

National Transportation Safety Board

Office of Research and Engineering

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CEN22FA317

GPS & COMMUNICATION DEVICE

Specialist's Factual Report

January 16, 2024

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A. ACCIDENT

Location: Chapelle, New Mexico
Date: July 16, 2022
Time: 1920 Mountain Daylight Time (MDT)
Airplane: Bell UH-1H, Bernalillo County Sheriff's Department, N911SZ

B. GPS & COMMUNICATION DEVICE SPECIALIST

Specialist David L. Case
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C. DETAILS OF THE INVESTIGATION

A global positioning system (GPS) group was not convened. The NTSB Vehicle Recorder Division received the following GPS device:

Recorder Manufacturer/Model: Garmin GTN 750Xi
Part Number: 011-04634-60
Recorder Serial Number: 5FR600405

1.0 Device Description

The Garmin Touchscreen Navigator (GTN) 750Xi is an avionics device that supports functions including communication, navigation, flight planning, arrival and departure procedures, and precision approaches. Controls consist of rotary knobs and push-keys on the bezel with a 6.9 inch color display providing information in addition to touchscreen controls.

1.1 Data Recovery

Upon arrival at the Vehicle Recorder Laboratory, an exterior examination revealed the unit had sustained significant impact damage as shown in Figure 1. The front screen was shattered, and the display did not appear to function when power was applied. It was noted that the device was contained within a sturdy enclosure, and only the display was broken, so an attempt was made to use the display from a Garmin GTN 650, which had the same electrical connections as a GTN 750, but a smaller screen. The smaller display worked, but the user interface for downloading the logs was off the screen. Garmin provided instructions on how to make the 750 operate as a 650, and the data logs were downloaded using the manufacturer's procedure for this device.



Figure 1. Photo of the GTN 750Xi showing impact damage.



Figure 2. Photo of the GTN 750Xi showing the data placard.

1.2 Recording Description

The data extracted included 199 sessions from September 9, 2021 through July 17, 2022.¹ The last log was recorded starting 00:36:07 UTC and ending 01:20:13 UTC on July 17, 2022, and contained the accident. Time for the rest of this report was converted to Mountain Daylight Time (MDT) by subtracting 5 hours from recorded time. This subtraction also brings the date back to the previous day, which is the day of the accident in local time.

1.3 Parameters Provided

Table 1 describes data parameters provided by the GPS device. Date, Time, Latitude, Longitude, and GPS Altitude are recorded by the device. Groundspeed and Track are derived from the recorded parameters.

Table 1. GPS Data Parameters.

Parameter Name	Parameter Description
GndSpd (kt)	GPS Ground Speed, in nautical miles per hour
AltGPS (ft wgs)	GPS Altitude, in feet above sea level using the World Geodetic System datum standard.
VSpd (fpm)	Vertical Speed, derived from AltGPS over time, in feet per minute
TRK (deg)	Track - direction of flight over ground, in degrees
WptBrg (deg)	Waypoint bearing, the bearing to the currently selected waypoint, in degrees
WptDst (nm)	Waypoint distance, the distance to the currently selected waypoint, in nautical miles
AtvWpt (ident)	Active Waypoint, the identifier for the currently selected waypoint.

D. OVERLAYS AND TABULAR DATA

Data obtained from the GTN-750Xi was used to produce the following overlays and tabular data. Due to data buffering on the GPS unit, the data likely ended a few seconds before the accident. A steep descent towards the recorded accident site was noted at the end of the recording.

Figures 3 and 4 are plots of data that were recorded by the GTN-750Xi. Figure 3 is a plot of the entire recording, figure 4 is a plot of the last few minutes of the flight.

Figures 5 through 8 are graphical overlays generated using Google Earth for the accident flight. The weather and lighting conditions in Google Earth are not necessarily the weather and lighting conditions present at the time of the recording.

¹ All dates and times are referenced to coordinated universal time (UTC).

Figure 5 contains the entire recording, including takeoff, flying to and around a ridge south of Las Vegas New Mexico, two short landings, and then a turn to the west in the direction of Albuquerque.

Figure 6 shows flying south to a location west of Mesas Cuatas, continuing over a connected mesa/ridge that appears consistent with firefighting operations, and then a turn back north.

Figure 7 illustrates the helicopter flying north, then circling back south making two stops, and then heading west towards Albuquerque.

Figure 8 shows the end of the recording, including a rapid descent pointed towards where the helicopter was found after the accident.

The corresponding tabular data used to create figures 3 to 8 are provided in electronic comma separated value (CSV) format as attachment 1 to this report.

Submitted by:

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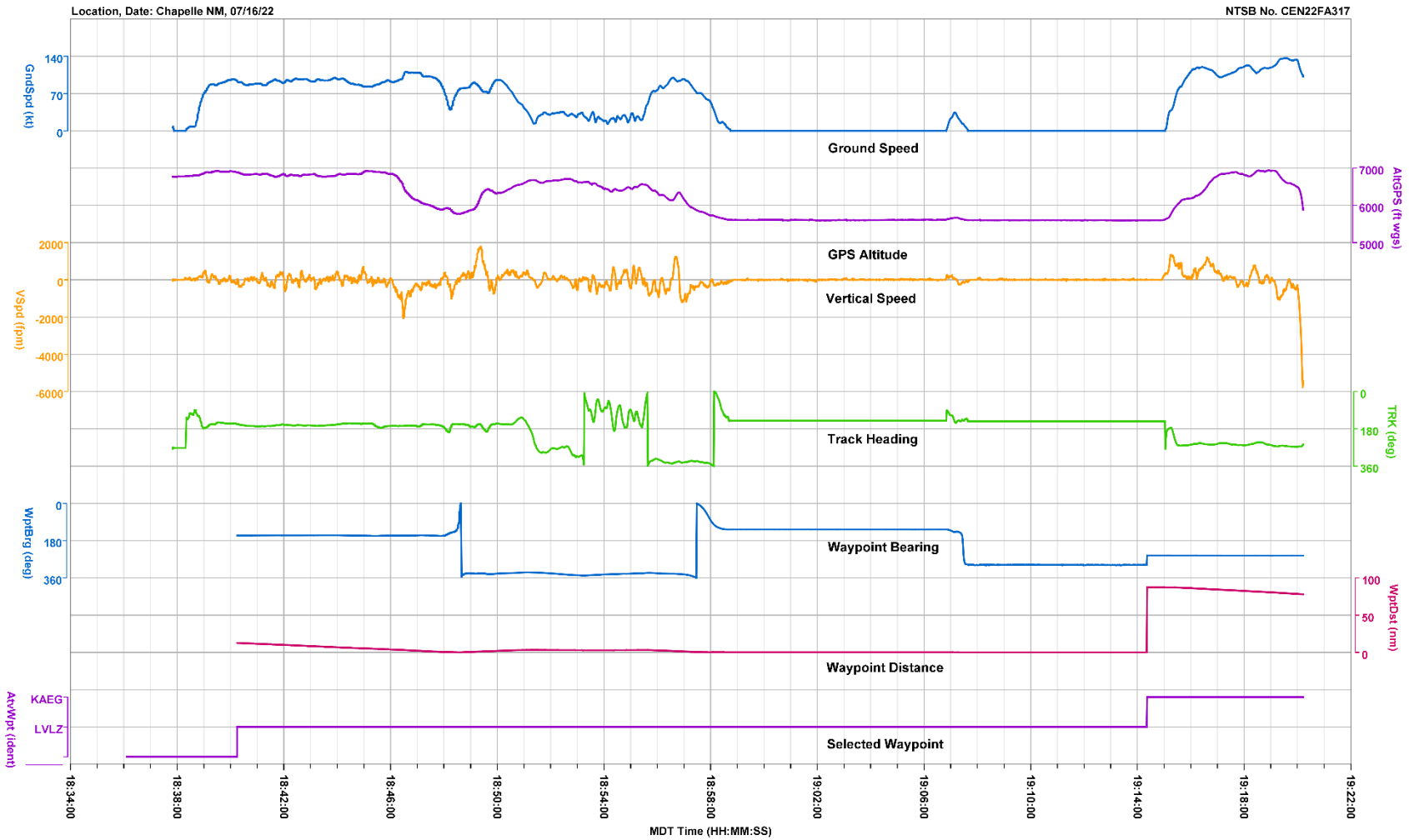


Figure 3. Plot of GPS parameters for the entire recording.

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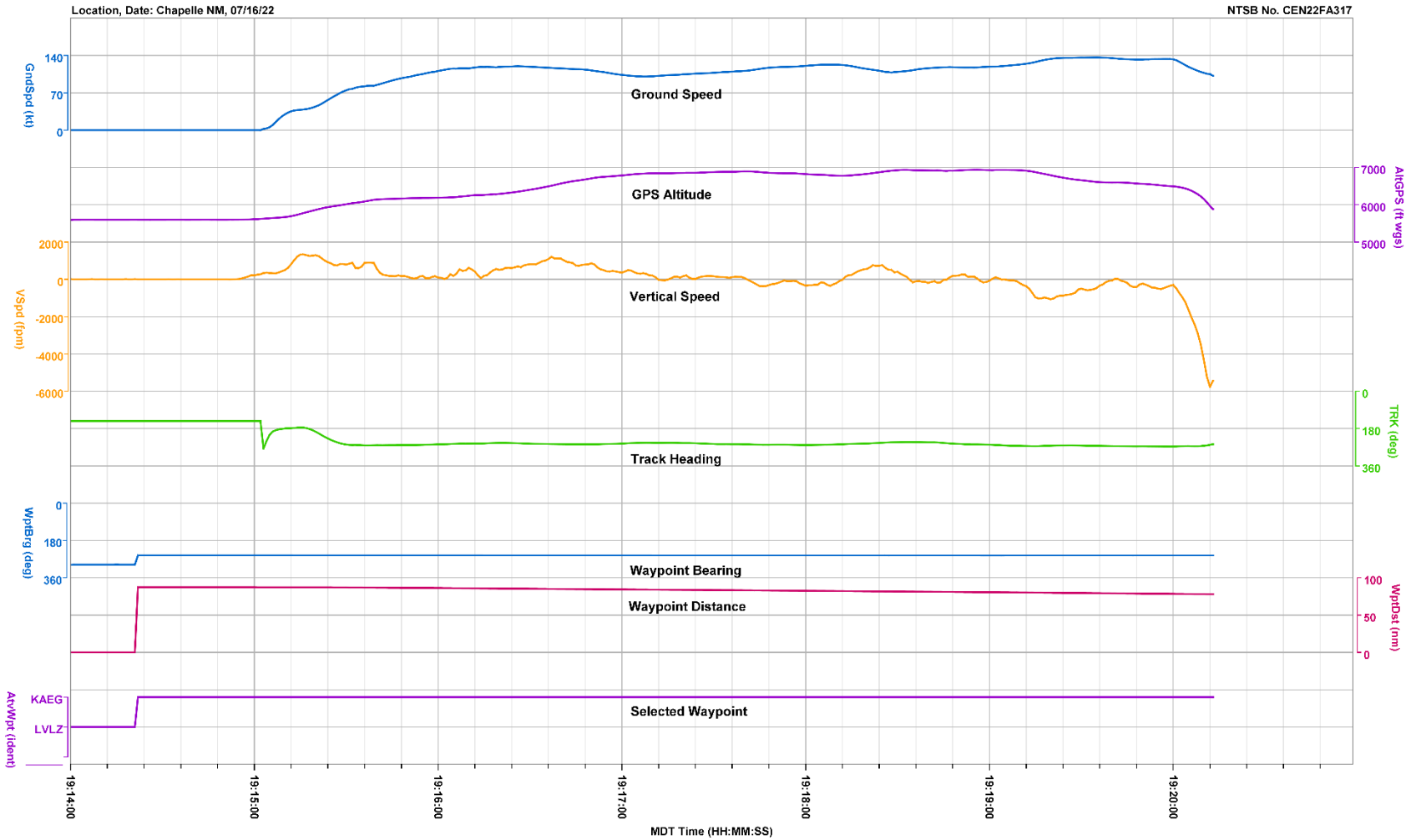


Figure 4. Plot of GPS parameters for the accident.



Figure 5. Plot of the aircraft's flight path for the entire recording.

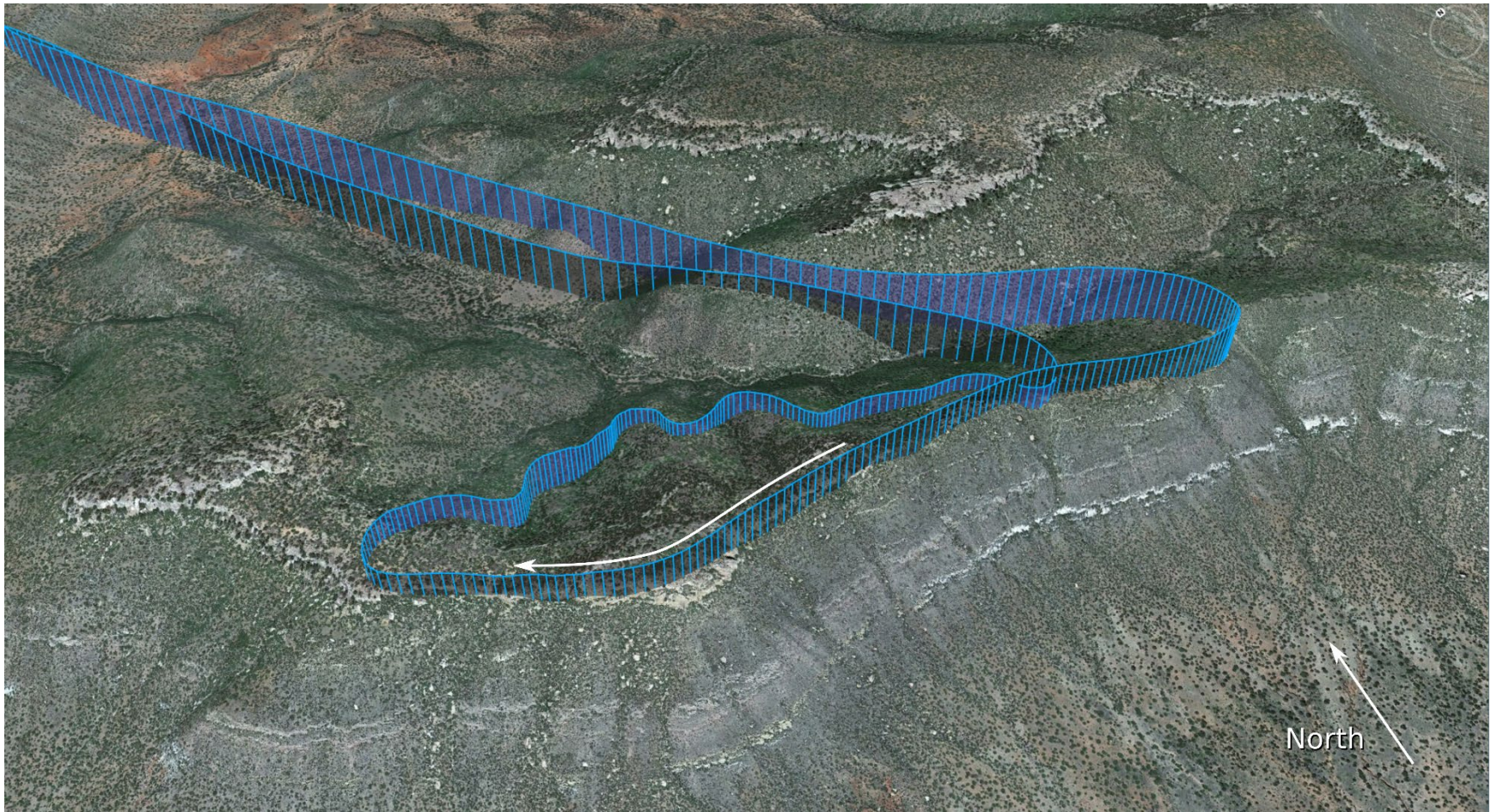


Figure 6. Map overlay of the aircraft's flight along a ridge near Mesas Cuatas south of Las Vegas, NM.



Figure 7. A map overlay showing the location of the 2 landings in the middle of the recording.

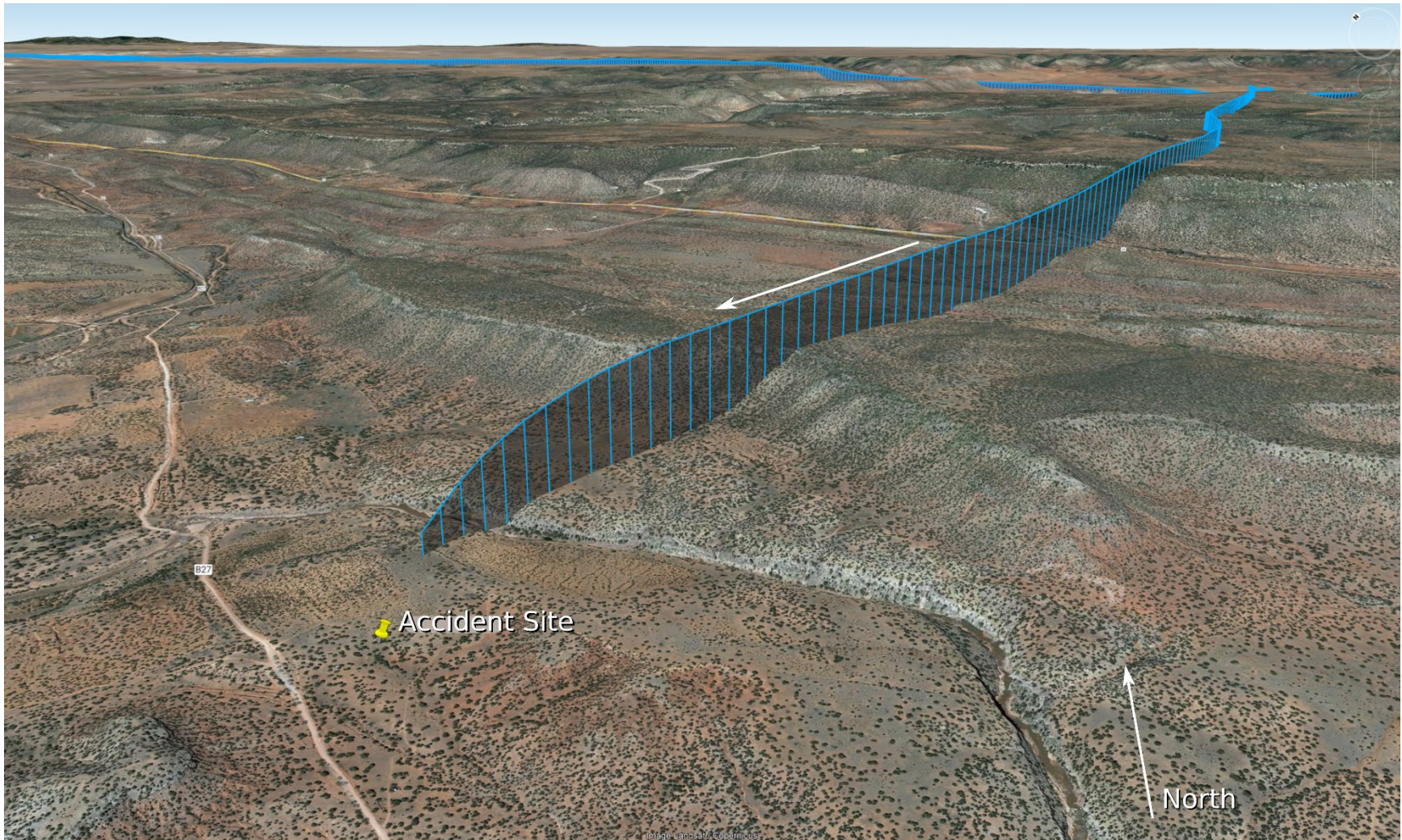


Figure 8. The end of the recording, showing the helicopter flying towards Albuquerque and descending.