Technical Report for the Unkur Copper-Silver Deposit, Kodar-Udokan Area, Russian Federation

**Report Prepared for** 

European Uranium Resources Ltd. Azarga Metals Ltd. LLC Tuva-Cobalt



**Report Prepared by** 



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#### European Uranium Resources Ltd.

Unit 1, 15782 Marine Drive White Rock, BC Canada V4B 1E6 Tel: +1.604.536.2711

#### Azarga Metals Ltd.

200 Gloucester Road Sun's Group Centre, Level 5-1, Suite 9 Wanchai Hong Kong SAR Tel/Fax: +8862 8758 2318

#### LLC Tuva-Cobalt

Geologicheskaya Street 2 City of Chita Zabaikal'ye Province Russian Federation

#### SRK Consulting (Russia) Ltd.

4/3 Kuznetsky Most Street, build.1, 3<sup>rd</sup> Floor, 125009, Moscow, Russia

e-mail: info@srk.ru.com website: www.srk.ru.com Tel: +7 (495) 545-44-16 Fax: +7 (495) 545-44-18

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#### Author:

Robin Simpson, MAIG Principal Consultant, (Resource Geology)

#### With the assistance of:

Alexander Batalov, MAusIMM Senior Consultant (Resource Geology)

Dr David Pattinson, CEng, MIMMM Corporate Consultant (Minerals Processing and Metallurgy)

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# 1 Summary

#### Introduction

SRK Consulting (Russia) Ltd. (hereinafter referred to as SRK) was commissioned by European Uranium Resources Ltd. (hereinafter referred to as the Company) to prepare a report, in accordance with the requirements of NI 43-101, for the Unkur Project, located in the Zabaikalsky Region, Russian Federation. LLC Tuva-Cobalt, an indirectly owned 100% subsidiary of Azarga Metals Itd., holds the license for the right to explore and mine subsurface mineral resources of the Unkur Project.

This technical report summarizes the information available on the Unkur Project and demonstrates that the Unkur Project qualifies as an "early stage exploration property". In the opinion of SRK, this property warrants further exploration expenditures. An exploration work program of diamond core drilling and geological modelling is recommended.

Opinions and conclusions expressed by SRK herein are based on the historical exploration data collected during the 1969-1971 and 1975-1978 field campaigns.

SRK's opinion is valid through March, 2016. This opinion relies on the information provided by the Company by that time. In its turn, the information presented by SRK reflects specific technical and economic conditions at the time of reporting. Taking into account the specific character of mining these conditions can significantly change over a short time period.

SRK is not an insider, associate or an affiliate of European Uranium Resources Ltd., and neither SRK nor any affiliate has acted as advisor to European Uranium Resources Ltd., its subsidiaries or its affiliates in connection with this project. The results of the technical review by SRK are not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

### **Property Description and Location**

The licensed area of the Unkur Project is located in the Kalarsky District of the Zabaikalsky Region, 15km east of the Novaya Chara town. The area of the license is 53.9 km<sup>2</sup>. License ЧИТ 02522 БР for geological exploration and mining of copper and associated components at the Unkur Project belongs to LLC Tuva-Cobalt, an affiliated company of European Uranium Resources Ltd.

# Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Unkur site can be accessed from the Chara village and the Novaya Chara town by the yearround unsealed road. The distance from the site to Novaya Chara is about 22 km. The Baikal-Amur Mainline (BAM) railroad is located 5.5 km away from the licensed area.

There is an airport in Chara. Novaya Chara railway station is accessed by the BAM from Bratsk through the town of Severobaikalsk. In winter snow roads are used to access Chita and Taksimo.

The climate of the Project area is a harsh continental climate with very cold and long winters and short hot summers. The average air temperature in January at the upper elevations of the Project area is minus 27.8°C. The winter air temperature minimum in lower elevations is minus 57°C and at altitude, minus 47°C. The July air temperature maximum is plus 32°C. The cold and long winter (October to April) is characterised by high air pressure. Yearly precipitation distribution is very uneven. The first snow usually falls in mid-September and snow cover melts in the middle of April at lower elevations and in May at higher elevations.

The district is economically poorly developed. As of 2014 the estimated population of the Kalarsky district was 8,383 people within an area of some 56,000 km<sup>2</sup>.

There is a federal electric power line of 100 MW passing through the north-eastern part of the licensed area.

The Project area is located on the northern slopes of the Udokan range in the catchment of the Kemen and Unkur rivers. The Project area is characterized by low- and medium-mountain relief with absolute elevations of 1,100-1,200 m, and local differences in elevation of 100-200 m.

### History

The first phase of systematic exploration of the region was 1948-1953. This work established the copper-bearing properties of the Lower Proterozoic sedimentary strata, and the Udokan deposit and other deposits were discovered.

The Unkur deposit was discovered during 1:200,000 scale mapping in 1962.

Follow-up work, in particular trenching, was carried out in 1963. Two further campaigns of substantial exploration works (diamond drilling, trenching, mapping and geophysical surveys) took place in 1969-1971 and 1975-1978. These campaigns outlined mineralization over a strike length of approximately 5 km.

No field exploration works have been carried out at the Unkur Project since 1978.

Based on the results from the two exploration campaigns, estimates of copper and silver tonnes and grade were produced in 1972 (Table ES-1), 1979 (Table ES-2), and revised in 1988 (Table ES-3). These estimates adhere to the procedures and categories of the Soviet resource/reserve system. The qualified person has not done sufficient work to classify these historical estimates as current mineral resources or mineral reserves, and the issuer is not treating the historical estimate as current mineral resources or mineral reserves.

These historical estimates for the Unkur project were prepared in accordance with the Soviet Union resource/reserve classification system. The categories used in the Soviet system are based on reliability of the exploration data, complexity of the geological setting, and exploration maturity of the deposit.

NI 43-101 requires mineral resource reporting to adhere to the resource category definitions of the Canadian Institute of Mining, Metallurgy and Petroleum. The categories in the Soviet resource/system are incompatible with these definitions, and the estimation methods mandated by the Soviet system are different to the geological modelling and geostatistical estimation methods the qualified person would recommend as optimal for the Unkur deposit. Furthermore, the poor quality of the core remaining from the previous exploration programs, and the difficulty of doing detailed verification of historical results, means that any future program of resource definition drilling is likely to replace rather than build on the historical drilling data. Therefore, the historical estimates reported here should be regarded as an indication of exploration potential, instead of an inventory that is likely to be converted into mineral resources.

For the 1972 estimate, the combined strike length of the C2 and prognostic resources was 5 km, and the depth limit on the extent of the prognostic resources was 1000 m below surface. Prognostic silver resources were estimated within the copper mineralization domain. Average silver grades were determined based on the chemical assays of eight composite samples. The arithmetic mean of these samples is 73.3 g/t, and this grade was applied to all the blocks. Therefore, the prognostic resources of silver amount to 10.1 Kt Ag.

Resources	Block No.	Mineralization Thickness, m	Contained Ore, Kt	Average Cu Grade, %	Contained Metal, Kt
C2	Block 1	12.4	77,760	0.80	622
	Block 2	4.3	9,978	0.60	60
Total, C2 Category		9.8	87,738	0.78	682
Prognostic	Block 3	12.4	33,849	0.80	271
resources	Block 4	8.3	16,409	0.75	123
Total, prognostic resources		10.7	50,258	0.78	394
Total		10.1	137,996	0.78	1,076

 Table ES-1: Results from the 1972 estimate for the Unkur Project (Mulnichenko V., 1972),

 classified according to the Soviet Union resource/reserve classification system of 1960

Upon completion of the second phase of exploration works for the Unkur Project carried out in 1979, the second estimate for the Unkur deposit was performed with regard to the new drilling data (Table ES-2). Prognostic silver resources were again estimated within the copper mineralization domain, based on the chemical assays of eleven composite samples. The arithmetic mean of these samples is 68.3 g/t, and this grade was applied to all the blocks. Therefore, the prognostic resources of silver amount to 9.7 Kt Ag.

Resources	Block No.	Mineralization Thickness, m	Contained Ore, Kt	Average Cu Grade, %	Contained Metal, Kt
C2	Block 1	12.9	91,820	0.80	725
02	Block 2	4.3	9,978	0.60	60
Total, C2 Category		8.6	101,798	0.77	785
Prognostic	Block 3	12.9	24,685	0.80	195
resources	Block 4	8.3	16,409	0.75	123
Total, prognostic resources		10.6	41,095	0.77	318
Total		10.1	142,893	0.77	1,103

 Table ES-2: Results from the 1979 estimate for the Unkur Project (Berezin G., 1979), classified according to the Soviet Union resource/reserve classification system of 1960

In 1980 the Soviet resource/reserve classification system was updated. The changes primarily affected the definitions of the C2 resource category and prognostic resources: under the new system, the C2 category was grouped with estimated reserves, and the prognostic resources were divided into three categories: P1, P2, and P3. In 1988 the Unkur deposit was re-estimated and re-classified in accordance with the new classification system. A consequence of this revision was the entire inventory was classified as prognostic resources (Table ES-3).

Table ES-3: Results from the 1988 estimate of Unkur Project resources, classified according
to the Soviet Union resource/reserve classification system of 1980

Resources	Component	Contained Ore, Kt	Average Grade	Metal Contained
D1	Copper	82 500 0	0.79%	660 Kt
P1	Silver	83,500.9	68.3 g/t	5703 t
DO	Copper	58,107.7	0.75%	436 Kt
P2	Silver		68.3 g/t	3969 t
P3	Copper	87,532.5	0.77%	674 Kt

Resources	Component	Contained Ore, Kt	Average Grade	Metal Contained
	Silver		68.3 g/t	5979 t

The most recent assessment of the copper and silver resources for the Unkur Project was prepared by the geologists of the Central Geological Research Institute (TsNIGRI). The results of this estimate are presented in (Table ES-4). The data supporting the 2014 estimate are the same as for the 1979 and 1988 estimates, and the resource/reserve reporting system is the same as was in place for the 1988 estimate, but the estimated tonnes and metal were an order of magnitude lower than in the 1988 estimate.

The differences between the prognostic resource statements of 1988 and 2014 are due to different interpretations of how the Russian resource/reserve reporting system should be applied to the Unkur deposit. One of the main reasons for the substantially lower tonnage estimate in 2014 is that extrapolation down dip was limited to 300 m below surface, on the assumption that this would be the maximum depth of open pit mining. A greater depth limit, of 1,000 m below surface, was used to constrain the 1988 and earlier estimates, on the basis that the deposit could potentially be mined by underground methods.

Table ES-4: Results from the 2014 estimate for the Unkur Project (Volchkov and Nikeshin, 2014), classified according to the Russian resource/reserve classification system of 1980

Category	Block No.	Component	Tonnes, Kt	Average Grade	Metal Contained
D1	1	Copper	16,516.5	0.90%	148.6 Kt
P1	2		3,964	0.65%	25.8 Kt
Total D1		Copper	20 480 E	0.85%	174.4 Kt
Total P1		Silver	20,480.5	77.96 g/t	1,600 t

### **Geological Setting and Mineralization**

The Unkur Project is located in the Unkurskaya syncline formed by Lower Proterozoic metamorphosed sediments of the Aleksandrovskaya, Butunskaya, and Sakukanskaya formations. The syncline extends northwest-southeast for 10-12 km and is 4 km wide.

The copper-bearing horizon is confined to sediments of the lower subformation of the Sakukanskaya formation. The portion of the horizon delineated by historical mapping, drilling, trenching, and geophysics is located on the southwest limb of the Unkur Syncline, and dips northeast at 45-60°.

Within the copper-bearing horizon, higher grade mineralization (historical intersection grades of 0.7 to 1.2%) is concentrated in the centre of the horizon and has a sheet-like form. The thickness of the higher grade mineralized zone is typically 3-12 m, but with a maximum observed thickness (from trenching) of 24 m.

Primary minerals in the mineralized zone are chalcopyrite, pyrite, bornite, magnetite, hematite; accessory minerals are chalcocite and ilmenite. The oxide minerals present are malachite, broshantite and covellite.

A hypogene zonation of the mineralized zone is noted in the distribution of the copper minerals: a chalcopyrite-pyrite-bornite association is found in the centre; either side of this there is a monomineral chalcopyrite association, and then a distal pyrite association at the edges of the mineralized zone. The oxidised zone is poorly developed, to a depth of 5-10 m from surface. The mineralized zone is displaced by northeast-striking fault and breccia zones. Displacements are typically 20-70 m, but for some faults displacements are as much as 150 m.

### **Deposit Types**

The Unkur deposit is interpreted as a sediment-hosted stratiform copper deposit.

### Exploration

At the date of this report, no material exploration works have yet been conducted by, or on behalf of, the issuer. Historical exploration is discussed in the History section of this report.

### Drilling

Historical holes were drilled using a single-tube core barrel. All drill holes are vertical. Hard metal bits were used for soft rocks, and diamond bits were used for bedrock. The average core recovery from 8 drill holes that intersected copper mineralization was 65%. The maximum depth of the intersected copper mineralization was about 240 m.

SRK notes that there is no information on collar coordinates for drill holes and trenches in the reports from the 1969-1972 and 1975-1978 campaigns. All the drill holes and trenches are depicted on historical maps and sections, and the locations have been derived by georeferencing this hard copy information. Actual drillhole collar positions on site were not found during the SRK site visit, so the collar locations have not been verified by the qualified person.

### Sample Preparation and Analyses

Historical samples were analysed for copper by the Central Chemical Laboratory, Chita. In addition to the copper assays, composite samples were fire assayed for silver and gold. The historical information available for the Project does not include a description of sample preparation procedures and equipment. In SRK's opinion, the historical samples are not suitable for mineral resource estimation because there is insufficient documentation of the historical sample preparation and analytical procedures, and insufficiently rigorous quality control protocols were applied.

### **Data Verification**

Data verification by the qualified person was limited to a personal inspection of the property and a review of documentation from the historical exploration campaigns. No confirmatory sampling was carried out.

In the qualified person's opinion, despite concerns about the quality of the historical data, these data are suitable for the purposes of assessing exploration potential and planning further exploration.

## **Mineral Processing and Metallurgical Testing**

In December 2014 a single 350 kg sample of the oxide Cu-bearing ore of the Unkur deposit was collected for metallurgical testwork. This sample was analysed by ZAO SGS Vostok Ltd, and the results were reported to LLC Tuva-Cobalt in February 2015. SRK reviewed this report, and made the following conclusions:

- Copper and silver can be recovered from the Unkur oxide ore.
- The presence of significant amounts of carbonate minerals in the ore results in high acid consumption during copper leaching.
- Silver can be effectively recovered from acid leaching residues.

#### **Mineral Resource and Mineral Reserve Estimates**

There are no mineral resources for the Unkur Project that comply with the definitions and requirements of NI 43-101. Historical estimates are discussed in the History section of this report.

### **Environmental Studies, Permitting and Social Impacts**

For this early development stage project, information regarding environmental and social setting is limited and obtained through publicly available data and from state authorities. There is no information available regarding any environmental liabilities to which the Unkur Project may be subject for, and no information about environmental and socio-economic studies that have already been conducted for the deposit. Before commencement of the design stage, baseline environmental and socio-economic studies will need to be conducted to support the project design decision making process. At the project design stage, an environmental impact assessment will be required, including proposals for impact mitigation activities. According to the mining license conditions, environmental monitoring should start at pre-engineering stages (geological exploration stage) and be adjusted at subsequent stages of project implementation (construction and operation).

The key environmental and social risks that SRK considers relevant at this stage of the Project, based on the limited information available, include water management issues due to proximity of the Kemen River, and potential cumulative socio-economic and environmental impacts due to a presence of other mineral deposits in the Kalarsky district which are at different development stages.

### **Adjacent Properties**

The Udokan copper deposit is located 25 km south of the licensed area of the Unkur Project. Similar to Unkur, the copper mineralization of the Udokan deposit is confined to sediments of the Sakukanskaya formation. For Udokan though, the mineralization is in the Upper subformation, whereas the Unkur mineralization is in the Lower subformation.

Information regarding Udokan is publically available on the Baikal Mining Company (Baikal) website (http://www.bgk-udokan.ru/en/). Mineral Resources and Ore Reserves for Udokan have been prepared according to the definitions and standards of the JORC Code. The reported combined Measured and Indicated Mineral Resources for Udokan, as of March 2014, are 1,822 Mt @ 1.01% Cu and 10.7 g/t Ag, for 18.4 Mt contained Cu, and 628 Moz contained Ag. The feasibility study for Udokan was completed in February 2014, and, according to the project execution dates presented by Baikal, mining will commence in 2021.

In addition to Unkur and Udokan, other sandstone hosted copper deposits in the Kodar-Udokan Area are discussed in a publically available US Geological Survey report (http://pubs.usgs.gov/sir/2010/5090/m/pdf/sir2010-5090M.pdf). This study gives details of stratiform copper mineralization occurrences elsewhere in the Sakukanskaya formation, and also within sandstones of other Lower Proterozoic formations of the Kodar-Udokan Area.

The qualified person for this report on the Unkur Project has not verified the information relating to Udokan and other deposits in the Kodar-Udokan Area, and this information is not necessarily indicative of the mineralization on the Unkur property.

### Interpretation and Conclusions

The Unkur deposit is interpreted to belong to the stratiform sediment-hosted copper deposit type. The copper-bearing horizon in the project area is within a Lower Proterozoic sedimentary package (the Udokan Series) which has been broadly folded into a doubly plunging syncline (the Unkur Syncline). The Lower Proterozoic sediments are covered by Quaternary moraine with a thickness of 40 m near the bedrock exposures of copper bearing sandstone, but up to 200 m thickness near the margins of the project area.

The copper-bearing horizon has been traced, from drill holes, trenches and outcrop, for a length of about 5 km northwest-southeast in the southwest limb of the Unkur Syncline.

Eight historical diamond drill holes returned copper samples with grades greater than 0.6% Cu (the grade historically used for defining substantial mineralization). The mean length of these intersections is 13 m and the mean grade is 0.78%. The deepest intersection is 250 m down hole.

Within the zone of copper mineralization, silver grades were estimated by sampling composites of the copper samples. The average silver grade of these composites was 68.3 g/t.

The reliability of these historical results is in doubt though, because of significant core recovery problems: recovery in the mineralized intervals was 65% on average, and as low as 31%. In addition to the poor recoveries, the overall quantity and quality of historical data are insufficient to be the basis for preparing mineral resource estimation.

Despite the risks and uncertainties arising from data quality, SRK considers that the Unkur Project has a high exploration potential. Continuity of the mineralized horizon has been established over a strike length of at least 5 km, and the extent of this horizon has not yet been closed off, either along strike or down dip. Information from geophysics, and sparse outcrop exposures, implies that the same copper-bearing horizon is also present, several kilometres away, on the northeast limb of the Unkur Syncline.

### Recommendations

In the opinion of SRK, the potential of the Unkur Project is sufficient to justify additional exploration expenditures, which will also satisfy the minimum exploration expenditure requirements. SRK has proposed a work program to delineate the copper and silver mineralization, estimate mineral resources and prepare an initial mineral resource statement and preliminary economic assessment to meet NI 43-101 disclosure guidelines.

The proposed program includes:

- Creation of a 3D database;
- Creation of a 3D topography surface;
- Completion of georeferencing of all historical workings and drill holes;
- Review, compilation and interpretation of historical data in order to define drilling targets;
- Core drilling to delineate copper mineralization;
- Trenching and re-sampling of historical trenches;
- Analysis of drill hole and trench samples for at least total copper, copper oxide and silver.
- Implementing quality control samplings, including the use of blanks, duplicates, and reference materials.
- Bulk density measurements for at least 30 samples from each rock and mineralization type.
- Metallurgical testwork on the mineralized material, and on any marginal waste rock types that are likely to be processed;
- Hydrogeological studies;
- Geological modelling;
- Mineral resource estimation and preparation of an initial mineral resource statement;
- Preparation of a preliminary economic assessment.

