

Appendix G

Supplemental Micrositing Assessment



**Supplemental Assessment of Revised Mulqueeny Ranch Wind
Repowering Project to Minimize Raptor Collisions in the Altamont
Pass Wind Resource Area**

Prepared for:

Mulqueeny Wind Energy, LLC
200 Liberty Street, 14th Floor
New York, NY 10281
Contact: Jonathan Kirby
213.212.0781

Prepared by:

Estep Environmental Consulting
3202 Spinning Rod Way
Sacramento, CA 95833
Contact: Jim Estep
916.921.2515

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Introduction

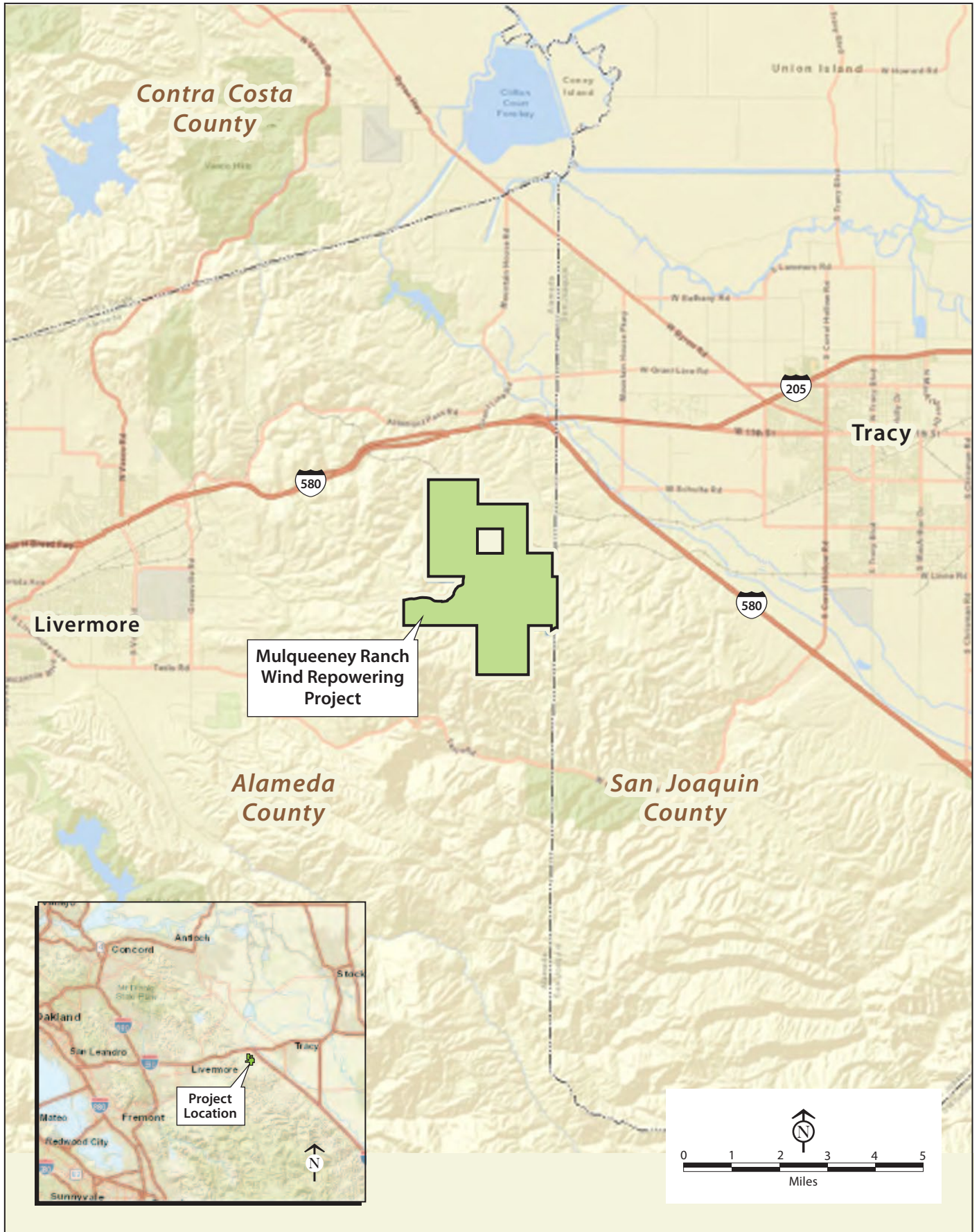
This report is supplemental to the July 2020 assessment to minimize raptor collisions at the Mulqueeny Ranch Wind Energy Repowering Project (Estep 2020). Through coordination with project engineers and assessment of alternative turbine locations and related road and turbine pad construction, the project configuration and number of project turbines has been modified to address potential collision-related effects on raptors identified in the Estep (2020) report and subsequent iterations. Refer to Estep (2020) for project background, land use description, study methods, and a detailed assessment of the original 36 turbine layout and alternative turbine sites, which included a total of 93 individual turbine site locations. Through ongoing coordination, the final turbine layout for the project has been reduced to 24 turbines and includes further relocation of turbines to minimize raptor collisions and to accommodate construction constraints, set-back requirements, and wind conditions.

Project Location

The Mulqueeny Ranch Wind Energy Repowering project area is located at the far eastern edge of the Altamont Pass Wind Resource Area (APWRA), south of Interstate 580, north of Tesla Road, 4 miles east of Livermore. The eastern border of the project area is the Alameda/San Joaquin County line. Patterson Pass Road, the only public and only paved road in the project area, extends east-west through the center of the project area (Figure 1).

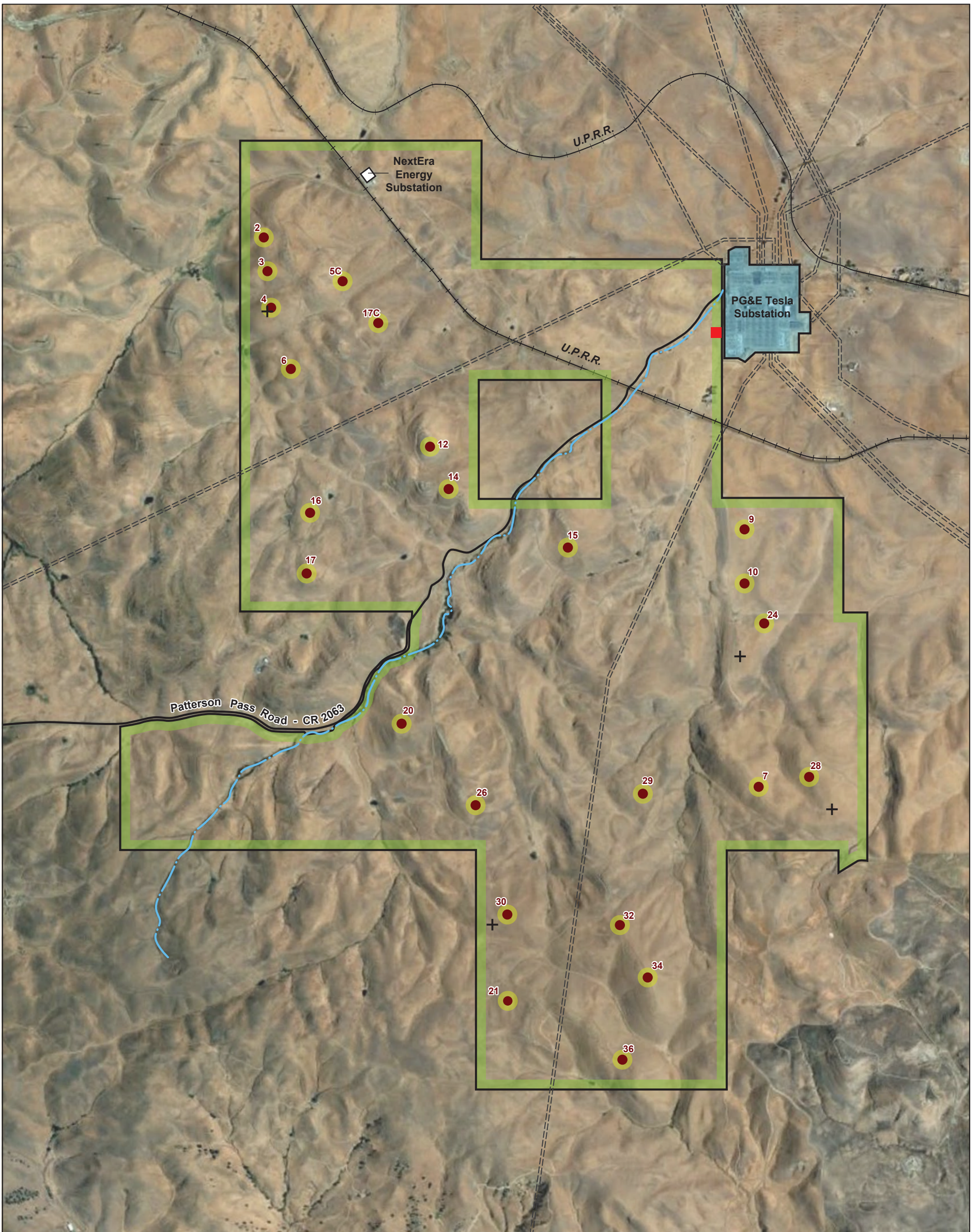
Description of Final Project Layout

The final Mulqueeny Ranch Wind Energy Repowering Project (project or Mulqueeny Ranch Project) includes the removal of 518 old-generation turbines and related infrastructure, and the installation of 24 new-generation wind turbines with generating capacities between 2.2 and 4.2 MW to develop a maximum production capacity of 80 MW. With the exception of four meteorological towers (Met towers), all of the old-generation turbines and associated infrastructure, including turbine pads, transformers, and overhead power lines, were removed in 2016 in anticipation of repowering. The new turbines would be distributed across 29 contiguous parcels totaling approximately 4,590 acres under a single ownership (Figure 2). The final configuration has been determined on the basis of site constraints, data obtained from meteorological monitoring of the wind resources, construction feasibility, and results of bird use surveys and avian micro-siting considerations; as well as turbine availability and energy production cost. The project would use existing roads where available, most constructed during the development of the original old-generation turbine layout; however, most of these roads will require widening and other improvements to accommodate material deliveries for the larger new-generation turbines. Construction of some new roads, mostly smaller spur roads extending from the existing primary road network, would also be necessary to access some turbine sites. The project would also require the installation of underground electrical lines connecting the turbines to a new substation that would be built adjacent to the Pacific Gas and Electric Company

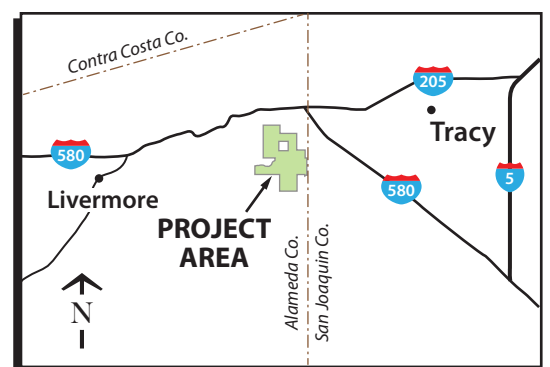
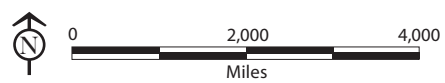


SOURCE: ICF 2019.

Figure 1
Location of the Mulqueeny Ranch Wind Repowering Project



- Project Boundary
- Wind Turbine Generator
- Proposed Project Substation
- Existing Temporary MET Mast (to be removed)
- Existing Transmission



09/25/2020
 BASE MAP SOURCE: ICF 2019.

Figure 2
 Mulqueeney Ranch Wind Repowering Project - Final Turbine Layout

(PG&E) Tesla substation. Other than the short connection to the Tesla substation, the project would not require any high-voltage overhead transmission lines.

Assessment Methods

Refer to Estep (2020) for field survey methods. With the exception of the two new alternative locations (Turbines 5-C and 17-C), field survey data were available to address conditions at relocated sites.

Each site was plotted on Google Earth Pro (2018) to examine the overall relationship to the topographical landscape, and to verify topographical characteristics and recorded distances from the field survey. Each site was carefully examined to determine the presence of conditions that are thought to contribute to potential collision risk. In addition to the field data collected as described above, this also included proposed road and turbine pad construction, placement of new met towers, and golden eagle use and nest proximity. For this supplemental assessment, project engineers also provided more detailed information on access roads and turbine pads. Each site was further evaluated with regard to potential topographic changes resulting from these features.

Three risk categories, Moderate Risk, Moderate-High Risk, and High Risk, were used to assign risk designations to each proposed and selected site. The assignment of risk designations was based on the presence or absence of the risk factors or conditions described in Estep (2020), and the application of those factors to each site-specific assessment. Although the variables were not equal – mainly the absence of fatality data and the use of eagle nest and eagle use proximity – the three risk designations can be thought of as generally corresponding to the HRT risk rankings (High Risk designation equates to HRT rankings of 9 and 10; Moderate-High Risk to HRT rankings of 7 and 8; and Moderate Risk Turbines correspond to rankings of less than 7).

In addition to using precise measurements with regard to slopes, distances, and other specific risk factors, on-the-ground interpretation and professional judgement were employed to evaluate the potential magnitude of risk. The risk designations are based entirely on an individual interpretation of conditions at each site as well as the presence/absence of risk factors. They are based on our current understanding of conditions that lead to turbines and raptors interacting at the same location in space, and that as a result may contribute to higher rates of collision events. They do not otherwise indicate that a site *will* have more or less collision events than another, only that based on these factors, the *potential for* more or less collision events is assumed.

