

A Slippery Slope*

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* May be viewed as a Slide Show

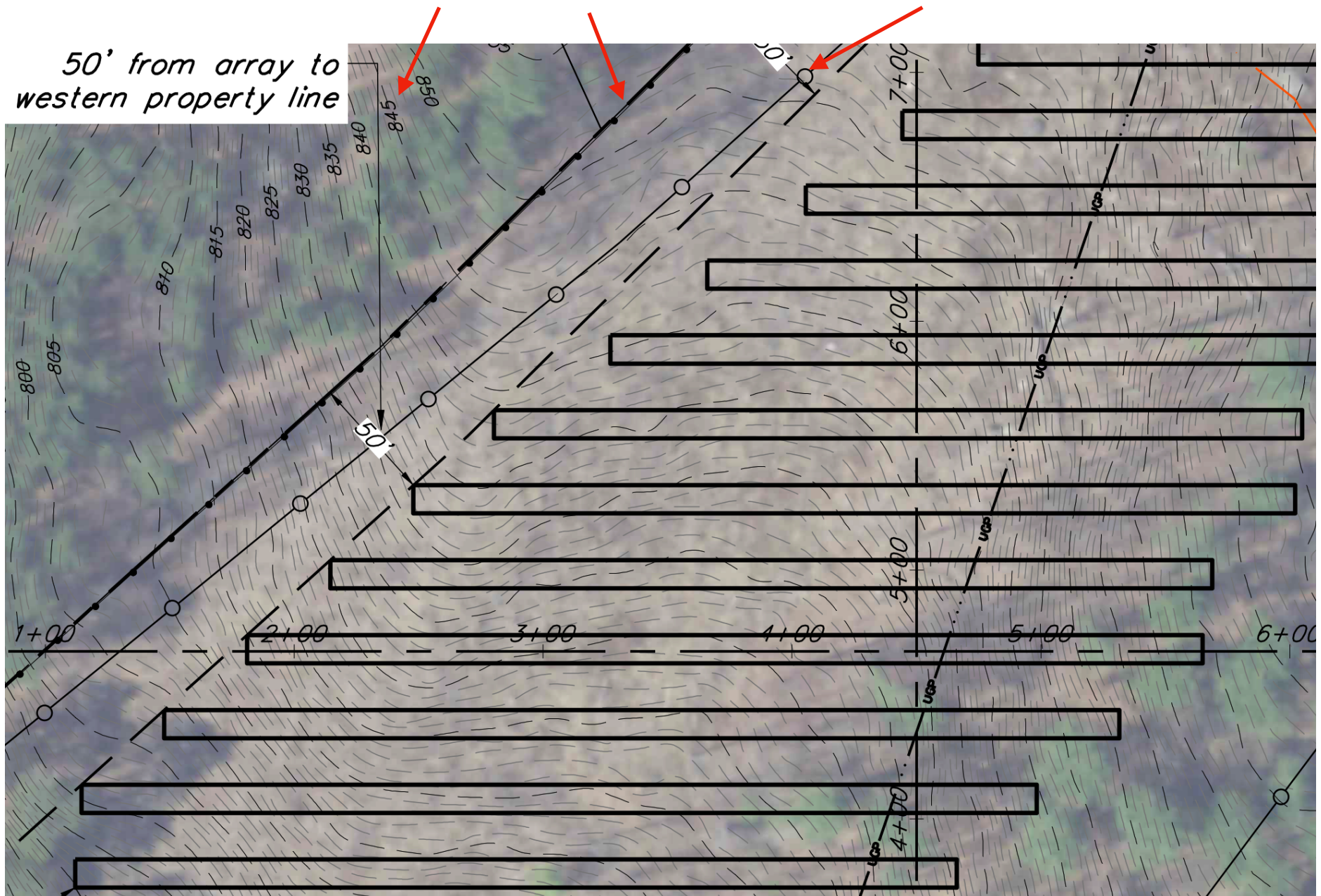
Exhibit MB-39 Part 1

Site Plan Reference Page

Site Plan	Date Filed	Exhibit Name	revision date	Array	LoD	Contours Major/Minor	Source of Contour Lines	Source of 25% Slope Layer	Road Cut & Fill	Elevation Drawing
First	8/8/21	MS-2		1 group	11.9 acres	5 ft/1 ft	Everywhere - LiDAR	no slope layer	shown	Yes
Second	2/16/22	MS-2	2/9/22	rearranged into 2 groups	11.9 acres	5 ft/1 ft	Around Array - Survey Elsewhere - LiDAR	no slope layer	shown	No
Third	2/25/22	MS-2A	2/22/22	no change	11.9 acres	10 ft/2 ft	Around Array - Survey Elsewhere - LiDAR	Around Array - Survey Around Road - None Remaining LoD - None	shown	Yes
Fourth	4/19/22	MS-2B	4/18/22	no change	11.9 acres	10 ft/2 ft	Around Array - Survey Elsewhere - LiDAR	Around Array - Survey Around Road - LiDAR Remaining LoD - None	not shown	Yes
Fifth	6/24/22	MS-2	6/17/22	rearranged (still 2 groups)	11.6 acres	10 ft/2 ft	Around Array - Survey Elsewhere - LiDAR	Around Array - Survey Around Road - LiDAR Remaining LoD - None	not shown	No
Sixth	7/13/22	MS-2	7/13/22	no change	11.6 acres	10 ft/2 ft	Around Array - Survey Elsewhere - LiDAR	Around Array - Survey Around Road - LiDAR Remaining LoD - LiDAR	not shown	No

Exhibit MB-39 Part 2 Looking at the Contours

The First Site Plan is the **Only** Site Plan With Natural LiDAR Contours Throughout
5 foot major Contour Lines Property Line and LoD Fence



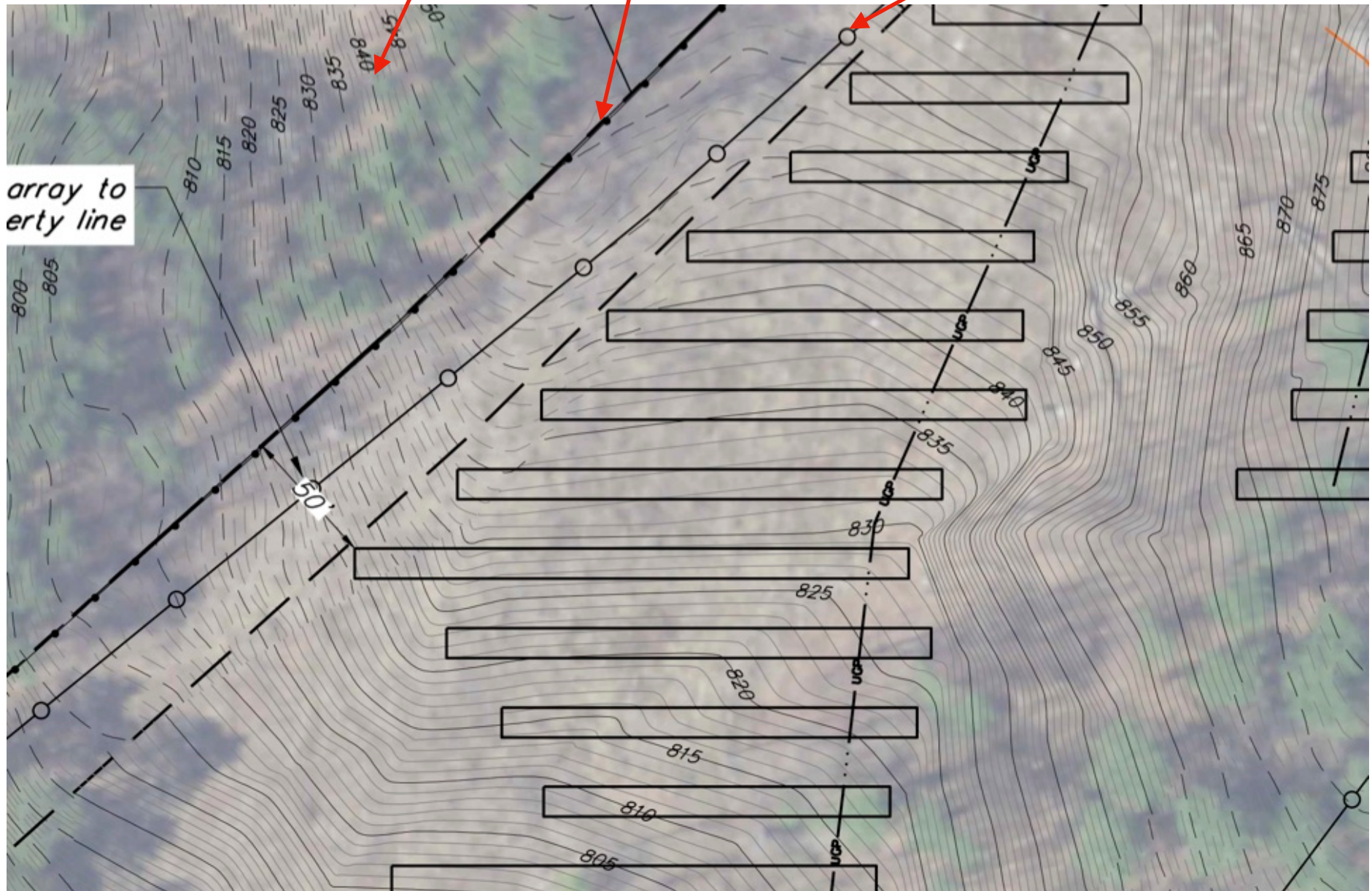
In the **Second Site Plan**, panels have been rearranged to be in two groups.