SRK considers that approximately 39 drill holes (18,700 m of core drilling, at drill spacings of 400 x 400 m and 800 x 800 m) will be required to sufficiently delineate copper mineralization for the purposes of supporting initial mineral resource estimation.

The overall work program can be divided into phases. The initial phase should comprise 6 to 8 holes (the "top priority holes" in Figure 18-1) for approximately 2,800 m of drilling, with the objectives of

The budget for this first phase is approximately CN\$479,000.

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# Appendices

Appendix A: License

# 2 Introduction

The Unkur Project is an early stage copper-silver exploration project, located in the Kalarsky District, Zabaikalsky Region, Russia. The Kalarsky District is about 400 km northeast of the city of Chita. LLC Tuva-Cobalt, an affiliated company of Azarga Metals Ltd., holds a license for the right to explore and mine subsurface mineral resources of the Unkur Project. In December 2014, Azarga Metals Ltd. commissioned SRK Consulting (Russia) Ltd. (SRK) to visit the property and prepare a technical report for the Unkur Project. The services were rendered between December of 2014 and January of 2015 leading to the preparation of the report. The report was updated following an agreement between Azarga Metals Ltd. and European Uranium Resources Ltd., executed on March 1, 2016, whereby the shareholders of Azarga Metals Ltd. sold 60% of the issued shares to European Uranium Resources Ltd. in exchange for shares of European Uranium Resources Ltd. and deferred cash payments.

This technical report was prepared following the guidelines of the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1.

This technical report summarizes the information available on the Unkur Project and demonstrates that the Unkur Project qualifies as an "early stage exploration property". In the opinion of SRK, this property warrants further exploration expenditures. An exploration work program of diamond core drilling and geological modelling is recommended.

#### 2.1 Scope of Work

The scope of work, as defined in a contract of engagement executed on November 20, 2014 between Azarga Metals Ltd. and SRK, includes the preparation of an independent technical report in compliance with the National Instrument 43-101 and Form 43-101F1 guidelines. This work involves the following aspects:

- Review of the geological information;
- Site visit;
- Review of the exploration data and its quality;
- Review of the available mineral processing data;
- Review of the hydrogeological information;
- Review of the infrastructure required;
- Review of the license environmental requirements;
- Compiling of the report.

#### 2.2 Work Program

An initial version of this technical report was prepared in the Moscow and Cardiff offices of SRK Consulting Ltd. during the months of December, 2014 to February, 2015. SRK updated the report for European Uranium Resources Ltd. in March 2016.

### 2.3 Sources of Information

This report is based on the information collected by SRK during a site visit performed between 8 and 11 December, 2014, and on additional information provided by Azarga Metals Ltd. throughout the course of SRK's investigations. Other information was obtained from the public domain. SRK has no reason to doubt the reliability of the information provided by Azarga Metals Ltd. Specific sources of information were:

- Discussions with Personnel from LLC GeoExpert Ltd. (a subcontractor of Azarga Minerals Ltd);
- Inspection of the Unkur Project area, including outcrop and drill core;

- A two volume report from the results of exploration undertaken by the Naminginskaya expedition team at the Unkur copper project in 1969-1971.
- A three volume report from the results of exploration undertaken by the Lukturskaya expedition team at the Unkur copper project and Klyukvennoye deposit in 1975-1978.

#### 2.4 Qualifications of SRK Group

The SRK Group comprises over 1,000 professionals, offering expertise in a wide range of resource engineering disciplines. The SRK Group's independence is ensured by the fact that it holds no equity in any project and that its ownership rests solely with its staff. This fact permits SRK to provide its clients with conflict-free and objective recommendations on crucial judgment issues. SRK has a demonstrated track record in undertaking independent assessments of Mineral Resources and Ore Reserves, project evaluations and audits, technical reports and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies and financial institutions worldwide. The SRK Group has also worked with a large number of major international mining companies and their projects, providing mining industry consultancy service inputs.

### 2.5 Personal Inspection on the Property

Robin Simpson (the qualified person for this report, and a Principal Resource Geologist from SRK Consulting (UK) Ltd) and Alexander Batalov (Senior Resource Geologist, SRK Consulting (Russia) Ltd) visited the site on December 8-11, 2014, accompanied by Azarga Metals' representative Yury Saitov, the Chief Geologist for the Unkur Project.

During the site visit, outcropping copper-bearing horizons in the river bed were available for inspection, as was drillhole core from the 1969-1971 and 1975-1978 exploration campaigns.

SRK notes that at the time of the site visit, as is typical for the region in December, the Project area was almost completely covered with deep snow, and historical prospecting trenches were not accessible.

The purpose of the site visit was to review the historical exploration data, examine drill core, interview Project personnel and collect all relevant information for compilation of a technical report.

The site visit also aimed at investigating the geological and structural controls on the distribution of the copper-silver mineralization.

SRK was given full access to relevant data and conducted interviews to obtain information on the past exploration work, including procedures used to collect, record, store and analyse historical exploration data.

#### 2.6 Declaration

SRK's opinion contained herein and effective March 1<sup>st</sup>, 2016, is based on information collected throughout the course of SRK's investigations.

This report may include technical information that requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, SRK does not consider them to be material.

SRK is not an insider, associate or an affiliate of European Uranium Resources Ltd., and neither SRK nor any affiliate has acted as advisor to European Uranium Resources Ltd., its subsidiaries or its affiliates in connection with this project. The results of the technical review by SRK are not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

# 3 Reliance on Other Experts

SRK understands this is the first public record for the Unkur Project to be prepared according to the standards of disclosure of NI 43-101 and the requirements of 43-101F1. Furthermore, SRK understand no report or estimation for the Unkur Project has been prepared according to other international reporting standards by other experts or qualified persons

SRK was informed by European Uranium Resources Ltd., at the time it was commissioned to prepare this report (March 1, 2016), that there are no known litigations or legal impediments potentially affecting the Unkur Project.

SRK relies wholly on the legal information provided in the Share Purchase Agreement dated March 1, 2016, among European Uranium Resources Ltd., Azarga Metals Limited and the selling shareholders of Azarga Metals Limited. These sources of information pertain to the property ownership, terms of the purchase agreement, underlying interests such as Net Smelter Royalty and the obligations for maintaining the license with government agencies. These items are referenced in Section 4 of this report.

## 4.1 Location

The Unkur Project lies in the Kalarsky district of the Zabaikalsky administrative region, 15 km east of the Novaya Chara town (Figure 4-1 and Figure 4-2).



Figure 4-1: Unkur Project Overview Location Map (compiled by SRK, 2015)

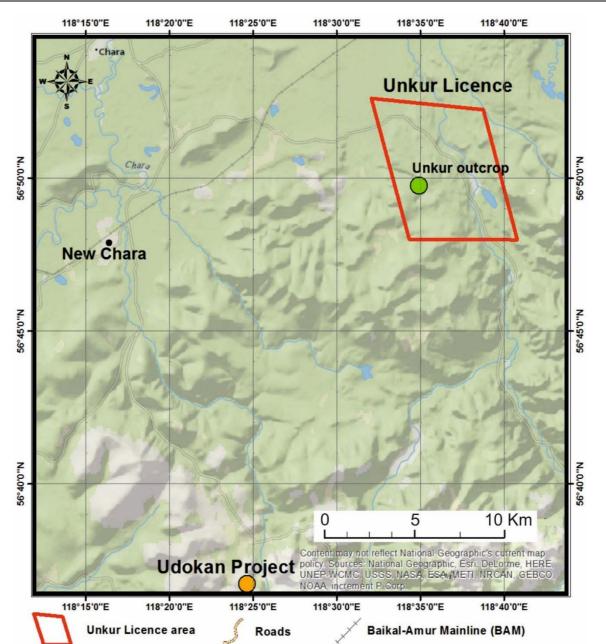


Figure 4-2: Unkur Project Location Map (compiled by SRK, 2015)

Deposits of nonferrous, ferrous and rare metals are found in the Kodar-Udokan Area as well as hard coal and industrial minerals.

The main commercial mineral is copper, which is confined to the deposits of the Udokan Series. The major undeveloped deposit is the Udokan deposit of copper-bearing sandstone. Other mines and unexploited deposits of the Kodar-Udokan Area include:

- The Chiney titanium magnetite iron ore deposit (Figure 4-1)
- The Apsat coal mine (Figure 4-1)
- Mining of industrial minerals, mainly sandstone and gritstone, at various locations.
- The Katuginskoye Project: rare metal deposits associated with intrusions of subalkalic metasomatically altered granites.

#### 4.2 Licence Agreement

The subsoil license for the Unkur Project belongs to LLC Tuvacobalt, an affiliated company of European Uranium Resources Ltd. The license is based on License 4ИТ02522БР (geological

study, exploration and production of copper, silver, and associated components for the Unkur Project). The License was awarded via a bidding process on August 26, 2014, held in Chita, and was registered on September 02, 2014 in the Department of Subsoil Use for Central and Siberian District of Russia (Tsentrsibnedra) in Krasnoyarsk.

The License covers an area of 53.9 km<sup>2</sup> and is valid through December 31, 2039.

The licence details and conditions are given in Table 4-1, and the coordinates of the licensed area are listed in Table 4-2.

Item	Description			
License	ЧИТ02522БР			
Name	Licence Agreement on conditions of subsoil use for mining of copper, silver, and associated minerals in the Unkur Project			
Valid From	02/09/2014			
Expiry	31/12/2039			
Area	53.9 km <sup>2</sup>			
GKZ Resource Approval	Not included in the State Balance Sheet			
The GKZ prognostic resources, 1988	Prognostic Resources: P1 – ore tonnage is 83,501 Kt, metal (Cu) content - 660 Kt, metal (Ag) content - 5703 t; P2 – ore tonnage is 58,108 Kt, metal (Cu) content- 436 Kt, metal (Ag) content - 3969 t; P3 – ore tonnage is 87533 Kt, metal (Cu) content - 674Kt, metal (Ag) content - 5979 t.			
Conditions	Compliance with the Russian Legislation, advanced geological survey, full- extraction of on-balance mineral reserves/resources.			
	Industrial and occupational safety.			
	Environmental Protection.			
	Social and economic development of region.			

 Table 4-1:
 License Details

Table 4-2:	License	Coordinates
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Point	Latitude (dd° mm' ss")	Longitude (dd° mm' ss'')
1	56 48 01N	118 34 20E
2	56 52 36N	118 32 03E
3	56 52 14N	118 38 45E
4	56 47 59N	118 40 45E

The subsoil user shall be guided by the Subsoil Law of the Russian Federation when undertaking exploration works.

#### 4.3 Permit Acquisition and Legislative Requirements

The licence appears to cover all the existing resources of the deposit including an unexplored northeastern part of the deposit; the licence covers all the potential resources of the deposit at depth.

### 4.4 Royalties, Rights, Payments and Agreements

The licence states the charges and taxes relating to subsoil use which include the following:

- mineral extraction tax as per Russian Federation Laws;
- water tax as per Russian Federation Laws;
- a single payment of RUR 20.856M for the right to use subsoil for mining copper and associated minerals;
- Other charges and taxes prescribed by the tax laws of the Russian Federation.

#### 4.4.1 Royalties

According to the license conditions the holder of the license (LLC Tuvacobalt) shall pay the following rates:

1. Early Stage Exploration: For the entire subsoil area, except for the deposit areas at the Exploration Stage, the rate for the 1<sup>st</sup> year is RUR 50 per km<sup>2</sup>; then for years 2-5 the rate will be RUR 162/year per km<sup>2</sup>; and from the 5<sup>th</sup> year RUR 225/year per km<sup>2</sup>.

2. Exploration Stage: RUR 1,900 per  $km^2$  for the 1<sup>st</sup> year, then; RUR 8,707/year per  $km^2$  for the 2<sup>nd</sup> and 3<sup>rd</sup> years of the works.

#### 4.4.2 Environmental Liabilities

According to the license agreement the subsoil user (LLC Tuvacobalt) is obliged to follow the statutory regulations of the Russian Federation on subsoil and environmental protection.

The subsoil user shall perform environmental monitoring (atmosphere, subsoil, waters, soil, biological resources) in the area of the mining enterprise influence.

There is no information available regarding any environmental liabilities to which the Unkur Project may be subject for. Any historical disturbance from exploration activities that may exist on site are outside of current Licensee liabilities according to existing legislation unless Licensee voluntarily accepts them.

#### 4.4.3 Permits Required for the Proposed Work

The license is valid through December 31, 2039. Upon approval of detailed project development the license validity period shall become the mine life of the deposit, which will be calculated based on the technical and economic justification for the deposit development.

The license for the right to explore and mine subsurface mineral resources contains the terms of development of the project and reporting documentation as well as of the exploration work:

1. Approval of a project design for geological investigation of subsurface mineral resources (early stage exploration) which has previously received a positive conclusion in accordance with Article 36.1 of the Subsoil Law of the Russian Federation not later than 02/09/2015.

2. Submission of the prepared documents based on geological study of the subsurface mineral resources to the State Appraisal of Reserves of Commercial Minerals in accordance with Article 29 of the Subsoil Law of the Russian Federation not later than 02/09/2020.

3. Approval of a project design for detailed exploration which has previously received a positive government conclusion in accordance with Article 36.1 of the Subsoil Law of the Russian Federation not later than 02/09/2021.

4. Submission of the prepared documents based on detailed exploration results to the State Appraisal of Reserves of Commercial Minerals in accordance with Article 29 of the Subsoil Law of the Russian Federation not later than 02/09/2024.

5. Preparation and approval of the technical project of deposit exploration arranged in accordance with Article 23.2 of the Subsoil Law of the Russian Federation not later than 02/09/2026.

6. Preparation and approval of the technical project of abandonment and suspension of workings, drill holes and other underground workings arranged in accordance with Article 23.2 of the Subsoil Law of the Russian Federation a year ahead of the planned completion of the deposit development.

7. Submission of the annual information report on the works carried out onsite not later than January 15 of the year following the reporting period. The order of presentation of these materials is determined by Federal Agency on Subsoil Use and its territorial bodies.

8. Submission of annual statistical reporting (5-GR, 70-TP, 71-TP, 2-LS, 2-GR, 7-GR forms etc.) within the prescribed time limits.

The dates of bringing the deposit into development and driving up to the rated capacity are determined in the project plan of the deposit development.

#### 4.5 Surface Rights and Legal Access

Exploration and development of mineral deposits is generally not possible without the use of the ground surface for such purposes, ie, without access to the relevant land plot. Under Russian law relevant subsoil use licences do not automatically entitle the companies to occupy the land necessary for their activities and associated industrial activities. The issue of obtaining the necessary land rights are addressed by companies separately to, and in parallel with, the obtaining of the subsoil licence. Land use rights are obtained for the parts of the licence area actually being used, including the plot being mined, access areas and areas where other mining-related activity is occurring.

Russian legislation on land does not definitively provide at what stage the subsoil user should initiate the procedure for obtaining land rights. Under existing subsoil legislation the formalisation of a subsoil user's land rights for the purposes of geological exploration and subsoil use are carried out under the procedure stipulated by the Land Code. In practice, the procedure for obtaining land rights to a land plot required for exploration and mine development may take several months.

The process of obtaining land rights is governed by federal and regional legislation. Although regional legislation should not contradict Russian federal law, in practice, some parts do. This results in certain ambiguity and irregularity in the procedure of obtaining land rights. Under the Land Code, mining companies generally have either the right of ownership or lease with regard to a land plot in the Russian Federation.

The majority of land plots in the Russian Federation (including all of the license area for the Unkur Project) are owned by federal, regional or municipal authorities, which, through public auctions, tenders or private negotiations, can sell, lease or grant other rights of use over the land to third parties. The general principle, as fixed in the Land Codes, states that the land plots required for the performance of works associated with subsoil use out of lands in state or municipal ownership, should be granted for lease outside a tender or an auction. The Government establishes the procedure for calculation of the amount of rental payments for such land plots.

LLC Tuva-Cobalt has not leased the land yet, but has initiated this process and expects to obtain the land rights in time to carry out a program of exploration work in 2016.

#### 4.6 Obligations to Vendor

On March 1, 2016, European Uranium Resources Ltd. and Azarga Metals executed a share purchase agreement whereby the six shareholders of Azarga Metals (the "Selling Shareholders") will immediately sell 60% of the issued shares of Azarga Metals to European Uranium Resources Ltd in exchange for shares of European Uranium Resources Ltd and deferred cash payments. Subject to terms and conditions, the Selling Shareholders have agreed to grant European Uranium Resources Ltd the right to purchase the remaining 40% of the shares of Azarga Metals (the "Call") and

European Uranium Resources Ltd has granted the Azarga Metals Selling Shareholders the right to sell the remaining 40% of the shares of Azarga Metals to it (the "Put"). The fair value of that 40% interest will be negotiated at the time of exercise.

Azarga Metals (BVI) owns 100% of the issued shares of Shilka Metals LLC (Cyprus) which in turn owns 100% of the issued capital of Tuva-Kobalt (Russia). Tuva-Kobalt was awarded the Unkur mineral exploration and exploitation license via a bidding process on August 26, 2014 and is valid through December 31, 2039.

On closing European Uranium Resources Ltd will issue the Selling Shareholders 15,776,181 common shares, which will be approximately 37% of the number of shares as constituted after closing the transaction, the Private Placement, the Debt Settlement and the Consolidation (the "Consideration Shares"). In exchange for the Consideration Shares, the Selling Shareholders will transfer 60% of the issued shares of Azarga Metals to European Uranium Resources Ltd. The Consideration Shares will be restricted from trading for two years from issue date. European Uranium Resources Ltd will be assigned existing loans made by the Selling Shareholders to Azarga Metals of up to US\$800,000 that bear interest at the rate of 12% per annum, which can be capitalized or paid in cash (the "Debt"). The Debt must be paid within seven years from closing. The Selling Shareholders will retain a 5% net smelter return royalty ("NSR") and their combined 40% interest in Azarga Metals will be free carried to initial production and profitability subject to the Put/Call Options. European Uranium Resources Ltd will have the right to buy back up to 2% of the NSR at a cost of US\$5 million per percentage point so that upon paying US\$10 million the NSR will be reduced to 3%. In addition European Uranium Resources Ltd will make deferred cash payments to the Selling Shareholders of US\$1,680,000 (the "Deferred Cash Payments") beginning with US\$80,000 payable on 1 June 2017, with a payment on each annual anniversary that increases by US\$80,000 a year so that the final payment of US\$480,000 will be due on 1 June 2022. In the event of a change of control of European Uranium Resources Ltd, the Debt and Deferred Cash Payments will become due and payable within five days.

European Uranium Resources Ltd has undertaken to spend a minimum of US\$3,000,000 on exploration activities on the Unkur Project prior to 30 June 2019, and an additional US\$6,000,000 between 1 July 2019 and 30 June 2023.

If at any time, a Resource (adding Measured, Indicated and Inferred of all combined deposits within the Unkur Project area) is estimated to contain copper and silver to the equivalent of 2 million tonnes or more of copper where Measured plus Indicated Resources comprise at least 70% of that estimate, taking the value of silver as copper equivalent (the "**Bonus Payment Threshold**"), an additional US\$6,200,000 will be payable to the Selling Shareholders within 12-months' notice that the Bonus Payment Threshold has been met.

#### 4.7 Permits

No permitting is required until the project reaches the feasibility study stage. The exploration stage only requires observation of existing environmental laws and regulations.

The project is not in a protected woods territory and European Uranium Resources Ltd. expects that no tree cutting will be required for the purposes of exploration, so it should be possible for exploration to proceed without a forestry permit.

#### 4.8 Other Factors or Risks

If the project proceeds to feasibility study stage or production, then the right to use the licensed area may also be suspended or restricted in the following cases:

1. Failure to submit the required documentation given in "Permits required for the proposed work" within 6 months of the specified deadlines.

2. Failure to make the regular payments specified in "Royalties".

3. Failure to comply with the project deadlines and production output requirements, as relating to the geological investigation of subsurface, deposit exploration and deposit development stages.

