FIRST EURASIAN
MINING

Sayak Copper Dumps Project
January 2020

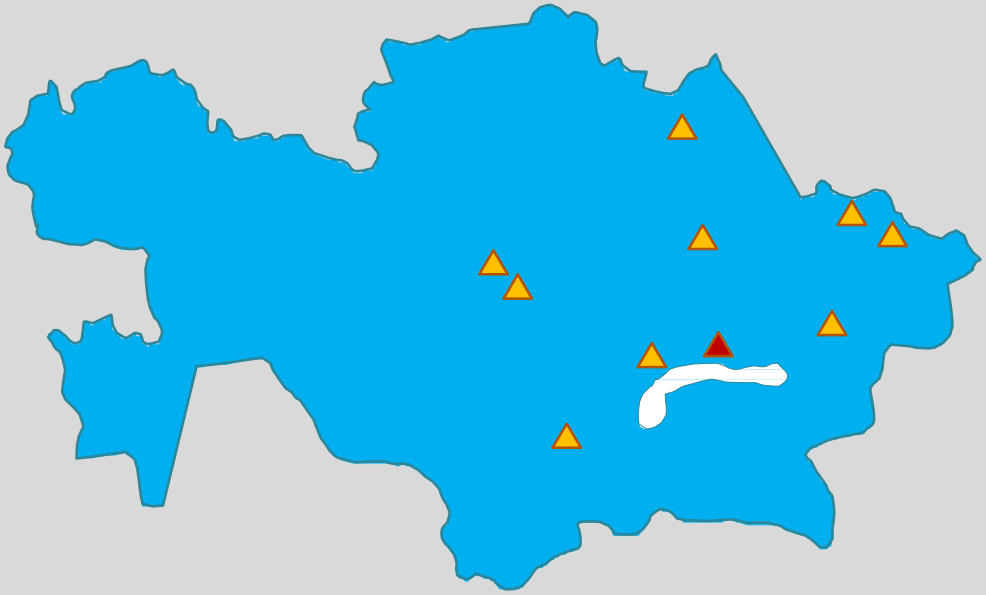
SUMMARY

First Eurasian Mining (FEAM) is a subsidiary of Commonwealth American Partners, L.P., a diversified privately-held company with over 20 years successful track-record in petroleum and mining sectors in FSU and world-wide.

- Portfolio of advanced and near-production assets, complimented by high-upside exploration projects
- Geographic focus on Kazakhstan and Mongolia
- Primarily targeting copper and other commodity metals with stable high demand on the world market
- Established low-cost in-situ technology ensures profitability even in low price environment
- Multi-national management team with proven track record and experience developing analogous projects in the same region

KAZAKHSTAN: COPPER MINING

- Historically, Kazakhstan one of the largest copper producers in the world
- A number of medium-to-large open-pit mines have been in continuous operations since the 1930's
- In total, several billion tons of low-grade waste dumps accumulated over life-time of mines across the country
- Well-developed mining infra-structure and experienced labor force
- Kazakhstan already has three operating SX-EW plants, with two more being planned



▲ - Existing open-pit copper mine

KAZAKHSTAN
SAYAK COPPER DUMPS

The Sayak group of open-pit copper mines located near Lake Balkhash in Central Kazakhstan (Karaganda region), has been in continuous operation since 1971. Along with Kounrad, Sayak has been key feeder for the giant Balkhash smelter, responsible for 65% of Kazakhstan's copper production. Waste dumps of over 300M tons, accumulated from over 40 years of operations.