Assessment of the Final Project Layout

Table 1 summarizes the locations and status of each of the 36 originally proposed turbine locations, including the 24 turbines selected for the final layout, which includes two additional replacement turbine locations (5-C and 17-C). The status of turbines includes several categories including the following:

- Removed from the project. Fourteen original turbine locations were removed from the project.
- Recommended Site Selected. This refers to two locations that were recommended in response to the assessment of the original location. The risk level from Estep (2020) was retained and other than incorporating any additional relevant information regarding road and turbine pad construction, no further assessment was necessary.
- Alternative Relocation Sites. This refers to alternative locations proposed by the applicant in response to the assessment of the original and recommended locations. Although several were within 20 to 30 feet, no turbine in the final layout were at these locations. Instead, they were considered New Alternative Sites.
- New Alternative Site Selected. This refers to 22 new alternative locations. These locations were not assessed in Estep (2020) and are the focus of this supplemental assessment. Many of these sites are in relatively close proximity to the original, recommended, or previous alternative locations. However, a few are more distant from the original sites.
- New Replacement Site. This refers to the two new alternative turbine locations (5-C and 17-C) that replace Turbines 15 and 19, which were removed following the latest layout iteration. These were also not assessed in Estep (2020).

Aerial figures of each of the 24 final turbine sites along with the locations of the previously proposed locations (i.e., initially proposed site, recommended site, and proposed alternative relocation site) are included as Appendices A-1 and A-2. The location, status, and assessment of each of the 24 final turbine locations is described below.

Turbine 2

A new alternative location was selected for Turbine 2 approximately 23 feet southeast of the proposed alternative relocation site (Figure A-1), which was rated as a Moderate-High Risk site due to proximity to converging swales and high documented golden eagle activity. Conditions are similar at the new site. The original site, which was rated High Risk, was on the west-facing slope near the top of an east-west ascending swale. Access road construction will occur along the existing road, and although expanded, is not expected to increase risk. The turbine pad, which incorporates the original and recommended locations, will increase the elevation of the site by approximately 2 feet and is not expected to increase risk due to topographic changes. Thus, Turbine 2 retains the assigned risk level from Estep (2020) of Moderate-High.

Table 1. Risk Determination for 24 Proposed Locations at the Mulqueeny Wind Turbine Repowering Project

Turbine	Location		Status	Original Risk Determination of 14 Removed Sites	Risk Determination of 24 Retained Sites
	Lat	Long			
1	37.718619°	-121.602677°	Removed	High	
2	37.716521°	-121.602413°	New Alternative Site Selected		Moderate-High
3	37.714602°	-121.602712°	New Alternative Site Selected		Moderate-High
4	37.712127°	-121.602490°	Recommended Site Selected		Moderate-High
5	37.710440°	-121.600994°	Removed	High	
6	37.708471°	-121.601187°	New Alternative Site Selected		Moderate
7	37.683361°	-121.565814°	New Alternative Site Selected		Moderate
8	37.681245°	-121.603173°	Removed	Moderate-High	
9	37.698772°	-121.567125°	Recommended Site Selected		Moderate
10	37.695880°	-121.567229°	New Alternative Site Selected		Moderate
11	37.693250°	-121.564960°	Removed	Moderate	
12	37.704517°	-121.591030°	New Alternative Site Selected		Moderate-High
13	37.698788°	-121.594993°	Removed	High	
14	37.701225°	-121.589189°	New Alternative Site Selected		Moderate-High
15	37.697806°	-121.579768°	New Alternative Site Selected		Moderate
16	37.699562°	-121.598941°	New Alternative Site Selected		High
17	37.695903°	-121.600096°	New Alternative Site Selected		Moderate
18	37.683496°	-121.612027°	Removed	Moderate-High	
19	37.686618°	-121.565025°	Removed	High	
20	37.686429°	-121.592154°	New Alternative Site Selected		Moderate-High
21	37.671117°	-121.583727°	New Alternative Site Selected		High
22	37.692812°	-121.587049°	Removed	High	
23	37.697147°	-121.578960°	Removed	Moderate	
24	37.693121°	-121.565039°	New Alternative Site Selected		Moderate
25	37.691347°	-121.579662°	Removed	Moderate-High	
26	37.682131°	-121.587005°	New Alternative Site Selected		Moderate
27	37.681158°	-121.559242°	Removed	Moderate-High	
28	37.683431°	-121.560576°	New Alternative Site Selected		Moderate
29	37.682380°	-121.574364°	New Alternative Site Selected		Moderate
30	37.674707°	-121.584833°	New Alternative Site Selected		Moderate
31	37.673472°	-121.583879°	Removed	High	
32	37.673570°	-121.576095°	New Alternative Site Selected		Moderate-High
33	37.672205°	-121.574347°	Removed	Moderate-High	
34	37.671345°	-121.573662°	New Alternative Site Selected		Moderate-High
35	37.667972°	-121.584146°	Removed	High	
36	37.666409°	-121.576810°	New Alternative Site Selected		Moderate-High
5-C	37.713696°	-121.597038°	New Replacement Site		Moderate-High
17-C	37.710285°	-121.595240°	New Replacement Site		Moderate-High

Turbine 3

A new alternative location was selected for Turbine 3 approximately 108 feet east of the recommended relocation site (Figure A-2), which was rated as Moderate-High Risk due primarily to its location within a high eagle use area. The original site, which was rated High Risk, was on the edge of the south-facing slope. Risk was reduced by moving the site upslope slightly to the top of the broad lateral ridge. Conditions at the new location are similar to the recommended site. Access road construction will occur along the existing road along the north-south ridgeline, and thus no further topographic issues are expected due to road construction.

The turbine pad, which incorporates the original and recommended locations, will decrease the elevation of the site by nearly 8 feet, dropping further below the elevation of the north-south-oriented ridgeline and creating a broad notch on the top of the lateral ridge. Turbine 3 retains the assigned risk level from Estep (2020) of Moderate-High.

Turbine 4

The recommended relocation site was selected for Turbine 4 (Figure A-3), which was rated as a Moderate-High Risk site primarily due to its location within a high eagle use area. Both the original and recommended sites are within the boundaries of the turbine pad, which will reduce the elevation of the site by about 5 feet but create a broad, flat area along the ridge. Access road construction will occur along the existing road along the north-south ridgeline, and thus no further topographic issues are expected due to road construction. Turbine 4 retains the assigned risk level from Estep (2020) of Moderate-High.

Turbine 6

A new alternative location was selected for Turbine 6 approximately 1,130ft WSW of the original site (Figure A-4). The original and recommended locations were both rated as Moderate Risk. Overall conditions are similar at the new alternative location, which is on a broader, flatter hilltop. Primary access road construction will occur along the existing road east of the site, but an approximately 400-foot east-west spur road will be required to access the turbine pad. This area extending to the new turbine pad, construction of which will increase elevation by only about 1.5 feet, is fairly flat with no significant topographic features and thus road and turbine pad construction are not expected to contribute to further risk. Turbine 6 therefore retains the assigned risk level from Estep (2020) of Moderate.

Turbine 7

A new alternative location was selected for Turbine 7 approximately 870 feet SE of the original site, which was rated as High Risk, and 440 feet SE of the recommended relocation site, which was rated as Moderate risk (Figure A-5). The selected location is on the top and in relatively broad, flat portion of the northwest-southeast-oriented ridge. Access road construction will be limited to the existing access road along the ridge top, and the turbine pad will be construction on a relatively broad area of the ridge top, reducing elevation by approximately 2.5 feet. No additional risk factors are identified compared with the recommended alternative location and thus Turbine 7 retains the assigned risk level from Estep (2020) of Moderate.

Turbine 9

The recommended relocation site was selected for Turbine 9, which was rated as a Moderate-Risk site (Figure A-6). The site is on relatively flat terrain in the far east side of the project area, with no significant topographic risk factors and relatively low reported golden eagle use. Access

road construction will occur primarily along existing roads in generally flat terrain. The turbine pad, which will reduce the elevation by approximately 3 feet, will also be constructed on generally flat terrain, and thus no further topographic issues are expected due to road or turbine pad construction. Turbine 9 retains the assigned risk level from Estep (2020) of Moderate.

Turbine 10

A new alternative location was selected for Turbine 10 approximately 280 feet northwest of the original site (Figure A-7), which was rated as Moderate-High, and 215 feet north of the recommended site, which was rated as Moderate. The new alternative location is sited on the same generally flat feature as the recommended site and no additional topographic risk factors are introduced. New spur roads will be constructed to access the site from the west; however, because of the low-elevation terrain, it is not expected to influence raptor movement or introduce additional risk. The turbine pad will also be constructed within a generally flat area and will not alter the elevation of the site. Therefore, Turbine 10 retains the assigned risk level from Estep (2020) of Moderate.

Turbine 12

A new alternative location was selected for Turbine 12 approximately 303 feet northwest of the original site and 206 feet NW of the recommended site (Figure A-8), both of which were rated High Risk due to the location on a narrow, steeply-sloped, isolated hill top. Although sited on the northwest slope, an otherwise High-Risk location, construction of the turbine pad will modify the entire hill by reducing the elevation by nearly 9 feet and creating a broad, flat hill top. Because of the steepness of this hill, a new access road will be required to accommodate material deliveries. The existing access road ascends around the west, north, and east slopes of the hill. The new access road will ascend around the south and east slopes. This will create a significant bench in the hill slope, which can influence raptor movement along the slope. Use of this site will require significant earth-moving and reconfiguration of the hill; however, because it will flatten and create a broader surface for the turbine pad, and allowing for the turbine to be sited further from steep slopes, collision risk may be reduced somewhat compared with the High-Risk original and recommended sites. Turbine 12 is therefore assigned the risk level of Moderate-High.

Turbine 14

A new alternative location was selected for Turbine 14 approximately 22 feet northwest of the original site and 67 feet northwest of the recommended site (Figure A-9), both of which were rated as Moderate-High Risk. The new alternative location is located downslope of the original site in a notch in the ridgeline, usually regarded as a risky topographical feature, and result in an increase in the assigned risk category. However, the turbine pad will be constructed along a large portion of the ridgetop, effectively removing the notch along the ridge and reducing elevation by about 7 feet. In doing so, topographic conditions will be similar to the original and

recommended sites. Access road construction will be largely along existing roads with minor deviations near the ridge top to accommodate turning radius. Thus, Turbine 14 retains the assigned risk level from Estep (2020) of Moderate-High.

Turbine 15

A new alternative location was selected for Turbine 15 approximately 350 feet south of and along the same old-generation turbine string as the original, recommended, and proposed alternative relocation sites (Figure A-10), all of which were considered Moderate Risk. Conditions are similar to the previous alternative sites. Although within a broad, shallow saddle, installation of the turbine pad is expected to alter the topography of the ridgeline and moderate the potential effect of the saddle. Access road construction will be along existing roads and is also not expected to increase risk. Therefore Turbine 15 retains the assigned risk level from Estep (2020) of Moderate.

Turbine 16

A new alternative location was selected for Turbine 16 approximately 1,350 feet NNE of the original and proposed alternative relocation sites, both of which were rated as High Risk (Figure A-11). The new alternative site is downslope of the original site at the base of higher elevation hills to the north, west, and south. Access road construction will be limited to expansion of existing roads; however, the turbine pad will create a large bench on the west-facing slope. This site is considered High Risk due to the location on a slope and below higher elevation hills on three sides. Turbine 16 therefore retains the assigned risk level from Estep (2020) of High Risk.

Turbine 17

A new alternative location was selected for Turbine 17 approximately 62 feet southwest of the original site and 26 feet southwest of the recommended site (Figure A-12), both of which were rated as Moderate Risk. Although the new alternative location is slightly downslope on the west-facing slope of the hilltop, the turbine pad, which will incorporate the new alternative location and the original and recommended locations, will reduce the elevation of the hilltop by about 17 feet. Although requiring substantial earth-moving and reconfiguration of the hilltop topography, this will create a large, broad, generally flat area that will eliminate slope-associated risk. Turbine 17 therefore retains the assigned risk level from Estep (2020) of Moderate Risk.

Turbine 20

A new alternative location was selected for Turbine 20 approximately 33 feet northwest of the proposed alternative relocation site (Figure A-13), which was rated as a Moderate-High Risk site due to proximity to converging swales and proximity to the Patterson Pass Road golden eagle nest. The original site, which was rated High Risk, is about 800 feet northeast. There was no recommended alternative for this site. Access road construction will occur along the existing

road and is not expected to result in increased risk. The turbine pad will lower the elevation of the site by about 13 feet and create a broader, flatter surface, altering the configuration of the hilltop, but not creating additional topographic-related risk. Thus, Turbine 20 retains the assigned risk level from Estep (2020) of Moderate-High.

Turbine 21

A new alternative location was selected for Turbine 21 approximately 463 feet northeast and downslope of the original (Figure A-14). There was no recommended alternative for this site, which was rated High-Risk due to its location on a steep slope. The new alternative location is on relatively flat terrain at the base of higher elevation hills to the south, west, and north. Access road construction will occur along the existing road and the turbine pad will require minimal excavation, neither is expected to result in increased risk. However, the location of the turbine at the base of steep slopes poses significant risk to birds using the lower elevation corridors for movement. Thus, Turbine 21 retains the assigned risk level from Estep (2020) of High-Risk.

Turbine 24

A new alternative location was selected for Turbine 24 (Figure A-15). It is a new site unrelated to and in an entirely different location than the original site, which was rated as High Risk, and the recommended site, which was rated as Moderate Risk. Due to a variety of factors, both of these sites were abandoned and the new site selected, which is on the far eastern edge of the project area in the vicinity of Turbine 11, which was removed from project consideration. The new alternative site is located along a broad, flat, and low elevation ridge with no significant topographic features. Accessing the site will require a spur road extending about 600 feet eastward from the primary road that will also connect Turbines 9, 10, and 19. Turbine pad construction will occur in fairly flat terrain on the broad ridge, requiring minimal excavation and resulting in only negligible change in elevation. Topography in the area is flat to gently rolling and road and turbine pad construction is not expected to increase risk. Turbine 24 is therefore assigned the risk category of Moderate Risk.

Turbine 26

A new alternative location was selected for Turbine 26 (Figure A-16), about 316 feet northwest of the original site, which was rated as High Risk due to its location on a slope, and 185 feet southwest of the recommended site, which was rated as Moderate Risk due to its location along the ridgetop above the original site. The new alternative location is also located on the ridgetop along an old-generation turbine string with risk similar to that of the recommended site. Access road construction will occur mainly along the existing road; however, the spur road off of the main ridgeline road will drop onto the south and east-facing slope of the ridge in order to provide a turning radius sufficient to support material deliveries. This will create a bench in the slope, which will ascend for approximately 600 feet to the east and north/northwest. However, because the turbine is located on the top of the ridge, this new bench is not expected to result in

increased risk at this site. Because the ridge is fairly flat and broad at this location, the turbine pad area will require minimal excavation and result in a negligible change in elevation. Thus, Turbine 26 retains the assigned risk level from Estep (2020) of Moderate.

