

**Possible Gold and Industrial Metal
Content and Value
in Exploration Licence EXPL 5/2009**

Pampana River

**Tonkolili District,
Northern Sierra Leone**

September 2010

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1. Summary

Exploration Licence No. EXPL 5/2009 was issued to Allied Mining and Supply Ltd. (AMS) on 12th August 2009. The licence is located in the Kholifa Rowalla, Kafe Simiria and Tane Chiefdoms in the Tonkolili District of the Northern Province of Sierra Leone covering an area of 141.3 km². The concession is situated on the western fringes of the southern Sula Mountains greenstone belt and for most of the northern and central part it straddles the Pampana River. On the west of the southern part, the concession runs along the Pampana River.

The property is in the heart of one of Sierra Leone's richest alluvial gold mining fields, South of the Sula Mountains in the Greenstone belt on the North Pampana River, around 120 miles east of the capital, Freetown. With gold at over \$1,200 per ounce, high tonnage alluvial mining is extremely attractive. Assay results from a recent sampling program (completed spring 2010) reveal widespread and commercially minable alluvial deposits of Rare Earth and transition metals in addition to gold values.

The Sula Mountains comprise an elongate chain some 120 kilometers long by 16 kilometers wide which forms an open, northerly-trending arc. The mountains represent a relict zone of volcano-sedimentary rocks, now metamorphosed to green schist and amphibolites grade. A broad band of ultra basic rocks in the northwest is succeeded to the southeast by amphibolites with horizons of banded iron formation.

The major part of Sierra Leone is underlain by granitic gneissic and supracrustal rocks of Archaean age (>2600 m.a.) which make up a granite-greenstone belt-mobile belt terrain forming part of the West African Craton. The age of this orogenic belt is Archaean (3200-2600 m.a.), but Eburnean Age (2090-1830 m.a.) deformation is found in its southern continuation in Liberia. A series of major northwest southeast-trending shear zones cut across the regional trends of the Archaean greenstone belt relicts in Sierra Leone. These zones are considered to have developed during the latter part of the Liberian event as an integral part of the deformation process. The interaction between the two orientations of structure created a locus for large, long-lived complex trap sites capable of hosting significant concentrations of hydrothermal mineral deposits.

The history of gold and diamond mining in Sierra Leone goes several years back. In 1926, the Sierra Leone Geological Survey discovered alluvial gold associated with the greenstone belts. From 1930 to 1946, gold was produced commercially from the more accessible Kangari Hills and Pampana River areas, with peak production of 40,764 ounces of bullion in 1936. Following the enactment of an ordinance permitting the local people to work gold, alluvial operations resumed on the Pampana River with an average production of 2,850 ounces until 1954, when dredging ceased. Production records since then are incomplete, though in the late 1980s some 10 kilogrammes of gold were reportedly produced monthly from artisanal workings in the Lake Sonfon area. Total official production was 342,784 troy ounces.

2. Property Description and Location

The Pampana Exclusive Prospecting Licences (EXPL 5/2009) lie 150km east of Freetown and cover an area of 139km², at the southern end of the Sula Mountains greenstone gold belt. The current exploration property is located in the heart of one of Sierra Leone's richest known alluvial gold mining fields. The property covers approximately 140.1 square kilometers

of prime exploration and mining concession located south of the Sula Mountains in the Greenstone belt on the North Pampana River, around 120 miles east of Freetown, Sierra Leone's capital.

3. Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Allied Mining and Supply Ltd., (AMS), concession is a nearly triangular licence for the exploration for gold and other base metals located on the Pampana River from where it emerges from the main schist belt in the Kolifa Rowalla, Kafe Simiria and Tane Chiefdoms in the Tonkolili District. The concession, about 141km² in area has a series of meanders of the Pampana from the northern part of the concession to the south where the river forms the western limit of the property. Access to the licence area is along the tarmacked Freetown-Kono Highway through Magburaka, which is the largest township and District Headquarters, about 240km east of Freetown. Several unpaved roads and foot tracks crisscross the property.

