- After deduction of royalty payments and recovery of costs (a, b and c above) the remainder of Sales Revenue shall constitute Net Proceed and shall be shared between EGSMA and the investor on agreed upon basis.
- As the investor shall be initiating new mining activities in remote areas, the income generated by these activities shall be granted 15 years exemption from all taxes imposed in Egypt now or in the future.
- The investor shall at all times and without any governmental restriction, limitation, tax or duty be free to transfer annually funds representing his share of Net Proceeds or recovery of costs to US\$ or other freely convertible foreign currency.
- All items, parameters and obligations given above are subject to negotiation between EGSMA and the investor.
- The agreements concluded between EGSMA and the investor will be issued as a law from the People's Assembly of the A.R.E.

## **5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY**

### **Accessibility**

The Fawakhir Concession area is located in the Eastern Desert region about midway between the Nile River valley and the Red Sea coast. The area is accessible from Cairo via the dual-carriageway asphalt road along the Red Sea coastline to the small town of Quseir (400 km, 5 hours), and then can be accessed from Quseir (80 km, 1 hour) via the asphalt road that links Quseir with Qift and Luxor in the Nile valley. Most parts of the Concession area can be accessed along the main wadis (dry valleys) by rough desert tracks that are only suitable for 4-wheel-drive vehicles. The steep, rocky, hills

between the wadis are only accessible on foot. Provision for access to water and surface rights is included in the terms of the Concession Agreement.

### **Climate**

The area has an arid climate, dominated by hot summers and mild winters. The average annual precipitation is about 17.4 mm which falls mainly in the late summer (July to October) period. The monthly mean temperature varies between 24° and 38°C during the summer; and between 12° and 26°C during the winter. The relative humidity varies between 28% in summer and 57% in winter. The predominant wind direction is from the north.

### **Local resources**

There are no significant local resources in the Concession area which is virtually uninhabited. EMRA has retained the old mine camp and mining facilities at the El Sid gold mine (figures 13 and 16) and some of the buildings are being rented by SMWG for use as an exploration camp.

### **Infrastructure**

There is little infrastructure in the Eastern Desert region and the population is sparse, consisting of small coastal settlements and semi-nomadic tribesmen.

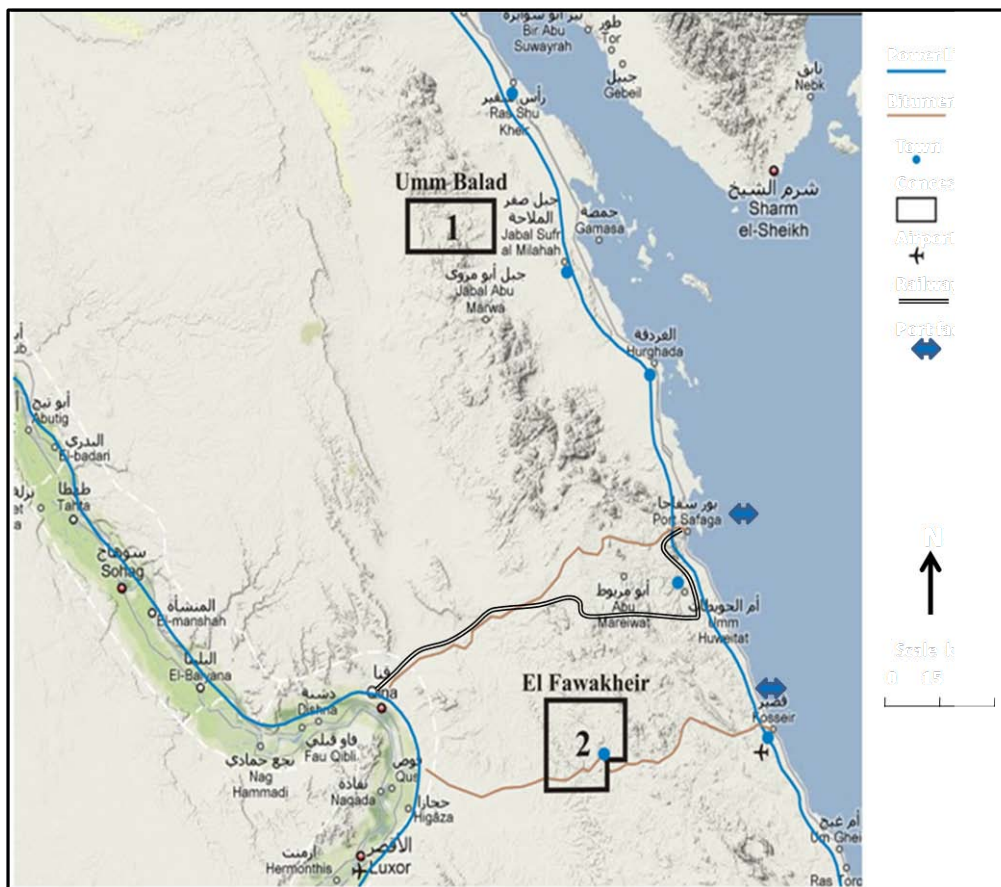
There are international airports at Luxor that serves tourist sites in the Nile valley; and at Hurghada and Marsa Alam on the Red Sea coast that serve the extensive development of tourist resorts and marine centres.

The Eastern Desert region is served by the port of Suez in the north, which has modern container handling facilities, an oil refinery and a major airport. There are small, but reasonably modern port facilities at Port Safaga and also about 10 km north of Quseir that service the phosphate mines.

The Eastern Desert area is bounded to the west by a single track railway and a bitumen road which follow the Nile River between Cairo and Wadi Halfa on the Sudan border. To the east, the area is bounded by a modern bitumen road which follows the Red Sea coastline from Suez to Halaib on the Sudan border. These two transport corridors are linked by several connecting roads which traverse narrow valleys through the hills. There is also a railway that connects Port Safaga to the Nile valley railway at Quena, although this now appears to serve only the phosphate mines. Away from these roads, access is restricted to rough, unformed tracks suitable only for four-wheel drive vehicles.

There are high-voltage electric transmission lines along the coast road and along the Nile valley.

**Figure 3 Location and Infrastructure map of the SMWG Concession Areas**



### **Physiography, vegetation and environmental constraints**

The Eastern Desert region of Egypt forms a narrow north-south trending strip of land located between latitudes 22°N and 30°N and longitudes 30°E and 36°E, between the Nile River valley and the Red Sea coast. The area consists of a dry, dissected plateau ranging from 500m to 2000m above sea level. The area is dissected by a large number of wadis (dry valleys) that drain from the mountainous interior towards the Red Sea coast following the general eastwardly slope. Ground-water resources originate mainly from the occasional rainfall that soaks into the loose wadi sediments and accumulates in basement depressions or is trapped by faults and buried dykes. Ancient water wells such as Bir Nakhil, Bir um Fawakhir, Bir Ain El Gazalle, Bir Hammamat and Bir el Laqeita are located along the ancient Pharonic Road between Qusier and Qift, with other wells along the ancient Roman Road at Bir Sartut, Bir Abu Had, Bir el Gendi and Bir el Shalul.

The concession area consists of typical rocky desert that is almost completely devoid of vegetation.

There are no environmental or other protected “reserves” in the Concession Area, or in the surrounding Eastern Desert region. However, access to much of the area is restricted to protect the extensive archaeological remains that occur throughout the area.

## 6.0 HISTORY

### 6.1 MINING IN THE EASTERN DESERT

Gold and other minerals have been mined in the Eastern Desert area since ancient times and this was a major source of wealth for Ancient Egypt. During the past two thousand years, these ancient workings were periodically re-discovered by the Greeks, Romans, Byzantines, Arabs and British colonisers. One of the first Ancient Egyptian gold-mining sites to be studied archaeologically (by the Oriental Institute of the University of Chicago in 1992, 1993 and 1996) was the Bir Um Fawakhir gold-mining settlement that housed more than 1,000 people who worked the gold mines. It was also an important caravan station serving traffic travelling between the Nile and the Red Sea.

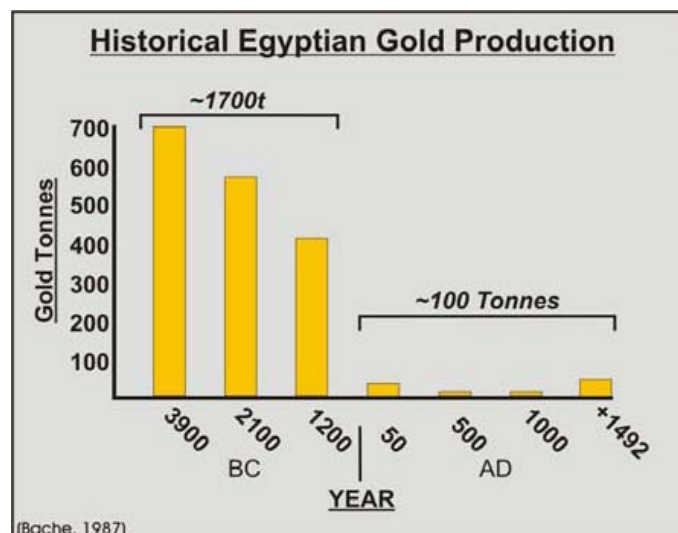
During the period 1900 - 1950, British companies developed several small-scale gold mines in the Eastern Desert region, notably at El Sid, Fawakhir, Sukari, Barramiya, Kurduman, Hangliya, Um Uud, Um Rus and Abu Dabbab, but total gold production during this period amounted to less than 250,000 ounces.

In 1959, gold mining was brought under the control of the government owned *Egyptian Gold Mining Company* that operated at six locations, namely, Fawakhir, El-Sid, Barramiya, Sukari, Atud and Umm Uud. All gold mining in Egypt ceased in 1962.

During the 1970s, geological mapping and mineral exploration was carried out with Soviet assistance, but this was terminated without any significant mining development having occurred.

Some limited exploration for gold and base-metals was carried out by UK companies in the 1980s, mainly in the Barramiya and El Sid areas.

**Figure 4** Historical gold production in Egypt



More recently, Egypt's extractive industry has focused on crude oil and natural gas along with marble and construction material from quarries. Petroleum and gas account for 15% of national GDP, compared to only 1% for the mining industry. The country has substantial mineral resources, including phosphate, coal, tantalite and significant deposits of other minerals. Egypt also has a substantial exploration potential for gold in the Eastern Desert.

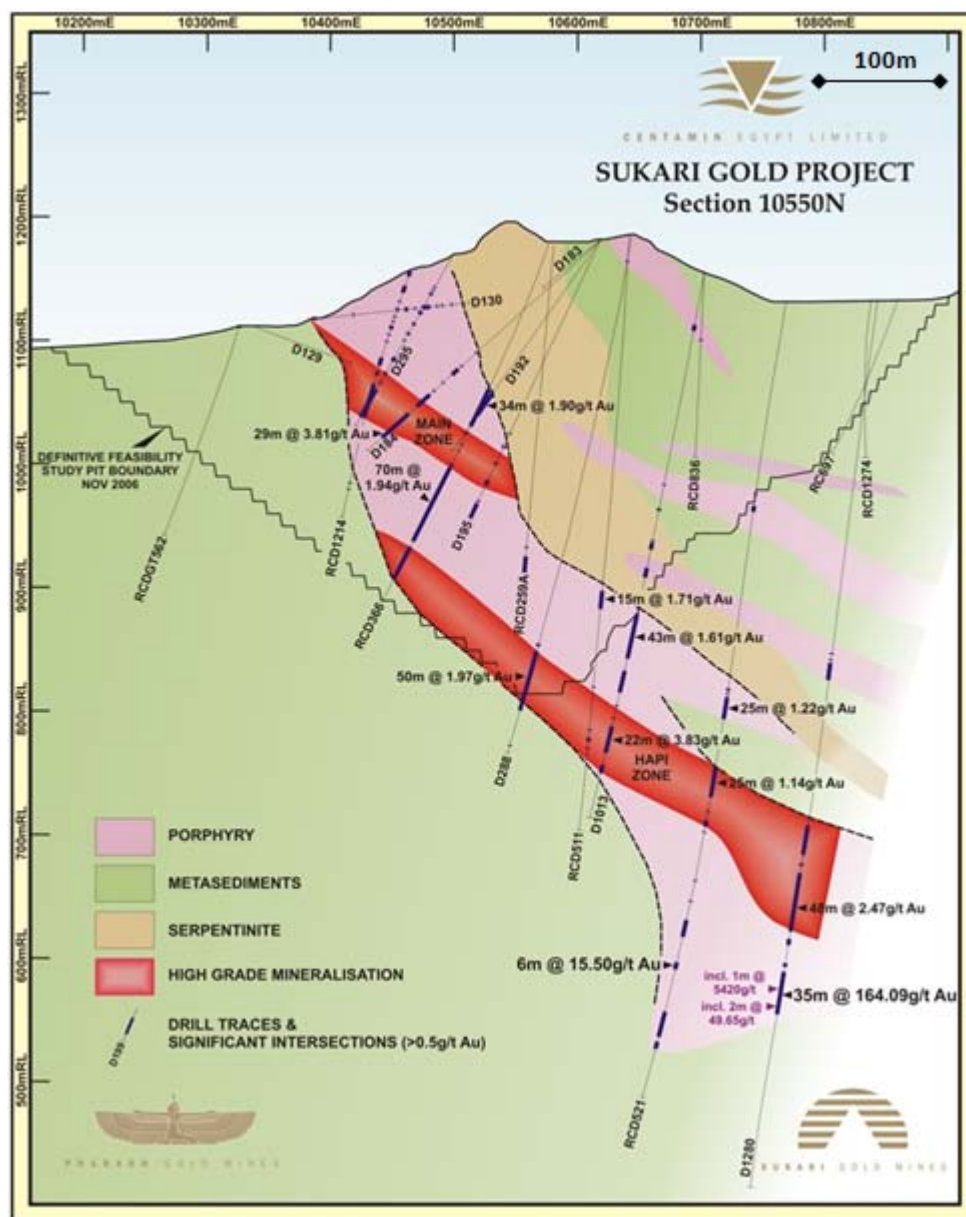
Recently, the Government of Egypt initiated a series of reforms regarding its policies and institutional frameworks to pave the way for a more attractive business environment for domestic and international



mining investments. In association with the International Finance Corporation (IFC), the government launched a Mining Policy Reform Project in 2007 for the Ministry of Petroleum and Mines represented by EMRA to initiate this reform process by streamlining investment procedures and reducing or eliminating bureaucratic obstacles wherever possible (IFC, 2009).

Recently, the Australian company *Centamin* began exploring for gold in Egypt in 1995 and examined many of the known deposits including, El Sid, Fawakhir, Um Balad, Abu Marawat and Barramiya, but, following their significant new discoveries at Sukari, Centamin relinquished their interest in most of these other areas. The discovery and development of the multi-million ounce gold deposit at Sukari, is the first significant new gold discovery in Egypt for at least 2000 years.

**Figure 5** Geological Cross-section through the Sukari deposit  
 (Source: Centamin Annual Report, 2008).



The Sukari gold deposit is hosted in a felsic (calc-alkaline) intrusive known as the “Sukari Porphyry” of granodiorite to tonalite composition with minor associated rhyolite and dacite. The gold mineralisation is hosted within a large, sheeted quartz-vein system within a shear zone. The Sukari Porphyry is about 2 to 3 km long and from 100 to 600 metres wide in outcrop with a north-easterly trend parallel to the regional structural grain. The porphyry dips to the east, at an average of 65-70°, with localised flexures ranging between 30-80°. Gold mineralization at Sukari is commonly localised in brecciated porphyry occurring with quartz and fine-grained pyrite as matrix to the breccia. Gold mineralisation at Sukari is related to the sulphide minerals; with pyrite the most abundant sulphide, followed by arsenopyrite. The sulphides occur disseminated in altered rocks and in quartz veins.

In 2005, Centamin was granted an exploitation (mining) licence, based on a feasibility study for a 4 to 5 million tonne per year mining operation. Following construction of the mine and processing plant at Sukari, commercial production started in October 2009. The Sukari deposit represents the first significant discovery resulting from the use of modern exploration and mining concepts in Egypt. Application of these concepts in other areas may result in further discoveries of large, low-grade, open-pit type deposits (Centamin, 2010).

[Note: The QP of this report has been unable to verify the information (relating to Sukari) and the information is not necessarily indicative of the mineralisation on the property being reported on.]

## **6.2 GOLD MINERALISATION IN THE EASTERN DESERT**

Gold occurrences are the most wide-spread and abundant of all the metalliferous deposits in the Eastern Desert, possibly because they have been the most intensely explored and developed. There are about 100 known gold-quartz vein deposits that were worked in ancient times. Some of these were re-worked during the period 1902 to 1958 when a total of 6.7 tonnes of gold was produced. El Sid was the largest of these (Kochin & Bassyuni, 1968).

The localization of gold mineralization in its present position was related to the action of hydrothermal fluids produced during thrusting, regional deformation (faulting and folding) and emplacement of “younger” intrusive rocks. These fluids leached gold along its pathways from source rocks that determined the geochemical association and ore-mineral assemblage of each resulting group of mineral localities. The known gold occurrences appear to form three possible mineralogical-lithological associations:-

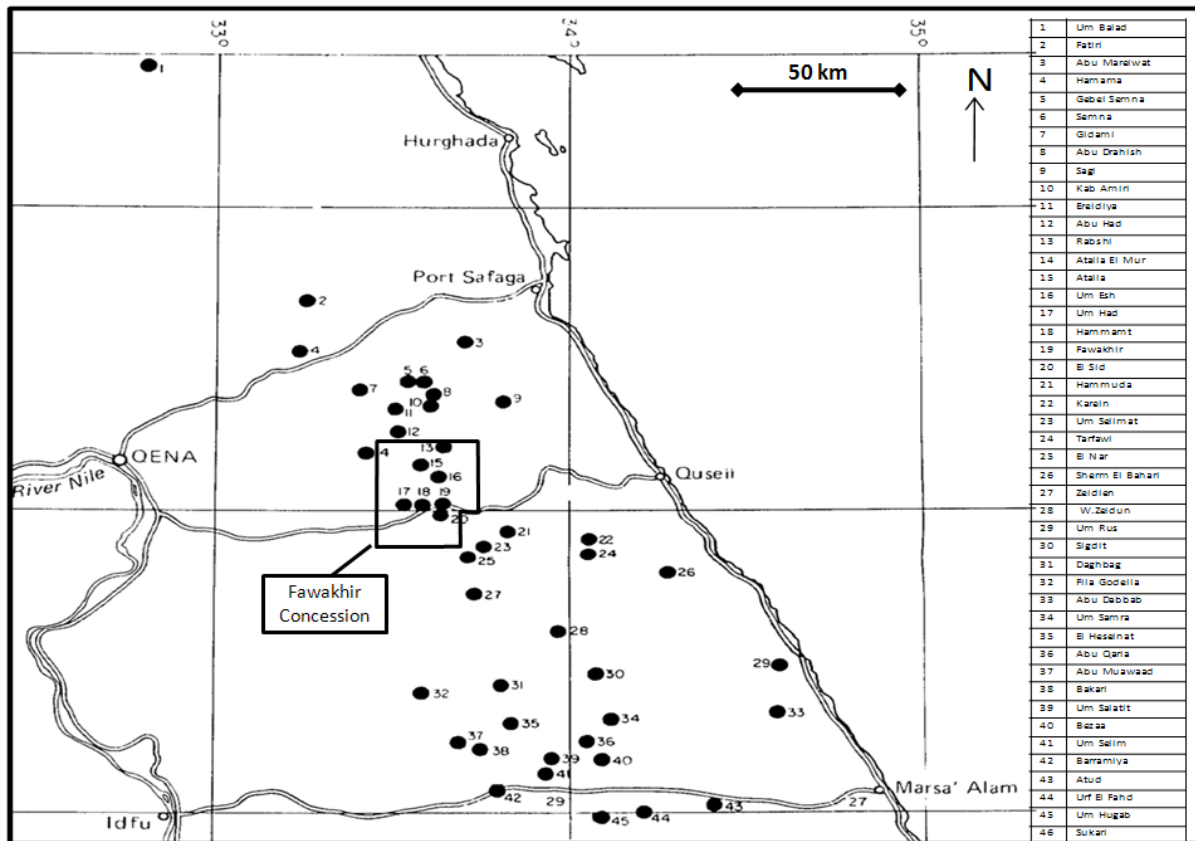
- i. Ophiolite group (schist-mudstone-greywacke series; sheeted basalts, altered ultramafic rocks (serpentinites and talc-carbonates) and metagabbro;
- ii. Island arc group (volcanic, volcano-sedimentary rocks, gabbro-diorites, granodiorites and Dokhan volcanics); and
- iii. Cordillerean-extensional group (pink and red granites as well as felsite porphyry and other felsic dyke rocks).

Each of these three tectonic groups possesses a specific mineral assemblage and geochemical association that is related to its source-rock type (Hassaan and El-Sawy, 2009).

The first group of gold occurrences usually occur as simple gold-quartz veins cutting mafic (ophiolitic) rocks of varying compositions. The distribution of these gold occurrences is similar to the distribution of the chromite-ilmenite-nickel-copper occurrences and it is concluded that these gold occurrences represent a mineralogical characteristic of the ophiolite rocks. Most of these gold occurrences are small quartz veins (less than 1000m in length and 1m in width) which have little commercial potential except where they form larger multiple vein swarms or sheeted vein systems.

The second type of gold deposits is associated with the margins of granodiorite and diorite bodies intruded into the mafic rocks. Sukari is the largest and best-known deposit of this type. The Atallah, Fawakhir and El Sid deposits are also of this type.

**Figure 6 Map of known gold localities in the central Eastern Desert**



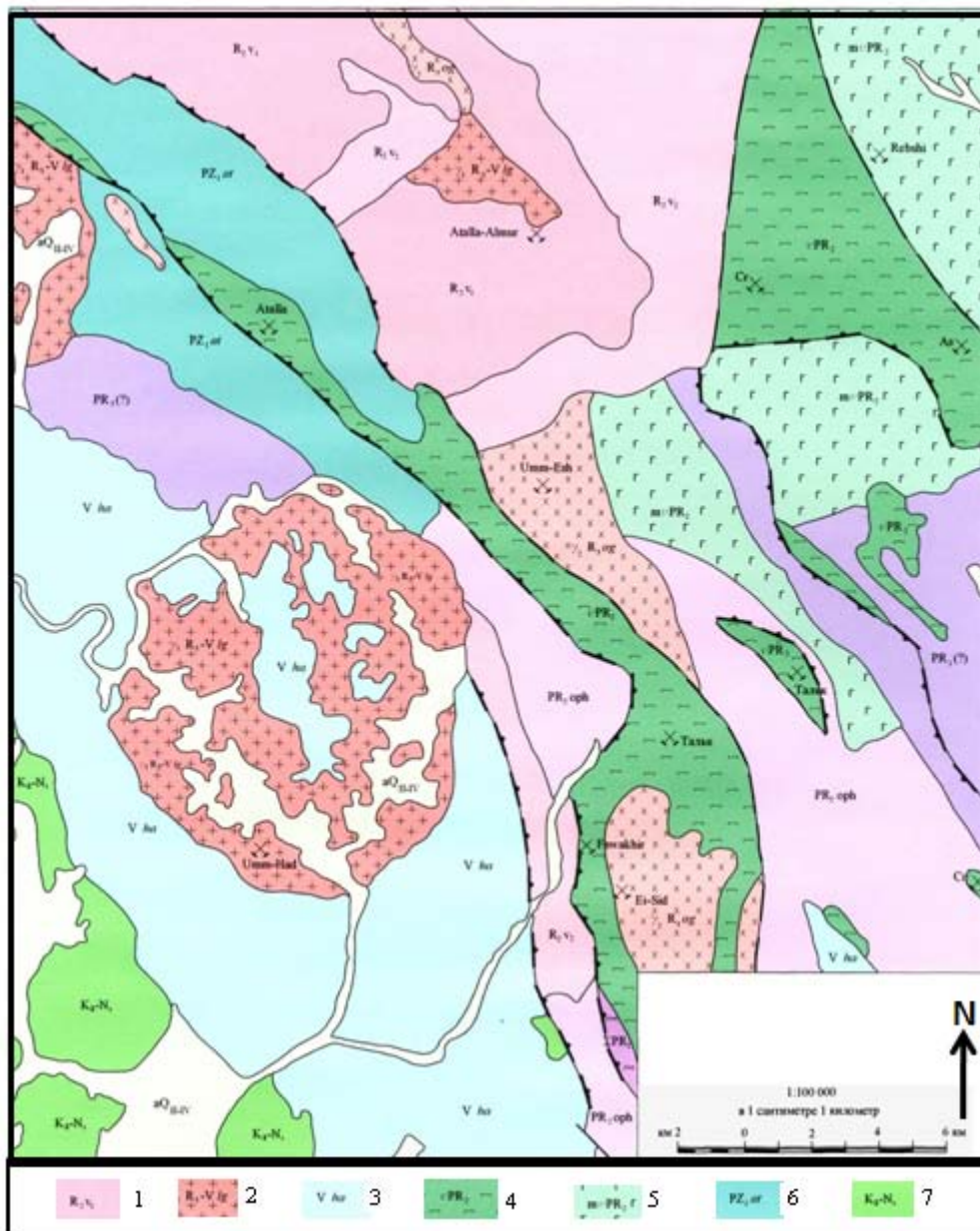
### 6.3 LOCAL HISTORY – FAWAKHIR CONCESSION AREA

The area of SMWG's Fawakhir Concession has been explored and mined for gold and other minerals since the early pharaonic times, as evidenced by the numerous and widespread ancient workings and their associated archaeological remains. These provide evidence of successive periods of activity that have been related to the periodic invasions of the Hittites, Phoenicians, Greeks, Romans, Byzantines, Ottomans and British colonisers.

