# A REPORT TO ADMINISTRATOR, NOAA

## FLASH FLOOD DISASTER IN SOUTH CENTRAL TEXAS

MAY 11-12, 1972

# PREFACE

As directed by NOAA Directives Manual Chapter 28 and NWS Manual Chapter I-02, a Southern Region disaster survey team was formed to investigate the flash flood disaster of May 11-12, 1972, over the upper Guadalupe and San Marcos River Basins in south-central Texas. The survey members were charged with reviewing the natural hazards warning system and the performance of all elements of NOAA who participated in providing data for the warning service. This document is a report by the team of their findings and recommendations on the deficiencies that were evident.

The team consisted of Messrs. Robert Ellis, NWS Southern Region Flash Flood and Community Warning Coordinator and Robert Orton, NWS State Climatologist for Texas.. Additional assistance to the team was provided by Mr. George Kush, Tech-Admn. Assistant; Mr. Carl Hostetter, lead forecaster on duty the night of the disaster; Mr. Rod Gonzales, PA; and Mr. Ed DiLoreto, MIC, all from WSFO San Antonio. Other information was furnished by Mr. Dave Owens, MIC, WSO. Information was exchanged with the U. S. Soil Conservation Service (SCS) staff members, San Marcos; representatives of the U. S. Corps of Engineers (USCE), District Office, Fort Worth; and the U. S. Geological Survey (USGS) Office, San Antonio. Local officials and citizens offered on-the-scene observations through interviews.

The survey team arrived in New Braunfels at 2:30 p.m. on Friday May 12, and made a preliminary survey of the damage there and at Seguin. Travel and interviews were continued in the area through Sunday, May 14th, by a member of the team.

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# EXECUTIVE SUMMARY

## Flash Floods in South Central Texas

## May 11-12, 1972

### Introduction:

The Hill Country of Texas has a long history of flash flooding during the spring tornado season and from occasional fall hurricanes. On May 11, 1972, the folly of man's encroachment upon the flood plain and dismissal of flood risks set the stage for the significant flash flood disaster which occurred late that night and early on the 12th in the small ranch and resort city of New Braunfels (*ist das leban schoen* -- where the living is great). Flash flood waters crashed through the city from Blieders Creek, Comal and Guadalupe Rivers in minutes to only a few hours after rains up to 16.5 inches in two hours fell over the local drainage area below Canyon Dam. Eighteen persons were drowned; property damage has been estimated at $20 million for the area. No deaths but heavy property damage resulted from flooding in Seguin and San Marcos.

The survey team believes many other persons would have lost their lives if it were not for the alertness of the staffs at WSFO San Antonio and WSO Austin in recognizing the imminence and danger of the flash flooding, and by the positive steps taken by the two offices to disseminate warnings to officials having responsibility for public safety and rescue operations. The loss of life could have been much higher if the summer youth camps along the river were in full operation or if weekend campers were at campsites on the River Road upstream from New Braunfels on the Guadalupe River.

indings:

e forecasts and warnings issued by both the WSFO San Antonio and Austin were timely and accurate because experienced forecasters rpreted the severity of the rainfall rates indicated by the radar s. The RATTS system for video transmission has several critical tions for use in forecasting severe weather or flash floods.

ood warnings to New Braunfels public safety officials were n transmission through the Texas State Department of Public S) communications system. The siren used to warn the public fective. Many people did not receive broadcast warnings; and did could not believe they were in danger until flood waters r homes or cars.

ls had not visited New Braunfels recently nor distributed posters for public information.

e 1. NWS Flash Flood Warnings (CDT) May 11, 1972

| | |
|---|---|
| | Flash flood warning for several counties including Comal and Guadalupe. |
| n. | Flash flood warning for Cibolo Creek. |
| m. | Flash flood warning for Hays County especially City of San Marcos. |
| p.m. | Flash flood warning for Comal and Guadalupe Counties. |

U. S. Geological Survey Crest Stages and Time (CDT)

Guadalupe River above Comal River at New Braunfels
31.65 ft., 00:30 a.m., May 12, 1972

Comal River at New Braunfels
1st crest 36.55 ft., 11:45 p.m., May 11, 1972
2nd crest, 35.45 ft., 05:30 a.m., May 12, 1972

U. S. Geological Survey Crest Stages and Time (CDT) (continued)

3. Cibolo Creek at Selma

   24.3 ft., 3:00 a.m., May 12, 1972

4. San Marcos River at San Marcos

   26.0 ft., 2:00 a.m., May 12, 1972

Recommendations:

1. Training of NWS forecasters, meteorological technicians, and radar personnel in flash flood forecast and warning techniques.
2. Encourage visits between forecasters and radar meteorological technicians in order to better utilize exchange of radar intelligence.
3. A focal point is needed at each WSFO who can make field trips to locate potential flash flood areas before future disasters occur.
4. A Flash Flood Specialist should be located in each River Forecast Center to research and develop warning procedures for community self-help systems.
5. Many more rainfall and river gaging stations along with flash flood alarms are needed for use in forecasting and warning of future flash floods in the U. S.

   The NWS plan for radars and radar remoting should include new local-use radar or an efficient video relay system for all stations vith warning responsibility not covered by WSR-57 radars.

   faster system of dissemination of warnings via an interrupt gnal to radio and TV broadcast statinns is needed.

   h community should make a general natural disaster plan for coping flash floods as well as other sudden severe weather. NWS needs

to publish a model flash flood preparedness manual for use by urban and rural areas.

9. A community warning system is needed which is capable of:

   a. Reaching the majority of citizens day or night with emergency power resources.

   b. Conveying the degree of emergency with survival actions necessary.

10. NWS should advise agencies responsible for comprehensive flood plain management needed to decrease future flood losses due to urban sprawl and encroachment by resort centers. The dysfunctions of the flood control dam upstream made the consequences of the flood much more disastrous.

11. A warning system should not be a one-channel system, but a combination of complementary linkages, e.g., NWS to mass media and emergency organizations, broadcasts, sirens, and police with public address systems. There are many formal and informal organizations in a community that can be utilized in the warning process.

12. NOAA/PA 72020 Flash Flood Poster "The Treacherous Torrent" should be distributed free in order that every citizen threatened by future disasters know what actions to take for survival. (Appendix E)

# Chapter 1

## Flash Floods, May 11-12, 1972

During the night of May 11, 1972, intense rains in the central portion of Texas along the Balcones Escarpment caused severe flash flooding in and along the Guadalupe River around the cities of New Braunfels and Seguin, the Cibolo Creek area in Bexar County, and Purgatory Creek at San Marcos. Many people, caught unprepared or reluctant to believe warnings, lost their lives and property. Some, clinging to trees, were rescued. Seventeen people drowned in New Braunfels, one in McQueeny. Property damage estimates range from 15 to 20 million dollars for the area. National Guard units, ordered in by the Governor of Texas, and Air Force helicopters began rescuing people early Friday morning, the 12th. By Friday afternoon many people returned to find neighbors missing and houses sometimes blocks from where they once stood, or completely destroyed. Many houses were covered by several feet of water. The citizens could not believe that normally dry creeks and placid rivers could rise so quickly and do so much damage.

The drainage area above New Braunfels to Canyon Dam is 87 sq. mi., while the watershed area that flooded the west portion of the city consisted of Dry Comal Creek and Blieders Creek and is approximately 130 sq. mi. It is over the latter area that it is believed the heavier rains fell because of the erosion and damage that was experienced. Both watersheds are shown on the Comal County map with storm isohyetal (page 1, Appendix A). The topography of the Guadalupe and San Marcos Rivers upper watersheds is generally typical of the Edwards Plateau. The Edwards Plateau is characterized by rugged hills, narrow valleys, thin soil cover, and frequent outcropping

of rock; conditions which combined with steep stream and valley slopes, are very conducive to rapid rainfall runoff rates. The Balcones Escarpment (a geologic fault) separates the hilly Edwards Plateau country from the flatter, gently rolling Coastal Plains area. The escarpment crosses the San Marcos River above New Braunfels. Above the escarpment the streams in question flow through eroded valleys with steep slopes. Below the escarpment they have low banks and wider flood plains.

The Soil Conservation Service bucket survey of unofficial rainfall reports found that an average depth of 8 inches of precipitation fell over a 350 sq. mi. area. The storm isohyetal map ~~(page Appendix A)~~ shows the rain pattern oriented NE-SW along the hills above New Braunfels but below Canyon Dam. Rainfall recorders, located 15 miles northwest of New Braunfels on the northern edge of the storm, indicate the heaviest rain fell within two hours ending about 11 p.m. Twelve inches of rain was reported by Mr. Potter (x location on isohyetal map) in about one hour, described in newspaper story and SCS survey interview, page 2, Appendix A. Also, 30-minute rainfall values of USCE Canyon Dam recording rain gage are listed. At the center of the storm rainfall Mr. Hagan recorded 16.5 inches, "Rain started at 9:00 p.m. - rained hard from 9:20 p.m. until 12:00 midnight. Emptied 5.5 inch gage three times."

This flood occurred after storm rainfall for the period May 6-8 and also on the morning of May 10th had saturated the ground. The Guadalupe River (USGS gage) rose rapidly from 2.44 feet at 9:30 p.m. to 27.50 feet

at 11:30 p.m. cresting 31.65 feet at 00:30 a.m. on May 12th. A preliminary peak discharge of 92,600 c.f.s. was computed for this USGS location. Higher flood stages were observed at this site in 1869, 1913, and 1935. The Comal River's first crest of 36.55 ft. (60,800 c.f.s.) at 11:45 p.m. was caused by Blieders Creek runoff. The USGS recording gage was flooded at 20 ft. but flood marks and interviews were used to reconstruct the hydrograph. A second crest of 35.45 feet (55,800 c.f.s.) at 5:30 a.m. occurred from flood waters of the Dry Comal Creek. Picture and newspaper article of flood history on the Comal River is on page 3 of Appendix A. Stage hydrographs of these USGS gages show the rapid rate of rise of these three flood waves that struck New Braunfels. (page 4, Appendix A). The computed Blieders Creek peak discharge was 48,500 c.f.s. from a 15 sq. mi. drainage area upstream from Loop 337 at a few minutes before 11:30 p.m. Purgatory Creek in San Marcos (34.6 sq. mi.) experienced a peak discharge of 38,800 c.f.s. compared to the highest of record 28,700 c.f.s. during the 1970 flood. A crest on Cibolo Creek at Selma of 24.34 ft. equaled the crest recorded in the September 1952 flood.

Flood forecasting is a non-structural alternative in preventing flood losses but will not stop the increase in losses until wise resource planning strategies are adopted. The Federal Flood Insurance program by HUD was designed to help communities use modern flood plain management techniques in coping with their potential flood problems. The SCS were contacted by FIA to make a detailed flood study of New Braunfels, and when this was completed the city notified citizens who were below the

100-year flood level. They were told that subsidized insurance was available. Only a few home owners took out policies; as one citizen said, "We have not had a flood since 1952 and with the new dam, I did not think it would flood again." Leaders in Seguin gave the state engineer a very cool reception when he had presented the case for flood insurance at a recent public meeting. The people in the New Braunfels and Seguin area had become complacent about the risks of flooding because they believed Canyon Dam would protect them from future flood disasters. This false sense of security hastened the occupation of the "protected" flood plain below the dam and encouraged building in other "unprotected" canyons and valleys.

In spite of the very rapid runoff concentration and the magnitude of resultant flooding, it is the opinion of the survey team that loss of life in New Braunfels would have been greatly minimized if the warnings had been heeded as they were by residents along Cibolo Creek and Purgatory Creek, and later at Seguin on the Guadalupe downstream from New Braunfels. Flood story from New Braunfels weekly newspaper gives human account of the disaster on pages 5-6, Appendix A. Areas of damage are indicated on attached city maps (circled numbers show where damage pictures were taken), pages 7 to 11, Appendix A.

# Chapter 2

## Meteorological Analysis, Rainfall Predictions, and Flash Flood Warnings

### The River and Flood Services

The broad-scale objective of the river and flood services of the National Weather Service (NWS) is to provide a single, authoritative source of forecasts and warnings for the protection of life and property and for efficient management of water-control structures. To carry out the responsibilities for river and flood forecasting and warning in keeping with this objective, the NWS has both meteorological and hydrologic systems to acquire and collect data, process data, and prepare forecasts and warnings. The significant features of the two systems applicable to Texas are as follows:

The National Weather Service (NWS) of the National Oceanic and Atmospheric Administration (NOAA) provides the general public with weather and flood forecast and warning services.

Meteorological analyses and predictions are made available through a forecast system consisting of three levels--National, state or large portions of states, and zones.

1. The National Meteorological Center (NMC) at Suitland, Maryland, mainly through computerized operations, provides various broad-scale analyses and predictions in graphic form for the Northern Hemisphere. Similar products that show greater detail are made available for the conterminous States and adjacent marine areas. This basic (synoptic-scale) guidance material covers forecast periods to 72 hours and is distributed to Weather Service Offices over the National

Facsimile System (NAFAX). Quantitative precipitation forecasts for 12-, 24-, and 48-hour periods are also provided for the conterminous states.

2. Weather Service Forecast Office, San Antonio (WSFO) is responsible for weather forecasts and warnings for the southern portion of Texas. The WSFO provides main field forecast support and guidance to local Weather Service Offices.
3. Weather Service Office, Austin (WSO) is responsible for local weather forecasts based upon guidance from the two higher echelons. This guidance is expanded by the Austin station when local observations indicate a need. This WSO is the most direct link to the public and is responsible for preparing and disseminating warnings of severe weather events to designated counties in its immediate vicinity.

Hydrologic analyses and predictions are provided through a forecast system consisting of two levels--River Forecast Centers and River District Offices.

1. The River Forecast Center (RFC) Fort Worth analyzes precipitation and stream data for established regions and prepares river and flood forecasts for use and dissemination by district offices in its region. It also provides routine headwater advisory and flash flood guidance.
2. The River District Office (RDO) at WSFO San Antonio maintains the rainfall and river reporting networks in its established district, transmits the data to the River Forecast Center and disseminates the RFC forecasts to the public and federal and state agencies.

Coordination and monitoring of forecasts and warnings, along with the issuance of flash flood alerts, watches, and warnings is the responsibility of San Antonio WSFO. Comal (New Braunfels), Guadalupe (Seguin) and Bexar (Cibolo Creek) are in San Antonio's county area of responsibility for severe local storm warnings. Austin WSO issues severe storm and flash flood warnings for Hays (San Marcos) along with its other counties in accordance with NWS Manual Chapter E-13 (Flash Flood Alerts, Watches and Warnings).

Synoptic Discussion by San Antonio WSFO Lead Forecaster

On May 11, 1972, convective thundershower activity associated with the proximity of a diffuse east-west quasi-stationary front over south-central Texas developed in a north-south line during the late afternoon and evening in the area. Cells in a disorganized pattern of insignificant thundershower activity drifted slowly northward into the San Antonio, Texas, area towards sunset, tending to concentrate over the higher terrain immediately north of the city around 8 to 9 p.m. CDT. Weather radar indicated a large, slow-moving cell persisting over the area from San Antonio to 25 miles north, and the intensity of the radar echo, along with the lack of movement and records of previous heavy rainfall in the area, presented the National Weather Service Forecast Office at San Antonio with a potential flash flood situation. The afternoon quantitative precipitation forecast from the NMC, along with the limited fine mesh predicted moisture and precipitation concentration, as well as the indicated movement of an upper air impulse from the southwest into the area, combined to impress the San Antonio forecasting office with the excessive rainfall potential for the area. Following contact with a cooperative rainfall

observer in the area of apparent heavy persistent rainfall who reported 4.71 inches of precipitation falling within a short period of 1 hour and 10 minutes and heavy precipitation continuing, previously issued flash flooding warnings were accentuated for Comal, Bexar, and Guadalupe Counties by contact with Department of Public Safety and local county sheriffs. During the following two hours the heavy thundershower activity oriented itself in an east-west line along the southern edge of the rising terrain north of a San Antonio-New Braunfels line with individual cells moving very slowly eastward over an area previously saturated by heavy showers and thundershowers of the prior ten days. The activity resulted in excessive runoff into the Guadalupe and Comal River drainage system below Canyon Dam and produced a damaging crest of water which moved rapidly through the area.

Precipitation guidance charts, forecasts, and flash flood warnings issued are included from page 1 through page 6 in Appendix B.

Findings:

The NMC rainfall prediction guidance as well as forecasts and warnings issued by both WSFO San Antonio and WSO Austin were accurate, timely and consistent. The value of an experienced professional forecaster on duty--one who knows when to take action before an extreme short-fuse weather disaster strikes--cannot be over stressed. At the recent WSFO/WSO coordination meeting held in San Antonio, flash flooding was covered with other subjects but only a few forecasters attended. Flash flood forecast techniques are not understood by all WSFO forecasters.

Recommendations:

2-1 Instructions on handling flash flood situations should be given to personnel attending the forecaster and met tech schools.

2-2 Mesoscale Analysis and Forecasting, Maurice Pautz, Nov. 1971, should be in every station's technical library.

2-3 An on-station drill using a past local flash flood should be completed by all WSFO's and WSO's as is done prior to the tornado season.

2-4 All field personnel should review NWS manual chapter E-13.

2-5 A slide-tape presentation on flash flood forecasting techniques should be made and circulated to all NWS offices.

## Chapter 3

## Data Collection and Communications

Surveillance radars at Austin and the new (July 1971) WSR-57 radar observatory at Hondo, Texas, provide detection of severe storms which may produce excessive rainfall. The new station fills a large gap in the weather radar coverage of south-central Texas with a range in excess of 200 miles. The radar picture is transmitted directly to the Weather Service Forecast Office at San Antonio via WBRR-68 RATTS recorder. The two transparencies of the Hondo radar chart may be used to compare the Canyon Dam to New Braunfels drainage area as well as counties most seriously affected with the storm cells plotted by the WSMO Hondo radar staff for the 0100Z-0500Z period (Appendix C). Also the history of the flash flood storm is shown by radar photos. The 0204Z and 0302Z RATTS transmissions show a flat pattern with very little intelligence on cell strengths for the use of the forecaster at WSFO San Antonio. The telephone link between WSMO Hondo radar meteorological technicians and the forecaster at WSFO San Antonio helped interpret the RATTS plots as well as radar reports sent via RAWARC.

The duty forecaster stated that if it had not been for his experience observing past storms on the WSR-1A PPI scope, he would not have been alerted to the seriousness of the storm. The local use radar at WSO Austin, also proved to be a valuable tool in forecasting flash floods in their warning area. The technology of accurate river and flood forecasting is dependent upon adequate and timely rainfall and stage data. It is even more essential that such basic data be available, particularly rainfall reports for areas subject to flash flooding. The

report from Bulverde (located on west side of isohyetal map) of intense rainfall and local flooding verified the strong radar echo from the storm. The flash flood warnings were issued for counties downstream from the radar storm movement.

Radar summaries from Hondo from 7:45 p.m. through 11:45 p.m. CDT, May 11, were sent on NOAA Weather Wire with emphasis on severe weather and heavy precipitation centers along with rainfall rates (pages 11-12, Appendix C). These data, if broadcast with the issued warnings, would have helped public safety officials and the public to track the storms and may be the only alert some citizens receive of heavy rainfall (usually on local radio stations).

The SCS preliminary bucket survey data was transferred from the local isohyetal map to the radar chart with official cooperative rainfall observers storm total rainfall (page 13, Appendix C). The strong radar centers were concentrated over the New Braunfels local drainage area during the time of reported heavy rainfall rates. Rainfall rates recorded on the rain gages northwest of New Braunfels along with a partial record of a USGS rain gage (2.3 inches in 10 minutes) in the Dry Comal Creek basin are the only recording gages in the storm area. The USGS converted a peak discharge of 2630 c.f.s. on Trough Creek (0.48 sq. mi.) to a runoff rate of 8.49 inches per hour. The local newspaper clipping indicates a possible record rainfall rate for Texas at the unofficial site northwest of New Braunfels (Mr. Potter). The NWS official cooperative observer reported only 5.66 inches of rain on the morning of the 12th. A study of the radar film from Hondo, and the final

the final rainfall data needs to be made.

Findings:

The satellite readouts at WSFO San Antonio were of no use in forecasting this storm because it occurred during the hours of darkness. WSFO San Antonio and WSO Austin both used radar data in issuing severe weather and flash flood warnings. Experience is needed (at least one year for radar personnel) in using radar information effectively. The RATTS system is not an efficient method of video transmission for use in forecasting local storms. The one telephone link between WSFO San Antonio and the radar site at Hondo is vulnerable to damage. Coordination between radar stations was very good.

Recommendations:

3-1 Replacement of RATTS system with a good video display for the forecasters in the new WSFO San Antonio office and an acceptable local-use radar should be furnished all stations with warning responsibilities.

3-2 A new single-sideband radio link to WSMO Hondo with WSFO San Antonio should be installed along with emergency power in order to prevent communication failure in future disasters.

3-3 A visitation program should be established to discuss radar utilization.

3-4 More rainfall gages should be located strategically over the radar umbrella, especially at Department of Public Safety offices that could be called at any time day or night.

## Chapter 4

## Public Dissemination

Severe weather and flash flood warnings along with general weather forecasts are distributed by the NOAA Weather Wire Service. This service links by teletype, the National Weather Service Office with outlets to the news media (newspapers, radio, television) and any other private or government agency in the area where a primary wire service has been established, if they arrange to secure a drop on this circuit. KGNB New Braunfels, KCNY San Marcos, KWED Seguin, and several outlets in Austin and San Antonio currently are on the NOAA Weather Wire Service circuit. Other local radio stations may obtain the information relayed through news wire services. The Police Department at New Braunfels, Seguin and Comal County Sheriff's Office are on the Texas Law Enforcement teletype network. The WSFO San Antonio station duty manual lists telephone numbers for warning distribution--Comal County, KGNB and sheriff; Guadalupe County, KWED and sheriff.

Severe thunderstorm, tornado and flash flood warnings were issued for many other communities as listed on the San Antonio WSFO severe weather log. Enclosed memo by MIC, WSFO San Antonio, describes special efforts made to alert the Sheriff of Comal County of the danger (log and letter are attached in Appendix D). At the same time WSO Austin was busy with storms in their areas. The MIC, WSO Austin states that with telephone circuits busy it was also necessary to have the DPS relay NWS warnings via their teletype and radio system to the Sheriff and Police Department at San Marcos.

The lack of warning response was partly due to the vulnerability of the public everywhere when daytime local radio stations go off the air, the late TV news is over, and many people are asleep. Mr. Bob Freinieth, KGNB news director, could not remember when they first received warnings, but they came back on the air about 11 p.m. and continued broadcasting through the night. The FM station which usually begins operation in the evening experienced technical difficulties. Power failure and telephones were out due to the flood in some sections of town, but many citizens listened to the local radio station for flood and rescue information. Out of town TV stations do not always broadcast warnings for other localities. Channel 12 TV in San Antonio did interrupt a late talk show with flash flood warnings and Channel 4 included the flash flood warnings in its 10:15 p.m. weather show along with reports of heavy rainfall.

Findings:

The New Braunfels public safety officials received flash flood warnings, but did not react in time to warn the public. The City Police Dispatcher remembered having the first flash flood warning relayed to them by DPS about 9 p.m. The Chief of Police stated he was not informed of the flood until 2 a.m. and that his department depended on DPS communications for warnings. There is a time delay in warnings being relayed through the DPS system in the state capitol at Austin. Friday afternoon of the 12th while in the City Manager's Office, a flash flood warningsfor New Braunfels was heard on the radio. A staff member checked on the DPS teletype and reported no warning had been received 30 minutes later.

Time of flash flood warnings and dissemination contacts are plotted with stage hydrograph and crest data of the flood furnished by the USGS (page 4 Appendix A).

Recommendations:

4-1 All DPS, Sheriffs, and City Police Dispatcher Offices should be encouraged to obtain receive drops on NOAA Weather Wire.

4-2 The capability to selectively interrupt commercial radio and TV broadcasts in threatened areas is needed to prevent loss of life in future disasters of this type.

# Chapter 5

## User Response and Service Benefits

The local government usually gives direct warning and initiates evacuation procedures when time permits. Also, in conjunction with volunteer relief groups, it responds to the disaster by coordinating search and rescue operations, providing aid and calling for outside assistance, and later, repair, cleanup and rehabilitation operations. Some local governments may have the attitude that because the police, fire departments and public works departments deal with small disasters on a day-to-day basis, a major disaster would only require the same response on a slightly larger scale, but as in this case, by the time the urgency was assessed through channels, it was too late.

The New Braunfels Fire Department utilized an air raid siren about midnight to warn the public and alert volunteer help, but its use was not generally interpreted by the public as a signal for widespread disaster, and the roar of the flood waters drowned it out as close as two blocks away. (See Table 1, page 2, for forecast and crest times) The New Braunfels and Comal County governments did not appear to have planned for potential flash flood disasters. The lack of action was partly due to the apathy of leaders and citizens toward the flood threat. There was a firm conviction by many residents who evacuated and whose houses were flooded or destroyed that no flood waters could ever reach their homes. Especially with the new (1964) Canyon Dam protecting them from a flood of the 1952 magnitude or higher. There is also the possibility that in an area subject to many severe weather and flash flood warnings, the public and local officials cannot discriminate ~~between average & severe storms~~.

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between average and severe storms.

The New Braunfels City Manager and Engineer were stunned and exhausted from all-night rescue operations and a helicopter survey of damages. They gave an estimate of damages and outlined where lives were lost. The community disaster organizations had set up operations at the National Guard Armory for evacuation and cleanup assistance. Radio station KGNB relayed official instructions, news on flood conditions, and names of missing citizens. The slow CD reaction to this flash flood came after flooding began; sounding of the fire siren was too late!

In Seguin the evacuation of people from the flood plain prior to the flood was carried out by police vehicles cruising with bull horns and by door-to-door contact some time after midnight. The river crested at Seguin about 6:30 a.m., May 12, 1972. This system proved very successful in reaching the public and it is difficult to visualize how any other system could have done a more effective job in saving the city from even one drowning. Flooding occurred there 3 or 4 hours after the crest at New Braunfels. The knowledge of the time of flooding and crest would have helped so that they could have known how much time they had to get people and property out. Property damage of millions occurred to the Glen Cove area, a new and expensive subdivision of 40 to 50 houses built in the flood plain since 1968. Flooded city pools and recreation areas were covered with mud, but this is an example of the wise use of flood plains. The National Guard Unit at Seguin tried to rescue people in the Treasure Island area of Lake McQueeny

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but many refused to leave their property and had to be rescued by helicopter.

Some citizens in New Braunfels did not react to any warnings until flood waters entered their houses or police ordered them to leave. The residents who had watched TV or heard radio severe thunderstorm and flash flood warnings and had stayed up late were able to escape before the crest hit. A resident of the Landa Park Estates had heard a warning and stepped outside to move a canoe from the low river bank and seeing the rapid rise of water returned to rescue his wife, but no property including his two Cadillacs. Some looting and shooting was going on in the area. A gentleman in the Guadalupe-Comal area stated that he had heard braodcast warnings but did not leave until water came in his second-story home. He did not believe that the Comal River could rise that high (over 30 ft.) above the normally low spring fed stream. This area is about 100 yards upstream from the Guadalupe River and he believed that it crested there about 2:30 a.m.

On the night of May 11 and morning of May 12, 1972, severe thunderstorms with damaging winds, hail and reported tornadoes along with flash flooding, followed by river flooding, were being experienced over many locations. in Central Texas. Flash flood warnings for Cibolo Creek and special calls to public safety officials by WSFO San Antonio allowed people to be evacuated from a mobile home park in time to save lives and personal property.

At 10:10 p.m. a flash flood warning was issued for persons in Hays County, especially the city of San Marcos, by the WSO Austin. Severe flash flooding occurred on Purgatory Creek and other streams in San Marcos about midnight. Property damage has been estimated at a million dollars but because of the timely warnings, hundreds of people were evacuated and no lives were lost. The community's fast response may be due to the fact that they had as severe a flood on May 14-15, 1970. Also, the flood crest there hit between 8:00 and 10:00 a.m. instead of in the late hours at night.

Findings:

Local officials and citizens in the New Braunfels area did not react to the flash flood warnings in time to avert the disastrous loss of life because they either had not received them via mass media or public safety officials, did not believe them, or did not know what action to take in a flash flood emergency.

A visit to New Braunfels, other than routine substation inspections, had not been made recently by NWS officials. The NWS flash flood posters had not been distributed to the community.

Recommendations:

5-1 Flash flood watches should be used more often than warnings for low probability of flash flooding.

5-2 A better understanding is needed by forecasters of the limitation of the flash flood guidance given by the RFC.

5-3 Study of flood hazard reports and field trips would impress on forecasters the risk of flash floods in both rural and urban areas.

5-4 Flash flood posters should be distributed to every community.

5-5 Emergency and natural disaster plans should be made and kept current by every community faced with potentially hazardous situations resulting from the occasional hydrometeorological excesses of nature. Course of action plans should be prepared and a "dry run" response made at regular intervals.

5-6 NWS teams need to attend national meetings of government officials (city managers, planners, not just Civil Defense meetings) and stress tornado, hurricane, and flood programs as a package.

5-7 In some areas prone to sudden, violent types of disasters, there should be some sort of mass emergency warning system:

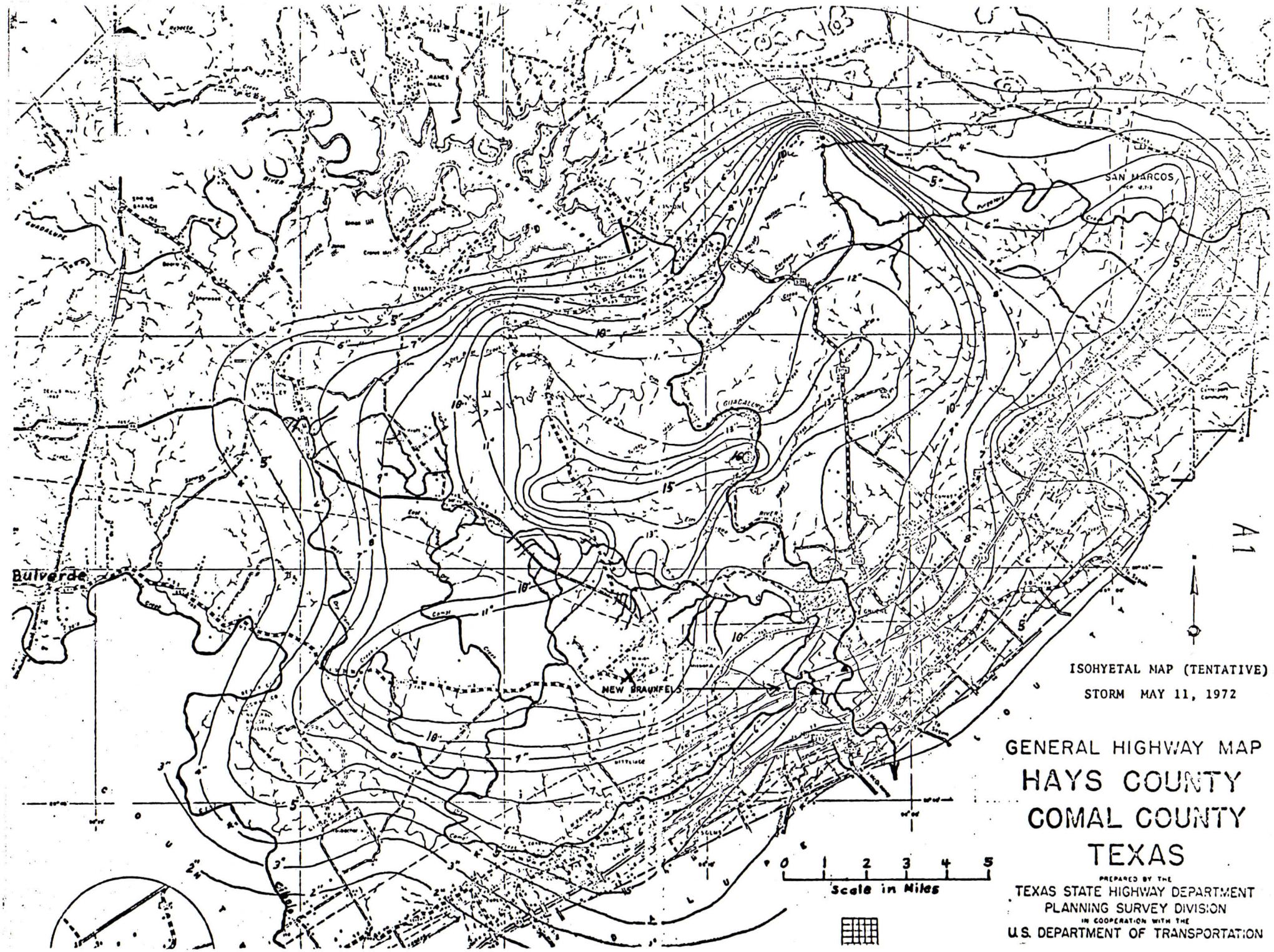
1. It should be able to reach an overwhelming majority of the community's population at any time of day or night and operate under extreme conditions including general power failure.
2. It should give the public a clear idea of the nature of the potential threat and convey the degree of emergency, explaining immediate steps which must be taken for safety.

5-8 A community flash flood reporting network of stream and rainfall stations and a flood warning procedure developed and operated in conjunctinn with the National Weather Service is an alternative for preventing future flood losses.

5-9 A stage flash flood alarm with a sensor on Dry Comal Creek and upstream from New Braunfels on the Guadalupe River is also a possibility. A rainfall activated alarm located in the upper

portion of Blieders Creek watershed would be needed because of the small drainage area and steep slopes.

5-10 A community warning system for San Marcos also needs investigation along with many other potential flash flood areas.




ISOHYETAL MAP (TENTATIVE)

STORM MAY 11, 1972

GENERAL HIGHWAY MAP

# HAYS COUNTY
# COMAL COUNTY
# TEXAS

PREPARED BY THE
TEXAS STATE HIGHWAY DEPARTMENT
PLANNING SURVEY DIVISION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION

A1

STORM OF MAY 11-12

Canyon Lake USCE

| Time | Precip. |
|---|---|
| 5/11 2030 | |
| 2100 | .40 |
| 2130 | 1.65 |
| 2200 | 1.15 |
| 2230 | 1.00 |
| 2300 | .60 |
| 2330 | .15 |
| 2400 | .15 |
| 5/12 0130 | |
| 0200 | .10 |

NEW BRAUNFELS HERALD

May 18, 1972

Extent of the rainfall in the Bulverde Road area just off State Highway 46 Thursday night can be judged from this report from Charles Potter, whose home is atop a hill about a mile and a half from Hwy. 46.

When the rain really began coming down hard about 9 p.m., Potter, who doesn't have a rain gauge, put out an "absolutely straight-sided iced tea glass, six inches tall" to measure the rainfall. He assured us it was placed well away from any chance of catching any runoff from the roof of the house.

Within 20 minutes the glass was filled to within a half inch of the top, and the driving rain was bouncing the water out of the glass. Potter placed a second glass, identical to the first, next to the first one, and within 40 minutes, it too, was full to the point of splashing out. After the rain settled down to a more moderate fall, both glasses filled and ran over.

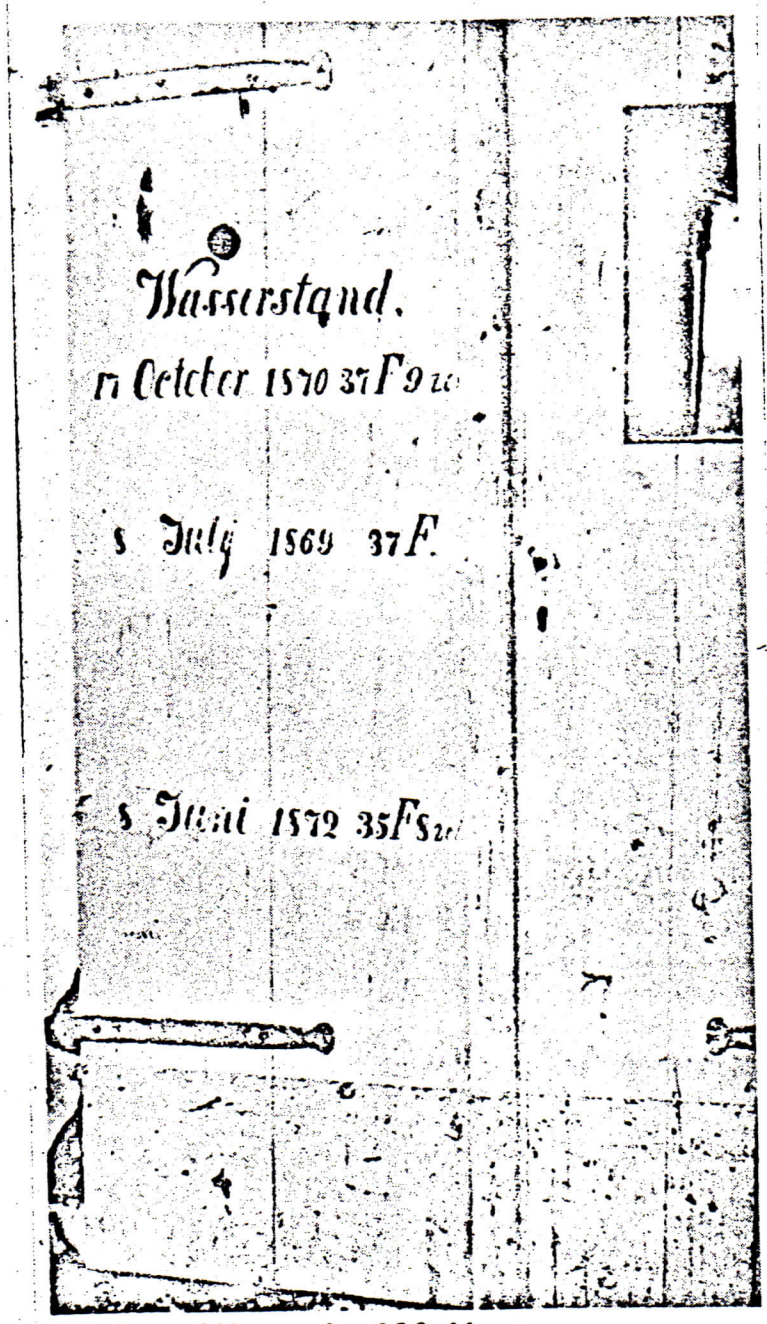
So at that spot in the east fork of the Dry Comal Creek watershed, at least 12 inches of rain fell between 9 and 11:30 p.m., Potter says.

New Braunfels Area Storm of May 11, 1972

SCS Rainfall Bucket Survey

"Potter - 12 inches plus. Straight-sided beverage glass - 6 inches deep. Started raining at 8:30 p.m. - Placed one glass on outside edge of patio at 8:40 p.m. - Ran over at 9:00 p.m. Placed another glass beside it at 9:00 p.m., it ran over at 9:40 p.m., at which time he discovered a leak around chimney and could not check further."

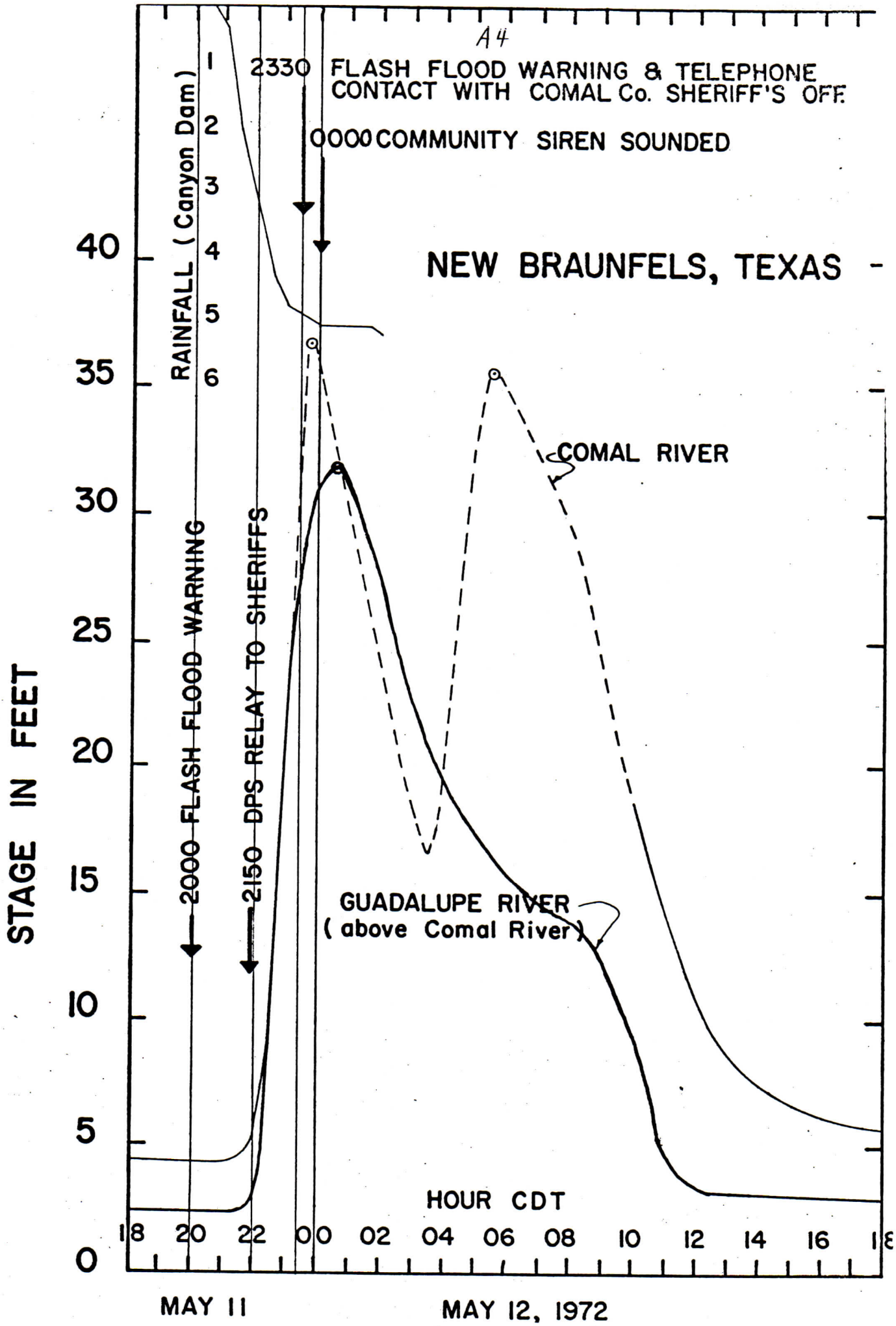
A3




## *Highest Water in 100 Years*

This cellar door record of Comal River flood levels was begun by Capt. Julius Giesecke in the old Rennert Brewery and is being kept current by hisgrandson, Alfredo Stein, who now lives in the house at 346 Stein Court. The earliest date on the door is July 8, 1869, when the water crested at 37 feet. On Oct. 17, 1870, the Comal reached an all-time high of 37 feet, nine inches. Less than a month short of a century ago, on June 8, 1872, the water reached a mark of 35 feet, eight inches. The flood of 1952 is recorded in a penciled notation near the top of the door reading, "Sept. 11, 1952, 34 feet, 0 inches." A six-inch threshold kept the '52 flood from reaching the cellar door. Last Friday's high water mark of 34 feet, four inches is shown by a chalk mark on the door. It was the first time in just four weeks short of 100 years that water had gotten into the basement.

(Staff Photo)


A4
NEW BRAUNFELS, TEXAS
RAINFALL (Canyon Dam)
1
2
3
4
5
6
2330 FLASH FLOOD WARNING & TELEPHONE CONTACT WITH COMAL Co. SHERIFF'S OFF.
0000 COMMUNITY SIREN SOUNDED
2000 FLASH FLOOD WARNING
2150 DPS RELAY TO SHERIFFS
COMAL RIVER
GUADALUPE RIVER (above Comal River)
STAGE IN FEET
0
5
10
15
20
25
30
35
40
HOUR CDT
18
20
22
00
02
04
06
08
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12
14
16
18
MAY 11
MAY 12, 1972

A5

# Flood Takes 15 Lives,

New Braunfels HERALD AND ZEITUNG

Texas' Largest Non-Metropolitan Weekly!

Vol. 21 — No. 20 New Braunfels, Texas 78130 Thursday, May 18, 1972 40 Pages — 15c Per Copy

# Does $15 Million Damage

A torrent of water flashed through New Braunfels late Thursday night, taking at least 15 lives and leaving at least $15 million of damage in its wake.

Plunging down the Comal and Guadalupe River channels in two separate waves, waters from a Hill Country downpour washed humans, livestock, cars, and houses into the current.

City Manager Jim Hester said about 250 families have been left homeless.

The peak of devastation and flood level struck the upper Comal River shortly after 11 p.m. and the Guadalupe River near IH 35 about 1 p.m.

Screams of victims added to the horror of the night. You could hear them for hours in Landa Estates, according to resident. One child said he was not frightened until his family got outside and he heard the screaming.

A guard rail gave way on Loop 337 above Bleiders Creek, and autos were washed off into the creek.

Over 3,000 were routed out of their homes during the night and found shelter in emergency facilities, arriving in underwear, parts of bathing suits, night clothes . . . all drenched.

A mother who had lost a four-year-old daughter when the flood struck Guada-Coma wandered in a daze.

A young husband and father whose wife and baby son were carried to their death in Landa Estates helped others evacuate their families.

Six helicopters airlifted people marooned on rooftops. Aged patients were evacuated by boat from Elley's rest home. Volunteers came from San Antonio with boats in the early morning to help in rescue work.

Some survived the storm by staying in their homes. Others are alive because they fled houses that were reduced to kindling.

Between 150 and 200 were treated for flood injuries at New Braunfels Hospital within 24 hours following the peak of the disaster.

Funerals for six flood victims were held Monday; one Saturday and one Sunday.

FAUST TRAGEDY

At the Joseph Faust residence on low land along the Guadalupe River downstream from the IH 35 bridge, Faust and his wife Jean awoke to find about two feet of water in their Villa Rio home.

"By the time we got organized, the water was up to our waists," said Faust. They escaped through a side window and were clinging to the eaves when the current swept them against a tree.

They were in the tree when their house broke loose, crashed into the tree, knocking it down and throwing the Fausts into the water.

Mrs. Faust was carried away. When Faust surfaced, he caught on to a section of roof from the neighboring Rudy Seidel house into which the Faust house had crashed.

Faust was carried about seven miles down the Guadalupe. Knowing that he soon would reach the Lake Dunlap dam and be carried to certain death, he attempted to swim to trees. Making no progress, he returned to his roof raft.

Making another attempt to reach safety, he grabbed for a tree branch and held on, then jumped into shallow water and reached the bank. He walked until he found a trailer house and a ride back into New Braunfels.

Mrs. Faust's body was found about noon Friday below Lake Dunlap dam at Elm Grove.

Still missing Wednesday were Mrs. Melvin Nolte Sr. and Mrs. Leslie Engler whose husbands perished in the flood, and Mrs. Bertha Weiss.

LANDA ESTATES

Cathleen Schleser, whose home is on the upper Comal River said water was lapping at her front door at 11 p.m. She grabbed an armload of clothes out of a closet and her cat, ran out and tossed them into her car. It then was about 11:15.

In seconds, the water rose about four feet. She grabbed her cat, and the rising waters carried them across neighboring yards of two houses into a third yard where she grasped a clothes line pole.

The water rose beyond the point where she could maintain her hold on the pole, and she and the cat were carried across the yard to a tree. The cat slipped out of her hands and into the tree.

Exhausted from being whirled about in the current and sick from all of the asphalt and water she had swallowed, Miss Schleser said she gave up and sank beneath the surface.

A clothes line caught her, and she was sprung back to the surface. She managed to cling to the tree.

As if someone had pulled the plug, flood waters suddenly drained out, and rescuers began to enter the area.

Miss Schleser said she had no idea how long the ordeal lasted.

(See "Flood," Page 2-A)

## What Next?

The bewilderment and sorrow of having all of one's belongings washed away or damaged by a flood in the night are reflected in the face of this Landa Estates refugee sheltered at the Civic Center. This woman, whose name is not known, told photographer Alan King she squatted in her kitchen sink, water at chin level, screaming for help until the water subsided. Although her house is still standing, all her belongings are badly damaged or destroyed. With the rest of the community she asks, "What now? What are we to do?" (Staff Photo)

# Flood

(Continued from Page 1-A)

It seemed like hours, but she was safe in Eagles Hall by 2 a.m.

**WENZELS**

Stanley Wenzel said water at their Union Ave. home was ankle deep by 10:30 p.m. Thursday. With his wife and their haemophilic child, they left the house, staying close to houses as they headed for the MKT tracks.

Mrs. Wenzel fell under the water, and he pulled her out. At Klingemann, the current became extremely swift. They were washed across the street into some brush in a vacant lot, and Mrs. Wenzel went under again. He found her and pulled her up a second time.

A pick-up truck carried in the current struck him in the side. Then he dodged a camper sailing by. When they saw a 60-foot trailer from Heidelberg Lodges coming directly at them broadsie, they climbed up into one of Mrs. Juanita Rahe's trees ans sat it out.

Gas was bubbling up out of the water and steaming transformers came floating by, said Wenzel.

Elderly men and women who stayed with their homes sat it out in sinks and on top of kitchen cabinets. Many were unable to open their doors.

Ricky Rheinlaender was having a snack and visiting with his mother when they noticed water bubbling up out of the floor furnace. He opened the door and was thrown across the room by the force of in-rushing water.

They sought refuge on top of an auto, and when it started to float, moved to the roof of the house.

There was an unconfirmed story of a man carried the length of Edgewater on the roof of a house and getting off to help a woman who had become separated from her husband in the midst of the flood.

**HEROISM & HORROR**

Stories of heroism, of horror, and of miracles were endless.

People who wanted to help appeared on the scene independently as soon as the first reports were out Thursday night. Many were up and about because the severe electrical storm and downpour kept them awake.

Radio Station KGNB, which is required to sign off at sundown, went back on the air for the emergency and broadcast continuously all night.

Messages uniting separated families . . . or at least assuring one another they were safe . . . were relayed until the phones became so overloaded the local telephone company office asked that calls be limited to emergencies only.

**FLOOD FREAKS**

Freak action of the flood moved the Henry Boyd house from one end of the lot to the other, but pictures and decorative plates remained hanging onthe walls, and no water entered the house.

In a Comal River house which flood waters entered to a level of six feet, framed pictures remained standing on a table, a collection of cut glass and porcelain birds survived without a chip, and bed linens in one chest drawer were dry.

Good fortune followed bad.

A Union Ave. housewife who had removed her rings and placed them on a washing machine while making a pie, returned to find them there, under a blanket of mud.

Another Landa Estates woman returned to the house to rescue a diamond ring given her by her mother-in-law. In the struggle through waist-high flood waters, the ring slipped from her finger.

After the flood, a neighbor boy found it in the mud on the street.

**PRAISE FOR HELPERS**

Flood victims continue to praise the work of rescue workers, law enforcement and National Guardsmen who kept the curious out of stricken areas, and all of the volunteer helpers who continue to appear on the scene.

There still is need for volunteers.

Utility companies were praised for their quick action in restoring services.

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A resort is a good place to lose everything except weight.

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NEW BRAUNFELS HERALD and ZEITUNG

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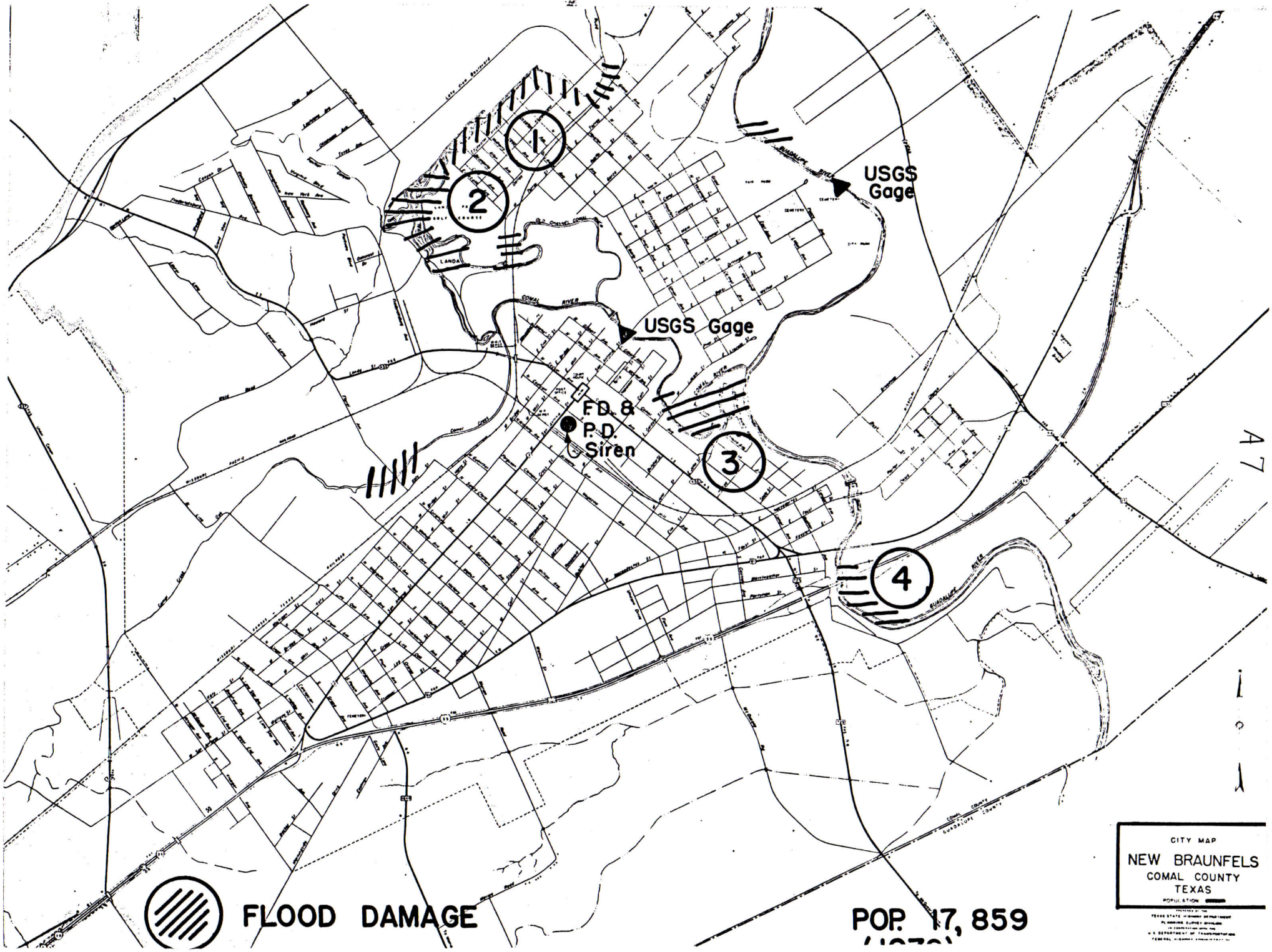
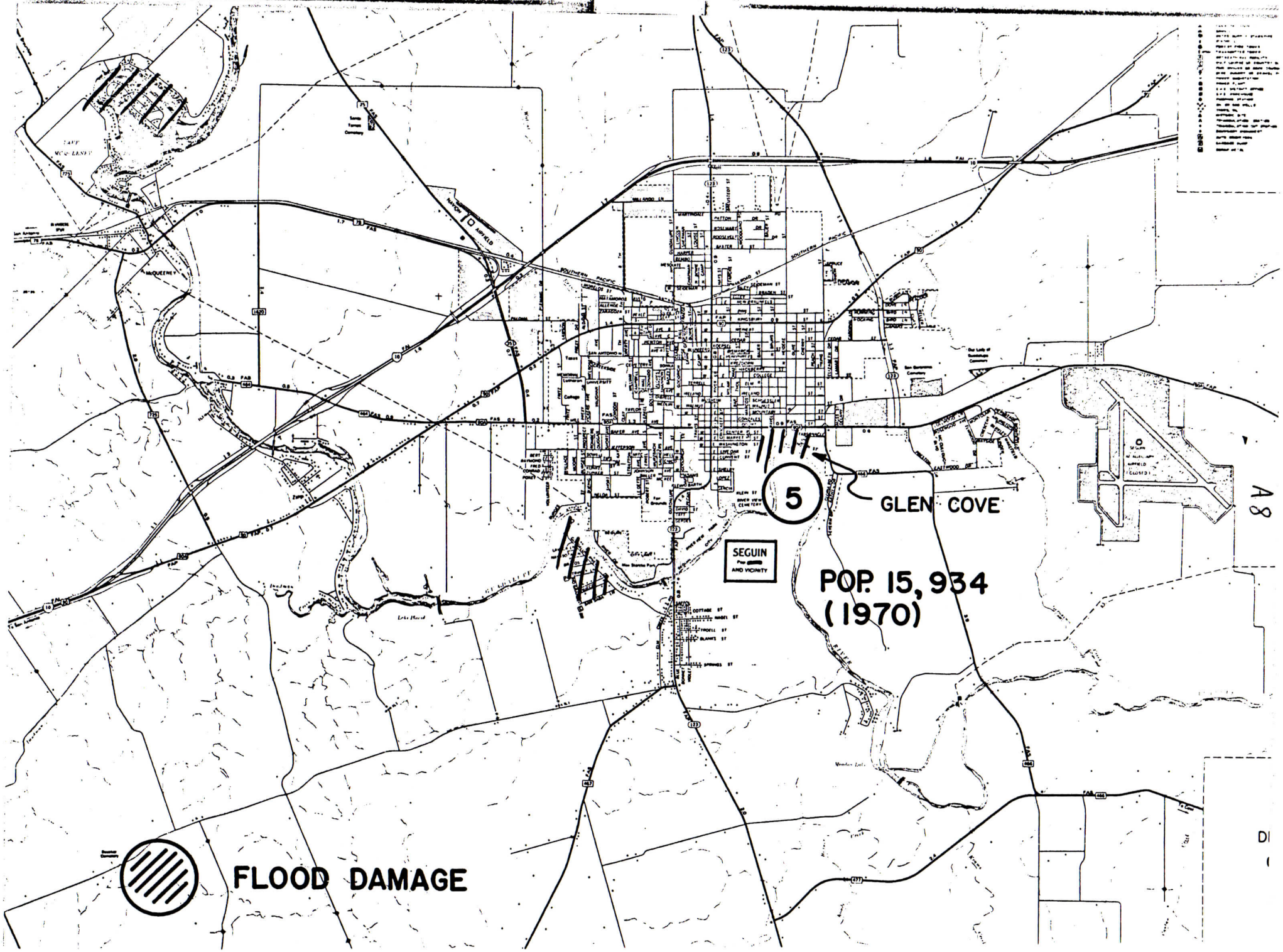

USGS Gage
USGS Gage
F.D. &
P.D.
Siren
1
2
3
4
COMAL RIVER
GUADALUPE RIVER
LANDA
CITY MAP
NEW BRAUNFELS
COMAL COUNTY
TEXAS
POPULATION
FLOOD DAMAGE
POP. 17, 859




