TCC
Supplemental Testimony
Mark Baird
EXH-5910-S

BEFORE THE STATE OF WASHINGTON
ENERGY FACILITY SITING EVALUATION COUNCIL

In the Matter of the Application of: Scout Clean Energy, LLC, for Horse Heaven Wind Farm, LLC, Applicant.	DOCKET NO. EF-210011 SUPPLEMENTAL TESTIMONY OF TCC WITNESS MARK BAIRD

Q: Please state your name and address.

A: Mark Baird, P.O. Box 842, 4716 Mill Creek Rd, Fort Jones CA 96032.

Q: Please briefly state your work experience and qualifications.

A: I have over 23,000 hours of flight experience, 17,500 in the DC-10.

I hold the following airman certificates: ATP multi engine land with type ratings in B-744, DC-10, MD11. I hold an Airframe and Power plant mechanic certificate, and an advanced ground instructor rating. I have 15 years experience as an instructor pilot in the DC-10, and 7 years experience as a pilot engaged in aerial firefighting using the DC-10 fire tanker.

Q: Did you review information about the Horse Heaven Hills project location and terrain?

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A: Yes, in preparing for my testimony, TCC member and witness Paul Krupin utilized CalTopo to assist in familiarizing me with the fire history and topography of the area. These materials included the following maps and photographs:

Page 6 is the Fire map created by the South East Washington Interagency Team for the Hansen Road – Rupert Road Fire that occurred on June 16, 2023. The map shows the location and the extent of the fire perimeter. The area is located south of Interstate 82 south of Benton City, WA. The Hansen Road fire is approximately 12 miles in length east to west and one to two miles wide north to south.

Page 7 is an aerial photo taken out the window of one of the DC-10's dropping fire retardant on the Hansen Road – Rupert Road fire, on June 16, 2023, showing the extent of the fire and the fire perimeter.

Page 8 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the fire history data layer on the lands to the north of the Horse Heaven Hills project area. The fire history in this area covers events from the year 2002 to present roughly 20 years). The black dots show the proposed Horse Heaven Hill project wind turbine locations. The orange and red zones are the individual fire events with their name and the date they occurred. The fire perimeters in red show the extent to which the fire burned. This map depicts an area south of Interstate 82 south of Benton City and Kennewick in Washington State.

Page 9 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope angle shading data layer using 40-foot contour lines to visually enhance the steep slope terrain in and north of the Horse Heaven Hills project area.

Page 10 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the road map data layer to visually enhance the

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identification of known vehicular access roads in the area and terrain in and north of the Horse Heaven Hills project area.

Pages 11 and 12 are CalTopo digital Geographic Information System maps (www.Caltopo.com) showing the USGS Topographic Map data layer showing the detailed contour lines to aid in the interpretation of rugged and steep terrain in the area of the fire and in and north of the Horse Heaven Hills project area. Page 11 is the western section and page 12 is the eastern section of the burned area north of the Horse Heaven Hills Project area.

Page 13 is a CalTopo digital Geographic Information System map (www.Caltopo.com) switched from a topographic map to an aerial photo layer (NAIP from the USDA Farm Service) showing the 40-foot contours on top of the ground surface. This map can be used to visually enhance the identification of known ground surface features including irrigation, wineries, residences, roads, and highways and much more. This figure covers the area in and north of the Horse Heaven Hills project area.

Page 14 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope shading contours and the fire history data layers simultaneously. Four-mile radial circles were drawn around six selected fire perimeter locations, and a polygon was then drawn around the external perimeter of these circles. The polygon identifies a potential restricted airspace zone needed to ensure the safety of aerial firefighters.

Page 15 is a CalTopo digital Geographic Information System map (www.Caltopo.com) showing the slope shading contours and the fire history data layers simultaneously. Two-mile radial circles were drawn around six selected fire perimeter locations, and a polygon was then drawn around the external perimeter of

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these circles. The polygon identifies a smaller potential restricted airspace zone needed to ensure the safety of aerial firefighters.

Q: Please describe your observations and comments on the Horse Heaven Hills Wind Farm and how it relates to aerial firefighting operations.

A: The Horse Heaven Wind project as mapped and described in the information I received would, for all intents and purposes, be indefensible by air. The communities and structures adjacent to, or nearby, the project would also be indefensible using fixed wing aircraft. Aerial firefighting efforts would either be impossible or rendered totally ineffective due to the height and spacing of the turbines in addition to their placement on the higher ground, which negates the ability to prevent fire from running uphill or "backing behavior," which is typical in terrain described and illustrated in the project maps.

Aerial assets are also prohibited from dropping retardant on electrical infrastructure and any watercourses in the fire area, further reducing the capability of the aircraft to assist in building effective fire lines. Fire retardant weighs nine pounds per gallon. Dropping at between 150 and 160 knots at low altitude would cause catastrophic damage to any of the proposed infrastructure were it to be hit during routine fire fighting activity.

Q: Please describe your opinion on how close the turbines can be located if airspace must be restricted to ensure that aerial firefighting operations can be conducted safely.

A: Turbine location, blade turbulence, tip vortex, quantities and spacing of turbines, and proximity to water courses, communities and other structures impact aerial

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firefighting capability and effectiveness of aerial tankers, particularly LATS (Large Air Tankers) and VLATS (Very Large Air Tankers). Blade turbulence and tip vortex also impact helicopter operations.