# 5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

### 5.1 Accessibility

The Unkur site is accessed from the Chara village and the Novaya Chara town by the year-round natural road passing along the Baikal-Amur Mainline (BAM). The road distance from the site to Novaya Chara is about 22 km, and to Chara is about 33 km.

In Chara there is an airport with a paved airstrip that accommodates regular flights from Chita, some 800 km to the southwest.

Novaya Chara railway station is accessed by the Baikal-Amur Mainline (BAM) from Bratsk (1,356 km) through the town of Severobaikalsk (637 km).

In winter snow roads are used to access the city of Chita and town of Taksimo.

#### 5.2 Local Resources and Infrastructure

The district is economically poorly developed.

As of January 1, 2010 the estimated population of the Kalarsky district was 9,579 people within an area of some 56,000 km<sup>2</sup>, including 4,354 people in Novaya Chara, 2,290 in Chara, 1,569 in the village of Kuanda, and 596 in the village of Ikabya. There are also several settlements of 100 to 300 inhabitants: Udokan, Chapo-Ologo, Kyust-Kemda, Nelyaty, and Sredny Kalar.

There is a federal electric power line of 100 MW passing through the north-eastern part of the licensed area.

#### 5.3 Climate

The climate of the Project area is a harsh continental climate with very cold and long winters and short hot summers. During the cold period, the terrain is dominated by a stable Siberian anticyclone with significant temperature inversions. The air temperature varies depending on the relief. The average air temperature in January is minus 27.8°C at the upper elevations of the Project area, and minus 33.2°C in the Chara valley. The winter air temperature minimum is minus 57°C at lower levels and minus 47°C at altitude. The July air temperature maximum is plus 32°C and at the foothills it is plus 27°C. The cold and long winters (October to April) are characterised by high air pressure. Yearly precipitation distribution is very uneven. The first snow usually falls in mid-September. A stable snow cover is formed during the first half of October. The snow cover melts in the middle of April at lower elevations and in May at higher elevations.

#### 5.4 Physiography

The Project area is located in the northern slopes of the Udokan Range in the catchment of the Kemen and Unkur Rivers which are right-bank tributaries of the Chara River. The area of the deposit is characterized by low and medium mountain relief with absolute elevations of 1,100-1,200 m, and local differences in elevation of 100-200 m; there are flat watersheds and smooth hillsides in the northern part of the area with 400 m elevations (Figure 5-1).

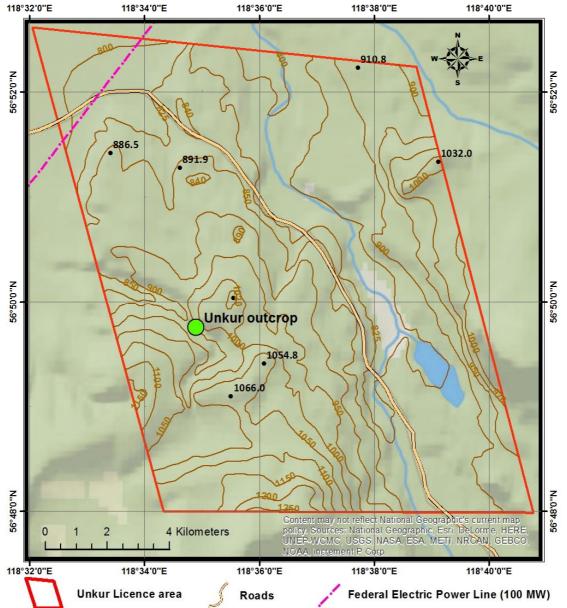


Figure 5-1: Topography Map for the Unkur Project (compiled by SRK, 2015)

#### 5.5 Seismicity

The area of the deposit and adjacent areas is quoted as being 9 points on the 12 point Russian MSK-64 scale of seismicity used throughout the CIS. This constitutes a severe earthquake potential zone, with at least one catastrophic earthquake likely to occur over a 25 year period.

### 5.6 Vegetation

The deposit and surrounding area is covered by tiaga vegetation (swampy coniferous forest), as is typical between the tundra and steppes of Siberia. The main forest-forming species is Dahurian larch.

# 6 History

#### 6.1 Historical Exploration

#### 6.1.1 Discovery and Initial Work

Unkur copper mineralization was discovered by geologists of the All-Union Aerogeological trust in 1962 during the course of 1:1,200 000 geological mapping (Shulgina et al., 1962). The mineralized layer was observed within a canyon of the Unkur River and traced for 1 km through limited outcrops of copper-bearing sandstone. In these exposures, the thickness of the layer varied from about 5-8 m. Based on the chemical assays of channel and chip samples an average copper grade of 1% was determined. It was established that the mineralization is stratabound within the Lower Sakukan subformation.

In 1963 the Udokan expedition team (a stated-owned company that includes Lukturskaya, Naminginskaya, and other exploration teams), carried out trenching every 200-300 m for 1.2 km to further define the copper mineralization zone. Sampling from the trenches showed mineralized intervals of 10-12 m thick with an average copper grade of 1.02%. Also in 1963, the Udokan team carried out magnetic and electric geophysical surveys over limited areas of the south-eastern syncline at 100 m spacing between profiles and 20 m spacing between measurement points. The magnetic survey identified distinct magnetic suites, but did not directly reveal the zone of copper mineralization.

In 1966 a group of geologists from A.P. Karpinsky Russian Geological Research Institute (VSEGEI) visited the Unkur site. Based on a number of lithological characteristics the sediments hosting the mineralized layer were classified as shallow-marine and deltaic strata.

#### 6.1.2 The 1969-1971 Campaign

The studies mentioned above formed the basis for carrying out substantial prospecting works at the Unkur Project, at 250-500 m profile spacing, from 1969-1971 by the Naminginskaya Exploration Team. These studies (Table 6-1) included drilling, mapping and geophysics.

Period	Unit	1969-1971	1975-1978
Core drilling	m	5,549.1	1,154
Trench volume	m <sup>3</sup>	20,524.3	19,144
Mapping traverses	km	50	
Core sampling	samples	194	36
Trench sample length	m	62.7	192
Geochemical sampling	samples	370	580
Chemical analysis	samples	2,486	100
Combined sampling for silver grade	samples	8	11
Composite sampling	samples	51	

Table 6-1: Exploration Works on the Unkur Project, 1969-1978

From the 1969-1971 works the geological setting of the mineralized area, and the internal structure and geochemical characteristics of mineralization became better understood. Based on the new drilling and trenching data the copper-bearing horizon of 20-50 m thick was traced from southeast to northwest for 4-6 km to a depth of 350 m. The average copper grade for the mineralized zone was determined as 0.75%. Geophysical methods identified the copper-bearing horizon for a further 4km northwest under the moraine sediments 150-180 m thick. Based on the results from the 1969-1971

#### 6.1.3 The 1975-1978 Campaign

Exploration Team.

From 1975-1978 detailed exploration works, at a 25 m profile spacing, were carried out by geologists of the Lukturskaya Exploration Team (Berezin G., 1978) in order to assess the potential of the Klyukvenny copper-bearing deposit, southeast of the Udokan deposit, and the potential of the Luktursky gabbroid massif, which borders the northwest flank of the Unkur deposit. The Klyukvenny and Luktursky deposits fall outside the licensed area owned by the Company, but secondary to the focus on Klyukvenny and Luktursky, further sampling and geophysical assessments took place on the Unkur deposit. The Unkur works included drilling of 4 core holes. The aim of this drilling was to test the lateral extents of the deposit. Only one of these holes (C-102) intersected the copper-bearing horizon, at a depth of 250 m.

The summary of the exploration works from the 1968-1971 and 1975-1978 programs is given in Table 6-1. Figure 6-1 is a map of drill holes and trenches for all the campaigns, and shows the profiles of geophysical surveys. The surface position of the copper-bearing horizon, derived from mapping, drilling and trenching, is shown in this figure as a green line.

Since 1978 no field exploration works have been carried out at the Unkur Project.

#### 6.1.4 Geophysical Surveys

Ground geophysical surveys at the Unkur Project were carried out in 1963 and during the 1969-1972 and 1975-1978 exploration campaigns. Geophysical methods included electric logging (induced polarization, dipole electric profiling), time-variable natural magnetic field, magnetic and gravity survey.

In order to study physical properties of the copper-bearing horizon, samples were taken from outcrops and drillhole core. These samples were used to determine degrees of magnetization, polarizability, resistivity, and specific gravity.

Based on geological description of outcrops, trenches and drillhole core, the geological unit underlying the copper-bearing horizon was identified as highly pyritized. Disseminated pyrite will potentially act as a geophysical marker, for induced polarization in particular, that mayidentify the base of the copper-bearing horizon.

The results from magnetic and polarizability surveys are shown in Figure 6-2 and Figure 6-3.

Cumulative data on gravity, magnetic, and electric survey helped determine trends for fold hinges at the north-western and south-eastern margins of the deposit, and defined a series of northeast- and northwest-striking faults which break the Unkur Syncline into several blocks.

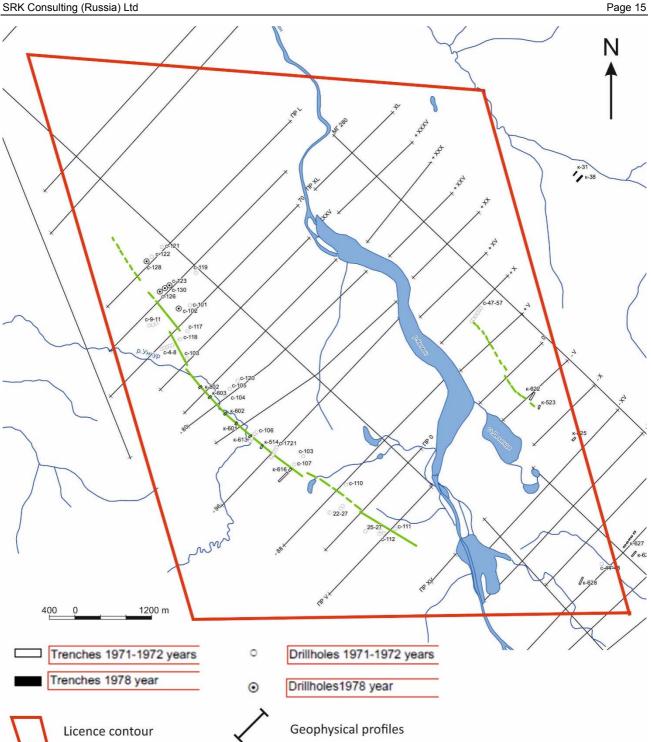


Figure 6-1: Unkur Project Drillholes, Trenches and Geophysical Survey Profiles (illustration provided by LLC GeoExpert Ltd., 2014)

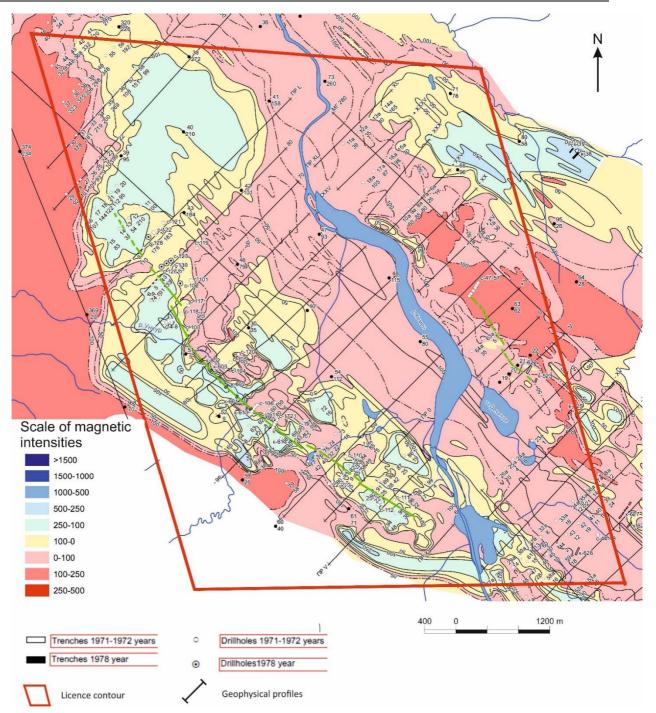
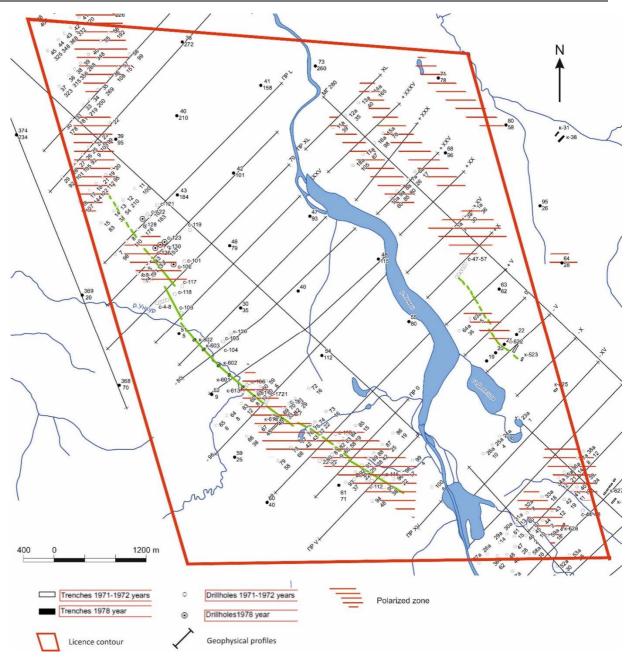


Figure 6-2: Unkur Project Area Magnetic Survey (illustration provided by LLC GeoExpert Ltd., 2014)





#### 6.2 Historical Estimates

Four historical estimations of copper and silver mineralization for the Unkur Project have been prepared: Mulnichenko (1972), Berezin (1979), a 1988 estimate for the licence agreement, and a 2014 estimate by the Central Geological Research Institute. These estimates are all based on polygonal methodology, and were prepared in accordance with the procedures and definitions of the Soviet Union resource/reserve estimation and reporting system. The qualified person has not done sufficient work to classify the historical estimates as current mineral resources or mineral reserves, and the issuer is not treating the historical estimates as current mineral resources or mineral reserves.

NI 43-101 requires mineral resource reporting to adhere to the resource category definitions of the Canadian Institute of Mining, Metallurgy and Petroleum. The categories in the Soviet resource/reserve system are incompatible with these definitions, and the estimation methods mandated by the Soviet system are different to the geological modelling and geostatistical estimation

methods the qualified person would recommend as optimal for the Unkur deposit. Furthermore, the poor quality of the core remaining from the previous exploration programs, and the difficulty of doing detailed verification of historical results, means that any future program of resource definition drilling is likely to replace rather than build on the historical drilling data. Therefore, the historical estimates reported here should be regarded as an indication of exploration potential, instead of an inventory that is likely to be converted into mineral resources.

#### 6.2.1 Resource/reserve classification system of the Soviet Union

The summary of the Soviet resource/reserve categories below is quoted from Henley (2004). Note that Prognostic Resources in the 1960 version of the classification system were a single category; this category was split into three after the 1980 revision to the classification system.

**Category A**: The reserves in place are known in detail. The boundaries of the deposit have been outlined by trenching, drilling, or underground workings. The quality and properties of the ore are known in sufficient detail to ensure the reliability of the projected exploitation.

**Category B**: The reserves in place have been explored but are only known in fair detail. The boundaries of the deposit have been outlined by trenching, drilling, or underground workings. The quality and properties of the ore are known in sufficient detail to ensure the basic reliability of the projected exploitation.

**Category C1**: The reserves in place have been estimated by a sparse grid of trenches, drill holes or underground workings. This category also includes reserves adjoining the boundaries of A and B reserves as well as reserves of very complex deposits in which the distribution cannot be determined even by a very dense grid. The quality and properties of the deposit are known tentatively by analyses and by analogy with known deposits of the same type. The general conditions for exploitation are known. The ore tonnage is derived from estimates of strike length, dip length and average thickness of the ore body. Allowance for barren blocks may be made statistically.

**Category C2**: These reserves are based on an extremely loose exploration grid, with little data. The limits of the orebody are defined mainly by extrapolation within known geological structures, and from comparison with other similar deposits in the vicinity. The grade and mineral properties of the orebody are determined from core samples and comparison with similar mineral deposits in the area. The reserves have been extrapolated from limited data, sometimes only a single hole. This category includes reserves that are adjoining A, B, and C1 reserves in the same deposit.

**Prognostic Resources** are estimated for mineralization outside the limits of areas that have been explored in detail and are often based on data from trenches and from geochemical and geophysical surveys.

**Category P1**: Resources in the P1 category may extend outside the actual limits of the ore reserves defined in the C2 category. The outer limits of P1-type resources are determined indirectly by extrapolating from similar known mineral deposits in the area. P1 is the main source from which C2 reserves can be increased.

**Category P2**: These resources represent possible mineral structures in known mineral deposits or ore-bearing regions. They are estimated based on geophysical and geochemical data. Morphology, mineral composition and size of the orebody are estimated by analogy with similar mineralized geologic structures in the area.

**Category P3**: Any potential ore-bearing deposits are classified as resources in the P3 category. The presence of these resources relies on the theoretical definition of a "favourable geological environment". Resource figures are derived from figures of similar deposits in the region.

#### 6.2.2 The 1972 Estimate

The results of the estimation based on the 1972 data are presented in Table 6-2. Prognostic silver resources were estimated within the copper mineralization domain. Average silver grades were determined based on the chemical assays of eight composite samples. The arithmetic mean of these samples is 73.3 g/t, and this grade was applied to all the blocks. Therefore, the prognostic resources of silver amount to 10.1 Kt Ag.

Category	Block No.	Zone Thickness, m	Tonnes, Kt	Average Cu Grade, %	Contained Metal, Kt
C2	Block 1	12.4	77,760	0.80	622
02	Block 2	4.3	9,978	0.60	60
Total, C2 Category		9.8	87,738	0.78	682
Prognostic	Block 3	12.4	33,849	0.80	271
resources	Block 4	8.3	16,409	0.75	123
Total, prognostic resources		10.7	50,258	0.78	394
Total		10.1	137,996	0.78	1,076

 Table 6-2:
 Results from the 1972 estimate for the Unkur Project (Mulnichenko V., 1972), classified according to the Soviet Union resource/reserve classification system of 1960

#### 6.2.3 The 1979 Estimate

Upon completion of the second phase of exploration works for the Unkur Project carried out in 1979, the second resource/reserve estimate for the Unkur deposit was performed with regard to the new drilling data (Table 6-3). Prognostic silver resources were estimated within the copper mineralization domain. Average silver grades were determined based on the chemical assays of eleven composite samples. The arithmetic mean of these samples is 68.3 g/t, and this grade was applied to all the blocks. Therefore, the prognostic resources of silver amount to 9.7 Kt Ag.

Table 6-3:	Results from the 1979 estimate for the Unkur Project (Berezin G., 1979), classified
	according to the Soviet Union resource/reserve classification system of 1960

Category	Block No.	Zone Thickness, m	Tonnes, Kt	Average Cu Grade, %	Contained Metal, Kt
C2	Block 1	12.9	91,820	0.80	725
02	Block 2	4.3	9,978	0.60	60
Total, C2 Category		8.6	101,798	0.77	785
Prognostic	Block 3	12.9	24,685	0.80	195
resources	Block 4	8.3	16,409	0.75	123
Total, prognostic resources		10.6	41,095	0.77	318
Total		10.1	142,893	0.77	1,103

#### 6.2.4 The 1988 Estimate

In 1980 the Soviet resource/reserve classification system was updated. The changes primarily affected the definitions of the C2 resource category and prognostic resources: under the new system, the C2 category was grouped with estimated reserves, and the prognostic resources were divided into three categories: P1, P2, and P3. In 1988 the Unkur deposit was re-estimated and re-classified in accordance with the new classification system. A consequence of this revision was the entire inventory was classified as prognostic resources (Table 6-5).

For the 1988 estimate, a 0.4% Cu grade threshold was used for defining the resource domain, compared to the 0.6% Cu threshold used for the 1972 and 1979 estimates.