The climate is a wet tropical monsoon, with a single wet season each year. The average annual rainfall is about 2,500 centimeters. The greater part of this rain falls in the wet season, from mid-May to mid-November. The wettest month is usually August, but rivers attain maximum discharge at their lowest in March and April, and begin to increase in May. Ground water levels do not rise significantly until late July. Daytime shade temperatures range from 18° to 35°C with 65% humidity in the dry season and up to 95% in the rainy season. The coldest month on average is January when dry winds called 'Hamattan' blow from the north east towards the coast.

The original vegetation was tropical rain forest, but over most of the region, the forest has been destroyed to make way for farms. Residual areas of primary forest remain particularly along river banks. Elsewhere, the land has all been farmed on the shifting cultivation system, and is normally covered with dense secondary bush whose height varies with the number of years that have elapsed since the ground was farmed. In the north, where rainfall is less, there are large areas where the secondary bush has been replaced by elephant grass, with shrubs and trees persisting only along the watercourses.

The Pampana River has its source from Lake Sonfon in the northern Sula Mountains which is well known for its gold mineralization. In its course, the river action erodes the mineralized primary gold deposit and carries the gold with other heavy minerals in the eroded sediments to be deposited in suitable locations along its course. One suitable location is the meanders of the river within the concession area. The river flows south- and west-wards across the main body of the Sula mountains greenstone belt. The Sula Mountains comprise an elongate chain some 120 kilometres long by 16 kilometres wide which forms an open, northerly-trending arc. The mountains comprise a relict zone of volcano-sedimentary rocks, now metamorphosed to greenschist and amphibolite grade.

Having descended the steep valleys of the Sula Mountains and entering the subdued granitic terrain surrounding the Sula Mountain, the Pampana River becomes a series of meanders with several rock bars exposed across the river. These rock boulders and series of meanders have become locations for the deposition of heavy minerals and have become the locus for alluvial gold mineralization and therefore alluvial mining.

4. History

Historically, the Pampana River and its tributaries supported some of the richest alluvial gold workings in the Sula Mountains. The entire stretch of the Pampana River along the southern boundary of the licence was dredged for gold in the 1940s and '50s. The United Nations Development Programme (UNDP) conducted a joint geochemical survey with the Sierra Leone Geological Survey in 1987. The work located gold anomalies in streams along the Pampana River.

Gold placers have been mined from the entire greenstone belt with the exception of the Maranda. The most productive has been the largest belt - the Sula Mountains/ Kangari Hills. Virtually all production records have been from this belt. Amongst the most productive areas have been from rivers in the Lake Sonfon area, the Tebenko River (Makong, Makele) the Mokeke River and Maranda, the Yirisen River and Pampana River.

The largest production has come from the dredging of the Pampana River but one of the dredge tails which was sampled was estimated at 0.2gm per cubic yard. The most lucrative section of river has revealed grades of 1gm per cubic yard with an average 0.5gm per cubic yard in the river which is 60m wide with rock exposures. Dredging was successfully done by the Pampana Mining Company for at least 20 miles along the river.

Between April 1984 and May 1987 the United Nations Revolving Fund (UNRF) for Natural Resources Exploration undertook an extensive regional programme of gold exploration in the Pampana district of the southern Sula Mountains. The programme was designed to identify the source rocks of the alluvial gold being mined extensively by artisanal miners. Stream sediment sampling (1,087 samples), soil sampling (2,474 samples), topographic surveying, mapping, pitting and trenching were undertaken. Following verification of stream sediment anomalies, two areas, namely, Yirisen and Masamank (South Pampana EXPL) were targeted for detailed soil sampling with a total of 1,477 sample sites.

