

AGREED:

APPROVED:

Kumtor Gold Company CJSC
Deputy Chairman of the Board
Kadyrov K. T. _____

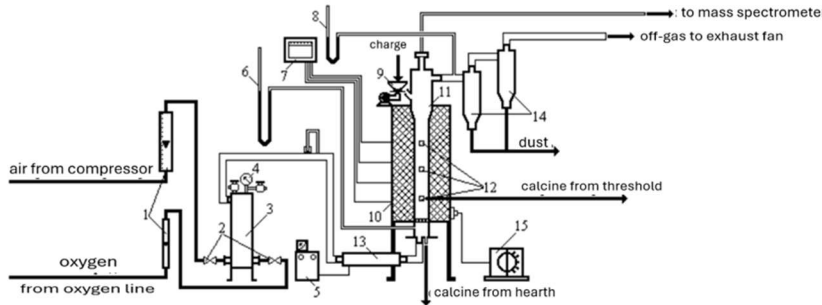
Kumtor Gold Company CJSC
Deputy Chairman of the Board

_____ 2026

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TERMS OF REFERENCE
for the purchase of a semi-industrial line (unit) for roasting of concentrate

№	Basic data and requirements	Description of basic data and requirements
1	Name of the Customer organization	Kumtor Gold Company Closed Joint-Stock Company (hereinafter - KGC).
2	Name of the Contractor organization	Determined by the customer.
3	Name and location of the object	Tailings facility of the Kumtor Mine Mill, Zheti-Oguz district, Issyk-Kul region, Kyrgyz Republic. Distance to Bishkek is 350 km. It is located about 60 km southeast of Lake Issyk-Kul and about 60 km from the border with the People's Republic of China.
4	Main parameters of the technological process	<p>1. Capacity of the roasting section should correspond to the flotation section and be at least 400 kg/day. (16 kg/hour). Main equipment with a diagram of the apparatus chain, including the following stages:</p> <ul style="list-style-type: none"> • Charge preparation includes dosing water and adding binders to the charge, as well as accelerators or combustion inhibitors. • A device for feeding paste-like charge into the furnace; • Installation of fluidized bed combustion; • Air mixture preparation and supply system for roasting; • Electric blast heater system with power regulation • Device for unloading cinder into water; • Wet cinder grinding system and preparation for cyanidation • Exhaust gas dedusting system • Sulphuric acid production system • Scrubber for fine cleaning and neutralization of exhaust gases. • Acid effluent and cyanidation tailings neutralization system. • Aspiration system with hoods covering all open parts of installations and equipment <p>2. Additional equipment for testing the second version of the roasting process with preliminary granulation of the charge:</p> <ul style="list-style-type: none"> • Charge granulator with granules of a certain size of 2.5-3 mm to stabilize the fluidized bed and reduce dust removal; • Drying oven for drying granules by electroheat; • Device for dosing feed granules into the furnace; • Dispersing grid with nozzles for granule roasting; <p>3. Reagents used: Ca(OH)_2, $\text{Al}_2\{\text{Si}_4\text{O}_{10}\}$, CuSO_4, O_2, N_2, H_2O, S, CaSO_4 Note: The time (kinetics) of charge preparation and roasting is given from the reports of the technological regulations</p> <ul style="list-style-type: none"> • Stage I charge preparation - 30 minutes; • II stage of roasting - 60-120 minutes; • Stage III: unloading for shock cooling – 1 minute; • Stage IV: grinding of cinder - 10 minutes; • Stage V: cleaning gases from dust – 1 minute; • Stage VI gas desulphurization – 2 minutes; • Stage VII: neutralization of waste gases and acidic solutions - 1 minute; • Stage VIII: saturation of gas-cleaning solutions to obtain sulfuric acid – up to 24 hours. • Stage IX: pumping sulfuric acid into a cube tank for storage - 10 minutes