Turbine 28

A new alternative location was selected for Turbine 28 (Figure A-17), about 908 feet NNW of the original site, and 570 feet NNW of the recommended site, both of which were rated as Moderate Risk. The new alternative location is further northwest along the northwest-southeast-oriented ridge, where all three sites are located. At the new alternative location, the ridgeline is descending, which is generally considered a risk factor. However, the descent is minimal and the turbine pad, which will result in a negligible change in elevation will moderate the descent further. Although the turbine pad will create a broad, shallow bench in the slope, due to the size of the turbine, this is not expected to contribute to risk at this location. Construction of the access road will be limited to expansion of the existing road along the top of the ridge. Therefore, Turbine 28 retains the assigned risk level from Estep (2020) of Moderate.

Turbine 29

A new alternative location was selected for Turbine 29 (Figure A-18), about 102 feet southwest of the original site, which was rated as Moderate Risk. Topographic conditions at the new alternative site are similar to the original site. Access road construction is also similar to the original site with an approximately 300-foot spur road required to access the site. The turbine pad will require significant excavation and will reduce the elevation of the site by about 8 feet. But this will create a broad, relatively flat bench around the turbine site. These topographic modifications are not expected to increase risk at this site. Therefore, Turbine 29 retains the assigned risk level from Estep (2020) of Moderate.

Turbine 30

A slightly new alternative location was selected for Turbine 30 (Figure A-19), 44 feet southeast of the recommended site, which was rated as Moderate Risk. The original site, which was rated High Risk, is about 215 feet northeast and downslope of the recommended site. Like the recommended site, the new alternative site is on the top of the flat ridgetop along an old generation turbine string. The turbine pad incorporates the recommended and new alternative site and access road construction will be limited to an expansion of the existing road along the ridge top. Risk is considered similar to the recommended site and thus Turbine 30 retains the assigned risk level from Estep (2020) of Moderate.

Turbine 32

A new alternative location was selected for Turbine 32 (Figure A-20), about 145 feet southwest and slightly downslope from the recommended site, which was rated as Moderate-High Risk.

The original site is about 300 feet northwest of the recommended site at the bottom of a swale and below steep slopes, and was rated High Risk. Construction of the turbine pad will place the new alternative location on a fairly broad, flat bench 5 to 8 feet below the top of the ridgetop, but will be further away from the steep slope to the east than the recommended location. Thus, Turbine 32 retains the assigned risk level from Estep (2020) of Moderate-High.

Turbine 34

A new alternative location was selected for Turbine 34 (Figure A-21), about 530 feet north of the original site, which was rated as Moderate-High Risk due to proximity to steep slopes, slope-accelerated winds, and a slightly descending ridge slope. Both are along a narrow, north-south-oriented ridgeline along an old generation turbine string. The new alternative site is similar to the original site except that it is just below the highest point along the ridge, which ascends northward for about 200 feet before beginning to descend. The turbine pad will level this area and create a flatter ridgeline. Access road construction will be limited to expansion of the existing ridgetop access road and is not expected to increase risk. Thus, Turbine 34 retains the assigned risk level from Estep (2020) of Moderate-High.

Turbine 36

A new alternative location was selected for Turbine 36, about 300 feet west of the original site (Figure A-22), which was rated High Risk. The original site was located within a saddle along the ridgeline. Recommended and alternative sites relocated the turbine northwest or southwest along the ridge and out of the saddle. The final site relocates the turbine on the edge of the saddle to the northwest. Construction of the turbine pad will increase the elevation by only 1 foot and therefore is not expected to moderate the potential effect of the saddle, but moving the turbine outside of the saddle is expected to slightly moderate risk. However, at the final site location, the rotors will extend over the saddle, retaining collision risk to birds using the saddle as a crossing point. Access road construction will be limited to expansion of the existing ridgetop access road and is not expected to increase risk. Although slightly less than the original site, the final site remains a Moderate-High risk due to the proximity of the saddle, the narrow ridge, and steep slopes to the east and west.

Turbine 5-C

Turbine 5-C is a new replacement alternative site, one of two new sites that replace Turbines 15 and 19, both of which were removed. Turbine 5-C is on the northeastern edge of the project area in the rolling low-elevation hills east of Turbines 4, 5, and 6 (Figure A-23). The site is on a low-elevation, broad northeast-southwest-oriented ridge. The site is above a ravine on the south, and just above the apex of a shallow north-south swale on the north. These features may influence bird movement through the area, and although the turbine rotors would intersect with these features, because of the size of the turbine, they do not represent significant topographical risk factors at this site. However, the site is also near the base of a gradual ascent to a higher

elevation ridge to the west, which is approximately 120 feet above the elevation of Turbine 5-C. Birds flying eastward across this ridge would encounter the rotor-swept area within approximately 850 feet. There are no other topographic features associated with the site that would be regarded as high risk (e.g., steep slopes, saddles, notches, etc.). The site is approximately 0.53 miles from the nearest transmission corridor, but no other perching or nesting opportunities occur in the vicinity. The site is 1.43 miles northwest of the nearest documented golden eagle nest along Patterson Pass Road, and 1.32 miles southwest of the nearest golden eagle activity center. Although near the area of highest golden eagle activity documented in the project area (near turbines 2 through 4), documented activity in the immediate vicinity of this site is low. Access road construction will be limited to expansion of existing roads. Because the ridge is fairly flat and broad at this location, the turbine pad area will require minimal excavation and result in a negligible change in elevation. Although there are no significant risk factors associated with the site itself, its proximity near the base of the higher elevation ridge to the west represents the primary risk factor for Turbine 5-C, which is considered a Moderate-High-Risk site.

Turbine 17-C

Turbine 17-C is also a new alternative replacement site, one of two new sites that replace Turbines 15 and 19, both of which were removed. Similar to Turbine 5-C, Turbine 17-C is on the northeastern edge of the project area in the rolling low-elevation hills east of Turbines 4, 5, and 6 (Figure A-24). Turbine 17-C is on a relatively low-elevation, broad hilltop. There are no topographic risk factors associated with the site itself. However, the hilltop descends into a broad, shallow swale on the north and a relatively shallow ravine on the south, which continues toward the southwest, developing a broad, deep saddle between two hills west and south of Turbine 17-C. This feature is likely to influence east-west bird movement through the area, and because the turbine rotors would extend across a portion of this feature, pose some collision risk to birds using this corridor. In addition, as with Turbine 5-C, the site is also at the base of a relatively steep ascent to the higher elevation ridge to the west, which is approximately 110 feet above the elevation of the Turbine 17-C site. Birds flying eastward across this ridge would encounter the rotor-swept area within about 700 feet. The site is 0.27 miles north of the nearest transmission corridor, and there are no other perching or nesting opportunities in the vicinity of the site. The nearest documented golden eagle nest is 1.17 miles south of the site along Patterson Pass Road and the nearest golden eagle activity center is 1.42 miles northwest. This site is also in an area with low documented golden eagle activity. Access road construction will be limited to the expansion of existing roads. Because the hilltop is flat and broad at this location, the turbine pad area will require minimal excavation and result in a negligible change in elevation. Although there are no significant risk factors associated with the site itself, its proximity to a broad saddle between two hills and a steep ascent to higher elevations to the west, Turbine 17-C is considered a Moderate High-Risk Site.

References Cited

Estep, J.A. 2020. Assessment of Proposed Wind Turbine Sites to Minimize Raptor Collisions at the Mulqueeney Ranch Wind Repowering Project in the Altamont Pass Wind Resource Area. Prepared for Mulqueeney Wind, LLC, New York, NY.

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Repowering Project to Minimize Raptor Collisions in the Altamont
Pass Wind Resource Area**

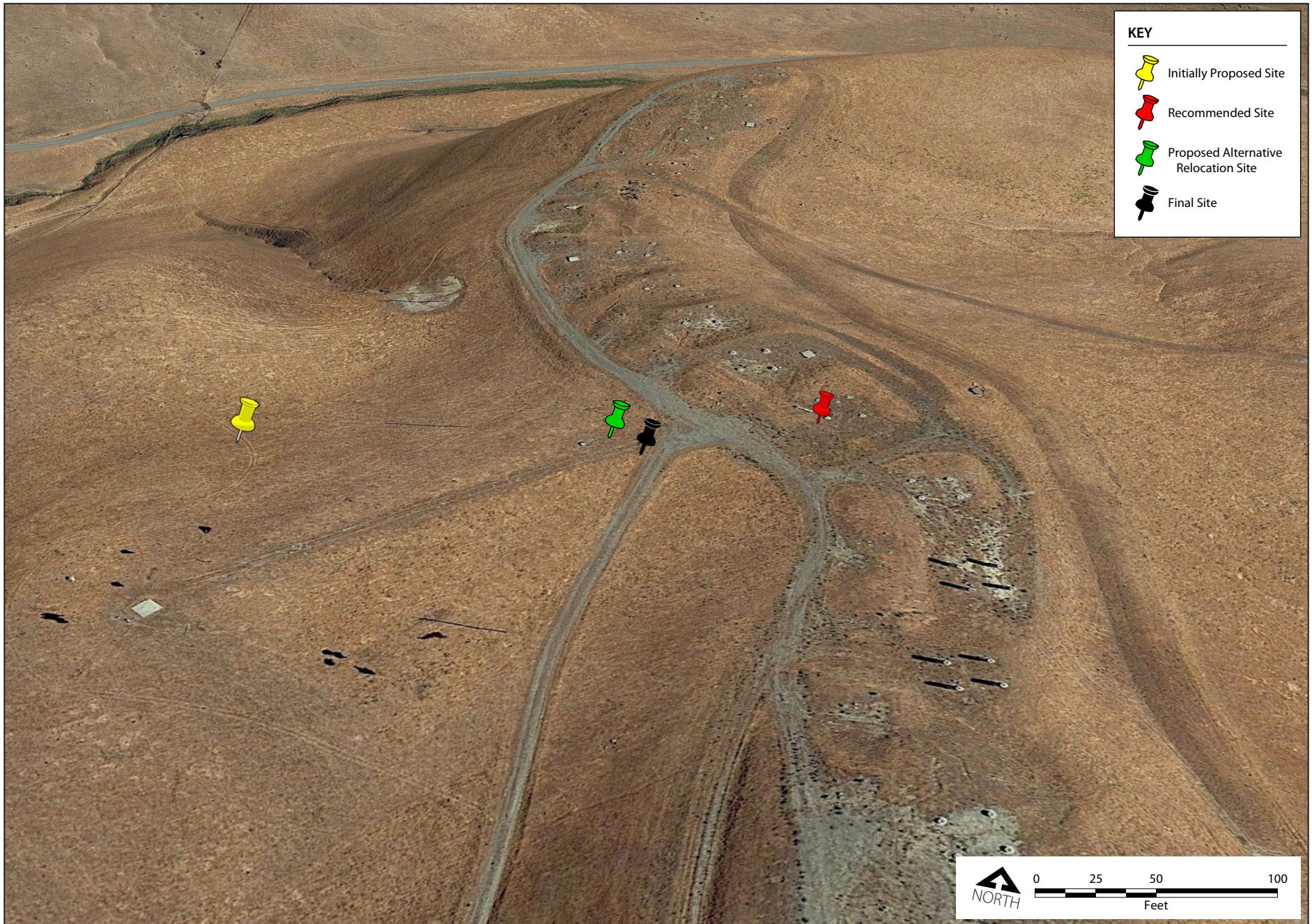
September 2020

APPENDIX A-1:

Aerial Figures A-1 through A-12

Prepared for:
Mulqueeney Wind Energy, LLC

Prepared by:
Estep Environmental Consulting



09/22/2020

SOURCE: Google Earth 2020.