Between three and four nautical miles spacing would at least make aerial firefighting possible in order to save lives and property. FAA TERPS, and ICAO Pan Ops dictate maneuvering minimum radius of turn for large aircraft as well as minimum climb rates to avoid known obstacles in approach and departure corridors where obstructions are known and accurately mapped; 2.7 nautical miles is the minimum radius of turn for category E aircraft with maneuvering speeds of 168 plus knots. A climb of 200 feet per nautical mile is the minimum for most departure procedures. If the ridge top is 2000 feet msl and it has a 500-foot tower on top of it, climb capability would be exceeded quickly.

Based upon the above information it is my opinion that turbines would require spacing of three to four nautical miles to provide aircraft with the ability to safely and effectively fight fire.

Q: Are you providing photographs?

A: Yes, attached.

I declare under penalty of perjury under the laws of the State of Washington that my testimony and reports are true and correct to the best of my knowledge and belief.

Signed this 3rd day of September 2023 in Fort Jones California

Mark Baird___/s/_____

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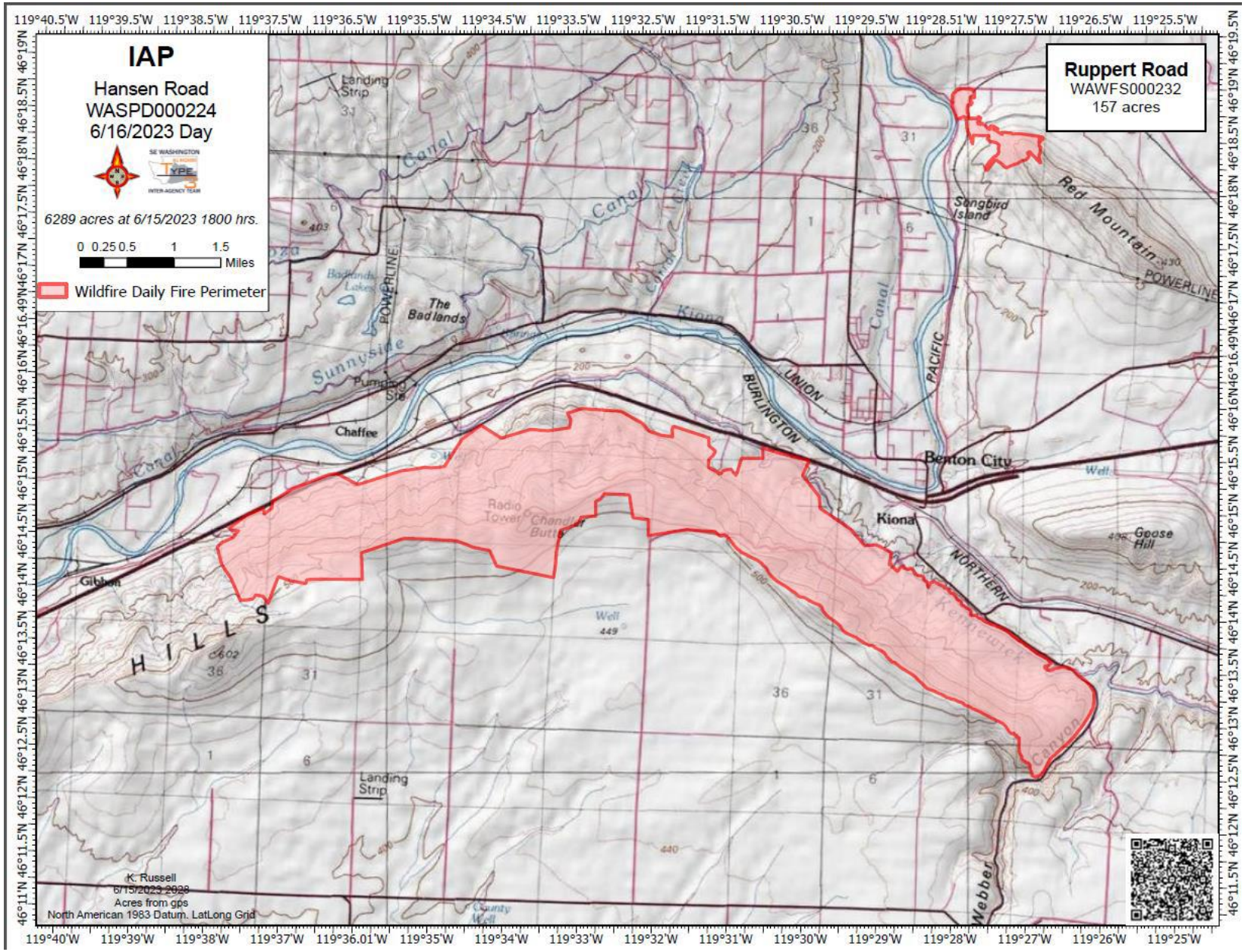
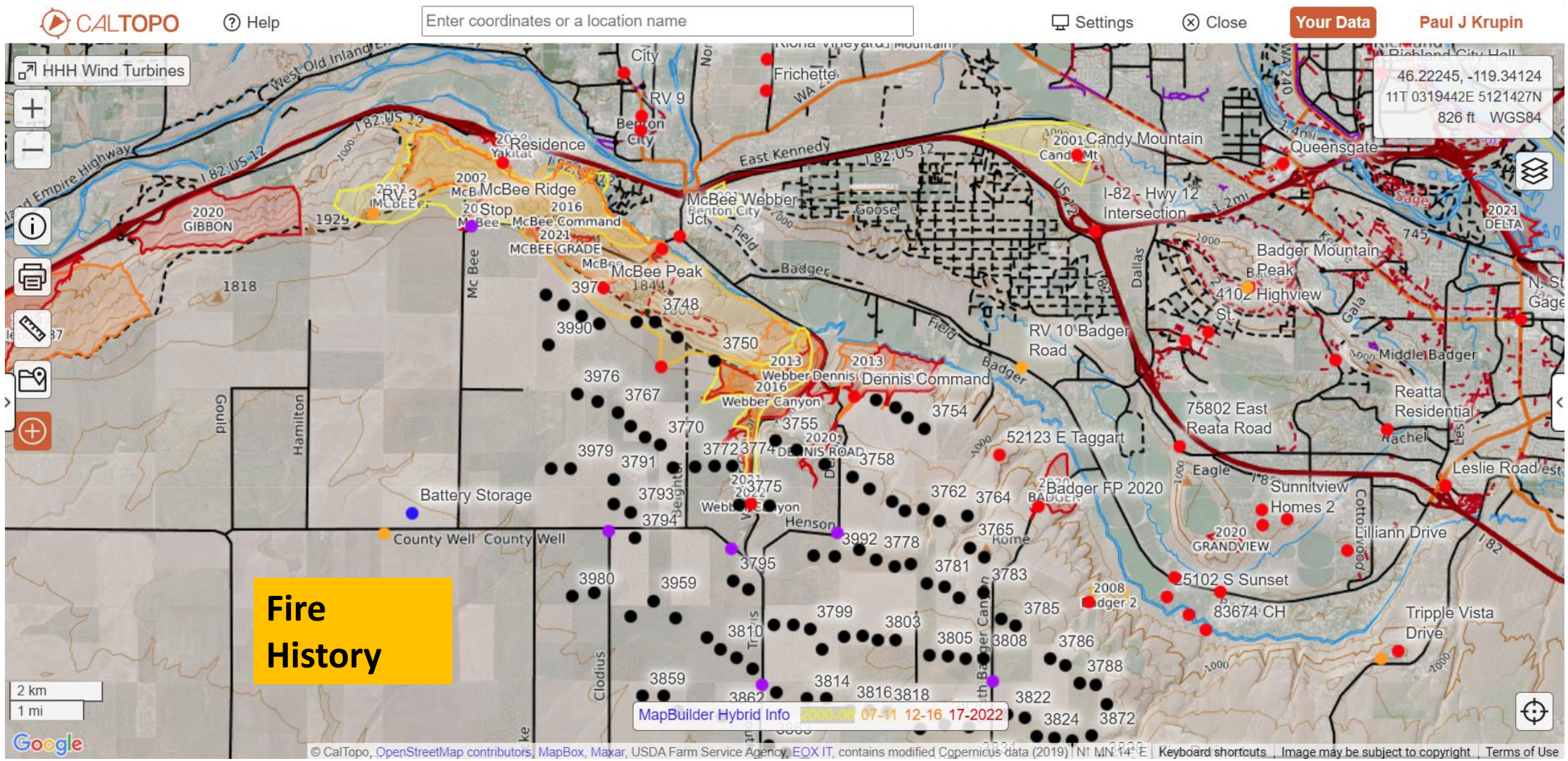

IAP
Hansen Road
WASPD000224
6/16/2023 Day
6289 acres at 6/15/2023 1800 hrs.
0 0.25 0.5 1 1.5
Miles
Wildfire Daily Fire Perimeter
Ruppert Road
WAWFS000232
157 acres
K. Russell
6/15/2023 2028
Acres from gps
North American 1983 Datum. LatLong Grid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Paul J Krupin
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11T 0319442E 5121427N
826 ft WGS84
Fire History
2 km
1 mi
Google
MapBuilder Hybrid Info
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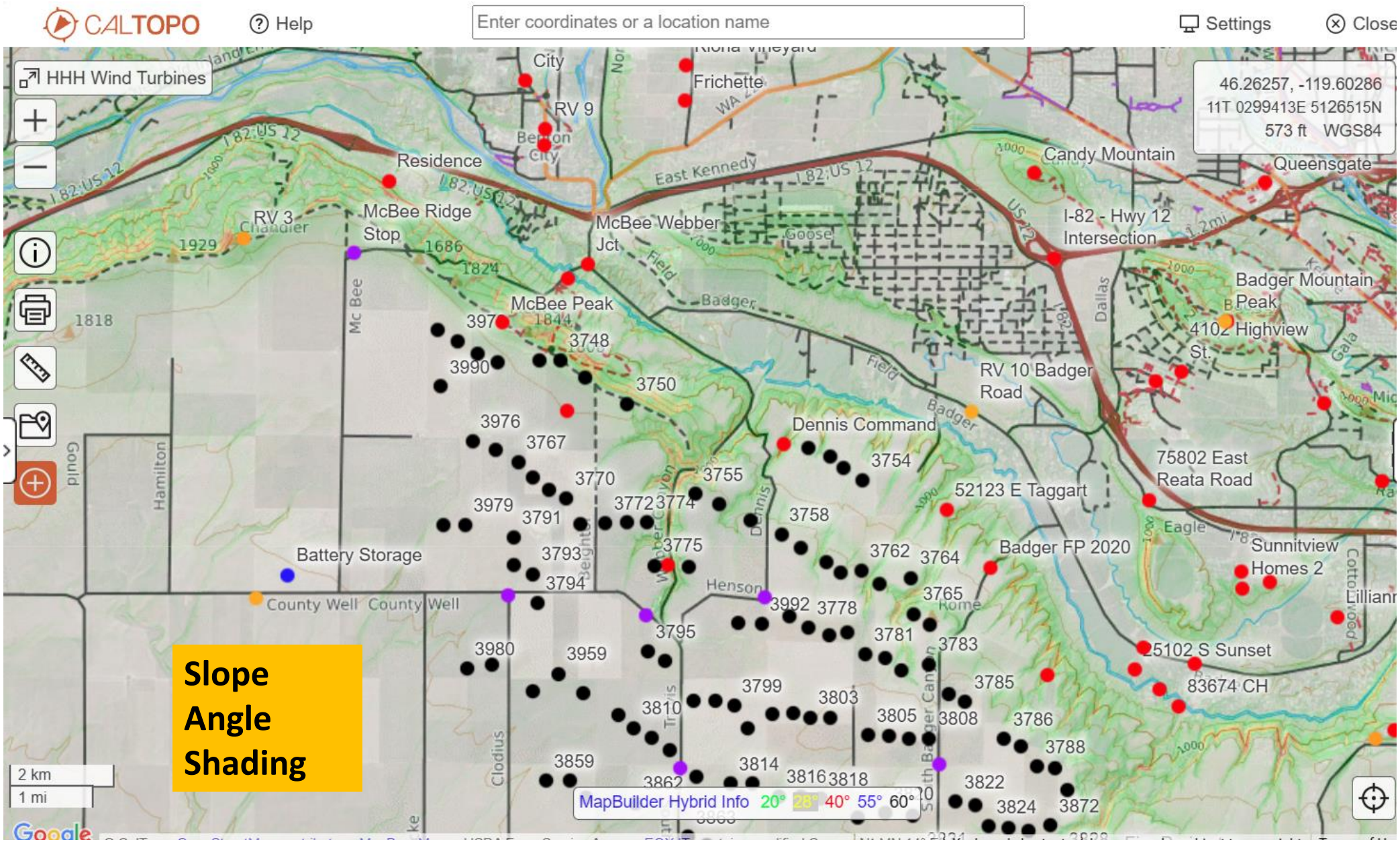
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46.26257, -119.60286
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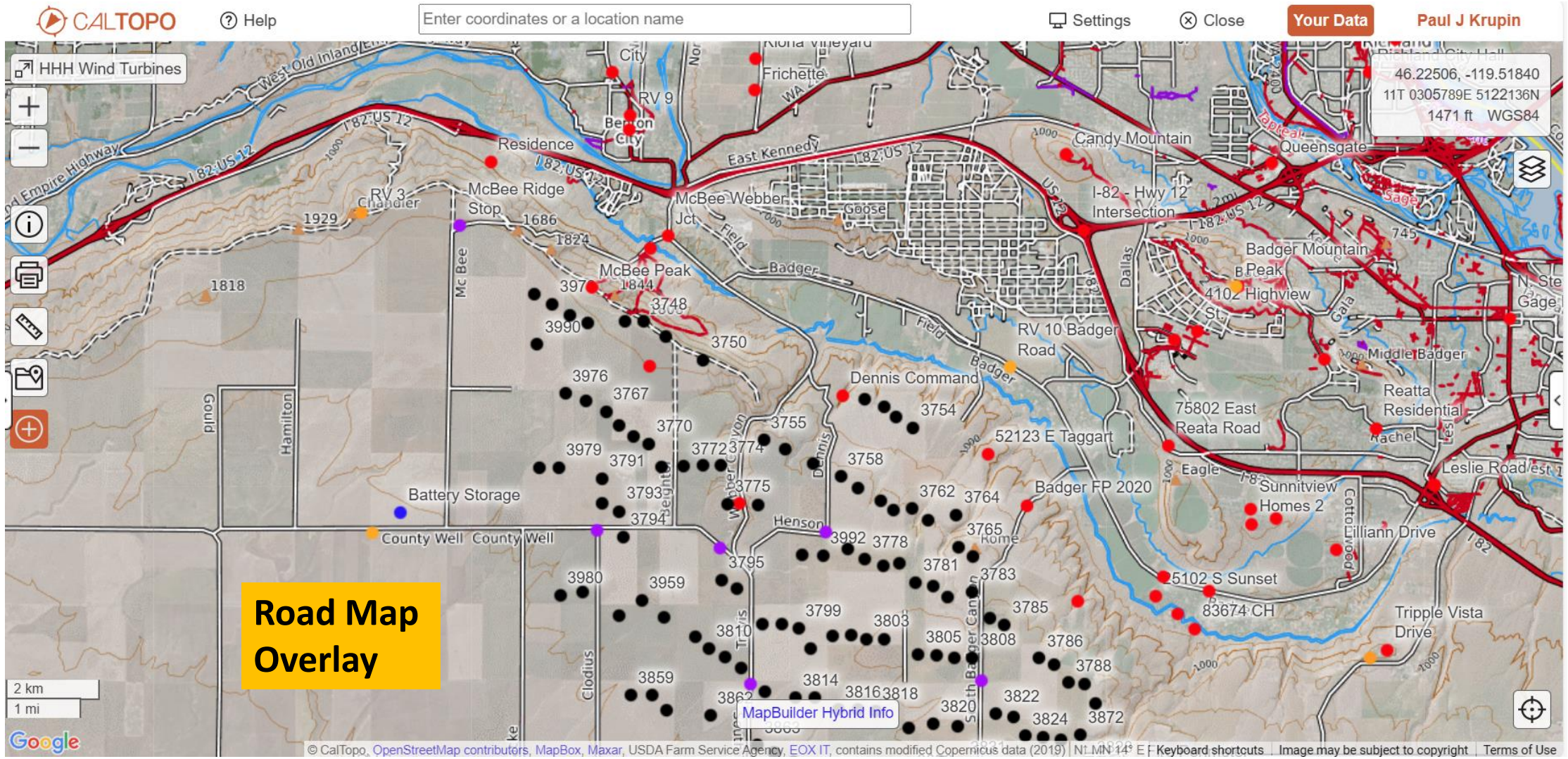
Slope Angle Shading
MapBuilder Hybrid Info 20° 28° 40° 55° 60°
2 km
1 mi
Google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Paul J Krupin
HHH Wind Turbines
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11T 0305789E 5122136N
1471 ft WGS84
Road Map Overlay
MapBuilder Hybrid Info
2 km
1 mi
Google
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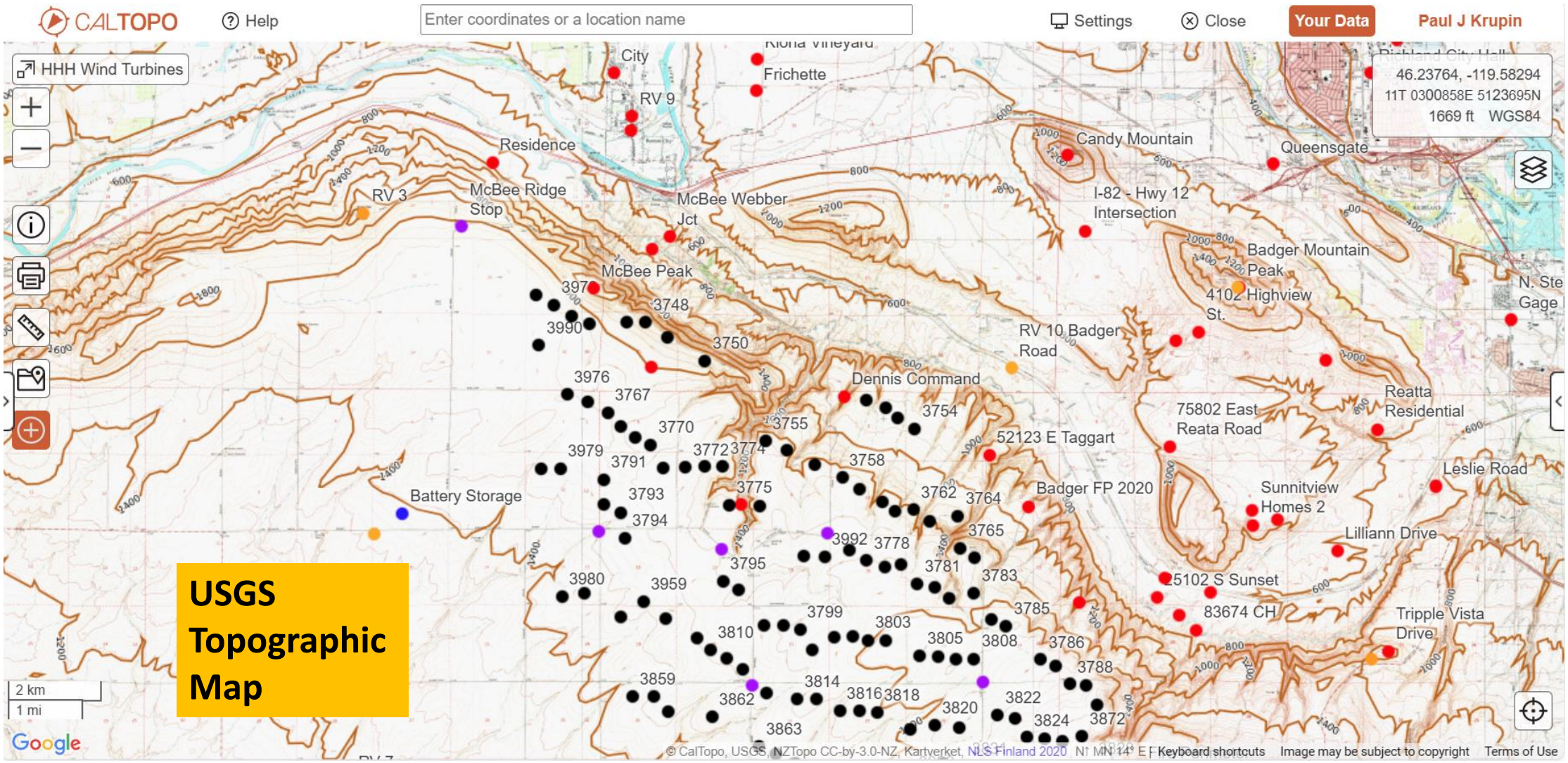
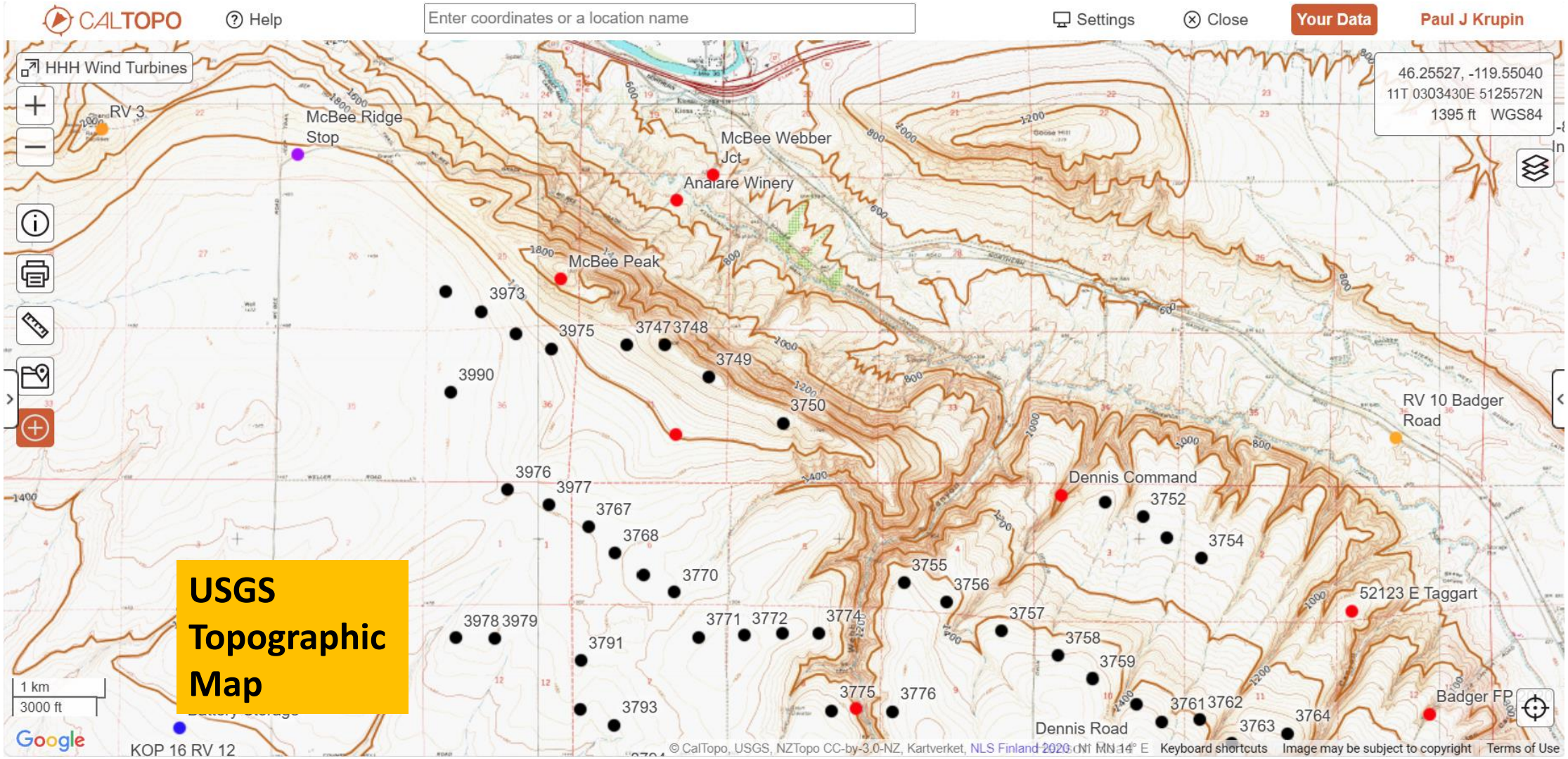


USGS Topographic Map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Enter coordinates or a location name
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Close
Your Data
Paul J Krupin
HHH Wind Turbines
46.25527, -119.55040
11T 0303430E 5125572N
1395 ft WGS84
RV 3
McBee Ridge Stop
McBee Webber Jct
Anaiare Winery
McBee Peak
3973
3975
3747
3748
3749
3990
3750
RV 10 Badger Road
3976
3977
3767
3768
3770
Dennis Command
3752
3754
3755
3756
52123 E Taggart
3757
3758
3759
3978
3979
3771
3772
3774
3791
3775
3776
3761
3762
3763
3764
Badger FP
3793
Dennis Road
KOP 16 RV 12
USGS Topographic Map
1 km
3000 ft
Google
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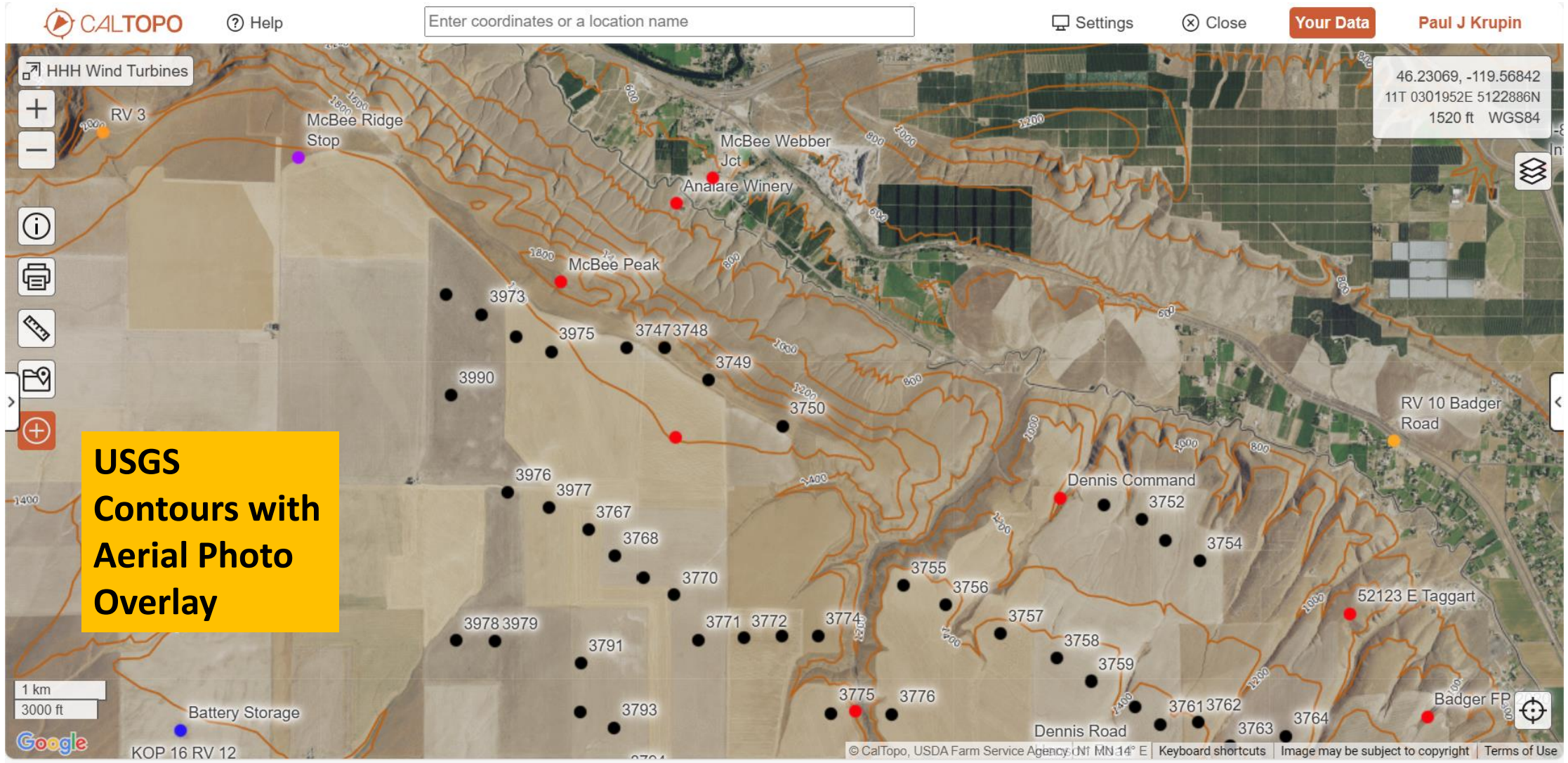
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Enter coordinates or a location name
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Your Data
Paul J Krupin
HHH Wind Turbines
46.23069, -119.56842
11T 0301952E 5122886N
1520 ft WGS84
RV 3
McBee Ridge Stop
McBee Webber Jct
Anafare Winery
McBee Peak
3973
3975
3747 3748
3749
3990
3750
RV 10 Badger Road
3976
3977
3767
3768
3770
Dennis Command