# Table 6-4:Results from the 1988 estimate for the Unkur Project (source: Unkur Licence<br/>Agreement), classified according to the Soviet Union resource/reserve<br/>classification system of 1980

Category	Component	Tonnes, Kt	Average Grade	Metal Contained
D1	Copper	83,500.9	0.79%	660 Kt
P1	Silver		68.3 g/t	5,703 t
P2	Copper	58,107.7	0.75%	436 Kt
	Silver		68.3 g/t	3,969 t
P3	Copper	97 522 5	0.77%	674 Kt
	Silver	87,532.5	68.3 g/t	5,979 t

#### 6.2.5 The 2014 Estimate

The most recent assessment of the prognostic copper and silver resources for the Unkur Project was by the geologists of the Central Geological Research Institute (TsNIGRI). The results of this estimate are presented in Table 6-6. The data supporting the 2014 estimate are the same as for the 1979 and 1988 estimates (there have been no material additions to the supporting data since 1978); the resource/reserve reporting system is the same as was in place for the 1988 estimate; the threshold for defining the resource domain (0.4% Cu) is also the same as used for the 1988 estimate, but the estimated tonnes and metal in 2014 were an order of magnitude lower than in the 1988 estimate.

The differences between the prognostic resource statements of 1988 and 2014 are due to different interpretations of how the Russian resource/reserve reporting system should be applied to the Unkur deposit. The main reasons for the substantially lower tonnage of the 2014 estimate are:

- 1) The 1988 estimate included a substantial portion of P3 material, representing mineralization on the northeast limb of the Unkur Syncline. All of this northeast limb material was omitted from the 2014 estimate.
- 2) From the southwest limb of the Unkur Syncline, the P2 category of the 1988 estimate included about 1,000 m of interpolation along strike, between areas covered by drilling and trenching, and about 1,000 m extrapolation along strike to the northwest. This along strike interpolation and extrapolation was not included in the 2014 estimate.
- 3) For the 2014 estimate, extrapolation down dip was limited to 300 m below surface, on the assumption that this would be the maximum depth of open pit mining. A greater depth limit, of 1,000 m below surface, was used to constraint the 1988 and earlier estimates, on the basis that the deposit could potentially be mined by underground methods.

Table 6-5:	Results from the 2014 estimate for the Unkur Project (Volchkov and Nikeshin,
	2014), classified according to the Russian resource/reserve classification system
	of 1980

Category	Block No.	Component	Tonnes, Kt	Average Grade	Metal Contained
P1	1	Coppor	16,516.5	0.90%	148.6 Kt
PI	2	Copper	3,964	0.65%	25.8 Kt
Total P1		Copper	20,480.5	0.85%	174.4 Kt
		Silver	20,400.5	77.96 g/t	1,600 t

# 7 Geological Setting and Mineralization

### 7.1 Regional Geology

The Unkur Project is situated on the southern Siberian platform in the Kodar-Udokan structural zone. Within this zone, Archaen, Lower-Proterozoic, Vendian, Lower-Cambrian, Mesozoic and Cenozoic formations are present.

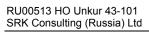
The bedrock in the vicinity of the Project is dominated by Lower-Proterozoic, weakly metamorphosed terrigenous-sedimentary rocks. This sedimentary succession is intruded by Early-Proterozoic, Proterozoic and Mesozoic igneous complexes.

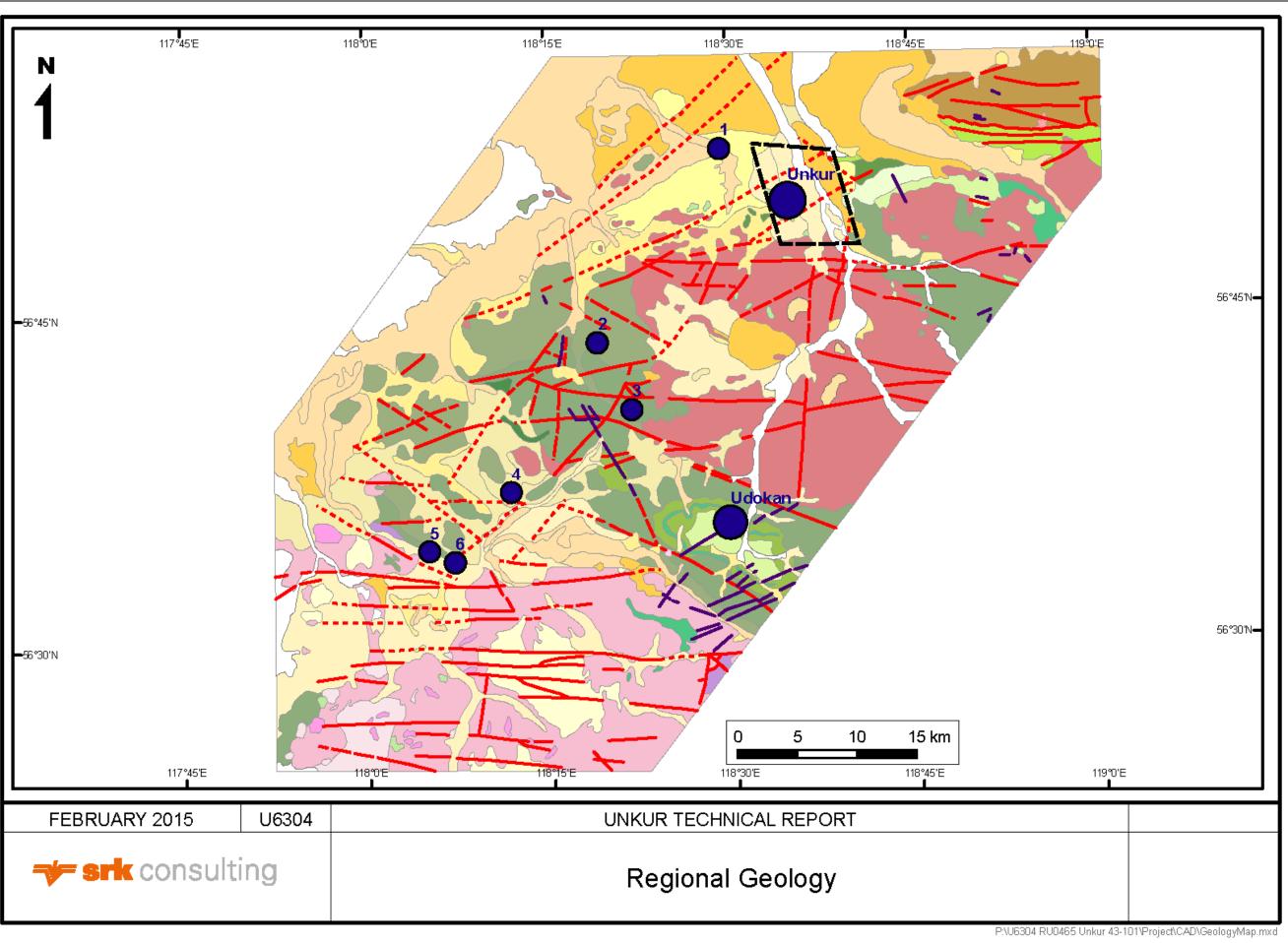
#### 7.2 Local Geology

Locally, the geology is composed of Lower Proterozoic metamorphosed sediments of the Udokan Series, Lower Proterozoic granitoids of the Chuisko-Kodarsly complex, gabbroid massifs and dykes of the Late Proterozoic Chiney complex, and Quaternary alluvial and glacial cover (Figure 7-1).

The sediments of the Udokan series were deposited in a shallow marine environment. In ascending stratigraphic order, the formations of the series are named as the Ikabyinskaya, Inyrskaya, Chitkandinskaya, Alexandrovskaya, Butunskaya, and Sakukanskaya. The overall thickness of the series is 5,350 m.

The copper-bearing horizon is confined to sediments of the Lower subformation of the Sakukanskaya formation. This subformation is a 500 m thick package of alternating pinkish-grey medium-grained sandstones and grey to black siltstones.





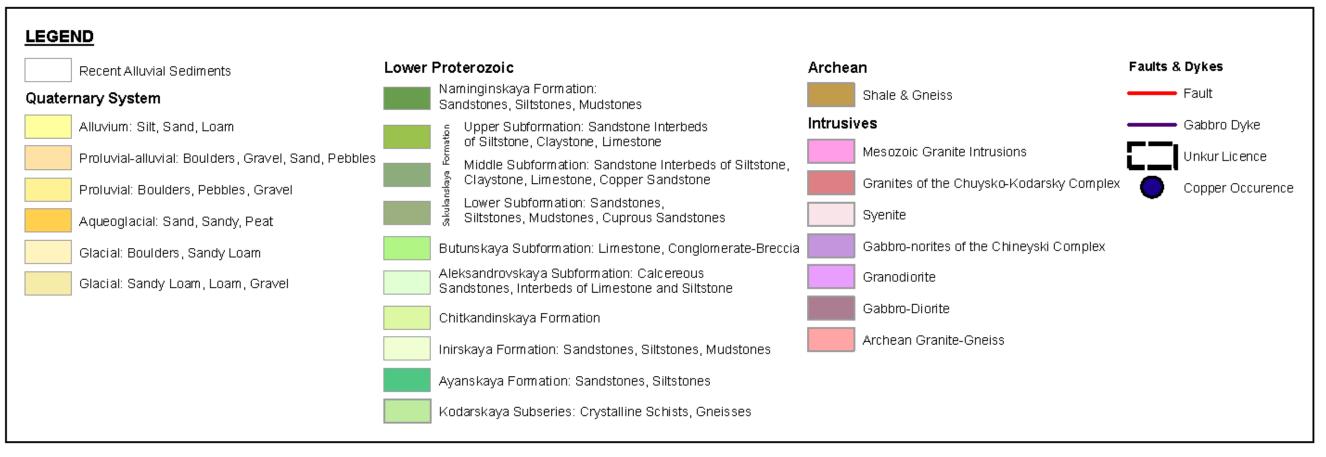


Figure 7-1: Regional Geology Setting (modified by SRK from Mulnichenko, 1972). In addition to the Unkur and Udokan deposits, the other copper occurrences shown on the map are: Luktursky (1); Nirungnakanskaya group (2 and 3); Ingamakitskaya group (4, 5 and 6)

# 7.3 Property Geology

#### 7.3.1 Udokan Series Formations

In the vicinity of the Unkur deposit, the sediments of the Udokan Series are folded into a broad, doubly-plunging syncline, with an approximately vertical axial plane striking northwest (Figure 7-2). The northwest-southeast extent of this synclinal structure is about 12 km.

Three of the Udokan Series formations have been identified within the Unkur Project area: Alexandrovskaya, Butunskaya and Sakukanskaya

The rocks of the Alexandrovskaya formation are exposed in the south-western limb of the syncline, and comprise a package of interstratified siltstone and argillites, with quartzites about 1m thick occurring every 25-30 m. The formation is characterized by a magnetic low. Based on geophysical data, the thickness of the formation in the project area is about 450-600 m.

The upper part of the Butunskaya formation is exposed in the canyon of the Unkur river, and occurs as a package of alternating siltstone and fine-grained sandstone. The formation is characterized by a magnetic high. Based on the geophysical data, the thickness of the formation in the project area is 500-600 m.

The Sakukanskaya formation hosts copper mineralization and occupies most of the Unkur Project area. In the east and northeast this formation is intruded by the Chuisko-Kodarsly granitoids of the Kemensky massif. The Sakukanskaya formation is mainly medium-grained grey sandstone.

Of the Sakukanskaya subformations, the Middle and Lower have been identified in the project area. The Lower subformation characterized by grey and pinkish-grey sandstones alternating with grey and black siltstone, and is 1,000 to 1,200 m thick. The Middle subformation mainly consists of grey and pinkish-grey sandstones interlayered with calcareous sediments. Rough cross-bedding is characteristic of the sandstone. The overall thickness of the Middle subformation is about 1,000 m.

#### 7.3.2 Structure

As noted above, the major structure of the deposit is a syncline with a northwest-striking axial plane. The southwest limb of the fold dips to the northeast at 40-60° and is complicated by higher order folding.

The Butunskaya and Sakukanskaya formations outcrop in the northeast limb of the fold, and dip 15-30° southwest, increasing to 35-60° closer to the axial plane.

To the southeast the syncline gradually flattens. In the northwest, geophysical evidence implies the syncline is cut by a branch of the Kemensky Fault.

The Kemensy Fault is one of three large northwest-striking faults. The other in this group is the Burunginsky Fault. The displacement in vertical direction on these major faults does not exceed 300 m.

The Unkur Syncline is also cut by the Charskaya northeast-striking fault system. Displacements on these faults do not exceed 150-200 m.

All the faults have undergone tectonic-magmatic re-activation at various stages. There is no reliable information on the cross-cutting relationships between faults.

#### 7.3.3 Intrusive Rocks

The Udokan Series formations are intruded by gabbro-diorite dykes of the Chineisky complex. Dyke thicknesses range from metres to tens of meters, with observed strike lengths of 200-1,000 m. The dykes strike northeast and northwest, corresponding to the strikes of the two main fault systems.

Glacial sediments cover most of the project area and form numerous moraines. The average thickness of the moraine cover is 40 m; however, this cover increases to 180-200 m thickness in both the northwest and southeast of the project area.

Recent alluvial sediments have been deposited by the Unkur and Kemen Rivers. These sediments are composed of gravel and sandy soil and form 5-20 m high terraces above flood-plains.

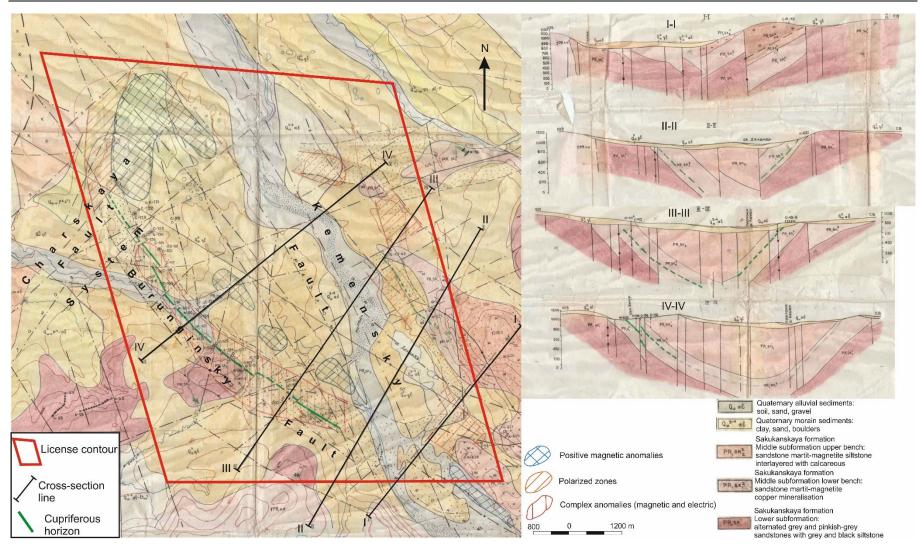
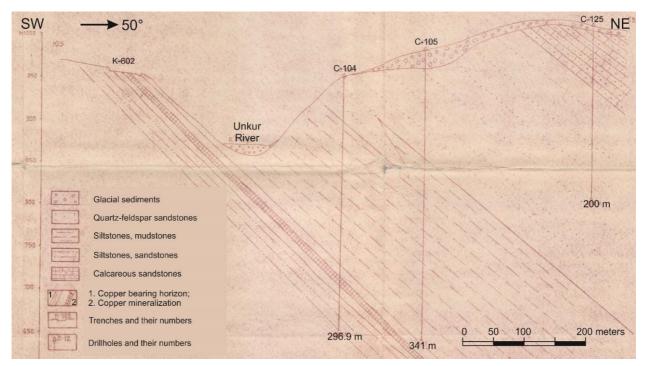


Figure 7-2: Property Geology (modified by SRK from Berezin, 1979)

## 7.4 Mineralization

The copper-bearing horizon was initially identified and traced in the south-western limb of the Unkur syncline. It is confined to weakly metamorphosed deposits of the Lower Sakukanskaya subformation. Stratigraphically, the position of the copper-bearing horizon is 80-100 m above the base of the Sakukanskaya formation. Copper oxide minerals among Pleistocene sediments are a possible indicator of the location of the horizon on the opposite (northeast) limb of the Unkur syncline.

The horizon dips northeast at  $45-60^{\circ}$  (Figure 7-3), and has been traced along the strike for 4.6 km, including a 3 km length of drill hole and trench intersections. The maximum drillhole intersection depth is 300 m. The thickness of the horizon ranges from 12-50 m.



# Figure 7-3: Typical Geological Cross-Section, Central Part of the Unkur Project (modifed by SRK from Mulnichenko, 1972)

The copper-bearing horizon is composed of carbonate and non-carbonate sandstone and siltstone. A rhythmical-layered structure is characteristic of the horizon. This rhythmicity is from the alternation of carbonate and non-carbonate sandstones and siltstones. The thickness of the layers varies from 1 to 40 m.

From geophysical methods, the copper-bearing horizon has been traced under moraine sediments for 4 km. It is characterized by high polarizability.

Radioactivity of the Udokan Series in the Unkur area is low.

The historical sampling results showed that higher grade copper mineralization (with a mean grade of 0.7-1.0%) is confined to the central part of the copper-bearing horizon and has a sheet-like morphology. This higher grade zone is usually from 3 to 12 m thick, but sometimes up to 24 m thick.

Primary copper minerals comprise chalcopyrite, pyrite, bornite, magnetite, hematite; accessory minerals are chalcocite and ilmenite. The oxide minerals present are malachite, brochantite and covellite.

A hypogene zonation is noted in the distribution of the copper minerals: a chalcopyrite-pyrite-bornite association is found in the centre; either side of this there is a monomineral chalcopyrite association, and then a distal pyrite association at the edges of the mineralized zone.

The weathered zone is poorly developed, to a depth of 5-10 m from surface. Copper oxide minerals are also observed at deeper levels in fractured zones.

The mineralized zone is displaced by northeast-striking fault and breccia zones. The displacements are typically 20-70 m, but for some faults displacements are as much as 150 m.

Below the copper-bearing horizon are pyritized calcareous sandstones and siltstones; above the horizon are sandstones and siltstones of the upper part of the Lower Sakukanskaya subformation.

# 8 Deposit Types

The Unkur deposit is interpreted as a sediment-hosted stratiform copper deposit. This geological model is considered appropriate for the deposit because of the following observations:

- 1. There is a clear stratigraphic control on copper mineralization, which is confined to the upper part of the Lower Sakukanskaya subformation.
- 2. Several sedimentary features (such as cross-bedding, wave rippling and dessication cracks) imply a shallow and relatively low-energy depositional environment. This facies type is a key requirement for many models of other stratiform copper deposits.
- 3. Absence of obvious igneous or structural first order controls on mineralization. The faulting in the Unkur Project area generally appears to be post-mineralization.
- 4. A simple copper mineral composition, which is characteristic of sandstone-hosted copper deposits.

The nearby Udokan copper deposit is also an example of a sediment-hosted stratiform copper deposit. Globally, other prominent examples of this deposit type are the Dzhezkazgan copper deposits in Kazakhstan, the Zambian copper belts, and the Kuperschiefer in Central Europe.

# 9 Exploration

No material exploration works have been conducted by, or on behalf of, the issuer. Historical exploration is discussed in the History section of this report.

# 10 Drilling

Most drilling and trenching at the Unkur Project was carried out during the 1969-1971 campaign (Table 10-1).

SRK notes that the reports from the 1969-1971 and 1975-1978 campaigns list no coordinates for drillhole collars and trench locations. Instead, the drill holes and trenches are depicted on maps and sections. The historical collars have not been found; therefore it is not possible to verify these locations. SRK has derived the location data by scanning and georeferencing the historical hard copy maps. SRK estimates that the x and y collar coordinates derived in this manner could have an uncertainty of up to 100 m.