The contour lines under and around the array are derived from a ground based survey.

5 foot major Contour Lines

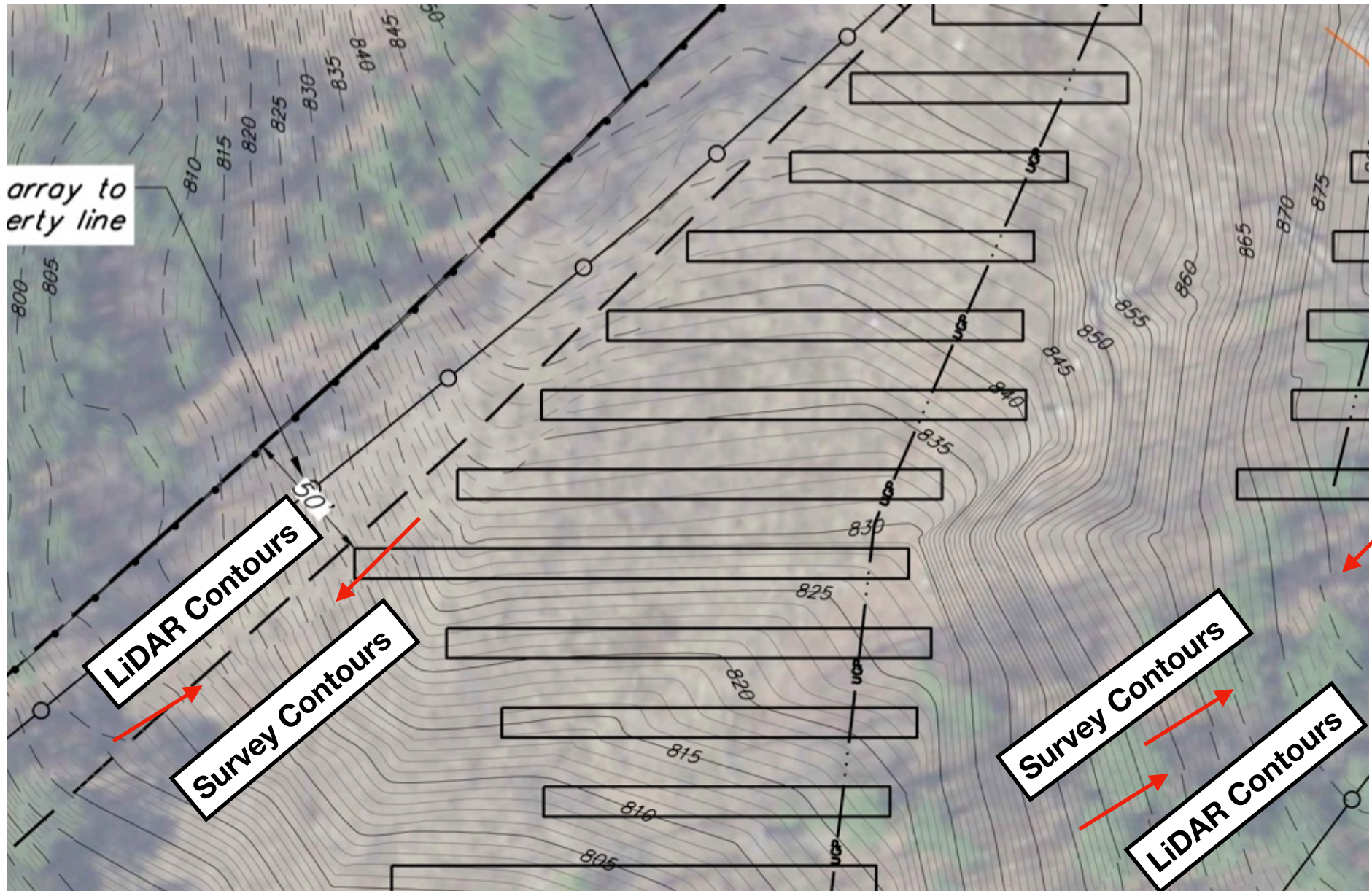
Property Line and LoD

Fence



Discontinuities (Red Arrows) in the **Second Site Plan** are visible where the ground based survey is patched onto the LiDAR base layer

The next page has Magnifying Loupes...



Discontinuities (Red Arrows) in the **Second Site Plan** are visible where the ground based survey is patched onto the LiDAR base layer

Here are the Magnifying Loupes



Fence

*50' from array
to northern
property line*

Northeast corner of the Site.
1st Site Plan
5 ft major, 1 ft minor contours

The local high point on the ridge is a 'double hump' at 905 and 906 ft elevation.

Property Line &
Limit of Disturbance

Limit of Disturbance

*±60' from array
northern property*

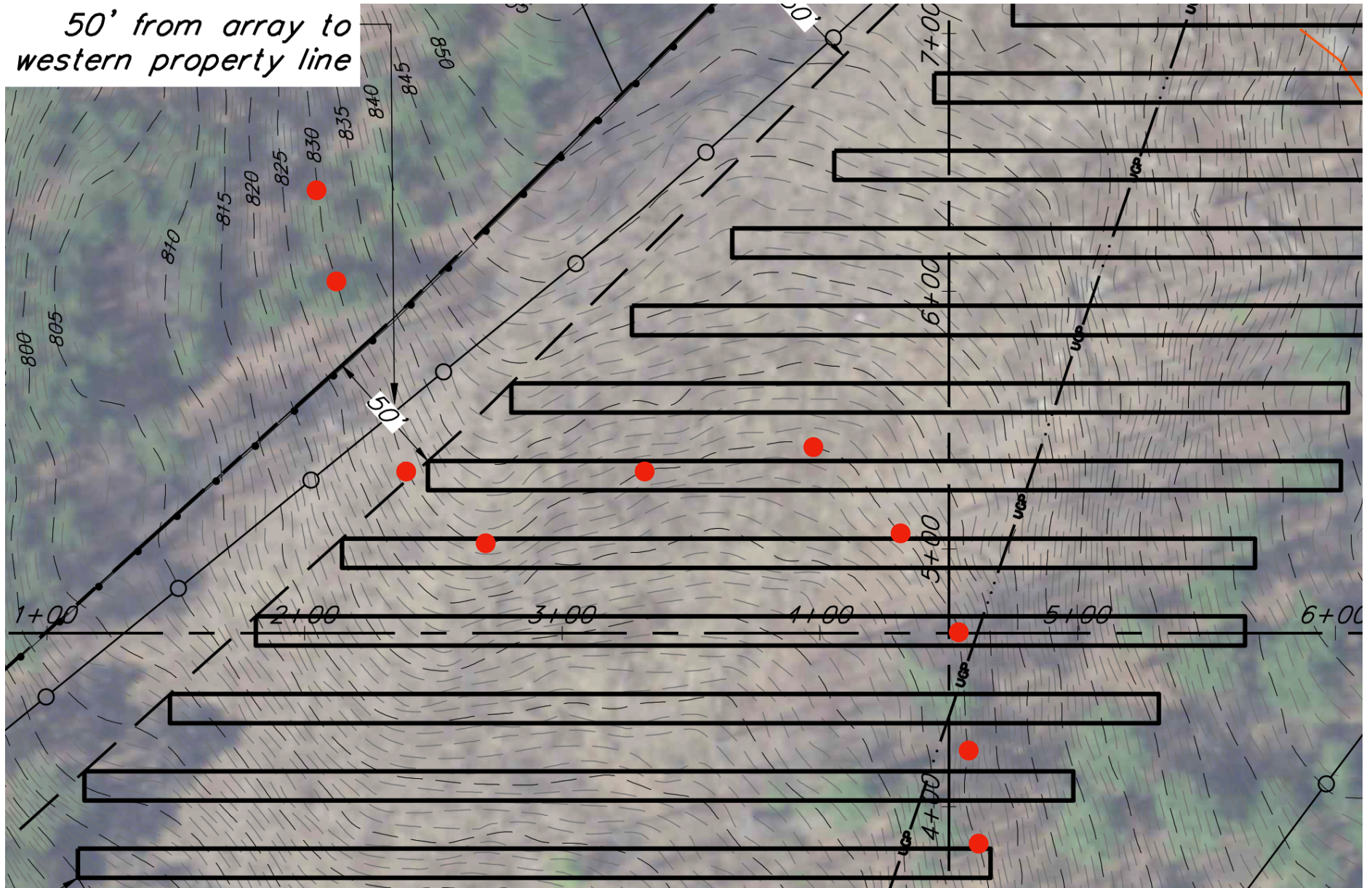
Northeast corner of the Site.
2nd Site Plan
5 ft major, 1 ft minor contours

Note the discontinuities where the ground based survey was patched onto the LiDAR base layer.

