BACKGROUND

Kugluktuk draws its water from the Coppermine River about 2.5 km upstream from the Coronation Gulf. Numerous problems have been reported with the water system over the years resulting in numerous engineering studies. There are several major and different issues, including: chronic excessive turbidity, seasonal salt water intrusion, sand and silt build-up around the intake pipe, strategic horizontal and vertical locations of intake pump house and pipe, the need for a new intake pump house, and sufficient water storage.

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Within the past several years a new water treatment plant has been designed and constructed. This plant has partially dealt with many of these problems. Yet some work remains to be done in order to provide a continual and healthful supply of water for the community.

A.D. Williams Engineering Inc. (ADWE) was commissioned to investigate and design facilities to remediate the problems currently being experienced. Until recently the investigation has focused on locating an area of scour in the river bed in which to locate new intakes, rather than the deposition area where they are currently located. To this end a hydraulics sub-consultant was retained and bathymetric and river engineering investigations completed.

A low area of the river bed was located close to shore and slightly downstream of the existing location, reachable with intakes from near the existing pump house. This appears to be a scour area. The hydraulic analysis recommended measures to maintain the scour in this area.

While the proposed intake location appeared promising, there are still problems associated with it that would need to be resolved. Foremost among these is the periodic intrusion of saline water, which is unlikely to be resolved by a new river intake. High turbidity, greater than the treatment plant is currently capable of handling, is another unresolved issue. While these issues are likely soluble, they require additional processes and controls.

It was suggested there may be a potable water aquifer under the river bed that could be accessed. An initial investigation using geophysical techniques identified three potential targets that are indicated to be aquifers. However, while the geophysical investigation identified the targets as likely being coarse-grained material underlying impermeable fine-grained material, it is unable to confirm the presence of treatable water or the yield of the aquifer. Accordingly, it has been decided to initiate a drilling program to access the aquifer, sample the water quality and pump test it to ascertain its yield.