Figure A-1
Location of Proposed, Recommended, and Final Sites for Turbine 2 at the Mulqueoney Wind Project

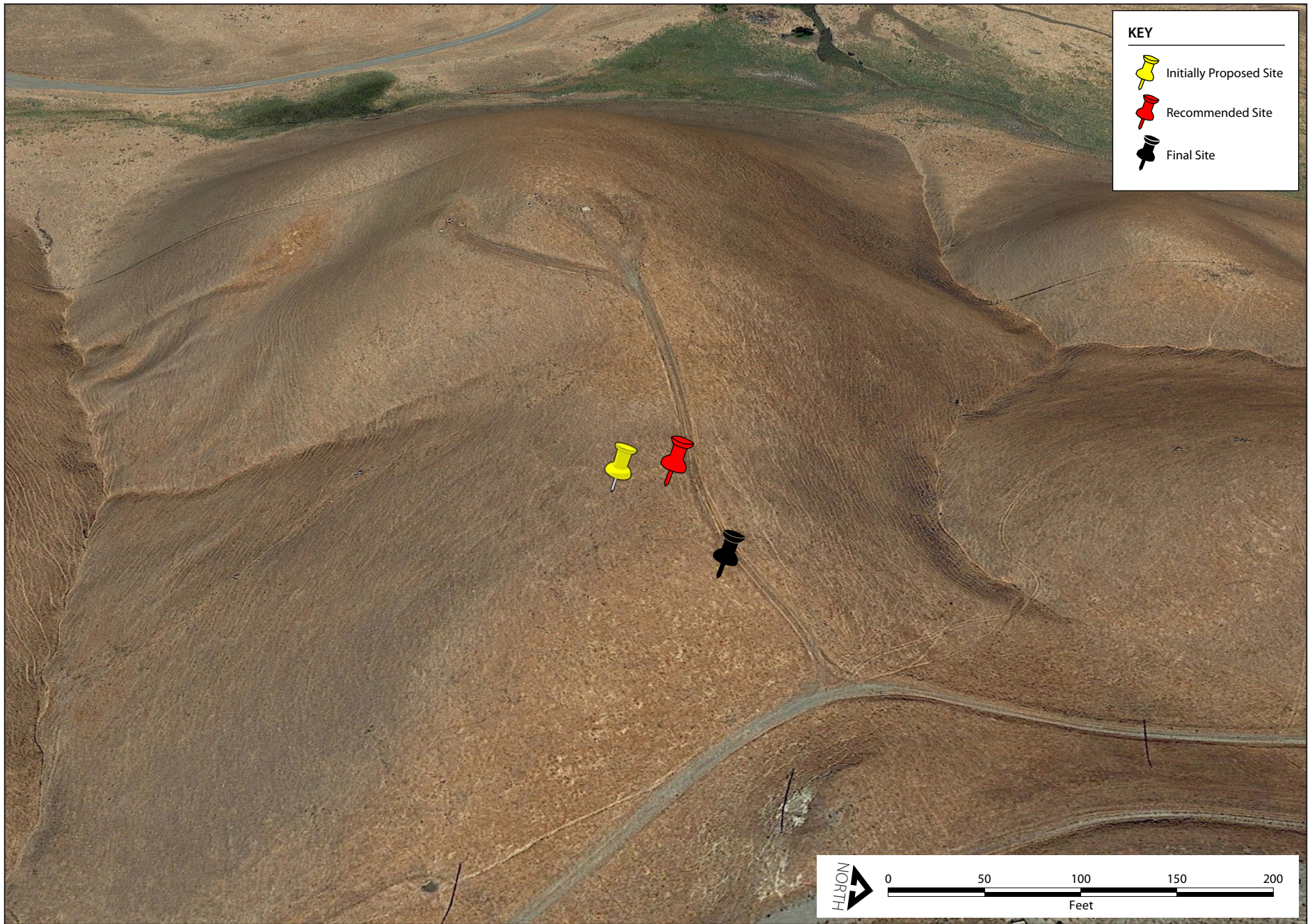
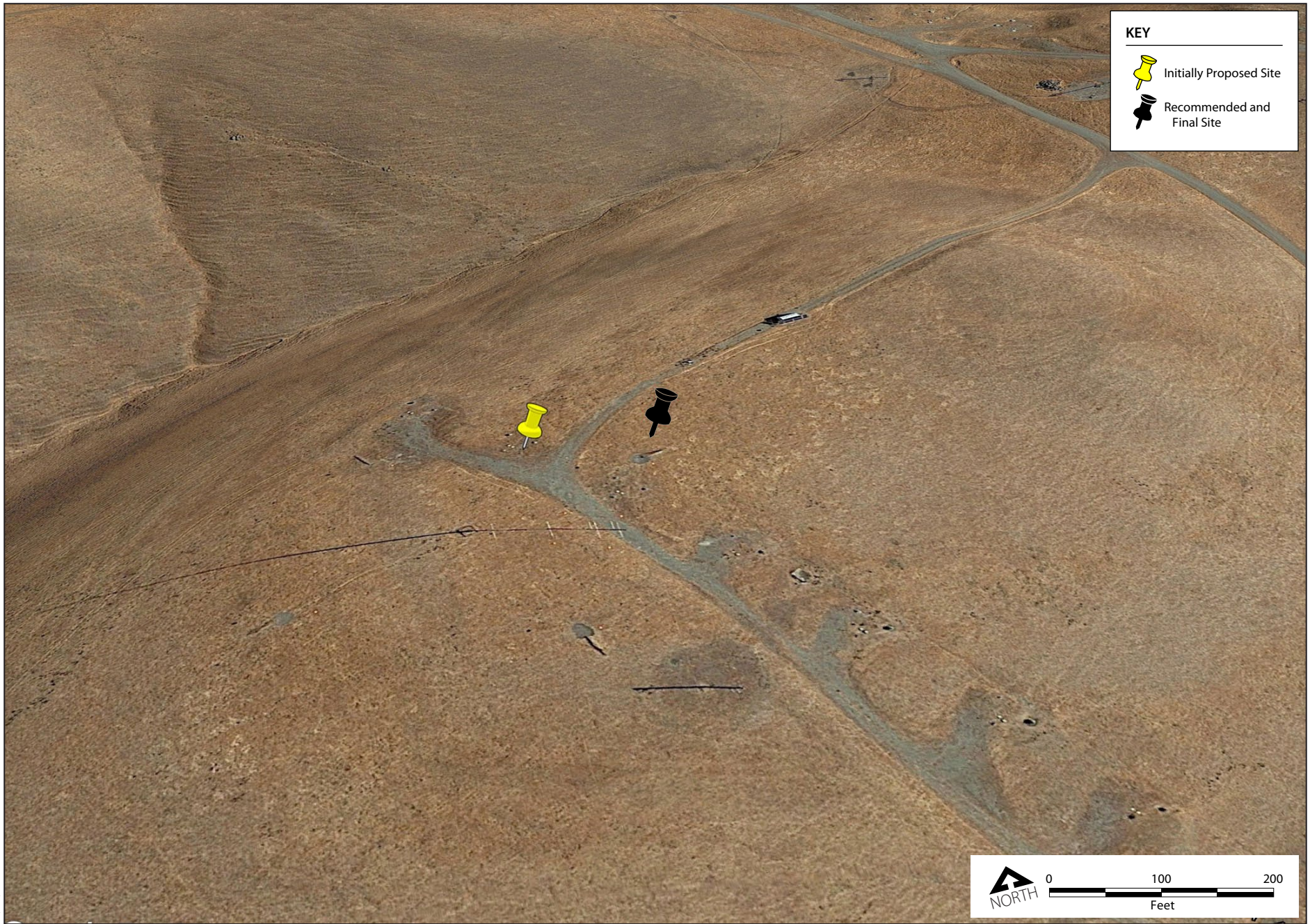


Figure A-2
Location of Proposed, Recommended, and Final Sites for Turbine 3 at the Mulqueoney Wind Project



SOURCE: Google Earth 2020.

Figure A-3
Location of Proposed, Recommended, and Final Sites for Turbine 4 at the Mulqueoney Wind Project

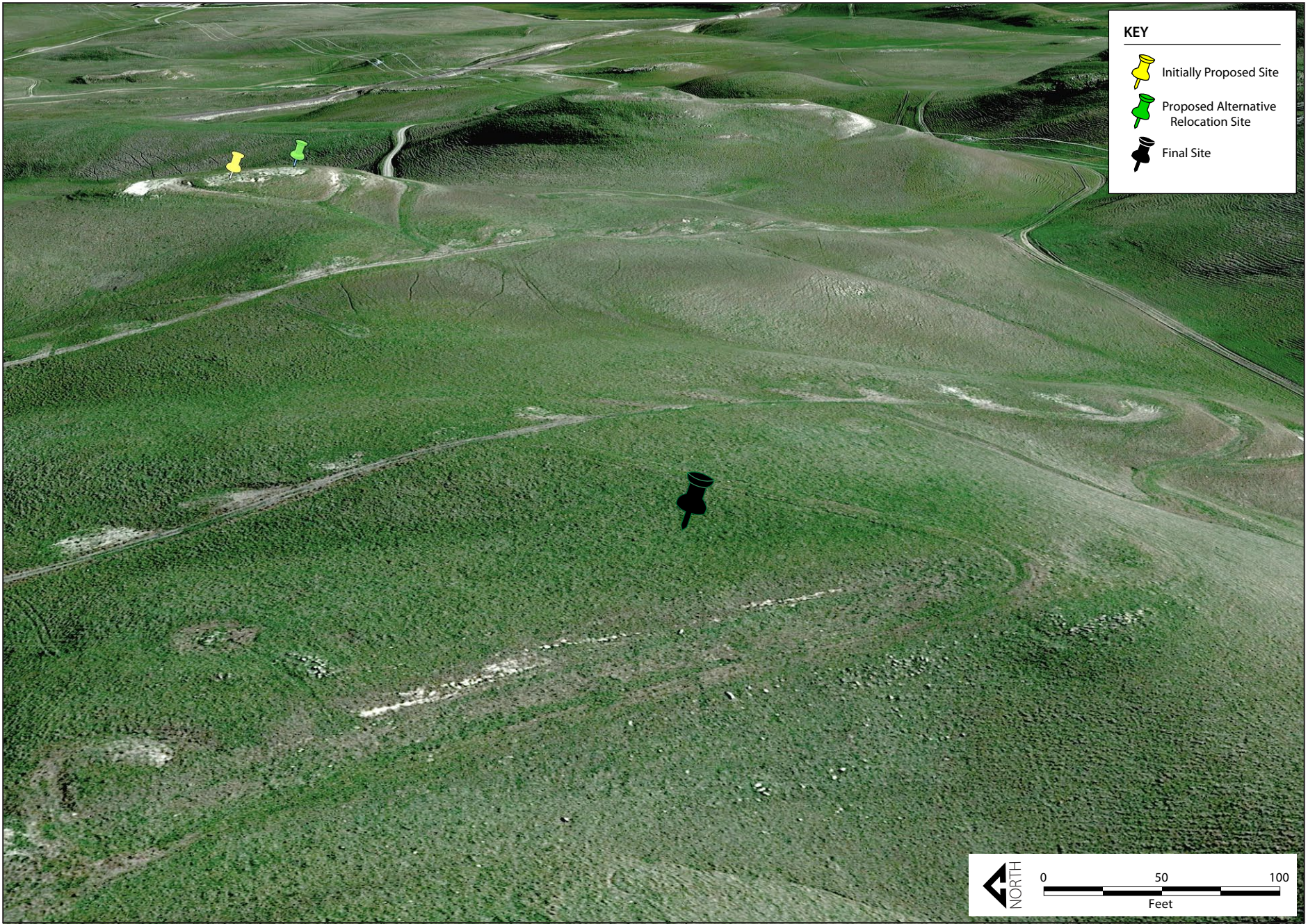


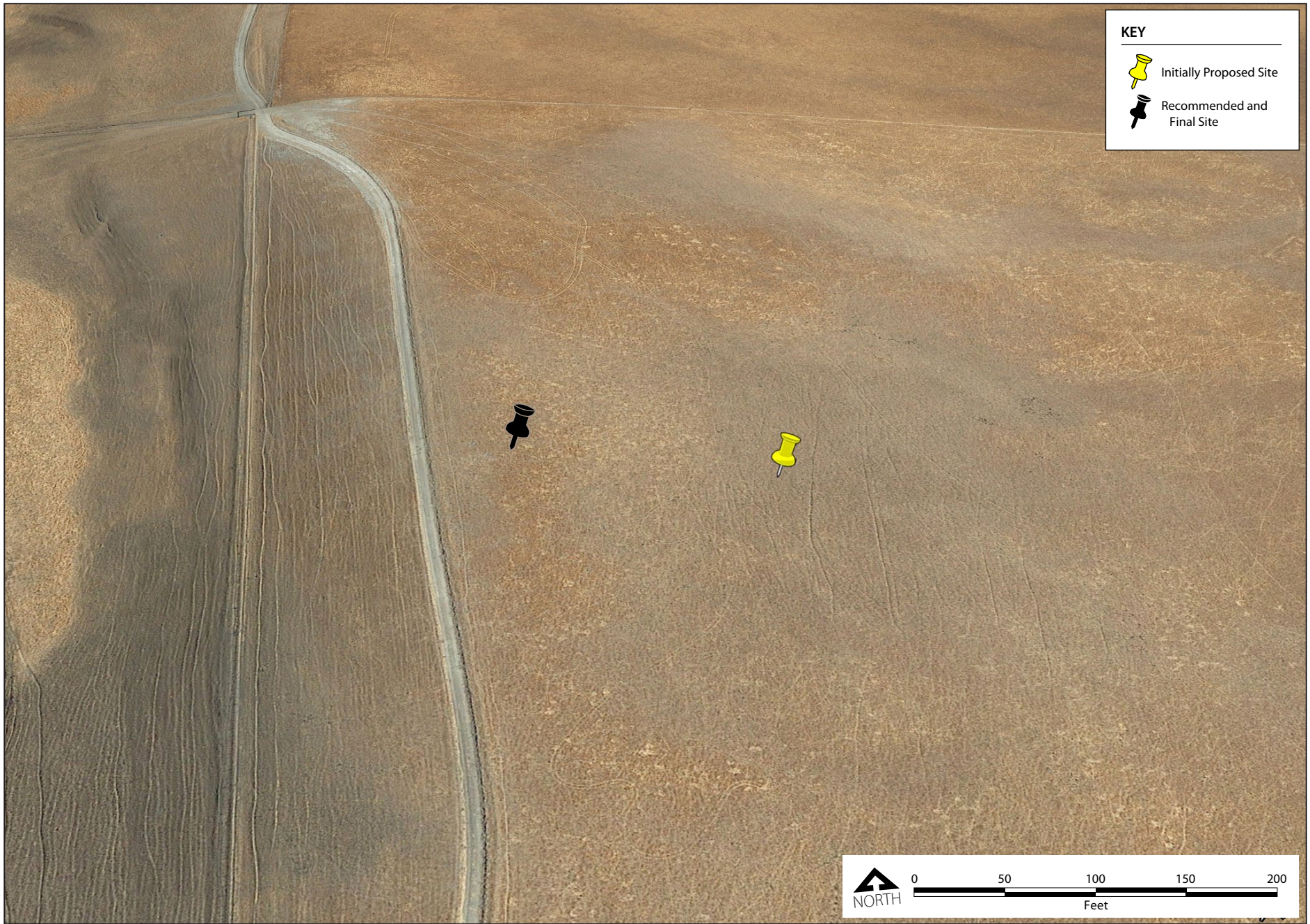
Figure A-4
Location of Proposed, Recommended, and Final Sites for Turbine 6 at the Mulqueoney Wind Project



09/25/2020

SOURCE: Google Earth 2020.

Figure A-5
Location of Proposed, Recommended, and Final Sites for Turbine 7 at the Mulqueoney Wind Project



09/22/2020

SOURCE: Google Earth 2020.