All Site Plans after the 2nd Plan have 10 ft major contours and the 'double hump' is not seen because there is no 905 ft contour

The **First Site Plan** has LiDAR contours throughout.

The 830 ft Elevation is marked with Red Dots.

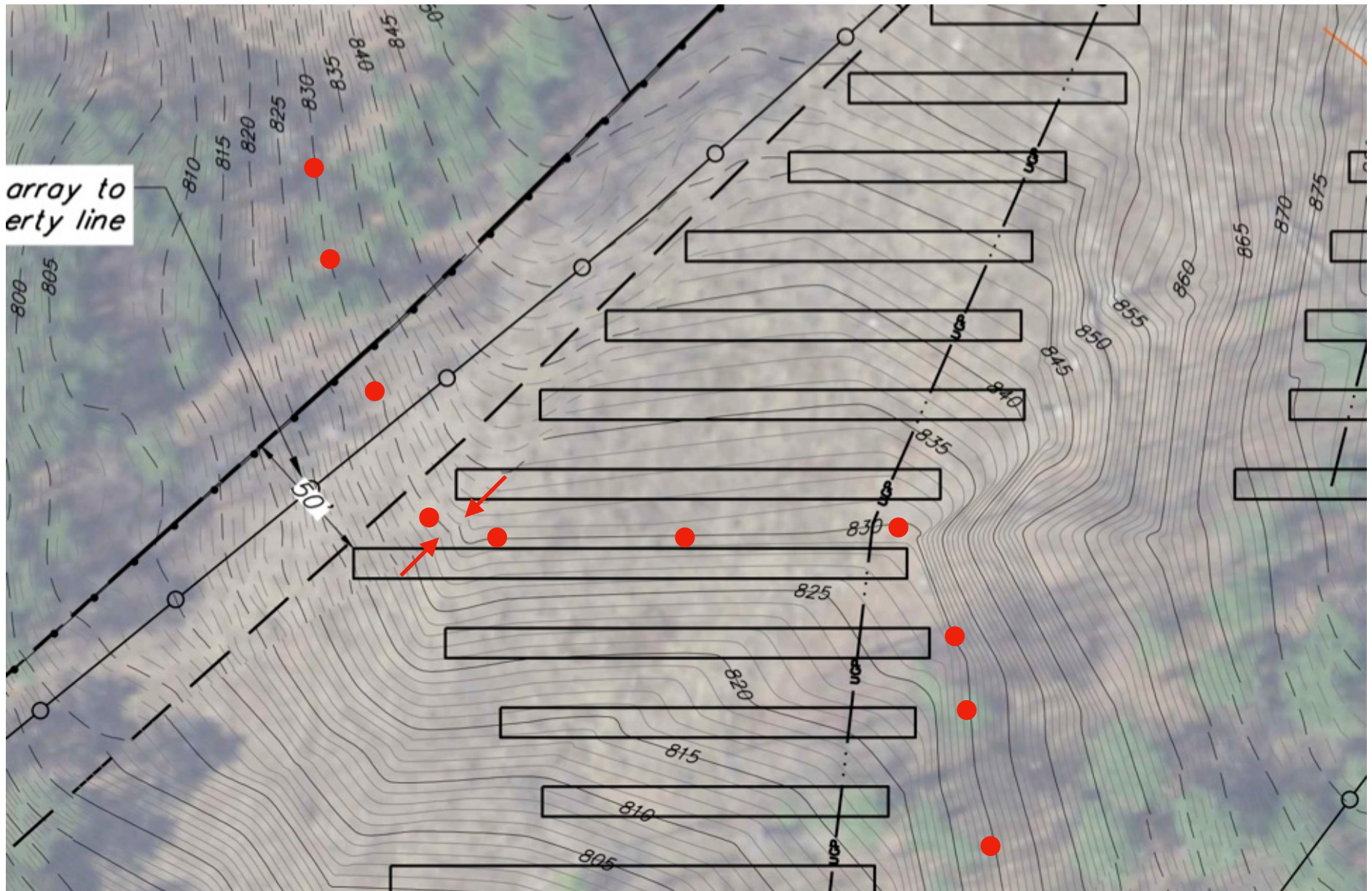


In the **Second Site Plan**, the 830 ft Elevation is marked with Red Dots.

Compare to previous page!

The surveyor did not locate elevations at enough points to accurately draw the contours.

The discontinuity runs through the 830 ft contour line at the Red Arrows.



MB-39 Part 3 Looking at the Slope Layers

In the **Third Site Plan**, a greater-than-25% Slopes Layer (Yellow) was applied to the area of the ground based survey. The Major Contours are coarser (10 ft) and the discontinuities (red arrows) a bit less noticeable.



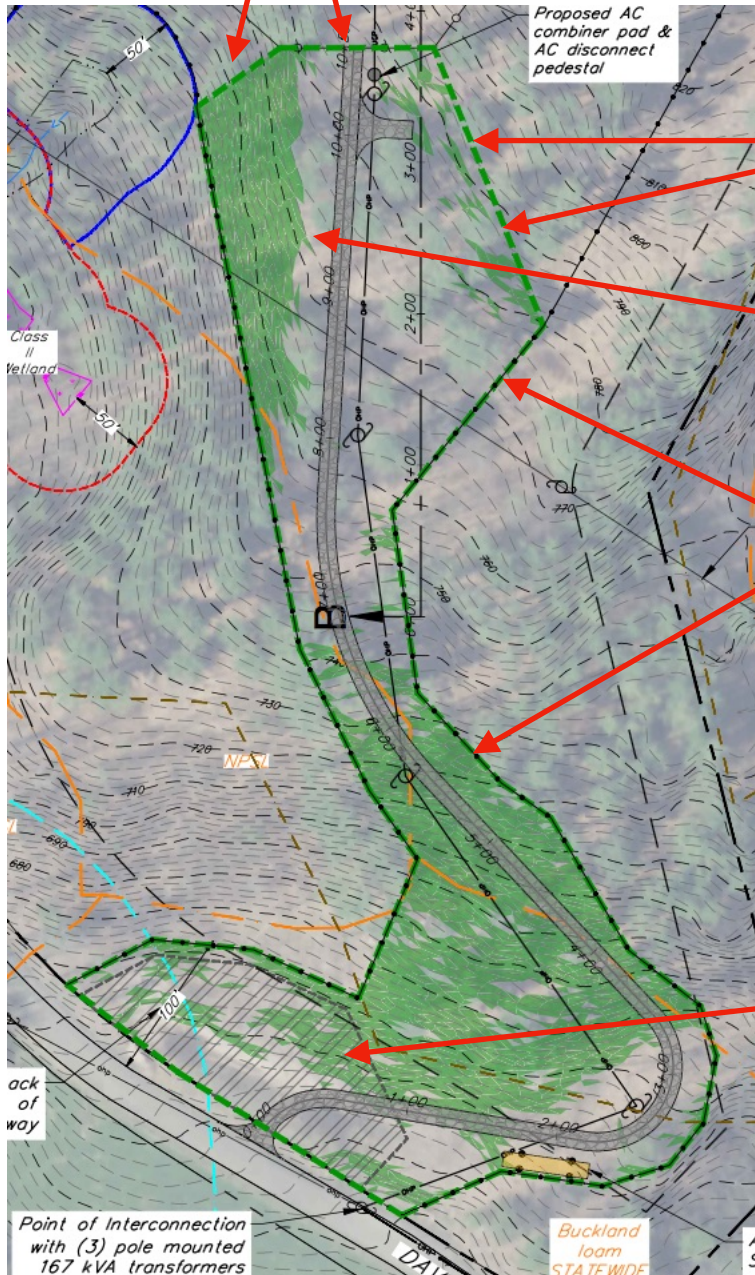
In response to the Hearing Officer's **repeated** request (April 4, 2022) for a 25% Slope Layer over the Limits of Disturbance, the developer placed a LiDAR Slopes Layer around the Access Road of the Fourth Site Plan.

