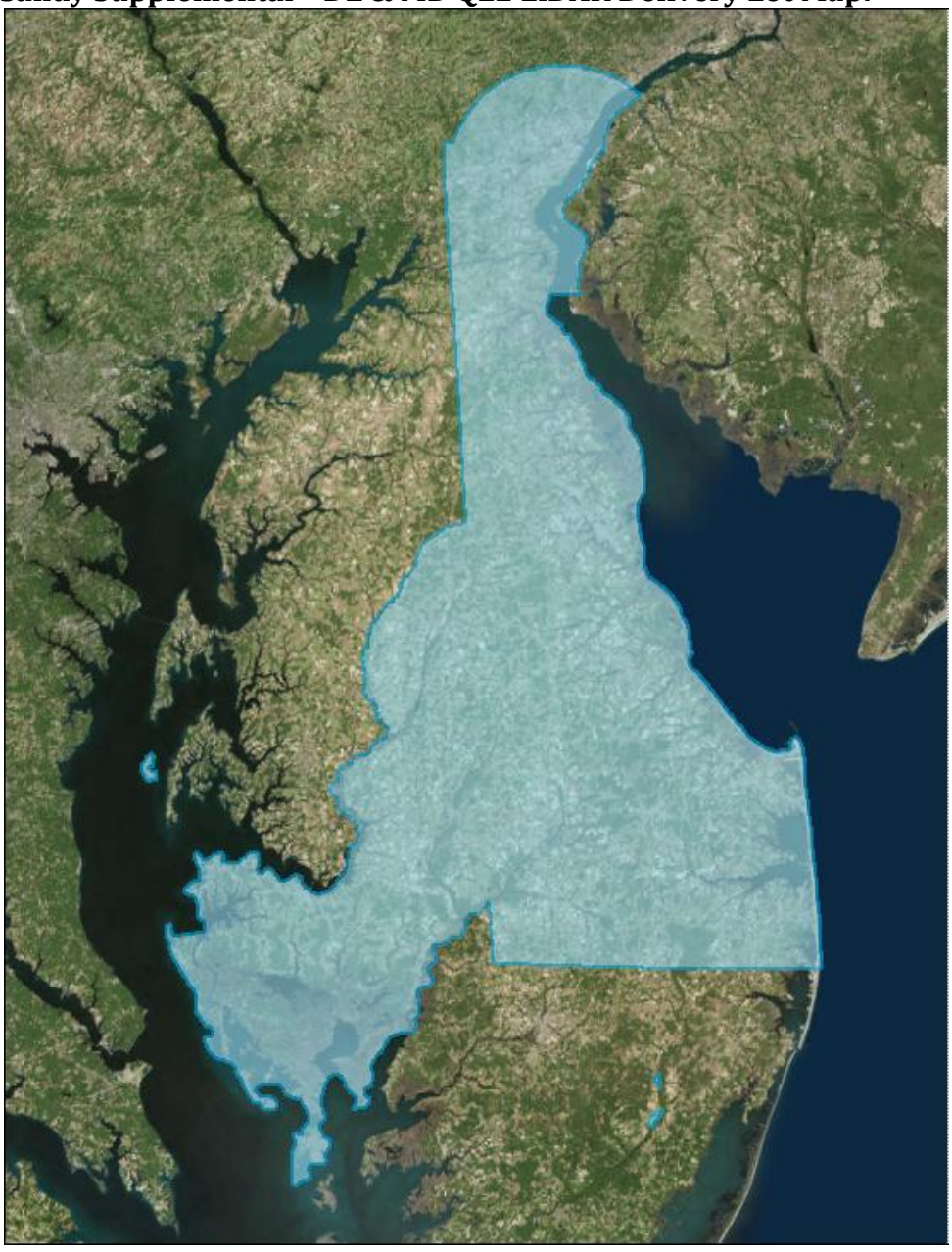
Delivery Summary Report: Delivery Lot 5
October 13, 2014