Figure A-6
Location of Proposed, Recommended, and Final Sites for Turbine 9 at the Mulqueeny Wind Project

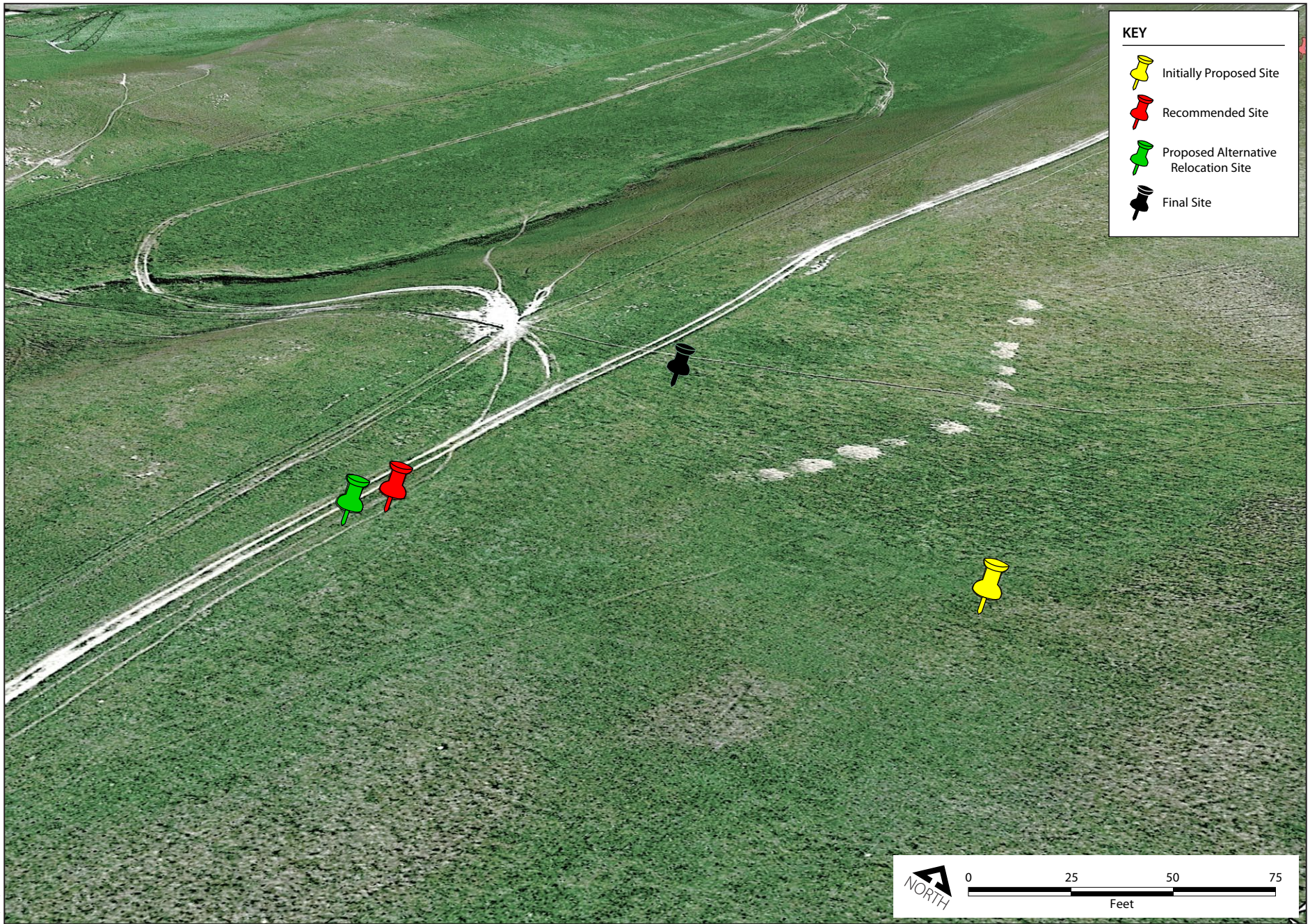


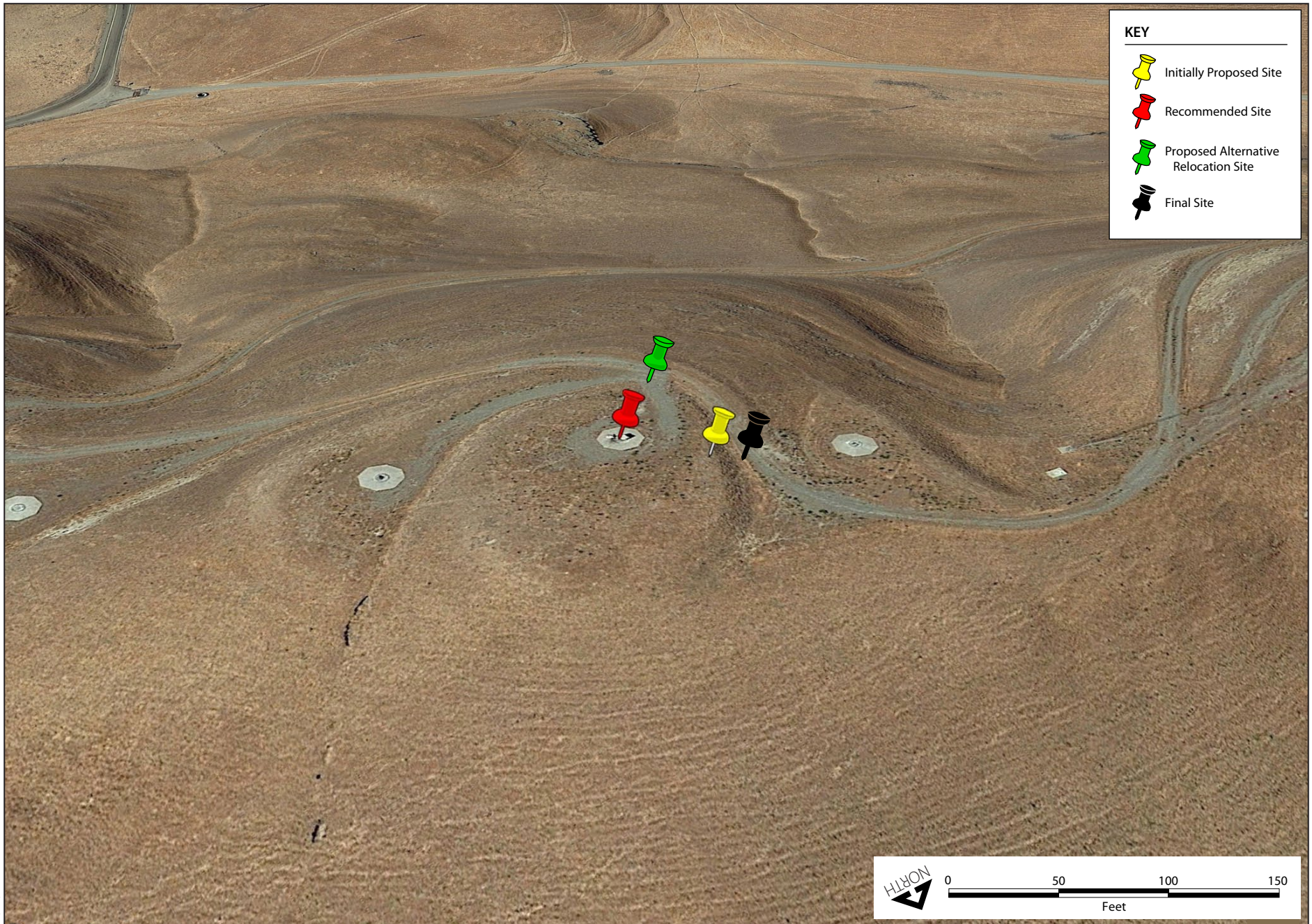
Figure A-7
Location of Proposed, Recommended, and Final Sites for Turbine 10 at the Mulqueoney Wind Project



09/22/2020

SOURCE: Google Earth 2020.

Figure A-8
Location of Proposed, Recommended, and Final Sites for Turbine 12 at the Mulqueoney Wind Project



SOURCE: Google Earth 2020.

Figure A-9
Location of Proposed, Recommended, and Final Sites for Turbine 14 at the Mulqueoney Wind Project

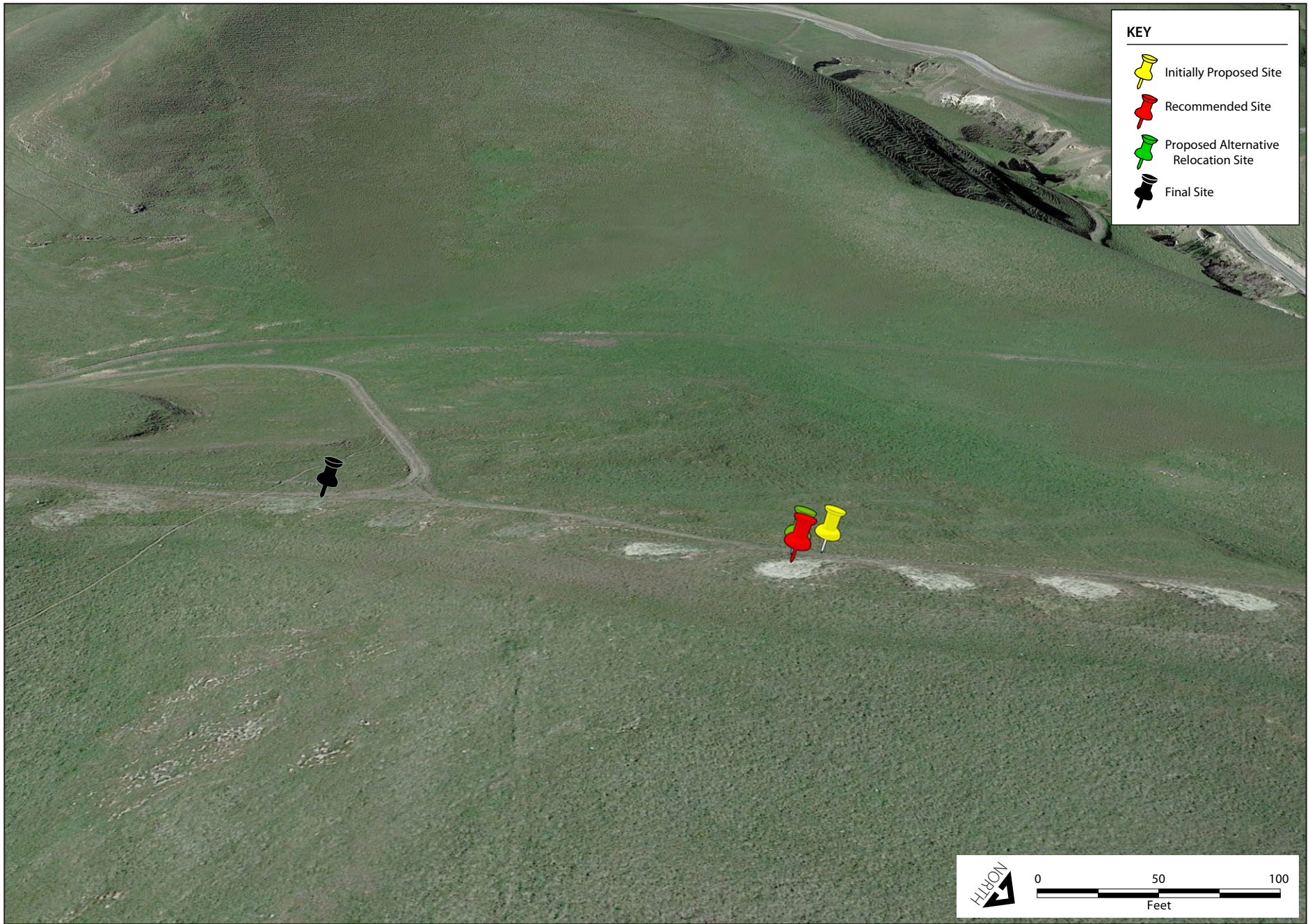
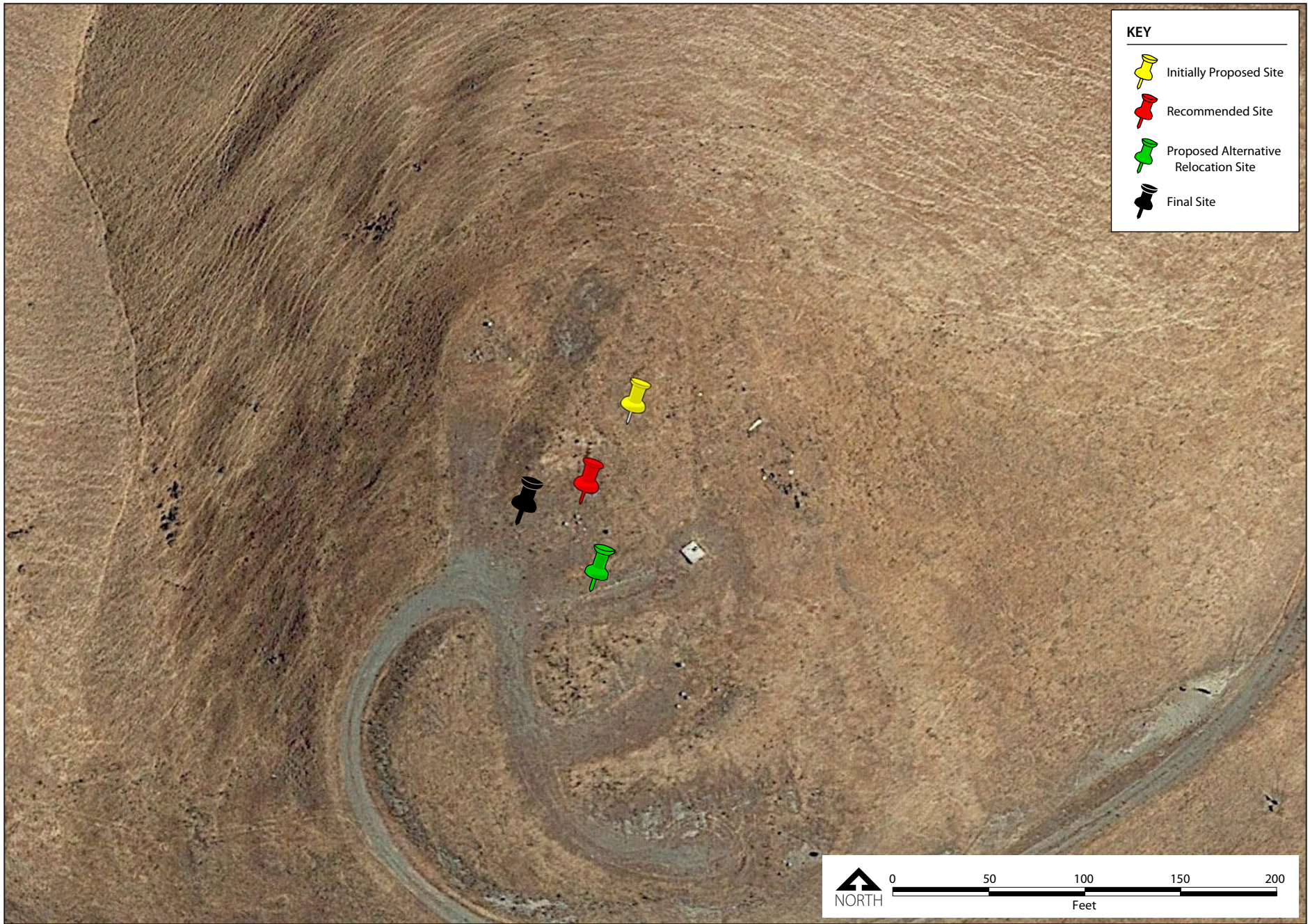


Figure A-10
Location of Proposed, Recommended, and Final Sites for Turbine 15 at the Mulqueoney Wind Project



SOURCE: Google Earth 2020.