The first documented exploration commenced in 1902 with the grant of exploration concessions to the British companies *Egyptian Mines Exploration Co. Ltd.*, *North Western Exploration Co. Ltd.*, and *Central Egypt Exploration Co. Ltd.*

By 1910, mining of high-grade quartz-vein gold deposits had commenced at Fawakhir and Atallah; and later in 1949 at El Sid. Operations continued sporadically until all gold mining was suspended by the government in 1959.

**Figure 7** Simplified geology map of Fawakhir Concession Area with known gold deposits



LEGEND for Figure 7 1 – older grano-diorite, 2 – younger granite, 3 – mafic volcanic, 4 – ophiolitic volcanic, 5 and 6 – meta-sediments, 7 – Cretaceous Nubian Sandstone.

(from Geologic maps of Wadi Al Barramiya and Al Qusayr quadrangles, Egypt, scale 1:250,000, 1992)

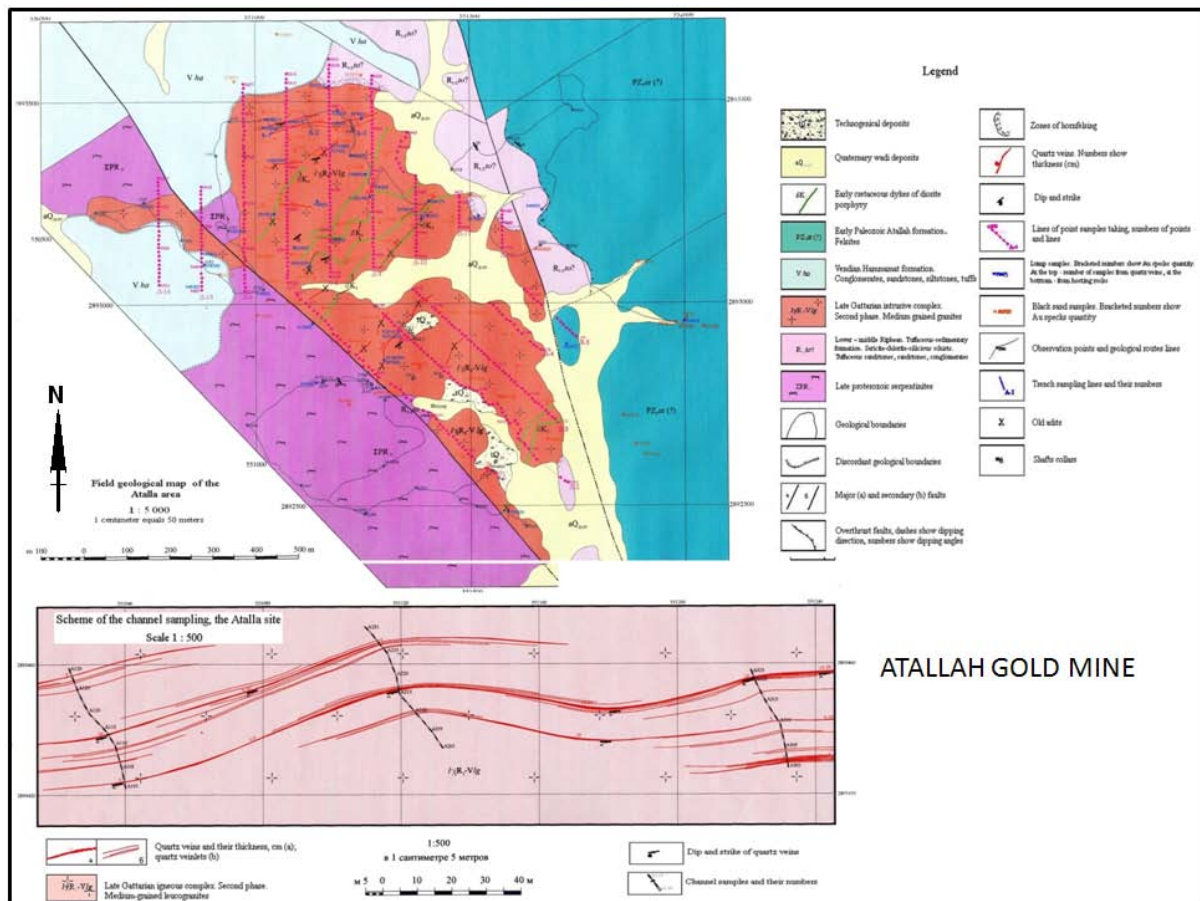
#### 6.4 ATALLAH GOLD MINE

The Atallah gold deposit is located at Latitude 26°11'N, Longitude 33°31'E, about 15km NW of the El Sid mine and about 9 km north of the Fawakhir mine. It is accessible from Bir Fawakhir by a good gravel road (1 hour) along Wadi Atallah, which joins Wadi Hammamat at Bir Fawakhir.

The basement rocks exposed in the mine area include an ophiolitic melange intruded by felsite and calc-alkaline granite. These rocks include, from the oldest to youngest, serpentinites and related rocks, rhyolite tuffs, felsites, the Atallah mine granite, sulphide-bearing quartz veins and post-granite

dykes. The serpentinites and related talc-carbonate and talc-graphite schist country rocks, form prominent NW-SE trending ridges. The felsites and the Atallah mine granite intrusion form a low hill about 1.5 km in length and 1 km wide, that trends NNW - SSE (Osman et al, 1997).

**Figure 8 Geological map of the Atallah gold mine area**



The Atallah gold mine worked a zone of gold-sulphide bearing quartz veins that strike NE - SW and dip 65° SE, in the southern part of the granite mass. The individual en-echelon veins extend for about 275m along strike and vary from 0.2m up to 1m wide within a 2m to 6m wide shear zone.

Gold mineralization at Atallah is closely associated with the zone of silicification (quartz veining) within the granite. Analysis of the sulphide-bearing quartz veins and granites from the Atallah gold mine revealed two phases of mineralization. The first phase consisted of disseminated arsenopyrite replacing feldspars in the granite. The second phase consisted of quartz veins in the granite with an assemblage of gold, pyrite, galena, sphalerite and chalcopyrite. Petrographic studies showed the gold occurs as free gold in quartz and as inclusions in pyrite and galena (Osman et al, 1997).

The ancient workings at Atallah were re-opened by a small syndicate under Mining Lease No 20 held by Atallah Ltd., (Messrs John Taylor & Sons) who worked at Atallah between 1914 and 1918. The mine closed in 1918 after producing gold with a value of £E 38,347 (Hume W F, 1937). In 1915, the mine was visited by a government Mines Inspector (Rogers, B M: 1916) who wrote the following description:-

*“During 1915 the mine produced 3999 ozs of “Bar Gold” from 4115 tons of crushed ore. Most of the ore was mined from the 260ft level and the south stope below it. The No 1 Back Stope at the 170ft level which previously only carried low values had recently given much better results and was*

supplying ore tonnage with an unexpectedly good grade. The southerly side of the mine was practically worked out to the 'black country' (mafic volcanics) with the exception of what may be found below the existing bottom level. Other exploratory work has not been attended with such encouraging results so that the total quantity of ground ready for stoping was small and the end of the mine was said to be within sight.

Two dumps of clean quartz were estimated to contain 150 tons of ore and a grab sample taken by (Rogers, B.M.: 1916) to represent the whole of the dumps, assayed at 55.45 dwts of gold per short ton. Two other dumps of partly sorted fines were estimated to contain 130 tons. A similar grab sample was taken of these dumps and assayed at 14.95 dwts of gold per short ton. This gave a total of 310 tons of ore available, of which 130 tons contained a total of 97 ozs of gold, and 180 tons containing a total of 499 ozs of gold. This gave a grand total of 596 ozs in all dumps available. This ore is a good representative of the development openings so far completed, and was no doubt extraordinary rich ore. The ore was sorted by hand at the mine site and then carted 15 km south to the Bir Fawakhir mine for processing (Rogers, B.M.: 1916)".

[**Note: This historical estimate should not be relied upon and is not being treated as a current mineral resource as defined in sections 1.2 and 1.3 of the Instrument**]. This mining district was briefly described by Sampson (in Hume, 1937):-

"a small, but rich, vein extending for some 900 feet at the surface, and accompanied by several rather less important reefs which run more or less parallel to the main vein. The quartz varies in colour from pure white through various shades of blue to almost black, and contains amongst other minerals galena, pyrites and blende to a greater or less extent. The gold values vary from a few dwt up to as much as 15 oz to the ton (2240 lbs.). The quantity of base-metal sulphides visible to the naked eye affords, as a rule, an excellent criterion of the gold value of the ore"

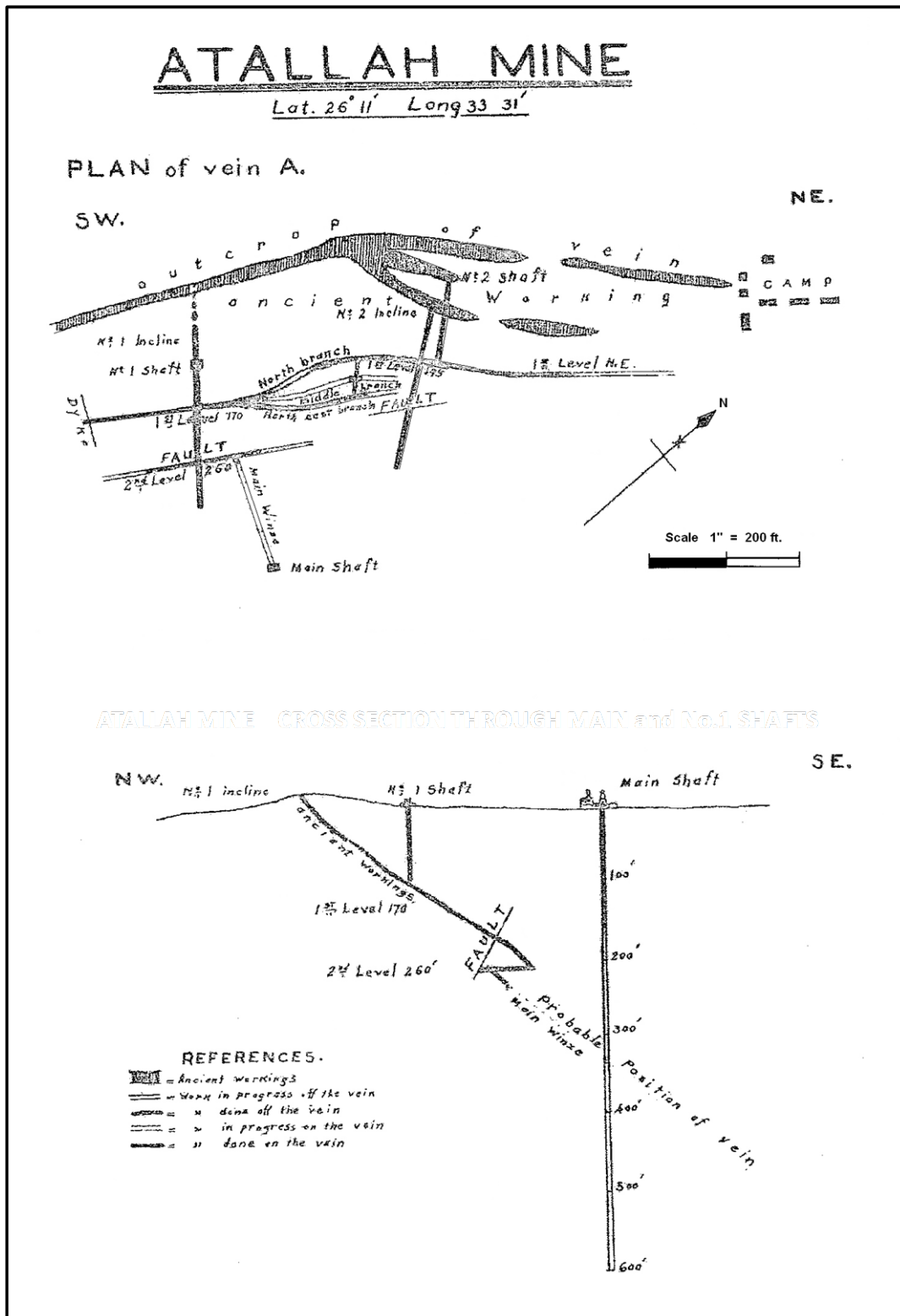
Jenkins (in Hume, 1937) noted that:- "six parallel veins strike in a north-east and south-west direction for about 800 feet and the old workings could be examined down to a depth of 150 feet. The dip of the veins is 50°SE, and they terminate to the south-west at the contact with a basic intrusion beyond which they have not been traced. The veins reach a maximum width of 47 inches. The proportion of silver : gold averaged about 1 : 3.5. The gold obtained by **cyaniding** showed an even higher content of silver, the latter forming nearly a third of the alloy".

At the present time, there are about 5000 tonnes of cyanided tailings at the mine site. These appear to be of fairly recent origin, perhaps dating from the 1930s, but there is no information available regarding when or by whom this cyanidation work was carried out.

The mine was also visited by a government Mines Inspector in 1943 (Howary, Inspector of Mines, 16 April 1943), who wrote the following description:-

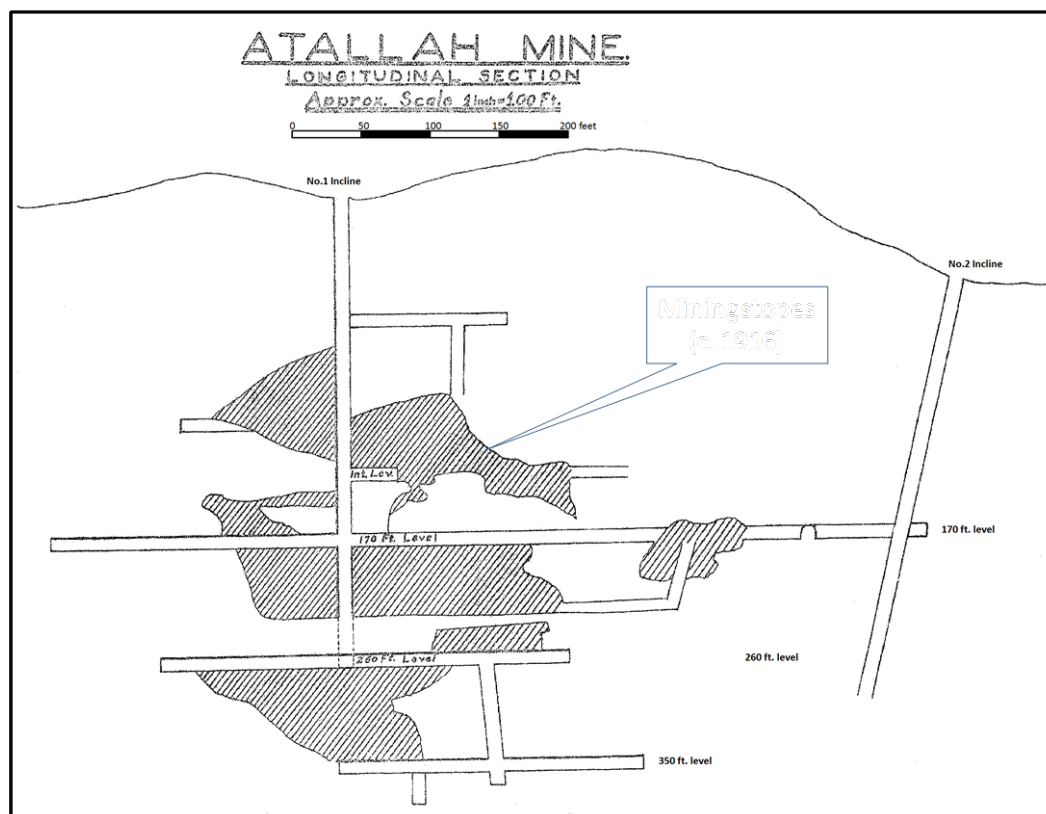
"Nearly 5000 tons of probable and possible ore are indicated in the mine at present (1943). Carrying on development at the present rate, would indicate a further 5000 tons at the end of one year. Taking the average width of the lode at 1.3 ft., the ore obtainable from six development points in the mine per day would be 3.9 tons. In the very near future, more points will be available and this tonnage would be increased to 6 tons by working 3 further openings. The ore indicated in the mine at the end of that year would be as follows:- Developed ore during year = 5000 tons, Possible and Probable Ore available = 5000 tons, Less stoped ore = 640 tons, leaving Probable & Possible Ore = 9360 tons (Howary, 1943)". Note :- these are historical resource estimates and are not CIM/JORC compliant.

Figure 9 Plan of Atallah Mine



Source: Atallah Ltd./Egyptian Geological Survey and Mining Authority (Rogers, B.M.: 1916)

**Figure 10 Long section through Atallah gold mine area**



In 1971, the Atallah mine area was examined briefly by EGSMA/Technoexport.

In 1988, the mine was examined by Minex Minerals (Egypt) Ltd, who surveyed and sampled the existing mine dumps and cyanide tailings dumps and estimated there were about 5000 tonnes of cyanided tailings. These may relate to the mining activity described by Hume (1937) and Howary (1943).

#### **Atallah Almur (Atallah East) Prospect**

East of Wadi Atallah between latitudes 26° 07" and 26° 15", there are numerous alluvial workings and a few bed-rock workings for gold, scattered over an area of about 50 km<sup>2</sup>.

In 1988, Minex Minerals (Egypt) Ltd., carried out regional mapping and exploration of this area, which consists of andesites, rhyolites and siliceous metasediments, all intruded by a granodiorite pluton. Andesites outcropped over most of the area and were fine-grained, homogenous, siliceous lavas with minor tuffaceous horizons. In the west, near Wadi Atallah, the rhyolites contain a silica-barite facies with occasional gossanous veins. In the east, a number of ironstone horizons outcrop. To the south and east of the andesites, there are slatey, fine-grained, siliceous rocks that may be metamorphosed sediments and sedimentary tuffs. In the north of the area, a biotite granodiorite intrudes the andesites. The contact is sharp with no observable metamorphic aureole or alteration. The principle structural trend is east-west, but in the north and east the regional northwest to southeast trend dominates.

Eleven small bed-rock workings were located within the area. Of these, 6 were small quartz veins, the other five being situated in shear-zones. The quartz veins were 10 to 40 cm wide and of white quartz with goethite-filled cavities. It is likely that there are more similar vein workings in the area.



The shear-zones were 20 cm to 1m in width and composed of fractured and carbonate-altered country rock. Other than the carbonate alteration and occasional ferruginous alteration, no evidence of mineralisation was seen in these shear-zones.

Twenty six rock-chip samples were collected from the old workings and also from the ironstones and silica-barite zones within the rhyolitic horizons despite the fact that these have not been worked. All the rock-chip results were poor, with only one sample yielding a value of 4.0 g/t Au.

Twenty three heavy-mineral samples were collected from wadi sediments downstream from the alluvial workings, but only two yielded any trace of gold on panning.

## **Conclusions**

The Atallah gold mine comprises one main quartz vein about 250m in length and about 0.35m wide, and several smaller and thinner parallel quartz veins in a granite host rock. The main vein was worked during the period 1914-18 and produced a few thousand tonnes of ore at an average grade of about 30 g/t.

At a later date, probably in the 1930s, about 5,000 tonnes of ore were treated by cyanidation, but there is no data available about this activity.

The size of the deposit suggests that it may be too small to justify commercial development on its own, but it could have potential for development as a low-grade, open-pit satellite operation to a larger mining operation close by.

## **6.5 FAWAKHIR AND EL SID MINES**

The Fawakhir and El Sid gold mines are located about 80 km west of Quseir and about 80 km east of Qift, adjacent to the tarred road joining the coastal town of Quseir and the towns of Qena and Luxor on the Nile River.

El Sid is located 3 km south of Bir Fawakhir (33°36' E/26°00' N). The El Sid mine was also known as the As Sudd ancient workings.

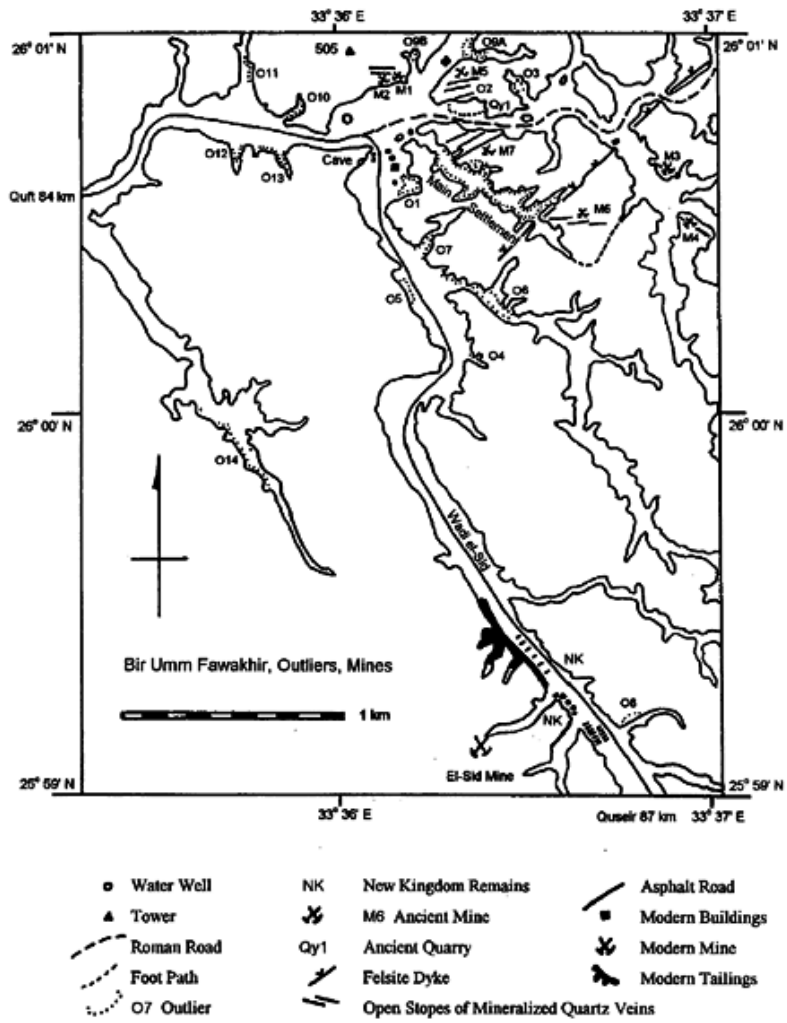
### **6.5.1 FAWAKHIR MINE**

The Fawakhir mine is located at 33° 36'E/26°02'N, about 3 km north of the El Sid mine site.

The modern settlement at Fawakhir consists of a guard post, two tea houses, a mosque and a few buildings left from the abandoned mine. The settlement lies in a wide, flat, sandy area (c 7.5 km<sup>2</sup>) surrounded by steep rocky hills dissected by numerous wadis. On the hillside to the west are a number of ancient mine workings, and at its foot is the important water well, Bir Umm Fawakhir. The ancient gold mine at Bir Umm Fawakhir was the subject of a 3-year archaeological survey in 1996 (Meyer, 1996). The main group of ancient ruins is situated in a long, narrow wadi hidden from the road by a spur of hills. Other, smaller clusters of ruins nearby have not yet been investigated.

The ancient workings are primarily open trenches running diagonally up the granite hill that follow the quartz veinlets intruded into altered/sheared granite.

**Figure 11** Location of the Fawakhir and El Sid mine sites  
 (Source: Oriental Institute, 1995)



**Figure 12** Fawakhir mine area showing ancient settlement  
 (Source: Bard K.A.)



The mine was worked between 1910 and 1912 by a British company (John Taylor and Sons), when it produced about 50,000 tonnes at a grade of about 1.2 ounces/tonne (37 g/t). The modern adit workings (dating from the 1910-12 period) extend about 100m horizontally into the mountain and are roughly two metres high, with two short side galleries and an air shaft. The granite is jointed, fissured and intensely altered in places.

It was also worked and the ore processed by cyanidation prior to the 1950s before being abandoned in about 1950.

Kochin (1968), who quoted Neubauer (1956), reported that about 30,000 tonnes of tailings were present at grades up to 3.63 g/t. Minex (1981) mapped and sampled the old tailing dumps and estimated that there were about 14,000 m<sup>3</sup> at SG of 1.6 = 22,000 tonnes. The weighted average assay results for each dump area were:

Dump 1	-	1.97 g/t
2	-	2.05 g/t
3	-	1.73 g/t

### 6.5.2 EL SID MINE

The El Sid mine is located at wadi level at an elevation of about 400m asl. The hills on either side rise about 500m as steep rocky ridges to a height of 1060m. The main wadi is about 500m wide at this point but varies from 50m up to 2500m wide within a short distance of the mine.

The El Sid mine was Egypt's largest gold producer. It was worked between 1940 and 1957 when it produced some 3,110 kg (100,000 oz) of gold from 120,000 tonnes of ore, at an average grade of 27.9 g/t (Kochin et al, 1968). This was almost half the total Egyptian recorded gold production for this period. There are reported to be about 330,000 tonnes of waste rock and/or tailings averaging about 3 g/t Au left on surface.