Drillhole details are presented in Table 10-2.

Table 10-1: Unkur Project Diamond Drilling and Trenching

Туре	1969-1971	1975-1978
Core drilling (m)	5549.1	1154
Trenches (m <sup>3</sup> )	20524.3	

Hole	Azimuth	Dip	Depth	Easting*	Northing*	Elevation*	Line	Date	Core Recovery,	
ID	Azimum	Dip	(m)	(m)	(m)	(m)	Line	Dale	%	
C-103	-	-90	202	595890.5	6300076	901	1	1971	72	
C-104	-	-90	296.9	596476.49	6299524.8	941	2	1971	88	
C-105	-	-90	341.9	596956.84	6298968.8	962	2	1971		
C-107	-	-90	148.7	597525.52	6298474.8	1057	4	1971	76	
C-108	-	-90	329.6	597662.1	6298595	1040	4	1971		
C-22	-	-90	12.5	598067.96	6297739.7	1043	5	1971		
C-110a	-	-90	265	598326.75	6298167.7	1007	5	1971		
C-110	-	-90	192	598342.43	6298070.1	1014	5	1971		
C-112	-	-90	250	598897.99	6297426.3	1015	6	1971		
C-111	-	-90	285	599062.06	6297496.6	977	6	1971	31	
C-102	-	-90	101.2	595772.25	6300834	916	7	1971	50	
C-118	-	-90	274	595781.58	6300379.9	927	8	1971	58	
C-117	-	-90	231	595899.77	6300502.8	926	8	1971		
C-123	-	-90	284	595613.32	6301181	905	9	1971		
C-119	-	-90	219.7	596024.93	6301372	886	9	1971		
C-122	-	-90	254.7	595355.37	595355.37 6301621.9 898		10	1971		
C-121	-	-90	21	595505.35	595505.35 6301762.8 892		10	1971		
C-102	-	-90	272	595772.25	6300834	916		1978	50	
C-126	-	-90	262	595471.39	6301091.7	911		1978		

#### Table 10-2: Summary of Unkur Drill holes, 1969-1978

Hole	Azimuth	Dip	Depth	Easting*	Northing*	Elevation*	Line	Date	Core Recovery,	
ID	Azimuti	ыр	(m)	(m)	(m)	(m)	LIIIE	Date	%	
C-128	-	-90	345	595274.25	6301539.5	899		1978		
C-130	-	-90	275	595550.09	6301142.9	907		1978		
Total			4863.2							

Note:

\* Coordinates derived by SRK from historical plans.

A total of 8 drill holes intersected high-quality copper mineralization in the bedrock. The deepest mineralized intersection is from hole C-104, from a down hole depth of 242.4 m.

### 10.1 Trenching

Trenching was performed to investigate the bedrock exposure and verify geophysical anomalies. The depth of trenching did not exceed 5 m. The depth of penetration into bedrock was not less than 0.5 m.

Trenches were driven on the southwest limb of the Unkur syncline every 200-300 m along the strike of the copper-bearing horizon. A total of 15 trenches were cut (Figure 10-4). Six trenches were excavated on the northeast limb in order to verify geophysical anomalies and study the lithological section.

Trenches were generally prepared by blasting followed by bulldozing.

From the trenches, copper mineralization was continuously outlined for some 2 km.

# 10.2 Drilling

Core drilling during 1969-1971 campaign aimed to assess the copper-bearing horizon, under the moraine sediments. All these drill holes are vertical.

As part of the 1969-1971 campaign, a set of "mapping" holes were drilled to 30-40 m depth. The profile spacing for this group of holes was 400 m, with a distance between holes of 15–20 m. This drilling was carried out by UPB-25 rigs using a single-tube core barrel. A hard metal bit (76 mm diameter) was used for drilling through the sedimentary cover, and then a diamond bit (59 mm diameter) for the bedrock. The total length of the mapping hole drilling was 1,200 m.

A deeper set of drill holes were drilled in 1969-1971 to define copper mineralization to 200-350 m depth. This single-tube drilling was carried out by ZIF-300, ZIF-650 and SBA-500 rigs. The distance between the profiles of these drillholes was 400-800 m, and the distance between holes was 80-200 m. A 146 mm diameter bit was used for the sedimentary cover, a 90 mm bit was used for bedrock, and a 76 mm bit was used for the mineralized zone. The core recoveries for the drillholes which intersected mineralization are shown in Table 10-2.

A deviation survey was carried out for all drillholes. The dip deviations from vertical did not exceed  $1-2^{\circ}$ .

### **10.3 SRK Comments**

From 1969-1978, 56 drill holes were drilled in the Project area. The drilling method was single-tube core barrel. The average length-weighted core recovery from the mineralized intersections was 65.2%.

During the site visit, SRK visited an old core storage facility and inspected the state of the historical core (Figure 10-1). The core was in a poor state, partly due to degradation over the 40 or so years since drilling, but it was also apparent that the fractured pieces of core had ground against each

other during the drilling process, contributing to the poor recovery. The intervals of most interest – the mineralized intersections – had been removed for whole-core sampling.

The mineralized zone in the area covered by the historical drilling generally dips to the northeast at 40-60°, therefore the vertical drill holes are not at the optimum orientation for testing this zone. SRK would recommend that future drilling should be inclined to intersect the mineralized zone at a higher angle.



Figure 10-1: Core Recovered from hole C-118 (source: SRK December, 2014)



Figure 10-2: Old Core Storage, the Unkur Project (source: SRK December, 2014)

# **11** Sample Preparation, Analyses, and Security

# **11.1 Sample Preparation and Analyses**

Sampling of drill holes and trenches was performed by geologists of the Naminginskaya and Lukturskaya Parties of the Udokanskaya expedition. The intervals selected for sampling included the mineralized zone, as identified by the geologists, and the host rock for 2-4 m either side. Samples were prepared by the Central Chemical Laboratory, Chita. The historical information available for the Project does not include a description of sample preparation procedures and equipment. Trench, core and composite samples (composed of several core samples) were analysed for copper; geochemical samples were submitted for a semiquantitative spectral analysis for 10 elements. Composite samples were fire assayed for gold and silver and analysed by spectral analysis for 36 elements.

No information on the certification of the Central Chemical Laboratory is available.

#### 11.1.1 Trench Sampling

Trenches were sampled by channel sampling. The average length of the channel samples was 2 m, but the length of individual samples varied from 0.3 m-3.6 m, in order to match contacts of lithological and mineralization zones identified by the geologists. The nominal cross sectional area of the samples was 5 cm by 3 cm. A total of 42 samples (62.7 m) were taken (Table 11-1).

Trench-ID	From	То	Sample-ID	Sample length, m	Cu grade, %
1	37.5	40.0	606	2.5	0.41
1	40.0	42.0	607	2.0	0.98
1	42.0	43.0	608	1.0	0.18
2	22.0	24.0	683	2.0	0.43
2	24.0	26.0	684	2.0	0.41
2	26.0	28.0	685	2.0	0.58
2	28.0	30.0	686	2.0	0.46
2	30.0	32.0	687	2.0	0.23
3	67.0	69.5	626	2.5	0.62
3	69.5	71.5	627	2.0	0.91
3	71.5	73.5	628	2.0	0.88
3	73.5	75.5	629	2.0	0.51
3	75.5	78.0	630	2.5	0.36
3	88.0	90.5	636	2.5	0.27
3	90.5	93.0	637	2.5	1.16
3	93.0	95.0	638	2.0	0.96
3	95.0	97.0	639	2.0	0.98
3	97.0	99.0	640	2.0	0.58
3	99.0	101.0	641	2.0	0.74
3	101.0	103.0	642	2.0	0.71
3	103.0	105.0	643	2.0	0.82
3	105.0	107.5	644	2.5	0.65
3	107.5	110.0	645	2.5	1.5

 Table 11-1: Assay Results for Trench Sampling of Mineralized Intervals

Trench-ID	From	То	Sample-ID	Sample length, m	Cu grade, %
3	110.0	112.0	646	2.0	0.6
3	112.0	114.0	647	2.0	0.34
4	109	111	717	2.0	0.56
5	129	131	900	3.0	0.5
5	152	154.0	763	2.0	0.33
5	154.0	156.0	764	2.0	0.08
5	156.0	158.0	765	2.0	1.4
5	158.0	160.5	766	2.5	1
5	160.5	162.5	767	2.0	0.35
616	16.0	18.0	627	2.0	0.42
616	18.0	20.0	626	2.0	0.81
616	20.0	22.0	625	2.0	0.76
602	10.0	13.6	26,674	3.6	1.18
602	13.6	15.0	26,675	1.4	0.96
602	15.0	16.4	26,676	1.4	2.2
602	16.4	18.7	26,677	2.3	0.8
602	18.7	20.5	26,678	1.8	1.02
602	20.5	22.6	26,679	2.1	0.94
603	11.2	12.4	40,527	1.2	0.5
603	12.4	13.8	40,506	1.4	0.6
603	13.8	15.8	40,507	2.0	1.36
603	15.8	17.8	40,508	2.0	1.2
603	17.8	19.8	40,509	2.0	0.74
604			40,528	2.0	0.76
604			40,529	2.0	0.66

#### 11.1.2 Drill Core Sampling

Only the copper-bearing zone was sampled from the drill holes.

The average sample length for the exploration drillholes (200-350 m deep) was 2 m, but varied to fit lithology and mineralization intensity boundaries (Table 11-2). Intersections of reasonably intact core were manually halved: one half was used as a sample, and the other half was stored as a duplicate. Frequently though, the core returned from drilling was very broken, with poor recovery, and for these intersections all the available chips were included in the sample.

Sample lengths for the mapping drillholes (hole depths of up to 30 m) were typically close to 6 m, but the exact sampling boundaries were chosen with regard to mineralization intensity zones, as identified by the geologists. The longer length of the samples from mapping drill holes was adopted to compensate for the smaller core diameter (26-28 mm) compared to the exploration drill hole diameter (59 mm), in order to obtain comparable sample weights.

Table 11-2: Assay Results for Core Sampling of Mineralized Intervals

Hole-ID	From	То	Sample-ID	Sample length, m	Cu grade, %
C-1	18.0	24.4	2	6.4	0.5
C-1	24.4	30.0	3	5.6	0.3
C-1	30.0	35.7	4	5.7	0.9
C-12	8.0	10.1	9	2.1	1.7
C-12	10.1	12.0	10	1.9	1.6
C-12	12.0	13.4	11	1.4	1.6
C-12	13.4	16.7	12	3.3	
C-12	16.7	19.0	13	2.3	
C-12	19.0	21.0	14	2.0	0.7
C-13	19.0	23.2	19	4.2	0.9
C-13	23.2	27.4	20	4.2	
C-13	27.4	33.3	21	5.9	
C-13	33.3	38.0	22	4.7	1.8
C-103	88.0	90.0	131	2.0	0.7
C-103	90.0	92.5	132	2.5	0.3
C-103	92.5	93.6	133	1.1	0.4
C-103	93.6	97.0	134	3.4	1.3
C-103	97.0	98.5	135	1.5	0.7
C-104	242.4	245.4	182	3.0	0.6
C-104	245.4	248.6	183	3.2	0.9
C-106	152.0	154.7	156	2.7	0.9
C-107	85.6	87.5	165	1.9	0.3
C-107	87.5	89.5	166	2.0	0.2
C-107	89.5	91.5	167	2.0	0.7
C-118	136.4	138.9	241	2.5	1.4
C-118	138.9	140.4	242	1.5	2.4
C-118	140.4	141.7	243	1.3	1.3
C-118	141.7	143.1	244	1.4	0.8
C-118	143.1	145.1	245	2.0	0.7
C-118	145.1	146.3	246	1.2	0.4
C-118	146.3	148.3	247	2.0	2.3
C-118	148.3	151.1	248	2.8	1.3
C-118	151.1	153.4	249	2.3	1.1
C-118	153.4	155.2	250	1.8	0.3
C-118	155.2	160.0	251	4.8	1.1
C-118	160.0	163.5	252	3.5	2.5
C-118	163.5	164.2	253	0.7	0.5
C-118	164.2	167.5	254	3.3	3.3
C-118	167.5	169.6	255	2.1	2.4
C-118	169.6	171.6	256	2.0	3.1

Hole-ID	From	То	Sample-ID	Sample length, m	Cu grade, %
C-118	171.6	173.8	257	2.2	1.8
C-118	173.8	175.7	258	1.9	2.1
C-118	175.7	178.0	260	2.3	3.5
C-118	196.0	200.5	266	4.5	1.7
C-118	200.5	203.6	267	3.2	3.3
C-118	203.6	205.6	268	2.0	1.5
C-118	205.6	207.6	269	2.0	2.6
C-111	240.0	242.9	202	2.9	0.7
C-111	242.9	243.9	203	1.0	0.3
C-111	243.9	245.2	204	1.3	0.6

A total of 11 composite samples were made from the core sample duplicates in order to determine the grades of associated elements (primarily silver). Results are presented in Table 11-3.

Hole-ID	Sample	Silver grade, g/t
C-103	1	135.0
C-107	2	11.2
C-106	3	164.6
C-104	4	20.0
C-111	5	21.4
C-118	6	41.6
C-118	7	95.0
C-118	8	87.0
C-102	9	76.8
C-102	10	32.8
C-102	11	56.0
Average		67.4

Table 11-3: Assay Results for Group Sampling in 1975-1978

### 11.2 Bulk Density Data

Bulk density data were obtained by hydrostatic weighing of 51 samples. Samples were taken from the exposed rocks, dumps and drill hole core.

The minimum density value of the rocks from the copper-bearing horizon of the Lower Sakukansksys formation was 2.5 g/cm<sup>3</sup>, the maximum value was 2.86 g/cm<sup>3</sup>, and the average was 2.67 g/cm<sup>3</sup>.

### **11.3 Quality Control Programs**

Quality control on the historical sample preparation and analytical testwork of the Unkur samples was not done to presently accepted international best practises.

During the 1969-1971 campaign, the Central Chemical Laboratory inserted its own duplicate samples, at a rate of 17% of the total primary sampling (Table 11-4). This limited set of results does not show a significant problem with precision.

No quality control samples were analysed for the Unkur Project from the 1975-1978 campaign.

N⁰	OSample ID	CU_OSamples	DSample ID	CU_DSamples	Δ(CU_OS-CU_DS)
1	131	0.70	100	0.70	0.00
2	132	0.31	101	0.33	-0.02
3	133	0.36	102	0.41	-0.05
4	134	1.31	103	1.26	0.05
5	135	0.70	104	0.72	-0.02
6	182	0.60	105	0.54	0.06
7	183	0.94	106	0.88	0.06
8	202	0.69	107	0.66	0.03
9	203	0.30	108	0.24	0.06
10	204	0.63	109	0.60	0.03
11	242	1.60	110	1.60	0.00
12	243	0.99	111	1.01	-0.02
SUM		9.13		8.95	
Avera	ge	0.76		0.75	

Table 11-4: Results of Internal Control Pulp Duplicates by Central Chemical Laboratory in 1969-1971

# 11.4 Adequacy of Sample Preparation, Security, and Analytical Procedures

In SRK's opinion, the historical samples are not suitable for mineral resource estimation because there is insufficient documentation of the historical sample preparation and analytical procedures, and insufficiently rigorous quality control protocols were applied.

# 12 Data Verification

# **12.1** Data verification by the qualified person

Data verification was limited to a personal inspection of the property and a review of documentation from the historical exploration campaigns. No confirmatory sampling was carried out by the qualified person.

During the site visit SRK inspected an outcrop in the Unkur River bed, where the copper-bearing horizon was exposed (Figure 12-1). SRK surveyed the position of this outcrop, and the core storage site, using a hand-held Garmin GPS. Figure 12-2 shows the location of the outcrop, as recorded by SRK. The difference between the outcrop location and the mapped position of the copper-bearing horizon is about 200-300 m. Some of this difference possibly arises because the outcrop is in the river bed, whereas the mapping (from trenches) is showing the position of the horizon higher up the southwest slope of the valley.



Figure 12-1: Malachite Crusts (Green) on the Sandstone of the Exposed Copper-Bearing Horizon (source: SRK, December 2014)

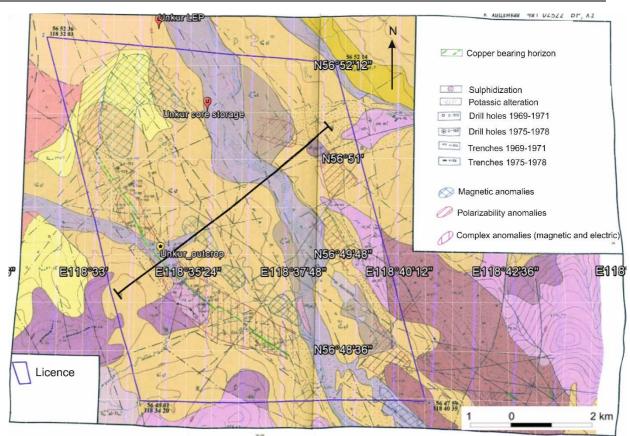


Figure 12-2: Location of Outcropping Copper-Bearing Horizon based on SRK's Data (compiled by SRK, using information from Berezin, 1979)

# 12.2 Limitations on data verification

The historical sampling could not be verified because of the poor condition of the core, due to poor recovery during drilling, deterioration of the core and core trays over the subsequent four decades, and collapse of the core storage shed. Also, it appears that the intervals of most interest (the mineralised intersections) were generally entirely consumed by sampling during the historical exploration programs.

Apart from the outcrop shown in Figure 12-1, all other known exposures of mineralisation within the project area were inaccessible due to snow cover at the time of the site visit by the qualified person.

# 12.3 Adequacy of data for the purposes used in this technical report

The data available for the Unkur deposit are suitable for giving an indication of exploration potential. The quantity and quality of data are not sufficient to support estimation of mineral resources.

# 13.1 Background

This review is based upon the metallurgical testwork results presented in the ZAO SGS Vostok Ltd. report, Project No. SA-1175-MIN-HT-14 "Metallurgical Testwork on Oxide Ore Sample of the Unkur Deposit" dated February 2015.

The testwork was conducted on a single, 350 kg sample of the oxide Cu-bearing ore of the Unkur deposit, identified as sample TP-1. The qualified person observed this sample being collected from an outcrop in the Unkur River bed (the same outcrop described in Item 12.1). In SRK's opinion, this sample can reasonably be considered as representative of the oxide portion of the deposit, but it must be noted that the weathered zone is poorly developed, to a depth of only 5-10m, and the some characteristics of the oxide may not be representative of the much larger fresh rock component of the deposit.

The testwork included:

- Fractional size analysis of the whole ore;
- Mineralogical analysis;
- Chemical analysis;
- Grinding kinetics tests;
- Gravity, flotation testing;
- Acidic hydrometallurgical leaching testing; and
- Diagnostic leaching of copper.

Mineralogical and petrographic tests were conducted at the Mineralogical Institute of Ural Department of Russian Academy of Science (UrO RAN).

### **13.2 Sample Characteristics**

The copper and silver deportment by size fraction, in the sample crushed to -1.7 mm, is presented in Table 13-1. In general terms the contained grade of both metals is consistent across all size fractions with a slight increase in grade of both metals in the minus 75 to 53  $\mu$ m and minus 53  $\mu$ m size fractions.

This deportment is consistent with the mineralogical observations.

Size Fraction Mass Yield **Distribution**, % Assay, %, g/t % Cu Ag Cu mm Ag g -1.7+1.18 175.03 17.50 1.27 27.60 16.62 17.68 -1.18 + 0.600331.00 33.10 1.28 27.30 31.69 33.08 1.23 10.75 -0.600 + 0.425113.84 11.38 25.80 10.47 1.22 25.30 -0.425 + 0.212124.30 12.43 11.34 11.51 8.22 1.21 7.25 -0.212+0.106 82.18 24.10 7.44 -0.106+0.075 27.47 2.75 1.35 25.60 2.77 2.57 1.47 -0.075 + 0.05322.99 2.30 28.10 2.53 2.36 123.19 12.32 1.86 32.80 17.14 14.79 -0.053 Head Calculated 1000.00 100.00 1.34 27.32 100.00 100.00 Head Direct 1.31 28.20

 Table 13-1:
 Distribution of copper and silver between size fractions (at 1.7 mm)

#### 13.2.1 Chemical Analysis

The sample was analysed and the chemical analyses is presented in Table 13-2.

