Dewberry Response to USGS Review of the TX Red River Atascosa Lidar Project

Produced for U.S. Geological Survey

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Executive Summary

The primary purpose of this project was to develop a consistent and accurate surface elevation dataset derived from high-accuracy Light Detection and Ranging (lidar) technology for the USGS FEMA VI Red River, Texas Lidar Project Area.

The lidar data were processed and classified according to project specifications. Detailed breaklines and bare-earth Digital Elevation Models (DEMs) were produced for the project area.

Deliverables for this project included classified point cloud data, bare earth hydro-flattened digital elevation models, intensity imagery, breaklines, survey data, metadata, project report, and project extent shapefiles.

The USGS review of these deliverables resulted in twenty one (21) specific DEM calls, one (1) metadata call/comment, one (1) LAS header call, and one (1) delivery block overlap call. Each type of call is discussed in more detail below.

PROJECT AREA

Data was formatted according to tiles with each tile covering an area of 1500m by 1500m. A total of 6731 tiles were produced for the project encompassing an area of approximately 5329 sq. miles.

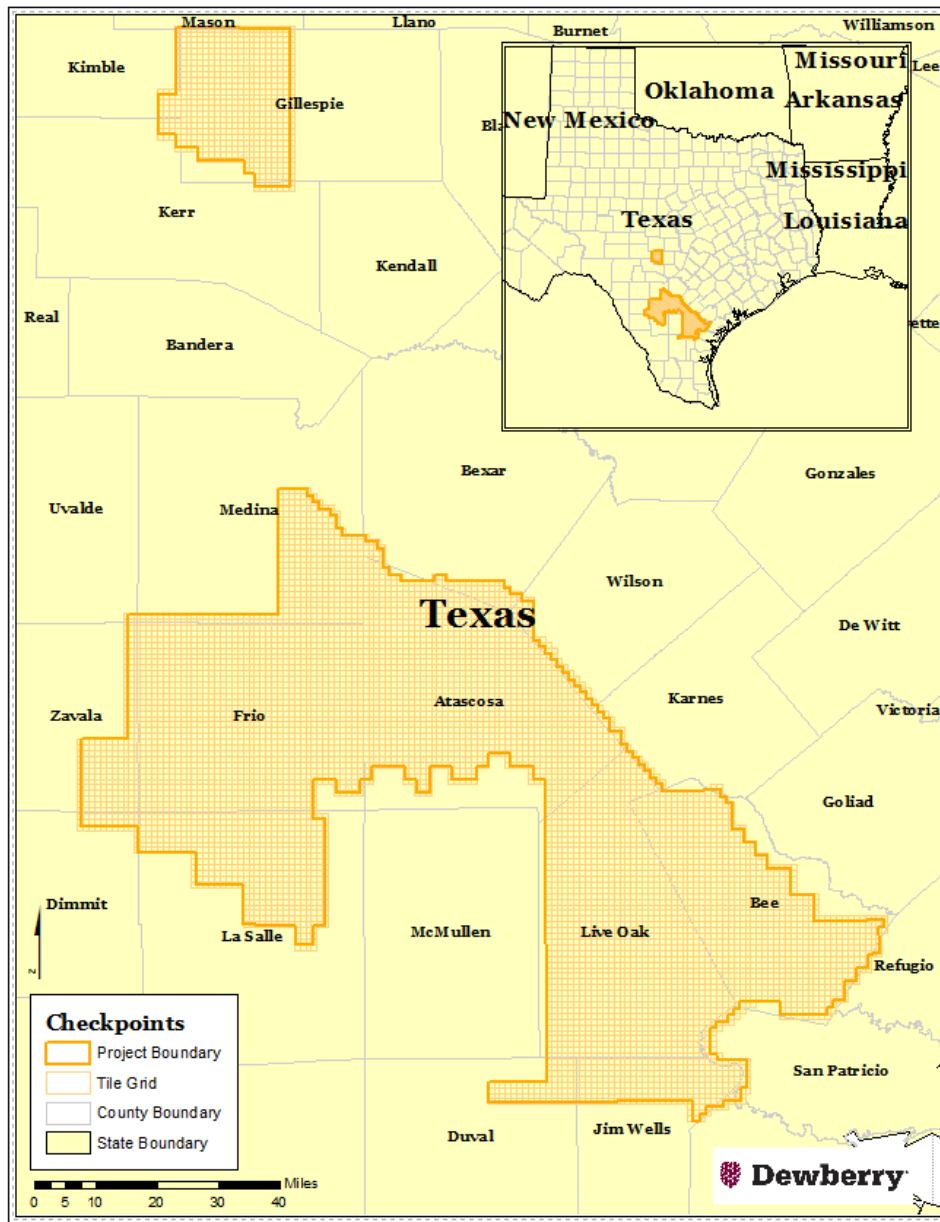## USGS FEMA VI - TX Red River Atascosa Lidar Project