geographical coordinates

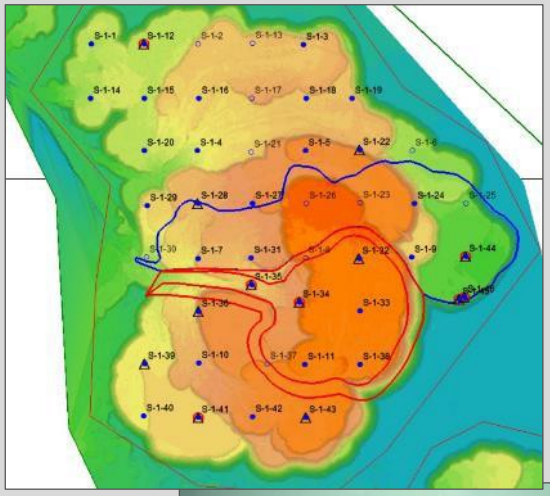
46 59' 15"N, 77 25'15"E

SAYAK COPPER DUMPS: EXPLORATION 2015-2016

- During 2015 the Company carried out a detailed survey of selected dumps at 1:500 and 1:5,000 scales using a Leica TC-407 total station.
- To define the base of the dumps historical topographic maps, pre-dump development plans were digitised and checked against the recent topographic survey
- During 2015-2016, the Company has undertaken a number of exploration activities, concentrating mainly on smaller, easier to appraise dumps:
    - Reverse circulation (RC) drilling – 47 holes
    - Surface Pitting – 141
    - Toe Pitting – 26
- In total, more than 900 ore samples, including those from pre-2014 exploration work were assayed.

SAYAK COPPER DUMPS: EXPLORATION 2018-2019

- In 2018 the Company completed drilling of its largest dump, Sayak Overburden, on a 200x200m grid. All 37 Symmetrix holes were drilled to the bottom of the dump with core samples taken every 2m and assayed for total and acid-soluble copper. In total, over 1600m were drilled and 813 samples were analyzed.
- Further 15 holes were drilled on the Tastau Overburden dumps on a slightly looser grid.
- Additional 177 total channels samples completed
- Comprehensive metallurgical column tests based on three composite representative samples were completed.
- Bottle-roll test-work for all holes drilled during 2018-2019 campaign to help define Production Plan for the project
- Further test-work may help further optimize production plan and improve project economics



SAYAK COPPER DUMPS: CURRENT RESOURCE ESTIMATES

In January 2020, Wardell Armstrong International completed a MRE and CPR assessment of the Sayak copper dumps project. The resource estimate is shown in the table below:

	Resource Category	Rock mass, kt	Ave. Cu grade, %	Metal, Tonnes
SAYAK 1 OVERBURDEN	Inferred	188,780	0.154	288,807
TASTAU OVERBURDEN	Inferred	112,988	0.067	75,702
TASTAU SULPHIDE	Inferred	9,318	0.182	16,959
MOLDYBAI 2 – SULPHIDE	Inferred	9,349	0.091	8,508
MOLDYBAI 1 - OXIDE	Inferred	1,185	0.357	4,230
TOTAL		**321,603**	**0.123**	**394,206**

Based on the results of bottle-roll and column test-work, the average copper recovery rate has been conservatively estimated at 35%.

On the basis of the above and upon detailed evaluation of the project's economics, Wardell Armstrong estimates the NPV of the project at **$164m** at 10%.

SAYAK COPPER DUMPS: SUCCESSFUL PILOT PLANT

- The Company has purchased a used fully-operational modular pilot SX-EW plant from Rio Tinto. The plant has been re-tooled to work in Kazakhstan and shipped from its location at Kennecott mines in Utah, USA to Kazakhstan.

- The initial pilot work focused on Moldybai 1 dump.
- The pilot plant commissioned in autumn 2017 and produced first copper in November 2017.
- Following remedial work on the leaching pad and collection system in spring of 2018, the plant has reached a steady-state production with PLS copper grade of 1.5-1.8 g/L, and average daily production of 200 kg of copper cathode
- Over 36 tons of cathode copper sold on the local market at near LME prices.

SAYAK COPPER DUMPS: PILOT PLANT INFRASTRUCTURE

- 1.2 km electric line to the site and 630 kW transformer – completed and connected to local electric grid
- 400 m access road to the site – completed
- 1.1 km water pipeline to the site – completed
- Building for the SX-EW pilot plant – completed, insulation and ventilation installed
- 1 km of piping for the heap irrigation – purchased, connected and laid out
- Ponds and collection trenches – completed and lined with geomembrane