Figure A-11
Location of Proposed, Recommended, and Final Sites for Turbine 16 at the Mulqueoney Wind Project



09/22/2020

SOURCE: Google Earth 2020.

Figure A-12
Location of Proposed, Recommended, and Final Sites for Turbine 17 at the Mulqueoney Wind Project

**Supplemental Assessment of Revised Mulqueeney Ranch Wind
Repowering Project to Minimize Raptor Collisions in the Altamont
Pass Wind Resource Area**

September 2020

APPENDIX A-2:

Aerial Figures A-13 through A-24

Prepared for:

Mulqueeney Wind Energy, LLC

Prepared by:

Estep Environmental Consulting

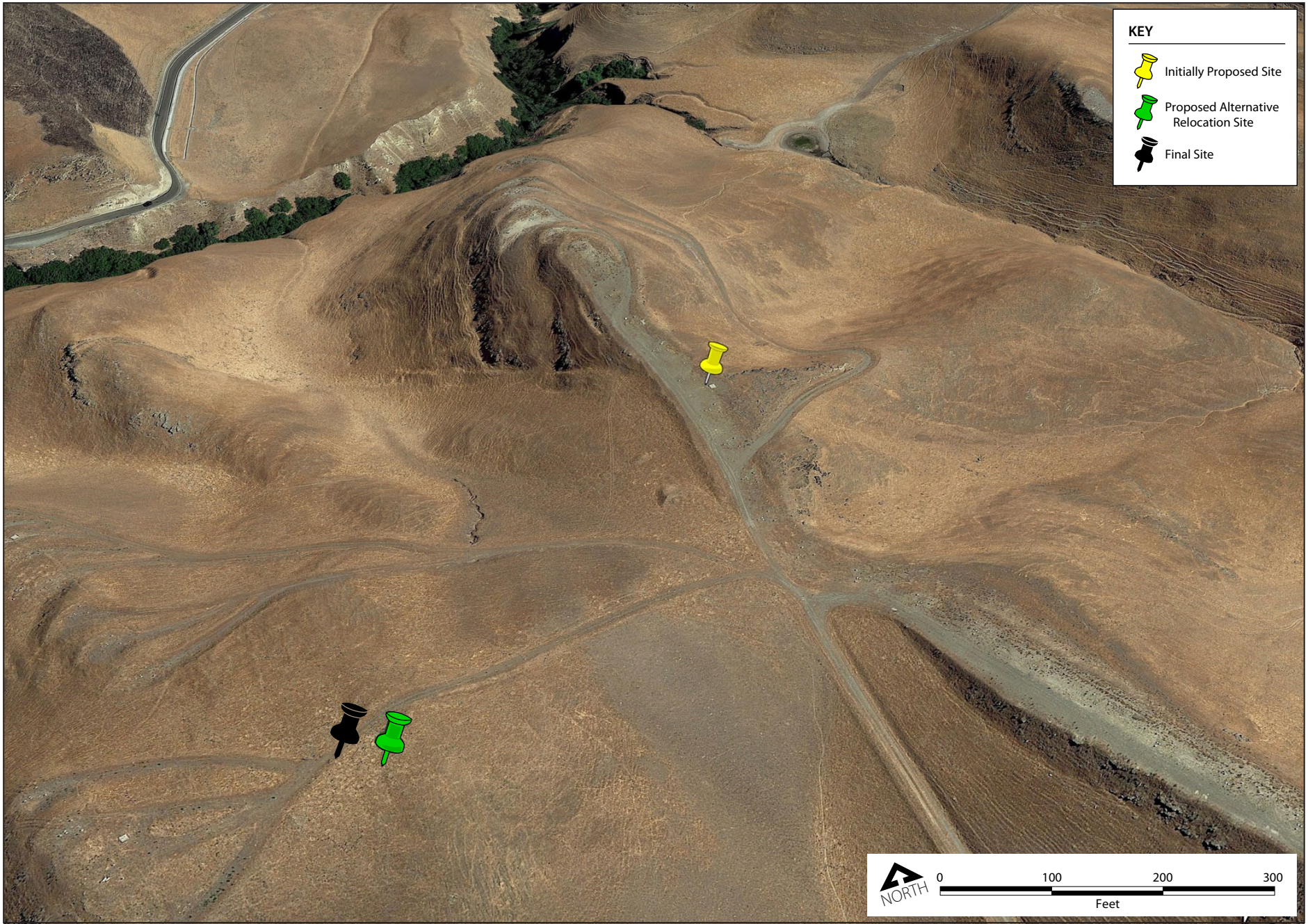


Figure A-13
Location of Proposed, Recommended, and Final Sites for Turbine 20 at the Mulqueoney Wind Project

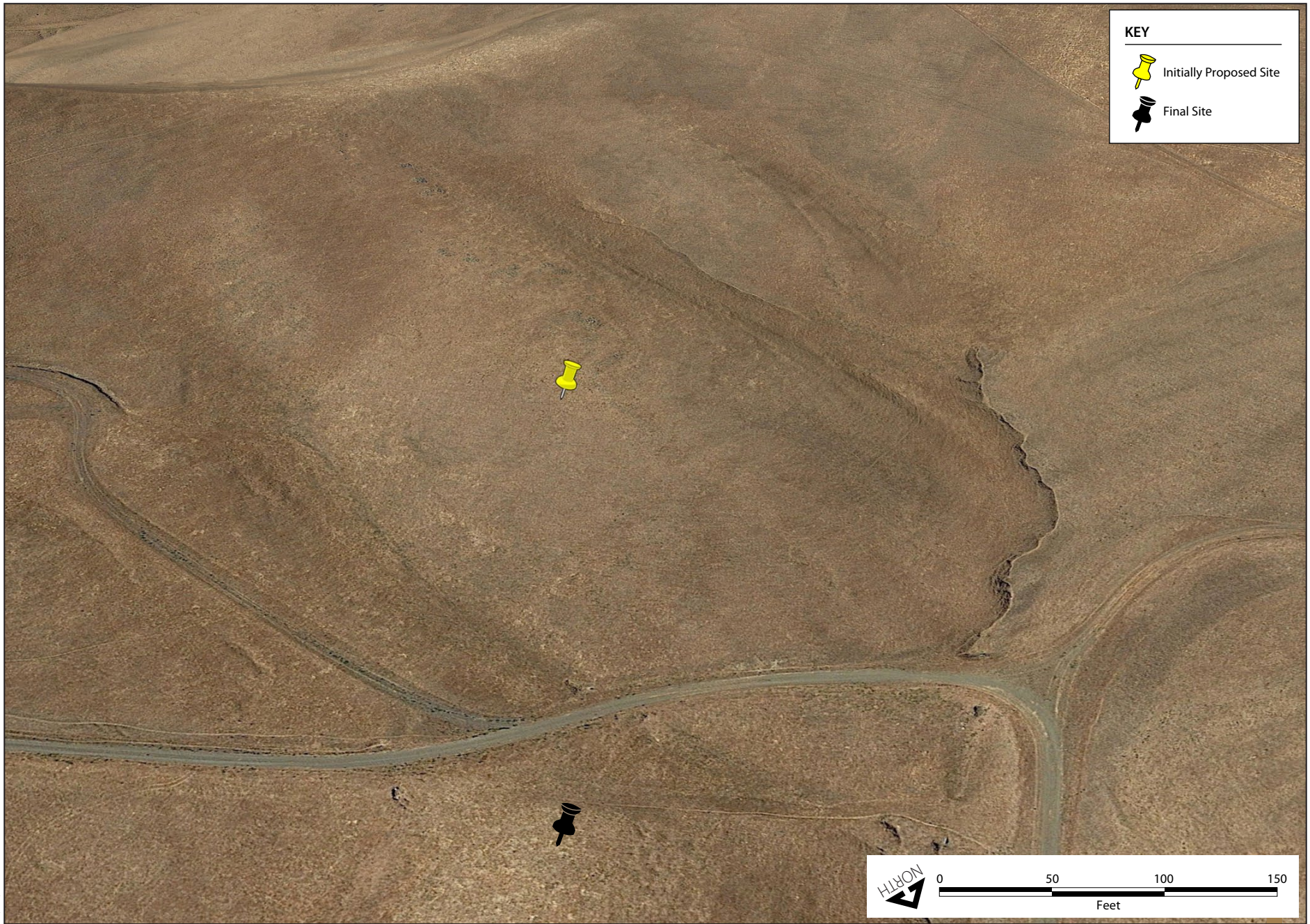
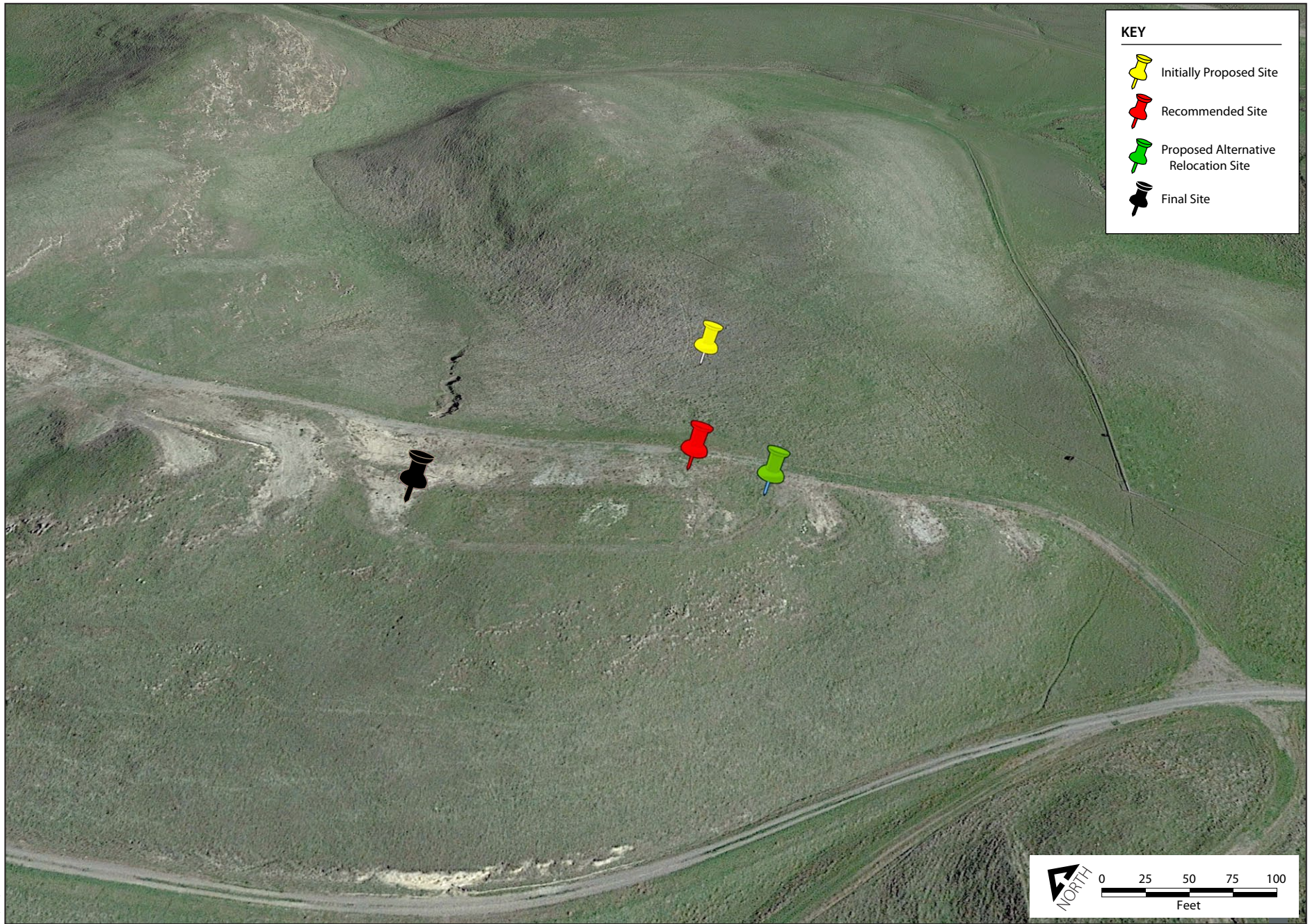


Figure A-14
Location of Proposed, Recommended, and Final Sites for Turbine 21 at the Mulqueoney Wind Project



SOURCE: Google Earth 2020.