Figure 1- Project Map

Edit Calls

BRIDGE REMOVAL

USGS identified four (4) bridges as being left in the ground model. Dewberry has reclassified the bridges to Class 17 Bridge Deck Class.
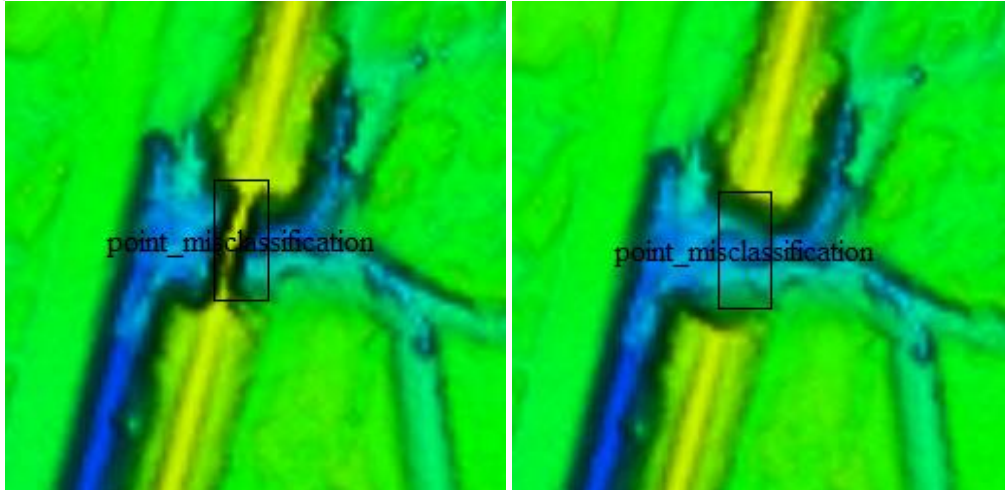
Figure 2-Tile 14RMS905965. The image on the left is an overview of the DEM where USGS made a bridge call. The image on the right is an overview of the DEM after Dewberry reclassified the bridge from ground to bridge deck.

UNREALISTIC CHANGE IN ELEVATION

USGS made three (3) hydro calls where there was an erroneous change in elevation between the waterbody and ground. Dewberry adjusted the DEM to better represent the terrain.
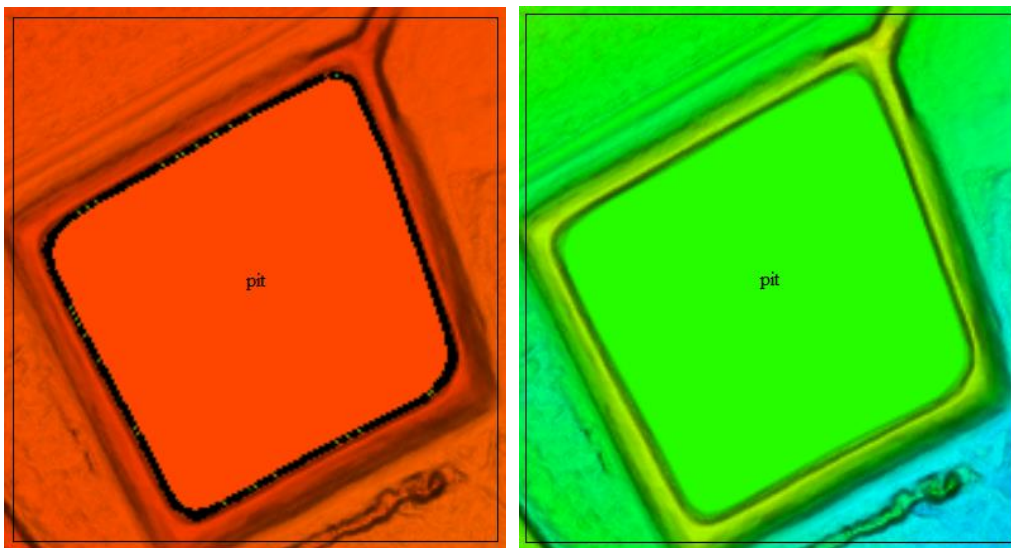

Figure 3- Tile 14RNS475770. The image on the left is an overview of the DEM where USGS made a call where there was an erroneous change in elevation between the waterbody and ground. The image on the right is an overview of the DEM after Dewberry adjusted the DEM to better represent the terrain.

