

ZHOU Yequan, PANG Baocheng, CHEN Youbin and LIU Yuandong, 2014. Comprehensive Prospecting Prediction of the Shijia Gold Deposit in Northwest Guangxi, China. *Acta Geologica Sinica* (English Edition), 88(supp. 2): 1334-1336.

## Comprehensive Prospecting Prediction of the Shijia Gold Deposit in Northwest Guangxi, China

ZHOU Yequan<sup>1</sup>, PANG Baocheng<sup>1,\*</sup>, CHEN Youbin<sup>2</sup> and LIU Yuandong<sup>3</sup>

<sup>1</sup> Guangxi Key Laboratory of Concealed Metallic Mineral Exploration, Gulin University of Technology

<sup>2</sup> Guagnxi Bureau of Geology, Mineral Prospecting and Exploitation

<sup>3</sup> Zhejiang Institute of Geological Survey

### 1 Introduction

The Shijia gold deposit, located in Baise City, Guangxi Province, is a typical micro disseminated gold deposit spatially closely related to diabase. The predecessors had studied ore-forming material sources of deposit (Liu et al., 2011; Liu et al., 2013) and diabase chronology (Hu et al., 1995). This paper mainly conducts a collective geological prospecting prediction in the mining area based on geophysical and geochemical anomaly characteristics and geological prospecting indicators. This will provide the basis for future exploration and prospecting.

### 2 Basic Geology of Deposit

The Shijia gold deposit sits in the Longchuan dome, which located to the northeast of the Youjiang fault zone. The ore-bearing strata are Yanguan Formation and Datang Formation of Lower Carboniferous Series, which are mainly composed of hot water sedimentary siliceous rocks and siliceous mudstone. The main ore-controlling structured of deposit are syndepositional fault on the edge of the dome and contacted fault zone between diabase and surrounding rocks within the dome. Totally 12 ore bodies have been discovered in the mining area, which are mainly located at the contacted fault zones of diabase and surrounding rocks and the fault zones inside diabase. Wallrock alterations closely related to Au mineralization include silicification, pyritization and arsenopyritization.

### 3 Indicators for Deposit

Main alterations of the deposit are the silicification and

\* Corresponding author. E-mail: 344026863@qq.com

pyritization, and both of them often occur together. Pyrite is one of the most important minerals containing gold, and gold content of the ore is proportional to the pyrite content. Due to weathering, the majority of pyrite is changed into limonite forming red brown or yellow brown gossan which acts as a good prospecting mark. In addition, the ore bodies are mainly formed at the contacted fracture zones of diabase and siliceous (shale) rocks, and are accompanied by pyritization, ferritization, kaolinization, silicification, chloritization; therefore, appearance of faults and alterations near the contact zones is also good mark to discover gold ore bodies. Diabase in the mining area is widespread. There is long contacted boundary between diabase and surrounding rocks. So, these contacted zones are important future prospecting targets for discovering new gold ore bodies with high value. However, most of the mining area is covered by thick topsoil on the surface, and the indicators for deposit are not obvious, it is necessary to find the prospecting targets with the help of geophysical and geochemical methods.

### 4 Geophysical and Geochemical Anomaly Characteristics in Mining Area

Gold mineralization zone in the Shijia gold deposit are mainly distributed in the vicinity of contact zones between diabase and surrounding rocks, and controlled by fracture zones and diabase. The contacted alteration zones of pyritized diabase and surrounding rocks show high polarization and high magnetism. According to this physical characteristics, whole area measurement was conducted on the Shijia gold deposit with high-precision magnetic survey and induced polarization method in scale of 1/10000. It is found from the high precision magnetic

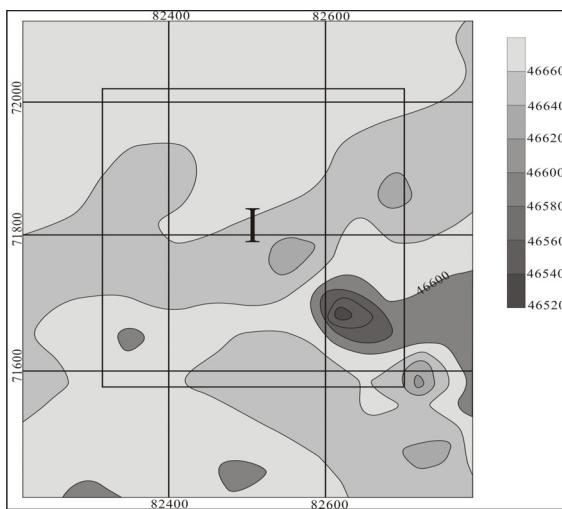


Fig. 1. High-precision magnetic survey on the Area I of the Shijia gold deposit.

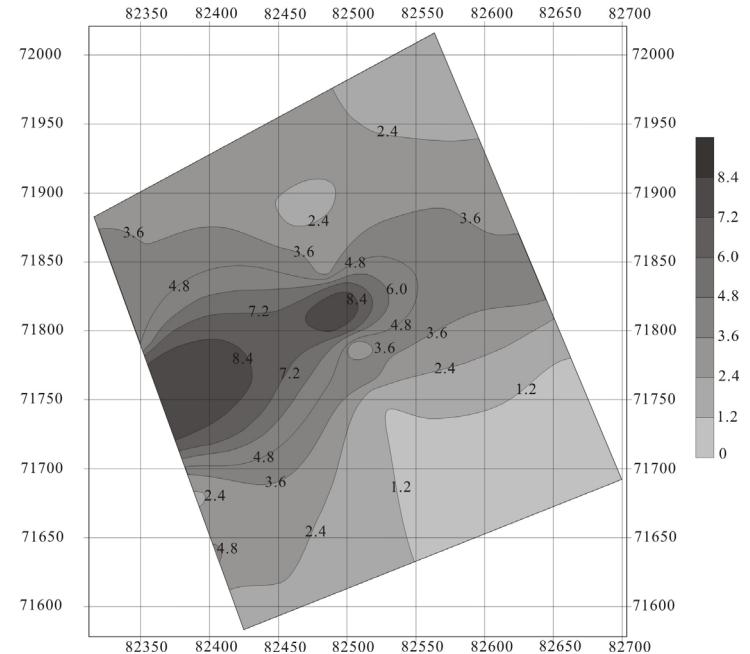


Fig. 2. Polarization plane anomaly of the Shijia gold deposit.