**Table 4 Dump and Tailings Resources at the El Sid and Fawakhir Mines**

Resource	Tonnes	Grade (g/t)	Gold (kg)
Dumps El Sid	13,822	2.50	34.560 [1]
Dumps El Sid	27,311	3.15	86.200 [1]
Dumps El Sid	11,070	2.69	29.820 [1]
Waste El Sid	150,000	4.00	600.000 [1]
Tails El Sid	3,530	1.99	7.030 [1]
Tails El Sid	105,217	0.90	94.700 [1]
Tails El Sid	9,970	0.62	6.280 [1]
Dumps Fawakhir	20,000	4.50	90.000 [1]
Tails Fawakhir	12,225	1.73	21.149 [2]
Tails Fawakhir	4,204	1.97	8.282 [2]
<b>Total (Metric)</b>	<b>331,870</b>	<b>2.98</b>	<b>990.786</b>
Sources: Table from Centamin Prospectus. [1] EGSMA [2] Minex			

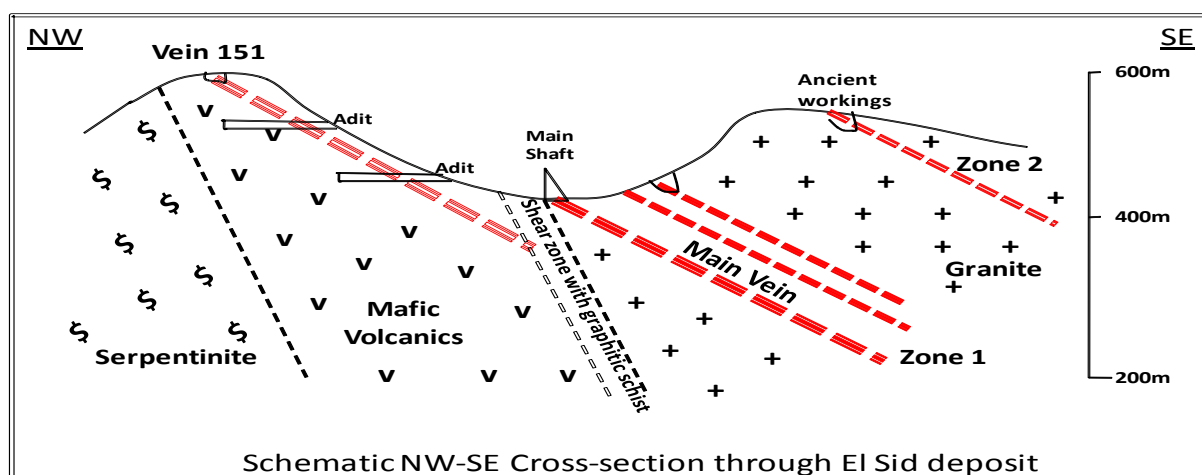
The El Sid deposit consists of a zone of quartz veining within two ENE-WSW trending parallel shear zones up to 1500m in length and up to 100m wide, with a combined width up to 350m (Kochin et al, 1968). There are 11 large quartz veins at El Sid, which strike roughly east-west and dip south at angles of 26 to 65 degrees. The gold mineralisation is associated with poly-metallic sulphides in quartz veins. The sulphide minerals include pyrite, arsenopyrite, sphalerite and galena. The following is a contemporary account of the El Sid mine in 1950, when it was owned by Count de Lavison (extracted from Derry, 1951).

“The modern operators discovered the mine by starting to work the ancient tailings, which had about 4 penny-weight (6 g/t) of gold... Then they followed these tailings up the valley and discovered the vein itself; which had been lost for centuries. The vein is flat-dipping at about 30 degrees and is banded quartz with fine galena and sphalerite on the margins. The vein was from one to four feet wide and the quartz ran over an ounce per ton in gold. The mine had an inclined shaft and had seven levels, the lower ones opened from a winze. They were having some trouble following the vein on the bottom level. In one place ... one of the ancient miners' stopes that they had broken into was 250 feet down on dip and may have been anywhere from 2,000 to 3,000 years old.... At the time of my visit (May 1950) they were mining about 80 tons a day (of ore + waste). The sorted ore, amounting to 35 tons per day, was trammed to the mill which was straight cyanidation. Last year (1950) they milled 10,900 tons and recovered 10,729 ozs of fine gold and hoped to double this the following year (1951).”

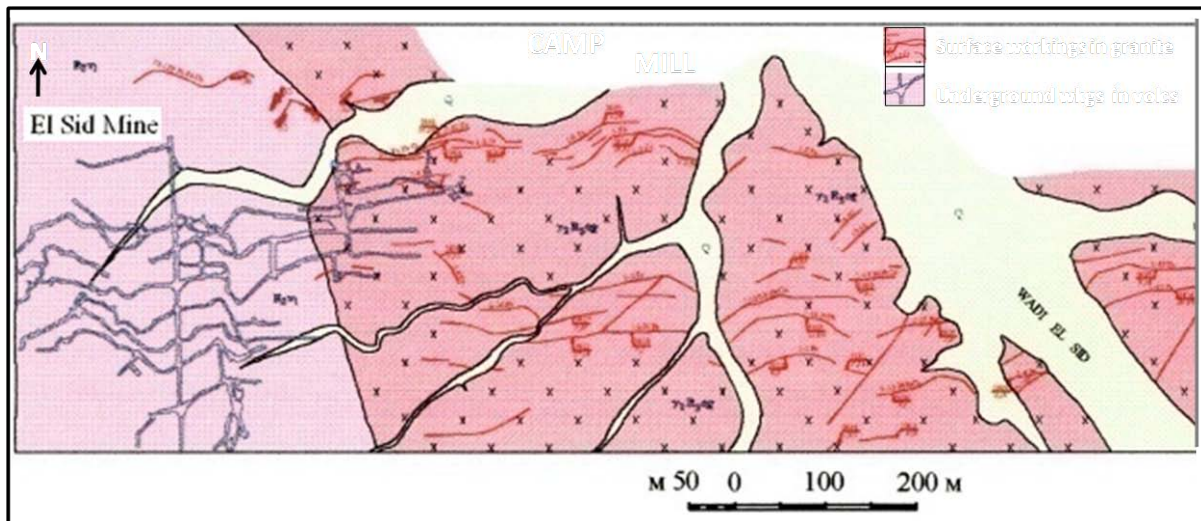
**Figure 13** Main shaft at the El Sid mine site



**Figure 14** Schematic NW-SE Cross-section through El Sid Deposit



**Figure 15 Plan of the El Sid mine workings**



Individual veins range up to 1.6m wide and were mined over strike length of about 900m and a vertical interval of 450m (1485 feet). About half of this vertical interval was from adits above wadi level (in Vein 151) and about half was below wadi level from the two main shafts.

Underground workings include 3 inclined shafts, with 4000m of drifts and winzes on 8 levels in the western part of the mine and 4 levels in the eastern part of the mine. The average gold content of the vein on Nos 2, 3 and 4 levels was 42.3 g/t Au over an average vein width of 0.52m (Gabra, 1986).

Significant mining was confined to the main vein, where 120,000 tons of ore at an average grade of 27.9 g/t gold were produced over 15 year period. The high-grade ore in the main vein is believed to be mined out. In 1956, it was reported that only 2832 tons of ore remained in pillars, at an average grade of 78 g/t Au.

A cross-cut between the main vein and the northern veins exposed a series of un-mined veins and veinlets in both the hanging-wall and foot-wall of the veins (Gabra, 1986).

At the present time (2009) the ground-water level in the mine is some 90m below the main shaft collar. The upper levels I-IV are accessible, but the lower levels are flooded.

In 1948, a new 30 ton/day gold treatment plant was installed at El Sid, after testwork showed that a high percentage of the gold could be recovered by cyanidation, either after amalgamation, or directly from ore. The plant used about 60 tons of water per day supplied from a single well on-site (Bir Fawakhir) (Anonymous, 1950).

Figure 16 Gold Treatment Plant at El Sid

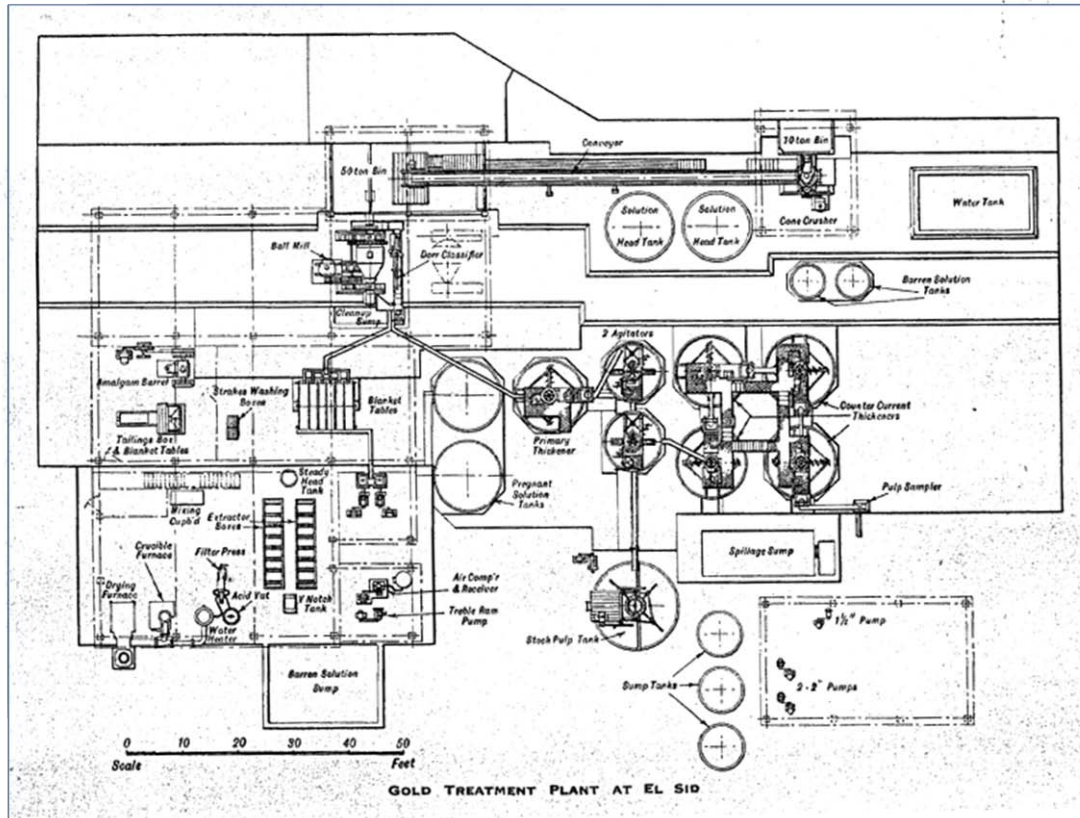


Figure 17 Processing plant at the El Sid mine site.



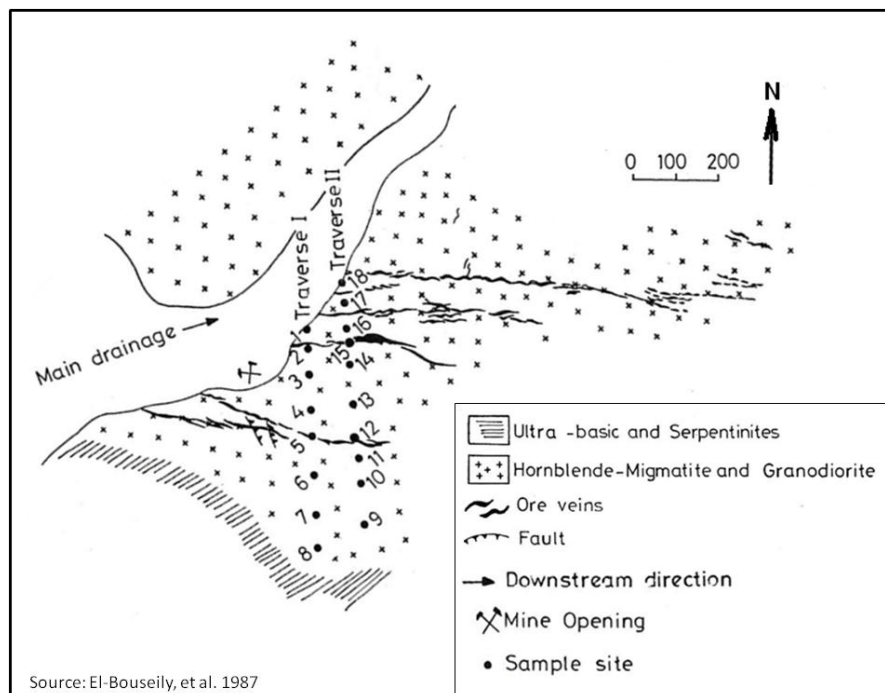
In the period following closure of the mine, numerous geological, geochemical and mineralogical studies were carried out by EGSMA, often with soviet assistance. Some of the results were published, as follows:-

Mineralization occurs within fissure-filling quartz veins exposed along the contact of the Fawakhir granitoid pluton with the host serpentinites and metagabbros. The main lode has been exploited for 280m along its strike by three inclined shafts, to a depth of 160m down-dip. The auriferous ENE-WSW trending quartz veins pinch, swell and bifurcate into smaller veins, veinlets and stringers and intersect other, barren, quartz veins that trend NNW-SSE and dip 54° SW, giving rise to a stockwork zone about 100m wide. The thickness of the exploited gold-bearing quartz veins decrease in the lower levels of the mine (Marraz, 1995).

Gold mineralization in the El Sid area occurs with polymetallic mineralization of Au, Ag, Pb, Zn and As. The principal metallic minerals are pyrite, arsenopyrite, sphalerite and galena with associated quartz gangue and subordinate amounts of calcite. Pyrite and arsenopyrite are the most common minerals throughout the deposit. The sulphides occur as fine- to medium-grained disseminations in hydrothermal quartz veins up to 6m in thickness. The veins are accompanied by a series of contiguous veinlets and offshoots forming a vein zone over 100m wide. Large veins extend 900 to 1100m along their strike and about 450m down-dip (El Ramly et al., 1970).

El Bouseily et al (1987) carried out a multi-element, litho-geochemical survey, based on two sample traverses 150m apart and 600m long, across the mineralised quartz vein system at the El Sid mine.

**Figure 18 Simplified geology and sample locations at El Sid gold mine**



Eighteen composite rock-chip samples, each covering about a 1.5m radius of the sample site, were collected from the least weathered outcrops along the traverses. The results showed that all the main metallic elements exhibited a direct relationship to the outcrop of the quartz veins. The results were summarised as follows:-

Element	Range ppm	Background ppm
Au	< 1.0 – 50.0	< 1.0
Ag	0.3 – 125	0.8
Cu	32 -721	< 30
Pb	20 – 415	< 20
Zn	30 – 3600	71
As	52 – 1800	62

Some of the most productive auriferous quartz veins extend into the meta-gabbro / serpentinite country rocks that are separated from the granite by a thick zone (ca 15 m) of graphite schist (Fig 19) where the shear zone consists of pockets of quartz and a mixture of graphite, carbonate and chlorite. The veins are formed mainly of massive milky-to-grey quartz with or without carbonate (calcite and siderite), chlorite and sulphide minerals. The principal sulphide minerals are pyrite, arsenopyrite, sphalerite, and galena. Chalcopyrite, pyrrhotite, bornite and covellite are rarely observed. The sulphide minerals occur as fine- to medium-grained aggregates and/or disseminations in the hydrothermal quartz veins. Gold and silver minerals are too fine-grained to be seen by the naked eye, but they have been identified from microscopic and geochemical studies of ore concentrates (Hume 1937; El Bouseily et al., 1985).

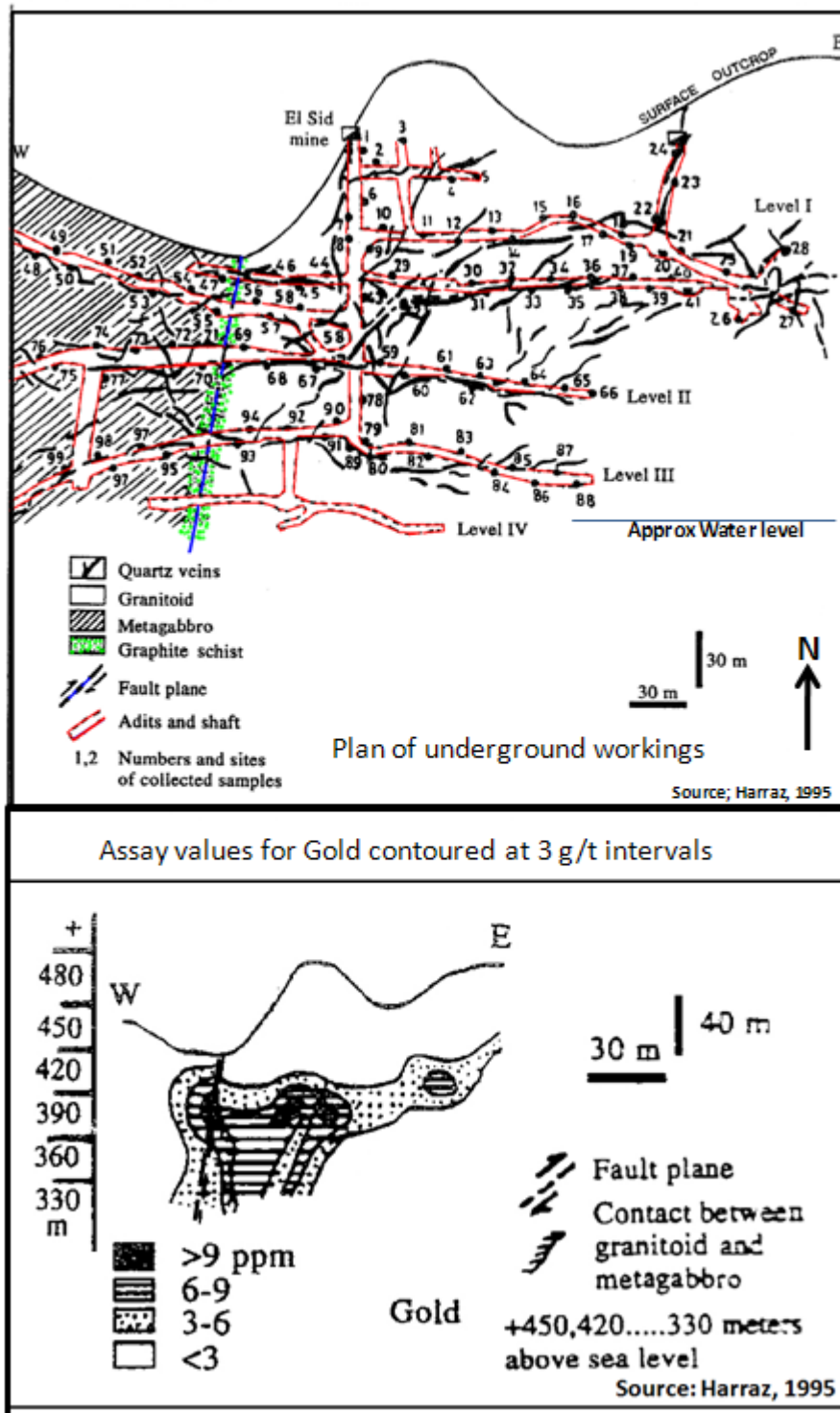
Harraz (1995) collected a total of 99 rock samples from the accessible levels in the eastern part of the underground mine workings at the El Sid mine (Fig. 19). Deeper levels in the mine were flooded. Each sample was collected as chip samples over an area of about 2m<sup>2</sup>. The collected samples included 62 samples of granitoid rocks, 37 samples of meta-gabbro, 35 samples of quartz veins and 27 samples of calcite veinlets and pockets of carbonate. Samples were split, crushed and then ground to pass through 100 mesh. The results (Table 5, Fig 20, below) showed that the gold and base-metal elements (Cu-Pb-Zn-Ag-As) formed a high-grade core adjacent to the faulted contact between the granite and the host volcanics and serpentinites. This high-grade zone showed a strong correlation with the graphite schist and associated basaltic volcanics that occur as a fault-bounded wedge of rocks along the granite- serpentinite contact. Both the gold and base-metal values decrease significantly within the granite and serpentinite rocks away from the contact zone. The mercury values appear to be concentrated in the weathered rocks above the water-table (Harraz, 1995).

**Table 5 Comparative assay values - mineral zoning at El Sid mine**

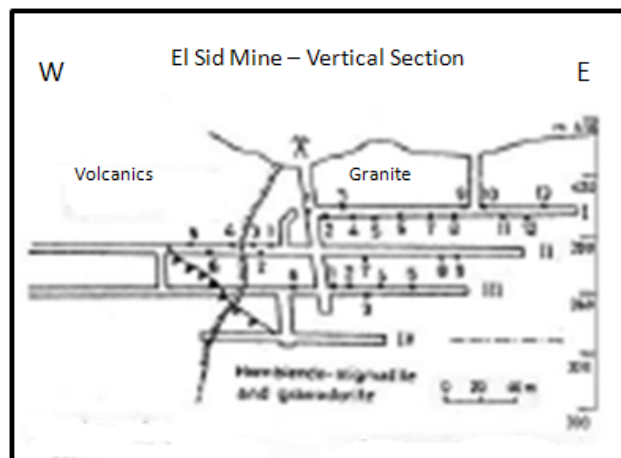
ELEMENT	Range of assay values in ppm (Harraz, 1995)			
	Background	Low	Medium	High
Au	< 3	3 - 6	6 – 9	> 9
Cu	< 100	100 - 200	200 – 300	> 300
Zn	< 200	200 - 300	300 – 400	> 400
As	< 150	150 - 300	300 – 450	> 450
Pb	< 50	50 - 100	100 – 150	> 150
Ag	< 1	1 - 2	2 – 4	> 4



Figure 19 Plan of the El Sid underground mine workings with sample locations



**Figure 20** Vertical E-W section through El Sid mine



A mineralogical study (El Bouseily et al, 1985) investigated the characteristics of pyrite, arsenopyrite, sphalerite and galena in hydrothermal quartz veins from the El Sid mine. These veins occur at the contact between granite and serpentinite and extend into the serpentinite through a thick zone of graphite schist. Gold occurs in the mineralized zone either as free gold in quartz gangue or dispersed in the sulphide minerals. Microscopic study revealed that Au-bearing sulphides were deposited in two successive stages with early pyrite and arsenopyrite followed by sphalerite and galena. Gold was deposited during both stages, largely intergrown with sphalerite and filling micro-fractures in pyrite and arsenopyrite. Spectrochemical analyses of separated pyrite, arsenopyrite, sphalerite and galena showed that these sulphides have similar average Au contents. Arsenopyrite and galena show relatively high concentrations of Au, Ag and Te, but the pyrite is relatively depleted in Ag and Te.

Pyrite, arsenopyrite, sphalerite, galena and chalcopyrite were the main sulphides encountered, while bornite and pyrrotite were minor constituents. These sulphides comprised 2% to 3% of the mineralized veins and commonly occurred as coarse- to medium-grained crystal aggregates, disseminated throughout the mineralized zone.

Pyrite was the most abundant sulphide phase. It usually occurred as discrete crystals, 2 to 5 mm across. Gold specks were occasionally seen filling fractures in pyrite. These fractures also facilitated replacement and/or corrosion of pyrite by sphalerite, arsenopyrite and galena.

Arsenopyrite was a close associate of pyrite. Gold occasionally filled micro-fractures in arsenopyrite and as interstitial fillings.

Sphalerite was the most abundant base-metal sulphide at El Sid, occurring as coarse- to medium-grained intergrowths with other sulphides, particularly galena. Both chalcopyrite blebs and gold blebs were observed in sphalerite. The gold inclusions in sphalerite were more common than gold inclusions in pyrite and arsenopyrite.

Galena was closely associated with sphalerite particularly at vein margins. Within quartz veins, fine streaks of galena were occasionally seen to occur associated with micro-crystalline quartz in a comb-like structure. The galena contained small inclusions of pyrite, arsenopyrite and sphalerite of erratic distribution, but relative to other sulphides, rarely contained gold inclusions.

Chalcopyrite occurred mainly in the form of inclusions in sphalerite. Individual chalcopyrite grains were rare and only observed intergrown with fine-grained varieties of arsenopyrite and galena.

Gold inclusions occurred in virtually all sulphides and in quartz.

The sulphides were probably deposited in two successive stages. The first stage gave rise to a coarse-grained mineral assemblage predominantly of pyrite and arsenopyrite which were disseminated throughout the mineralized zone. The second stage gave rise to fine-grained sphalerite, chalcopyrite and galena that generally fill micro-fractures in quartz and earlier formed sulphides.

### **6.5.3 SOUTH EL SID**

The ancient workings at South El Sid are located about 1 km south of the El Sid mine. Neubauer (1956) reported that the ancient dumps at South El Sid were derived from open-pit mining of a zone of closely spaced gold-bearing quartz stringers within a 300m long N-S trending zone of silicification along the contact of the granitic intrusion. Numerous pits revealed stringers of quartz and calcite in the bedrock, but the ancients did not work to depths greater than 25m. The ancient dumps amount to about 10,000 cubic metres and contain about 0.5 dwts (0.75 g/t) of gold on average. Neubauer referred to three holes drilled at the southern end of the main dump. Two inclined holes intersected cavities at shallow depths and a third vertical drillhole intersected nothing of value.

Detailed exploration was carried out by EGSMA/Technoexport teams in 1970-1971, who reported that detailed prospecting showed the ancient dumps are situated along the contact between meta-volcanics and grandiorite, where quartz and quartz-calcite veinlets up to 15 cm wide, extend about 100m from the contact. There was also a diorite-porphry dyke with traces of silicification and ferruginization exposed in the old stopes that had been selectively mined out. There were also shallow surface workings in iron-stained metavolcanics. 84 samples from the old workings yielded gold values up to 20.5 g/t in quartz and quartz-calcite veins, up to 3.4 g/t in the diorite porphyry dyke, and up to 0.34 g/t in the iron-stained zones.