EXCESSIVELY DIGGING HYDROGRAPHIC FEATURE

There is one (1) location where Dewberry flattened a hydrographic feature excessively. USGS identified this feature and asked that it be raised so as to more accurately portray the water surface. Dewberry agrees and it has been corrected. An example is shown below.
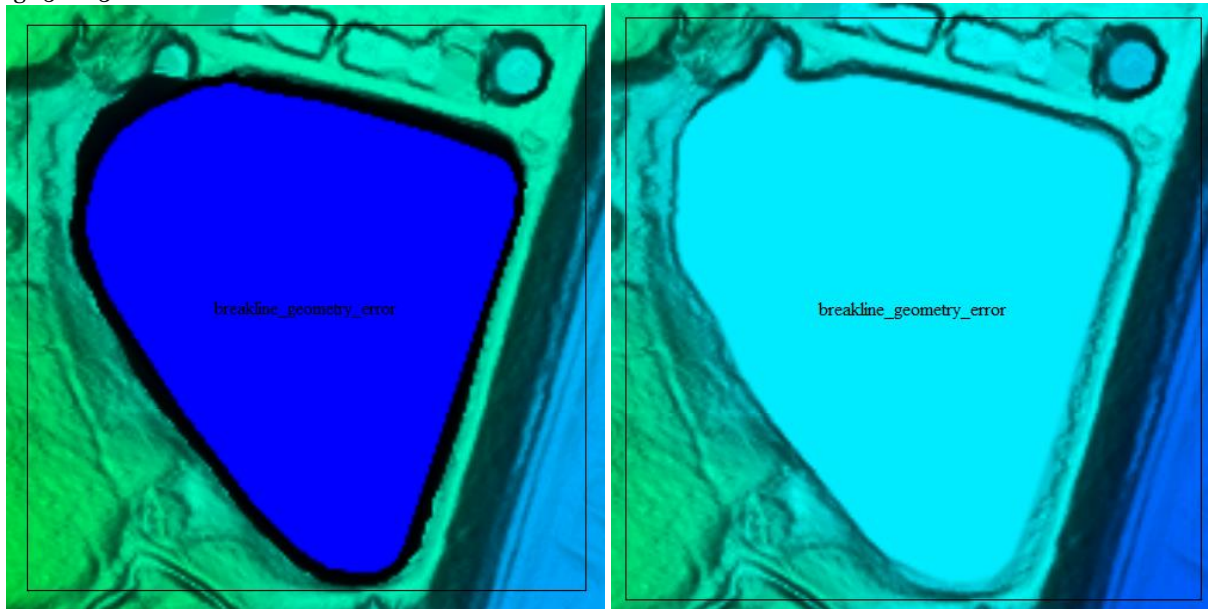
Figure 4- Tiles 14RNT100445 and 14RNT100460. The pond on the left was identified by USGS as an excessively digging hydrographic feature that needs to be raised to better portray the actual elevation of the water. The LAS and DEM have been corrected by changing the breakline elevations, shown on the right.