The ore sample contained 1.31% Cu and 28.2 g/t Ag (average).

The oxide copper mineralisation represents over 95% of the contained copper and the relatively low sulphur values for both  $S_{Total}$  and  $S_{Sulphide}$  confirm the relatively low amount of copper suphide minerals in this sample of oxide ore.

The Cao and MgO content together with the relatively high LOI values are significant since they are indicative of the presence of carbonate in the sample. This is detrimental to acid leaching in terms of the propensity to increase acid consumption.

Element	Method	Unit	Assay	Element	Method	Unit	Assay
Cu total	AAS72C	%	1.31	Мо	ICP90AM	ppm	<10
Cu oxide	AAS72C	%	1.25	Р	ICP90AM	%	0.12
Ag	AAS12EM	g/t	28.2	Pb	ICP90AM	ppm	<20
Au	FAA303M	g/t	0.03	Sb	ICP90AM	%	<0.005
С	CSA01VM	%	0.74	Sc	ICP90AM	ppm	11
S total	CSA06VM	%	0.02	Sn	ICP90AM	ppm	<50
S sulphide	CSA08VM	%	0.01	Sr	ICP90AM	ppm	70
Al	ICP90AM	%	6.45	Ti	ICP90AM	%	0.26
As	ICP90AM	%	<0.003	V	ICP90AM	ppm	80
Ва	ICP90AM	ppm	720	W	ICP90AM	ppm	<50
Be	ICP90AM	ppm	<5	Y	ICP90AM	ppm	17
Са	ICP90AM	%	2.54	Zn	ICP90AM	%	0.01
Cu	ICP90AM	%	1.3	AI2O3	ICP95AM	%	11.8
Cd	ICP90AM	ppm	<10	CaO	ICP95AM	%	3.79
Cr	ICP90AM	ppm	190	Fe2O3	ICP95AM	%	4.61
Со	ICP90AM	ppm	10	K2O	ICP95AM	%	4.01
Fe	ICP90AM	%	3.19	MnO	ICP95AM	%	0.16
К	ICP90AM	%	3.33	MgO	ICP95AM	%	2.33
La	ICP90AM	ppm	30	Na2O	ICP95AM	%	1.8
Li	ICP90AM	ppm	20	P2O5	ICP95AM	%	0.3
Mg	ICP90AM	%	1.39	SiO2	ICP95AM	%	65.4
Mn	ICP90AM	ppm	1250	TiO2	ICP95AM	%	0.46
Ni	ICP90AM	%	0.004	LOI*	ICP95AM	%	5.42

 Table 13-2:
 Chemical Analysis of sample TP-1

\*Note: LOI – Loss on ignition

#### 13.2.2 Mineralogy

Mineralogical examination of +1mm fraction of the crushed sample indicated that the ore is a mixture of fine-grained sandstones and siltstones with disseminated impregnation of iron oxides and oxide copper minerals. The ratio of the fine-grained sandstones and siltstones is approximately 3:1.

The mixed sample contains abundant quartz, albite, mica (muscovite and biotite), calcite, and traces of chlorite. The accessory minerals are zircon, apatite, barite, and titanium oxides. Small amounts of

sulphide minerals (bornite, chalcosite, covellite, chalcopyrite, pyrite) are present together with small amounts of silver and silver sulphide. The main copper oxide minerals are in the form of carbonates, malachite and azurite. Copper silicate, chrysocolla, is also present.

The fine grained sandstone (75%) contains abundant quartz and plagioclase and the intergrain cement is micaceous and contains carbonate minerals. The structure is fine-grained, the microtexture is massive and porous. These sandstones contain poorly disseminated iron oxides and rinds, films and impregnations of copper oxides such as malachite, azurite and copper silicate. The iron oxides are hematite, magnetite and martite. Zircon is also present. The fine grain sandstones are rich in copper salts and contain 5–10% by volume of malachite. Small amounts of copper sulphide minerals, bornite, chalcosite, covellite, chalcopyrite are present together with some pyrite. These are present in interstices of the gangue minerals and form rare disseminated impregnation in sandstones or individual inclusions in magnetite and hematite.

The siltstone (25%) is fine-grained and the texture is massive and weakly layered. The siltstone contains disseminated impregnation of iron oxides (from individual grains to 2% of the volume). The siltstone contains rinds, films and fine veinlets of copper minerals, usually malachite (from individual grains to 1–2% of the volume). The primary iron oxide is hematite, with small amounts of magnetite. The iron oxide grain size varies from 1 to 30  $\mu$ m and occasionally up to 0.2 mm.

The hematite and magnetite both contain 2 to 30  $\mu$ m inclusions of the sulphide minerals present. The intergrowths are generally complex. Hematite is partially rimmed by green Cu mineral films. The hematite grain size varies from 5–10  $\mu$ m to 70  $\mu$ m–0.1 mm. The magnetite crystal size is 50  $\mu$ m to 0.15 mm, and 1 mm in intergrowths with gangue minerals.

Pyrite is disseminated and present as individual free grains in gangue minerals.

The main copper bearing minerals are malachite  $Cu_2(CO_3)(OH)_2$  and azurite  $Cu_3(CO_3)_2(OH)_2$  and occur as rinds, thin films and impregnation in the fine-grained sandstone and siltstone, sometimes as veinlets and stringers in siltstones and sometimes as rims around the grains of magnetite and hematite. The malachite veinlets are 10–50 µm thick. The azurite is often intergrown with malachite. Some of the malachite contains admixture of zinc and lead. In some instances azurite contains a small amount of lead.

Small amounts of copper and lead arsenates are present sometimes with rare earth elements, (REE), Nd and Y.

Silver is found as silver sulphide and native silver. Silver sulphide Ag<sub>2</sub>S occurs as inclusions and emulsions in malachite, or with fine native silver inclusions. Native silver Ag occurs as fine (0.5  $\mu$ m) inclusions in silver sulphide and in malachite.

The SGS report states that the textural and structural features and mineralogical composition of the Unkur ores are similar to those of the Udokan ores and for metallurgical purposes the ores are characterized as mixed carbonate-sulphide.

The main conclusion from the mineralogy is that while the copper minerals should be readily extracted by acid leaching, the predominance of the two copper carbonates, malachite and azurite, will result in high acid consumption. Some of the sulphides will be recoverable by flotation but the relatively fine grain size and the presence of abundant copper oxides will probably result in low recoveries and poor grades, and sulphidisation will be required to recover oxide copper minerals by this means.

#### 13.2.3 Testwork results

A 350 kg mass of sample was received. The top size of material in the sample was 260 mm. The sample was stage crushed, screened and split for analysis and testing.

#### 13.2.4 Diagnostic Acid Leaching

A diagnostic leach test was used to identify the deportment of copper between different minerals. The results are given in Table 13-3. The majority of the copper is associated with malachite and azurite, copper carbonate minerals. While this means that the copper can be readily leached in acid conditions, the acid consumption will be high due to the carbonate – acid reaction. Insoluble copper in the form of sulphides, chalcosite, covellite, bornite and chalcopyrite represent less than 2% of the copper mineralisation and copper silicates, predominantly chrysocalla, represents approximately 3% of the contained copper.

The low copper sulphide content is also significant in terms of beneficiation and is not ideal for recovery by flotation. The oxide copper minerals will require pre-treatment to improve their floatability characteristics.

Cu Deportment	Cu Grade %	Cu Distribution %
Cu Soluble (Chalcanthite)	0.0002	0.02
Cu Oxide (Malachite, Azurite) – Carbonate	1.183	95.40
Cu Secondary (Chalcosite, Covellite, Bornite)	0.007	0.56
Cu Primary (Chalcopyrite)	0.013	1.05
Cu Silicate (Chrysocolla)	0.037	2.97
Cu Total	1.24	100.00

Table 13-3: Diagnostic Copper Leaching

#### 13.2.5 Gravity Concentration

Gravity concentration tests were conducted on 10 kg ore charges of the -1.7 mm crushed head sample TP-1 ground to  $P_{80}$  passing 600, 212, 75 and 53 µm. The gravity flowsheet included centrifugal Knelson separation followed by Mozley table upgrading. The test results indicated the low effectiveness of gravity concentration for processing of the oxide ore sample tested. The metal recovery and concentrate grade values were low. In all cases the Cu recovery to was <2% at a grade of 1.7 to 2.4% Cu. The Ag recovery was also low, <3.5% at a concentrate grade of 88 to 133 g/t.

These results were not unexpected based on the mineralogical examination performed. Further gravity concentration tests were not performed and, based on the sample tested, this method of concentration is not suitable for treatment of this ore.

#### 13.2.6 Flotation Tests

Ten laboratory flotation tests (F1-F10) were conducted to investigate the recovery of both copper sulphides and oxide copper minerals. The flotation testing flowsheet is shown in Figure 13-1.

Testing included staged flotation of the sulphide and oxide minerals, flotation with and without sulphidisation of oxide minerals with  $Na_2S$  to promote better flotation, and various reagent regimes. In general tests were conducted at 80% passing 75  $\mu$ m.

The flotation results are presented in Table 13-4.

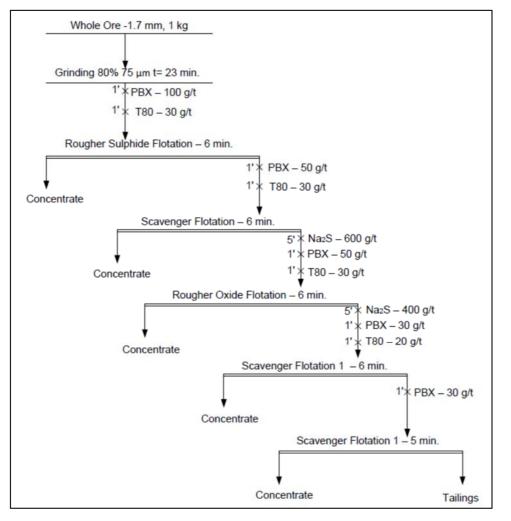


Figure 13-1: Flotation testwork flowsheet

The main conclusions from the flotation testwork were as follows:

- A two-stage flotation flowsheet is preferred;
- Preliminary sulphidisation of the oxide copper minerals with staged addition of sodium sulphide is required for the effective flotation of these minerals;
- Flotation recoveries for copper and silver are low and the best recoveries for copper and silver were 40–43% Cu and 66–70% Ag;
- The bulk rougher concentrate produced under the best conditions tested contained 5.4–6.9% Cu and 175–260 g/t Ag.

The flotation concentrates and the flotation tailings were used for further acid leaching tests.

Further metallurgical testwork would be required to improve the results and to optimise the conditions.

#### Table 13-4: Flotation testwork results

Test		Yie	eld	Grade	, %, g/t	Recov	very, %	20 102 1
No.	Products	g	%	Cu	Ag	Cu	Ag	Test Parameters
	Roug Sulph. Flot. Conc.	17.37	1.75	3.03	586.0	4.06	34.86	
	Scav. Sulph. Flot. Conc.	13.23	1.33	2.67	117.0	2.73	5.30	
	Rougher Oxide Flot. Conc.	20.66	2.08	16.40	252.0	26.16	17.83	Basic Flowsheet
F-1	Scav. Oxide Flot. Conc. I	17.03	1.71	5.12	116.0	6.73	6.77	(Sulphide+Oxide
	Scav. Oxide Flot. Conc. II	11.05	1.11	2.74	52.4	2.34	1.98	Flotation)
	Tailings	915.84	92.03	0.82	10.6	57.98	33.25	1
	Whole Ore	995.18	100.00	1.30	29.3	100.00	100.00	1
	Rougher Flot. Conc. 1	13.91	1.40	12.80	844.0	13.98	38.07	
	Rougher Flot. Conc. 2	16.14	1.62	4.46	161.0	5.65	8.43	Rougher Flota-
	Rougher Flot. Conc. 3	12.04	1.21	3.28	99.2	3.10	3.87	tion Kinetics with
F-2	Rougher Flot. Conc. 4	17.51	1.76	2.66	64.8	3.64	3.68	Preliminary Sul-
	Rougher Flot. Conc. 5	17.09	1.78	2.21	43.9	3.07	2.52	phidization of the
	Scav. Flot. Conc.	22.58	2.27	7.27	153.0	12.89	11.20	Oxide Minerals)
	Tailings	895.21	89.96	0.82	11.1	57.65	32.23	-
	Whole Ore	995.10	100.00	1.30	30.99	100.00	100.00	
	Rougher Flot. Conc. I	50.19	5.04	8.31	346.0	32.42	57.06	Electron with
	Rougher Flot. Conc. II	82.81	8.32	1.36	38.3	8.76	10.42	Flotation with Sulfhydryl (PBX)
F-3	Scav. Flot. Conc.	50.30	5.05	1.39	30.4	5.44	5.02	and Oxyhydryl
	Tailings	812.48	81.59	0.84	10.3	53.35	27.50	(OIH) Collectors
	Whole Ore	995.78	100.00	1.29	30.56	100.00	100.00	(ent) concoror
19	Rougher Flot. Conc.	39.50	3.98	3.32	196	10.06	26.84	Flotation with
F-4	Scav. Flot. Conc.	30.09	3.03	2.80	94.4	6.46	9.85	Oleic Acid with-
1-4	Taioings	982.30	92.97	1.18	19.8	83.48	63.31	out Preliminary
	Whole Ore	991.89	100.00	1.30	29.08	100.00	100.00	Sulphidization
	Concentrate	7.78	0.78	2.20	207	1.32	5.48	
	Middling 2	21.56	2.17	3.88	158	6.43	11.59	Rougher+Cleane
F-5	Middling 1	39.23	3.95	2.62	86.3	7.90	11.52	r Flotation with
F-0	Scav. Flot. Conc.	17.41	1.75	2.49	88.9	3.33	5.27	Leic Acid and
	Tailings	908.19	91.35	1.16	21.4	81.02	66.14	Silicic Acid
	Whole Ore	994.17	100.00	1.31	29.56	100.00	100.00	
	Concentrate	8.76	0.88	3.52	302	2.33	8.97	
	Middling 2	11.84	1.19	3.78	180	3.38	7.23	]
F-6	Middling 1	39.24	3.94	2.21	88.1	6.54	11.72	As above (ad-
F-0	Scav. Flot. Conc.	29.02	2.91	2.90	101	6.35	9.94	justed)
	Tailings	906.97	91.08	1.19	20.2	81.40	62.14	
-	Whole Ore	995.83	100.00	1.33	29.61	100.00	100.00	
	Rougher Flot. Conc. I	33.89	3.49	10.05	398	29.30	49.94	Two-stage Flota-
	Rougher Flot. Conc. II	23.10	2.38	4.02	197	7.65	16.86	tion: Stage 1
F-7	Scav. Flot. Conc.	15.61	1.61	2.06	55.8	2.65	3.23	60% passing 75
	Tailings	898	92.52	0.82	9.0	60.40	29.94	µm, Stage 2 80% passing 53
	Whole Ore	970.6	100.00	1.25	27.81	100.00	100.00	μm
	Rougher Flot. Conc.	24.32	2.44	12.50	535	22.96	43.97	Flotation with
F-8	Scav. Flot. Conc.	13.64	1.37	5.41	154	5.57	7.10	PBX and MIBC
	Tailings Whole Ore	958.97 996.93	96.19 100.00	0.99	15.1 29.68	71.47	48.93 100.00	(with Na <sub>2</sub> S)
	Rougher Flot. Conc.	30.52	3.07	10.90	452	25.29	48.36	Flotation with PAX and MIBC (with Na <sub>2</sub> S)
F-9	Scav. Flot. Conc.	17.46	1.76	5.09	118	6.76	7.22	
	Tailings Whole Ore	945.70 998.68	95.17 100.00	0.94	13.4 28.71	67.95 100.00	44.42 100.00	
			-					
	Rougher Flot. Conc.	55.99	5.62	7.29	299	30.73	59.76	Flotation with A
F-10	Scav. Flot. Conc.	13.09	1.31	5.51	124	5.43	5.79	5 (with Na <sub>2</sub> S)
	Tailings	927.89	93.07	0.91	10.4	63.84	34.45	
	Whole Ore	996.97	100.00	1.33	28.10	100.00	100.00	

#### 13.2.7 Hydrometallurgical Testing

The hyrometallurgical testing included acid leaching of the whole ore and the flotation concentrate and cyanidation of the final tailings to recover silver.

The outline flowsheet of the tests is shown in Figure 13-2.

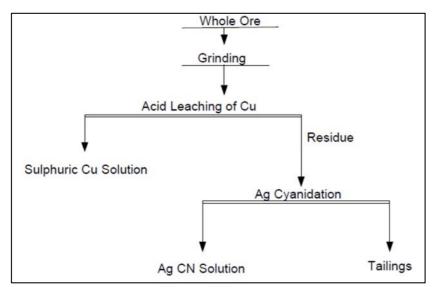


Figure 13-2: Hydrometallurgical testing flowsheet

#### Whole ore leaching

Nine whole ore sulphuric acid leach tests were performed considering particle size, pulp solids concentration, leach residence time, pH and acid addition.

The best result achieved copper extraction of 95.8% from a feed ground to 80% passing 75  $\mu$ m, using a leach residence time of 2 hours, at pH 2 and 33% w/w solids concentration. The acid consumption was high at 90.52 kg/tonne of feed. SGS reported that 78% of the acid used was consumed by gangue carbonate minerals.

Tests showed that coarser grinding, higher pH, reduced acid addition and higer pulp densities resulted in lower copper extraction.

It is noted that the conditions were not optimised.

#### Cyanidation of Silver from whole ore leach residues

Bottle roll cyanidation tests were performed on the acid leaching residues from the whole ore leaching tests. The following test parameters were used:

- NaCN concentration 0.2% (2 g/L);
- Pulp density 33% (L:S = 2:1);
- pH 10.5–11.0;
- Cyanidation leach time 48 h.

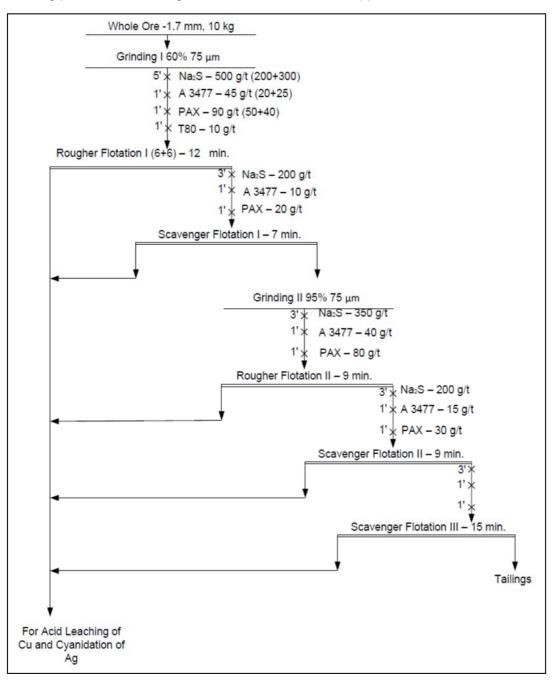
The CN solutions and residues were analysed for Ag and the cyanide consumption was calculated based on additions and residual cyanide in solution.

The silver extraction to the cyanide solution varied from 91.6% to 97.9% with 3.88 to 0.84 kg/t\_{ore} CN added.

Silver extraction from the acid leach residue from the best copper leaching test was 96% and the cyanide consumption was 0.84 kg/t ore.

#### **Combined flowsheet**

A combined flowsheet included bulk flotation of copper and silver followed by hydrometallurgical processing of the flotation concentrate to extract copper and silver was also evaluated. The main testwork flowsheet is given in Figure 13-3. A second test was performed incorporating concentrate cleaning prior to acid leaching. This test resulted in lower copper and silver recoveries.