Minex (1990) mapped and sampled the area of the old waste dumps and recorded a total of 93 ancient pits and trenches in and around the dumps. The ancient workings appeared to have exploited mineralisation associated with quartz-calcite stringers, altered volcanics and porphyry dykes. The veins were all thin and strike east-west. However, the area of old workings extends north-south, roughly following a zone of silicified, carbonated and ferruginous volcanics along the granite contact. Minex estimated the dumps contained about 50,000 tonnes of material that, if it is representative of the body of auriferous rock beneath the old mined area, could be indicative of a large, low-grade deposit. In order to test this potential, a short percussion drill programme was undertaken by Minex in October 1989. A total of 13 holes were drilled for a total of 377m. Individual holes ranged from 12m to 54m in depth at a 45° or 60° declination. Some of the holes had to be discontinued because they intersected cavities. Though the country rocks were well pyritised, the drill-hole samples all returned assay values of less than 0.2 g/t Au. Minex concluded that the ancients worked only the thin quartz stringers, leaving the barren wall-rock as waste.

## **7.0 GEOLOGICAL SETTING**

### **7.1 REGIONAL GEOLOGY OF THE EASTERN DESERT**

Between the Red Sea and the Nile River valley, Precambrian rocks outcrop as a long, narrow, strip of mountainous terrain about 100 to 200 km wide; and extend 800 km from the Sinai Peninsula in the north to the Sudan border in the south. The Precambrian geology is complex as the area has been subjected to intense dynamic and thermal metamorphism, accompanied by the intrusion of a variety of igneous bodies, over a long period of time.

**Table 6 Precambrian succession in the Eastern Desert of Egypt**

<b>STRATIGRAPHIC GROUP</b>	<b>LITHOLOGIES</b>	<b>AGE (Mya)</b>
Alkali granites	Alkali granites	-
Younger granites	Syenite granites	200-570
Hammamat Group	Sandstones and conglomerates	-
Dokhan Volcanics	Calc-alkaline volcanics	602-639
Eastern Desert Ophiolitic Melange	Basaltic volcanics, including pillow basalts Meta-gabbo-diorite complex Serpentinities	500-650
Meatiq Group	Geosynclinal Shadli Volcanic Group	700-770
Older Granites	Geosynclinal meta-sediments, Syntectonic granites, granodiorites and diorites Granite-gneisses and migmatites	- 700-987 900-1200

These Pre-cambrian rocks are overlain, both to the west and to the east, by Mesozoic and Tertiary sediments.

#### **The Granite-gneiss**

The oldest rocks, which have yielded age dates of 900 to 1200 Mya, are thought to be a basement granite-gneiss complex that outcrops in the Sinai Peninsula and west of the Nile River. These are thought to represent windows of the older Kibaran craton which underlies much of north and west Africa. These rocks consist of felsic to intermediate gneiss, migmatite and anatectic granitoids. These high-grade metamorphic rocks do not contain any significant gold or base-metal deposits.

#### **The "Older" Granites**

These syn- and post-orogenic grey granites and granodiorites occur throughout the Eastern Desert, but rarely contain any minerals of economic interest. Some alluvial tin deposits developed from the erosion of these granites have been investigated and the best areas appear to be at Nuweibi where an alluvial tin deposit was outlined; and Abu Dabbab where a tin-tantalum deposit was located.

#### **The Shadli Volcanics and meta-sediments**

These consist of a sequence of dacite, latite and rhyolite volcanics and volcano-clastics, usually altered to lower greenschist facies. They form a discontinuous line of narrow outcrops between Safaga and Bernice in the eastern part of the area. In the area around the Urn Samjuki copper deposit, they form several phases of basaltic to rhyolitic volcanism which have yielded age dates in the range of 710 to 770 Mya.

#### **The Ophiolite Sequence**

The granitic basement rocks are overlain by an assemblage of mafic and ultramafic hypabyssal and volcanic rocks which have yielded age dates in the range of 500 to 650 Mya. Some recent workers have interpreted these mafic rocks as a "melange" of oceanic crust (ophiolite) obducted onto the older continental "craton" which underlies the area to the west. The ophiolite sequence is thought to have been thrust from the east or northeast as a crude "nappe" structure, or as a series of imbricate wedges, onto an older craton, which would account for the tectonically dismembered nature of the outcrops.

The tilting and dismembering of the overthrust "nappe" has exposed a complete section through the oceanic (ophiolite) crust, from the deepest ultramafic mantle rocks, through the overlying gabbro-diorite hypabyssal rocks, to the near surface basalts and pillow lavas. Often, the basalt volcanics are overlain by marine sediments which may include late stage felsic volcanic and exhalative components such as banded-iron-formations (BIF's). The typical ophiolite succession may include, from top to bottom:-

- Marine sediments (oceanic layer 1) - siltstones, mudstones, calcarenites, limestones, marbles, cherts, iron and manganese "BIFs", felsic volcanics and volcano-clastics.

- Mafic volcanics (oceanic layer 2) - pillow-basalts, andesites, volcano-clastics and dolerite dykes.
- Mafic Hypabyssal rocks - diorites, diabase, gabbros.
- Ultra-mafic Hypabyssal rocks - hartzbergites, peridotites, dunites and serpentinites.

In the Eastern Desert, the most complete sequence of ophiolite rocks occurs along the Qift to Quseir road, where there are strongly sheared, serpentinitised dunites, peridotites and gabbros. These are overlain by a thick sequence of mafic lavas and soda-rich pillow-basalts with some minor mafic to intermediate intrusives and volcano-clastics of the Muweilih Formation (layer 2). These are, in turn, overlain by calcareous pelitic and psammitic schists with minor bands of marble and graphitic chert of the Khors Schist (layer 1). This exposure is reflected in the wide range of minerals found in this area; from the chromite-ilmenite-magnetite of the hypabyssal rocks, through the nickel-copper-cobalt-gold of the mafic layers, to the iron-copper-lead-zinc-manganese of the uppermost felsic volcanics. Gold is the most widespread mineral and occurs as gold-quartz vein-type deposits in all rock types throughout the stratigraphic sequence.

### **The Hypabyssal Rocks**

These outcrop in a broad arc from near Port Safaga to just south of Marsa Alam; and in a second arc from near Ras Banas to Halaib. These hypabyssal rocks are generally ultra-mafic to mafic dunite and peridotite, diorites, mafic volcanic and volcano-clastic rocks, which are often altered to serpentinites, talc, chlorite and biotite schists of lower greenschist facies. In the El Geneina area, east of Aswan, these rocks include peridotites, pyroxenites, olivine gabbros and meta-gabbros which are flanked by diorites, epidiorites and amphibolites (meta-basalts) and with spillitic pillow-lavas and jaspers just to the north. At Zagrat, just south of El Geneina, serpentinite breccias are thrust over pillow-lavas and the underlying composite dyke zone.

### **The Mafic Volcanics (Dokhan Volcanics)**

These consist of a thick sequence of pillow-basalts, andesite flows and volcano-clastics, usually altered to lower greenschist facies. They outcrop as two broad arcs extending from Safaga to Marsa Alam and from Marsa Alam to the Sudan border in the south.

### **The Oceanic Sediments**

These overlay the volcanics. They have been described as "flysch"-type geosynclinal sediments and include deep-water turbidites of mudstones and greywacke. They also include thin units of calc-pelites, marbles, graphitic shales, banded ironstones and jaspers. At Abu Swayel, these sediments include pelagic limestones and argillites (layer 1) overlying contorted cherts and basic pillow lavas (layer 2). These are often overlain by arenaceous "molasse" type meta-sediments of the Hammamat Group, including siltstones, greywackes, arenites and conglomerates.

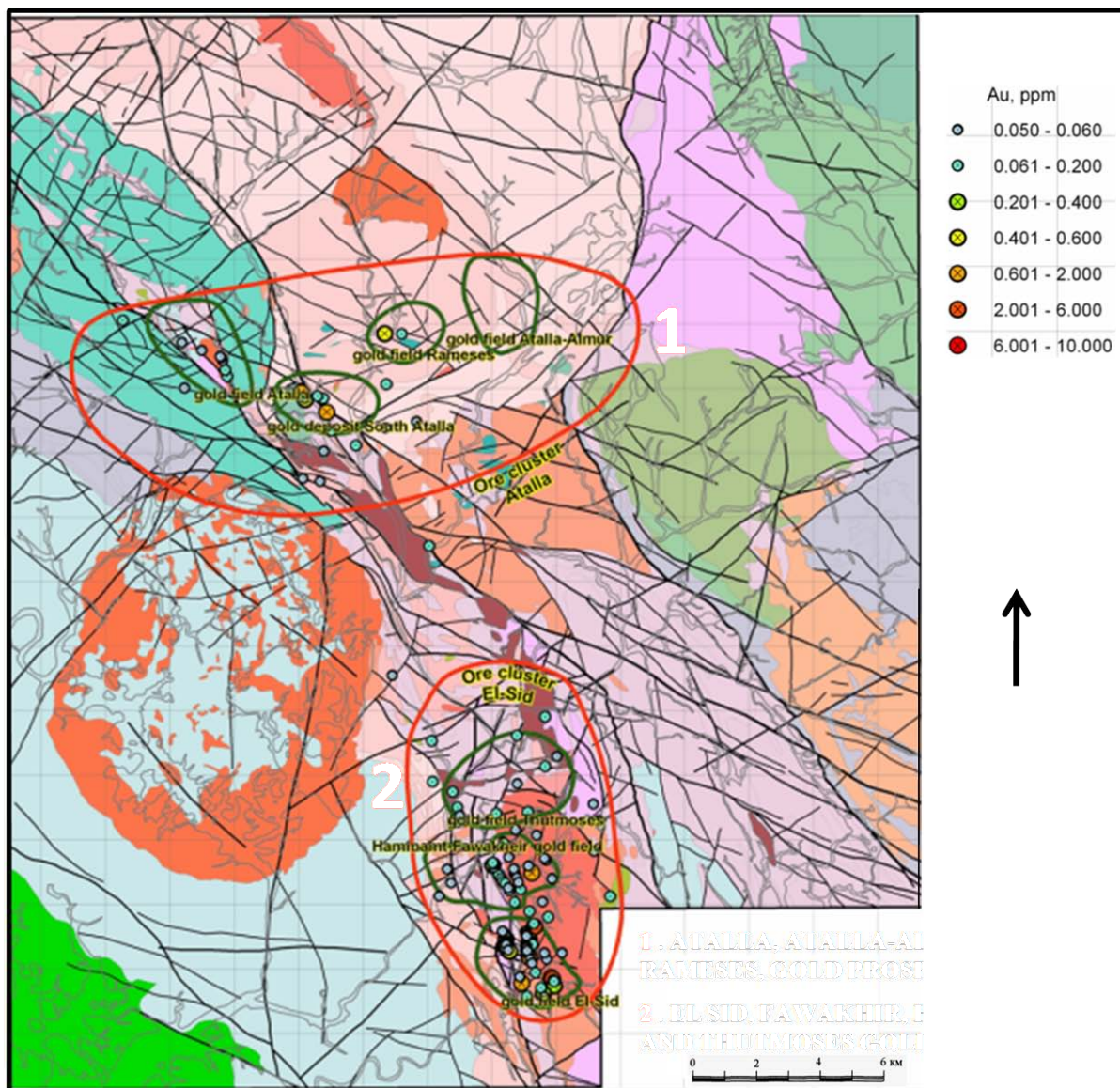
### **The Mesozoic and Tertiary "Cover" Rocks**

Palaeozoic sediments are absent in the Eastern Desert and the Precambrian rocks are overlain unconformably by Cretaceous Nubian Sandstone. Along the Nile River in the Aswan area, the Nubian Sandstone is up to 120m thick and contains sub-economic "oolitic" iron deposits and the Duwi phosphate deposits. Along the Red Sea coast, the Precambrian rocks are overlain by a sequence of Tertiary marine and lacustrine sediments comprising limestones, chalk, shales, sandstones and conglomerates. These rocks contain the lead-zinc deposits at Um Gheig, Zug El Bogar, Anz and Gebel Rusas and manganese deposits in the Eiba area; as well as a wide range of non-metallic minerals.

## 8.0 DEPOSIT TYPES

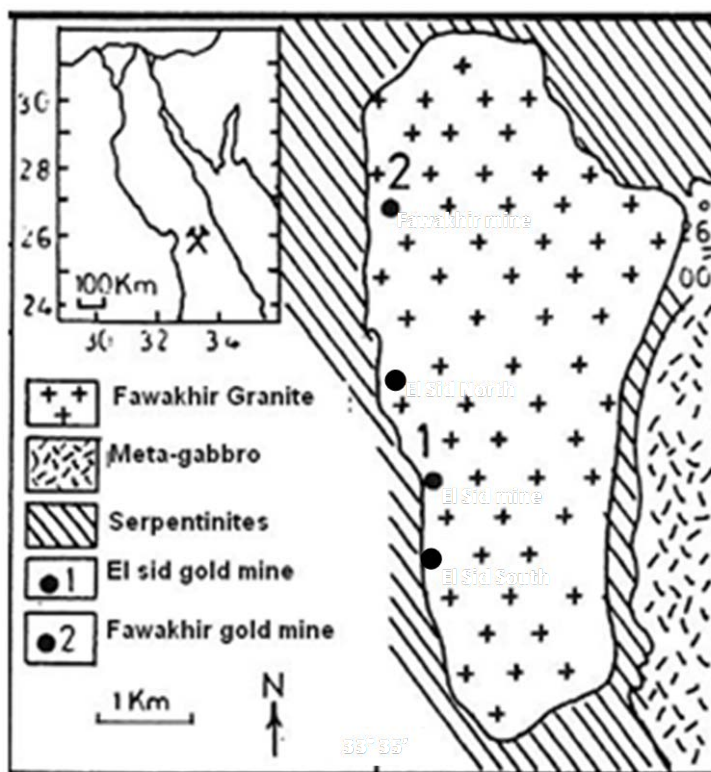
All the known gold mineralisation in the Fawakhir Concession area consists of typical gold in quartz vein type deposits. These may occur as single veins or as complex vein stockworks.

**Figure 21** Geology and gold deposits in Fawakhir Concession area



The mineralisation at Fawakhir and El Sid (and at Atallah) is hosted in a felsic intrusive known as the “Fawakhir Granite Porphyry” with minor associated rhyolite and dacite phases, which is about 5 km in length and from 200 to 1000 metres wide, with a north-easterly trend parallel to the regional structural grain. The close relationship between the gold-quartz vein mineralisation and the contact zone between the granite and the mafic volcanic host rocks, is similar to that which occurs at the Sukari gold mine about 100 km to the south and also at the old Atallah gold mine about 15 km to the north.

**Figure 22 Relationship between the gold occurrences and the granite host**



More detailed descriptions of individual deposits are included in Section 6 above.

## 9.0 MINERALISATION

The gold mineralisation at Fawakhir, El Sid and Atallah is hosted within sheeted quartz-vein systems within extensive, low-angle, E-W trending shear zones in the host granitic and volcanic rocks as described in Section 10.1 below. Gold mineralization is commonly associated with fine-grained pyrite and other sulphide minerals; with pyrite being the most abundant sulphide, followed by arsenopyrite. The sulphides occur disseminated in quartz veins and in the altered host-rock between the veins. The gold mineralisation is similar to that which occurs at the Sukari gold mine about 100 km to the south and also at the Atallah gold mine about 15 km to the north.

**Figure 23**      **Gold-bearing quartz vein (1.1m thick) in El Sid mine**



#### **10.0 EXPLORATION BY SMWG (2008 – 2010)**

During the period 2008 to 2009, SMWG carried out systematic mapping and sampling of the geological structure of the Fawakhir Concession area. This was based on satellite image interpretation (Landsat, Alos, Google) and creation of geological maps at 1:50,000 scale.

The results of this work were recorded in four reports, entitled:-

- Summary information report on the results of work on the Fawakhir licensed area during the first six months of 2008 year;
- Summary information report on the results of work on the Fawakhir licensed area during May-December of 2008 year.
- Annual information report on the work on Fawakhir licensed area during January 2008 – May 2009 year.
- Information report on works carried out at El Sid ore field of Fawakhir licensed area in 2008 -2009.



**Table 7 Summary of work on Fawakhir Concession Area (in 2008-10)**

ACTIVITY	Units	Number	Cost US\$
Compiling geological knowledge of the Concession area	Km2	950	46K
Geological interpretation of Satellite imagery	Km2	950	
Digitizing of the geological maps of El Sid, Fawakhir and Atallah deposits	Km2	950	
Assessing results and preparation of Reports	-	-	180K
Geochemical sampling profiles (at 500m x 100m and 500m x 50m grid spacings)	Line km	625	162K
Geochemical sampling (0.2 kg)	Samples	10928	
Geological mapping and prospecting mineralised areas	Km2	50	259K
Trenching (for mapping and channel sampling)	Line km	3.35	119K
Channel sampling (12 to 17 kg)	Samples	1990	238K
Rock Chip sampling (2 kg)	Samples	1079	
Heavy-mineral samples (20 litres)	Samples	266	
Grab sampling (15-18 kg)	Samples	480	
Mineralogical analysis	Samples	931	
Sampling for thin and polished sections	Samples	236	37K
<b>Sample Analysis</b>			
– fire assay (Au)	Samples	3170	225K
– atomic absorption (Cu, Mo)	Samples	193	
- Spectral analysis (35 elements) and gold	samples	720	
<b>TOTAL</b>	-	-	1,266 K

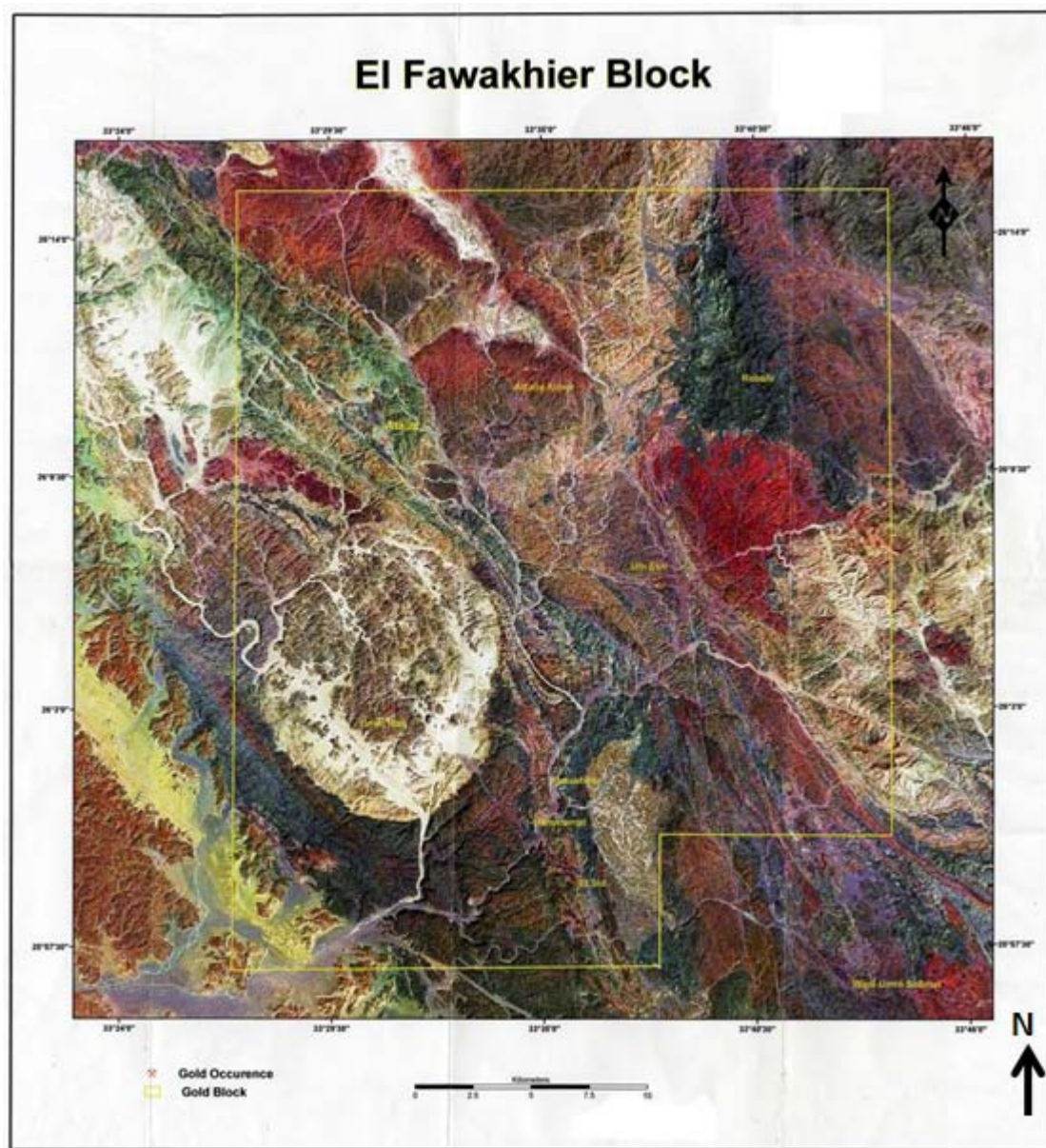
The geology of the host rocks and the mineralised vein structures has been described in detail for each of the main mineralised areas at Atallah, Fawakhir, El Sid and South El Sid in the exploration history section above. One of the principal outcomes of the SMWG work has been the production of more accurate and detailed geological maps than previously available. Relevant extracts of these are shown in the figures below.

### 10.1 LOCAL GEOLOGY OF THE FAWAKHIR CONCESSION AREA

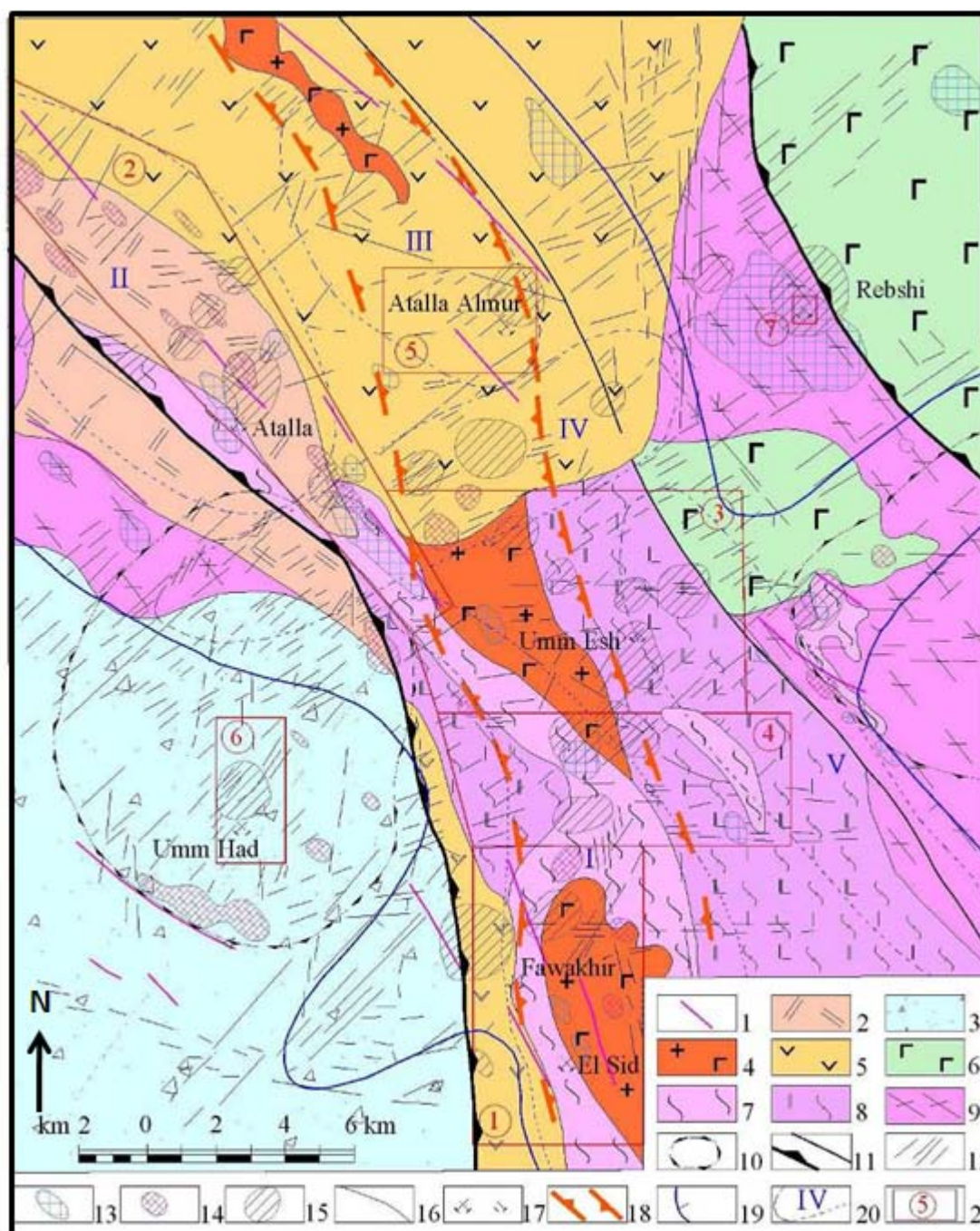
The results of the systematic geological mapping and geochemical sampling programme, has resulted in new insights into the extent and distribution of the ancient gold mining activities and into the geological controls of the gold mineralisation. The key result was the recognition that most of the ancient gold mining activity was confined to a narrow NNW – SSE trending “corridor” about 30 km long and about 3 km wide (shown on figure 25 below). This gold bearing “corridor” coincides with a series of lenticular granite intrusions that are similar to that which hosts the Sukari gold deposit about 100km to the south. Mapping indicated that the ancient gold mining activity in the Fawakhir Concession area is related to E-W trending quartz veins intruded into tension fractures along the western margin of these granite intrusions.