3752
3754
3755
3756
3757
3758
3759
52123 E Taggart
3978 3979
3791
3771 3772
3774
3775
3776
3761 3762
3763
3764
Badger FP
3793
Battery Storage
KOP 16 RV 12
Dennis Road
1 km
3000 ft
Google
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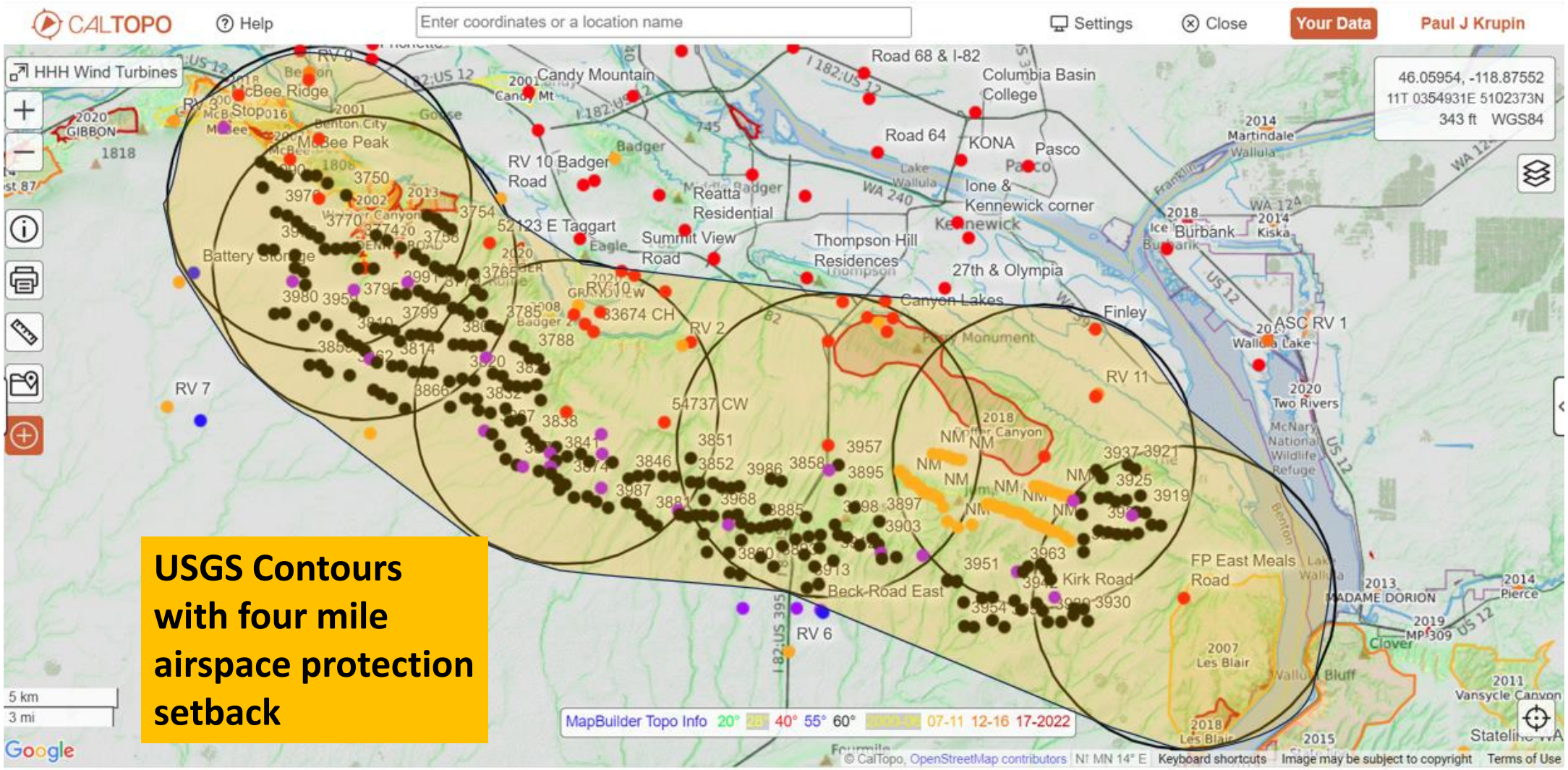
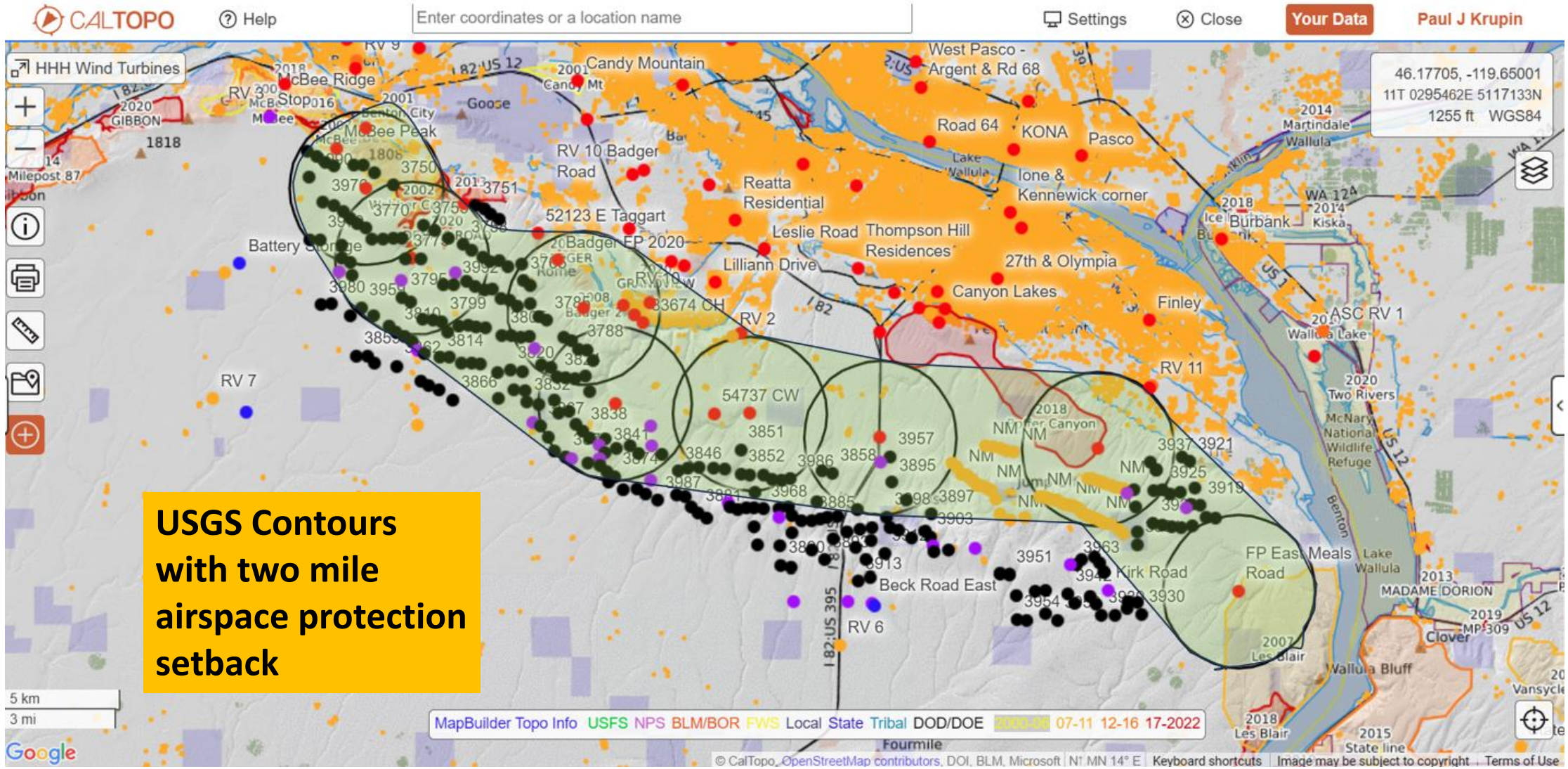
USGS Contours with Aerial Photo Overlay



USGS Contours with four mile airspace protection setback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Your Data
Paul J Krupin
HHH Wind Turbines
46.17705, -119.65001
11T 0295462E 5117133N
1255 ft WGS84
USGS Contours with two mile airspace protection setback
McBee Ridge
McBee Peak
Candy Mountain
West Pasco - Argent & Rd 68
Road 64
KONA
Pasco
RV 10 Badger Road
Reatta Residential
Ione & Kennewick corner
52123 E Taggart
Badger FP 2020
Leslie Road
Thompson Hill Residences
Lilliann Drive
27th & Olympia
Canyon Lakes
Finley
Burbank
ASC RV 1
RV 11
RV 2
RV 7
RV 6
54737 CW
33674 CH
Beck Road East
Kirk Road
FP East
Meals Road
Two Rivers
MADAME DORION
Clover
Wallula Bluff
Fourmile
5 km
3 mi
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