

AMC HP SRU™ achieves 77% reduction in water use in the Arctic Tundra

CASE STUDY

In freezing conditions, AMC Heli-Portable SRU™ (AMC HP SRU™) reduced the risk of environmental contamination, reducing water consumption by 77% and increasing efficiencies on an environmentally restricted site in the North West Territories, Canada.

Challenge

North Tech Drilling was conducting a diamond drilling program for Aurora Geosciences Limited (AGL) at Kelvin Lake, approximately 290km (180 miles) from Yellowknife, Canada. The region is extremely environmentally sensitive, with some plants, such as lichens, taking up to 80 years to regenerate if damaged. Water sources are strictly monitored by government agencies, especially during the warmer months when the ice melts and water begins to flow.

Water for drilling operations is sourced from Kelvin Lake and pumped directly to the drill site. Local government land use management agencies are particularly concerned with water consumption and landfill at the site, requiring the exploration company to comply with strict permit conditions.

The drill program commenced during the holiday season, delays were expected due to extreme temperatures and seasonal shutdowns. AMC, Aurora Geosciences Limited (AGL) and North Tech Drilling took this opportunity to trial the AMC HP SRU™ in a proactive effort to reduce water consumption and improve drill cuttings management.



Results

- Reduced water consumption by 77%
- Reduced associated pump wear and tear and fuel costs
- Improved drill cuttings management, limiting risk of spills
- Reduced volume of landfill waste
- Reduced warm water flow back to the lake for minimal impact on the ice
- Minimised transportation costs and runs
- Allowed drilling in an environmentally sensitive location, restricted by permits
- Improved productivity by reducing frozen water pipes and overflowing tanks
- Environmental benefits recognized by government environmental inspectors.

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Solution

The modular design of AMC HP SRU™ enabled it to be easily transported to the remote site in a Dash 7 Cargo aircraft. Designed for easy installation and assembly, the AMC HP SRU™ has colour coded components and guide points to direct the pieces together in minimal time.



Left: All components of the AMC HP SRU™ weigh under 700kg and can be easily dismantled for transport. Right: AMC HP SRU™ was quickly configured on site.

The AMC HP SRU™ was connected to two diamond drill rigs. Cuttings were removed quickly and deposited directly into a bulk / mega bag. This bag was then lifted by helicopter (in summer) or snowmobile (during winter) to the waste dump, freeing up personnel and minimising the risk of direct contamination to the ice.

The cuttings generated by the AMC HP SRU™ were dry with significantly less volume and weight, making transport and disposal cheaper and easier. Dry cuttings reduce environmental contamination risks compared to those with a high water content. Liquid waste must be placed on ice until frozen before transporting. It turns into sludge easily, creating further contamination risks for waste dump operators and drilling contractors.

The auxiliary hydraulic circuit on the AMC HP SRU™ gave the drillers the option to run a hydraulic sump pump independent of the rig's hydraulic system. This allowed the closed-loop system to flow when the drill rig was shut down, reducing incidents of frozen water lines or over flowing tanks during stoppages.

The AMC HP SRU™ reduced water consumption at the Kelvin Lake drill site by 77%, from an average of 24,830L per day to 5,730L per day. With minimal water use, the site was also able to reduce additional fuel costs as well as pump wear and tear.

"The AMC HP SRU™ has substantially lowered our water content; this both reduces the volume of material transported from the rig and reduces the potential of suspended solids to run off in freshet surface waters."

Dave Cox, Site Geologist – Aurora Geoscience

Project Outcome

AMC HP SRU™ was able to reduce the flow of warm water back into the lake and extend the drilling program, despite unseasonably warm weather – a significant achievement. At completion, ice at the drill site was preserved at 1.5m (5ft) thick. The AMC HP SRU™ significantly reduced the impact on the surrounding environment and improved the efficiency of operations, including:

- Significantly reduced water consumption – reducing water use by 77% from previous years
- Reduced transport and disposal costs from compact and dry cuttings
- Closed loop system reduced time spent managing and mixing muds, allowing personnel to focus on completing the drilling program
- Reduced incidents of frozen water lines or over flowing tanks when the drill rig was shut down
- The drilling contractor maintained their environmental permits, proving to local authorities it reduced the risks of environmental contamination.

"Using the AMC HP SRU™ allowed us to eliminate the need for warm clean water returns to the lake while drilling on ice. This greatly helped in preserving the strength and quality of our ice over the course of the season."
Dave Cox, Site Geologist – Aurora Geoscience

The use of the AMC HP SRU™ was highly praised by the client, Aurora Geosciences Limited (AGL), and in the environmental inspection report; government inspectors were extremely impressed with the outcome of the operation with the AMC HP SRU™.

"The unit has been a major asset to us and it's worth has been tested over the course of a winter drill program and we are looking to increase our use of the AMC HP SRU in coming drill programs."

Dave Cox, Site Geologist – Aurora Geoscience

Further Information

For more information about this case study, please contact amc@imdexlimited.com or your local AMC representative.

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