DPH-10 Report on Check Points

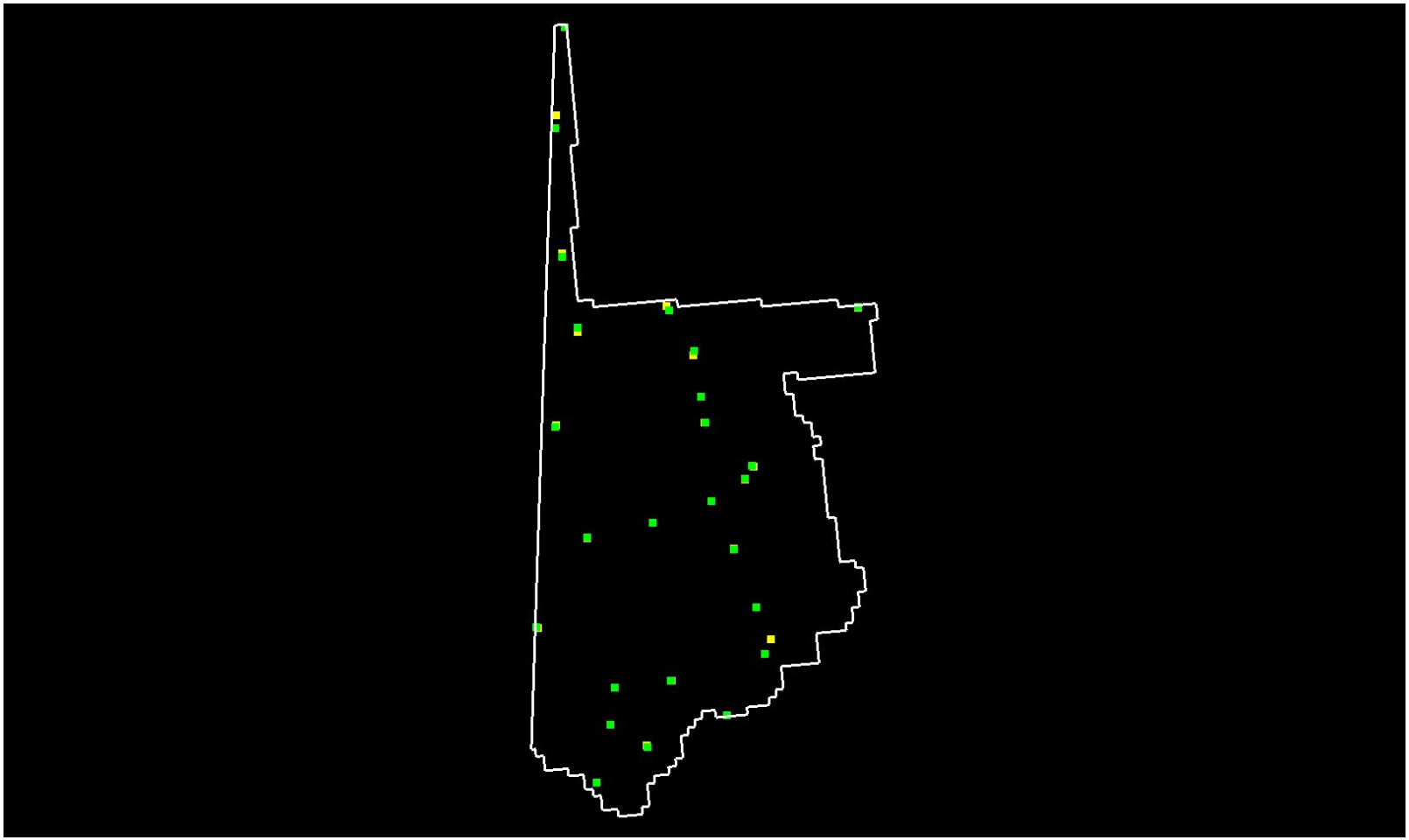
The USGS Lidar Base Specification Version 2.1 states: "Data producers are encouraged to carefully review the requirements in the "Positional Accuracy Standards for Digital Geospatial Data" (ASPRS, 2014). Check points for NVA assessments shall be surveyed in clear, open areas (which typically produce only single lidar returns) devoid of vegetation and other vertical artifacts (such as boulders, large riser pipes, and vehicles). Check points shall not be located on ground that has been plowed or otherwise disturbed. The same check points may be used for NVA assessment of the point data and DEM. Check points for VVA assessments shall be surveyed in vegetated areas (typically characterized by multiple return lidar). Check points will be located in areas having a minimum homogeneous area of (ANPS*5)2, with less than one-third of the required RMSEz deviation from a low-slope (<10 degree) plane. In land covers other than forested and dense urban, the tested check point will have no obstructions above 15 degrees over the horizon. All tested locations will be photographed showing the position of the survey tripod and the ground condition of the surrounding area. Control points used in the calibration process for data acquisition shall not be used as check points. Check points shall be an independent set of points used for the sole purpose of assessing the vertical accuracy of the project. The quantity and location of check points shall meet the following requirements, unless alternative criteria are approved by the 3DEP in advance (see ASPRS 2014 for additional information.):

- The ASPRS-recommended total number of check points for a given project size shall be met.
- The ASPRS-recommended distribution of the total number of check points between NVA and VVA assessments shall be met.
- Check points within each assessment type (NVA and VVA) will be well-distributed across the entire project area. See "Glossary" section at the end of this specification for a definition of "well-distributed."
- Within each assessment type, check points will be distributed among all constituent land cover types in approximate proportion to the areas of those land cover types (ASPRS, 2014)."

The purpose of this section is to show check points (NVA and VVA).

DPH-10 Report on Check Points - continued

Data Source - D:\00_San_Miguel\Client_Shapes\Co_SanLuisJuanMiguel_Block4_24NVA_26VVA_utm13.shp
Result Path - D:\00_San_Miguel\San_Luis_Juan_Miguel_B4_UTM13\DPH_10\CheckPoints.jpg



Yellow points are NVA, green points are VVA.
White polygon is defined project area (DPA) boundary

DPH-10 Report on Check Points - continued

Total check points: 50

Check points in defined project area (DPA): 50

Total NVA check points in defined project area (DPA): 24

Total VVA check points in defined project area (DPA): 26

Total defined project area (DPA): 2401.756 square KM

Density of check points in defined project area (DPA): 0.021 points per square KM

TABLE C.1 RECOMMENDED NUMBER OF CHECKPOINTS BASED ON AREA

Project Area (Square Kilometers)	Horizontal Accuracy Testing of Orthoimagery and Planimetrics	Vertical and Horizontal Accuracy Testing of Elevation Data sets		
	Total Number of Static 2D/3D Checkpoints (clearly-defined points)	Number of Static 3D Checkpoints in NVA[9]	Number of Static 3D Checkpoints in VVA	Total Number of Static 3D Checkpoints
≤500	20	20	5	25
501-750	25	20	10	30
751-1000	30	25	15	40
1001-1250	35	30	20	50
1251-1500	40	35	25	60
1501-1750	45	40	30	70
1751-2000	50	45	35	80
2001-2250	55	50	40	90
2251-2500	60	55	45	100

[9]Although vertical check points are normally not well defined, where feasible, the horizontal accuracy of lidar data sets should be tested by surveying approximately half of all NVA check points at the ends of paint stripes or other point features that are visible and can be measured on lidar intensity returns.

Source: ASPRS Positional Accuracy Standards for Digital Geospatial Data (Edition 1, Version 1.0. - November 2014)