		<div>4. Note: Time (kinetics) of charge preparation according to the second option of roasting with the addition of batch granulation and pellet drying operations</div> <div><ul style="list-style-type: none">• Stage I charge preparation - 30 minutes;• Stage II: granulation and drying – 30 minutes;• III stage of roasting - 60-120 minutes;</div> <div>Technological diagram of roasting:</div> <div></div> <div><div>1 - rotameters, 2 - fan, 3 - receiver, 4 - pressure gauge, 5 - gas heater regulator, 6 - furnace pressure gauge, 7 - temperature measuring controller, 8 - flue gas pressure gauge, 9 - disk feeder, 10 – furnace, 11 – reactor, 12 - discharge openings, 13 - reaction gas preheater, 14 – cyclones, 15 - furnace power transformer</div></div>																																																																																
5	Basic parameters for process management	<table><tr><th>Component</th><th>Unit of measure</th><th>Concentrate #1</th><th>Concentrate #2</th></tr><tr><td>Au</td><td>g/t</td><td>4,71</td><td>16,48</td></tr><tr><td>Ag</td><td>g/t</td><td>7,45</td><td>8,19</td></tr><tr><td>TC</td><td>%</td><td>2,55</td><td>8,08</td></tr><tr><td>Corg</td><td>%</td><td>2,12</td><td>6,87</td></tr><tr><td>Sb</td><td>%</td><td><0,01</td><td><0,01</td></tr><tr><td>As</td><td>%</td><td><0,01</td><td><0,01</td></tr><tr><td>Cu</td><td>%</td><td>0,035</td><td>0,072</td></tr><tr><td>Fe</td><td>%</td><td>13,67</td><td>6,66</td></tr><tr><td>S</td><td>%</td><td>25,33</td><td>4,4</td></tr><tr><td>S-</td><td>%</td><td>23,87</td><td>4,17</td></tr><tr><td>Te</td><td>%</td><td><0,01</td><td><0,01</td></tr><tr><td>Zn</td><td>%</td><td>0,043</td><td>0,18</td></tr><tr><td>Pb</td><td>%</td><td>0,17</td><td>0,04</td></tr><tr><td>Cr</td><td>%</td><td>0,018</td><td>0,018</td></tr><tr><td>Hg</td><td>%</td><td>0,55</td><td>0,25</td></tr><tr><td>CaO</td><td>%</td><td>1,42</td><td>4,56</td></tr><tr><td>MgO</td><td>%</td><td>0,7</td><td>1,52</td></tr><tr><td>Al2O3</td><td>%</td><td>6,1</td><td>16,74</td></tr><tr><td>SiO2</td><td>%</td><td>21,33</td><td>41,87</td></tr></table> <div>Note: Concentrate #1 is low-carbon; Concentrate #2 is high-carbon.</div>	Component	Unit of measure	Concentrate #1	Concentrate #2	Au	g/t	4,71	16,48	Ag	g/t	7,45	8,19	TC	%	2,55	8,08	Corg	%	2,12	6,87	Sb	%	<0,01	<0,01	As	%	<0,01	<0,01	Cu	%	0,035	0,072	Fe	%	13,67	6,66	S	%	25,33	4,4	S-	%	23,87	4,17	Te	%	<0,01	<0,01	Zn	%	0,043	0,18	Pb	%	0,17	0,04	Cr	%	0,018	0,018	Hg	%	0,55	0,25	CaO	%	1,42	4,56	MgO	%	0,7	1,52	Al2O3	%	6,1	16,74	SiO2	%	21,33	41,87
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6	Layout Requirement	<div>The process line should be mobile and modular for installation and operation without prior preparation of the base (consider the possibility of installing equipment in containers with internal lining with fire-resistant materials).</div> <div>The layout of the equipment should include:</div> <div><ul style="list-style-type: none">• Contact vats for charge preparation with mixers for 200 liters - 3 pcs.• Weighing hopper over the CV for 100 liters – 3 pcs.• Peristaltic pump up to 100 l/h - 3 pcs.• Peristaltic dosing pump 10-15 l/h - 4 pieces.• Peristaltic dosing pump 0.5 l/hour - 4 pieces.• Screw pump 10-15 l/h – 2 pieces.• Submersible drainage pump for 1000 l/h - 4 pcs.• Screw stove feeder up to 30 kg/hour – 1 pc.</div>																																																																																