The Fawakhir and El Sid mines, as well as other known auriferous zones, consist of quartz vein stockworks, located on or close to the western margin of a biotite-granite intrusion that forms a N-S trending elongated mass, about 7 km in length and from 2 to 3 km wide. The wall-rocks include a faulted and locally foliated melange of mafic volcanics, metagabbro and serpentinite (Marten, 1986). The Atallah mine further north occurs on the western margin of a similar granite intrusion about 5km long and 3 km wide.

**Figure 24** Landsat imagery of Fawakhir Concession area  
processed to enhance geological structure (SMWG, 2009)



**Figure 25** Simplified Geology and Prospective areas for gold mineralisation (shown in orange) (SMWG, 2010)



**LEGEND for figure 25**

1- dikes and small bodies of granite (determined on geophysics data); 2- Early Palaeozoic superimposed fault troughs filled up by felsites of Atallah formation; 3- Late Proterozoic – Vendian post orogenic superposed fault troughs filled up by coarse deposits of Hammamat formation; 4- Late Proterozoic - early orogenic structures: 4- zones of hybrid gabbro-diorite-monzonite-granodiorite complexes, interaction products between oceanic and continental magmas with associated emplacement of gold deposits; 5- superimposed troughs confined to rift structures and filled up by calc-alkaline intermediate and felsic volcanics containing gold and banded-iron-silica formations (BIF's); 6- early orogenic gabbro-troctolite-pyroxenite massifs within ophiolitic belts; 7-

serpentinite mélangé zones prospective for gold deposits of various types; 8– Late Proterozoic ophiolitic belt with gold mineralisation in ultrabasic rocks; 9– mafic complex rocks; 10– dome structures; 11– faults main (to the left) and minor (to the right); 12– small lineaments, fissures; 13-14– anomalous areas of geophysical fields: 13– total magnetic zones potentially related to small intrusive bodies and intrusive magnetite and pyrrhotite aureoles (requires field verification); 14– radiometric total count anomalies potentially related to alkaline metasomatic alteration zones (needs field verification); 15– lineaments from satellite imagery prospective for gold mineralisation (needs field verification); 16– geological boundaries; 17– gold occurrences (to the left) and mineralization points (to the right); 18– favourable zone for gold deposits related to BIF and serpentinite mélangé rocks intruded by monzonite intrusives; 19– Fawakhir gold mining area limits; 20– gold zone limits; Roman numerals are indicated gold zones: I – El Sid, II – Atallah, III – Atallah Almur, IV – El Kubbania, V – Umm Esh; 21–gold prospecting and geochemical sampling site mapped at 1:5000 and 1:2000 scale; Arabic numerals are indicated sites: 1- Fawakhir, 2- Atallah, 3- Umm Esh, 4- Fawakhir North, 5- Almur, 6- Umm Had, 7- Rebshi; the rectangle is the zone of detailed gold prospecting and selective geochemical sampling.

The exploration work carried out by SMWG in each of the main areas of interest in the Fawakhir concession area is summarised in the following sections.

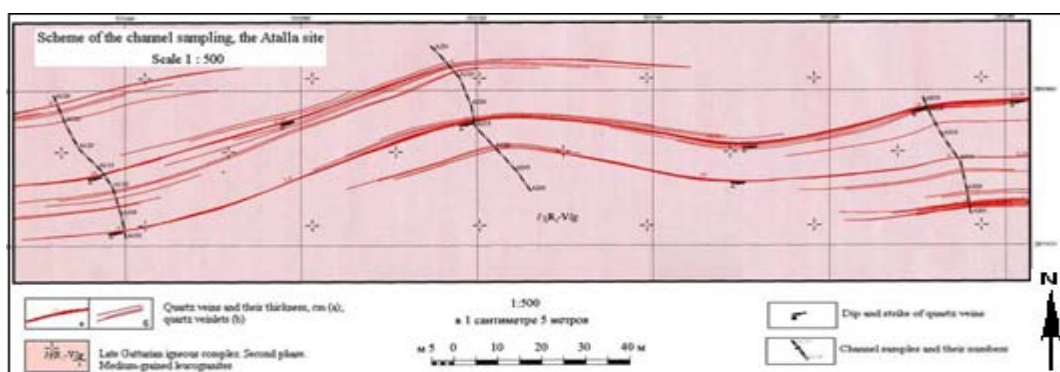
## 10.2 ATALLAH MINE AREA

The area around the old Atallah mine was geologically mapped and the mineralisation was found to consist of a series of narrow (<1m) en-echelon quartz veins intruded into a 5 – 10m wide shear zone.

The main gold bearing vein structure was trenched along three profiles about 80m apart and the bottom of the trench was cleaned and channel sampled with samples over continuous 1.5m intervals. In total 82 samples were collected.

Trench №	Length of Trench (m)	Sample Length (m)	No. Channel samples
A-1	41	1.5	29
A-2	43.8	1.5	29
A-3	32.2	1.5	23

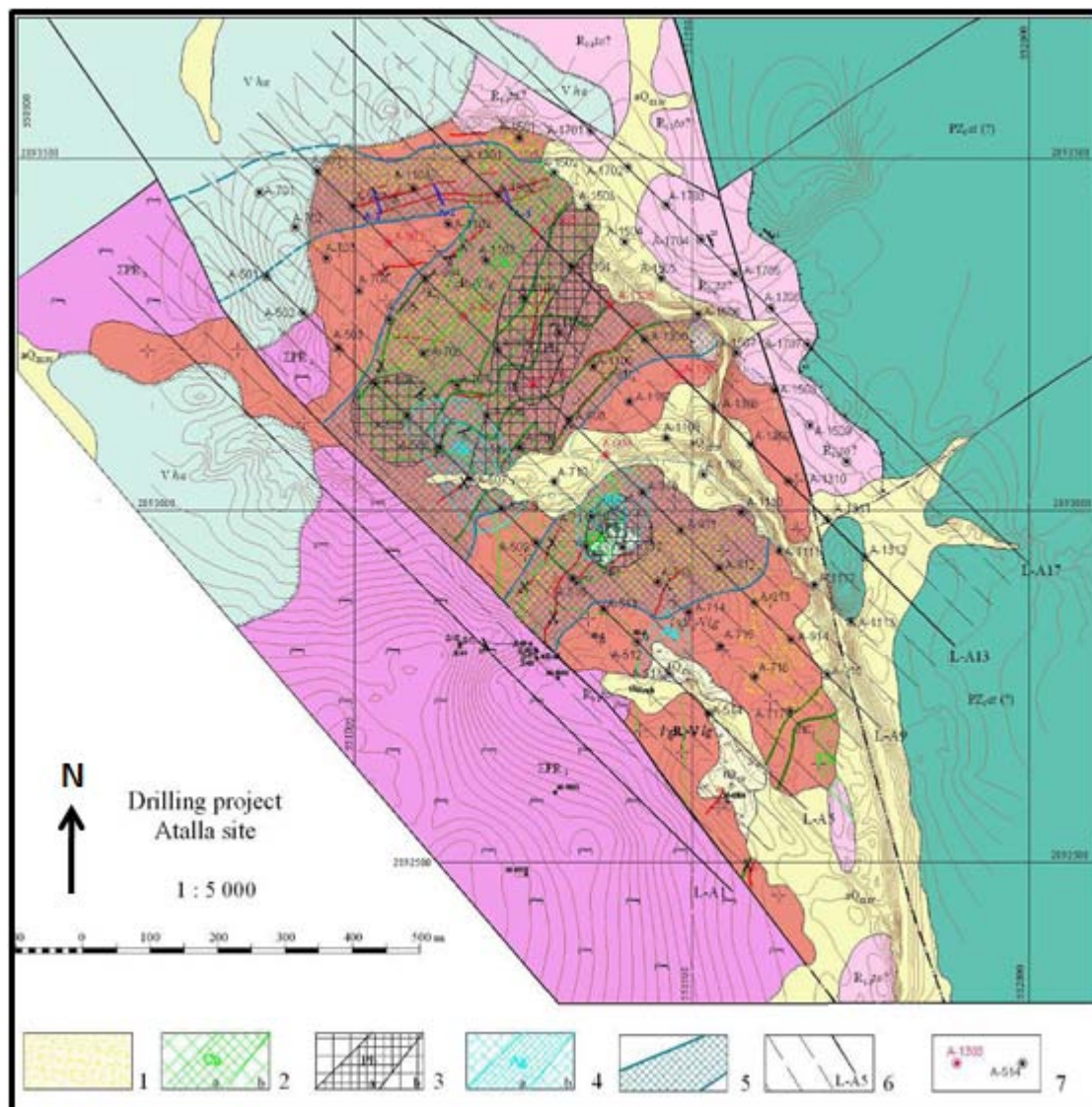
**Figure 26 Geological and sampling plan of Atallah mine area**



The results of the three lines of channel sampling were disappointing, with most of the assay values being less than 0.1 g/t Au, as follows:

Trench A1	1.5m @ 2.1 g/t Au, all others less than 0.16 g/t Au
Trench A2	all values less than 0.1 g/t Au
Trench A3	all values less than 0.1 g/t Au

**Figure 27 Atallah Geology and Mineralisation**



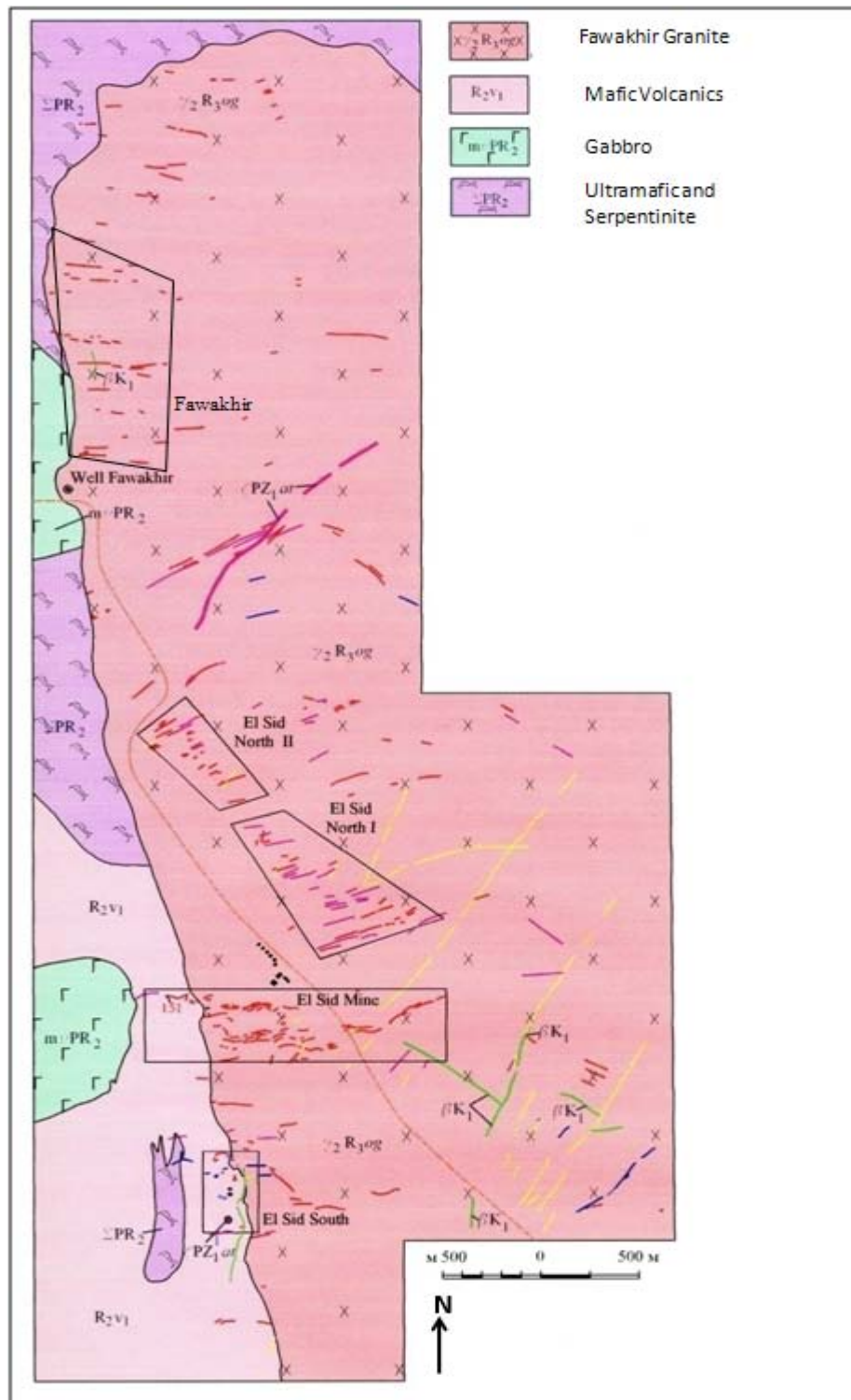
**LEGEND** 1 - argillization zones (based on SMW geological observations, 2-4 - trace metal content in bedrock samples from Atallah granite body (Bouseliy et al., 1992): 2 - (a) copper more than 180 ppm and (b) 120-180 ppm; 3 - (a) lead more than 240 ppm and (b) 180-240 ppm; 4 – (a) silver more than 3 ppm and (b) 2-3 ppm; 5 - mineralised zone; 6 - prospecting lines; 7 - proposed bore holes 1st stage (red) and 2nd stage (black).

### 10.3 FAWAKHIR – EL SID AREA

The Fawakhir / El Sid goldfield includes two old mines at El Sid and Fawakhir, numerous ancient gold workings at South El Sid, El Sid North I and II, and Fawakhir II and III, as well as several other prospective areas. The goldfield extends over a 14 km<sup>2</sup> triangular area (about 8.5 km N-S and 1 - 3 km E-W), along the western contact of a granitic intrusion. More than 300 gold-bearing quartz veins zones have been mapped within this area. Most of them are less than 200m in length and their thickness rarely exceeds 0.15 – 0.5 m. The largest individual vein is 1100m long and up to 1.5 m wide. All the known gold-bearing veins have been mined in ancient times.

At El Sid, 390 ancient excavations (220 trenches and 170 shafts) have been mapped with a total length of about 4 km. At El Sid South 330 ancient excavations were found (140 trenches and 190 funnel-shaped) with total length of about 5 km. The cumulative extent of all of the ancient excavations, including Fawakhir, Fawakhir II and III and North El Sid I and II, is about 14 linear km. These excavations rarely exceed depths of 10-15 m.

**Figure 28** Simplified Geological map of Fawakhir and El Sid mineralised areas

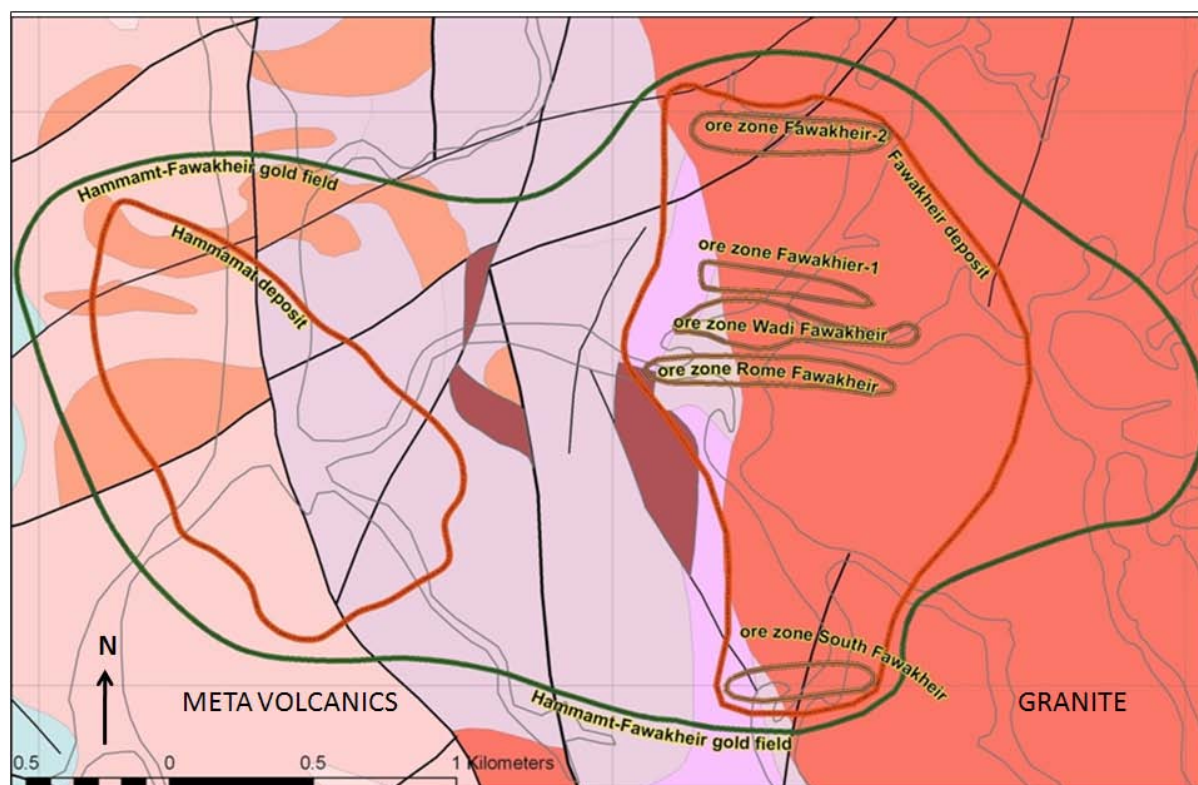


#### 10.4 FAWAKHIR MINE AREA

The Fawakhir mine exploited a zone of quartz veins located along the contact zone of a granodiorite intruded into serpentinised ultra-mafic rocks and diorites of the Dokhan Volcanic Series. The E-W trending veins and small stockwork zones were traced over a strike length of 350-500m, with a surface outcrop width of 15 to 40m. Individual veins dip 40°-65° SE and are up to 1.5m wide and 540m long.

Observation of the mineralised zone in surface outcrops indicated that individual quartz veins were mostly less than 2 cm wide, but the vein density varied from less than 1 vein per metre up to 6 veins per metre. The larger veins generally dip to the south at angles of 40° to 70°.

**Figure 29 Simplified geology of the Fawakhir gold deposits**



Channel sampling of the main (southern) mineralised zone (Zone 1) at Fawakhir, together with sampling in the three underground adits, showed that the individual high-grade quartz veins were dispersed within a much wider (20 to 40m) zone of shearing and hydrothermal alteration which carried low-grade (1 g/t Au) gold values.

At Surface, the Fawakhir -1 deposit was channel sampled along 4 lines. Based on results of this sampling, using 0.3 g/t cut-off grade, two parallel mineralised zones were determined, joining into a single 43m wide zone in the central part. The average gold grade weighted by the width is 1.2 g/t.

The walls of the accessible adits (underground excavation), intersecting the southern mineralised structure close to the wadi at depths of 15 to 30 m, was partially channel sampled along one wall of the adit. In total, 80 channel samples were taken. In the longest adit (No.1) two mineralised sections were determined, 1.1m and 3.6m wide, with average weighed gold grade of 15.87 g/t and 6.2 g/t, respectively. In Adit No.3, located higher up the slope, one mineralised interval was 0.8m wide at

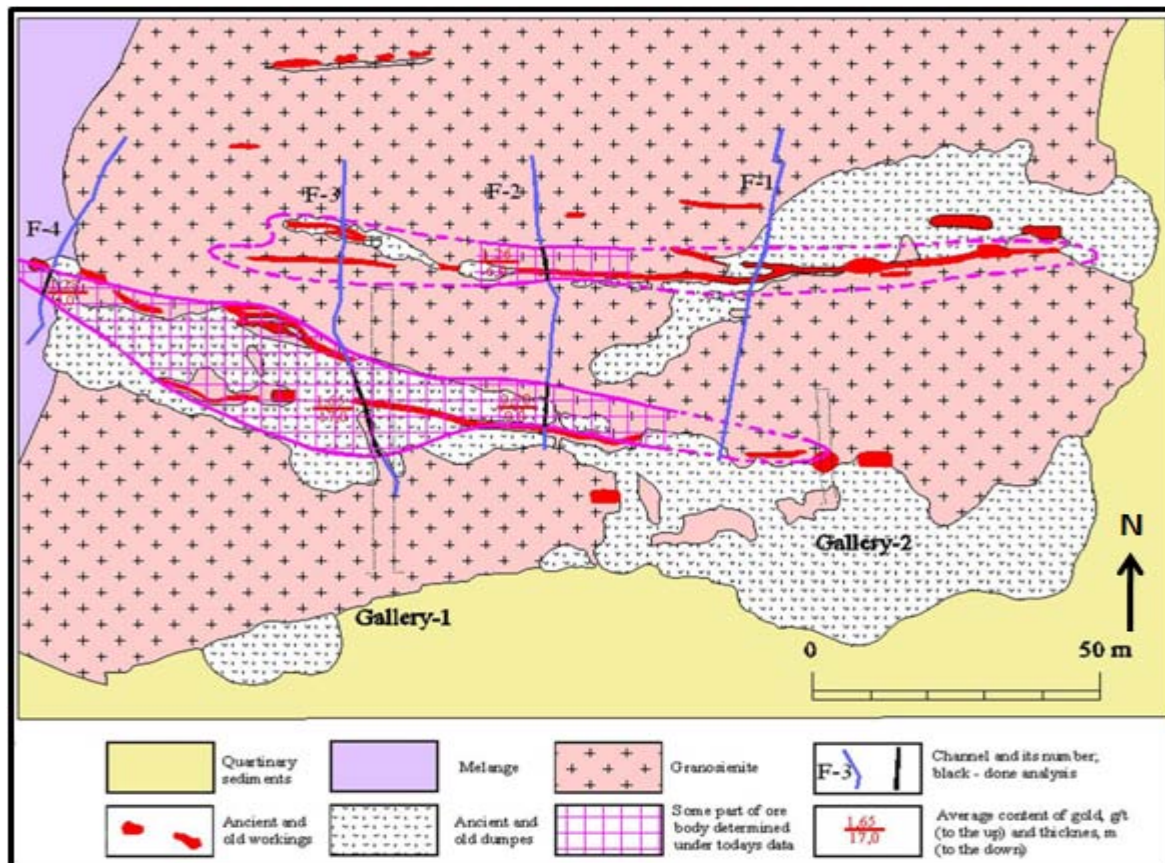
1.76 g/t Au. In Adit No.2 about 100m further east, two mineralised intervals of 2.02m and 1.0 m wide at 1.75 g/t Au were determined.

The sampling results from Zone 1, shown in the table below, indicate that the whole sheared/altered zone is about 21m wide at surface and averages about 1.53 g/t Au.