#### Figure 13-3 Combined flowsheet testing regime (test OF-1)

The bulk flotation test results, OF-1 and OF-2, for the combined circuit are presented in Table 13-5. The reduced recovery of both copper and silver due to the concentrate cleaning stage in test OF-2 is clearly evident. The copper and silver recoveries reporting to the uncleaned concentrate (test OF-1) were 41.5 and 74.6% respectively.

Test No.	Draduat	Yiel	Yield		Grade, %, g/t		Recovery, %	
	Product	g	%	Cu	Ag	Cu	Ag	
OF-1	Concentrate	956.0	9.56	5.55	250.0	41.50	74.60	
	Tailings	9044.0	90.44	0.827	9.0	58.50	25.40	
	Whole Ore	10000.0	100.00	1.28	32.04	100.00	100.00	
OF-2	Concentrate	197.0	1.97	9.97	685.5	15.23	48.73	
	Middling	582.69	5.83	5.31	103.0	23.99	21.66	
	Tailings	9220.31	92.20	0.85	8.9	60.78	29.61	
	Whole Ore	10000.00	100.00	1.29	27.71	100.00	100.00	

#### Table 13-5: Combined flowsheet – bulk flotation results

The acid leach test results L-10 and L-11 on the flotation concentrates from the bulk flotation tests OF-1 and OF-2 are presented in Table 13-6. The copper recoveries from concentrate are in excess of 94% in both cases but the overall copper extraction based on the whole ore are relatively low, 39.3% for the uncleaned bulk flotation concentrate, test L-10. The acid consumption figures back calculated to a fresh ore basis are significantly reduced from the whole ore figures, 16.3 kg/t for the uncleaned bulk flotation concentrate, test L-10.

Test No.	Product	Yield, mL, g	Cu Grade, mg/L, %	Cu Recovery, %		H <sub>2</sub> SO <sub>4</sub>		
				Conc.	Whole ore	kg/t conc.	kg/t ore	Parameters
L-10	Solution	1523	25708.09	94.69	39.30	170.38	16.29	pH = 2, 33% Solids, t = 2 h
	Residue	664.7	0.330	5.31	2.20			
	Test OF-1 Conc.	750.0	5.512	100.00	41.50			
L-11	Solution	376	44026.1	94.53	14.40		5.64	pH = 2, 33% Solids, t = 2 h
	Residue	138.6	0.690	5.47	0.83	286.41		
	Test OF-2 Conc.	185.0	9.455	100.0	15.23			

 Table 13-6:
 Combined flowsheet – bulk flotation concentrate acid leach test results

The silver recovery from the tailings from the uncleaned bulk flotation concentrate acid leach test (OF-1 & L-10) are presented in Table 13-7. Silver extraction is in excess of 95% and the cyanide consumption is low.

Table 13-7:	Cyanidation of Silver from the Acid Leach Residue of Test OF-1 & L-10
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	Viold	field, Ag Grade, hL, g mg/L, g/t	Recovery, %		NaCN Added			
Product	mL, g		Conc.	Whole Ore	kg/t conc.	kg/t ore	Parameters	
Solution	1292	126.8	95.25	71.06			NaCN – 0.2%, 33% Solids, pH 10.5-11.0, t = 48 h	
Conc. CN Residue	625	13.2	4.75	3.54	3.0	0.29		
Acid Leach Residue	630	282.1	100.00	74.60				

The combined flowsheet demonstrates that the lower acid consumptions are achievable based on treating flotation concentrates instead of whole ore, albeit at the expense of copper recovery, reducing from 93% for whole ore leaching to approximately 39%. The overall silver recovery on a whole ore basis is reduced from 96% to 71%.

### **13.3 Flowsheet Options**

Three flowsheets have been considered for the processing of the Unkur oxide ore.

- Flowsheet I two-stage grinding-flotation flowsheet;
- Flowsheet II –whole ore hydrometallurgical processing including acid leaching of copper followed by cyanidation of Ag from the acid leach residues.
- Flowsheet III combined flowsheet including flotation of the ore and hydrometallurgical processing of the flotation concentrate by acid leaching to extract copper followed by cyanidation of Ag from the acid leach residues.

The copper and silver recovery figures and the reagent consumptions are shown in Table 13-8 for each flowsheet.

	Recovery, %		Consumption, kg			
	Cu	Ag	H <sub>2</sub> SO <sub>4</sub>	NaCN		
Flotation only						
Flowsheet I	41.5	74.6				
Hydrometallurgical Proces						
Flowsheet II – 1 (pH=1.5)	98.38	97.86	92.35	1.26		
Flowsheet II – 2 (pH=2.0)	95.88	95.97	90.52	0.84		
Combined Flowsheet						
Flowsheet III	39.30	71.10	16.29	29.00		

Table 13-8: Metallurgical Test Results for Various Flowsheets

None of the flowsheets have been optimised either technically or economically.

### **13.4 Conclusions**

- Copper and silver can be recovered from the Unkur oxide ore.
- The presence of significant amounts of carbonate minerals in the ore results in high acid consumption during copper leaching.
- Silver can be effectively recovered from acid leaching residues.

#### **13.5 Recommendations**

- Further sampling and mineralogical and metallurgical testing should be performed on samples from across the ore body to determine the variation in response to the different processing routes.
- Additional minerals beneficiation testing should be performed to access the possibility of reducing the carbonate content of the feed to flotation and/or acid leaching.
- Additional testwork will be required on the on the selected route to optimise the parameters.
- An economic evaluation of the different processing flowsheets is required.

# **14 Mineral Resource Estimates**

There are no mineral resources for the Unkur Project that comply with the definitions and requirements of NI 43-101. Historical estimates, prepared according to the Soviet resource/reserve reporting system, are discussed in Item 6.2.

# **15 Adjacent Properties**

The Udokan copper deposit is located 25 km south of the licensed area of the Unkur Project. Similar to Unkur, the copper mineralization of the Udokan deposit is confined to sediments of the Sakukanskaya formation. For Udokan though, the mineralization is in the Upper subformation, whereas the Unkur mineralization is in the Lower subformation.

Information regarding Udokan is publically available on the Baikal Mining Company (Baikal) website (http://www.bgk-udokan.ru/en/). Mineral Resources and Ore Reserves for Udokan have been prepared according to the definitions and standards of the JORC Code (2012 edition). The reported Mineral Resources for Udokan are given in Table 15-1. The feasibility study for Udokan was completed in February 2014, and, according to the project execution dates presented by Baikal, mining will commence in 2021.

The results and mineral resources reported for Udokan are not necessarily indicative of mineralization on the Unkur property.

 Table 15-1: Mineral Resources for Udokan, as of March 2014, compiled from figures publically reported on the Baikal website

Resource Category	Mt	Cu grade (%)	Ag grade (g/t)	Cu metal (Mt)	Ag metal (Moz)
Measured	339	1.03	8.9	3.5	97
Indicated	1,483	1.01	11.1	14.9	531
Measured and Indicated	1,822	1.01	10.7	18.4	628
Inferred	932	0.89	14.3	8.3	428
Total	2,754	0.97	11.9	26.7	1,056

# 16 Other Relevant Data and Information

This section presents analysis of the Unkur Project's mining license agreement, environmental and social requirements, description of key environmental permits and studies required by national legislation and international practice for project development stages as well as recommendations for further works. The project is considered to be at an early development stage thus information regarding environmental and social setting was obtained through publicly available data and data of state authorities.

# 16.1 Environmental and Social Setting

The Unkur Project is located in the northern part of Zabaikalsky Region within the Kalarsky District. The Kalarsky District is located at a significant distance from Chita and does not have a direct rail or road connection to the city. The administrative centre of the Kalarsky district is the village of Chara. The urban settlement (town) of Novaya Chara and nine rural settlements (villages) are located in the Kalarsky District. The population of the district is approximately 9,000 with population density of about 50 times below the Russian average. More than half of the population lives in settlements located along the Baikal-Amur Railway line (BAM). The majority of the population are Russians. Evenks (Indigenous people of North) comprise about 5%.

The Unkur Project is located approximately 22 km to the east of the Novaya Chara town and village of Chara (**Error! Reference source not found.**). The Chara River is the main watercourse in the Kalarsky District and the deposit area is drained by the Chara's tributary Kemen River. The Kemen River inflows into the Chara River below the Novaya Chara town and Chara village.

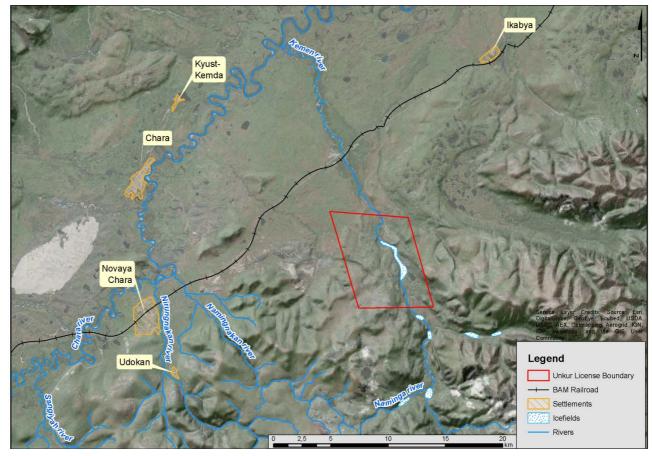


Figure 16-1: Location of the Unkur Project relative to settlements (compiled by SRK, 2015)

# 16.2 Environmental and Socio-Economic Studies

To date there is no information about environmental and socio-economic studies that have already been conducted for the deposit. As this is an early stage exploration project the studies will be conducted at later stages. The recommendations for the studies are provided in respective section below.

# 16.3 Review of Exploration and Mining License Environmental Requirements

The license for exploration and mining at the Unkur Project (ЧИТ 02522 БР, valid through 31 December 2039) contains the following environmental, socio-economic and industrial health and safety requirements that Licensee shall comply with (Section and paragraph numbering preserved):

- Section 11. Requirements on compliance with all requirements on subsoil resources protection, environmental protection, safety of mining works.
  - 10.1 Licensee shall comply with requirements defined by legislation on subsoil resources and environment protection, carrying out of activities related to subsoil resources use.
  - 10.2 Licensee shall comply with additional requirements in case they are defined by Section 14 of the mining and exploration requirements.
  - 10.3 Licensee shall carry out monitoring of the natural environment (air quality, subsoil, water bodies, soils, biological resources) in the impact area of the mining enterprise in accordance with established procedures.
- Section 14. Additional requirements
  - 14.1 Relationships between Licensee and state administration of the region where the deposit is located shall be conducted based on socio-economic agreements. The agreements shall be provided to Tsentrsibnedra (Department for Subsoil Use in Central Siberian District) and are kept in the subsoil license folder.
  - 14.2 In any other matters not included into these license conditions Tsentrsibnedra and Licensee shall follow the requirements of the Current Russian legislation.

SRK has reviewed the requirements listed above and concludes that they are similar to those generally applicable to mining companies in Russia. There are no specific requirements that would go beyond the general practice of developing or operating mineral deposits.

Environmental monitoring should start at pre-engineering stages (geological exploration stage) and be adjusted at subsequent stages of project implementation (construction and operation). Annual environmental monitoring procedures usually begin after completion and analysis of the results of a comprehensive set of baseline studies. Types of monitoring and the list of monitored parameters are defined according to types of impacts (physical, chemical or biological) and impacted environmental components (atmospheric air, subsurface, soils, surface water and ground water, vegetation).

It is an accepted practice in Russia that relationships between a mining company and local government are based on socio-economic agreements that present detail of the partnership and assistance of the mining company to the local community.

#### **16.3.1 Environmental Permitting Requirements**

According to the Russian environmental legislation, the decision making process related to all stages of the project development, including exploration, construction and operation, should be supported by consideration of the environmental issues.

At the current stage of project development the Licensee has to have a land lease for the area of the exploration works, which requires rehabilitation of the drilling sites and exploration roads after completion of the works. Before commencement of the design stage, baseline environmental and socio-economic studies have to be conducted to support the project design decision making

process. At the project design stage, an environmental impact assessment is performed and impact mitigation activities are proposed.

According to new regulations since January 2015, based on the state environmental review of the project design documents a project obtains a complex environmental permit for operation that details waste disposal, water discharge and air emissions. Additionally a ground water mining license (in case of ground water extraction) or a decree for the assignation of the water body (in case of water extraction from the surface sources) and an agreement for the surface water body usage (for discharge) have to be obtained for construction and operation.

Compared to international standards, Russian legislation pays low attention to the stakeholder engagement and community development issues related to impact assessment and further project development. It should be noted that Russian legislation is changing constantly. Most of these changes are minimal, however from time to time significant amendments are introduced, especially as applied to design documentation and approval processes.

# 16.4 Key Risks

The key environmental and social risks that SRK considers relevant at this stage of the project, based on the limited information available, that will need to be thoroughly investigated during next phases of project development are:

- Risk of unsuccessful constructional and/or operational water management. Due to proximity of the Kemen River to the deposit and potential presence of swamp areas on the territory of deposit the project may be required to manage and treat high amount of surface and ground water.
- Risk of potential cumulative environmental and socio-economic impacts from mining and supporting activities. The Kalarsky district has a significant mining potential with several mineral deposits present; some are operating mines and some are at development stages. The combined impacts of development of these deposits may require additional measures to be undertaken.

There may be other environmental risks; however it is not possible to identify them based on the limited information available.

#### **16.4.1 Recommendations on Further Work**

In summary, SRK considers the next stage of environmental work should comprise of, both for national and international requirements, the following steps:

- A desktop review of available environmental and socio-economic information;
- An initial environmental and social risk assessment, at a technical Scoping Study level, based on the results of the desktop review and on potential project design options.

For the pre-feasibility stage of the project development, a preliminary environmental and social impact assessment (an environmental scoping study) is required. Preliminary impact assessment includes initial elements of the stakeholder engagement process and analysis of data gaps that shall be covered by full scale environmental and socio-economic baseline studies at the next stage. The results of the baseline studies combined with project design form the basis for detailed Environmental and Social Impact Assessment (ESIA) that supplements a Feasibility Study report.

### **16.5 Hydrogeological Studies**

#### 16.5.1 Site Conditions

The climate of the project area is extreme continental with cold and long winters and short rainy summers. The annual average temperature is -7.8°C, minimum temperature is observed in December and January and can reach -57°C, maximum temperature is observed in July and August

and varies between 32 and 33°C. The average period with positive temperatures is approximately 160 days.

Average annual precipitation is 660-940 mm, the bulk of precipitation falls in July and August, at a rate of 130-140 mm per month, whereas the rest falls at a rate of 30 mm per month within winter season, i.e., in November-February. The depth of snow cover in valleys can reach 60-70 cm, whereas in the highlands it is up to 2 m.

The regional geology is dominated by Lower-Proterozoic, weakly metamorphosed terrigenoussedimentary rocks of the Sakukan and Naminginskaya suites, estimated to be 3 km to 3.4 km thick. The sedimentary succession is intruded by Early-Proterozoic, Proterozoic and Mesozoic rocks of the Kalar, Kodar and Ingamakit units.

The main watercourses are the Kemen River, the Unkur River, Dekandna Lake.

#### 16.5.2 Hydrogeological Conditions

Hydrogeological conditions of the deposit are characterised by a highly dissected drainage network caused by significant precipitation, steep surface gradients and rocks with fairly low hydraulic conductivity due to a presence of permafrost.

The absolute elevations of watersheds within the project area are between 1,050 m and 800 m. The absolute elevations of the valleys of rivers and creeks are 800-850 m (the Kemen River).

The catchment area of the Kemen River at the point where it crosses the deposit is 674 km<sup>2</sup>. An average profile gradient of the riverbed is 2.9%.

#### 16.5.3 Permafrost Conditions

The area of study is located in the region where continuous permafrost dominates and occasional taliks, underlying valleys of rivers and creeks, can be encountered. The specific feature of this territory is that the permafrost is well developed, its thickness is greatest on ridges, and decreases towards the base of river and creek valleys until it pinches out completely.

The thickness of the permafrost zone within the area of interest is reported to be 200-400 m. The base of the permafrost is measured to be at an elevation of 600 m in boreholes 122 and 123 and the thickness of the permafrost in these holes is 250 and 284 m, respectively.

The upper permafrost boundary varies depending on the season, and the thickness of a seasonal thawing layer depends on such parameters as slope exposure and the type and amount of vegetation.

#### **16.5.4 Description of Aquifers**

Based on the experience gained during working in the region where the Unkur deposit is located, SRK expects to encounter the following aquifers:

- An aquifer of alluvial and fluvio-glacial sediment in permanent talik;
- An aquifer of alluvial sediments in a seasonal thawing layer (above permafrost); and
- An aquifer of fractured metamorphic rocks (both a sub-permafrost water-bearing horizon and a water-bearing horizon of bedrock in open talik).

#### 16.5.5 Aquifer of Alluvial and Fluvio-Glacial Sediment in Permanent Aquifers

The aquifer of alluvial sediments in permanent talik includes the recent saturated alluvial sediments and the Upper Quaternary fluvio-glacial sediments, which can reach up to 300 m in thickness.

The water-bearing strata are represented by a non-graded boulder-pebble material with a sandgravel filling. Based on the flow pattern and degree of isolation from the ground surface, the aquifer is classified as an unconfined aquifer with porous media. The aquifer is recharged by infiltration of the surface runoff and direct precipitation. The area that contributes its water to the alluvial aquifer system coincides with the catchment areas of creeks and rivers in the deposit area that cross-flow.

#### 16.5.6 Alluvial Sediments in a Seasonally Thawing Layer

The above-permafrost aquifer is active during warm periods only and exists throughout the area. In terms of a hydrodynamic condition, this aquifer is classified as an uppermost unconfined aquifer. Depth to groundwater and aquifer thickness varies during summer and is 0-4 m in autumn, depending on slope aspect. Water-bearing strata are represented by the rubble-boulder material with various filling compositions (clay sand, loam).

#### **16.5.7 Fractured Metamorphic Rocks**

The bedrock aquifer consists of a sub-permafrost (sub-cryogenic) water-bearing horizon and bedrock water-bearing horizons in open taliks. Water-bearing strata are represented by fractured metamorphic sandstone and siltstone.

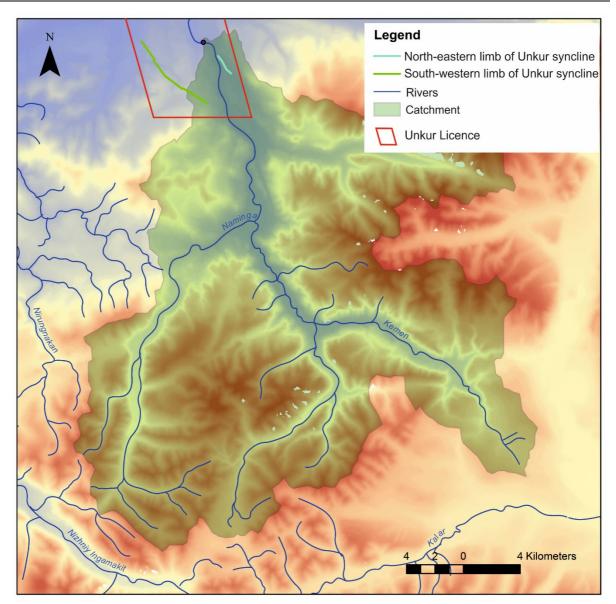
The thickness of the water-bearing fractured zone is not known. The fractured zone is frozen to a depth of 250-284 m (drillholes 122 and 123) in the north-western side of the deposit. Distribution of hydraulic conductivity of the sub-permafrost aquifer and its overall permeability are currently unknown. The thickness of sub-permafrost aquifer is likely to be much greater within the fault zones.