HYDRO-FLATTENING

USGS identified five (5) hydro-flattening errors. The edit calls were reviewed and the breaklines, LAS, and DEMs were corrected. An example is shown below.
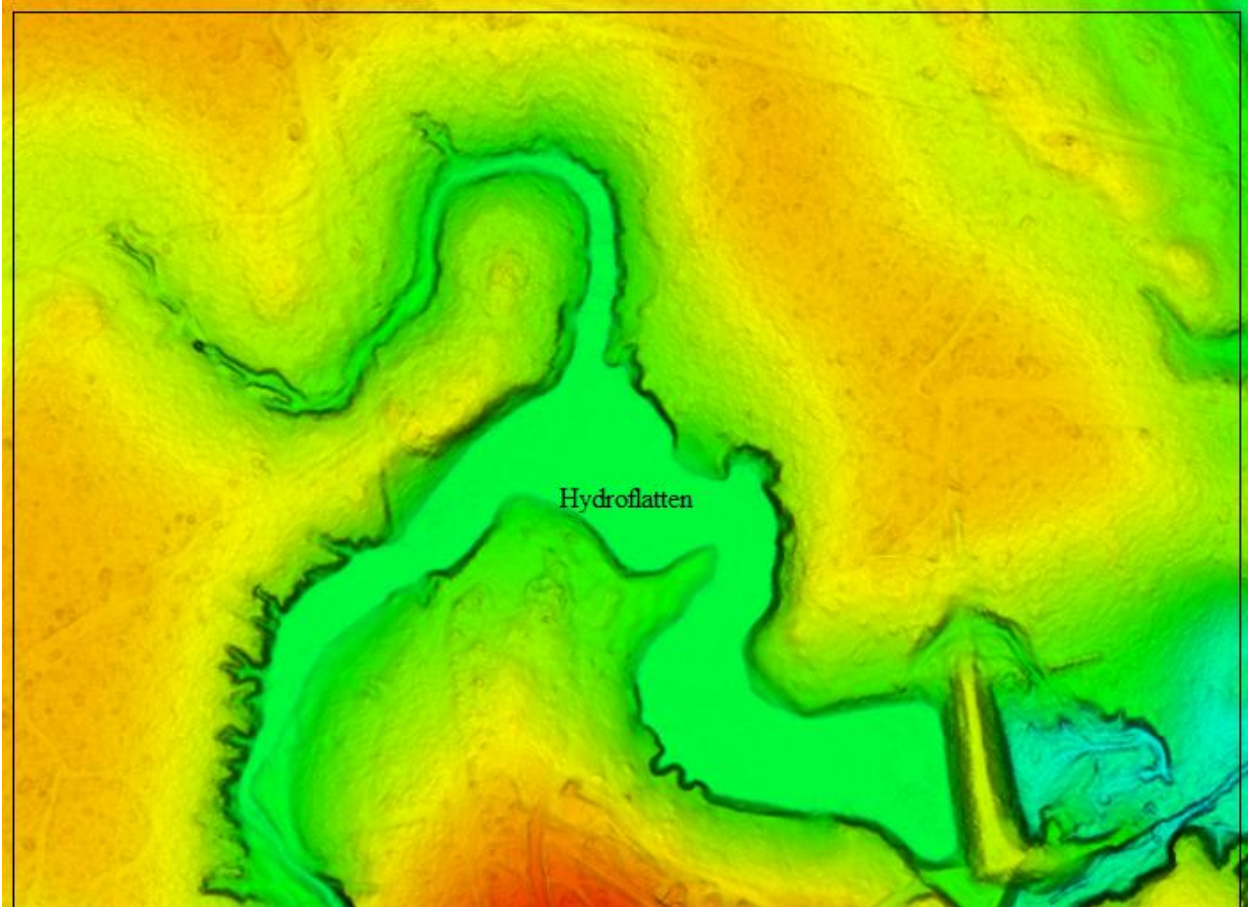
Figure 5- Tile 14RPS360410. The pond in the center of the image was identified by USGS as needing to be hydroflattened. The LAS, breaklines, and DEM have been corrected, shown below.
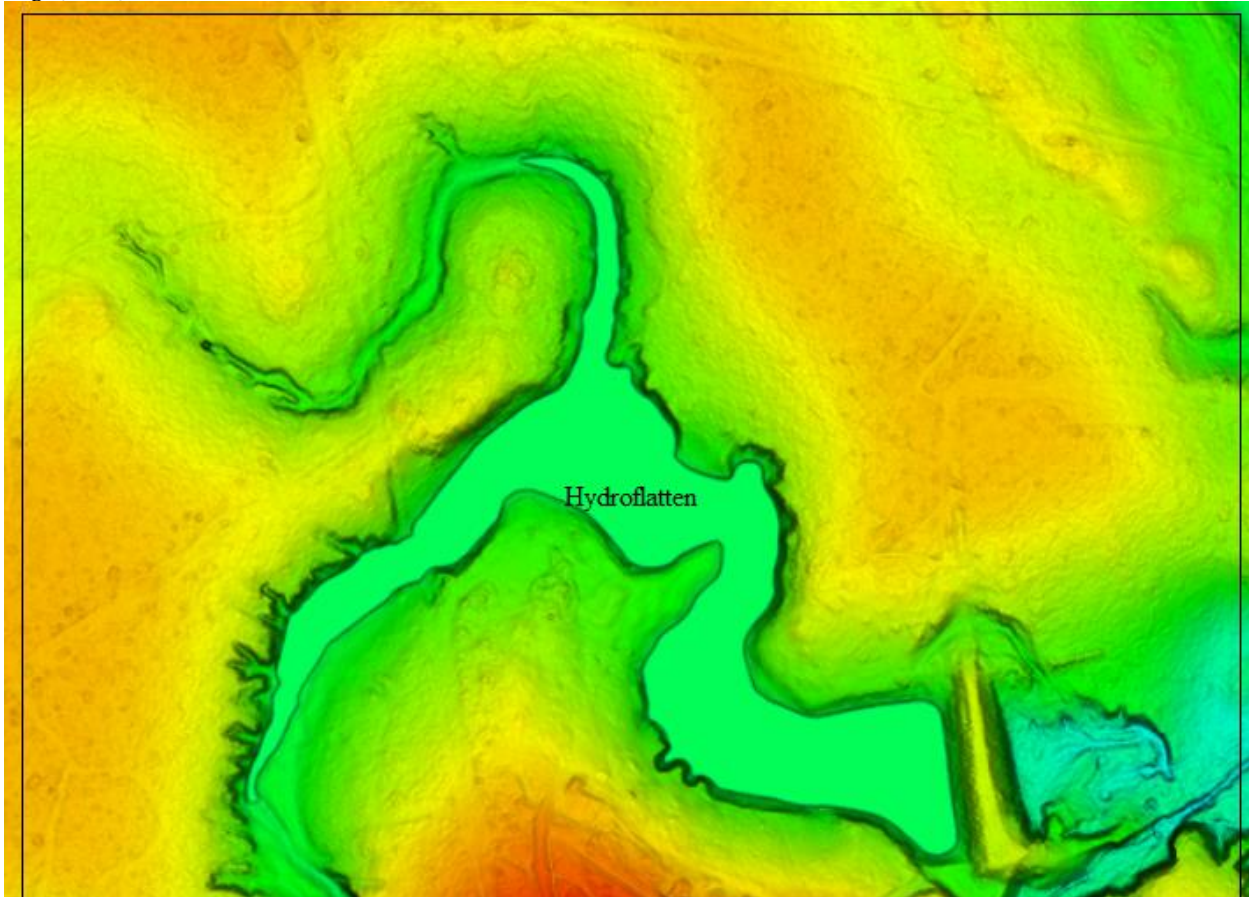
Figure 6- Tile 14RPS360410. The breaklines have been corrected to include the waterbody; the LAS and DEM were updated accordingly.

