26 August 2013

Eric Ratcliffe
STARR MT-1 Project Manager
Atkins Global
3901 Calverton Boulevard, Suite 400
Calverton, MD, 20705

RE: Certification of Minnesota LiDAR Quality
       Central Lakes Project

Dear Mr. Ratcliffe:

Attached you will find a signed and sealed Certification Statement for LiDAR that was
collected by the Minnesota Department of Natural Resources and its numerous partners.
Due to the size of the State, a regional acquisition approach was selected. As part of the
project planning process, we wanted to engage the county governments to be partners in
this project. A decision was made to report accuracy on the county level as part of that
engagement.

If you have any additional questions concerning the testing process, please contact me at
651.366.3457.

Sincerely,

Peter W. Jenkins, PLS, CFedS
Photogrammetric Unit Supervisor

Enclosures:
Certification Statement

cc:
S. Jiwani
T. Loesch

Certification of Minnesota LiDAR Data Quality

Project Area: Central Lakes Project, Minnesota

Counties covered: Aitkin, Cass, Hubbard, Itasca, Koochiching, Todd and Wadena

Date of acquisition: 26-28 April 2012

Horizontal Positional Accuracy: All these data products were acquired at 2400 meters above mean terrain (AMT) and have a horizontal accuracy of 0.40 meters, with a nominal point spacing of 1.5 meters.

Vertical Positional Accuracy: Accuracy of the dataset was verified by a second set of ground control points provided and tested by the State of Minnesota. The Consolidated Vertical Accuracy (CVA) of the TIN as tested by the State of Minnesota achieved 0.286 meters at a 95% confidence level of all land cover categories. 877 test points covering the 5 land classes as defined by ASPRS and NDEP were used in this evaluation. The vertical RMSE, 95% Confidence Level and sample count per county as tested by the State of Minnesota is as follows: Aitkin, RMSE 0.136m, 95% 0.266m, 101 points; Cass, RMSE 0.090m, 95% 0.176m, 120 points; Hubbard, RMSE 0.127m, 95% 0.248m, 141 points; Itasca, RMSE 0.170m, 95% 0.333m, 207 points; Koochiching, RMSE 0.110m, 95% 0.216m, 106 points; Todd, RMSE 0.161m, 95% 0.315m, 179 points; Wadena, RMSE 0.163m, 95% 0.319m, 137 points. There is a discrepancy between the points used for the individual counties and the total points used for the project area. The reason for this is that there are overlapping tiles where multiple points were used in the contract compliance phase and these results were shared with the Local Governmental Agencies as part of the partnership.

This is to certify that the work summarized above was completed in accordance with sound and accepted surveying practices and meets the accuracy requirements in the USGS's Lidar Guidelines and Base Specifications.

Peter Jenkins, PLS, CFedS

MN PLS # 22683

Photogrammetric Unit Supervisor

Minnesota Department of Transportation