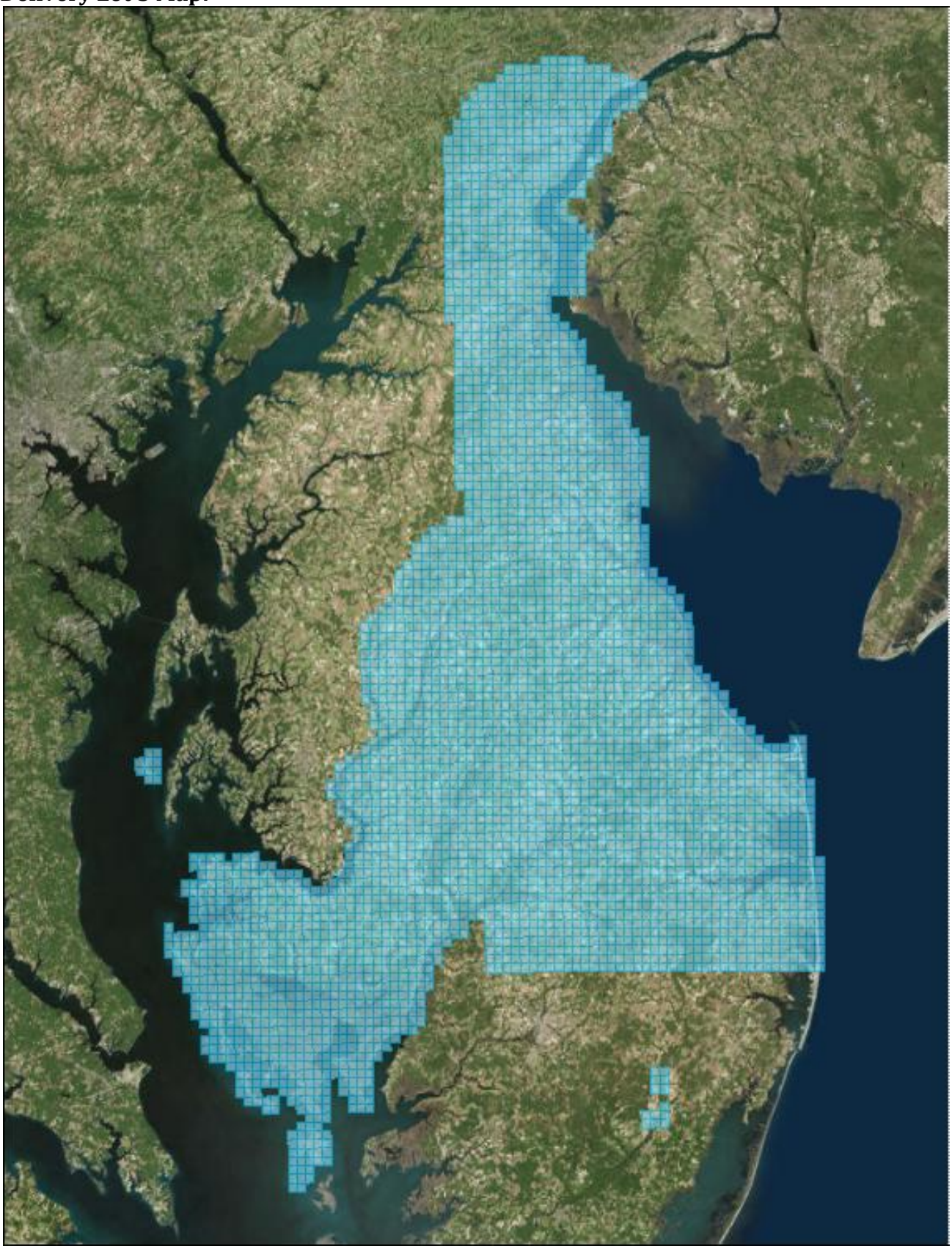
USGS Contract: G10PC00025
USGS Task Order: G13PD00884
Task Order Name: Sandy Supplemental – DE & MD QL2 LiDAR Task Order
Contractor: Photo Science, A Quantum Spatial Company

The following is a summary description of the deliverables and other pertinent information that comprise the shipment of Delivery Lot 5 to USGS on October 13, 2014.