BREAKLINE GEOMETRY ERROR

USGS identified five (5) issues where waterbodies did not accurately represent the terrain. The edit calls were reviewed and the breaklines, LAS, and DEMs were corrected. An example is shown below.
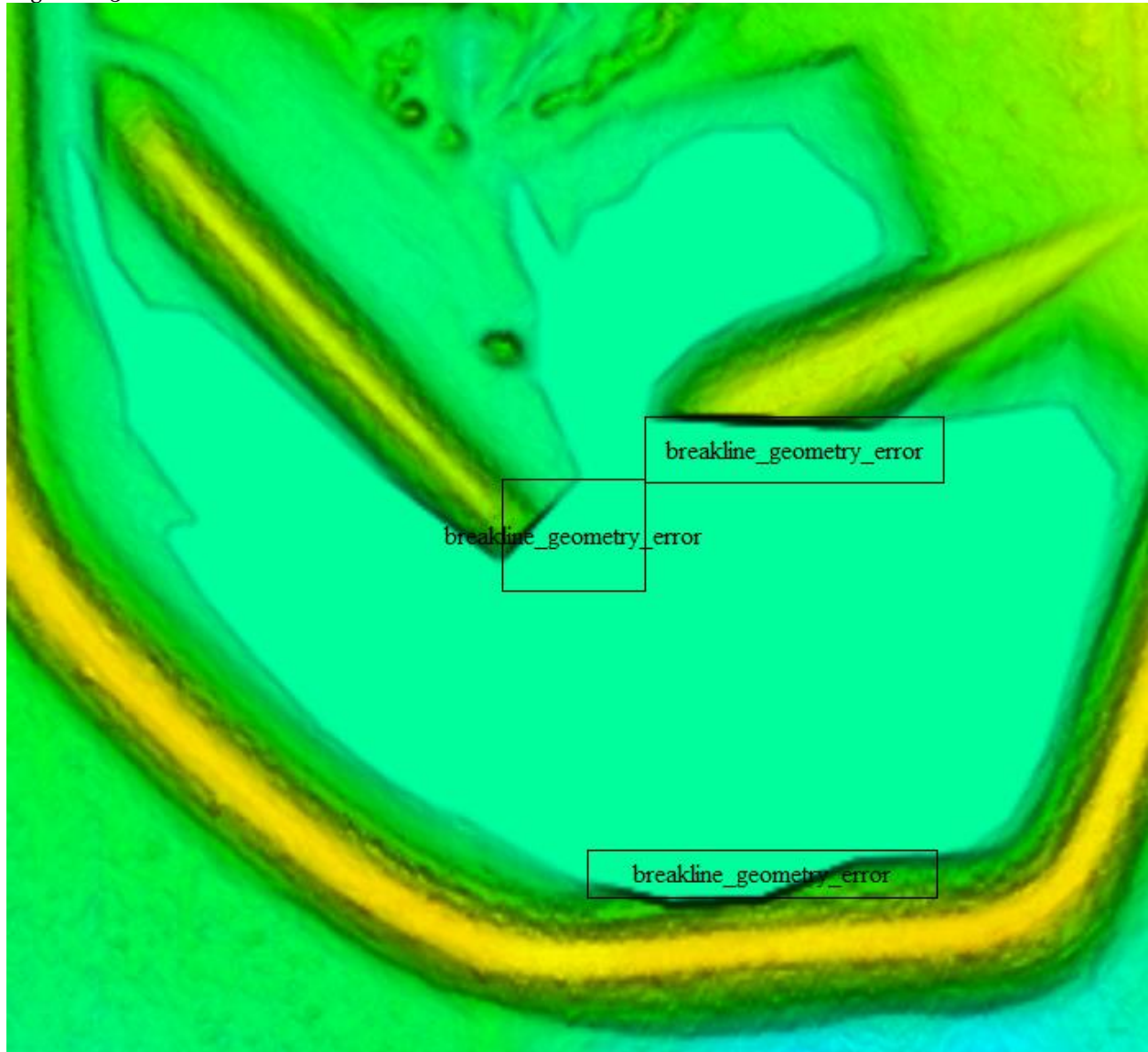
Figure 7- Tile 14RNS385875. The waterbodies in the center of the image were identified by USGS as not accurately representing the terrain. The LAS, breaklines, and DEM have been corrected, shown below.
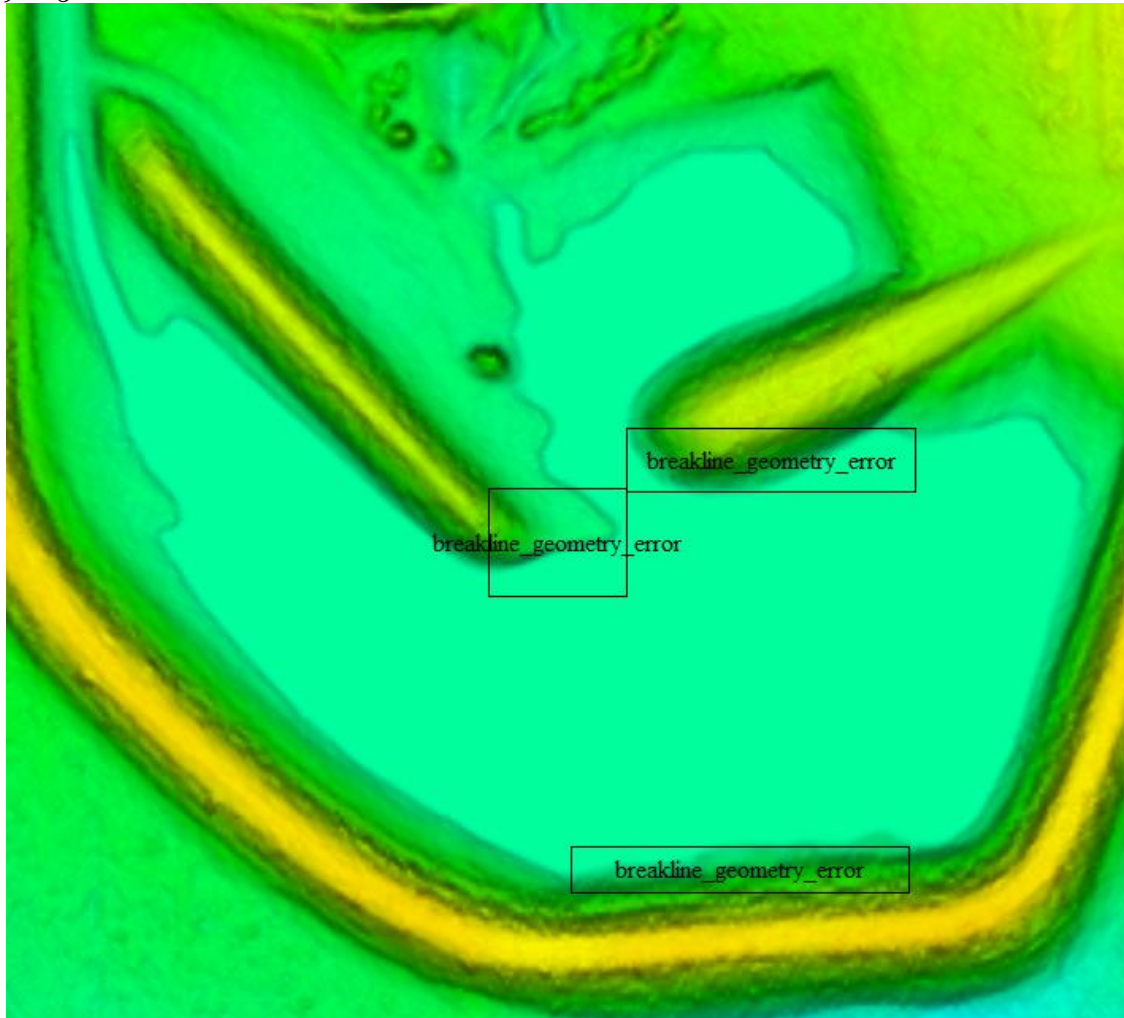
Figure 8- Tile 14RNS385875. The breaklines have been corrected to accurately represent the terrain; the LAS and DEM were updated accordingly.