At Yirisen soil sampling grids were extended 2.5km north-eastward from the northern limit of known gold mineralization. Two anomalous gold zones were defined by a 50 parts per billion (ppb) gold in soil contour. The most southerly anomaly is comprised of three parallel mineralized trends, the most easterly of which continues for 700m from the mapped extent of the Yirisen deposit. Some 1,200m north-east of the known mineralization, a second 1,500m long by 200m wide gold anomaly extends along the contact between amphibolite and talc schist lithologies. A second grid, 400m east of the main Yirisen grid at Kalmoro, identified a 750m long by 500m wide northeast trending anomalous gold zone, parallel to the trend of the Yirisen gold system.

The Yirisen project has many hallmarks of a potentially significant gold deposit. Certain parallels in terms of the style and extent of shear zone hosted mineralization can already be drawn with Mano River's KGL gold deposit (located approximately 350km south east) in western Liberia, where an initial gold resource of 610,000 ounces (indicated and inferred) at an average 4.8 grams per tonne (g/t) has been defined.

The most recent holder of a licence in the vicinity of the AMS Ltd concession, Golden Leo Resources, identified several structural sites considered to have potential for hosting gold mineralization within the prospect. Air photo interpretation on a more detailed scale was utilized to define target zones more precisely. Preliminary reconnaissance geological and structural traversing located mineralized amphibolites and previously unreported artisanal gold workings.

5. Geological Setting

The prospect previously held by Golden Leo which adjoins the AMS concession to the south lies in the southern part of the Sula Mountain Greenstone Belt, within a complex sequence of folded and sheared metasediments and metavolcanics with granitic intrusions both between folded greenstone units immediately north of the Pampana River, and in an anticline exposed within the river.

About 0.5 to 1.5 kilometers northeast of the prospect, a series of vertically-dipping ultramafic volcanic and metasediments contain pyritic bands with low gold values. Quartz stringers with pyrite, chalcopyrite and gold occur, and chalcopyrite-bearing quartz float with up to 20 g/t Au was found in the area. Approximately one kilometer farther east, the Yirisen zone comprises an anatexizing zone of aplitic sericitic quartz lodes in talc sericite schist with associated fuchsite. Seven veins range from 0.5 to 5.28 metres in width and carry arsenopyrite, chalcopyrite, galena, sphalerite, antimony minerals and pyrite, together with gold values averaging 18 g/t Au. The zone was traced for 400 metres, and the Survey estimated a resource potential of 1,000 oz Au per 1 metre depth.

The Pampana River drains large areas of known gold occurrences hosted in Archean greenstone belts. The Pampana North region is believed to contain significant reserves of high value gold and other precious metals. The region also features high quality alluvial gravels and hard rock quartz vein systems, situated near Sierra Leone's largest known hard rock vein deposit.

The northeastern section of the property spans 1,200 feet and is situated nine kilometers from the prolific Yirisen Gold deposit. Past sampling and ongoing assaying results have indicated the presence of lode gold reserves.

6. Deposit Type

Hard rock gold mineralization was first noted at Yirisen by the Geological Survey of Sierra Leone in 1958 as part of a programme of mapping and sampling of the country's major hard rock artisanal gold mines. The Survey identified seven north easterly trending sub-vertical lodes of gold mineralised quartz veining, averaging 150m in length. Sampling by the Survey returned numerous gold intersections in trenches.

Yirisen is one of the most advanced gold projects in Sierra Leone, historic work returning a best trench intersect of 6.4m@23g/t Au. The Yirisen gold system, as defined by a combination of mapped sites of in situ mineralization, artisanal workings and soil geochemical anomalies, trends north-northeast with a current inferred strike length of 3.75 km, open in both directions. Independent consultants ACA Howe International Ltd reported from a recent visit to Yirisen that several bands of high-grade gold mineralization occur over a total width of up to 200m. Artisanal workings, extending to depths of up to 5m, confirm that

gold is not solely restricted to the high-grade veins and that within both the oxide and sulphide zones, is partially free milling. Reports indicate recoverable alluvial gold on the Pampana North section (40.1sq/km) at over 500,000 oz., with average grades of 0.12 ounces per tonne qualifying as superior grade deposits as defined by the US Bureau of Mines. AMS Ltd was granted a boundary modification by the Sierra Leone Mines Ministry to include an adjacent 100 square kilometres.

