Survey Services for the Mining Industry

CEC's seasoned team of registered professionals and survey staff use cutting-edge technology and equipment to provide a full range of surveying/geomatics services. CEC delivers spatially referenced information that meets the specific needs of the coal, aggregates, and hard rock mining industries.

CEC maintains an array of survey equipment, including RTK and static GPS, robotic and manual Total Stations, automatic and digital levels, and data collectors for conventional survey. CEC also utilizes unmanned aerial systems (UAS), terrestrial LiDAR scanners, and manned or remote-controlled bathymetric/hydrographic workboats.

Robust professional capabilities, specialized experience, and technical competence and capacity allow CEC to provide the following services to mining industry clients:

Horizontal/Vertical Control Surveys

CEC's experience includes photogrammetric control; monitoring stations for dams, impoundments, site development, and earthwork; utility and roadway construction control; and waterway channel alignment.

Topographic Surveys

Various topographic techniques are employed depending on site characteristics and requirements, even in the most inaccessible areas. Topographic data can be collected using conventional survey techniques, survey-grade UAS, and/or terrestrial LiDAR scanning to create the appropriate base-mapping deliverable.

Agriculture/Vegetation Surveys

To assess environmental conditions for agriculture and environmental projects/permits, near-infrared cameras onboard the UAS can be used to generate Normalized Difference Vegetation Index (NDVI) images for monitoring and/or measuring soil composition and vegetative health, plant growth, biomass production, and vegetation cover and soil/water condition.

Construction Surveys

Capabilities include construction layout of surface/subsurface utilities, access roads, bridges, buildings, and parking lots. CEC also has experience in construction surveys of upland disposal sites, locks and dams, rivers, lakes, and canals.

Boundary and Land Title Surveys

CEC is experienced in boundary and American Land Title Association (ALTA) surveys ranging from tens to thousands of acres.

Volumetric Surveys

Volumetric surveys are performed for all levels of accuracy and accessibility, including unstable spoil piles or highwalls, etc. The measurement of raw material stockpiles and excavation areas to determine volumes and assess remaining available airspace is accomplished using conventional survey techniques, survey-grade sUAS, and/or terrestrial LiDAR scanning.

Bathymetric/Hydrographic Surveys

CEC utilizes manned and/or remote-controlled workboats equipped with specialized remote sensing technology to map and quantify sedimentary deposits for determining the size and volume of ponds, lakes, and impoundments.

Aerial Visual Inspections

The ability to fly in close proximity to, and optically zoom in on, a target means that visual inspections of difficult-to-access areas like stockpiles, highwalls, or strip mines can

PRACTICES

Air Quality
Civil Engineering
Ecological Sciences
Environmental Engineering and Sciences
Planning
Survey/Geospatial
Waste Management
Water Resources

INDUSTRIES

Manufacturing
Mining
Oil & Gas
Power
Public Sector
Real Estate
Solid Waste

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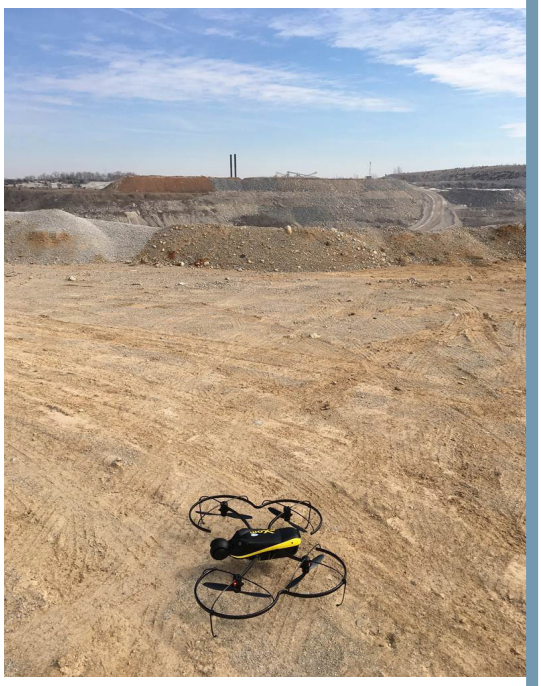
be accomplished quickly and safely from a distance. The high-resolution and HD-quality visual images can then be downloaded and electronically transferred to a host of users.



Aerial Photography

Armed with the ability to capture 14 megapixel photos or record 1080p HD video from a unique vantage point, a typical UAV data file can contain 10 to 30 million points due to lower flight heights and high-resolution photographs compared to a conventional aerial survey data file that can contain up to 50,000 points. Aerial photographs can be used to display time-lapse project progress, monitor remote locations, or provide photography to be used in presentations, displays, or advertising.