**Table 8 The results of fire assay analysis – Fawakhir Zone 1 channel samples**

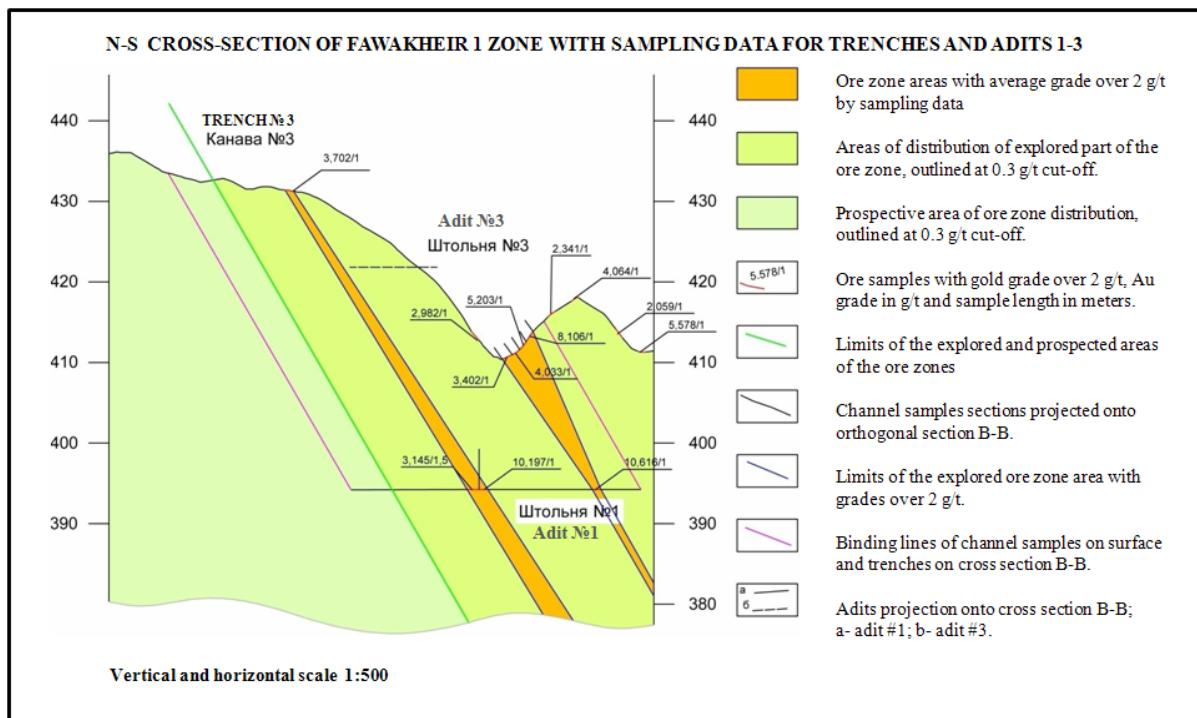
##	Sample number	Au (ppm)	##	Sample number	Au (ppm)	##	Sample number	Au (ppm)
1	Ø 3507	1.442	13	Ø 3371	1.305	25	Ø 3449	0.456
2	Ø 3508	0.342	14	Ø 3372	2.982	26	Ø 3474	1.248
3	Ø 3509	1.043	15	Ø 3373	1.391	27	Ø 3475	0.416
4	Ø 3511	1.919	16	Ø 3374	1.702	28	Ø 3476	0.149
5	Ø 3512	1.650	17	Ø 3441	1.158	29	Ø 3477	0.694
6	Ø 3358	0.479	18	Ø 3442	0.955	30	Ø 3478	0.323
7	Ø 3360	0.486	19	Ø 3443	0.390	31	Ø 3479	4.724
8	Ø 3361	1.077	20	Ø 3444	1.999	32	Ø 3480	0.163
9	Ø 3362	2.341	21	Ø 3445	0.135	33	Ø 3481	0.092
10	Ø 3364	1.134	22	Ø 3446	0.307	34	Ø 3482	0.110
11	Ø 3367	4.033	23	Ø 3447	1.980	35	Ø 3483	0.106
12	Ø 3370	1.258	24	Ø 3448	0.727	36	Ø 3484	0.547

**Figure 30 Surface extent of Fawakhir – Zone 1 mineralisation**

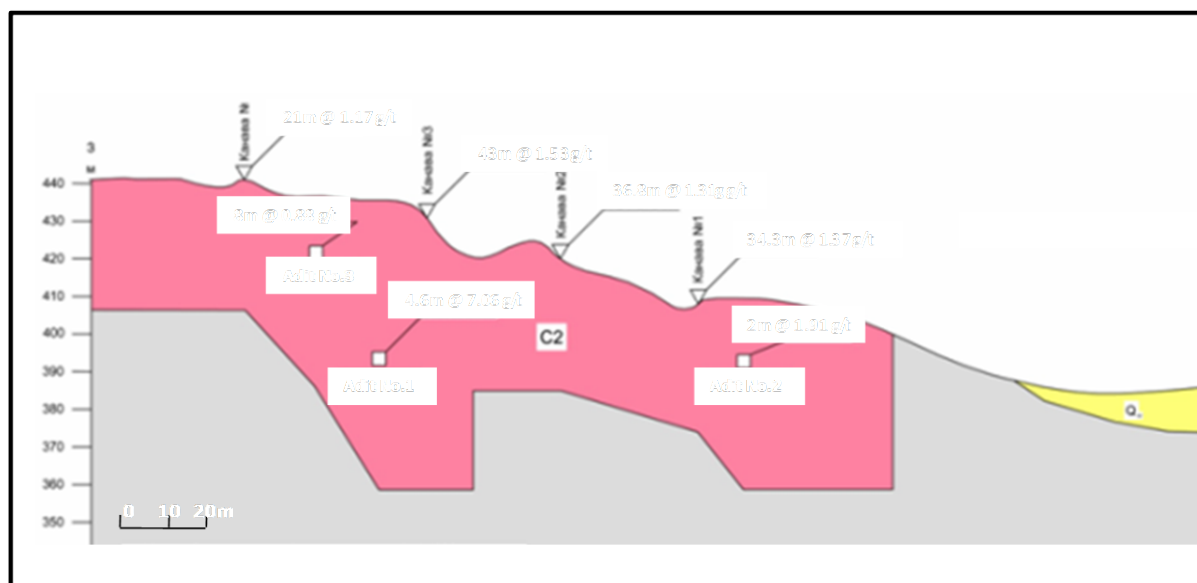




**Figure 31 N-S cross-section through Fawakhir Zone 1 mineralisation**



**Figure 32 Fawakhir-Zone 1 Exploration Target based on adit and trench samples**



A summary of the sampling results from Zone 1 is shown in the long section above and table below, which indicates that the sampled section of the mineralised zone projected to depths of about 40-50m below surface, is about 200m in strike length, is about 21m wide and averages about 1.53 g/t Au.

**Table 9 Fawakhir Zone 1 Exploration Target (assuming SG = 2.7 t/m3)**

Sampled Location	Mineralised width (m)	Average grade g/t Au	Average width (m)	Average grade g/t Au	Long section area m <sup>2</sup>	Volume m <sup>3</sup>	Tonnage Mt
Trench No.1	34.3	1.37	21.38	1.53	9528	203708	0.55 Mt
Trench No.2	36.8	1.31					
Trench No.3	43.0	1.53					
Trench No.4	21.0	1.17					
Adit No.1	4.6	7.06					
Adit No.2	2.0	1.91					
Adit No.3	8.0	0.88					

### Fawakhir Zone 2

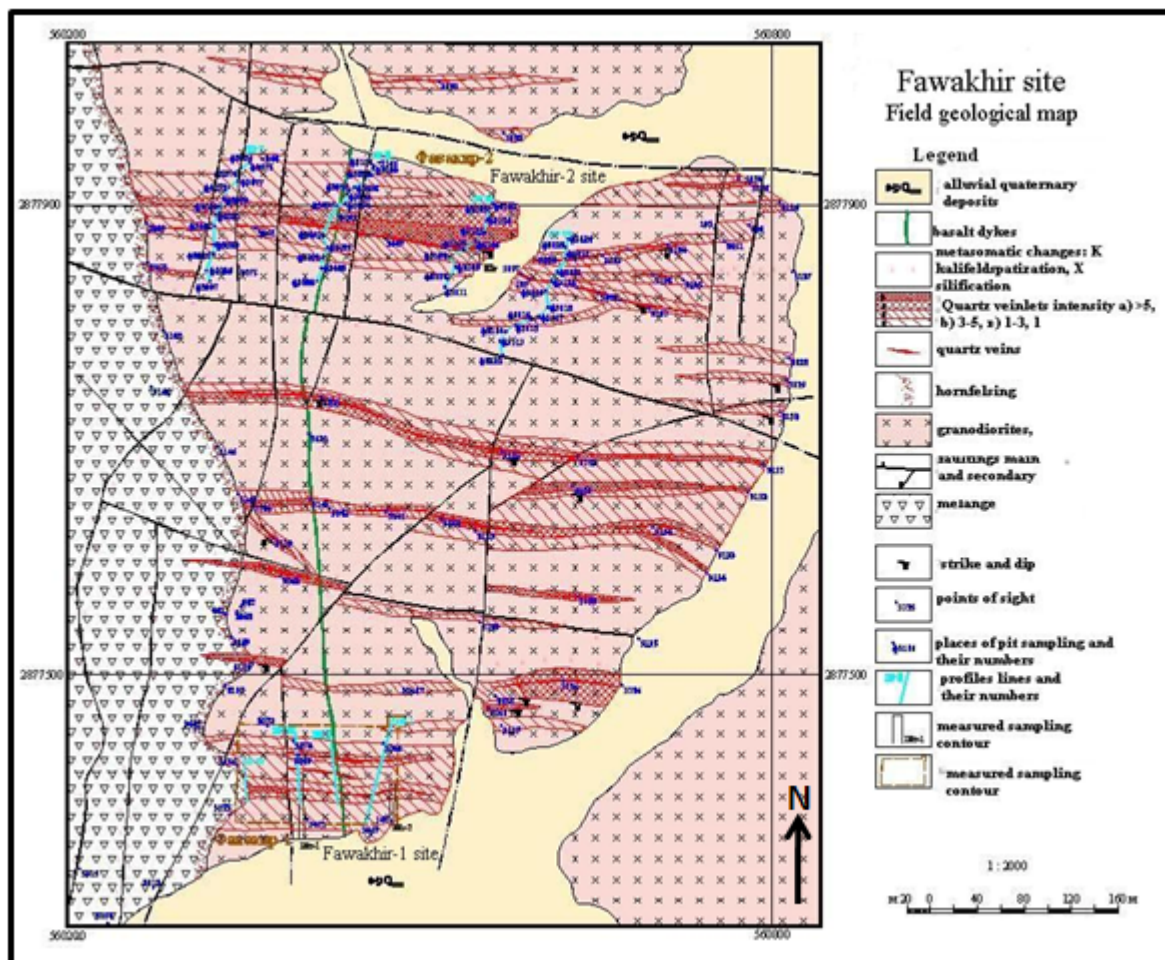
The Fawakhir Zone 2 mineralisation is located parallel to and about 100m north of Zone 1 and it is similar in both size and gold content to that at Zone 1.

In the northern sector (Zone 2) at Fawakhir there are 4 veins extending for 200-300m along strike with an average thickness of 0.2 to 0.3m. The gold is associated with the sulphide minerals, pyrite and chalcopyrite, in a quartz-calcite gangue. In the northern sector the gold content in 51 samples averaged 1 g/t and in 3 samples ranged from 2.06 to 13.38 g/t. As there is no sub-surface geological or sample data for Zone 2, no resource estimate can be made for Zone 2.

**Table 10 Summary of channel sampling at Fawakhir – Zone 2 (Source: SMWG, 2009)**

Trench Channel sampled	Mineralised width (m)	Average assay value g/t Au	Product (m) x (g/t Au)
F-2	9.0	0.90	8.1
F-3	17.0	1.65	28.0
F-4	5.0	1.28	6.4
Total	31.0	-	42.55
<b>Average</b>	<b>10.33</b>	<b>1.37</b>	<b>-</b>

Figure 33 Geological map of Fawakhir Zone 1 and 2 areas



These substantial zones of low-grade mineralisation indicate that Fawakhir has potential for the possible discovery of a low-grade, open-pit gold deposit.

### 10.5 EL SID MINE AREA (SMWG, 2009)

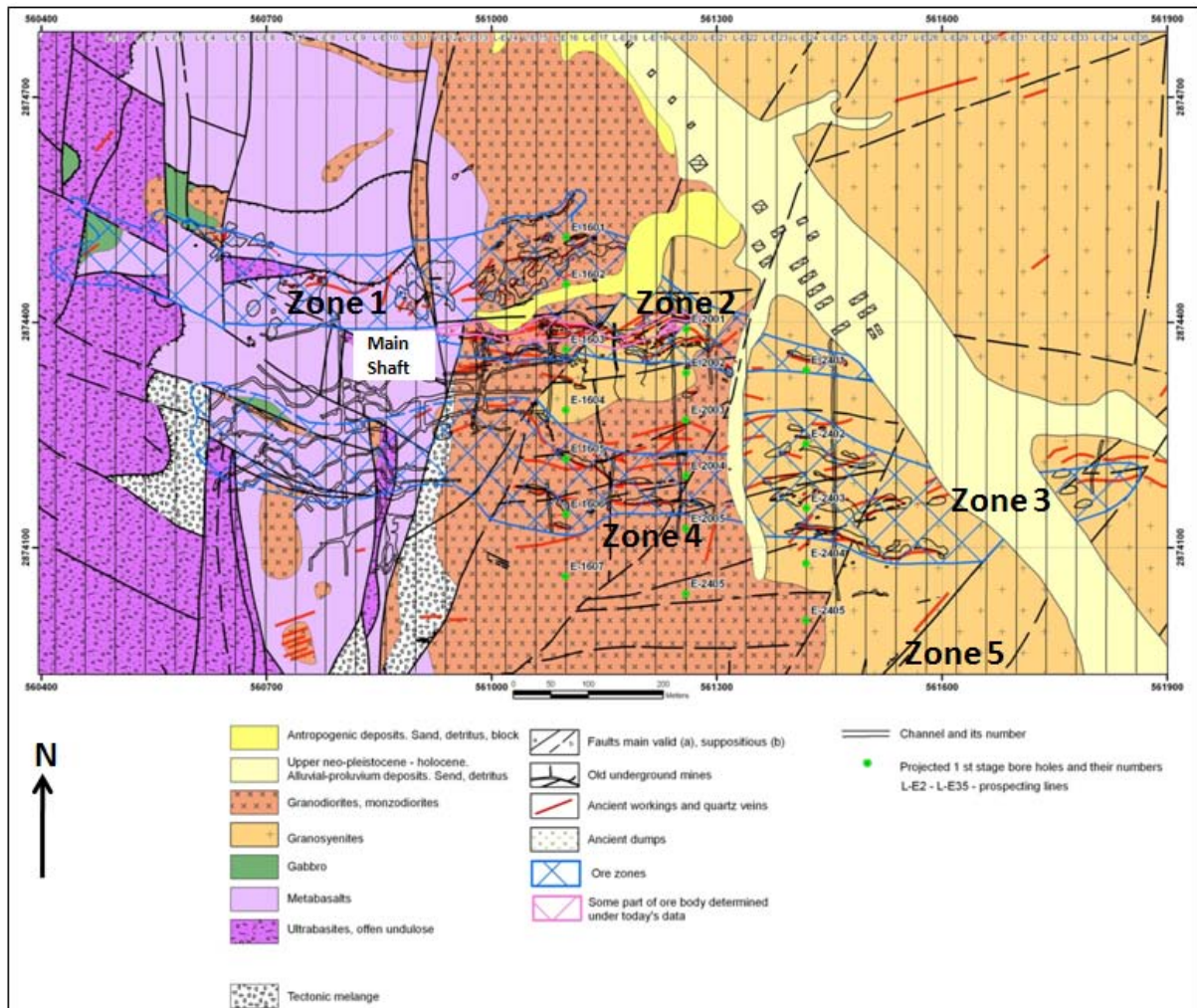
Geological mapping and trench sampling of the El Sid mine area confirmed that mineralisation occurs over an extensive E-W trending zone of sheared and altered rock that extends across the contact between the granite and the mafic volcanic host rocks. At the surface, the mineralisation may be considered to form two parallel zones which are each about 50m wide and up to 900m in length. The two zones are separated by a less intensely mineralised block of ground about 100m in width. Other veins on the eastern side of the main wadi that were worked at the surface in ancient times are also of interest.

Spectrographic analysis of trench samples (E101-112 and E201-215) from the outcrop of the El Sid main vein about 100m to 200m northwest of the main shaft showed a 2m to 5m wide zone of alteration on either side of the mined-out quartz vein. The spectrographic analytical values showed that this alteration zone was enriched in Au, Ag, Al, Ba, Ga, K, La, Na, Sr and Ti, and that it was depleted in Ca, Cr, Mg, Ni and Sb. Surprisingly, the Cu, Pb and Zn values were not noticeably anomalous.

The detailed geological mapping and sampling indicates that the mineralised zones are cut by several NNE-SSW trending post-mineral faults that in places coincide with the deeply incised valleys. These

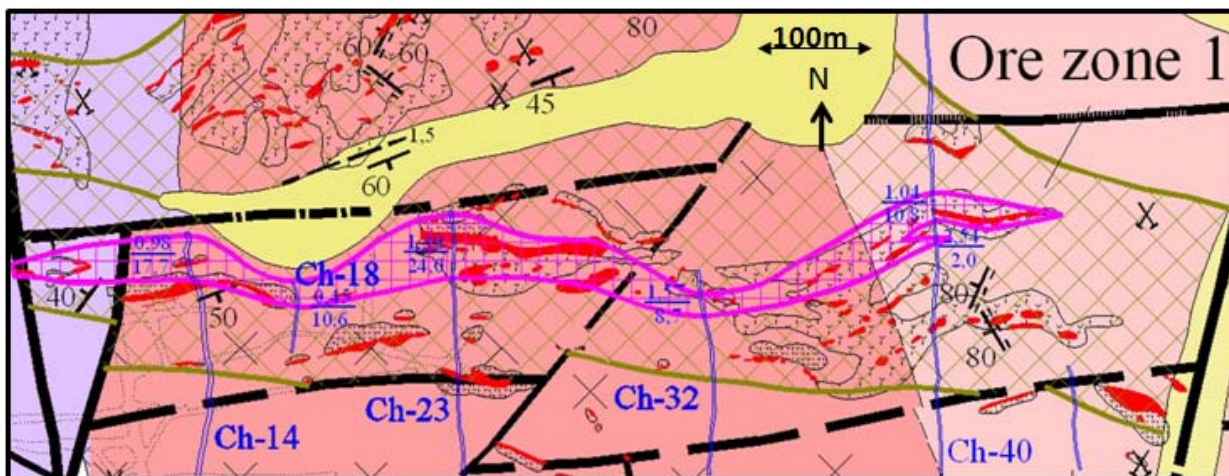
faults appear to disrupt the mineralised zones with the west side being displaced northwards and the east side being displaced southwards. The total displacement seems to be about 150m (see figure 34 below).

**Figure 34 El Sid mine area showing geology and mineralisation**



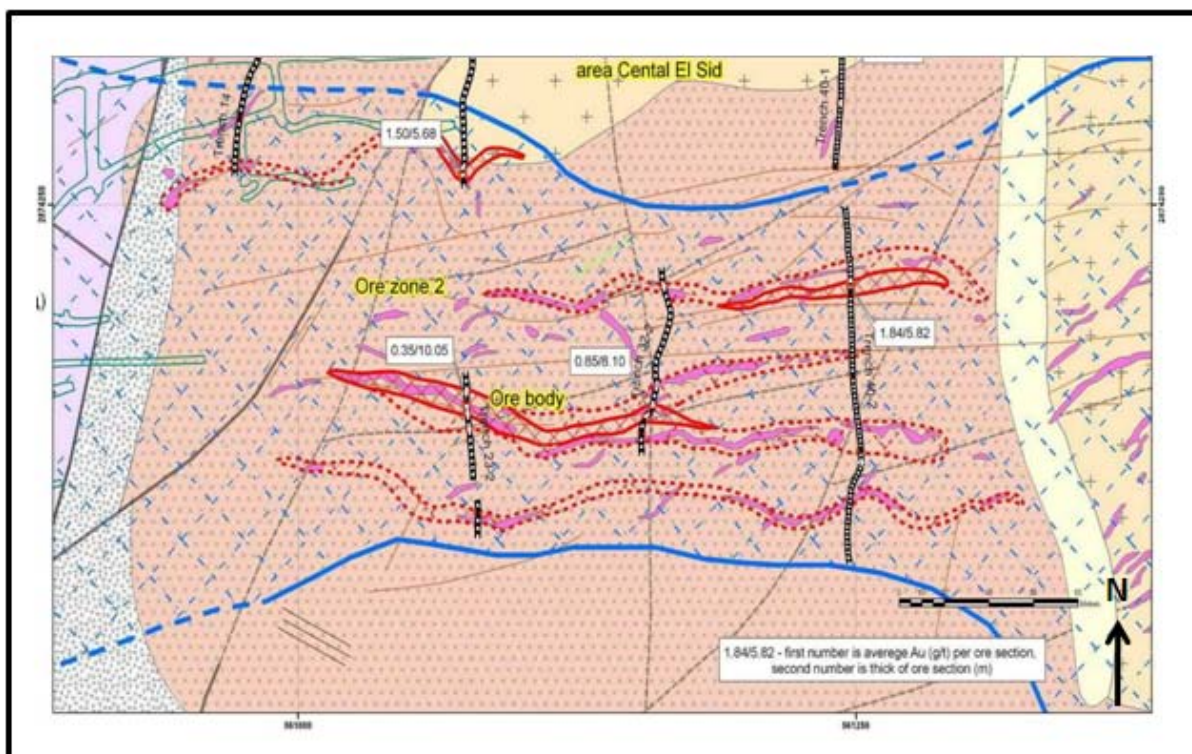
The El Sid mineralized zone was sampled on the surface by five lines of channel samples. Based on results of channel sampling contoured at 0.3 g/t cut-off grade, the mineralised zone varies from 8.7 to 24m wide and the average gold values vary from 0.98 to 1.57 g/t. Average grade, weighed on the width of the 5 sections was 1.13 g/t. It should be noted that the richer part of these gold-bearing veins were mined out in ancient times and therefore could not be sampled. By grab sampling the remaining pillars of these veins, which was done by the previous researchers, the gold grade in them was found to vary from 3.4 up to 18.2 g/t, whilst the average grade of the 11 veins sampled in the main part of the mine was 9.0 g/t Au. Accounting for the effect of these gold-rich quartz veins which make up about 5% of the total volume of the zone could increase average grade by about 0.6 g/t, to the level of 1.73 g/t Au. The waste dumps from the ancient mining at the deposit were grab-sampled and the 351 samples assayed averaged 2.05 g/t Au.

**Figure 35 El Sid Zone 1 sampling results**



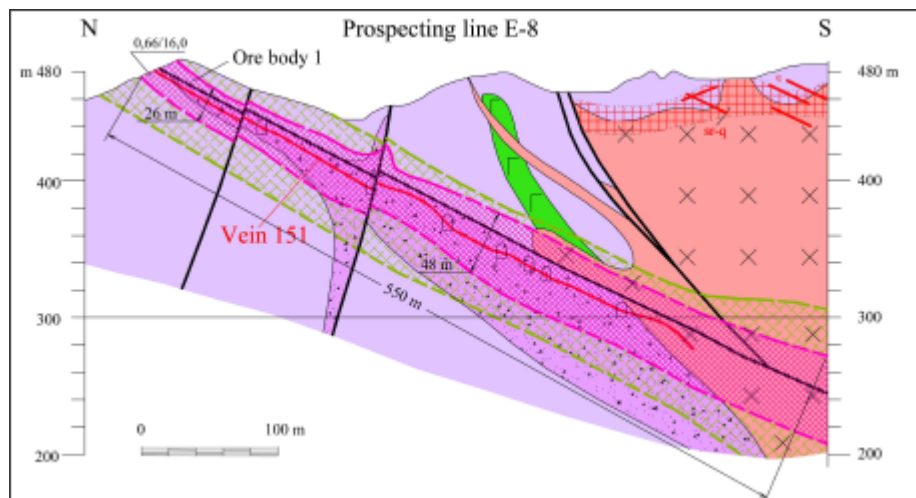
Parallel to and 50 m south of Zone 1 is the El Sid Zone 2 mineralisation that includes 12 parallel (or en-echelon) vein-structures. The width of Zone 2 at the western end is about 50m and channel sampling on two lines across the western part yielded average gold values of 10m at 0.35 g/t and 5.8m at 1.84 g/t Au. At the eastern end, where it is only 20 m wide, channel sampling (line 96) showed two sections of 9.2m at 0.47 g/t and 3.9m at 0.75 g/t Au, respectively.

**Figure 36 El Sid Zone 2 with sampling results**



About 100m south of and parallel to Zones 1 and 2 are the smaller and less well mineralised Zones 3 and 4, and another 100m south is the smallest Zone 5.

**Figure 37 Cross section through the El Sid deposit (looking east)**



The fire-assay results for some the channel samples are shown in Table 11 below:-

**Table 11 Results of fire-assay analysis - El Sid mine area**

REPORT: 00835.0			REFERENCE : Email: October 7, 2008								
CLIENT SMW GOLD			DATE RECEIVED : October 7, 2008								
METHOD HCl-HNO3-HClO4-HF Extraction, Fire-assay with atomic absorption finish											
##	Sample number	Au ppm	##	Sample number	Au ppm	##	Sample number	Au ppm	##	Sample number	Au ppm
1	B 14073	3.266	40	B 14112	0.103	79	B 23077	1.064	118	B 32103	0.099
2	B 14074	0.375	41	B 14113	0.075	80	B 23078	0.867	119	B 32104	0.257
3	B 14075	0.241	42	B 14114	0.218	81	B 23079	0.915	120	B 32105	0.357
4	B 14076	0.442	43	B 14115	0.025	82	B 23080	0.115	121	B 32106	0.043
5	B 14077	0.297	44	B 14116	0.035	83	B 23081	1.147	122	B 32107	0.020
6	B 14078	0.368	45	B 14117	0.028	84	B 23082	0.690	123	B 32108	0.030
7	B 14079	0.197	46	B 14118	0.032	85	B 23083	0.553	124	B 40106	0.693
8	B 14080	0.543	47	B 14119	0.021	86	B 23084	0.338	125	B 40107	1.384
9	B 14081	0.394	48	B 14120	0.031	87	B 23085	0.239	126	B 40108	0.706
10	B 14082	0.661	49	B 18081	0.100	88	B 23086	0.202	127	B 40109	0.280
11	B 14083	0.695	50	B 18082	0.060	89	B 23087	0.179	128	B 40110	0.013
12	B 14084	1.022	51	B 18083	0.395	90	B 23088	0.108	129	B 40111	1.506
13	B 14085	4.223	52	B 18084	0.094	91	B 23089	1.122	130	B 40112	0.621
14	B 14086	0.083	53	B 18085	0.404	92	B 23090	0.380	131	B 40113	0.797
15	B 14087	0.051	54	B 18086	0.407	93	B 23091	0.066	132	B 40114	2.167
16	B 14088	0.158	55	B 18087	0.984	94	B 23092	0.201	133	B 40115	1.720
17	B 14089	0.069	56	B 18088	0.420	95	B 23093	0.182	134	B 40116	1.501
18	B 14090	0.040	57	B 18089	0.120	96	B 23094	0.121	135	B 40117	0.076
19	B 14091	0.058	58	B 18090	0.394	97	B 32074	1.881	136	B 40118	0.137
20	B 14092	0.066	59	B 18091	0.395	98	B 32083	1.172	137	B 40119	0.028
21	B 14093	0.056	60	B 18092	0.030	99	B 32084	2.001	138	B 40120	0.215
22	B 14094	0.066	61	B 18093	0.033	100	B 32085	1.578	139	B 40121	0.080
23	B 14095	0.072	62	B 18094	0.031	101	B 32086	1.140	140	B 40122	0.095
24	B 14096	0.121	63	B 18095	0.030	102	B 32087	0.950	141	B 40123	0.036
25	B 14097	0.081	64	B 18096	0.033	103	B 32088	1.527	142	B 40124	2.741

26	B 14098	0.151	65	B 18097	0.089	104	B 32089	1.063	143	B 40125	2.346
27	B 14099	0.827	66	B 18098	0.059	105	B 32090	2.695	144	B 40126	0.255
28	B 14100	0.043	67	B 18099	0.056	106	B 32091	0.189	145	B 40127	0.160
29	B 14101	0.016	68	B 18100	0.013	107	B 32092	0.304	146	B 40128	0.098
30	B 14102	0.013	69	B 18101	0.389	108	B 32093	0.518	147	B 40129	0.015
31	B 14103	0.026	70	B 23068	1.860	109	B 32094	0.174	148	B 40130	0.015
32	B 14104	0.025	71	B 23069	0.620	110	B 32095	0.053	149	B 40131	0.371
33	B 14105	0.040	72	B 23070	1.461	111	B 32096	0.026	150	B 40132	0.107
34	B 14106	0.318	73	B 23071	1.482	112	B 32097	0.041	151	B 40133	0.869
35	B 14107	0.036	74	B 23072	1.343	113	B 32098	0.050	152	B 40134	0.648
36	B 14108	0.023	75	B 23073	3.365	114	B 32099	0.071	153	B 40135	0.020
37	B 14109	0.036	76	B 23074	1.822	115	B 32100	0.088	154	B 40136	0.073
38	B 14110	0.025	77	B 23075	3.339	116	B 32101	0.104	155	B 40137	0.022
39	B 14111	0.074	78	B 23076	0.960	117	B 32102	0.132	156	B 40138	0.023
									157	B 40139	0.010

This substantial zone of low-grade gold mineralisation indicates that the El Sid mine area has potential for the discovery of a possible low-grade, open-pit deposit, as the close relationship between the gold mineralisation and the granite contact at El Sid is geologically similar to that which occurs at the Sukari mine about 100 km to the south.