		<ul style="list-style-type: none"> • FB Furnace with a heat control transformer – 1 pc., • Mould for bulk material for 50 liters - 2 pcs. • Metal mould for emergency discharge of cinder 3 l – 2 pcs. • Contact tank with agitator for sinter shock treatment for 100 liters – 2 pcs. • Ball mill for grinding cinder -1 pc. • System for dewatering of crushed cinder (thickener, filter press); • Storage cabinet for cylinders with gases (oxygen, nitrogen) – 1 pc. • FB furnace blast gas mixture preparation receiver - 1 pc. • Electric blast heater with load control transformer - 1 pc. • Rotameters of gas flow - 6 pcs. • Air flow meters, Dy-2mm - 20 pcs. • Shut-off and control valves, Dn-40mm - 2 pcs. • Water pressure gauge, P = 10 MPa. • Blast pressure gauges - 6 pcs. • Vacuum pressure gauges (chemically resistant, heat-resistant) - 4 pcs. • Compressor of the discharge system for the FB furnace – 2 pcs. • Coarse dust capture cyclone – 1 pc. • Electrostatic precipitator for fine dust collection -2 pcs. • Irrigation scrubber for SO₂ capture - 2 pcs. • Drying and dehydrating device H₂SO₄ - 2 pcs. • Sulfuric acid plastic storage tanks - 4 pcs. • Foam layer scrubber for tertiary treatment of emissions into the atmosphere - 1 pc. • Chemically resistant pumps for H₂SO₄ solutions for 2-6 m³/h - 8 pcs. • Contact tank for neutralization of H₂SO₄ with limestone for 200 l – 2 pcs. • Contact tank for neutralization of residual cyanide for 200 liters - 2 pcs. • Limestone weighing hopper for 200 liters - 1 pc • Slaked lime weighing hopper for 200 liters - 1 pc. • Screw loader loading of bunkers in bulk - 1 pc. • Aspiration system with hoods from all dust sources - 8 pcs. • Aspiration system with hoods from all steam sources - 10 pcs. • Chemically resistant exhaust fan – 3 pcs. • Thermocouples in the furnace by zones 4 pcs, blast heating chambers (inlet-outlet) -2 pcs, in the cyclone 1 pc, in the electrostatic precipitator 1 pc, and in each of the 3 devices of the wet stage of gas cleaning 2 pieces for the gas path and one for the solution 3 pieces. A total of 17 pieces. • Gas analyzer with sensors for SO₂, CO, CO₂ – 3 pieces • Oxygen sensor – 3 pieces • Control cabinets with frequency converters for all electric motors; • Furnace Control Cabinet with Allen Bradley Controller • Tanks for fresh and recycled water. • Shower cabin with eye bath. • Automatic fire extinguishing system. • Centrifugal tailings pump assembly with 100 m hose. • Filter press with tailings capacity of up to 150 kg/hour. • Vertical loading muffle furnace, 3-5 kW. • DC electric arc furnace for smelting ores and concentrates, with a working volume of 1-3 liters. • 10 frequency converters for electric motors of model/type YE3-80M2-4 G V6, kW – 0.75, V – 380, Hz – 50, A – 1.8, rpm – 1420. (manufacturer – Shandong Huali Motor Group Co., Ltd.). <p>Additional equipment for granulated charge roasting technology:</p> <ul style="list-style-type: none"> • Extruder-granulator up to 30 l/h - 1 pc. • Muffle furnace for drying granules - 1 pc. • Furnace feeder-dosing screw or tray up to 30 kg/hour – 1 pc.
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		<ul style="list-style-type: none"> Tailings thickener (diameter selected based on capacity; 2 units required): <ul style="list-style-type: none"> Dry tailings capacity – 140 kg/hour; Density of thickened tailings – 60%. High-pressure cleaning system (Kärcher type) – 1 unit. <p>Additional equipment for flotation tests:</p> <ul style="list-style-type: none"> Laboratory flotation machine with a set of 1 L, 2 L, 3 L, 4 L, and 5 L chambers – 1 pc.; Laboratory flotation machine for cleaning with a set of 0.3 L, 0.5 L, 0.75 L, and 1 L chambers – 1 pc. 2 x Overhead Laboratory Stirrers. 1 x Magnetic Stirrer with a set of magnets for diluting reagents. 4 x Manual pH Meters. 4 x Dispensing Syringes. 2 x Laboratory Vacuum Filters in a prefabricated set with 3-liter Bunsen flasks and Buchner funnels (2 x 140 mm diameter and 2 x 180 mm diameter). 1 x Laboratory Fume Hood.