МЕДНЫЕ ОТВАЛЫ САЯК:
строительство завода SX-EW

On the base of the technological and industrial tests, by the scientific-research institute VNIItsvetmet was worked out a technological regulation for projection of the enterprises on processing of anthropogenic mineral formations (dumps) of the Sayak group of deposits.
In order to construct the plant with the capacity 10,000 tons of cathode copper per year, following works were carried out:
Land allotment was drawn up for construction of the plant
Engineering-surveying works were terminated

During construction of the plant, of the current operating pilot plant's capital structures and objects will be involved into the process.
The main buildings and structures of the SX/EW plant are:

- Building of the workshop for liquid extraction;
- Building of the workshop of electrochemical extraction;
- Administrative building;
- Building of the Diesel generator;
- Pump station for technological and fire-prevention purpose water, tank for water, station for purification of sewage;
- waste water treatment plant;
- Warehouse for reagents;
- Warehouse of spare parts;
- Pump stations in the quarry and of lifting stations;
- Substation;
- Check-point;
- Guard-fencing of the plant;
- Ponds-sandsettlers for pregnant solution (PS), the pond for PS, the pond for raffinate, the emergency pond and the pond for surface runoff and leakages;
- Sulfuric acid storage repository;

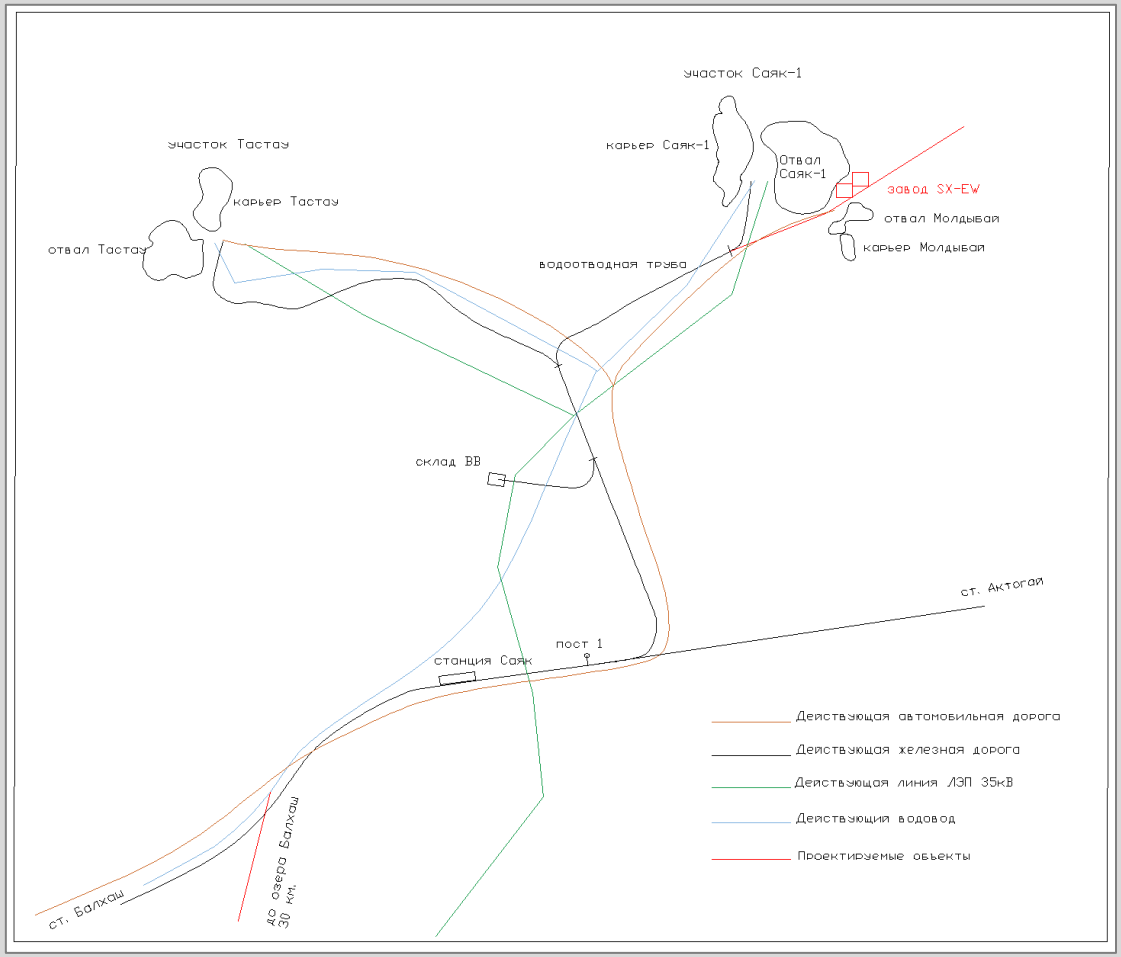
Total capital expenses for construction of the SX-EW (extraction and electrolysis) plant is $ 21,1 million USD.

