

Clarifications #1

Reference: RFQ No. 297310-VC

Date: 2019-09-18

SUBJECT: LAB-SCALE CONTINUOUS FLOW PILOT-PLANT FOR RECOVERY OF URANIUM FROM PHOSPHORIC ACID

Question #1:

According to document, in the scrubbing phase, iron, barium, magnesium etc. are precipitated. Sulfuric acid and water are to be recycled with a provision of drainage and the addition of fresh acid and water. It is unclear whether precipitates are removed from recycled acid and water? Please clarify.

Answer #1:

Yes, the precipitates will be removed the recycled acid and water. This can be accomplished on a batch basis via off-line filtration. No provisions shall be included in the System to install a separate filtration system.

Question #2:

Please provide dimensions and/or a scheme of the laboratory space where all equipment is to be installed since the document, Part IX. Pilot Plan is missing.

Answer #2:

The pilot plan is provided in this document, below these clarifications.

Question #3:

From the notes on the equipment it seems that not all cycles are continuous but rather only the single cycle is continuous at any given time. Is that correct?

Answer #3:

Yes. The system will be operated covering the 1st cycle extraction and stripping. After sufficient, loaded strip acid has been collected, the system will be re-arranged to suit the 2nd cycle.

Question #4:

In Section 5 of the operational description it states, "The degree of pretreatment of the acid is monitored by measuring the optical density of the acid at a 408 nm wavelength in a UV-Vis spectrophotometer." However, there is no UV-Vis spectrophotometer in the list of goods. Please clarify who must provide the UV-Vis spectrophotometer, the supplier or the end-user?

Answer #4:

The end-user will provide the UV-Vis Spectrometer.

Question #5:

In Section 5 of the operational description it states, "After the removal of dissolved organic matter, the oxidation-reduction potential (ORP) of the acid is then raised to >650 mV by addition of an oxidant

(i.e. H₂O₂).” However, there is no ORP meter in the list of goods. Please clarify who must provide the ORP meter, the supplier or the end-user?

Answer # 5:

The Supplier shall provide the ORP meter. The oxidation tank shall have an ORP sensor installed.

Question #6:

In Section 5 of the operational description it states, “First precipitation is conducted at pH 9, by adding 30% sodium hydroxide to precipitate other coextracted elements, followed by filtration to remove the precipitates. The second precipitation is done by further increasing the pH to pH 12.” However, there is no pH meter in the list of goods. Please clarify who must provide pH meter, the supplier or the end- user?

Answer #6:

The Supplier shall provide the pH meter. The mixing tank shall have a pH sensor installed.

Question #7:

In the text it is mentioned that a weak phosphoric acid solution needs to be cooled in a flash cooler to 30-40 °C, and strong acid solution heated to 40-50 °C. However, there are no coolers or heaters for phosphoric acid solutions in the list of goods. Please clarify the initial phosphoric acid temperature and whether they are to be cooled or heated like described in the pretreatment step.

Answer #7:

Initial temperature of the acid will be 25-40 deg C, averaging 30 deg C same with Philippine year-round temperature. For the stripping, the temperature for the first cycle stripping will be heated from 40-60 deg C.

In the list of equipment there are:

- HE-1 (Heat exchanger-1) (water bath) Heating of Loaded light Phase to 40-60 deg C.
- HE-2 (Heat exchanger-2) (water bath) Cooling of Loaded light Phase to 25-40 deg C.

While

HE-3 Heat exchanger 3 (water bath) is to be inserted in Stream 16 as described in the "First Cycle Flow Diagram" Heating of treated strong phosphoric acid to 40-60 deg C.

Question #8:

DT-1 is used as a dilution and the oxidation tank. We believe it should be one and the same tank in the pretreatment stage. Please explain, why in the list of the equipment, there are two different entries for DT-1 with a different volume?

Answer #8:

DT-1 is just one tank in the pretreatment stage final volume of 400L. In the pretreatment flow diagram, the acid entering the tank is a strong phosphoric (Stream 5). The acid is then added with water (Stream 8) and later with oxidant which is 30% Hydrogen peroxide (Stream 7).

Question #9:

In the pretreatment mode, it is intended to use a plate and frame filter press. The size is given as 452 liters.

- a) Could you clarify, what is the actual size of the plates and frames to be used?
- b) What is this 452-liter size? Is it cake volume or suspension? If suspension, then we need to know

the solid concentration.

Answer #9:

- a) The specific dimensions of the Plate and Frame Filter are not known and IAEA leaves it to the Supplier to determine the appropriate size of filter. It should be designed to be able to accommodate 1 m³/hr of feed flowrate.
- b) It is a suspension. The strong phosphoric acid has around 1% solid and 1,700 kg/m³. The output acid will be free of suspended solids.

Question #10:

According to the process scheme, phosphoric acid from the factory is pumped to the flash-cooler. Is the cooler a part of the factory, or should it be accommodated to the system?

Answer #10:

Please disregard the flash cooler in the equipment specifications as it is part of equipment within the factory.

Question #11:

Does the enclosed list of equipment cover all items to be supplied? For example, we see a mention of agitators in tanks but not mentioned in equipment list. Motors of this size are general purpose and not explosion proof. What is the requirement?

Answer #11:

Please do not supply agitators for the tanks. This will be up to the end-user to provide, if required.

Question #12:

No mention of piping and fitting requirements?

Answer #12:

Please include piping and fitting requirements/supplied to ensure the system is operational upon delivery/set-up.

Question #13:

No mention of instrumentation, if required? There is a mention of level gauges on certain tanks.

Answer #13:

Pricing for ORP (Eh) and pH meters shall be included, where required.

Question #14:

Is the 6x3m 2 tier structure part of supply or does it already exist?

Answer #14:

The IAEA leaves it to the Supplier to provide the optimum configuration for set up and operation.

Question #15:

Some equipment like mixer settlers need to be placed on a table or stand, is this part of supply?

Answer #15:

The end-user can provide tables/stands. Please include the required equipment that should be provided by the end-user to ensure the system can be set-up/operated.

Question #16:

What about stand to support AC column?

Answer #16:

Please provide that in your quotation as an optional item.

Question #17:

What about bunds for tanks, mixer settlers and pumps to collect spillages?

Answer #17:

The end-user can provide these items.

Question #18:

Is analytical equipment required?

Answer #18:

No, the end-user has a fully capable analytical laboratory.

Question #19:

Is there air available for air driven motors or agitators?

Answer #19:

The IAEA is not sure about this detail. Please include a note in the Quotation that the end-user needs to ensure that is present, if required for the operation of the system.

Question #20:

PLOT PLAN mentioned in technical spec section IX but not received?

Answer #20:

The plot plan is provided below. If any modifications are proposed to the plot plan as part of a Bidder's quotation, please note them as either optional items (if there is a cost associated) or in the notes section to highlight the changes.