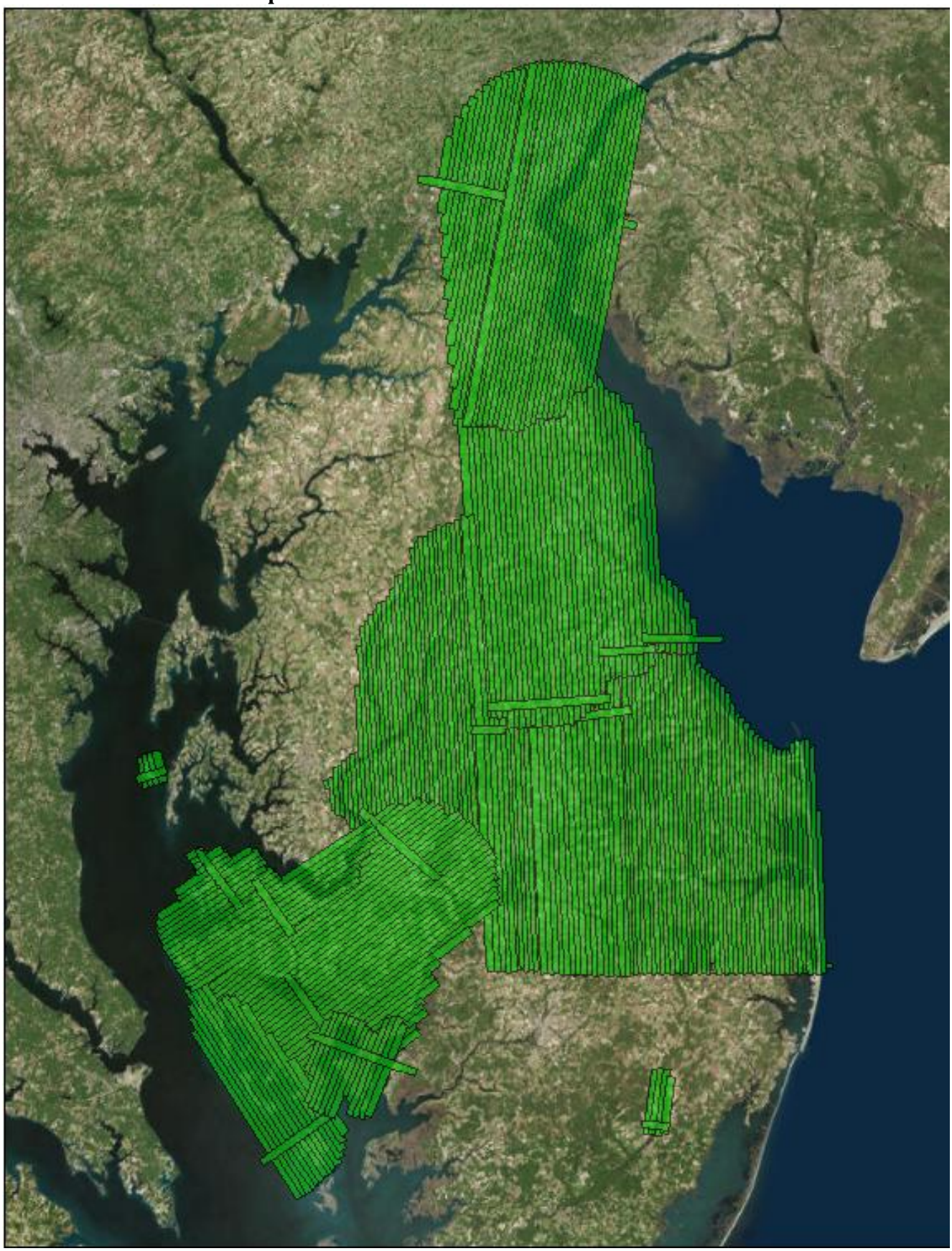
Sandy Supplemental – DE & MD QL2 LiDAR Delivery Lot Map:



