CARON WEATHER CONSULTANCY
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SAMPLE — ILLUSTRATIVE, NOT A LIVE FILE.

The property, insured, carrier and claim are fictitious. The weather data are not: every radar scan, station observation and storm report below is an archived NOAA / National Weather Service record for May 22–23, 2024 in San Angelo, Texas. The analysis point was chosen to show the method; no specific property or claim is referenced.

SITE-SPECIFIC HAIL AND WIND ANALYSIS — WRITTEN FINDINGS REPORT

Report date: October 31, 2026 (illustrative sample)

Prepared for: Appraisal panel — illustrative (fictitious insured, carrier and claim number)

Property analyzed: Illustrative commercial property, southwest San Angelo, Tom Green County, Texas; analysis point 31.4150° N, 100.4850° W

Reported date of loss: Thursday, May 23, 2024 (hail and wind)

Questions: Did hail fall at the property, how large, and when? How strong was the wind? Did another storm date also reach the property?

Period analyzed: Radar and station records, May 22–23, 2024; storm-report screen, May 23, 2023 – May 23, 2024

Prepared by: James M. Caron, CCM — Caron Weather Consultancy

The short version

- **Hail reached the property on May 23, 2024, between about 4:54 and 4:58 PM CDT.** Three ground reports within half a mile gave 2.75 to 3.00 inches, two of them measured at 3.00 inches. The best-supported hail size at the property is 2.75 to 3.00 inches.
- **The strongest wind came just before the hail, about 4:50 to 4:54 PM:** an estimated peak gust of about 52 mph from the north-northwest (range 44 to 58 mph). The 73 mph gust measured at the airport was 4.4 miles south and four minutes later; the record does not establish a gust that strong at the property.
- **The radar-only hail estimate at the property was 1.1 inches**, well under the 2.75 to 3.00 inches measured on the ground nearby.
- **Hail also reached the property the day before, May 22, 2024**, with ground reports up to 1.75 inches within a mile. Two hail days fall within 24 hours at this address; the ground reports put the larger hail on May 23.

Terms used

Hail size — NWS reports compare hail to common objects: 1.00 in = quarter, 1.75 in = golf ball, 2.75 in = baseball, 3.00 in = teacup. "Measured" means someone measured a stone; "estimated" means it was judged by eye.

Radial wind — the part of the wind blowing straight toward or away from the radar. The radar cannot see the crosswind part, so radial values are a floor, not a ceiling.

Lowest scan — the radar's lowest beam. Over this property it samples the air roughly 250 feet above the ground.

dBZ — radar reflectivity. Higher values mean heavier rain or hail; values near 60 dBZ and above are typical of hail cores.

ZDR and CC — dual-polarization radar measures of the shape and mix of what is falling. Hail lowers both; heavy rain alone keeps CC near 0.98 to 1.00.

MESH — Maximum Estimated Size of Hail — a radar-only hail-size estimate produced automatically for every square kilometer by NOAA's MRMS system.

Gust front — the leading edge of rain-cooled air pushed out ahead of a thunderstorm; it often brings the strongest wind before the hail.

Severe — National Weather Service criteria: hail 1.00 inch or larger, or a wind gust of 58 mph or more.

1. Summary of Findings

The findings below are stated to a reasonable degree of meteorological certainty and rest entirely on publicly archived federal weather records, itemized in Section 3. All times are Central Daylight Time (CDT).

1. **Hail, May 23, 2024.** The lowest radar scan recorded the dual-polarization signature of hail at the ground over the property from about 4:54 to 4:58 PM. Ground reports within 0.5 mile: 3.00 inches (measured), 3.00 inches (measured) and 2.75 inches (estimated, National Weather Service employee). The best-supported hail size at the property is 2.75 to 3.00 inches.
2. **Wind, May 23, 2024.** The storm's gust front crossed the property ahead of the hail. The radar sampled winds of 49 to 51 mph toward the radar about 250 feet above the property at 4:52 PM. Calibrated against the 73 mph gust the airport station measured at 4:56 PM, the best estimate of the peak gust at the property is about 52 mph from the north-northwest, with a range of 44 to 58 mph. The record does not establish a gust of 58 mph or more at the property.
3. **Radar-only estimate.** The automated radar hail-size estimate (MESH) at the property was 1.1 inches, and no more than 1.3 inches within a mile. Ground reports within half a mile measured 3.00 inches.
4. **Prior day.** Hail also reached the property on May 22, 2024: the lowest scan shows the hail signature over the property from about 4:56 to 5:09 PM, and the nearest ground report was 1.75 inches (estimated) 0.9 mile west-northwest. Radar winds over the property were similar on both days. The ground reports support larger hail on May 23.
5. **Twelve-month screen.** From May 23, 2023 to May 23, 2024, no other hail was reported within 3 miles of the property. Thunderstorm wind was reported within 3 miles on four other dates (June 9, June 23 and August 10, 2023; May 3, 2024).

Scope note: this report states what the weather was at the property and when. Whether any of it caused or contributed to particular damage is a question for the panel and its engineer, and is outside the scope of this report.

2. Assignment and Scope

In this illustration, an appraisal panel asks for the archived weather record at the property and a site-specific reconstruction of hail and wind for the reported date of loss, May 23, 2024, together with a check of other storm dates that reached the property. The work follows the claims-stage process: initial findings first, then this signed report for the file.

3. Data Relied Upon

All sources are public, archived federal records. Each would be delivered with the report in a reliance data package.

1. NEXRAD WSR-88D Level-II radar, station KSJT (San Angelo), NOAA archive: every volume scan from 4:06 to 5:31 PM on May 23, 2024 and 4:41 to 5:11 PM on May 22, 2024, including reflectivity, radial velocity, ZDR and CC.
2. NOAA Multi-Radar Multi-Sensor (MRMS) MESH, 60-minute maximum, ending 5:20 PM on May 22 and May 23, 2024.
3. ASOS surface observations, San Angelo Regional Airport (KSJT), May 23, 2024, including special observations and the peak-wind remark; via the Iowa Environmental Mesonet archive.
4. National Weather Service Local Storm Reports (NWS San Angelo), May 23, 2023 – May 23, 2024, all reports within 5 miles.
5. U.S. Census Bureau boundary, road and water files (2023) for the maps.

4. Methodology

The property sits 3.1 miles north of the KSJT radar, close enough that the lowest scan passes roughly 250 feet above the ground. For every scan, all radar samples within 0.75 km (0.47 mile) of

the property were extracted; a 1.5-km neighborhood was carried for context. Radial winds were filtered (3×3 median) so that only spatially coherent values are reported, and converted to mph. A hail signature is recorded when at least 20 samples near the property reach 50 dBZ and the median CC within them falls below 0.95. Storm-report distances are measured from the analysis point; NWS report times are converted from UTC.

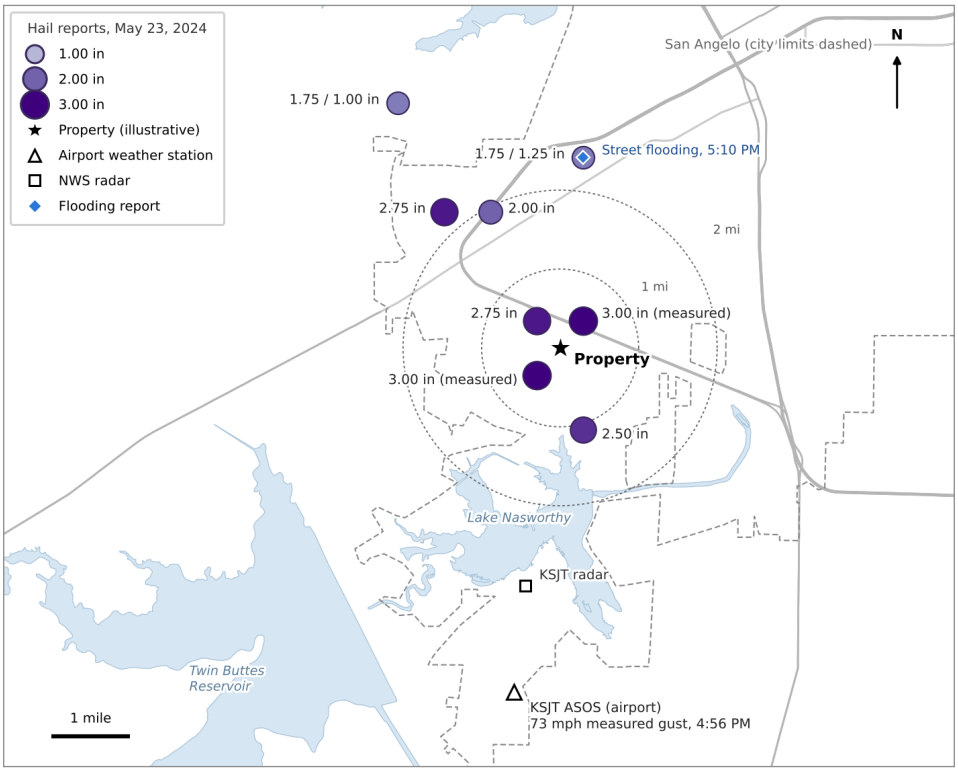
To turn radar wind into a gust estimate, the radar value over the airport station was compared with what the station measured at the same minute: 68 mph from the radar against a 73 mph measured gust at 4:56 PM, a ratio of 1.06. The beam crosses the wind at nearly the same angle over the station and over the property, so the ratio carries over. The range runs from 10 percent below the radar value over the property (44 mph) to the 1.5-km value corrected for the angle between the beam and the wind (58 mph). Wind direction at the property is inferred from the airport station and the radar wind pattern.

Limitations, stated plainly. A single radar measures only the radial part of the wind, so radar values are a lower bound. Storm reports are published to the nearest 0.01° of latitude and longitude (about 0.6 mile), and public report times are often approximate; here, the radar places the hail core over the property several minutes after two of the reported times. MESH is computed from radar data aloft and is not a ground measurement. No instrument stood at the property.

5. Detailed Findings

5.1 Storm reports around the property, May 23, 2024

Ten hail reports fell within 4 miles of the property between 4:37 and 4:59 PM, with sizes from 1.00 to 3.00 inches. The three closest — all within half a mile — are the largest: 3.00, 3.00 and 2.75 inches. The airport station, 4.4 miles south, measured a 73 mph gust at 4:56 PM, and street flooding to 12 inches deep was reported 2.4 miles north at 5:10 PM.



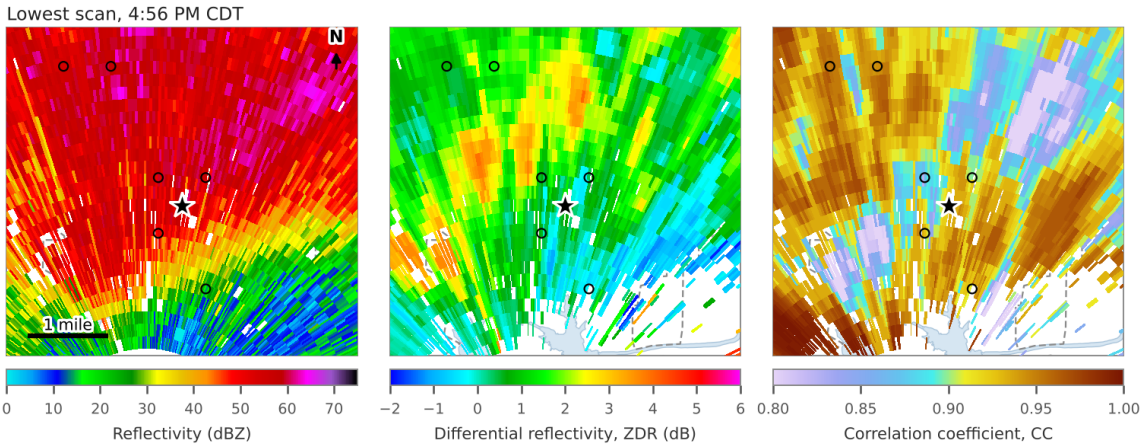
Hail reports, the measured wind gust and the flooding report around the property on May 23, 2024. Circle size and shade follow hail size; rings mark 1 and 2 miles from the property.

Time (CDT)	Report	From property	Source
4:45 PM	Hail 3.00 in (measured)	0.5 mi SW	Public; "golf ball sized hail with a few bigger than baseballs"
4:52 PM	Hail 3.00 in (measured)	0.5 mi NE	Public
4:55 PM	Hail 2.75 in (estimated)	0.5 mi NW	NWS employee
4:59 PM	Hail 2.50 in (estimated)	1.1 mi SSE	Public
4:48 PM	Hail 2.00 in (estimated)	1.9 mi NNW	Public (mPING)
4:50 PM	Hail 2.75 in (estimated)	2.3 mi NW	Public
4:39 / 4:47 PM	Hail 1.25 / 1.75 in (estimated)	2.4 mi N	Public (one via mPING)
4:37 / 4:42 PM	Hail 1.00 / 1.75 in (estimated)	3.7 mi NW	Public (mPING)
4:56 PM	Wind gust 73 mph (measured)	4.4 mi S	Airport ASOS (KSJT)
5:10 PM	Street flooding, water to 12 in	2.4 mi N	Amateur radio

NWS storm reports, May 23, 2024, nearest first; the three reports within half a mile are shaded.

5.2 Hail at the property: the radar signature

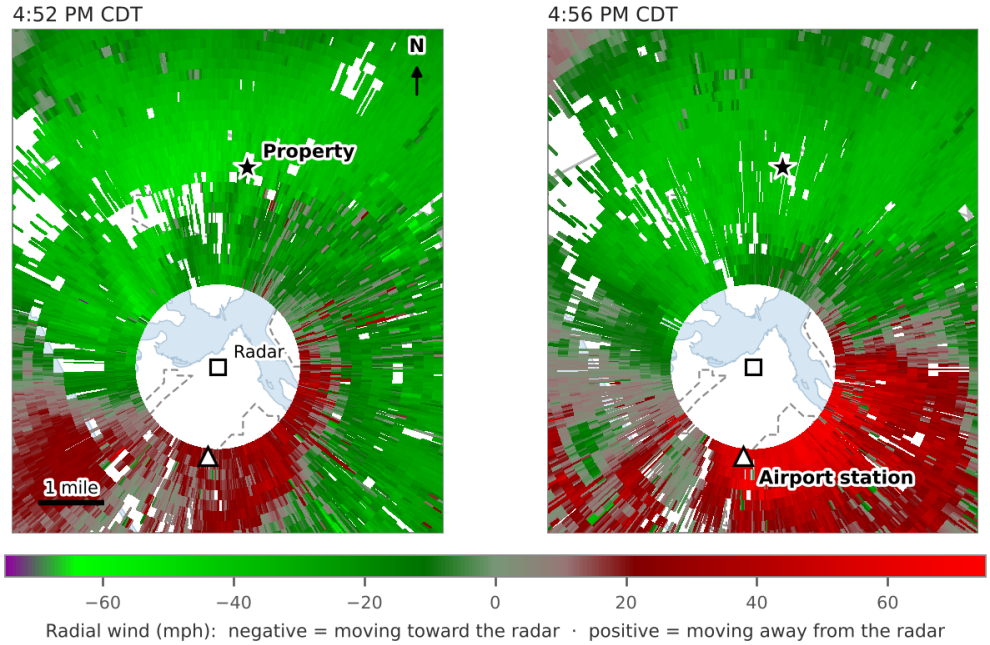
At 4:56 PM the lowest scan over the property shows reflectivity near 62 dBZ, ZDR near 1 dB and CC near 0.92 — the combination produced when hail, not rain alone, is falling through the beam. That signature held over the property on the scans at 4:54, 4:56 and 4:58 PM. From 4:59 to 5:10 PM reflectivity stayed near 60 dBZ but CC rose to 0.97 to 0.99 and ZDR to 2 to 4 dB: heavy rain behind the hail. The storm cleared the property by about 5:15 PM.



Lowest radar scan over the property at 4:56 PM on May 23, 2024: reflectivity, ZDR and CC. The star marks the property; open circles are that day's hail reports. ZDR and CC are lightly smoothed for display.

5.3 Wind at the property

The gust front reached the property before the hail. The radar wind toward the radar over the property rose from about 20 mph at 4:45 PM to 49 mph at 4:52 and 4:54 PM (51 mph within 1.5 km), then eased to 40 mph by 4:56 PM as the hail arrived. Four minutes later the same outflow reached the airport, where the radar sampled 68 mph and the station measured its 73 mph peak gust from the north-northwest. Applying the 1.06 station ratio to the property's 49 to 51 mph gives a best estimate of about 52 mph at the property, within a range of 44 to 58 mph.



Radar wind over the property at 4:52 PM (left) and over the airport station at 4:56 PM (right), May 23, 2024. Green is air moving toward the radar, red is air moving away; the outflow was blowing from the north-northwest across both points.

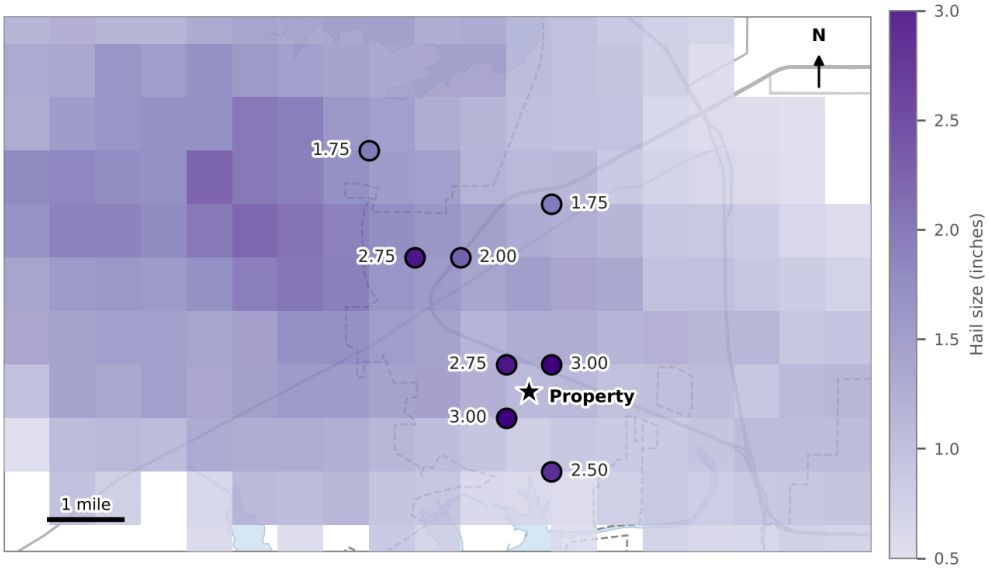
The timeline below sets the radar record over the property beside the airport observations. Wind peaked at the property at 4:52 to 4:54 PM, the hail signature followed at 4:54 to 4:58 PM, and the strongest measured gust came at the airport at 4:56 PM, after the gust front had moved south. Temperature at the airport fell from 93°F at 4:41 PM to 78°F at 5:02 PM.



Reflectivity and wind over the property, with airport station winds, 4:30 to 5:30 PM on May 23, 2024. The shaded band is the hail signature at the property. Station gusts are the highest in the minutes before each observation; the 73 mph peak at 4:56 PM is from the station's peak-wind remark.

5.4 Radar-only hail estimate versus ground reports

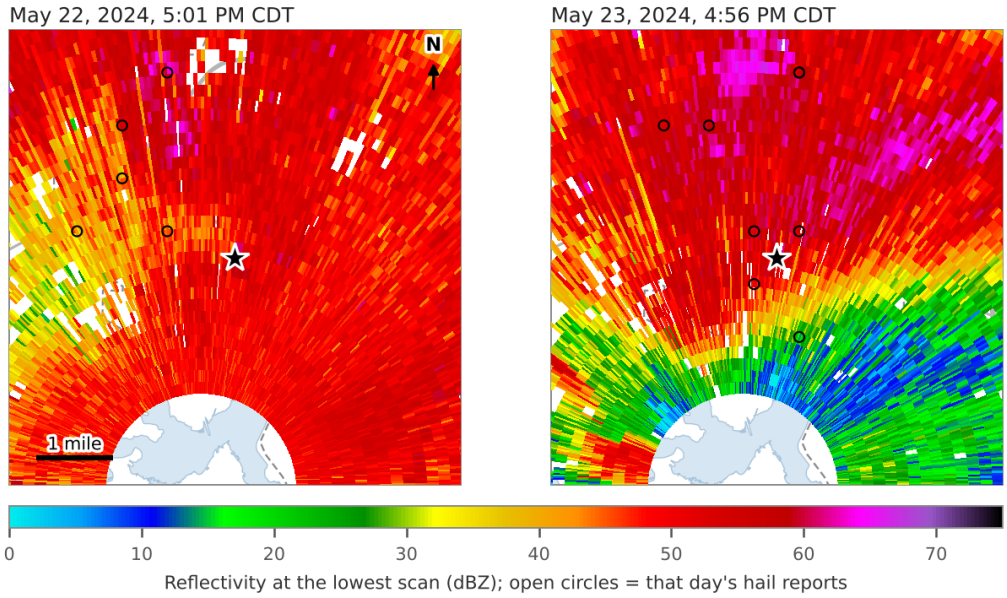
The MRMS radar estimate of maximum hail size (MESH) for the hour ending 5:20 PM was 1.1 inches at the property, no more than 1.3 inches within a mile, and 2.2 inches at its highest anywhere in the area. Ground reports within half a mile measured 3.00 inches. MESH is computed from radar reflectivity above the freezing level, several miles aloft, using a formula fitted to many past storms; at a single address it can run well below or above what reached the ground. This is why the findings above rest on the ground reports and the low-level radar signature, with MESH shown for comparison.



Radar-estimated maximum hail size (MESH, 60-minute maximum ending 5:20 PM, shading) against the hail sizes reported on the ground (circles, same color scale), May 23, 2024.

5.5 The day before: May 22, 2024

A storm crossed the same part of San Angelo 24 hours earlier. The lowest scan shows the hail signature over the property from about 4:56 to 5:09 PM on May 22 (reflectivity near 61 dBZ, CC 0.90 to 0.95), and radar winds over the property reached 51 mph at 5:02 PM — similar to May 23. Five hail reports fell within 2.6 miles, from 1.00 to 2.00 inches, all estimated; the nearest was 1.75 inches, 0.9 mile west-northwest. MESH at the property was 1.1 inches on both days. The record therefore supports hail at the property on both dates, with the larger stones on May 23.



Lowest radar scan over the property during the hail on May 22 (left) and May 23, 2024 (right). Open circles are each day's hail reports.

5.6 Twelve-month storm-date screen

NWS storm reports for the twelve months ending on the reported date of loss were screened for hail anywhere within 3 miles of the property and for thunderstorm wind within 3 miles or at the airport station.

Date	What was reported	Nearest to the property	Notes
Jun 9, 2023, 9:20–11:05 PM	Thunderstorm wind damage	Large tree limbs snapped, 0.5 mi NW	Roof and fence damage reported 2.6 mi NNW; airport measured 58 mph at 11:05 PM
Jun 23, 2023, 7:22–7:27 PM	Thunderstorm wind	Limbs and power lines down, 2.6 mi NNE	Airport measured 69 mph
Aug 10, 2023, 8:52–9:00 PM	Thunderstorm wind	Estimated 60 mph, 1.8 mi S	Airport measured 66 mph
May 3, 2024, 6:26 PM	Thunderstorm wind	Measured 59 mph, 2.7 mi E	—
May 22, 2024, 4:53–5:02 PM	Hail 1.00–2.00 in	1.75 in (estimated), 0.9 mi WNW	Radar hail signature over the property
May 23, 2024, 4:37–4:59 PM	Hail 1.00–3.00 in; wind	3.00 in (measured), 0.5 mi	Reported date of loss; airport measured 73 mph

Storm reports within 3 miles of the property (and measured gusts at the airport station), May 23, 2023 – May 23, 2024. Radar reconstruction was performed for May 22 and May 23, 2024 only.

5.7 Timeline at the property, May 23, 2024

Time (CDT)	At the property (radar)	At the airport station, 4.4 mi S
4:35–4:45 PM	Light rain at most; radar wind under 30 mph	Thunder begins 4:35; wind southeast 14 mph, gusts 21 mph; 93°F
4:48–4:54 PM	Gust front arrives; radar wind rises to 49–51 mph (peak 4:52–4:54)	Wind turns southwest, gusts 39 mph (4:51)
4:54–4:58 PM	Hail signature; ground reports of 2.75–3.00 in within 0.5 mi	Squall; wind northwest, gusts 64 mph (4:55); peak 73 mph from the north-northwest (4:56); 82°F
4:59–5:10 PM	Heavy rain, no hail signature; radar wind 30–40 mph	North wind, gusts to 73 mph in the 5:02 report; 78°F; rain begins 4:58
5:10–5:15 PM	Storm clears; street flooding reported 2.4 mi north at 5:10	North-northeast wind, gusts 48–52 mph; rain ends 5:14

Sequence of conditions at the property and at the airport station on the reported date of loss.

6. Limitations and Reservation of Right to Supplement

This is a claims-stage findings report based on the archived data itemized in Section 3; it is not a litigation expert report under any rule of civil procedure, although the data and methodology are suitable for that purpose. The radial-wind, report-location and MESH limitations in Section 4 apply throughout. Should additional materials become available — on-site observations, photographs with reliable timestamps, or additional station data — I reserve the right to supplement or refine these findings.

7. Certification

I certify that the findings stated in this report are my own, that they are stated to a reasonable degree of meteorological certainty, and that they rest on the recognized, publicly documented data sources and the transparent, repeatable methodology described above. My compensation for this engagement is a flat fee and does not depend on the substance of these findings, or on which party retains me.



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