Much of the historic trench and channel sampling was selective in nature, with disseminated mineralization between high grade zones of veining and sulphides appearing to have not been adequately tested, despite reports by local miners that gold is won from this material. An aggressive drilling programme must be designed to thoroughly test the mineralization and permit the estimation of a preliminary resource.

7. Mineralization

The Pampana River drains large areas of known gold occurrences hosted in Archean greenstone belts. The Pampana North region contains significant reserves of high value gold and other precious metals. The region also features high quality alluvial gravels and hard rock quartz vein systems. The northeastern section of the property spans 1,200 feet and is nine kilometres from the Yirisen Gold deposit. Past sampling and ongoing assaying results have indicated the presence of lode gold reserves.

A compilation of field mapping, Landsat and air photo interpretation to assist the prioritization of targets indicated by the initial regional geochemical results was also conducted. It is concluded from this that the area has potential for primary gold in veins and iron formation, volcanic-associated base metal mineralization, nickel laterite, and granite-hosted molybdenum mineralization. Gold targets exist within an extensive zone of imbricated tectonic rock slices at the intersection of four crustal scale shear zones. Historically the Pampana River and its tributaries supported some of the richest alluvial gold workings in the Sula Mountains. Structural features known to host gold and base metal mineralization are exposed within the Pampana EPLs including that for AMS Ltd.

Gold is considered to be derived from sericitic quartz vein lodes and tourmaline bearing pegmatites, the host rock being predominantly sheared ultramafic rocks, now serpentized and talc-tremolite schists. In many other schist belt gold deposits in West Africa, for instance at Mano's KGL and Weaju projects in Liberia, the host rock is also a strongly sheared, mylonitised and therefore silicified talc-tremolite schist.

8. Adjacent Properties

In the Pampana Area, several licences surround the concession. Immediately to the north is the Calone Mining Company concession which is exploring for lode gold in its area. The area was held by Golden Leo Resources previous to the current holder. Golden Leo has conducted sub-regional soil, laterite chip and lateritic lag surveying over the licence area at a sample density of between three and five per square kilometer. The geochemical programme confirmed the presence of gold associated with shear zones in the core of the fold structure and a series of anomalous zones have been identified which merit follow-up investigation.

Golden Leo identified several structural sites considered to have potential for hosting gold mineralization within the prospect. Air photo interpretation on a more detailed scale was utilized to define target zones more precisely. Preliminary reconnaissance geological and structural traversing located mineralized amphibolites and previously unreported artisanal gold workings.

It is concluded from these studies that the prospect has potential for primary gold and associated base metal mineralization and nickel laterite. A southward extrapolation of this into the AMS concession would warrant a systematic exploration for primary gold mineralization in the AMS concession.

The accompanied geological map with the current concessions shows the status of licences in the vicinity of EXPL 5/2009. This indicates that the areas which have potential for gold mineralization immediately around the AMS concession are the subject of current licences and are therefore not available for exploration by non-holders. It is perhaps possible for a JV arrangement to be met by the holder on successful negotiation.

9. Metallurgical Testing

During prospecting undertaken by AMS in 2009, samples collected from five sites along the Pampana River were sent for analysis at the ALS Chemex Laboratory in the USA. Assays of these heavy mineral concentrates including black sand proved quantities of rare earth metals and other valuable minerals such as Tantalum, Thallium, Zirconium, etc. in grades that could be considered commercially exploitable. Documented information and history on the hard rock areas within and immediately north of the AM&S Pampana prospect provide the opportunity for the Company to pursue an aggressive exploration program parallel with the planned gold and mineral sands production.

10. Mineral Resource and Mineral Reserve Estimates and values

Allied Mining & Supply Ltd., (AMS), recently completed its initial alluvial testing program on a section of the Sierra Leone property with promising results. The program was carried out in coordination with local mining authorities, Sierra Leone-based geologists and AMS staff, using dredges and portable exploration washes plants. Areas sampled included river beds, flats and terraces using random sampling, satellite images and historical data for site selection.

