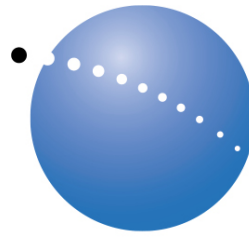


Satellite Surveying for Tailings Storage Facilities



PhotoSat[™]
Leaders in Satellite Surveying
for Mining and Energy
www.photosat.ca

Monthly satellite surveying of tailings facilities anywhere in the world

Accurate surveying of tailings facilities has traditionally been dangerous, difficult, expensive and slow. Satellite surveying eliminates the need for site access and allows frequent surveying, high accuracy and reliable volume and lift thickness measurements.

PhotoSat's algorithms and low cost graphic processors allows elevations and volumes for tailings to be measured monthly using satellites. Complete surveys of entire mine sites covering 100's of sq km can be delivered within a few days of a satellite pass. There are many satellites available.

Satellite surveying is a practical alternative to airborne LiDAR, drones and ground surveying, with the added advantage that visits to site are not required.



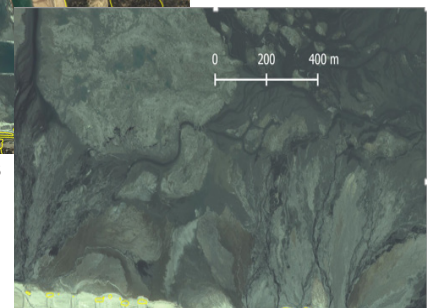
2010 satellite photo



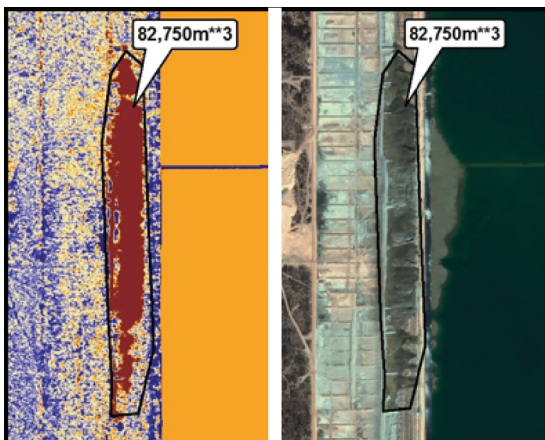
2015 satellite photo



Satellite photo with contours
Courtesy of Golder Associates



Zoom in with 50cm contours
showing beach detail



Tailings dam area, colour coded to show elevation changes with volumes of material added to the cells over a period of one month

Satellite Surveying for Tailings Storage Facilities

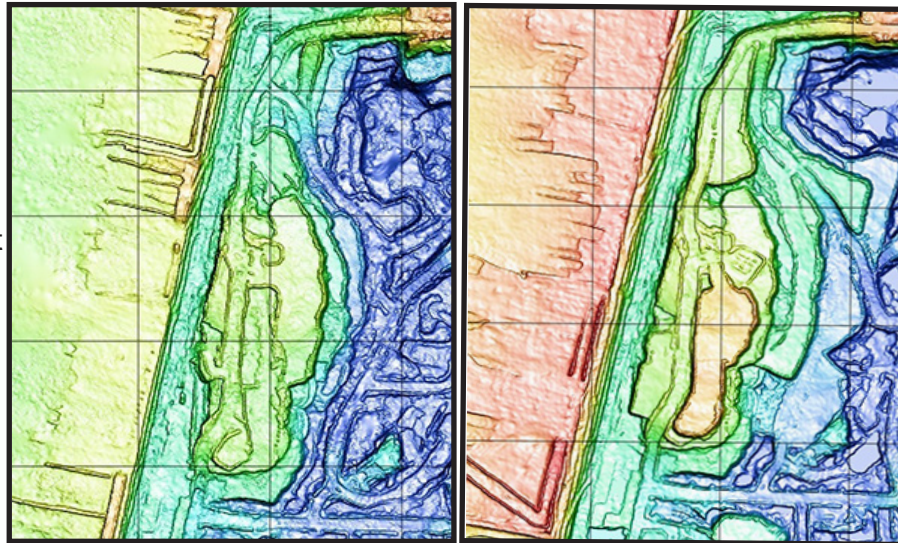
Satellite surveying of tailings storage facilities (TSF) includes:

- Monthly, weekly or “on demand” surveys of entire tailings storage facilities and/or entire mine sites.
- Delivered within a few days of the satellite pass.