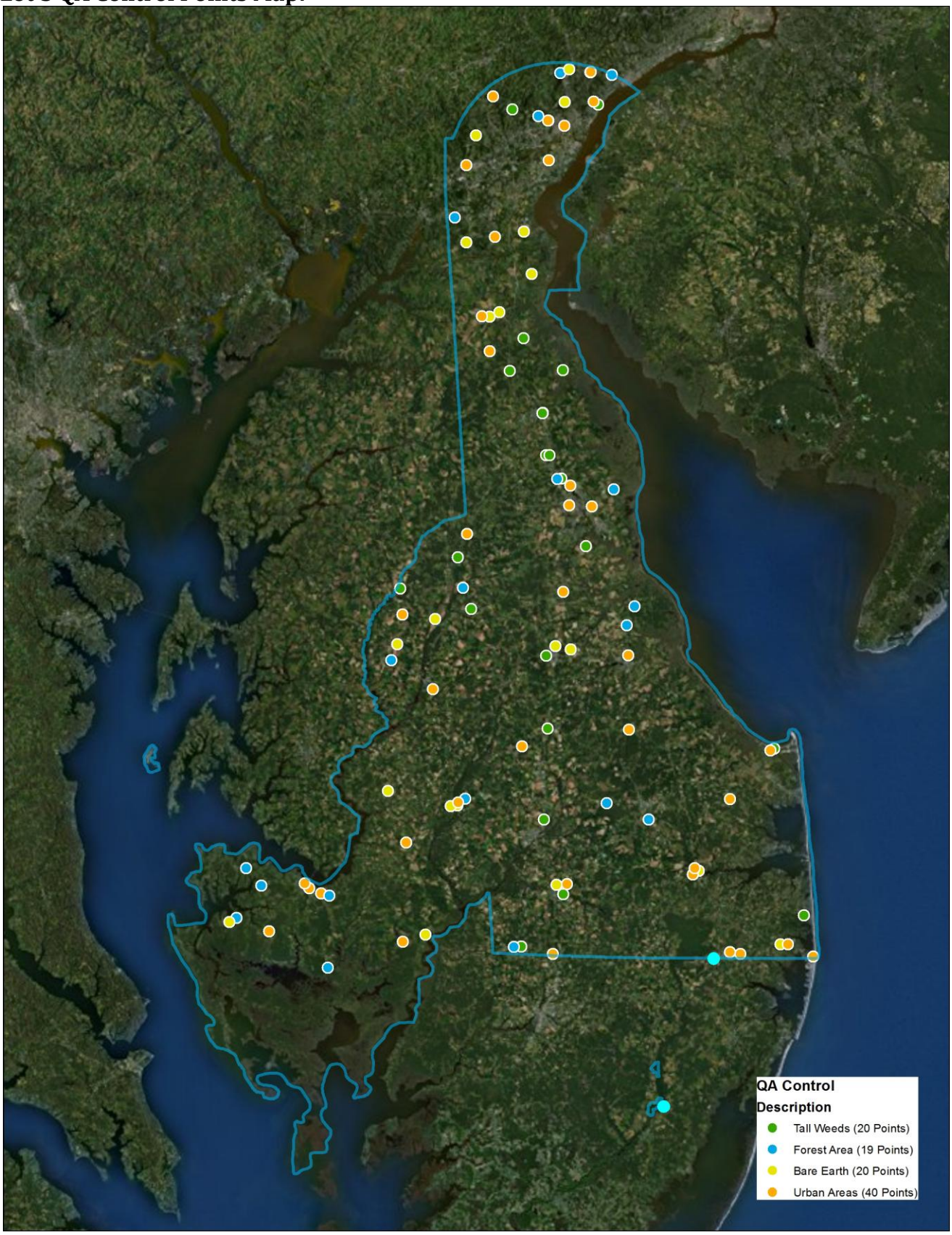
Delivery Lot 5 Map:



Lot 5 Raw Point Cloud Map:



Lot 5 QA Control Points Map:



Task Order Spatial Reference System:

- Horizontal: UTM Zone 18N, NAD83, Meters
- Vertical: NAVD88, GEOID12a, Meters

Deliverables Summary:

1. C.1.d.(i) Raw Point Cloud Data (calibrated and control adjusted): Included
    - LAS v1.2, Point Record Format 1
    - Total Number of Swath Files: 298
    - Total File Size: 1,057 GB (1,135,994,503,168 bytes)
    - Individual Swath Outline Shape File