The El Sid quartz-vein and hydrothermal alteration system has not been explored at depth except in the old mine workings that are currently inaccessible (see Section 6 above). However, if access to the old mine workings could be made the mineralisation at depth could be investigated by means of crosscuts or horizontal boreholes advanced south and north from the underground workings on the Main vein.

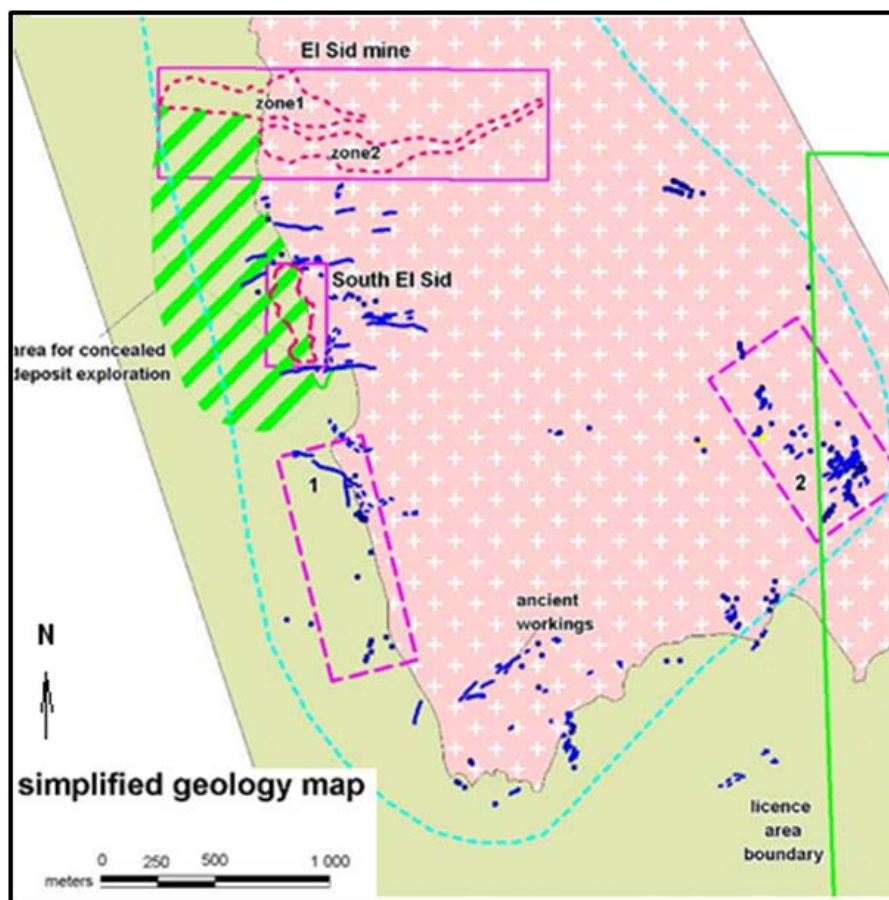
Therefore, only an Inferred Mineral Resource estimate, based on surface sampling data and the knowledge that the mineralised vein in the underground workings extend to depths of several hundred metres, can be considered. Due to the uncertainty that may be attached to Inferred Mineral resources, it cannot be assumed that all or any part of an inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable the evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.

## 10.6 SOUTH EL SID AREA

The ancient workings at South El Sid are located about 1 km south of the El Sid mine. Neubauer (1956) reported that the ancient dumps at South El Sid were derived from mining a zone of closely spaced gold-bearing quartz-calcite veins and stringers up to 15 cm wide, within a 300m long and 100m wide zone of silicification along the N-S trending contact of the granitic intrusion.

Geological mapping by SMWG found that the ancient workings extended discontinuously around the southern margin of the granite intrusion over a total distance of about 4 km. Many of these ancient workings do not appear to have been previously recorded (figure 38)

**Figure 38** Geological map of the South El Sid area (SMWG, 2010)



Waste dumps from the ancient workings were sampled by grab sampling about 12 - 14 kg of material. Gold values in the 23 grab samples from the ancient waste dumps at El Sid South averaged 2.3 g/t Au.

84 grab samples from the old workings at South El Sid yielded gold values up to 20 g/t in quartz and quartz-calcite veins, up to 3.4 g/t in the diorite porphyry dyke, and up to 0.34 g/t in the iron-stained zones.

## 11.0 DRILLING

There are no available records of any drilling in the Fawakhir/El Sid Concession area.

The current interpretation of a multitude of small, quartz lenses with substantial intervening comparatively low-grade waste provides encouragement that a significant mineral resource can be outlined. Core drilling will be required to confirm the geological interpretations and demonstrate the potential for defining an economically viable mineral resource.



## 12.0 SAMPLING METHOD AND APPROACH

The samples were collected, prepared and dispatched to the laboratory by employees, officers, directors or associates of the vendor. SMWG though based in Cyprus, is a company of Russian origin that employs Russian geologists and uses a standard set of methods and procedures based on the formal Russian State approved methodology, for all the geochemical, rock-chip and trench channel samples collected during their exploration programmes. This methodology is of a high standard and compares favourably with western best industry practice. Therefore, Behre Dolbear considers that the samples were:-

- Of good quality
- As representative of the material sampled as the method allows
- Not subject to any bias resulting from the sampling method or approach
- Appropriate for the rock types, geological controls and widths of mineralised zones
- Considerate of any other parameters relevant to the sampling interval.

### Geochemical sample collection

Geochemical surface soil / sediment surveys were carried out along samples lines orientated NNW-SSE in order to identify the extent and distribution of the mineralised areas. These surface soil geochemical samples were collected at 100m intervals (50m in areas of interest) along foot traverse lines 500m apart based on handheld GPS positioning. The samples each consisted of about 200g of fine sieved soil material. In total 10,928 samples were collected, but only 720 of these geochemical samples were sent the *All-Russian Scientific Research Institute of Mineral Resources* (“VIMS”) in Tula, Russia, for multi-element (35 elements plus Au) spectrographic analysis. The Tula Laboratory has ISO 17023-2000 accreditation, but apparently used a proprietary method based for separation and analysis of the magnetic fraction of the sample. In view of the Tula Laboratory’s non-conventional assay methodology, Behre Dolbear has disregarded this data. However, if these samples were analysed by a conventional method such as ICP, then the data would represent a useful litho-geochemical database and the known association between the copper-lead-zinc sulphide mineralisation and gold could be a useful geochemical indicator for the extent and distribution of the gold mineralisation.

### Grab Sampling

Waste dumps from the ancient workings were sampled by grab sampling about 12 - 14 kg of material, which was crushed, pulverised and reduced to the 250g sent to the Al Amri Laboratory for analysis by Fire-assay. In total, there were 570 grab samples taken, with 485 at El Sid; 43 at Fawakhir and 85 at El Sid South. Gold values in the ancient waste dumps at El Sid varied from 0.05 to 11.6 g/t Au and averaged 2.0 g/t (351 samples). At Fawakhir the average of 37 grab samples was 1.6 g/t Au (maximum 5.7 g/t) and at El Sid South the average of 23 samples was 2.3 g/t Au. However, these samples were selected from known mineralised areas and may not be representative of the bulk grade.

### Trench channel sampling

SMWG’s main exploration effort consisted of systematic trenching and channel sampling across the outcrop of the main mineralised zones. The distance between the trenches was generally 50m - 80m at El Sid and 30m – 50m at Fawakhir. The trenches were dug down to bedrock by hand, using local labour, and geologically mapped. Any mineralised sections of the trench identified from the geological mapping or from the presence of old workings, were marked out, the floor of the trench was cleaned and a power saw used to cut a continuous 100mm x 50mm channel, which was sampled over continuous 1m or 1.5m intervals. The samples, each weighing about 10-12 kg, were bagged on site and numbered for transport back to base camp. In total 3350m of trenches were dug and 1918 channel samples collected; 1200 at El Sid and 547 at Fawakhir including 80 from the underground adits; 86 at Fawakhir II and III; and 85 from El Sid South.

A substantial portion of the trench samples shown in Table 12 and Figures 25 – 29 above were inspected during the site visit by Behre Dolbear and found to be clean, well prepared, consistent with best industry practice and were representative of the material sampled.

**Table 12 Summary of Trench Channel Sampling and Rock Chip sampling**

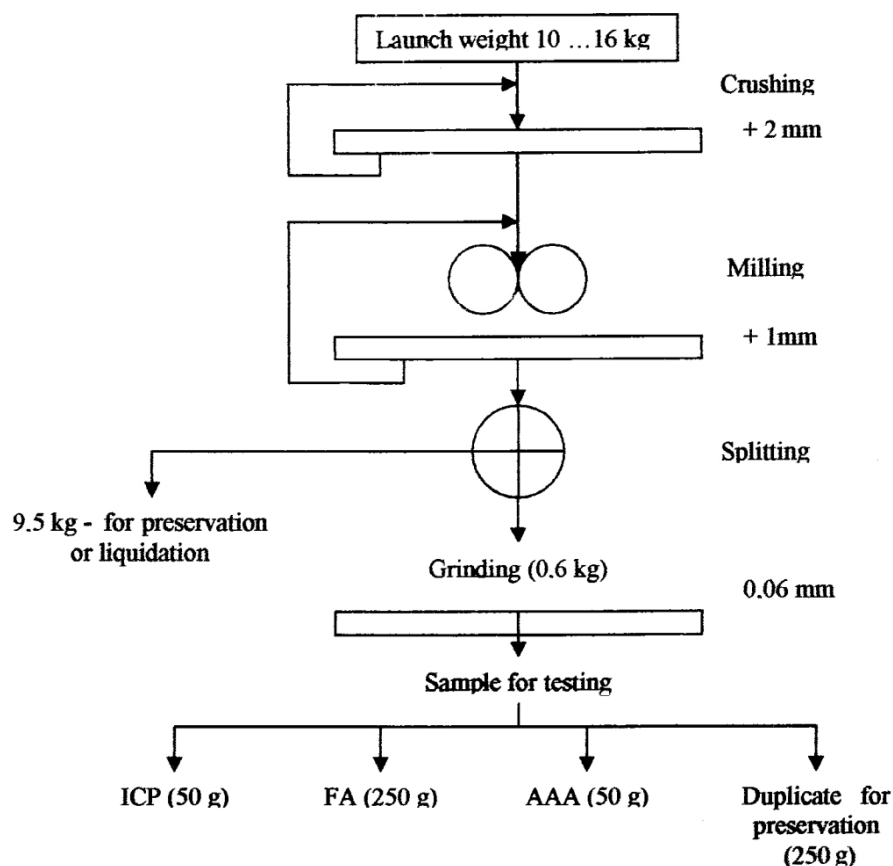
<b>Trench №</b>	<b>Area / Zone</b>	<b>Length of Trench (m)</b>	<b>Sample Length (m)</b>	<b>No. Channel samples</b>
K-14	El Sid Mine	264	1.5	103
K-18	El Sid Mine	151.5	1.5	21
K-23	El Sid Mine	398	1.5	148
K-32	El Sid Mine	375.5	1.5	100
K-39	El Sid Mine	380	1	3
K-40	El Sid Mine	424	1	417
K-45	El Sid Mine	195	1.5	70
K-60	El Sid Mine		1.5	251
K-96	El Sid Mine	360	1.5	60
S-01	El Sid South	127	1.5	85
T 1-21	El Sid South	127.50	1.5	85
F	Fawakhir I		1.5	467
F-1 - F-3	Fawakhir II	83.5	1.5	56
F-4 - F-6	Fawakhir III	37.6	1.5	30
A-1	Atallah Mine	41	1.5	29
A-2	Atallah Mine	43.8	1.5	29
A-3	Atallah Mine	32.2	1.5	23
E1-E2	Shear Надвиговой	28.5	1	27
F4-F6	Vein 10	37.6	1	30
F1-F3	Vein 20	78.25	1.5	56
	<b>TOTAL</b>	<b>3184.95</b>		<b>2090</b>

### 13.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

#### Sample preparation

The samples were prepared and dispatched to the laboratory by employees, officers, directors or associates of the vendor.

The rock samples and channel samples were subject to the following sample preparation procedure at the base camp.



Samples were crushed and milled at the SMWG exploration base camp, using ROCKLABS (New Zealand) crushers and “ring-mill” pulverisers. All the equipment was cleaned between samples using a compressed air line.

The pulverised sample was then split into three sub-samples, one of 250g sent for fire assay, one of 50g sent for ICP chemical analysis and one reference sample of 250g stored on site. All the reject part of the samples was retained on site for possible future reference.

In total 1930 of the prepared channel samples and 453 of the prepared grab samples were sent to the Al Amri Laboratory in Jeddah, Saudi Arabia for analysis for gold by fire-assay.

Behre Dolbear considers that the sample preparations were:-

- Of good quality
- As representative of the material sampled as the method allows
- Appropriate for the rock types, geological controls and widths of mineralised zones

The Al Amri Laboratory (Al Amri Chemicals & Laboratory Division is ISO 9001-2000 Certified (<http://zed-group.com/history.html>). Further details of QA/QC procedures are provided in Section 14 below. Behre Dolbear considers that the Al Amri Laboratory is reputable and reliable and that the preparation and analysis of the samples submitted was adequate and suitable for the material involved.

## 14.0 DATA VERIFICATION

Behre Dolbear verified the data in the following manner:-

Geological data was verified by reference to published 1:250,000 geological maps and by inspection of geological outcrops in key locations. The geological interpretations were verified by reference to the authors previous 30 years experience of geological mapping and mineral exploration throughout the Nubian-Arabian Shield (ie Egypt, Sudan, Saudi Arabia and Yemen) and by reference to the voluminous literature of published and unpublished reports on the geology and mineral resources of Egypt.

Sampling procedures used by SMWG field staff were verified by inspection of the sample locations, sample documentation and inspection of the sample preparation facilities and procedures.

Sample analysis methods and procedures used by the Al Amri Laboratory in Jeddah, Saudi Arabia (Al Amri Chemicals & Laboratory Division) that is ISO 9001-2000 Certified (<http://zed-group.com/history.html>) were verified by previous personal experience of the Al Amri Laboratory (on other projects) and by reference to the QA/QC documentation available on the Al Amri Laboratory website.

. The Al Amri Laboratory follows industry standard QA/QC procedures, including:-

- Checks on the precision of the instrument calibration by analyzing standard solutions with the required range of concentration.
- Accuracy Control is accomplished by using Certified Reference Materials (CRM) that are matrix-matched materials with assigned target values, CRMS are included in every batch or at frequent intervals if batches are large or if testing is continuous.
- Blanks are used to check for interference and detection limits of the assay method. One blank is included in every batch of samples, or at frequent intervals if batches are large or if testing is continuous.
- Duplicate samples are included in every batch, or at frequent intervals if batches are large or if testing is continuous.

Sample analysis results were verified by reference and comparison with the relevant sample location data and by comparison with historical sampling data from previous exploration work in the Fawakhir / El Sid area.

In November 2009, at Behre Dolbear's request, a total of 37 control samples were prepared by SMWG field geologists from duplicates of SMWG trench channel samples stored on site and were sent to the Al Amri Laboratory for analysis by Fire-assay and the results are shown in Table 13.

**Table 13 Results of control samples sent to Al Amri SA Laboratory**

Quality Control sample results - Gold values El Sid area						
No.	Sample number	Original Assay value ppm	Laboratory Repeat assay ppm	Duplicate Sample number	Duplicate Assay value ppm	Variance as % of Original assay value
<b>&gt; 4 ppm Au</b>						
1	Q-3365	10.616	10.488	K-1001	8.215	-23
2	Q-3186	27.616	27.303	K-1002	9.794	-65
3	9559	68.461	69.633	K-1003	63.4	-7
4	S-01029	10.679		K-1004	10.061	-6
5	Q-3536	5.487		K-1005	6.551	19
6	Q-3367	4.296		K-1006	6.021	40
7	Q-3366	5.203		K-1007	4.864	-7
<b>1 - 7</b>	<b>Average</b>	<b>18.908</b>			<b>15.558</b>	<b>-6.76</b>
<b>1 - 7</b>	<b>Range</b>	<b>4.3 - 68.4</b>			<b>4.8 - 63.4</b>	<b>-65 to +40</b>
<b>1 - 4 ppm Au</b>						
8	Q-3413	3.702		K-1008	2.832	-24
9	Q-3368	3.402		K-1009	2.936	-14
10	Q-3238	2.843		K-1010	5.276	86
11	Q-3461	2.211		K-1011	3.897	76
12	Q-3397	2.059		K-1012	3.136	52
13	Q-3257	1.623		K-1013	1.61	-1
14	Q-3500	1.021		K-1014	1.32	29
15	S-01061	2.545		K-1015	2.716	7
16	F-602	2.558		K-1016	2.967	16
17	3171	3.145		K-1017	2.21	-30
<b>8-17</b>	<b>Average</b>	<b>2.511</b>			<b>2.890</b>	<b>19.85</b>
<b>8-17</b>	<b>Range</b>	<b>1.0 - 3.7</b>			<b>1.3 - 5.3</b>	<b>-30 to +86</b>
<b>0.5 - 1.0 ppm Au</b>						
18	Q-3502	0.860		K-1018	2.781	224
19	S-01073	0.837		K-1019	0.634	-24
20	Q-3259	0.742		K-1020	0.782	5
21	Q-3454	0.646		K-1021	0.259	-60
22	E-105	0.583		K-1022	0.582	0
23	Q-3510	0.560		K-1023	0.55	-2
24	E-107	0.539		K-1024	0.552	2
25	T-41 (2)	0.623		K-1025	0.593	-5
26	Q-3356	0.657		K-1026	0.989	51
27	S-01082	0.580		K-1027	0.832	43
<b>18-27</b>	<b>Average</b>	<b>0.663</b>			<b>0.855</b>	<b>23.43</b>
<b>18-27</b>	<b>Range</b>	<b>0.53 - 0.86</b>			<b>0.2 - 2.7</b>	<b>-60 to +224</b>
<b>0.1 - 0.5 ppm Au</b>						
28	Q-3203	0.434		K-1028	0.241	-44
29	Q-3516	0.398		K-1029	0.218	-45
30	Q-3504	0.341		K-1030	0.314	-8
31	Q-3205	0.302		K-1031	0.265	-12
32	F-314	0.263		K-1032	0.223	-15
33	E-212	0.221		K-1033	0.233	5
34	F-114	0.124		K-1034	0.142	15
35	3177	0.171		K-1035	0.341	100
36	3170	0.268		K-1036	0.452	68
37	A-115	0.165		K-1037	0.142	-14
<b>28-37</b>	<b>Average</b>	<b>0.269</b>			<b>0.257</b>	<b>4.93</b>
<b>28-37</b>	<b>Range</b>	<b>0.12 - 0.43</b>			<b>0.14 - 0.45</b>	<b>-45 to +100</b>
<b>1 - 37</b>	<b>Average</b>	<b>4.51</b>			<b>4.03</b>	<b>11.75</b>
<b>1 - 37</b>	<b>Range</b>	<b>0.12 - 68.4</b>			<b>0.14 - 63.4</b>	<b>-65 to +224</b>

When compared to the original sample assay data, this group, if considered as a single batch of 37 “control samples”, shows a very similar range of values, a similar average value (4.51 : 4.03 ppm) and a fairly modest +12% variance. However, this may be a just a fortuitous averaging effect because:-

- Individual samples show a very wide range of variance from -65% up to +224%. Experience suggests that a range of variance from -50% to +50% may be considered reasonable for duplicate samples prepared in the field, although most laboratories would expect their internal repeat assays on the submitted sample material to be within the range of plus or minus 10% and would consider plus or minus 5% to be routinely achievable. In this respect the 3 “laboratory repeat assay values” in the above table are within the range of plus or minus 2% and therefore indicate a high level of reproducibility.
- The highest values, ie those > 10 g/t, were not consistently replicated. This suggests the variance may be due to the coarse grain size of the gold, often referred to as the “nugget effect”.
- The values in the range of 5 – 10 g/t were all replicated reasonably well by the new assay data. This suggests that it may be appropriate to apply a “top cut” at 10 g/t to all the very high values for resource estimation purposes.
- The values in the 0.3 – 1.0 g/t range showed the greatest range of variance from -60% to +224%. This is a cause for concern as this is the critical range of values that may span the possible “cut-off” value that will decide which material is considered to be “ore” or “waste” in any resource estimation.

The assay results for these 37 “control samples” suggest there may be a problem at the sample preparation stage, possible due to the samples not being sufficiently pulverised to eliminate any “nugget effect”. This might be improved by:-

- Milling the samples for a longer period.
- Ensuring that all sample splits are accurate and reliable by using standard laboratory “riffle splitters”.

Behre Dolbear compared the SMWG sample assay data with historical assay data collected from similar locations, by various organisations at various times during the past 40 years, as described in Section 6 History above. In general, the SMWG assay data was consistent with this historical assay data, which indicates that the SMWG sampling and analysis was reasonably accurate, reliable and fit for purpose. However, Behre Dolbear recommends that SMWG should introduce industry standard QA/QC protocols and procedures for all its sampling and analytical work.

## 15.0 ADJACENT PROPERTIES

There are no adjacent properties of significance.

## 16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

The SMWG project is at a relatively early stage of exploration and resource definition. Previous historical mining records have demonstrated the presence of substantial mineralisation, but substantial additional work is required to confirm the potential economic viability under modern conditions.. Significant exploratory and infill drilling, followed by mine planning and process testwork will be required to confirm the mineral resources and to confirm the viability of the project. There has been no mineral processing or metallurgical testing of materials from the known mineral occurrences in the Fawakhir/El Sid Concession Area. However, the history of the El Sid and other mines in the Concession area demonstrate that the gold mineralisation can be processed to achieve acceptable levels of gold recovery, using simple gravity, amalgamation and cyanidation methods.

## 17.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

The mineral resource estimates described below were prepared by the author of this report, using sample data and other information provided by SMWG.

The author, R.J. Fletcher, is a Senior Associate with the firm of Behre Dolbear International Limited, and is a graduate of the University of Leicester with a Bachelor of Science Honours degree in Geology and an MSc. in Exploration Geology from the University of North Queensland, Australia, and has been responsible for estimation of Mineral Resources and Mineral Reserves of gold mines and gold exploration projects for more than 40 years including many operating and/or abandoned gold mines in Egypt, Sudan and Saudi Arabia. He is a Fellow in good standing of the Australasian Institute of Mining and Metallurgy and a Chartered Geologist, and a Member in good standing of the Institute of Materials, Minerals and Mining and a Chartered Engineer. He is a qualified person for the purposes of National Instrument 43-101 and is independent of both the issuer and the vendor as defined in Section 1.4 of National Instrument 43-101.

### Assumptions, methods and parameters

The estimates of tonnages and grades were based on the following assumptions, methods and parameters:

- Geological interpretation of mineralised domains;
- Compilation of sample data within mineralised domains;
- Review of sample length compositing requirements;
- Review of extreme data values and application of top cuts, where appropriate;
- Creation of block models and application of density values;
- Estimation of gold grades within blocks;
- Classification of estimates with respect to CIM/JORC guidelines; and
- Resource tabulation and reporting.