20 cm vertical accuracy allows measurements of:

- volumes,
- area of deposit (wet and dry beach areas)
- lift thicknesses
- beach slope and length
- water body areas and volume changes
- monitor new construction or expansion

Colour shaded elevation survey of a TSF and mine pit area

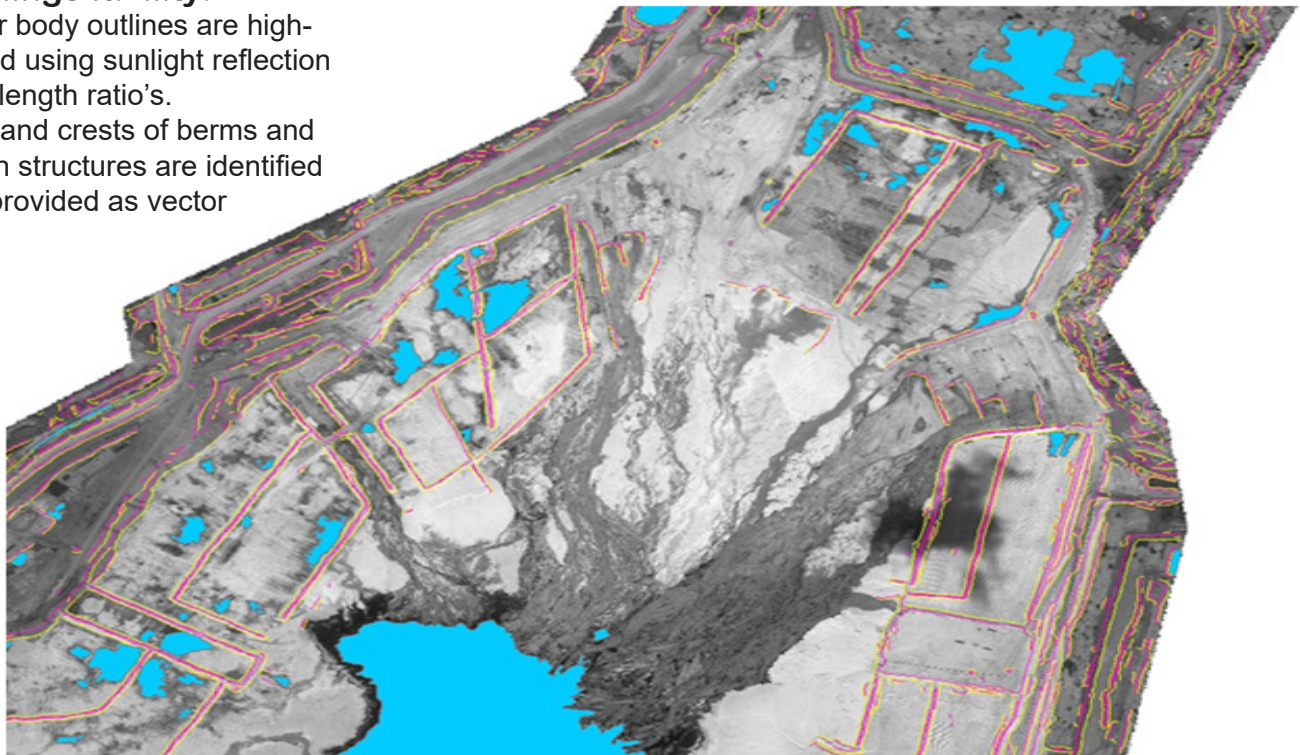


Colour shaded elevation survey of the same TSF area 1 month later. Note how the structures have been filled

Satellite orthophoto of a tailings facility.

Water body outlines are highlighted using sunlight reflection wavelength ratio's.