SAYAK COPPER DUMPS: SULFURIC ACID FACILITY

- To help reduce the costs of sulfuric acid (one of the main cost drivers) the Company is planning to construct its own facility producing acid from elemental sulfur
- Kazakhstan has ample supply of elemental sulfur:
  - USGS estimates Kazakhstan's annual sulfur production at 2.8m ton, primarily as a by-product of petroleum and gas industry
- 1ton of elemental sulfur yields 2 tons of sulfuric acid
- In addition to the acid, the facility produces a very substantial amount of high-pressure steam which can be converted to electricity.
- A 6MWT electric steam turbine will meet all of Company electricity needs

- **The NET costs of sulfuric acid (costs of acid production less electricity savings) has been estimated at $17/ton of acid**
- **The total CAPEX costs of the acid facility and electric steam turbine has been estimates at under $10m**

МЕДНЫЕ ОТВАЛЫ САЯК:
Расширение инфраструктуры



For expansion of the infrastructure will be used current objects, there is a need of following:

- Construction of the railway impasse with the length of 2.5 km.
- Construction of the water conduit from the lake Balkhash with the length of 30 km.
- Construction of an additional substati

Total capital expenses for buildings and structures compile 24,6 million USD, including for expansion of the infrastructure 8,2 million $USD.

KAZAKHSTAN:
SAYAK SX-EW PROJECT ECONOMICS 1

- Planned annual production: 10,000 tons of LME grade "A" cathode copper
- A 23-year copper production contract with the government of Kazakhstan signed in May 2017.
- Key production cost drivers:
  - Chemicals & Reagents and Power (variable) – favorable geographic location helps keeping these costs low
  - Labor and Production Overheads (fixed)
- Mineral Extraction Tax @ 5.7% on value of copper in PLS
- Distribution & Selling – mix of fixed and variable driven by local infrastructure and T&C of the off-take contract

КАЗАХСТАН:

ЭКОНОМИКА ПРОЕКТА САЯК для РАБОТ МЕТОДОМ SX-EW 2

The main technical and economic indications of the basic scenario are as follows:

Quantity of the commercial product (cathode copper) - 120 584 tons;

The volume of capital expenses - 58,401 $USD;

Discount rate - 10%;

NPV - 95,089 $ USD

IRR - 46%

KAZAKHSTAN: DEVELOPMENT TIMELINE

2017 — Sayak pilot SX-EW plant start-up

- Drilling, testing and assay sampling
- Construction, commissioning and start-up of the pilot plant

2018

- Continued drilling and sampling of larger Sayak and Tastau dumps
- Continued pilot plant operations and metallurgical testing.

2019

- Complete appraisal of all dumps and continued pilot plant operations and metallurgical testing.

2020 — MRE/CPR resource report completed

- Design of full-scale plant finalized, long-lead material ordered
- Construction of plant infrastructure commences

2021

- Construction of Sayak SX-EW plant.
- Construction of sulfuric acid facility

2022 — Sayak SX-EW plant start-up

- Start-up of SX-EW plant on Sayak

Reputable international advisors – Leaders in their respective fields

wardell armstrong — Full-service Independent technical mining consultancy

中国有色金属建设股份有限公司 CHINA NONFERROUS METAL INDUSTRY'S FOREIGN ENGINEERING AND CONSTRUCTION CO.,LTD — Preliminary-selected EPCm contractor for SX-EW plant