The developer did not place a Slope Layer over the entire LoD.

The arbitrary boundary of the LiDAR Slope Layer around the Access Road is seen on the next page.

Arbitrary Boundary of
LiDAR Slope Layer

Fourth Site Plan



Arbitrary Boundary of
LiDAR Slope
Layer

Frayed Edges

Limit of
Disturbance

Frayed Edges

In the **Fourth Site Plan**, a greater than 25% LiDAR Slope Layer (Green) was added around the Access Road.

Note the “frayed” edges of the slope layer. The Frayed Edges are typical of what a slopes layer on a natural landscape looks like.

**The Next Page has the
Magnifying Loupes...**

Arbitrary Boundary of
LiDAR Slope Layer

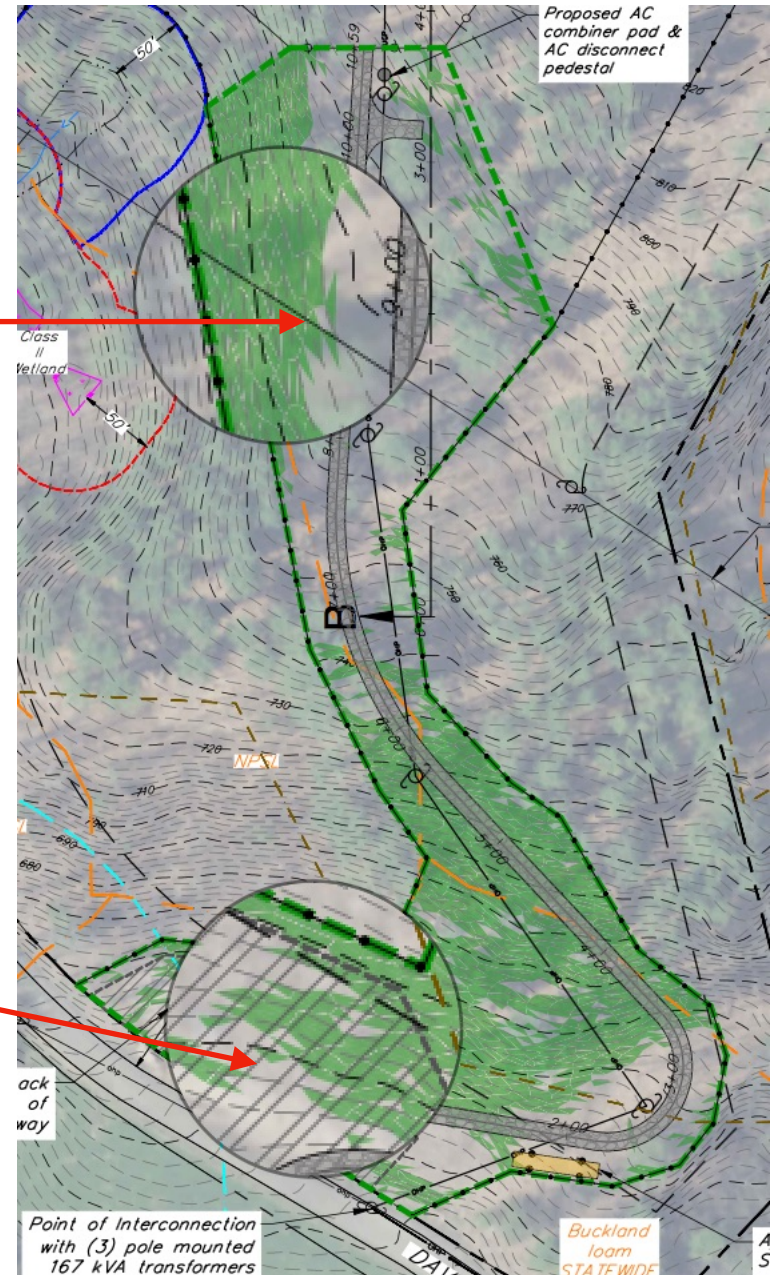
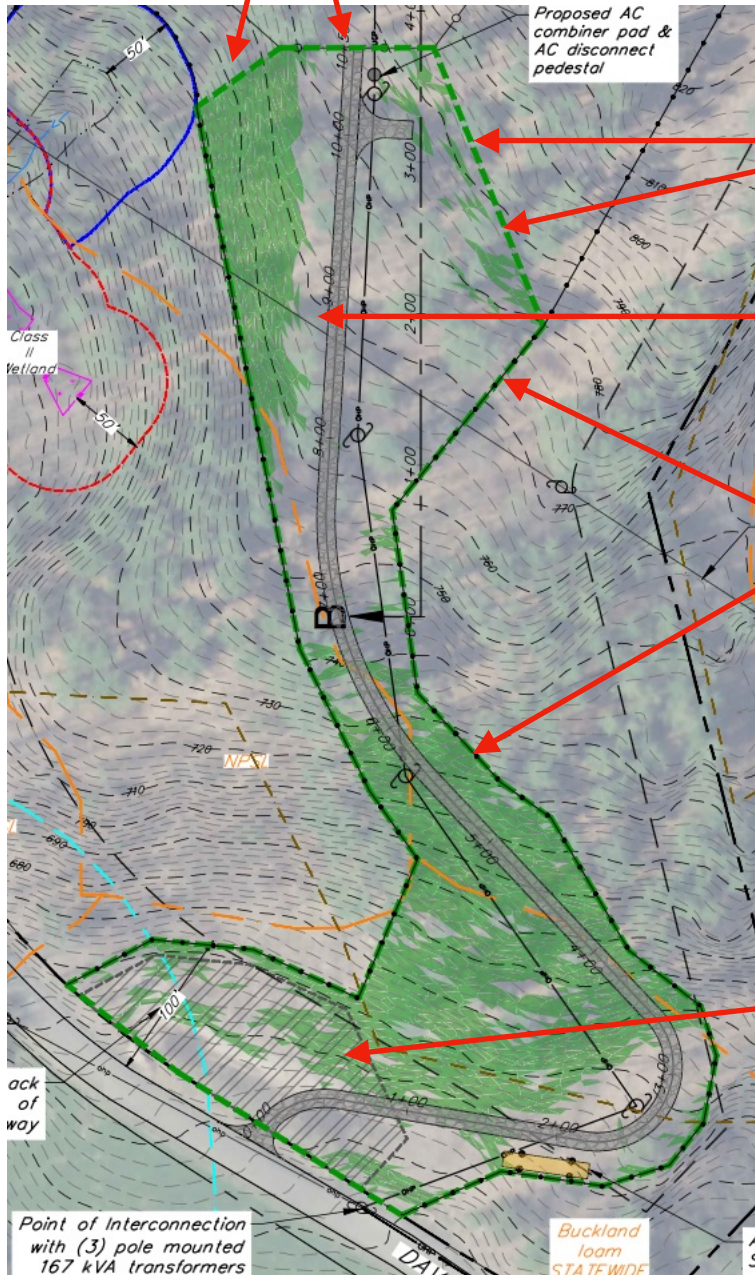
Fourth Site Plan