DATA NOT CLIPPED TO PROJECT BOUNDARY

USGS made two (2) calls of areas that were not clipped to the project boundary. The edit calls were reviewed and the DEMs were corrected. An example is shown below.
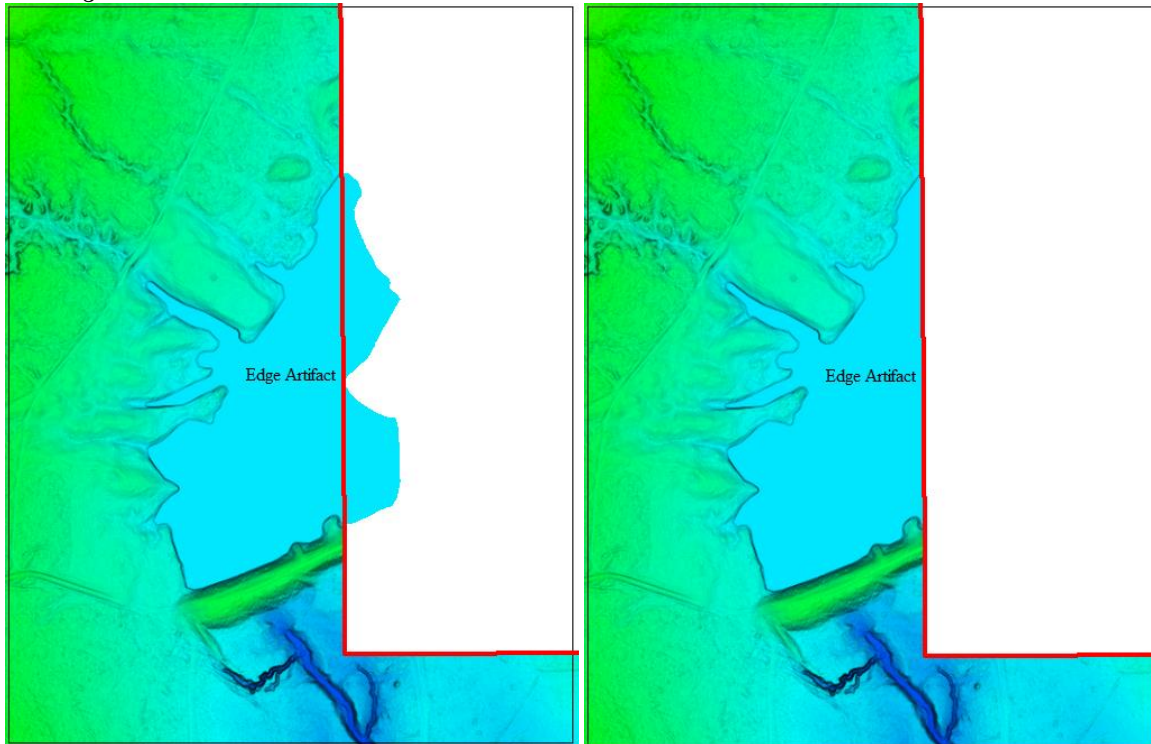
Figure 9- Tile 14RNS910800. The image on the left was identified by USGS as not being clipped to the project boundary. The DEM has been clipped to the project boundary, as shown in the image on the right.