Toes and crests of berms and beach structures are identified and provided as vector files

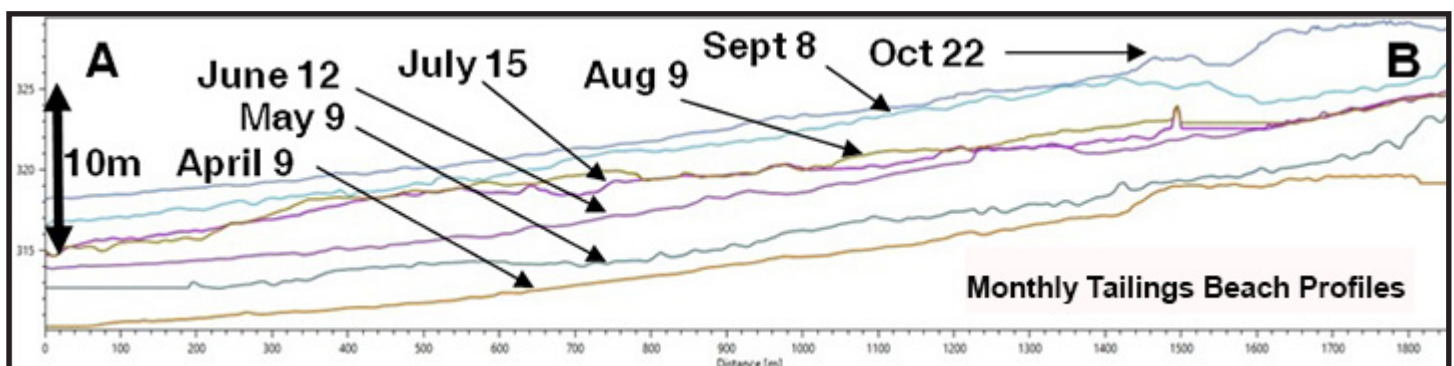


Satellite Surveying for Tailings Storage Facilities

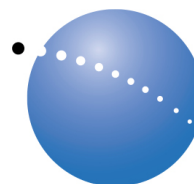


50 cm contours on a 30 day elevation isopach. This shows the tailings plumes development over 1 month.

Tailings beach profile line



Satellite Surveying for Tailings Storage Facilities



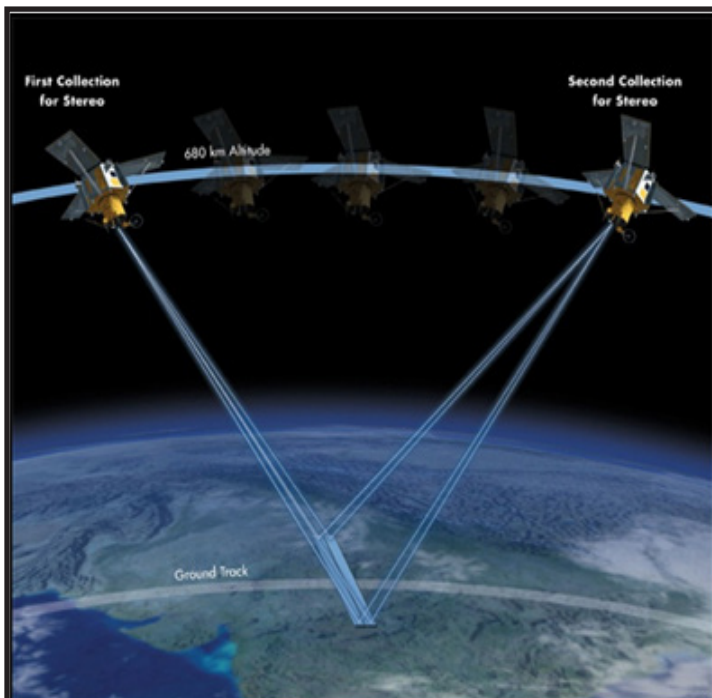
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How satellite surveying works.

- PhotoSat contracts with a satellite operator to get stereo satellite photos of a mine site.
- Mine areas from a few sq km to 1000's of sq km can be shot.
- Multiple satellites can be deployed
- No permits are required.
- No standby fees.
- No site visit
- Anywhere in the world.
- Images are processed within a few days using PhotoSat algorithms.



PhotoSat's standard delivery for an open pit mine includes:

- Elevation grids – usually a 1m grid with elevations accurate to better than 20cm.
- The surveying usually covers the entire mine site however specific areas such as the pit, tailings, stockpiles or leach pad can be delivered separately.
- Delivered in any format – suitable for immediate use in mine planning software such as AutoCAD, Rift TD, Muck3D or ArcGIS.
- Any projection or co-ordinate system.
- 50cm contours.
- Toes and crests.
- Water body outlines.
- Precision satellite photo of the entire region.



Over 650 satellite surveys of mines
and energy projects worldwide

Contact us for more information

info@photosat.ca

1-604-681-9770

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