An indicated depth of groundwater is 140 and 110 m in drillholes 122 and 123 respectively. The subpermafrost aquifer is classified as confined. No data on the hydraulic properties of the subpermafrost aquifer exist, apart from result of a long term (5 days) "bailer used" pumping test, which is not considered to be reliable. Based on the experience from the nearby deposits, the subpermafrost bedrock aquifer can be quite heterogeneous, with hydraulic conductivities varying between 0.01 m/day in unfractured rock, to 22 m/day in extensively fractured zone.

The sub-permafrost aquifer is largely recharged by precipitation and by water flowing from overlying water-bearing horizons through the system of continuous hydrogenous taliks and underlying horizons.

No data on the chemistry of the subpermafrost aquifer in deposit area has been provided.

The Unkur deposit is located significantly downstream from the headwaters (~38 km) of the Kemen River, so there is a large catchment area (674 km<sup>2</sup>, Figure 14-2) feeding into the River before it crosses the Project area. This suggests significant surface water flow rates. The flowrates will vary seasonally, increasing in warm periods and decreasing in cold periods. Maximum rates are expected to be seen during spring thaws, which usually take place through May to June.



#### Figure 16-2: The Kemen River Catchment (compiled by SRK, 2015)

The alluvial sediments in the seasonally thawing zone are expected to have limited amount of storage and are of less concern compared to alluvial and fluvio-glacial sediments in the permanent taliks and subpermafrost aquifer.

If encountered by mine workings, then the alluvial and fluvio-glacial sediments in the permanent talik zone may produce relatively large flow rates due to their potentially high hydraulic and storage properties. But due to the relatively small areal extents of this aquifer, inflows from alluvial and fluvio-glacial sediments are expected to have seasonal pattern, starting with the spring thaw and ending in early winter, when no recharge takes place and storage has been drained.

Within the first year of mining activity, the dewatering system will need to cope with surface water, direct precipitation and ground water discharge from the alluvium aquifer. If mine workings reach 250 m depth, then the subpermafrost aquifer will also start to discharge water into the mine.

The groundwater flow in bedrock is confined to fractures, so any inflows into any mine workings will be from major fracture systems. This bedrock aquifer is heterogeneous with highly variable hydraulic properties. Due to the large extent of the bedrock aquifer and high hydraulic properties within fractured zones, this aquifer may produce significant inflows even in "no-recharge" winter period.

There is a high probability that the subpermafrost aquifer is hydraulically connected to the surface water (the Kemen River) via continuous zones of talik, in which case the subpermafrost aquifer will transmit water from the river to the mine workings and change the hydrological regime of the Kemen River.

Due to the fact that the Unkur River crosses the south-eastern part of deposit there is a high chance that the river would need to be diverted for mining to proceed.

## **17** Interpretation and Conclusions

The Unkur deposit was discovered from geological mapping in 1963. Systematic exploration of the area took place in two campaigns: 1969 - 1971 and 1975 - 1978.

The main sources of information SRK has relied upon for evaluating the exploration potential of the deposit are the reports from the two historical exploration campaigns. These reports, and other data available as of December, 2014, were provided to SRK by Azarga Metals Ltd. SRK geologists Robin Simpson and Alexander Batalov also visited the Unkur Project in December, 2014.

The Unkur deposit is interpreted to belong to the stratiform sediment-hosted copper deposit type. The copper-bearing horizon in the project area is within a Lower Proterozoic sedimentary package (the Udokan formation) which has been broadly folded into a doubly plunging syncline (the Unkur Syncline). The Lower Proterozoic sediments are covered by Quaternary moraine with a thickness of 40 m near the bedrock exposures of copper bearing sandstone, but up to 200 m thickness near the margins of the project area.

The copper-bearing horizon has been traced, from drill holes, trenches and outcrop, for a length of about 5km northwest-southeast in the southwest limb of the Unkur Syncline. Outcrops several kilometres away showing copper mineralization in the northeast limb of the syncline are interpreted to represent the continuation of the same horizon. Nine historical diamond drill holes returned copper samples with grades greater than 0.6% Cu (the grade historically used for defining substantial mineralization). The mean length of these intersections is 13 m and the mean grade is 0.78%. The drilling lines are spaced 500 m along strike, and the deepest intersection is 250 m down hole. The quality of these historical results is in doubt though, because of significant recovery problems: recovery in the mineralized intervals was 65% on average, and as low as 31%.

Copper oxide minerals were observed to a depth of 15 m. Within the zone of copper mineralization, silver grades were estimated by sampling composites of the copper samples. The average silver grade of these composites was 68.3 g/t.

In terms of data quality, SRK has identified several key limitations:

- 1. There is no digital database for the deposit. All geological information has been presented as scanned copies;
- 2. The core remaining from the historical drilling is in poor condition; the core storage facility and the core trays have partially disintegrated, hole names and depth markers are often illegible, and the mineralized intervals have been entirely removed by full core sampling;
- 3. The historical drill hole collars are lost, therefore precise validation of hole locations and precise georeferencing cannot be completed;
- 4. The mineralized samples had poor recovery, as discussed above;
- 5. The program of quality control of analytical testwork for the historical sampling was insufficient to comply with current international practices; and.
- 6. No metallurgical testwork has been conducted on mineralized samples from the Unkur deposit.

Regarding the first five items above, the implication of these risks is that future sampling will replace the historical data, rather than verifying and building on an existing database. The consequence of an absence of metallurgical samples is that an important condition for defining mineral resources – establishing reasonable prospects for eventual economic extraction – remains uncertain.

Despite the risks and uncertainties discussed above, SRK considers that the Unkur Project has a high exploration potential. This potential is supported by the following observations:

1. The copper-bearing horizon has been defined in the south-western limb of the Unkur Syncline as reasonably continuous, and the horizon is traced on surface, in outcrops and trenches, and under moraine cover, by diamond drilling, to a strike length of over 5 km;

- 2. The historical sampling has not yet closed off the extent of the copper-bearing horizon, either along strike or down dip;
- 3. Information from geophysics, and sparse outcrop exposures, implies that the same copperbearing horizon continues on the northeast limb of the Unkur Syncline;
- 4. The limited information from historical sampling of silver indicates that silver grades within the copper mineralization zone could be high enough for silver to be an economically important ancillary element. Silver grades averaging 60-70 g/t are spatially associated with copper mineralization.
- 5. In the same region as the Unkur deposit, other copper deposits occur at a similar stratigraphic level, notably the Udokan copper-silver deposit, for which substantial Mineral Resources and Ore Reserves have been defined.

## **18 Recommendations**

In the opinion of SRK, the potential of the Unkur Project is sufficient to justify additional exploration expenditures, which will also satisfy the minimum exploration expenditure requirements. A work program is proposed to delineate the copper and silver mineralization, estimate mineral resources and prepare an initial mineral resource statement and preliminary economic assessment to meet NI 43-101 disclosure guidelines.

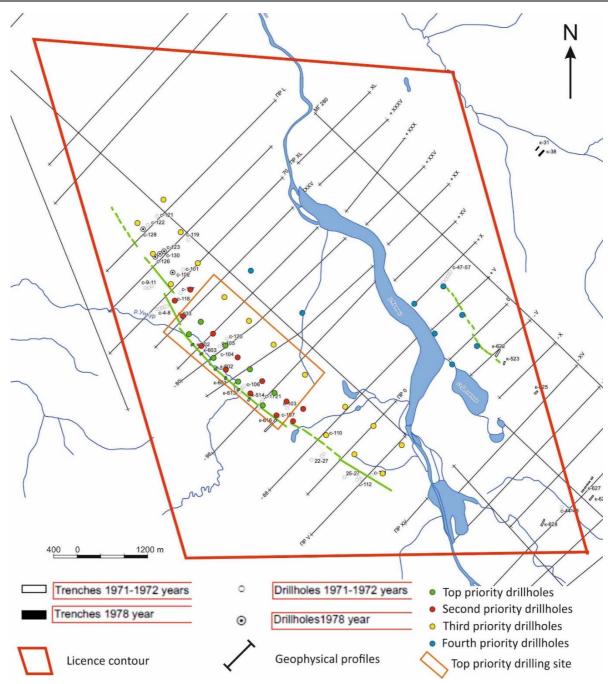
The proposed work program includes:

- Creation of an 3D database;
- Creation of a 3D topography surface;
- Completion of georeferencing of all historical workings and drillholes;
- Review, compilation and interpretation of historical data to in order to define drilling targets;
- Core drilling to delineation copper mineralization;
- Trenching and re-sampling of historical trenches;
- Analysis of drill hole and trench samples for at least total copper, copper oxide and silver.
- A program quality control samples, such as blanks, duplicates, and reference materials.
- Bulk density measurements for at least 30 samples of each rock and mineralization type.
- Metallurgical testwork on the mineralized material;
- Hydrogeological studies;
- Geological modelling;
- Mineral resource estimation and preparation of an initial mineral resource statement.
- Preparation of a preliminary economic assessment

SRK considers that approximately 39 drill holes (18,700 m of core drilling) will eventually be required to sufficiently delineate copper mineralization for the purposes of supporting initial mineral resource estimation. The expected length of sampled intervals is about 50 m for each drill hole; thus, the overall core sampling for 39 drillholes would be about 2,000 1 m samples. SRK recommends the main focus of drilling should be the central part of the southwest limb of the Unkur Syncline, at a 300 x 300 m drill spacing (Figure 18-1).

The overall work program can be divided into phases. The initial phase should comprise 6 to 8 holes (the "top priority holes" in Figure 18-1) for approximately 2,800 m of drilling, with the objectives of confirming results obtained from historical drilling and of providing geologic information to be used in planning the subsequent phases.

The budget for this first phase is approximately CN\$ 479,000. On completion of this first phase, results would be interpreted and the conclusions used to optimize subsequent exploration.



#### Figure 18-1: Location of Proposed Drillholes for the Unkur Project (compiled by SRK, 2015)

SRK is unaware of any other significant factors and risks that may affect access, title, or the right or ability to perform the exploration work recommended for the Unkur Project. Table 18-1 lists the estimated costs for the next phase of exploration works.

Table 18-1: Est	timated Cos	t for the I	Phase 1	Exploration	Program	Proposed	for the	Unkur
Pro	oject							

Description	Total Cost (CN\$)		
Diamond drilling (all inclusive, 2,800 m)	\$431,000*		
Analytics and quality control	\$4,500		
Sub-total	\$435,700		
Contingency (10%)	\$43,570		
Total	\$479,270		

Note: \* Drilling costs are based on CN\$154 per meter.

If the results from Phase 1 confirm the exploration potential indicated by the historical drilling, then the goal of the next phase would be to delineate mineral resources. An indicative budget for Phase 2 would be CN\$3,000,000, for approximately 32 drill holes (16,000m), and including preparation of a mineral resource estimate. Proceeding to Phase 2 would be contingent on the results from Phase 1, and the goals and budget for Phase 2 may change according to the results received from Phase 1.

## **19 References**

- 1. Berezin, G., 1979. Results of exploration undertaken by the Lukturskaya expedition team at the Unkur copper project and Klyukvennoye deposit in 1975-1978. Vols.1; 2 and 3.
- 2. Henley, S., 2004. The Russian Reserves and Resources reporting system discussion and comparison with international standards. Available online at *http://www.imcinvest.com/pdf/Russian\_reserves\_8.pdf*
- 3. Mulnichenko, V., 1972. Results of exploration undertaken by the Naminginskaya expedition team at the Unkur copper project in 1969-1971. Vols.1 and 2.
- 4. SGS Mineral Services 2015. Metallurgical Testwork on Oxide Ore Sample of the Unkur Deposit. Project No. SA-1175-MIN-HT-14.
- 5. Volchkov, A.G., and Nikeshin, U.V. 2014. Conclusions drawn by the Working Team of the FSUE (Federal State Unitary Enterprise) Central Geological Research Institute (TsNIGRI) based on the approbation of the prognostic copper resources of the Unkur deposit, the Zabaikalsky Region
- Zientek, M.L, Chechetkin, V.S, Parks, H.L., Box, S.E., Briggs, D.A., Cossette, P.M., Dolgopolova, A., Hayes, T.S., Seltmann, R., Syusyura, B., Taylor, C.D., and Wintzer, N.E., 2014, Assessment of undiscovered sandstone copper deposits of the Kodar-Udokan Area, Russia: U.S. Geological Survey Scientific Investigations Report 2010-5090-M, 129 p. and spatial data. Also available online at *http://dx.doi.org/10.3133/sir20105090M*.
- 7. License <code>ЧИT02522</code> (geological study, exploration and production of copper, silver, and associated components for the Unkur Project).

# Appendices

Appendix A: License

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### Department for Subsurface Use in Central Siberian District (Tsentrsibnedra)

#### SUBSURFACE USE LICENSE CHIT 02522 BR

Series number type

Issued to Limited Liability Company Tuva-Cobalt (Tuva-Cobalt LLC) represented by the Director Karimova Olga Vyacheslavovna with the purpose and work type: geological studies, exploration and mining of copper, silver and associated components at Unkur Project. The subsurface area is located in Kalarsky District of Zabaikalsky Region. Description of the subsurface area boundaries, coordinates of corner points, copies of topography plans, cross-section etc. are contained in appendices No. 3, 6. The subsurface area has the status of a mining license. The license is valid till 31.12.2039.

#### Stamp:

Department of geology and licensing in Zabaikalsky Region (Tsentrsibnedra) REGISTERED 02 September 2014 No. 02522 BR (signature) Tekunova O.A.

Неотъемлемыми составными частями настоящей лицензии являются следующие документы (приложения):

1. Условия пользования недрами, на \_\_\_\_\_л.;

2. Копия решения, являющегося основанием предоставления лицензии, принятого в соответствии со статьей 101 Закона Российской Федерации «О недрах»

3. Схема расположения участка недр на \_\_\_\_\_л.;

4. Копия свидетельства о государственной регистрации юридического лица

5. Копия свидетельства о постановке пользователя недр на налоговый учет 6. Документ на \_\_\_\_\_ л., содержащий сведения об участке недр, отражающие:

местоположение участка недр в административно-территориальном отношении с указанием границ особо охраняемых природных территорий, а также участков ограниченного и запрещенного землепользования с отражением их на схеме расположения участка недр;

геологическую характеристику участка недр с указанием наличия месторождений (залежей) полезных ископаемых и запасов (ресурсов) по ним;

обзор работ, проведенных ранее на участке недр, наличие на участке недр горных выработок, скважин и иных объектов, которые могут быть использованы при работе на этом участке;

сведения о добытых полезных ископаемых за период пользования участком недр (если ранее производилась добыча полезных ископаемых);

наличие других пользователей недр в границах данного участка недр;

7. Перечисление предыдущих пользователей данным участком недр (если ранее участок недр находился в пользовании) с указанием оснований, сроков предоставления (перехода права) участка недр в пользование и прекращения действия лицензии на пользование этим участком недр (указывается при переоформлении лицензии), на \_\_\_\_\_ л.;

8. Краткая справка о пользователе недр, содержащая: юридический адрес пользователя недр, банковские реквизиты, контактные телефоны, на 1 л.; 9. Иные приложения \_

(название документов, количество страниц)

Уполномоченное должностное лицо	
органа, выдавшего лицензию Начальник отдела	
(должность, ф.и.о. лица, подписавшего лицензира)	
Иванов А.В.	
Подпись Виван	
М. п., дата <u>02 семиября 2014</u> 2.	

BATA/PATT/SIMP

The following documents (appendices) are the indispensible constituents of this license:

- 1. Subsurface use conditions, on 9 pages;
- 2. Copy of the resolution which is the basis for the license provision, on 9 pages; the resolution passed in accordance with Clause 10 of the Russian Federation Law "On Subsurface";
- 3. Layout of the subsurface license area, on 2 pages;
- 4. Copy of the State Certificate of legal entity registration on 2 pages;
- 5. Copy of Tax Registration Certificate for the subsurface user, on 1 page;
- 6. Document on 3 pages, containing the following information on the subsurface license area:
  - Location of the subsurface area in terms of administrative and territorial allegiance, with specification of boundaries of specially protected natural areas and areas of limited or forbidden land use, with indication of these areas on the subsurface area layout;
  - Geological characteristic of the subsurface area with indication of mineral deposits (ore bodies) and mineral reserves (resources);
  - Overview of historical works performed in the subsurface area, presence of mine workings, drillholes and/or other facilities which can be used in work in this area;
  - Information on recovered minerals over the period of historical subsurface use (if historical mining was performed);
  - Presence of other subsurface users within the boundaries of this subsurface area;
- 7. List of the previous subsurface users of this license area (if the subsurface area was previously used) with indication of reasons and terms for the subsurface license provision (or transfer of rights) and for termination of license (in case of license renewal), on \_\_\_\_ pages.
- 8. Brief note on the subsurface user, containing: legal address of the subsurface user, bank details, contact telephone numbers, on 1 page;
- 9. Other appendices:

The authorized official of the license issuing body: **Department Head Ivanov A.V.** Signature:\_\_(signature)\_\_\_ (Stamp) Date: 02 September 2014

#### CERTIFICATE AND CONSENT

# To Accompany the report entitled: **Technical Report for the Unkur Copper-Silver Deposit, Kodar-Udokan Area**, [March 7<sup>th</sup>, 2016].

I, Robin Simpson, do hereby certify that:

- 1) I am a Principal Resource Geologist with the firm of SRK Consulting (Russia) Ltd. ("SRK") with an office at 4/3 Kuznetsky Most, Building 1, 125009, Moscow, Russia;
- 2) I am a graduate of the University of Canterbury, New Zealand in 1996, and Leeds University, United Kingdom in 2004. I obtained a BSc (Hons) degree in geology, and an MSc in geostatistics. I have practiced my profession continuously since 1996. I worked as a mine and exploration geologist at gold and copper mines in Australia for 7 years, and then joined SRK Consulting Ltd. in 2005 as a resource geologist. During my employment in SRK's Perth, Cardiff and Moscow offices I have frequently authored or reviewed mineral resource estimates, for a variety of commodities including copper;
- 3) I am a Member of the Australian Institute of Geoscientists, Membership Number 3156;
- 4) I have personally inspected the subject project from December 9 to 11, 2014;
- 5) I have read the definition of "qualified person" set out in National Instrument 43-101 and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of National Instrument 43-101;
- 6) I am the author of this report and responsible for all sections of this technical report;
- I, as a qualified person, I am independent of the issuer (European Uranium Resources Ltd), vendors (Azarga Metals Ltd & LLC Tuva-Cobalt) and the property, as defined in Section 1.5 of National Instrument 43-101;
- 8) I have had no prior involvement with the subject property;
- 9) I have read National Instrument 43-101 and confirm that this technical report has been prepared in compliance therewith;
- 10) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the Unkur Project or securities of European Uranium Resources Ltd; and
- 11) That, as of the date of this technical report, to the best of my knowledge, information and belief, this technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

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Moscow, Russia March, 2016 <u>["signed and sealed"]</u> Robin Simpson, MAIG Principal Resource Geologist, SRK Consulting (Russia) Ltd Project number: RU00513

March 7, 2016

To:

Securities Regulatory Authorities B. C. Securities Commission (BCSC) Alberta Securities Commission (ABC) Ontario Securities Commission (OSC) L'Autorité des marchés financiers (AMF) Toronto Stock Exchange (TSX)

#### **CONSENT of AUTHOR**

I, Robin Simpson, MSc, MAIG, do hereby consent to the public filing of the technical report entitled "Technical Report for the Unkur Copper-Silver Deposit, Kodar-Udokan Area, Russian Federation" dated effective March 1, 2016 (the "Technical Report") by European Uranium Resources Ltd. (the "Issuer") in connection with the property acquisition agreement announced by the Issur on March 1, 2016.

I also consent to any extracts from or a summary of the Technical Report by European Uranium Resources Ltd.

I certify that I have read the March 1, 2016 news release, filed by European Uranium Resources Ltd., that the Technical Report supports, and that this news release fairly and accurately represents the information in the Technical Report.

Dated this 7<sup>th</sup> day of March 2016.

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Robin Simpson, MSc, MAIG Principal Consultant (Resource Geology) SRK Consulting (Russia) Ltd.

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Approval Signature:

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