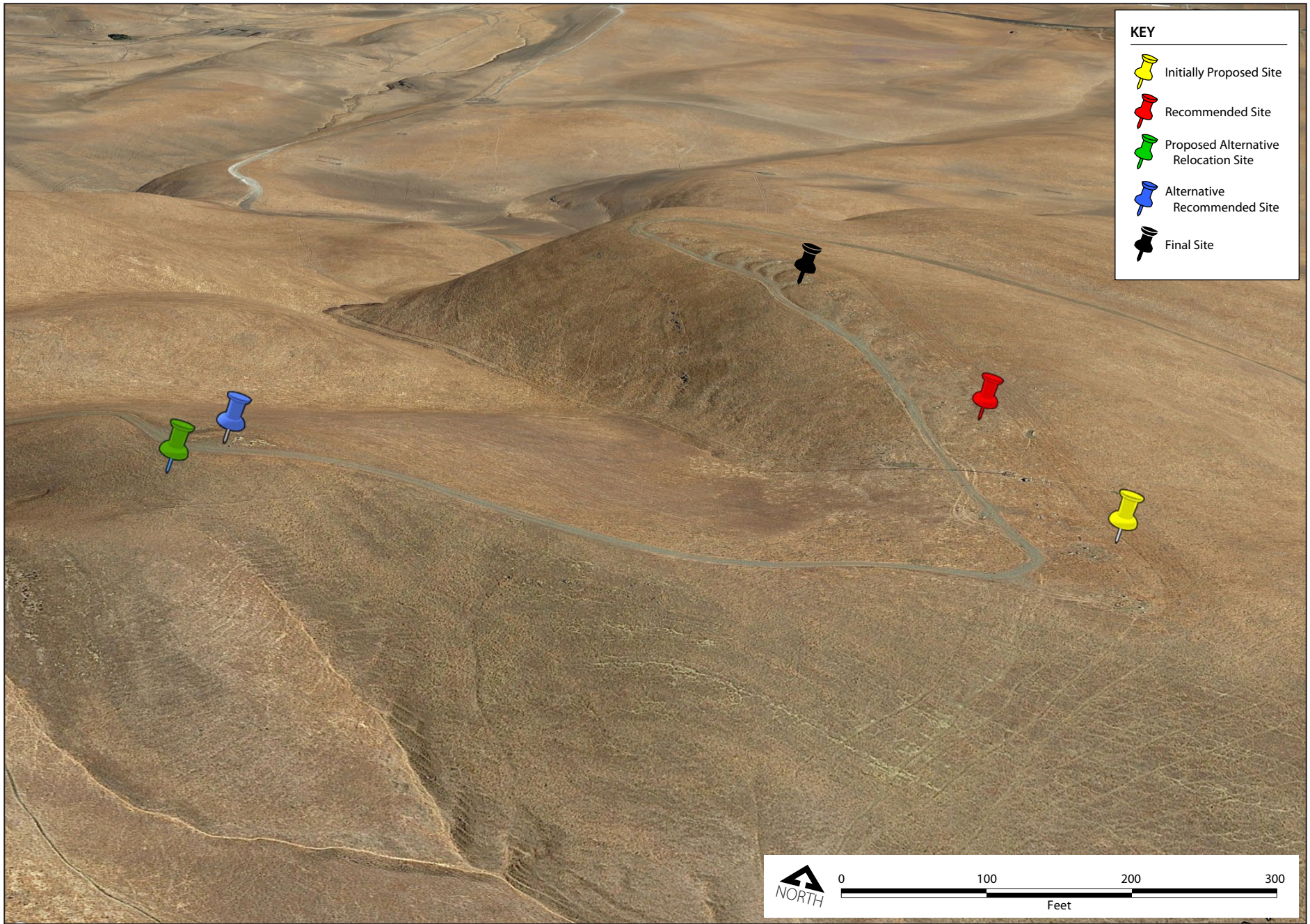
Figure A-15
Location of Proposed, Recommended, and Final Sites for Turbine 24 at the Mulqueoney Wind Project



09/22/2020

SOURCE: Google Earth 2020.

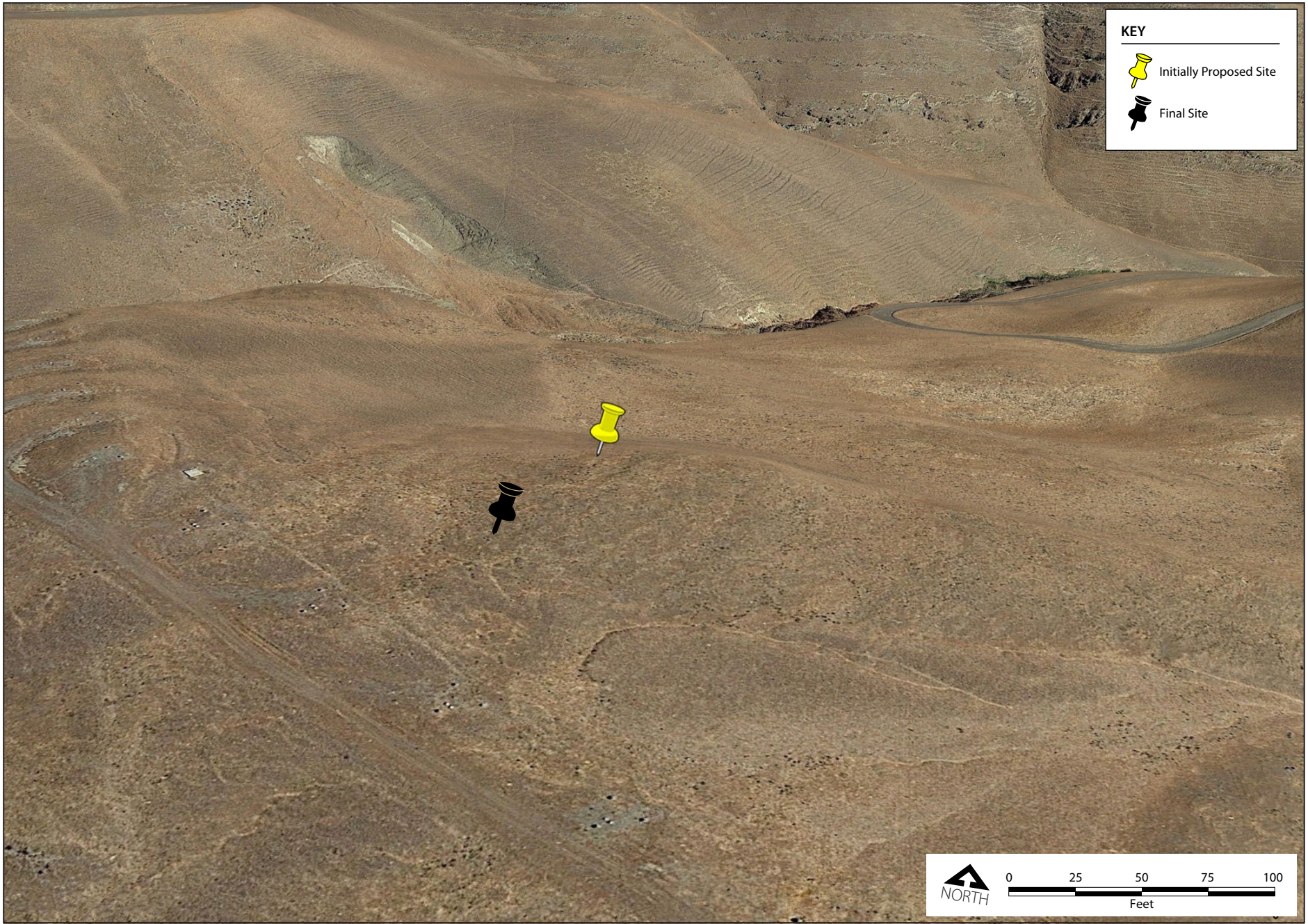
Figure A-16
Location of Proposed, Recommended, and Final Sites for Turbine 26 at the Mulqueoney Wind Project



09/22/2020

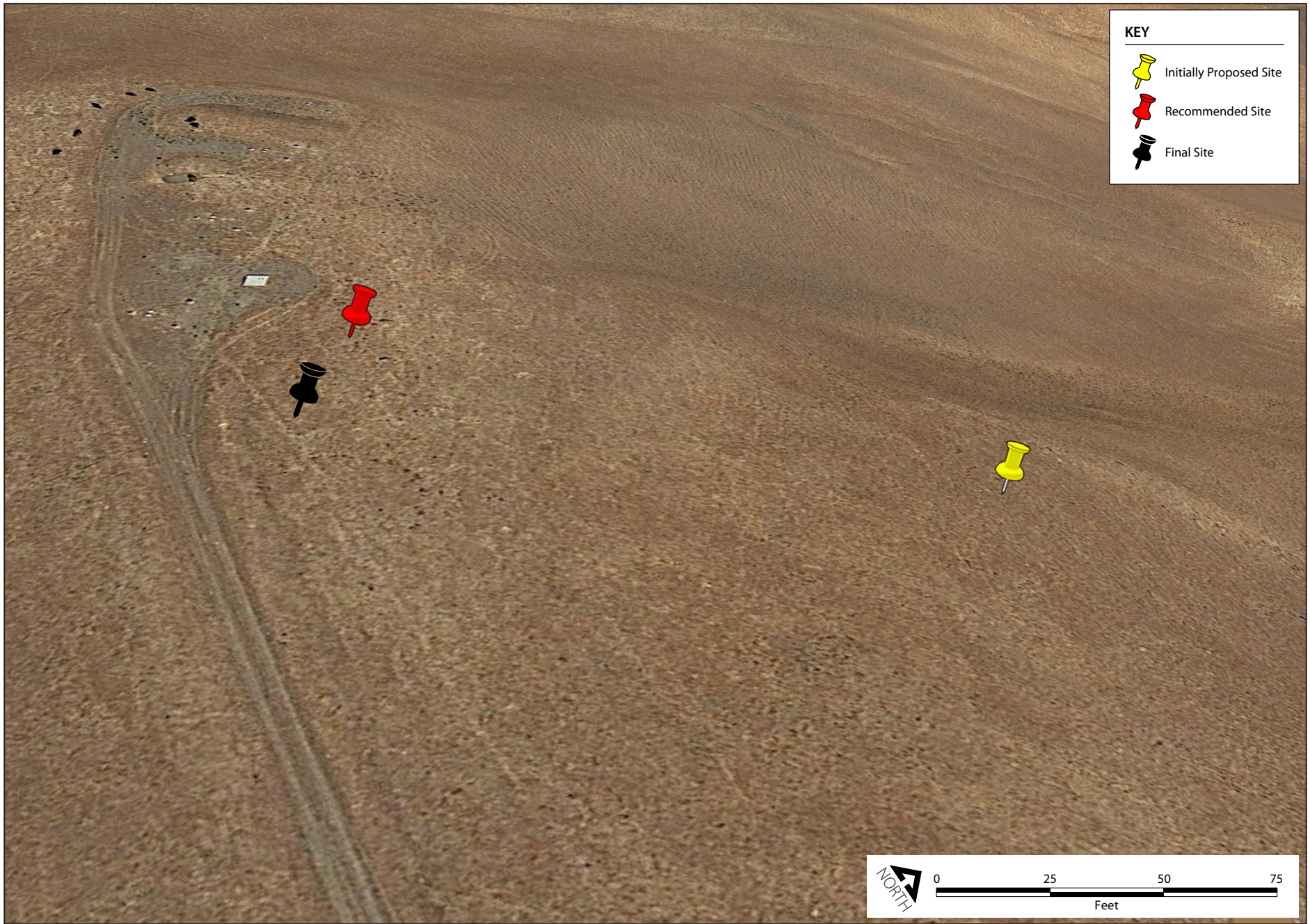
SOURCE: Google Earth 2020.

Figure A-17
Location of Proposed, Recommended, and Final Sites for Turbine 28 at the Mulqueoney Wind Project



SOURCE: Google Earth 2020.

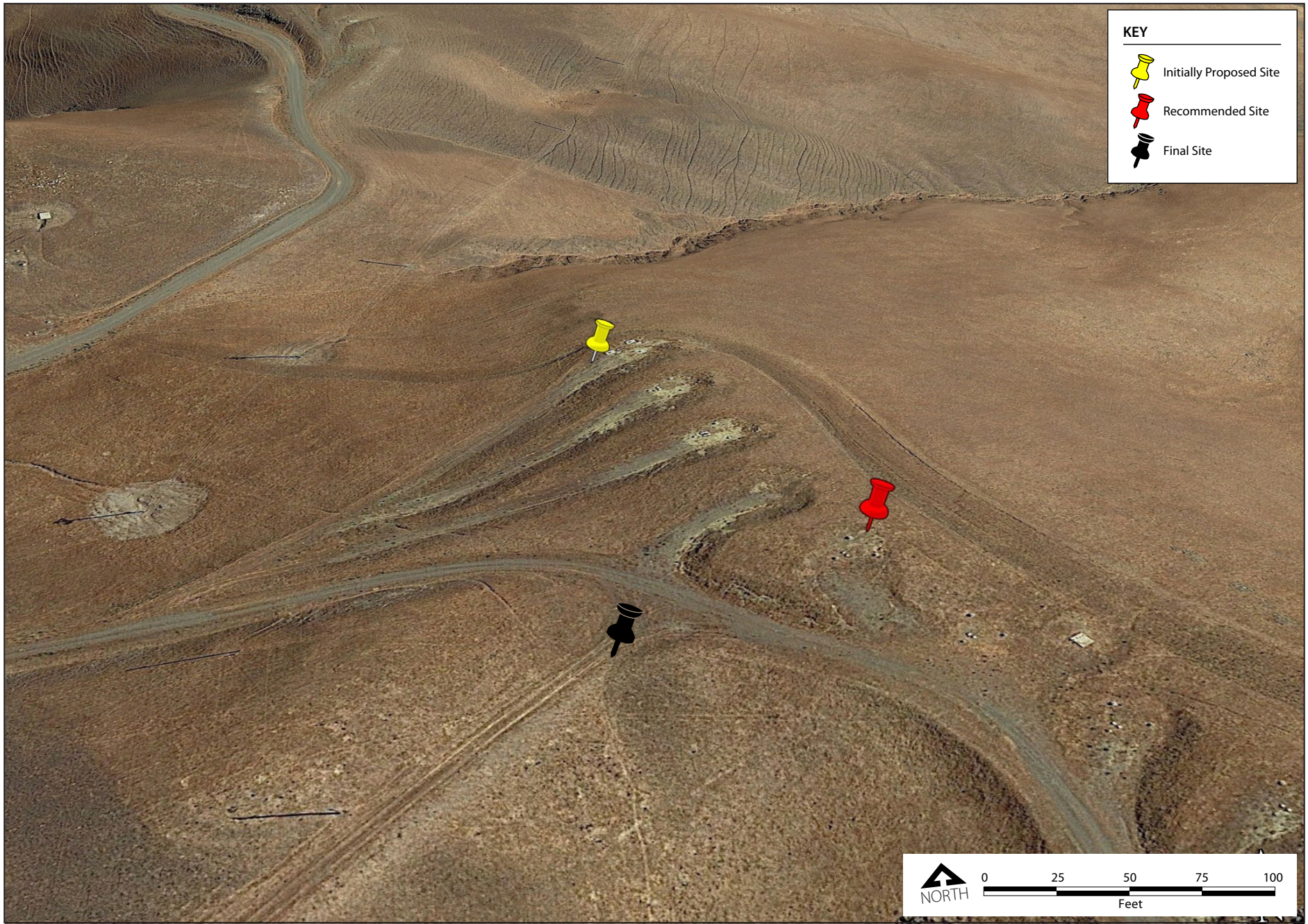
Figure A-18
Location of Proposed, Recommended, and Final Sites for Turbine 29 at the Mulqueoney Wind Project



09/22/2020

SOURCE: Google Earth 2020.

