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TO: Peer-to-Peer Dialogue Participants

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SUBJECT: Zakamensk remediation comments and recommendations

Problem: Dust from tailings

Remedy: Suppress dust with water or binder (e.g., Magnesium Chloride)

Considerations: Infiltrating water from dust control might increase tailings water discharge. Adding binders can be costly.

Problem: Subsurface water infiltrating tailings

Remedy: Steel, plastic, or clay cutoff walls

Considerations: Corrosion-proof steel would have to be found, special equipment needed to drive sheet steel to depth, steel is expensive. Experienced personal are needed to seam and install plastic for either cutoff walls, or covers, and plastic is quite expensive. Clay for cutoff walls and covers can be quite cheap if available locally but large excavating equipment and trained operators are necessary to install correctly.

Problem: Surface infiltration via precipitation into tailings (note that tailings cover a large area)

Remedy: Plastic or stratified earthen material cover.

Considerations: While plastic covers are the most impermeable, plastic is expensive, and experienced personal are needed to seam and install plastic for a covers, moreover, a plastic cover would need protection. Protection is usually provided by a substantial thickness of (about a meter thick) of earthen material that would add to the cost. Long-term maintenance would need to include preventing deep rooting plants from growing on and through such a cover, and preventing development that would compromise the plastic cover (no foundation piles).

A stratified earthen material cover with a thick compacted clay layer on top of the tailings, and a thick topsoil layer on top of the clay where plants would be cultivated would also reduce infiltration. Cost of the clay is related to how far it must be transported to Zakamensk, and how much is needed for an adequately thick barrier layer. The same can be said for the cost of topsoil, although there may be an option to offset some cost by using sewage and animal waste as an additive.

During our webinar, it sounded like installing either plastic or earthen material covers would be multi-year-long projects.

Monitoring: If controls are installed, how long will it take to see water quality improvements?

Considerations: It would take a long time to install any remedy and after installation, a long time for water already stored in the tailings to drain out. If infiltration is really stopped, water may stop draining from the tailings due to capillarity but the tailings pore water might remain acidic with high metal concentrations.

Food for thought eh?