BUILDING REMOVAL

USGS made one (1) call for removal of structures. The edit calls were reviewed and Dewberry has determined that the structures are part of the ground and therefore not removed. An example is shown below.
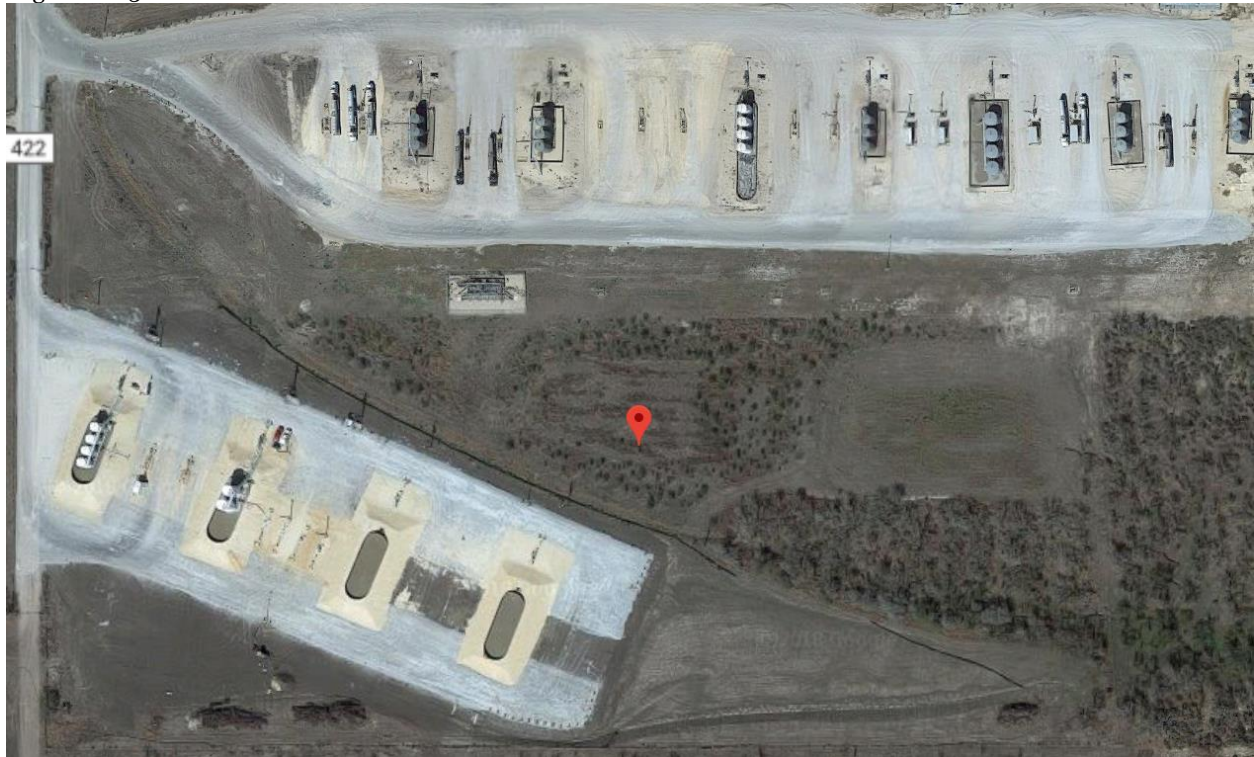
Reclass Structures
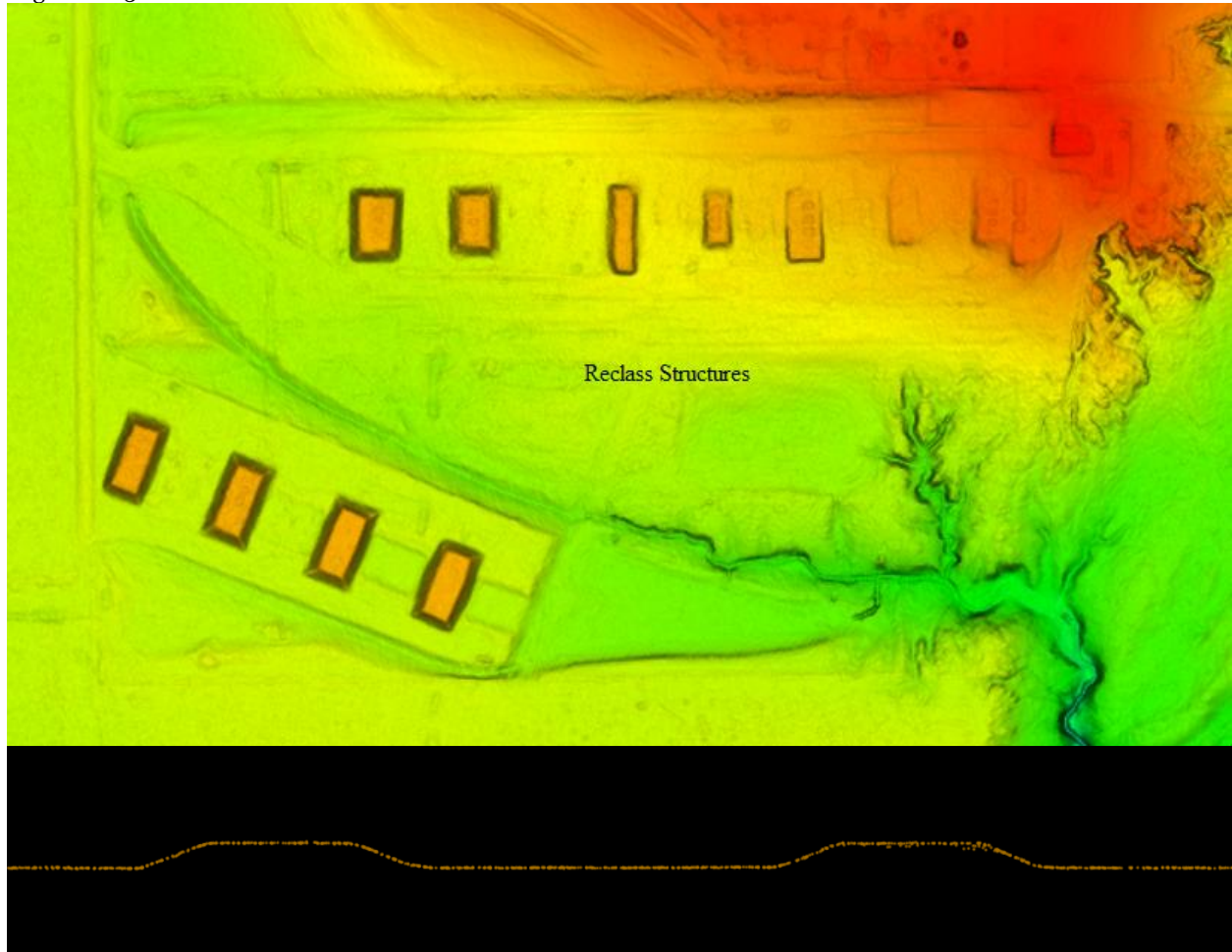
Figure 10- Tile 14RNS775470. DEM is shown in the top image, lidar profile of ground (orange) points is shown in the middle image, and base imagery is shown in the bottom image. These features appear to be earthen mounds or foundations. The elevation change of the in-ground features are accurately portrayed in the DEM.

