

## **REPORT ON THE CONSTRUCTION AND TESTING OF A BUCKET WHEEL EXCAVATOR**

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The Northern Centre for Advanced Technologies Inc. (NORCAT), in partnership with Electric Vehicle Controllers Ltd. (EVC), is presently engaged in the development and adaptation of existing mining technologies and methodologies for use extra-terrestrially as precursor and enabling technologies for ISRU and for use as ISSE in support of longer term missions.

More specifically, NORCAT, in collaboration with Colorado School of Mines, has developed, constructed, and tested a bucket wheel excavator. The unit is based upon the design developed by CSM's Mike Duke and Tim Muff.

The design of the test unit was developed with the CSM design as a guide. Considerations were exercised to facilitate construction and testing of key operational parameters. This yielded some changes in design and operating concepts, which were incorporated where appropriate. In addition, some bottle necks and weak points were identified in the original design.

NORCAT engaged Natural Resources Canada (NRCan) to fabricate a lunar regolith simulant from mine tailings that would exhibit some significant similarities to the reported mechanical properties of lunar regolith. The Bucket wheel unit was tested in this simulant in October 2004.

This presentation will report some key results of the Bucket wheel re-design.