SMWG supplied the sample data in computer spreadsheet format and specific gravity measurements were based on relevant geological reports.

### Geological Interpretation and Modelling

The El Sid / Fawakhir gold deposits are hosted in the contact zone of a large granite intrusion into mafic and ultramafic host-rocks. The near-surface mineralisation is assumed to be oxidised, whilst the deeper mineralisation is assumed to be the primary sulphide domain. There appears to be a distinct zone of secondary enrichment of gold values at or near the present-day water-table about 60m below wadi level, but there is no sub-surface data available to enable any differentiation of gold values within the oxide, secondary enriched or sulphide domains.

### Sample lengths

Channel sample lengths ranged from 0.2m to 1.5m in length, with the great majority of samples being 1.5m length. As most of the samples had intervals of 1.5m, compositing to ensure equal support (ie, length) was not required.

### Extreme Values

Behre Dolbear examined the gold assay data by means of sample assay histograms and noted the spatial location of any extreme values. A top-cut threshold of 10 g/t Au was determined by examination of the statistical plots and by examination of the effect of top cuts on the mean and variance of the sample data.

### Specific Gravity

No systematic specific gravity determinations are available. SMWG used the assumed density value of 2.7 for estimation of tonnage and, in the absence of any measurement data, Behre Dolbear accepts this as reasonable.

### **Cut-off grade**

As no economic analysis or feasibility study has been made to determine what economic cut-off grade will be applicable to the El Sid / Fawakhir project, the tonnes and grades have been estimated using a mineralisation boundary cut-off grade of 0.3 g/t Au, based on a visual review of the sample grades and distribution.

### **Geological and Grade continuity**

The geological and grade continuity is well established at surface where mineralised quartz veins extend over strike lengths of 200 – 400m at surface and have been worked over similar distances underground to depths of 200 – 400m down dip. There is some evidence that the quartz veins occur as en-echelon veins within a wider and much longer shear zone, so that as one quartz vein dies out it is replaced by another parallel vein, so that continuity is maintained over strike lengths much greater than the lengths of the individual vein.

### **Sample widths and True width**

Due to the lack of any historical underground sampling data from the El Sid and Fawakhir mines, and the preliminary nature of the exploration work carried out by SMWG, the estimation of mineral resources is mostly dependent on surface sampling with only limited sub-surface data. The disturbed nature of the surface in some locations, together with the removal of most of the gold bearing quartz veins from the near surface during previous mining activity, may have resulted in the surface sampling possibly being not fully representative of the in-situ mineralisation. There are two possible sources of bias in the surface sample data. Firstly, the removal of the gold bearing quartz veins to leave only the low-grade mineralisation in the altered wall-rocks, may have resulted in a possible negative bias in the gold assay values. Secondly, the extensive disturbance of the surface by previous mining activity may have dispersed the gold values over a wider area than the source mineralisation, possibly resulting in a positive bias in the width of the mineralisation.

The effect of these potential sampling bias may effectively cancel out, as the surface expression of the mineralised zone may be wider but lower in grade than the original undisturbed outcrop; while the sub-surface mineralisation may be narrower but higher in grade than the surface sampling indicates. However, the amount of contained gold may not be significantly different.

An additional factor is that there may be some leaching and dispersion of gold values in the near surface, oxidised zone above the water-table. This may be accompanied by secondary enrichment of gold values at or close to the water-table, as indicated by the work of Harraz (1995) and as reported from many other gold mines in Egypt, Sudan and Saudi Arabia. Any such secondary enrichment of gold values is likely to extend into the fractured wall-rocks resulting in an increase in the mineralised width, particularly in any zones of intense stockwork mineralisation.

Consequently, there seems to be little merit in attempting to estimate the sub-surface widths in the absence of sub-surface data. Therefore the surface width x grade has been assumed to be reasonably representative of the sub-surface width x grade.

For these reasons, it would be unreasonable to apply complex or sophisticated methods for the estimation of tonnage and grade at El Sid / Fawakhir. Therefore, they were estimated manually using the traditional polygonal method based on vertical long-sections drawn along the strike length of the vein.

The Exploration Results at El Sid, estimated on the basis of the surface sample values, defined in terms of width and strike length by the 0.3 g/t Au contour and projected down dip to the extent of the known underground workings, are summarised as follows:-



**Table 14**      **Inferred Mineral Resource Estimates at El Sid**  
(assuming SG = 2.7 t/m<sup>3</sup> and 0.3 g/t Au cut-off)

El Sid Mineralised Zone	Length along strike (m)	Average surface width (m)	Length down dip (m)	Volume, m <sup>3</sup>	Million Tonnes	Average grade (g/t Au)	Contained Gold (kg)
1	200	35	400	2800000	7.56	0.60	4536
2	400	45	400	7200000	19.44	0.95	18468
3	450	25	250	2812500	7.59	1.02	7745
4	400	25	250	2500000	6.75	1.16	7830
5	130	7	70	63700	0.17	0.71	122
<b>Total El Sid</b>				<b>15376200</b>	<b>41.52</b>	<b>0.93</b>	<b>38701</b>

This Table indicates that the total gold potential at El Sid / Fawakhir may exceed 1.2 million ounces. The tonnes, grades and ounces figures have been rounded and this may have resulted in minor discrepancies. The estimated gold content does not include any consideration of mining, mineral processing, or metallurgical recoveries.

**Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable the evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.**

Some of the many other mineralised zones located in the Fawakhir / El Sid Concession Area appear to have potential for low-grade open-pit mineralisation, but have not yet been mapped or sampled in sufficient detail to enable their mineral resource potential to be quantified. The JORC Code suggests that such mineralisation should be described using the term “Exploration Results” or “Exploration Target” and requires that such mineralisation be expressed as a range of values so as to emphasis the level of uncertainty involved. There is no material difference between the CIM and JORC definitions, except for the provision in the JORC Code for the reporting of “Exploration Results” as reproduced below:

**Reconciliation between CIM and JORC Code definitions**

<b>CIM DEFINITIONS (11<sup>th</sup> December 2005)</b>	<b>JORC DEFINITIONS (December 2004)</b>
<p>Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories.</p> <p>-----</p> <p><b>Inferred Mineral Resource</b> - is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.-----</p> <p>-----</p> <p>Due to the uncertainty that may be attached to Inferred Mineral resources, it cannot be assumed that all or any part of an inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration.</p> <p>-----</p> <p>Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable the evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.</p> <p>-----</p> <p>Exploration Results</p> <p>Not CIM compliant.</p>	<p>Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories.</p> <p>-----</p> <p><b>Inferred Mineral Resource</b> - is that part of a Mineral Resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes which may be limited or of uncertain quality and reliability.</p> <p>-----</p> <p>Commonly it would be reasonable to expect that the majority of Inferred Mineral resources would upgrade to Indicated Mineral Resources with continued exploration. However, due to the uncertainty of Inferred Mineral Resources, it should not be assumed that such upgrading will always occur.</p> <p>-----</p> <p>Confidence in the estimate of Inferred Mineral Resources is usually not sufficient to allow the results of the application of technical and economic parameters to be used for detailed planning. For this reason, there is no direct link from an Inferred resource to any category of Ore Reserves.</p> <p>-----</p> <p><b>Exploration Results</b> (Art.16) may or may not be part of a formal declaration of Mineral Resources....</p> <p>Art.18. Any statement referring to potential quantity and grade of the target must be expressed as ranges and must include 1) a detailed explanation of the basis for the statement and 2) a proximal statement that: The potential quantity and grade of Exploration Results is conceptual in nature, as there has been insufficient exploration to define a Mineral Resource and that it is uncertain if further exploration will result in the determination of a Mineral Resource.</p>

**Table 15 Summary of Exploration Targets in Fawakhir Concession**

<b>Location</b>	<b>Length along strike (m)</b>	<b>Width at surface (m)</b>	<b>Length down dip (m)</b>	<b>Average grade at surface (g/t Au)</b>
<b>Fawakhir Zone I</b>	175 - 225	10-22	40-60	1.3 - 1.7
<b>Fawakhir Zone II</b>	150 - 250	5 – 31	50 – 100	0.9 – 1.65
<b>Fawakhir Zone III</b>	250 - 500	5 - 15	50 – 100	0.5 – 1.5
<b>Atallah mine</b>	250 - 350	10 - 50	50 – 100	0.5 – 1.5
<b>El Sid South</b>	100 - 300	10 - 50	50 - 100	0.3 – 1.0

**The potential quantity and grade of these Exploration Targets is conceptual in nature, as there has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.**

## **18.0 OTHER RELEVANT DATA AND INFORMATION**

There is no other relevant data or information for the Fawakhir/El Sid Concession Area.

## **19.0 INTERPRETATION AND CONCLUSIONS**

The systematic geological mapping and geochemical sampling programme carried out by SMWG achieved its objectives as it has resulted in new insights into the extent and distribution of the ancient gold mining activities and into the geological controls of the gold mineralisation. The key result was the recognition that most of the ancient gold mining activity was confined to a narrow NNW – SSE trending “corridor” about 30 km long and about 3 km wide. This gold bearing “corridor” coincides with a series of lenticular granite intrusions that are similar to that which hosts the Sukari gold deposit about 100 km to the south. Mapping indicated that the ancient gold mining activity in the Fawakhir Concession area appears to be related to E-W trending quartz veins intruded into tension fractures along the western margin of these granite intrusions.

The Fawakhir and El Sid mines, consist of quartz vein stockworks, located on or close to the western margin of a biotite-granite intrusion that forms a N-S trending elongated mass, about 7 km in length and from 2 to 3 km wide. The wall-rocks include a faulted and locally foliated melange of mafic volcanics, metagabbro and serpentinite. The Atallah mine further north occurs on the western margin of a similar granite intrusion about 5km long and 2 km wide.

The surface sampling carried out by SMWG was appropriate and representative of the material sampled. The sample analysis was carried out by a reputable and accredited laboratory and the analytical results are a reliable indication of the sample material submitted.

The available data is sufficient to make a very preliminary estimate of Inferred Mineral Resources in the El Sid mine area based on current surface sampling and historical sub-surface data.

At the other prospects in the Concession Area the limited surface sample data and lack of sub-surface data is only sufficient to support the estimation of Exploration Targets (as defined by the JORC Code).

#### **Atallah mine**

- 6 The Atallah gold deposit consists of several small, widely-spaced quartz veins intruded into sheared granite. The historical underground mining operation was restricted to a single vein which was mined over a strike length of about 200m to a depth of about 150m.
- 7 The individual quartz veins are too small and too low-grade to support an underground mining operation, but the presence of quartz-vein stockworks in some places suggests there may be some potential for the discovery of a low-grade (c. 1g/t Au) open-pit type deposit. Such a discovery would require a substantial drilling programme to be implemented.
- 8 The probability that such a discovery at Atallah would justify a “stand-alone” development appears low and the most likely development scenario would be as a “satellite” operation to a larger operation at El Sid/Fawakhir.

#### **Fawakhir mine**

- 9 The Fawakhir mine area consists of multiple, parallel, quartz veins intruded into a 200m wide shear zone in granite.
- 10 The individual veins were too small and too low-grade to support an underground mining operation, but the presence of quartz-vein stockworks in some places suggests there may be potential for the discovery of a low-grade (c. 1g/t Au) open-pit type deposit. Such a discovery would require a substantial drilling programme to be implemented.
- 11 The probability that such a discovery at Fawakhir would justify a “stand-alone” development appears low and the most likely development scenario would be as a “satellite” operation to a larger operation at El Sid.

#### **El Sid mine**

5. The El Sid mine area consists of a multiple quartz-vein system about 200 – 300m wide and about 1000m in strike length intruded into the contact zone between sheared and altered granite and mafic/ultramafic country rocks.
6. The contact is marked by a zone of graphitic schist that may have been a significant geological/geochemical control for the high-grade gold mineralisation that was previously mined at El Sid.
7. There are numerous parallel and conjugate vein sets at El Sid that offer potential for the discovery of a large, low-grade (c. 1g/t Au) open-pit type deposit. Such a discovery would require a substantial drilling programme to be implemented.
8. There is sufficient available space at El Sid for development of an open-pit mine, but suitable sites for waste dumps and tailings disposal may be a problem. Development of an open pit may impact on the existing bitumen road which might need to be realigned further north, possibly along the route of the former Roman road north of Bir Fawakhir.

It is Behre Dolbear’s opinion that the results of the initial Exploration Phase met their original objectives and justify proceeding with the \$5million expenditure commitment for the Evaluation Phase required by the Concession Agreement.

## 20.0 RECOMMENDATIONS

### Proposed work programme

Geological investigations at South El Sid, El Sid, Fawakhir and Atallah, should be continued along with appropriate sampling and analysis. This will be supported by satellite imagery interpretation, geological mapping and sampling, topographic surveying, drilling, mineralogical sampling and testwork, as appropriate, in order to provide a sound basis for mineral resource estimation.

The first Stage of exploration work should include:-

7. A search the ERMA archives for the old El Sid mine and assay plans and the Neubauer (1959) report.
8. Engage a Mining Engineer to carry out a survey of the El Sid underground workings in order to establish their extent and layout and to sample any exposed veins and any cross-cuts that might provide data on the gold or other mineral content of the wall-rocks between the veins.
9. Use the mine survey data to locate the initial drill-holes to test any un-mined portions of the auriferous veins and their strike and down-dip extensions.
10. Consider a programme of underground drilling to test the hanging and footwall rocks for potential bulk, low-grade mineralisation.
11. Use this data to plan a surface drilling programme to test for a low-grade, open-pit type deposit.

**Table 16 Summary of Proposed Exploration Programme**

El Sid / Fawakhir Area - Stage 1		
ACTIVITY	UNIT	NUMBER
Prospecting work (scale 1:5000) with geological mapping	sq.km	10
Mineralogical and geochemical sampling	samples	500
Geomagnetic and geoelectric survey (scale 1:5000)	sq.km	10
Microscopic study of rock and ore types (microprobe analysis)	thin/polished sections	50
Drilling mobilisation, establishment and commissioning	Drill rigs	3
Construction of drillhole access roads / sites	km	20
Core drilling	metres	9000
Documentation and core sampling (1 m samples)	metres	7500
Borehole surveys	holes	200
Preparation of mineralogical and geochemical samples	samples	500
Fire assay for gold and silver	samples	7500
AAA analysis for copper and other elements	samples	4000
External control assays	samples	750

### Proposed drilling programme

The first stage drilling programme will establish the location and extent of the mineralisation and to raise the Inferred Resources to Indicated Resource category to a depth of 100m below surface.

Following a review of the first stage results, the drilling programme should be reviewed and amended as required in order to concentrate the second stage drilling programme on the priority targets. The **Decision** to proceed to the second stage drilling will **not** be dependant on the successful completion of the first stage as it is expected that any proposed second stage drilling at targets that fail to live up to expectations will be re-allocated to the highest priority targets. The objective of Stage 2 is to raise the Inferred Resources to Indicated Resource category to the full depth of a preliminary open-pit shell.

The first phase of widely spaced holes will be along profiles located 160m apart, followed by a second phase of infill drilling in the zones of interest, on profiles 80m apart and eventually in selected areas 40m apart. Distance between the drill holes along the profiles will be 40m.

Details of the proposed drilling programme are shown in the tables below:-

**Table 17 First stage of proposed drilling programme**

<b>First stage of El Sid Mine drilling plan</b>							
Number	Drill hole number	X, m	Y, m	Z, m	Azimuth, degree	Zenith angle, degree	Length, m
L-E16	E-1601	561100	2874513	446	360	35	60
	E-1602		2874451	424		25	100
	E-1603		2874364	440		25	190
	E-1604		2874283	440		25	255
	E-1605		2874218	430		21	240
	E-1606		2874144	430		21	240
	E-1607		2874061	443		21	320
L-E20	E-2001	561260	2874391	446	360	31	60
	E-2002		2874332	442		17	110
	E-2003		2874269	418		17	150
	E-2004		2874195	436		17	230
	E-2005		2874124	424		18	290
	E-2006		2874038	437		21	200
L-E24	E-2401	561420	2874336	432	360	12	50
	E-2402		2874238	442		27	135
	E-2403		2874152	449		27	210
	E-2404		2874078	443		25	265
	E-2405		2874002	434		25	250
<b>Total m</b>							<b>3355</b>

<b>First stage of Fawakhir drilling plan</b>							
Line number	Bore hole number	X, m	Y, m	Z, m	Azimuth, degree	Zenith angle, degree	Length, m
LF-03	F-301	560380	2877845	422	360	50	85
	F-303		2877673	437		50	310
	F-306		2877476	442		70	300
	F-309		2877308	383		70	270
	F-311		2877178	383		70	275
LF-05	F-501	560460	2877851	425		50	120
	F-503		2877712	400		50	290
	F-506		2877477	405		70	265
	F-509		2877296	383		70	280
	F-511		2877165	383		70	300
LF-07	F-701	560540	2877843	405		50	120
	F-703		2877675	414		50	340
	F-706		2877474	389		70	255
	F-708		2877353	383		70	255
	F-710		2877223	380		70	260
<b>Total m</b>							<b>3725</b>

<b>First stage of Atallah drilling plan</b>						
Line number	Bore hole number	X, m	Y, m	Azimuth, degree	Zenith angle, degree	Length, m
L-A9	A-903	551050	2893381	313	60	130
	A-905	551160	2893276			250
	A-907	551263	2893179			245
	A-909	551370	2893080			225
L-A13	A-1303	551265	2893397			250
	A-1305	551377	2893292			250
	A-1307	221479	2893195			250
<b>Total m</b>						<b>1600</b>

<b>Summary of Proposed Stage 1 and Stage 2 Drilling programmes</b>					
Location	No. of drill holes	Average length of drill holes, m	1st stage	2nd stage	Total drill hole length, m
El Sid mine	96	190	3400	10000	13400
Fawakhir-1	35	260	2500	4000	6400
Fawakhir-2	24	260	1300	3000	3400
Atallah	87	225	1600	3000	4600
<b>Total</b>			<b>8800</b>	<b>20000</b>	<b>28,800</b>

The budget for this work will be dependant to some extent on contractual arrangements for the drilling programme, but is expected to be similar to the \$5 million expenditure commitment required by the Concession Agreement. The main uncertainties relate decisions on whether to use own drill rigs or contractors and the related mobilisation and establishment costs.

**Table 18 Summary of Estimated Exploration Costs**

<b>ACTIVITY</b>	<b>ESTIMATED COST US\$</b>	
	<b>Stage 1</b>	<b>Stage 2</b>
Geological work	250,000	-
Surface sampling / assaying	250,000	-
Drilling – Stage 1	1,000,000	-
Supervision / logging / assaying	500,000	-
Drilling - Stage 2	-	2,000,000
Supervision / logging / assaying	-	1,000,000
<b>TOTAL</b>	<b>2,000,000</b>	<b>3,000,000</b>



## 21.0 REFERENCES

- Anonymous. 1950. A gold treatment plant (at El Sid). *The Engineer*, June 2, 1950. Pp.654-655.
- Akawy. A. 2007 Geometry and texture of quartz veins in Wadi Atallah area, Central Eastern Desert, Egypt. *Journal of African Earth Sciences*. Volume 47, Issue 2, February 2007, Pages 73-87
- Bard K. A. 1999 Encyclopedia of the archaeology of ancient Egypt, pp.175-176. Routledge, London.
- Centamin. Annual Reports 2003 – 2008. [www.centamin.com](http://www.centamin.com)
- Derry. D.R. 1951. A 3000 year old gold mine. *Can.Min.Jour.* Vol 72, Aug 1951, pp.E68-72.
- El-Bouseily A.M., El-Dahhar M. A. and Arslan A. I. 1985. Ore-microscopic and geochemical characteristics of gold-bearing sulfide minerals, El Sid Gold mine, Eastern Desert, Egypt. *Mineralium Deposita*, Volume 20, Number 3/July, 1985, Pp.194-200, Springer, Berlin/Heidelberg.
- El-Bouseily A. M., Ghoneim M. F., Arslan A. I., and Harraz H. Z. 1986 Mercury dispersion around El Sid – Fawakhir gold mine, Eastern desert, Egypt. *Journal of African Earth Sciences*. Vol. 5, No.5, 1986, pp. 465-469.
- El-Bouseily A. M., Ghoneim M. F., Arslan A. I., and Harraz H. Z. 1987 Primary dispersion and relative mobility of elements in the mineralized zone of the El Sid gold mine, Eastern Desert, Egypt. *Economic Geology*, Vol. 82, 1987, pp. 767-772.
- Gabra S.Z., 1986, Gold in Egypt – a commodity package. Minerals, petroleum and groundwater assessment program, USAID Project 263-0105, Cairo.
- Harraz H. Z. 1995 Primary geochemical haloes, El Sid gold mine, Eastern Desert, Egypt. *Journal of African Earth Sciences*. Volume 20, Issue 1, January 1995, Pages 61-71.
- Hassaan M.M., and El-Sawy K. 2009 Tectonic Environments and Distribution of Gold Deposits in the Pan African Nubian Shield, Egypt. *Australian Journal of Basic and Applied Sciences*, 3(2): 797-809, 2009.
- Hume W.F. 1937 *Geology of Egypt*. Government Press, Cairo.
- Kochin A, 1962 Report to the Egyptian Geological Survey and Mining Authority on Eastern Desert gold occurrences, 1962.
- Kochin, G.G., and Bassyuni, A.E. 1968, Report on the generalization of geological data (under contract 1247).
- Meyer C. 1997 Bir Umm Fawakhir: Insights into Ancient Egyptian Mining. *JOM*, 49 (3) (1997), pp. 64-68.
- Minex Minerals Egypt Ltd. 1989. Report on regional exploration of the El Sid Concession. Internal report, Jan. 1989.
- Minex Minerals Egypt Ltd. 1990. Report on work carried out at El Sid South, Internal report, Jan. 1990.

Oriental Institute, Chicago. The Bir Umm Fawakhir Survey. Annual reports.  
[www.oi.uchicago.edu/research/pubs/ar/91-92/fawakhir.html](http://www.oi.uchicago.edu/research/pubs/ar/91-92/fawakhir.html)

Osman, A.M., Kucha, H., and Piestrzyfiski, A. 1997. Gold from Atallah gold mine area, Central Eastern Desert, Egypt. Mineral Deposits, Papunen (ed.), 1997. Balkema, Rotterdam.

USGS - Mineral Resources On-Line Spatial Data-base - El Sid/Fawakhir Gold Deposit

Wasset, B., Bulgatov, A.V., 1973. 1970-71 Report on the results of prospecting of El Sid. Semna internal report, No. 22, 1973.

El Shazly, E.M., 1959. Notes on the mining map of Egypt. Repts. 20th Intern. Geol. Congress, Mexico (1956). Assoc. African Geol. Surv., pp.423-437.

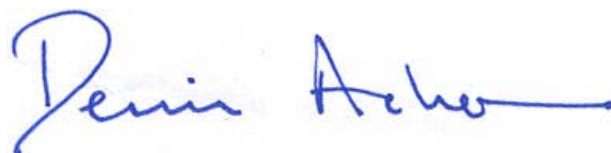
Neubauer (1959) report on El Sid mine.

## 22.0 DATE AND SIGNATURE PAGE

This Technical Report entitled “NI 43-101 Technical Report on the Fawakhir/El Sid Exploration Concession Area, in Egypt”, is dated 16th December 2010.

Signed this 16th day of December, 2010.

**BEHRE DOLBEAR INTERNATIONAL LTD.**



Per:

Name: Denis Acheson

Title: Chairman


### 23.0 CERTIFICATE AND CONSENT

To Accompany the Report Entitled “NI 43-101 Technical Report on the Fawakhir/El Sid Exploration Concession Area, in Egypt”, dated 16th December 2010.

I, Richard James Fletcher, do hereby certify that:

- i. I am a Senior Associate with the firm of Behre Dolbear International Limited with an office at: 3rd Floor, International House, Dover Place, Ashford, Kent, TN23 1HU., and do hereby certify that:-
  - i. I am a graduate of the University of Leicester with a Bachelor of Science Honours degree in Geology and an MSc. in Exploration Geology from the University of North Queensland, Australia, and have practiced my profession continuously since 1966 and have been responsible for estimation of Mineral Resources and Mineral Reserves of gold mines and gold exploration projects for more than 40 years. I have worked on, visited and reported on many of the operating and/or abandoned gold mines in Egypt, Sudan and Saudi Arabia that are geologically similar, during the past 30 years.
  - ii. I am a Fellow in good standing of the Australasian Institute of Mining and Metallurgy and a Chartered Geologist, and a Member in good standing of the Institute of Materials, Minerals and Mining and a Chartered Engineer.
  - iii. As of the date of this certificate, to the best of my knowledge, information and belief, this technical report contains all the scientific and technical information required to be disclosed to make this technical report not misleading.
  - iv. I am a qualified person for the purposes of National Instrument 43-101 and am independent of the issuer as defined in Section 1.4 of National Instrument 43-101 and I have not had any prior involvement with the property that is the subject of this report, nor have I received, nor do I expect to receive, any interest, directly or indirectly, in any of the Property or securities of Abenteuer Resources.
  - v. I have made a 2 day visit to the Fawakhir /El Sid Concession area in November 2009 and I have also reviewed technical data made available by SMW Gold Ltd and I am responsible for all sections of this report.
  - vi. I have read National Instrument 43-101 and Form 43-101F1 and the technical report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.

Signed.....



Date 16.12.10

R. J. Fletcher M.Sc., B.Sc. FAusIMM, MIMMM, C.Geol, C.Eng.

at Conwy, UK.