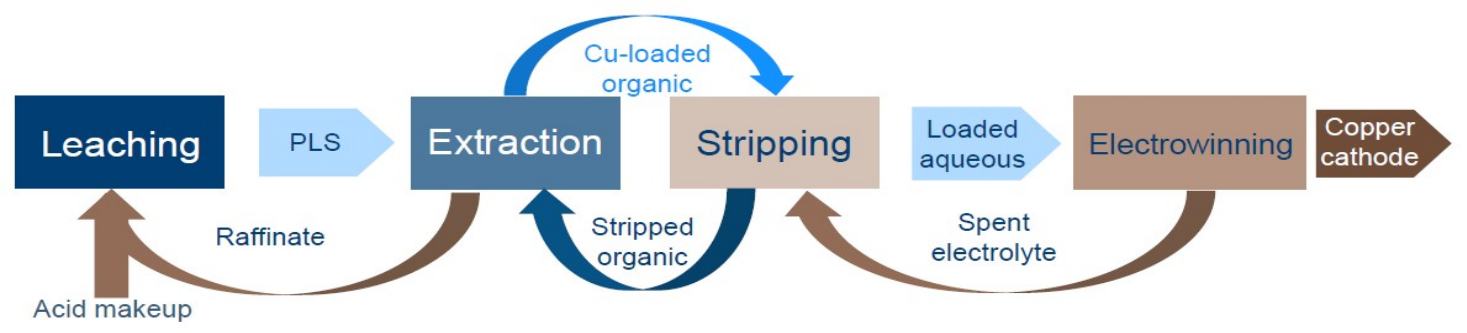
KINDLY TECH TRADING 凯恩德利 — Preliminary-selected EPCm contractor for acid facility

CONCLUSION

- Experienced team with a well defined plan
- Minimal exploration risk and established in-situ technology to ensure profitability even in low price environment
- Very significant amount of exploration and metallurgical test-work completed already to further de-risk the project
- Internal feasibility evaluation completed – most areas of work well defined. Major contractors already identified.
- Strategic clarity and operational discipline
- Established relationships in the industry to bring in large operators as partners, if necessary.

APPENDIX

KAZAKHSTAN: SX-EW TECHNOLOGY



SX-EW extraction technology combined with dumb leaching mining has been growing in importance over the past 20 years

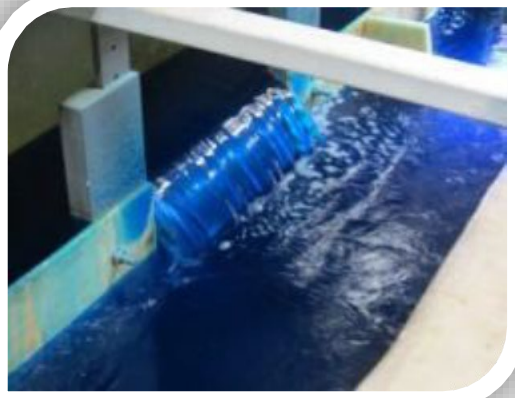
- More than 30% of world's refined copper production now comes from SX-EW plants
- A number of large operational dump-leach projects worldwide in Australia, Chile, USA, etc.
- Numerous operational SX-EW plants in China, Africa, Chile, Australia, Mongolia, USA and other countries
- Kazakhstan already has three operating SX-EW plants in Kounrad (Central Asia Metals, plc), Aktogay (KAZ Minerals) and Benkala (Frontier Mining, Ltd)
- All of produced copper cathode meets LME grade A specification (99.99% copper purity)

KAZAKHSTAN:
SX-EW TECHNOLOGY IN PICTURES

Drip piping on top of dump – irrigating with acid mixture

Collection trench at bottom of dump – PLC (metal-rich acid solution)

Treatment at SX mixer-settler tanks to extract pure copper electrolyte



Rich copper electrolyte solution on its way to EW workshop

Electrolysis at EW workshop

Final product: Pure cathode copper

KAZAKHSTAN: COUNTRY FACTS

- Ninth largest country in the world by land mass, and largest economy in Central Asia
- Stable political and economic environment since 1991;
- GDP per capita has surpassed that of Russia and remains one of the highest among FSU countries
- Mining accounts for 27% of GDP
- 3% of known global copper reserves (630Mt)