Artificial Boundary
of LiDAR Slope
Layer

Frayed Edges

Limit of
Disturbance

Frayed Edges



MB-39 Part 4 Why

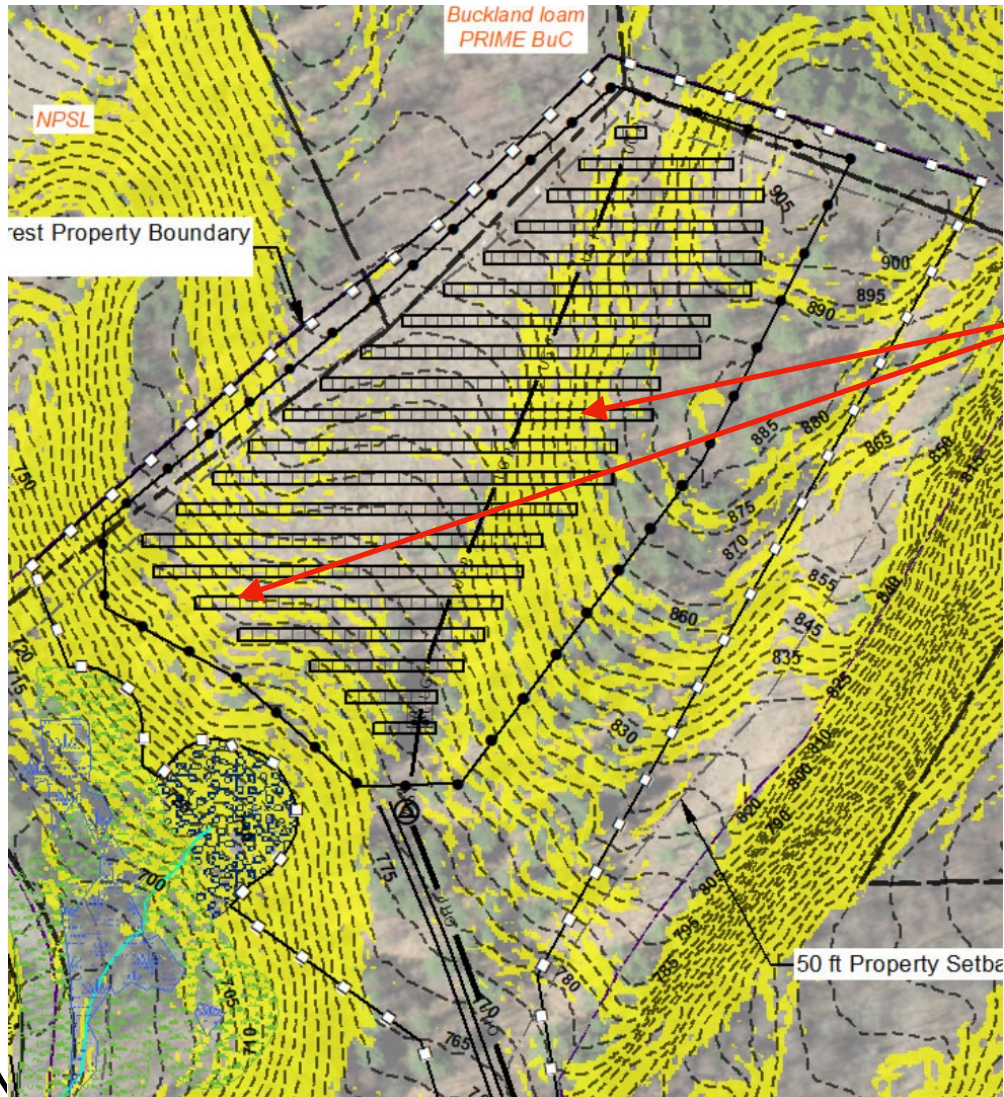
Before moving on to the Fifth and Sixth Site Plans...

A look at why the 2nd and 3rd plans were produced.

After Neighbor Intervenor alert the Town of Randolph to the slopes issue (October 2021), the Town asked the developer to overlay a 25% slope layer on the site plan.

This is the Preliminary Site Plan that was sent in response to the Town's request (slopes over 25% in Yellow).

[Exhibit MB-33, submitted with Mr. Binder's Rebuttal Testimony on 6/24/22]

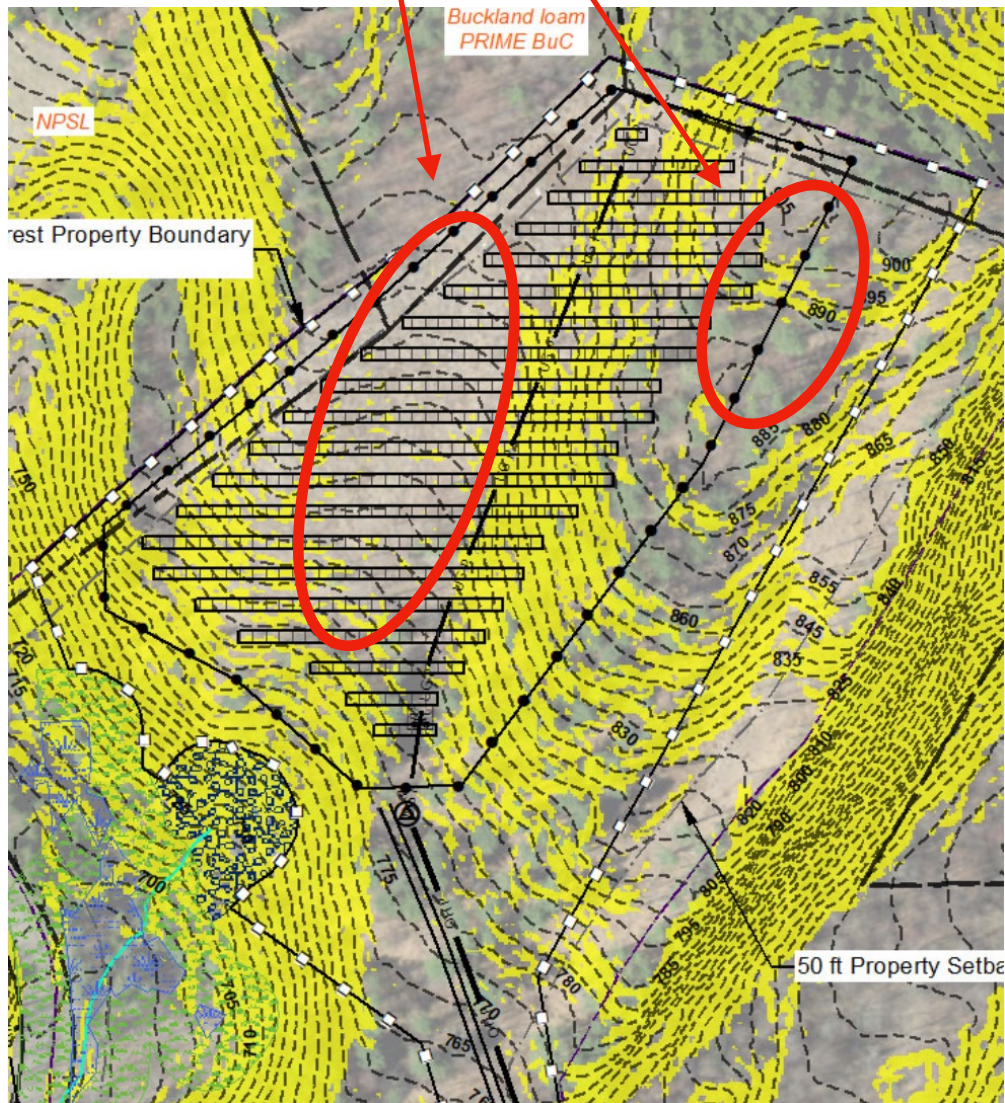


Steep slopes under the array

👉 The Town threatened to rescind their Preferred Sites Letter unless the panels were moved off slopes greater than 25%.

What is the developer to Do?

Two areas with not so much yellow



Rearrange the Panels.

Place them in the two areas with not so much yellow!

Done!

In the 2nd Site Plan, the Panels are Rearranged into 2 Groups.

☞ The developer assured the town that, **based on a survey**, no panels were on slopes greater than 25%

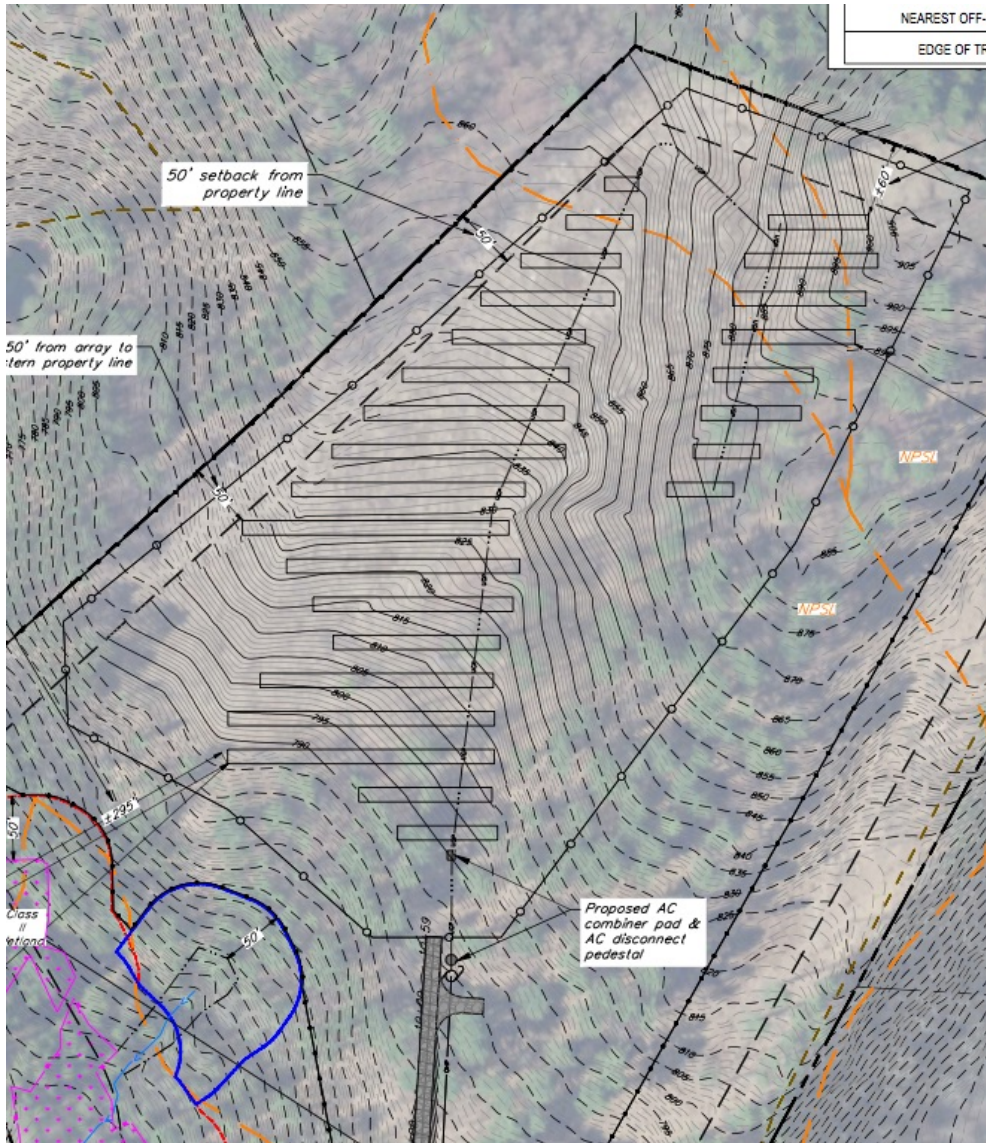
Problem Solved!