7	Special requirement	<ol style="list-style-type: none"> Provide a separate container for: <ul style="list-style-type: none"> a workstation (desk) for the process engineer, as well as an area with space for 3 tables, 8 chairs, and 3 cabinets for pre-shift meetings and briefings of the PPU personnel; provide a separate room for coffee breaks and meals; provide a separate entrance for a restroom (2 toilets and 2 sinks) and a locker room with a separate entrance. Provide a stand-alone mobile office, modular or container-type (based on a 40-foot container), fully factory-ready, for 6 employees. <p>Equipment and Fitting Requirements:</p> <ul style="list-style-type: none"> Zoning and Furniture: 6 workstations (desk, ergonomic chair, mobile pedestal), filing cabinets and coat closets, dedicated coffee break area. Electrical and Networking: Main switchboard with RCD; socket strip at each desk (at least 3x220V + RJ-45); heavy-duty power outlets in the kitchen area. Lighting. Climate and Ventilation: Year-round insulation, electric convectors, inverter split-system, supply and exhaust ventilation (from 180 m³/h). Construction: At least 2 PVC windows (tilt and turn, with blinds), insulated steel entrance door with a closer.
8	Obligations of the Contractor (supplier) for commissioning of equipment	<ol style="list-style-type: none"> Development of a detailed commissioning plan, schedules, and inspection checklists. Assembly supervision, connection testing, cold run-in, and calibration of the instrumentation and automation systems. Mandatory testing of interlocks, protection systems (interlocks), and emergency shutdowns. Load startup and confirmation of design performance indicators (equipment operating parameters). Personnel training (14 days) and finalization of as-built documentation. Technical support during the equipment stabilization period after startup.
9	Special terms	<ol style="list-style-type: none"> Equipment and metal structures must be manufactured taking into account the reagents used and operating conditions. Equipment, electric motors, pumps, and control cabinets should be selected taking into account work in high-altitude conditions. The warranty for all deliveries (equipment, vats, control cabinets, spare parts, tools and accessories) for a period of 12 months after commissioning and for any defects in workmanship or materials reserve the right to repair or replace defective parts. Technological support during installation and commissioning by a process specialist from the supplier. Supply of one set of spare parts, tools and accessories (hoses, belts, filter elements and wear parts);
10	Terrain conditions	<ol style="list-style-type: none"> The field is located at an altitude of 3,600 to 4,200 meters above sea level. The climatic characteristics of the work area are given from the Tien Shan weather station: <ul style="list-style-type: none"> the standard depth of seasonal thawing of soils under the open, bare surface of the horizontal site is 270 cm. the depth of seasonal thawing of soils may vary due to different exposure of slopes and the position of the roof of taliks.

		<ul style="list-style-type: none"> the average wind speed for the heating period is 80% - 9 m/s. ice wall, possible once in 25 years – 50 mm. air temperature: average annual - minus 8°C, maximum - plus 23°C, minimum - minus 49°C. snow load – 67 kg/m2 <p>3. In terms of soil and hydrogeological conditions, the seismicity of the site should be taken as 9 points, SN KR 20-02:2024.</p>
11	Production and delivery time	For the shortest possible time, taking into account the maximum configuration of the semi-industrial line (this is a criterion for evaluating the Commercial Proposal).
12	Requirements for the provision of technical documentation for equipment	<ol style="list-style-type: none"> 1. Technical passport of the equipment; 2. Operation manual; 3. Catalog of spare ones with indication of nomenclature numbers and drawings; 4. Quality certificates; 5. Supporting documents; 6. Safety Instructions

The Terms of reference prepared by: