CERTIFIED
Past Weather Reports

HAIL SAMPLE REPORT

Prepared By:
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Director of Forensic Services
Forensic Meteorologist
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Prepared For:
Joe Moe
Joe Moe Consultants, Ltd.

Reference:
Townhouse Association v ABC Insurance Partners
Anywhere, MN | September 20, 2016 & July 11, 2017

Submitted on:
Thursday, March 05, 2020

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Thursday, March 05, 2020

Mr. Joe Moe
Joe Moe Consultants, Ltd.
123 Green Street
Random, MN 12345

RE: Townhouse Association v ABC Insurance Partners
Anywhere, MN | September 20, 2016 & July 11, 2017

Dear Mr. Moe

As you requested, I have reviewed the weather conditions for 171 Anywhere Street in Anywhere, MN for January 1, 2009 - November 18, 2019. Enclosed is our Certified Past Weather Report based on the weather data examined.

If you have any further questions or comments regarding our report, please do not hesitate to give me a call. Should courtroom testimony be required, I would appreciate whatever advance notice is possible.

Sincerely,

Sherilyn Janet Patrick

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WEATHER ANALYSIS

HAIL OVERVIEW

Table 1 below contains the list of hail occurrences for 171 Anywhere Street in Anywhere, MN for January 1, 2009 - November 18, 2019 that were confirmed via storm reports as well as Doppler Radar. **There were at least 14 instances of penny-sized hail (0.75 inches in diameter) or greater that occurred at the incident address.**

Hail Diameter is the size of the largest hail stones (in inches), measured across the full stone, which occurred at the subject property. The Storm Prediction Center defines severe hail as 1.00" in diameter or greater (prior to 2010, the definition was 0.75" in diameter or greater).

Table 1. Daily Weather Table – January 1, 2009 - November 18, 2019

Date	Hail Diameter
Friday, July 24, 2009	0.75-1.00
Monday, May 30, 2011	1.00-1.25
Friday, July 1, 2011	0.88
Saturday, May 19, 2012	0.75-1.00
Monday, June 19, 2012	0.75-1.00
Friday, May 31, 2013	0.88-1.00
Sunday, May 3, 2015	1.00-1.25
Monday, June 29, 2015	0.75-1.00
Tuesday, July 5, 2016	0.88
Wednesday, September 21, 2016	1.00
Monday, May 16, 2017	1.00-1.50
Sunday, June 11, 2017	1.00-1.25
Friday, August 24, 2018	0.88
Friday, July 26, 2019	2.00-3.00

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Instances with hail of 0.75 – 1.00 inch diameter

On **July 24, 2009**, a strong storm moved over the property between 7:45 and 8:30 AM. After the storm, reports of hail 0.75-1.00 inches in diameter were received from trained spotters and local officials, in which a nearly continuous path occurred from three miles southeast of Anoka County Airport to the east of Anywhere. Upon review of the radar, the subject property would have also received the same, along with peak wind gusts of 30-40 mph.

July 1, 2011 saw a line of strong to borderline severe storms between 8 and 9 PM. The National Weather Service received a report of hail from a trained spotter of 0.88 inches in diameter hail from Arden Hills, MN. Upon review of radar, the incident location would have received the same, along with peak wind gusts 50-60 mph.

On **May 19, 2012**, strong storms passed through the area between 6:30 and 7:30 PM. The National Weather Service received several reports of hail from the St. Paul, MN area ranging from 0.75 – 1.75 inches in diameter. Based on radar, the same storm passed over the incident location and would have produced hail between 0.75-1.00 inches in diameter along with peak wind gusts 50-60 mph.

June 19, 2012 saw strong storms between 5:30 and 6:00 AM. The NCEI Storm Database reports two hail events within 5 miles of the subject property. One of 0.75 inches in diameter in Arden Hills, MN and another of 1.00 inch in diameter in Vadnais Heights, MN. The incident location would have received the same, with peak wind gusts 45-55 mph.

May 31, 2013 saw a severe storm between 2:00 and 2:30 PM. Several reports of hail 0.88-1.00 inches in diameter were reported in Ramsey County to the National Weather Service, two of which were located in Anywhere, MN and another in neighboring Arden Hills. As a result, the subject property also would have witnessed hail of 0.88-1.00 inches in diameter along with peak wind gusts 35-45 mph.

A strong thunderstorm impacted the area between 6:45 and 7:30 PM on **June 29, 2015**. According to the Storm Prediction Center's Storm Reports, there were multiple reports of hail within Ramsey County, the closest of which was a 1.00 inch report that occurred in New Brighton, MN. Based on radar, the core of the storm just passed west of the incident location; however, the site still would have seen hail between 0.75-1.00 inches in diameter along with 25-35 mph winds.

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July 5, 2016 saw severe thunderstorms between 6 and 7 PM. According to NOAA Storm Archives, a hail report was submitted by a cooperative weather station observer. During the event, the subject property would have experienced hail up to 0.88 inches in diameter along with peak wind gusts of 60-70 mph.

A severe thunderstorm impacted the area between 4:00 and 4:30 PM on **September 21, 2016**. According to the Storm Prediction Center's Storm Reports, a hail report of 1.00 inch in diameter was received within Anywhere, MN via a social media report. Along with hail of 1.00 inch in diameter, the incident location also would have experienced peak wind gusts of 40-50 mph.

August 24, 2018 saw a strong thunderstorm between 10:45 and 11:15 AM. The National Weather Service received one report of hail within Anywhere, MN from a trained spotter of 0.88 inches in diameter. Radar confirms that the same storm tracked over the incident location, and would have produced hail up to 0.88 inches in diameter. Peak wind gusts of 20-30 mph also accompanied the event.

Instances with hail of 1.00 – 2.00 inch diameter

On **May 30, 2011**, a few severe storms moved through between 10 AM and 10:30 AM. There were three total reports of hail from these storms within Ramsey and Hennepin counties, including a 1.00 inch hail report out of White Bear Lake, MN and two reports out of Richfield, MN of 1.00 and 1.25 inches in diameter. During this event, the subject property would have received hail of 1.00-1.25 inches in diameter, along with peak wind gusts of 30-40 mph.

Thunderstorms impacted the area between 5 and 6 PM on **May 3, 2015**. According to the NOAA Storm Archives, there were multiple reports of hail 1.00-1.25 inches in diameter across both Ramsey & Hennepin Counties. This same storm passed directly over the incident location and would have produced the same maximum hail size. Peak wind gusts during the event were 50-60 mph.

On **May 16, 2017**, a strong thunderstorm passed through the area between 5:30 and 6:00 AM. Several reports of hail 1.00-1.50 inches in diameter were reported to the National Weather Service from Anywhere, MN. In addition to the hail, peak wind gusts of 30-35 mph were also observed.

On **June 11, 2017**, a line of severe storms moved through between 8:30 and 9 AM. After the storm, there were two reports of hail within Ramsey County, one of 1.00 inch in diameter approximately 4.75 miles away to the south-southeast, and another of 1.50 inches in diameter approximately 2.5 miles to the north-northwest. Based on radar, the incident property would have experienced hail 1.00-1.25 inches in diameter along with peak wind gusts of 60-70 mph.

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Instances with hail of 2.00 – 3.00 inch diameter

A severe storm impacted the area between 8:00 and 8:45 PM on **July 26, 2019**. According to the Storm Prediction Center's Storm Reports, there were several reports of hail within Anywhere, MN which ranged from 1.50 – 3.00 inches in diameter. Based on radar, the incident property would have received hail between 2.00-3.00 inches in diameter along with 30 – 40 mph winds.

Day of Alleged Incident (September 20, 2016)

During the pre-dawn hours, the weather was clear as the temperature hovered settled to a low of 54 degrees. The daylight hours featured intervals of sun and clouds. The temperature rose to an afternoon high of 81 degrees. Throughout the evening the sky became mostly cloudy with temperatures dropping into the upper-60s to near 70. There was no rain that fell during the 24-hour period.

Day of Alleged Incident (July 11, 2017)

During the pre-dawn hours, the weather was mainly clear as the temperature settled to a low of 57 degrees. The daylight hours featured intervals of sun and clouds. The temperature rose to a late afternoon high of 88 degrees. At night, the weather was partly cloudy with temperatures falling into the mid-70s by Midnight. There was no rain that fell during the 24-hour period.

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DATA SOURCES AND OTHER REFERENCES

The following descriptions provide a review of each source and reference utilized in this report.

AUTOMATED SURFACE OBSERVING SYSTEM (ASOS)

ASOS stations are automated weather stations which provide vital weather information to both the meteorological and aviation community. There are currently more than 900 ASOS sites in the United States. In general, these stations report at 1-hour intervals, however will report special observations in the event of rapidly changing conditions which meet specific thresholds. Observations from ASOS typically include temperature, dew point, relative humidity, precipitation, wind speed and direction, visibility, atmospheric pressure, and types of weather occurrences such as hail, fog, and thunder. Local Climatological Observations (LCD) were accessed through NOAA's National Centers for Environmental Information (NCEI), the world's largest provider of weather and climate data.

AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)

AWOS stations are similar to ASOS stations; however, they are operated and controlled by the Federal Aviation Administration (FAA). Unlike ASOS, AWOS systems generally report in 20-minute increments and do no report observations for rapidly changing weather conditions. These systems are among the longest running automated weather stations and predate the ASOS. NOAA's National Centers for Environmental Information (NCEI) provides access to the data online in the form of Local Climatological Observations (LCD).

DOPPLER RADAR IMAGES

Doppler RADAR is used to detect where precipitation is falling in the atmosphere. There are 160 operational high-resolution Doppler weather RADAR sites across the United States. Radar images were accessed from the National Centers for Environmental Information's NEXRAD Data Archive. The RADAR site used in this report was KMPX, which is located in Chanhassen, MN. Radar images were accessed from the NOAA National Centers for Environmental Information (NCEI). Short Range Base Reflectivity images depict the intensity and location of precipitation from approximately 143 miles outward from the Radar site. The resolution of Short Range Base Reflectivity images is approximately 0.62 miles by 1.0 azimuth degree (Level III) or 0.16 miles by 0.5 azimuth degree (Level II). Depending on the mode of operation used, images are typically available every 4 to 10 minutes.

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NCEI STORM EVENTS DATABASE

NOAA Storm Data is an official publication of the National Oceanic and Atmospheric Administration (NOAA) which documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and /or disruption to commerce. The NCEI receives their Storm Data from the National Weather Service (NWS) about 60 to 90 days after the end of the data month. The National Weather service receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public. An effort is made to use the best available information, but because of time and resource constraints, information from these sources may be unverified by the National Weather Service.

NATIONAL WEATHER SERVICE (NWS) PRODUCTS

The National Weather Service Forecast Office is responsible for issuing daily zone forecasts, most watches, warnings, advisories, and special weather statements. Daily zone forecasts are issued several times a day, sometimes more if updates are needed. These forecasts are immediately made available to the public on the internet, local radio, and/or television stations. The watches, warnings, advisories, and special weather statements are issued when impending weather meets certain criteria set by the National Weather Service. Products are available through the NCEI Service Records Retention System (SRRS).

NWS PRELIMINARY LOCAL STORM REPORTS

Preliminary Local Storm Reports are issued by the National Weather Service Forecast Office when severe weather is observed. Some severe weather phenomena that are reported are: snow, ice, hail, damaging winds, tornadoes, flooding, etc. The National Weather Service receives their information from a variety of sources, such as, county, state and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, amateur radio operators, newspaper clipping services, the insurance industry, and the general public. The final and official list of reports is found in the Storm Events Database. Reports are available through the NCEI Service Records Retention System (SRRS).

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HOURLY & SUB-HOURLY OBSERVATIONS

- **KANE: Minneapolis Anoka Co Ap, MN (AWOS)**
  Elevation 912 feet – Located 7.2 miles northwest
- **KMIC: Minneapolis Crystal Ap, MN (ASOS)**
  Elevation 861 feet – Located 11.8 miles west
- **KMSP: Minneapolis/St Paul Ap, MN (ASOS)**
  Elevation 872 feet – Located 14.7 miles south-southwest
- **KSTP: St Paul Downtown Ap, MN (ASOS)**
  Elevation 700 feet – Located 10.5 miles south-southeast

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CERTIFICATION

I certify that the information in this report is true and accurate, and that any estimations, interpolations, or assumptions that have been made were done so by a professional meteorologist with expert accuracy within a reasonable degree of meteorological and scientific certainty. Any conclusions are based on the interpretation of the best available information at the time of the issuance of my report as well as my education, training, and experience. I certify that the analysis provided within this report represents my unbiased opinion as to the weather conditions at the subject property during the stated timeframe. I reserve the right to amend the conclusions made herein upon further discovery of additional meteorological data or other relevant materials. Use of any information within this report is intended for the referenced matter only and should not be utilized for any other purpose.

Sherilyn Janet Patrick, M.S.
Director of Forensic Services
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ABOUT WEATHERWORKS

Since 1986, WeatherWorks has provided dependable meteorological services to thousands of clients in the private and public sectors by understanding the core principles and complexities of meteorology in addition to utilizing technological advances. For over 30 years, WeatherWorks has prepared detailed, site specific, and easy to understand past weather reports for all types of cases and claims. The professional meteorologists at WeatherWorks have performed site specific analysis on over 3500 plaintiff and defense cases across the United States. Our sound meteorological advice and customized services relating to past, present, and future weather conditions remain vital in each of our client's decision making process, and provide our staff with the continued knowledge of the weather's impact on the spectrum of weather related cases and incidents.