But now there's another Problem:

At the PUC, the Hearing Officer wants to see a greater than 25% slope layer.

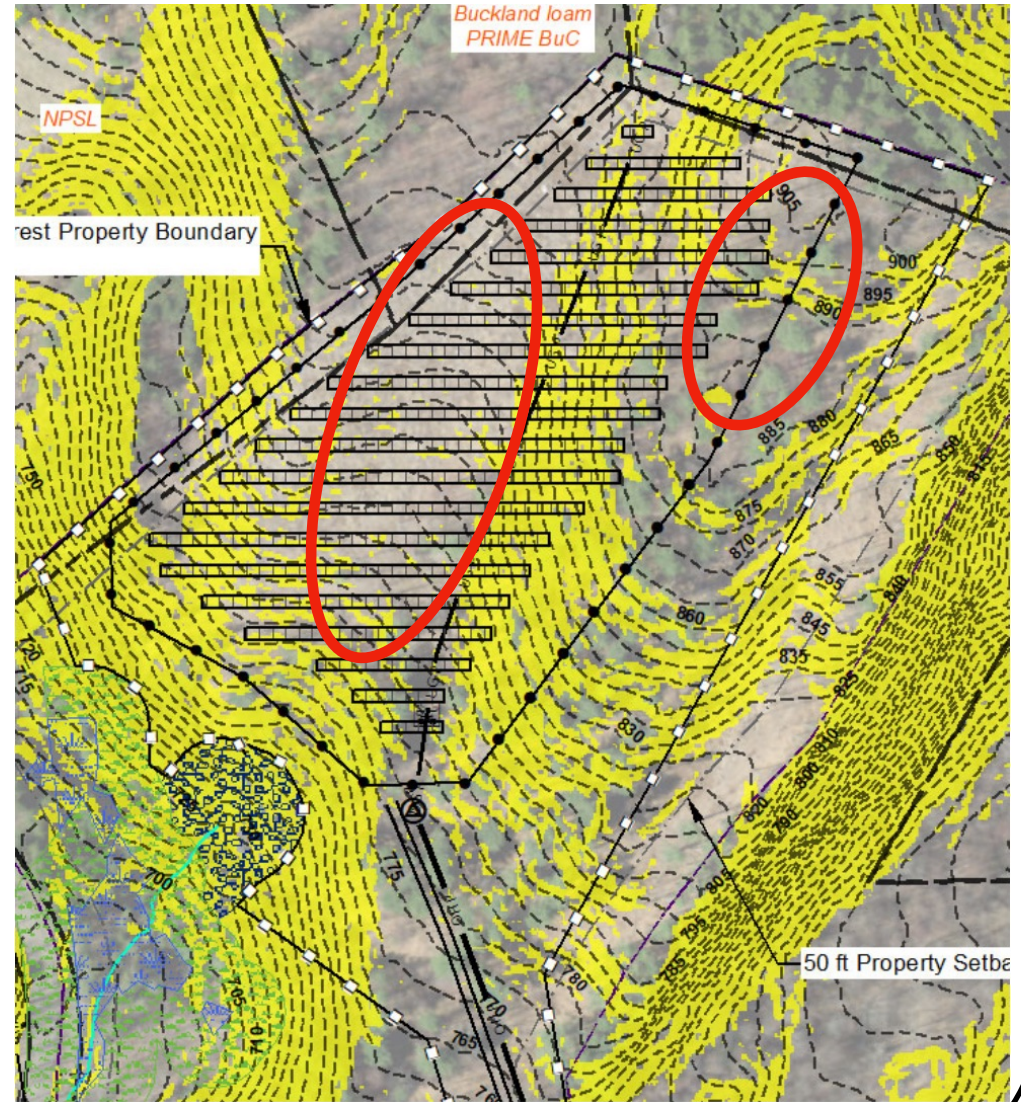
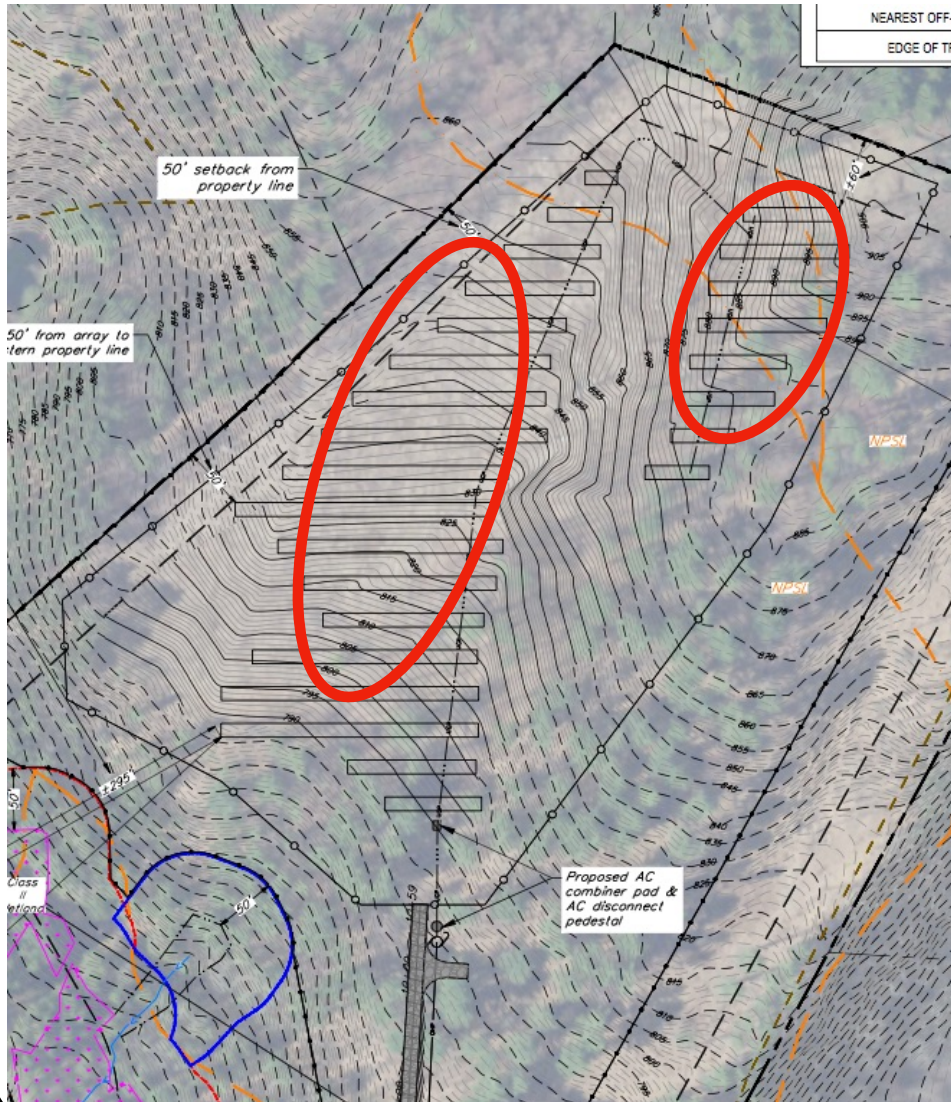
A LiDAR slope layer would show some panels are still on steep slopes.

What is the developer to Do?



If the developer puts a LiDAR Slope Layer on the site plan, it will reveal that there is still yellow under the panels

What can the developer do to hide the yellow under the 2 groups of panels?