Verified grades on river bank pits approached 10g/t; however more typical grades using random sampling were in the 1-2g/t range. The Company expects future drilling and bulk sampling to also reveal grades in that with occasional heavy mineralization. Stripping ratios should fall within 2:1 to 5:1 to one range making recovery highly cost effective. Heavy mineral sands were encountered throughout the prospect and in all gravel deposits. Previous assays on these sand types recovered from nearby AMS locations proved them to be a valuable secondary resource in commercially exploitable grades. Current samples have been processed at the RMS Ross Lab in Canada (Laboratory analytical results attached). Gold purity averages 90%+. The historical data estimates the potential value of the prospect to be in excess of \$500,000,000 at gold's current value holding steady at well over \$1,000 per ounce.

A Mahdi of Geo Resources (SL) Ltd. did an analysis of previous work conducted on the Pampana River in areas within the AMS concession. He came to the following conclusion:

“In determining the possible volume of auriferous gravels within EXPL 7/94, gravels within the present Pampana channel are discussed separately from those developed in the flats and terraces flanking the Pampana river bank.”

River Bank Deposits:

A study of the contours on Topographic Sheets 44 and 55 and the assumption that the gravels laid by the Pampana would not spread more than 1,500 metres from edge of the present river channel, have allowed possible gravel retention sites to be outlined and measured. The area of these retention sites total 11.7888Km² (11,788,800sq.metres) The thickness of the gravel is taken as the average of the gravel thicknesses as in all areas tested by NDMC (SL) Ltd., in its A₂ and A₃ development sampling programme. This approximated to 2.0 metres. The volume is therefore 23,577,600cu.metre (47,155,200cuyds.)

Pampana Channel Deposit:

Total length of river under consideration approximates 24 kilometers, with a mean width of the about 100 metres.

The following assumptions are made in computing a possible volume of gravels in the channel.

- (i) only about 30% of the river is dredgeable.
- (ii) Gravel thickness in the channel is 1.5 metres.

Possible gravel volume in channel:

$$8000 \times 100 \times 1.5 = 1,200,000\text{cu.metres (1,569,540cu.yds.)}$$

GOLD CONTENT IN THE CONCESSION

(a) In the Pampana Channel:

- (i) Assume the grade of 0.811 gm/m³ recovered by 1950 Dredge for a section of south of the concession holds good for dredgeable sections, then the gold content is 973,200gms or 31,293oz.
- (ii) Assume that depletion due to illicit mining over the years is set at 30% then the gold content is reduced to 21,905ozs

(b) In the Flanking Flats and Terraces:

Weighted Mean grade = 0.0098oz/yd³

Gravel Volume = 47,155,200yd³

Assume 70% of gravel would be economic, volume is reduced to = 33,008,640yd³

Gold content = 323,485ozs

Depletion of 15% Gold due to
previous mining - lawful and illicit,

Gold content is reduced to = 274,962ozs

11. Other Relevant Data and Information

Development of the prospect area can occur in two phases: phase one will define both alluvial and lode reserves for mining; phase 2 will be its reserve development and commercial mining program. Testing and existing data indicate gold concentrations ranging from 1 to 18 grams per tonne of material. Fire assays conducted in Freetown by AMS show the gold purity at 89%. Assays of black sand concentrates by AMS in 2009 proved quantities of rare earth metals and other valuable minerals in commercially exploitable grades. Of particular interest are the values of the ten of the lanthanide elements, as well as thorium, tantalum, yttrium, zirconium and chromium.

These sands are consistent and verified in the river channel and along the banks and benches. AMS geologists estimate 50kg/tonne rich black sands easily recoverable by dredging and land-based mining, suggesting the likelihood of highly profitable and immediate placer mining. Inspection of artisanal mining and prospecting sites within the license area show black sands throughout the claim.