METADATA

USGS made seven (7) metadata comments in the QA Review reports. The first six comments were metadata parser errors. The <lasintrz> tag has been changed to <lasintr> and the <postal> tag which was previously left empty has been updated in the Classified Point Cloud metadata. The <lbounding> tag has been changed to <lboundng> in all metadata files.

The last comment was that the Classified Point Cloud metadata needs to reflect the vertical accuracy and number of checkpoints used for the entire Red River project instead of just the Atascosa block. Additional metadata files have been added to reflect the vertical accuracy of the TX Red River project as a whole.

LAS HEADERS

USGS made one (1) call regarding the header of an LAS file. The LAS file is described as having points classified as 0, minimum GPS time of 0, real min x, y, and z counts different than headers information, and real extended number of points by return is different than header information. Based on this call, the LAS file and header were re-reviewed and updated to correct the issues.

DELIVERY BLOCK OVERLAP

USGS made one (1) call regarding the need to have overlap between delivery blocks. The TX Red River task order specifically states that there should be no overlapping tiles, therefore Dewberry has not included overlap between the delivery blocks.

Summary of Edit Calls

- There were four (4) bridge removal calls.
  - All issues have been corrected.

- There were three (3) unrealistic change in elevation calls.
  - All issues have been corrected.

- There was one (1) excessively digging hydrographic feature call.
  - The issue has been corrected.

- There were five (5) hydro-flatten calls.
  - All issues have been corrected.

- There were five (5) breakline geometry error calls.
  - All issues have been corrected.

- There were two (2) data not clipped to project boundary calls.
  - All issues have been corrected

- There was one (1) building removal call.
  - The issue was not corrected for reasons outlined in this report.

- There were seven (7) metadata calls.
  - All issues have been corrected.

- There was one (1) LAS header call.
  - The issue has been corrected.

- There was one (1) delivery block overlap call.
  - The issue was not corrected for reasons outlined in this report.