**Use the ground based survey to
contrive a slope layer!**

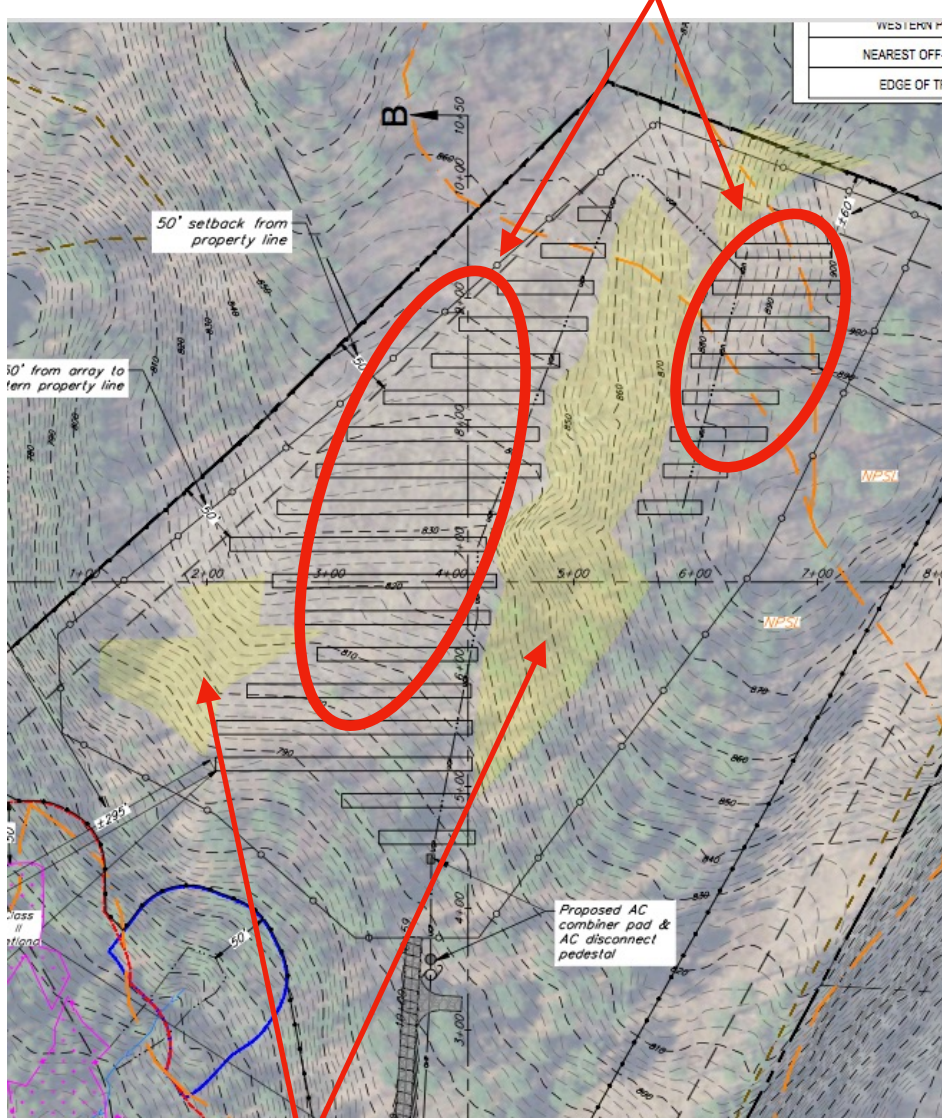
The surveyor located elevations at very few points. (see Exhibit MB-53)

When the computer determines the slope between two adjacent (but still far apart) survey points, the computer has to interpolate (guess) the elevations between the two points.

The result is that steep slopes are averaged with shallower slopes and the steep slopes just disappear from the Slope Layer.

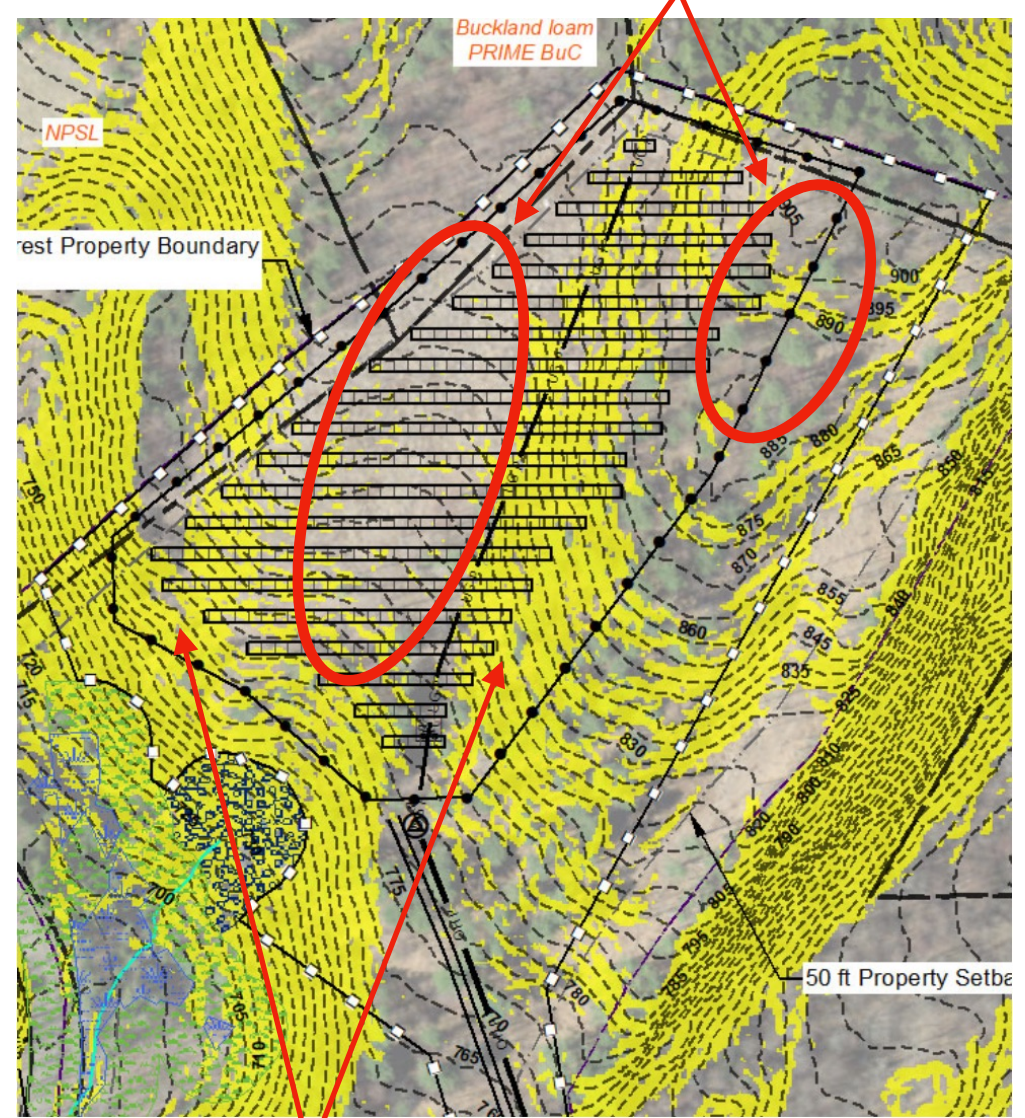
and thus, the Third Site Plan...

Third Site Plan No Yellow Here!