12. Conclusions and Recommendations

The potential for alluvial gold mineralisation has been established in the concession area based on the deposition of gold bearing sediments eroded from the primary gold mineralisation of the neighbouring Sula Mountains greenstone belt. The Sula Mountains has had a long history of gold mining, having produced gold from its primary sources (lodes and veins) and alluvial deposits from the terraces of the rivers that drain the schist belt.

The AMS concession which is located around the Pampana River provides a target for the exploration and eventual exploitation of these gold deposits. Dredging of the Pampana River has indicated an estimated average 0.2gm of gold per cubic metre but grades between 1gm per cubic metre and a median of 0.5gm per cubic metre in areas of the river 60m wide where rock exposures abound such as in the concession area is not uncommon.

Much of the historic sampling by trench and channel that has been conducted has been selective in nature, with disseminated mineralization between high grade zones of veining and sulphides appearing to have not been adequately tested, despite reports by local miners that gold is won from these materials.

An aggressive first phase drilling programme needs to be designed to thoroughly test the mineralization and permit the estimation of a preliminary resource.

It is considered that the Yirisen target represents a potentially significant gold deposit in terms of size and grade, and that further gold targets are likely to exist within Pampana due to the favorable geological and structural setting.

It is recommended therefore that a careful and detailed study of the geomorphology of the concession be conducted to determine the distribution of terraces in the concession, the

overburden and gravel thicknesses of the deposits. This can be done by a grid system over the deposit and pits located at regular intervals on the grid. This will enable grade measurement and reserve calculation to define a mining model of the deposit. While this is being done, a small scale dredging of the river channel can commence production to support the prospecting of the terrace deposits. In addition to the investigation of the alluvial potential, a detailed geological mapping (at a scale of 1:10,000) of hard rock could be conducted. This will be correlated to the adjoining hard rock potential of the surrounding concession and may indicate hard rock mineralization within the AMS concession. Drilling of any target could then be followed.

13. References

14. Statement of Qualifications and Consent of Author

Until June 2009, I was Director of the Geological Survey Division of the Sierra Leone Ministry of Mineral Resources which I joined in 1973 as geologist after graduation with a B.Sc Honours degree in geology from Fourah Bay College, University of Sierra Leone. Have over 35 years experience in the practice of geology combining both extensive field based mineral exploration and reconnaissance geological mapping with special interest in the exploration for gold, base metals and diamonds. Has several years experience in Administrative Management of the Geological Survey; My duties included advice to the Minister on all geological matters, including technical and policy issues pertaining to prospecting and exploration. Overall planning and supervision of field work. Maintenance of laboratory, library and record facilities. Monitoring of prospecting and exploration activities of mining and exploration companies. Overall supervision and financial management, and administration of senior staff. Technical adviser to the Minerals Advisory Board (MAB); Verification of work programmes and areas in applications for prospecting and exploration licenses. Policy Formulation for the Ministry and the Survey Negotiation with Mining Companies.

PUBLICATIONS/WRITTEN PAPERS:

- (a) Dissertation entitled "Geology of the Marampa-Masimira Area" - the iron ore mining district of Sierra Leone, 1973 (unpublished).
- (b) Field work Report in the Pyrenees mountain of Spain entitled "Engineering Geology of part of Pont de Suet Area, Central Pyrenees, Province Lerida, Spain", 1980 (unpublished).

- (c) Group study Project Report- Nickel Sulphide Project, Carnilya Hill, Western Australia, 1982 (unpublished).
- (d) Compilation of various mapping projects for the publication of The Geological Map of Sierra Leone at scale of 1:250,000 (Published by Council for Geoscience of South Africa – on behalf of the Government of Sierra Leone in 2004).

TRAVEL: Traveled to Botswana, Guinea, Ghana, Nigeria, Kenya, Senegal, Tunisia, Zambia, Morocco, South Africa, Namibia, Tanzania, Canada, The Netherlands, Spain, France, UK, Australia, Hong Kong, Finland, Germany, Israel and USA.

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