

Capturing aerial imagery with unmanned aircraft



Use of unmanned aerial vehicles (UAVs) has increased dramatically over the past five to six years and has shifted from mainly military to increasingly commercial purposes. Early on during this shift, SRK Consulting recognized that the ability to capture aerial imagery with small UAVs would enhance the specialist services it provides its earth and water resource clients and could offer substantial project benefits.

SRK has closely followed the advancements in commercial UAV systems. Following in-depth research, the company's

geographic information systems (GIS) staff from Saskatchewan and Nevada decided to collaborate on designing and building a UAV platform with off-the-shelf components. The goal of this UAV initiative was to prove the concept of a cost-effective solution that would enable SRK to offer its exploration and mining clients significant savings in time and money. After months of developing and testing the UAV platform and associated standard operating procedures, SRK has created a system that performs on par with other commercial systems at a fraction of the cost.

The system's data output includes orthomosaic images, Digital Surface Models (DSMs), and point cloud data. While the scope of potential applications for these data types is unlimited, for potash and other mining projects, SRK considers the data to be particularly valuable in change detection and the monitoring of construction and tailings deposition. The DSMs also enable volume analysis and calculations for bare-ground structures, such as open pits, borrow pits, material stockpiles, and coarse tailings management areas.

Not only does SRK's UAV platform help its clients acquire high-quality data, but, having designed, built, tested, and calibrated its own equipment, SRK is well equipped to troubleshoot any malfunctions and quickly conduct repairs with minimal downtime.

Because of the need to ensure public safety, most jurisdictions require authorization of UAV use. SRK has obtained a Special Flight Operations Certificate for potential work at 16 project sites within Transport Canada's Prairie and Northern Region, including most of Saskatchewan's currently operating potash mines.

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The short-term roadmap for SRK's UAV initiative includes implementing additional platforms and sensor technologies, such as infrared and LiDAR. The company is testing a prototype multi-copter platform that will facilitate collection of water and other samples in hard-to-reach or potentially unsafe areas. Also under development is a boat platform and related sensor technologies, such as instruments for measuring water depth, temperature, and quality.

As technology develops, UAVs will be able to access and gather information from more remote locations and harsh terrain. They offer a unique, cost-effective way of obtaining high-quality data, while improving workers' health and safety. Given the extensive opportunities presented by UAVs, they are becoming standard tools in the commercial sphere and have broad applications in the mining industry.

About SRK Consulting

SRK Consulting is an independent, international consulting practice that provides focused advice and solutions to clients, mainly from earth and water resource industries. For mining projects, SRK offers services from exploration through feasibility, mine planning and production to mine closure. Please see www.srk.com for more information. X