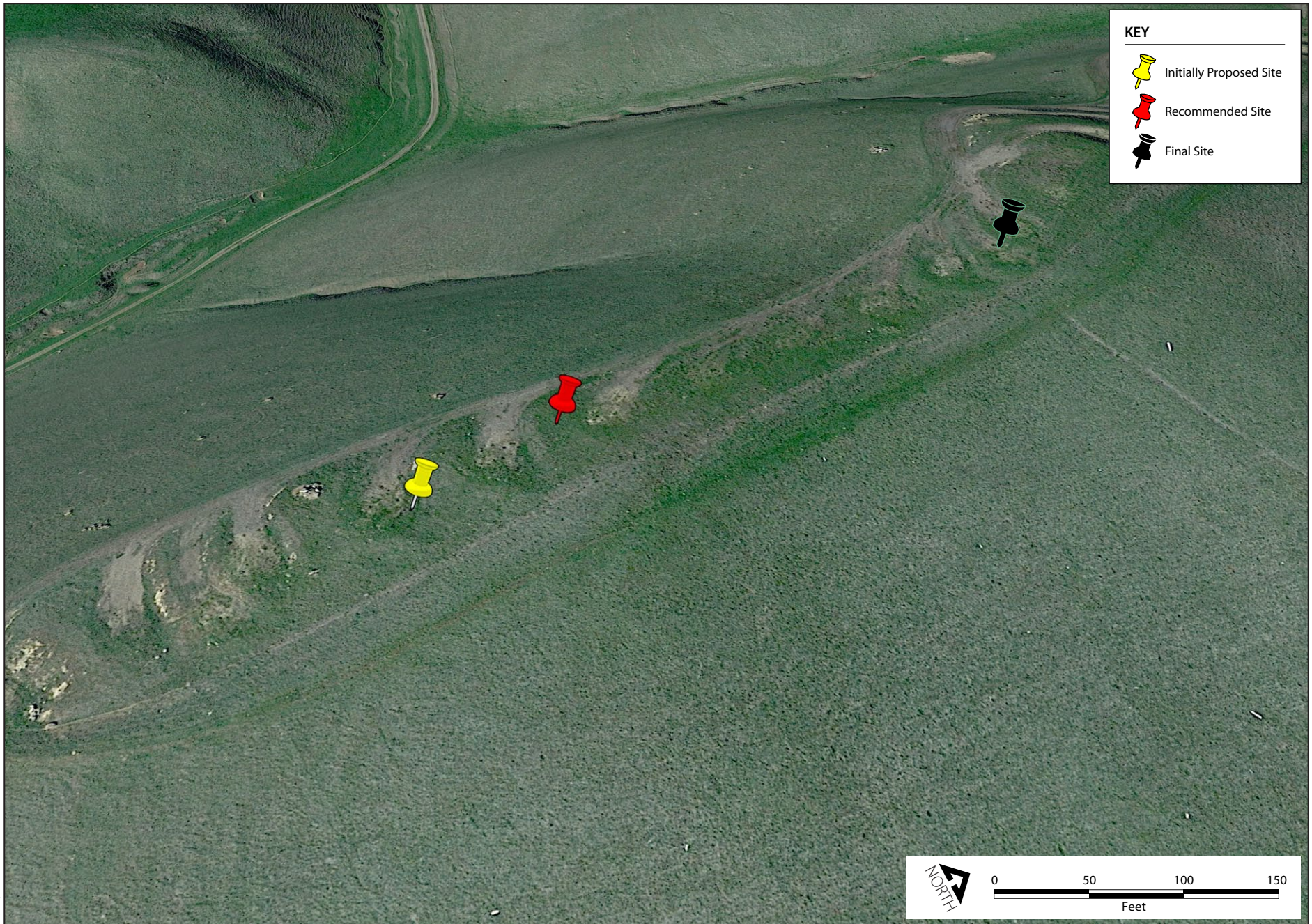
Figure A-19
Location of Proposed, Recommended, and Final Sites for Turbine 30 at the Mulqueoney Wind Project



09/22/2020

SOURCE: Google Earth 2020.

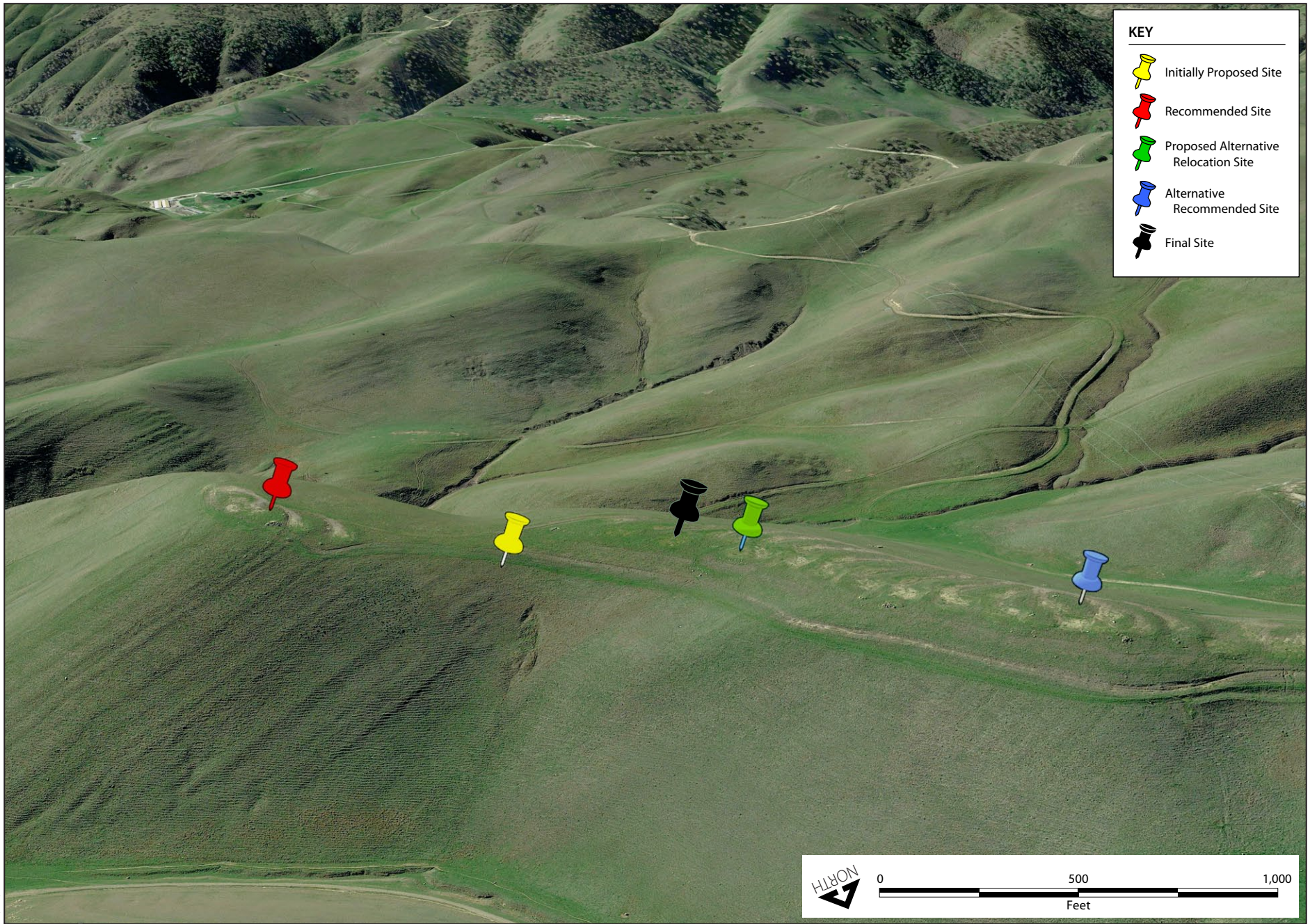
Figure A-20
Location of Proposed, Recommended, and Final Sites for Turbine 32 at the Mulqueoney Wind Project



09/25/2020

SOURCE: Google Earth 2020.

Figure A-21
Location of Proposed, Recommended, and Final Sites for Turbine 34 at the Mulqueoney Wind Project



09/25/2020

SOURCE: Google Earth 2020.

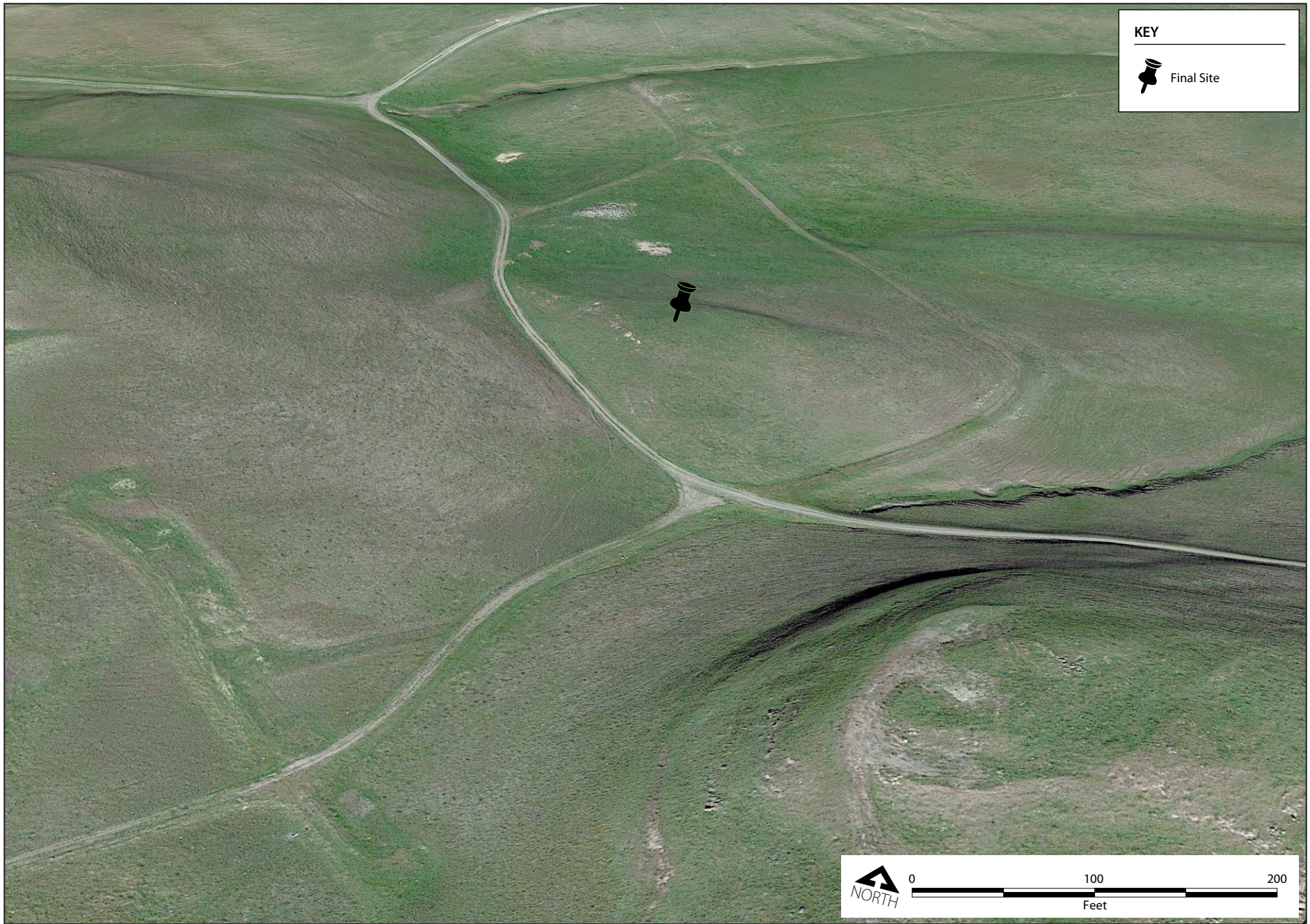
Figure A-22
Location of Proposed, Recommended, and Final Sites for Turbine 36 at the Mulqueeney Wind Project



09/25/2020

SOURCE: Google Earth 2020.

Figure A-23
Location of Proposed, Recommended, and Final Sites for Turbine 36 at the Mulqueoney Wind Project



SOURCE: Google Earth 2020.

Figure A-24
Location of Proposed, Recommended, and Final Sites for Turbine 17C at the Mulqueoney Wind Project