survey (Fig. 1) that the upper left part of the mining area (hereinafter referred to as Area I) has a strip of magnetic anomaly, which is presumed based on the existing geological data to correspond to the distribution of diabase bodies and inferred as contact surface of diabase and siliceous rocks at the boundary of magnetic anomaly. It is found from the polarization plane anomaly figure (Fig. 2) that the above magnetic anomaly area (Area I) has high polarization, and the polarization anomaly is distributed in the form of strip, which is closely related to the contact zones of diabase and siliceous rocks. The polarization anomaly is roughly consistent with magnetic anomaly in the direction, indicating that the buried diabase in this area have high magnetism and high polarization. It can be inferred that there might be good pyritization in this diabase.

It can be found from 1/5000 soil geochemical anomaly measurement of the Shijia gold deposit (Fig. 3) that Area I is the Au concentrated anomaly center, with the maximum anomaly value up to 692.0 ppb. The shape of anomaly area is approximate semi-ellipse. Corresponding rocks below the surface are siliceous rocks with siliceous mudstone at the Yanguan Formation of Lower Carboniferous Series and Indosinian diabase. In structure sense, the anomaly locates in the intersection of North-West Fault  $F_7$  and North-East faults.

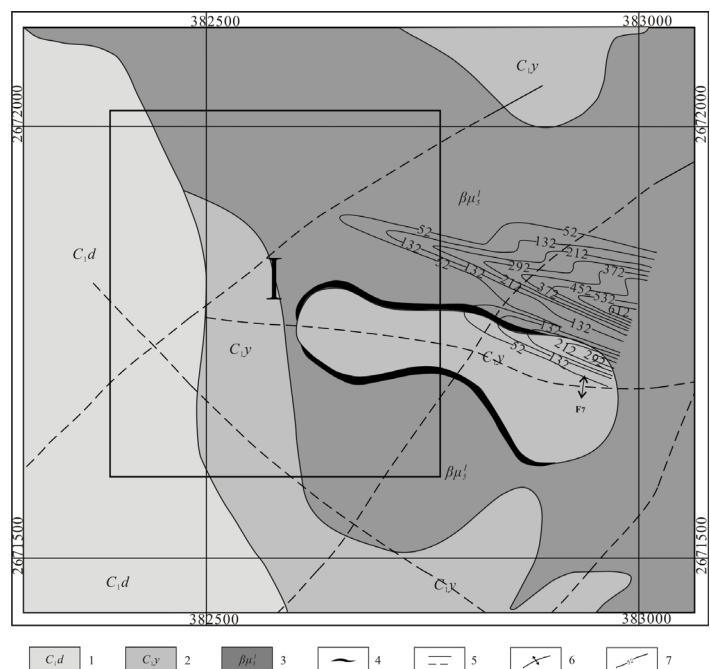


Fig. 3. Au anomaly on the Area I of the Shijia gold deposit.

1, Carboniferous System Lower Series Datangian Stage chert limestone and siliceous rocks; 2, Carboniferous System Lower Series Yanguanian Stage chert limestone and siliceous bands; 3, Indosinian diabase; 4, Inferred ore bodies; 5, Measured/inferred faults; 6, Measured anticline; 7, Gold anomaly lines and anomaly value.

## 5 Conclusion

It can be seen from the above geophysical and geochemical data that the upper left part of the mining

area (Area I) shows geophysical and geochemical anomaly; from the perspective of geology, Area I is located at the contact zone of siliceous rocks with siliceous mudstone at the Yanguanian Stage of Lower Carboniferous Series and Indosinian diabase, and at the intersection of North-West and North-East faults, which is the favorable site of mineralization in line with the mine prospecting marks. Therefore, Area I is delineated as prospecting area for mining as key exploration area for the next step.

## Acknowledgments

The research is supported by the Foundation of Guangxi Key Lab of Hidden Metallic Ore Deposits Exploration (11-031-20).

## References

- Hu, R.Z., Su, W.C., Bi, X.W., and Li, Z.Q., 1995. A possible evolution way of ore-forming hydrothermal fluid for the carlin-type gold deposits in the Yunnan-Guizhou-Guangxi Triangle area. *Acta mineralogica sinica*, 15(2): 144–149(in Chinese with English abstract).
- Liu, Y.D., Pang, B.C., Fu, W., Wu, R.H., Zhang, M., and Qin, X., 2011. REE characteristics and ore-forming indicator of the Shijia Au deposit in northwest of Guangxi. *Mineral Resources and Geology*, 25(4): 317–323(in Chinese with English abstract).
- Liu, Y.D., Pang, B.C., Zhang, J.F., and Rong, Y.P., 2013. Microelement geochemistry of pyrite from the Shijia gold deposit in northwest Guangxi. *Geology and Exploration*, 49 (3): 475–483(in Chinese with English abstract).