2. C.1.d.(ii) Classified Point Cloud: Included
    - LAS v1.2, Point Record Format 3 including File Source ID w/assigned value of 65,535
    - Classification Schema:
        - (01) Code 1 – Processed, but unclassified
        - (02) Code 2 – Bare-earth ground
        - (03) Code 7 – Noise
        - (04) Code 9 – Water
        - (05) Code 10 – Ignored Ground (Breakline Proximity)
        - (06) Code 17 – Overlap Default
        - (07) Code 18 – Overlap Ground
        - (08) Code 25 – Overlap Water
    - Total Number of Tiles: 3,842
    - Tile Dimensions: 1,500 meter x 1,500 meter
    - Total File Size: 0.98 TB (1,083,837,472,768 bytes)
    - Delivery Lot 5 Tile Shape Files (Lot 5 Boundary & Lot 5 Individual Tiles)

3. C.1.d.(iii) Bare Earth Surface (Raster DEM): Included
    - Format: ERDAS .IMG
    - Resolution: 1 meter grid cell size
    - Hydro Conditioning: Hydro Flattened
    - Total Number of Tiles: 3,842
    - Tile Dimensions: 1,500 meter x 1,500 meter (same used for Classified Point Cloud)
    - Total File Size: 32.2 GB (34,606,047,232 bytes)

4. C.1.d.(iv) Control:
    - Delivery Lot 5 QA Control Check Point Location Shape File Extract: Included
    - Deliver Lot 5 QA Control Check Point Published Values Extract .xls file: Included

5. C.1.d.(v) LiDAR Intensity Image: Included
    - Format: Grayscale, 8-bit, GeoTiff
    - Resolution: 1 meter grid cell size
    - Total Number of Tiles: 3,842
    - Tile Dimensions: 1,500 meter x 1,500 meter (same used for Classified Point Cloud)
    - Total File Size: 11.0 GB (11,865,866,240 bytes)

6. C.1.d.(vi) Breaklines: Included
    - Format: ESRI Shapefile
    - Coverage: Lot 5 Continuous, Non-Tiled
    - Total File Size: 37.9 MB (39,829,504 bytes)

7. C.1.d.(vii) Metadata: Included
    - Format: FGDC compliant, XML
    - File Types: Project, Tiled deliverable product group (classified .las, DEM, & Intensity)

8. C.1.d.(viii) Project Report:
    - Delivery Lot Summary Report: Lot 5 Included
    - Overall Project Report: To Be Delivered upon final acceptance of lot 5.

9. Lot 5 QA & Accuracy Reporting
    - FOCUS Report: Included
    - Lot 5 Provisional FVA/SVA/CVA Testing Results: .xls file Included
    - LAS Analysis (Excel File): Included
    - Raster Analysis (Excel File): Included

Lot 5 Provisional Accuracy Reporting:

- Number of QA Check Points falling within Delivery Lot 5 by Tested Land Cover Type:
    - Bare Earth (GR): 20
    - Forested (FO): 19
    - Tall Weeds (BU): 20
    - Urban (UA and BE): 40

- Testing:

Raw FVA

	Count	Minimum	Maximum	St. Dev	RMSE	95%	95th	Mean	Median	Skew
RAW FVA	20	-0.183	0.167	0.084	0.083	0.162	-	0.01	0.02	-0.37

FVA, SVA, CVA

	Count	Minimum	Maximum	St. Dev	RMSE	95%	95th	Mean	Median	Skew
SVA	79	-0.394	3.554	0.409	0.411	-	0.156	0.06	0.03	8.14
CVA	99	-0.394	3.554	0.367	0.369	-	0.141	0.05	0.02	9.03
Bare Earth (FVA)	20	-0.108	0.109	0.061	0.063	0.123	-	-0.02	-0.02	0.62
Tall Weeds	20	-0.057	0.254	0.070	0.098	-	0.146	0.07	0.06	0.61
Forested	19	-0.114	3.554	0.817	0.820	-	0.528	0.20	0.03	4.27
Urban Areas	40	-0.394	0.185	0.101	0.100	-	0.122	0.00	0.01	-1.71

Delivery Lot Notes/Comments:

Delivery Lot 5 reflects the telephone and email dialogue between USGS and Photo Science regarding the modification to Delivery Lot shipment contents and supporting information provided by Photo Science on an incremental delivery lot basis in order to better support incremental QA review by USGS. Delivery Lot 5 also includes recent agreement between USGS and Photo Science on the population of the file source ID for classified tiled .las file using a numeric value of "65,535". All task order classified .las tiles file source ID will be populated with this numeric value.