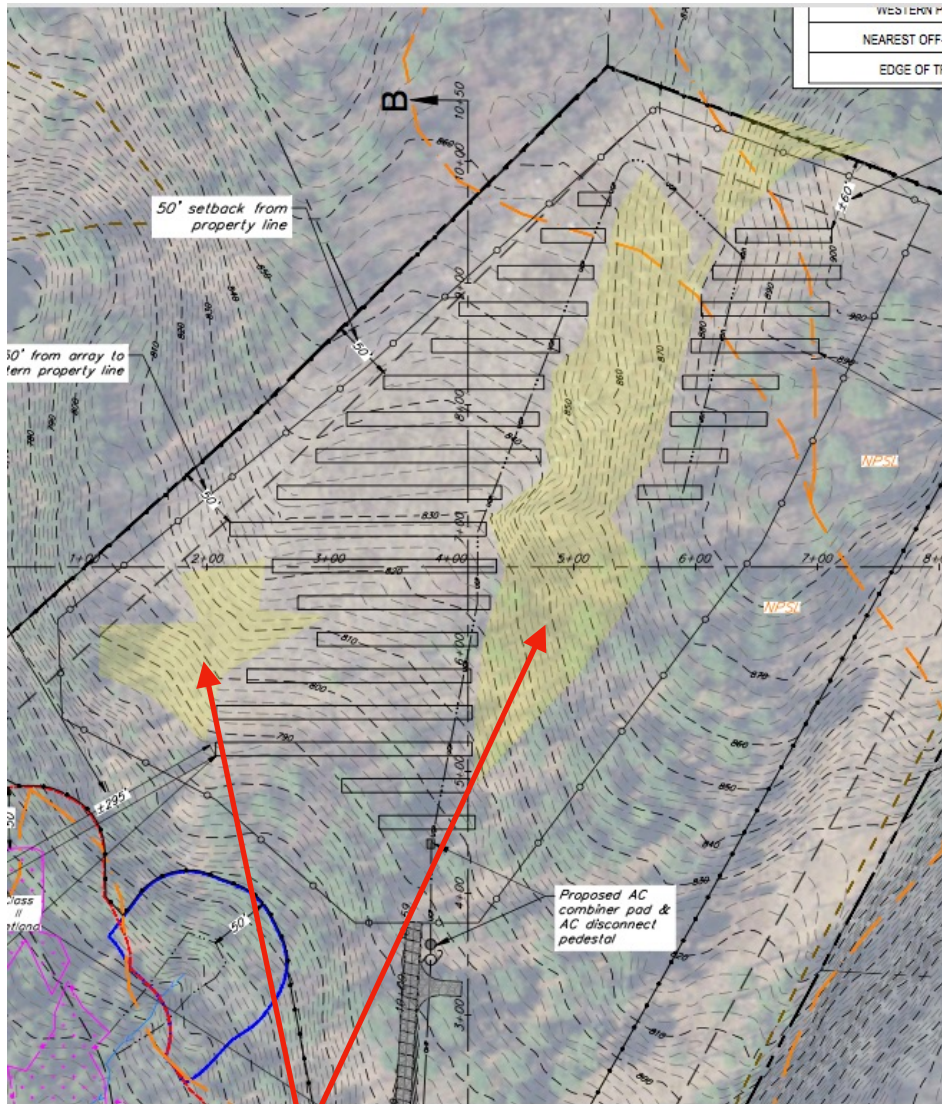
Contrived Slope Layer with unnatural shapes and smooth edges

Some Yellow here



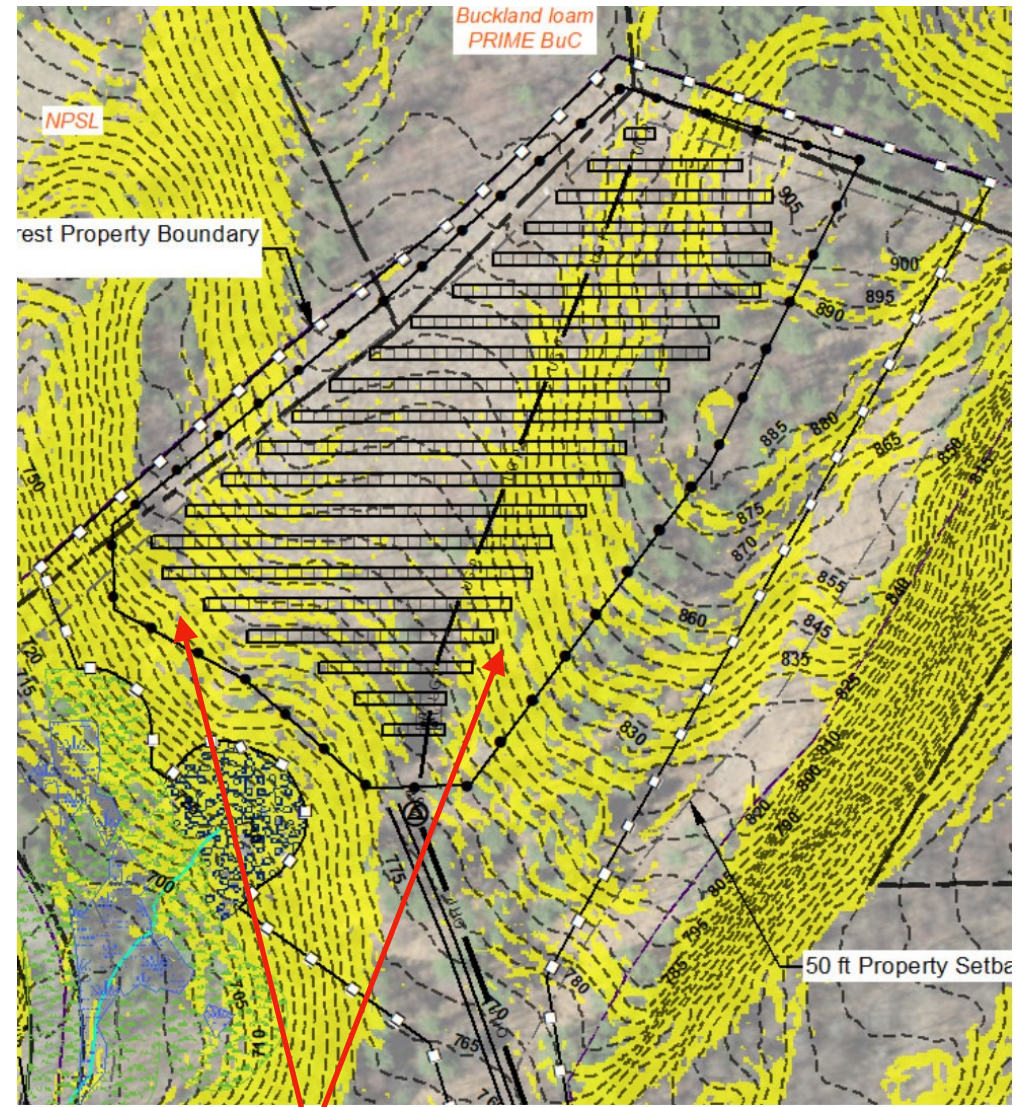
LiDAR Slope Layer with natural shapes and frayed edges

Natural landscapes do NOT make slope layers that look like this:



Contrived Slope Layer with unnatural shapes and smooth edges

Natural landscapes make slope layers that look like this:



LiDAR Slope Layer with natural shapes and frayed edges

Q1. Is there any reason why a developer would hire a surveyor for a solar project?

A1. Yes, to locate property lines, flag the limits of disturbance and setbacks and buffers, and sometimes to lay out the array, access road, stormwater structures, or utility lines.

Q2. Why would a solar developer go to the considerable expense of a ground based **topographic** survey if the developer could use LiDAR topographic contours with the click of a mouse?

A2. Generally, there is no good reason for doing so. In the present case, a ground based topographic survey served the purpose of hiding slopes greater than 25%.

Q3. Is there any reason not to use LiDAR contours and (if required) LiDAR slope layers in a solar site plan?

A3. No. Over the past decade it has become the norm to use LiDAR elevation data to draw contour lines on solar site plans.

It is unusual to see a large area of ground based topographic survey contours patched onto a base map with LiDAR contours (e.g. site plans 2-6).

It is also unusual to see a LiDAR slope layer on the same plan as a slope layer contrived from a ground based topographic survey (e.g. site plans 4-6).

MB-39 Part 5

The Slope Layers Meet

The Fifth Site Plan (not shown) rearranged the panels again and reduced the Limits of Disturbance (LoD) by 0.3 acre. Still present was the LiDAR slope layer around the road and the contrived slope layer under and around the array. Still absent was a slope layer on the remaining LoD.

In the first 5 Site Plans, the discontinuities between the ground based topographic survey and the LiDAR base map, although noticeable to the trained eye, were not glaringly obvious.

That changed in the Sixth Site Plan...

The 2nd Set of Discovery Questions forced the developer to acknowledge the lack of a Slopes Layer over the **entire Limits of Disturbance.**

If a LiDAR Slope Layer were applied to the entire Limits of Disturbance, it would show that some panels were on slopes greater than 25%.

If a LiDAR Slope Layer were applied **alongside the Contrived Slope Layer**, the discontinuities between the two layers and the different appearance of the two layers would be very obvious. The contrived nature of the slope layer under and around the array would be significantly more apparent.

The Slope Layers Finally Meet...
On the Next Page: The Sixth Site Plan

In the Sixth Site Plan, a LiDAR derived Slope Layer (Green) is shown everywhere within the LoD, except where the Contrived Slope Layer persists under and around the Array.



The discontinuities where the Contrived, ground-based-survey Slope Layer meets the LiDAR Slope Layer are now glaringly obvious.

The claim that the Array is entirely on Slopes less than 25% is not credible.



The Green LiDAR Slope Layer would extend under the Array if the contrived slope layer was not masking the actual steep slopes.

MB-39 Part 6 Conclusion