A8

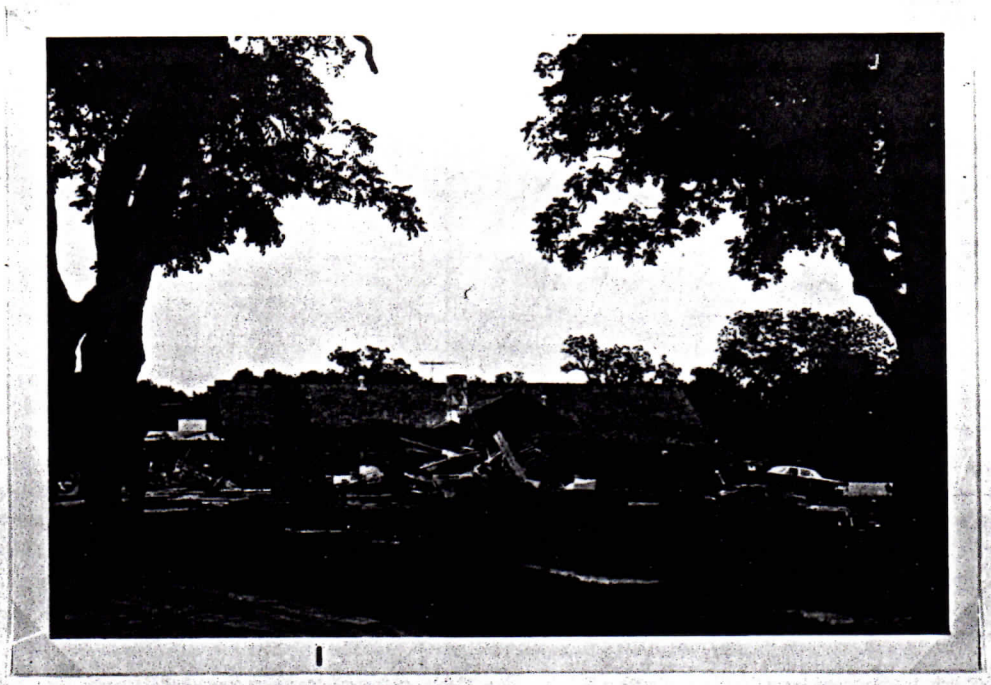
1. Landa Park Estates (New Braunfels)

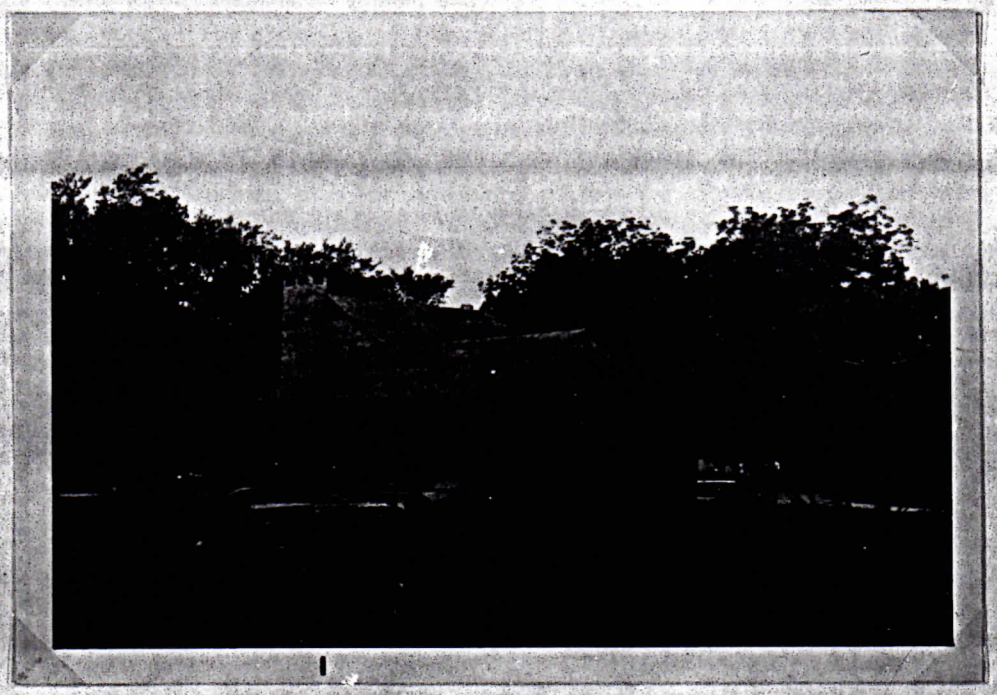
2. Comal Springs (New Braunfels)

A10

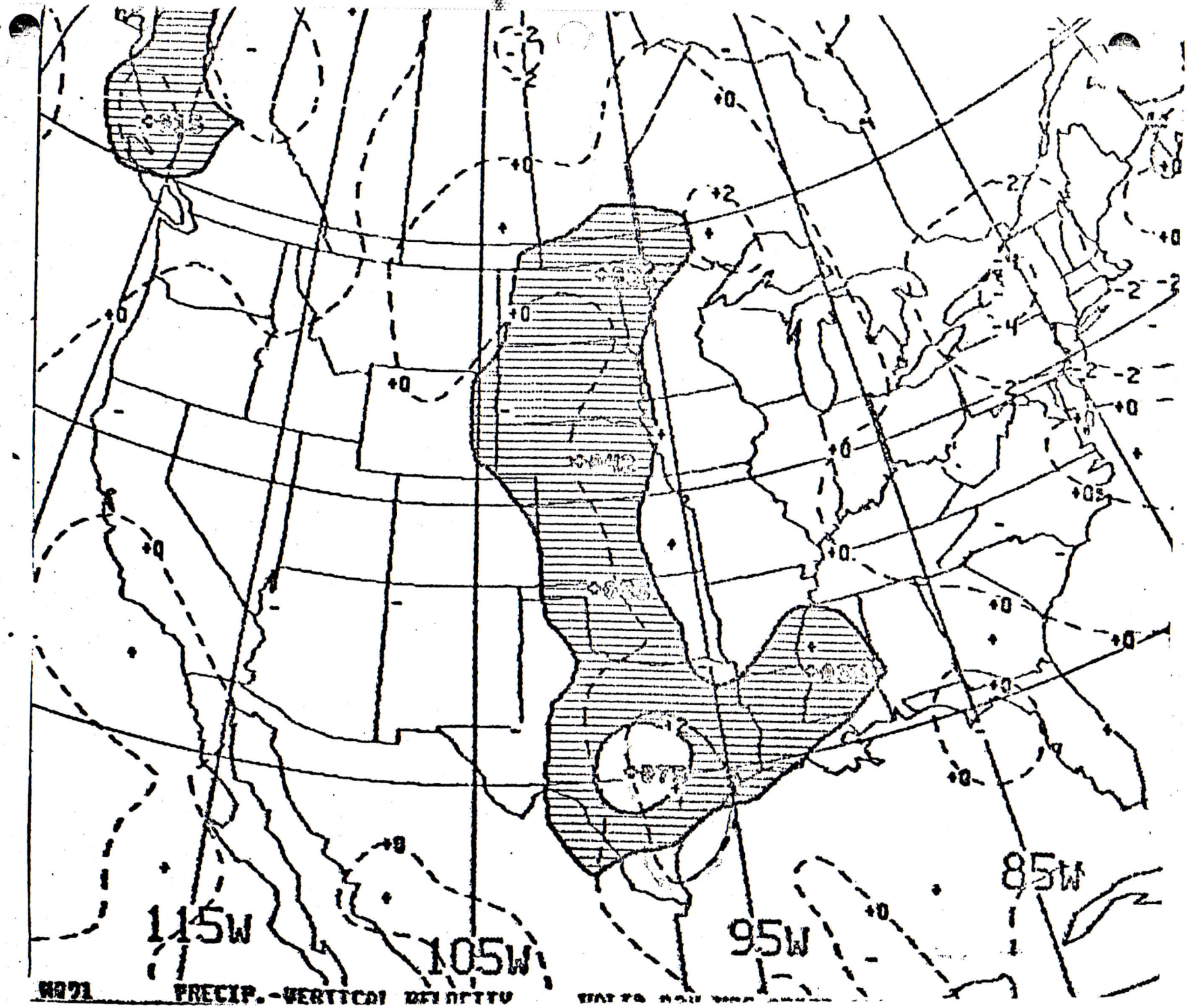
3. Cuada Coma (New Braunfels)

4. Villa Rio (New Braunfels)





5. Glen Cove (Seguin)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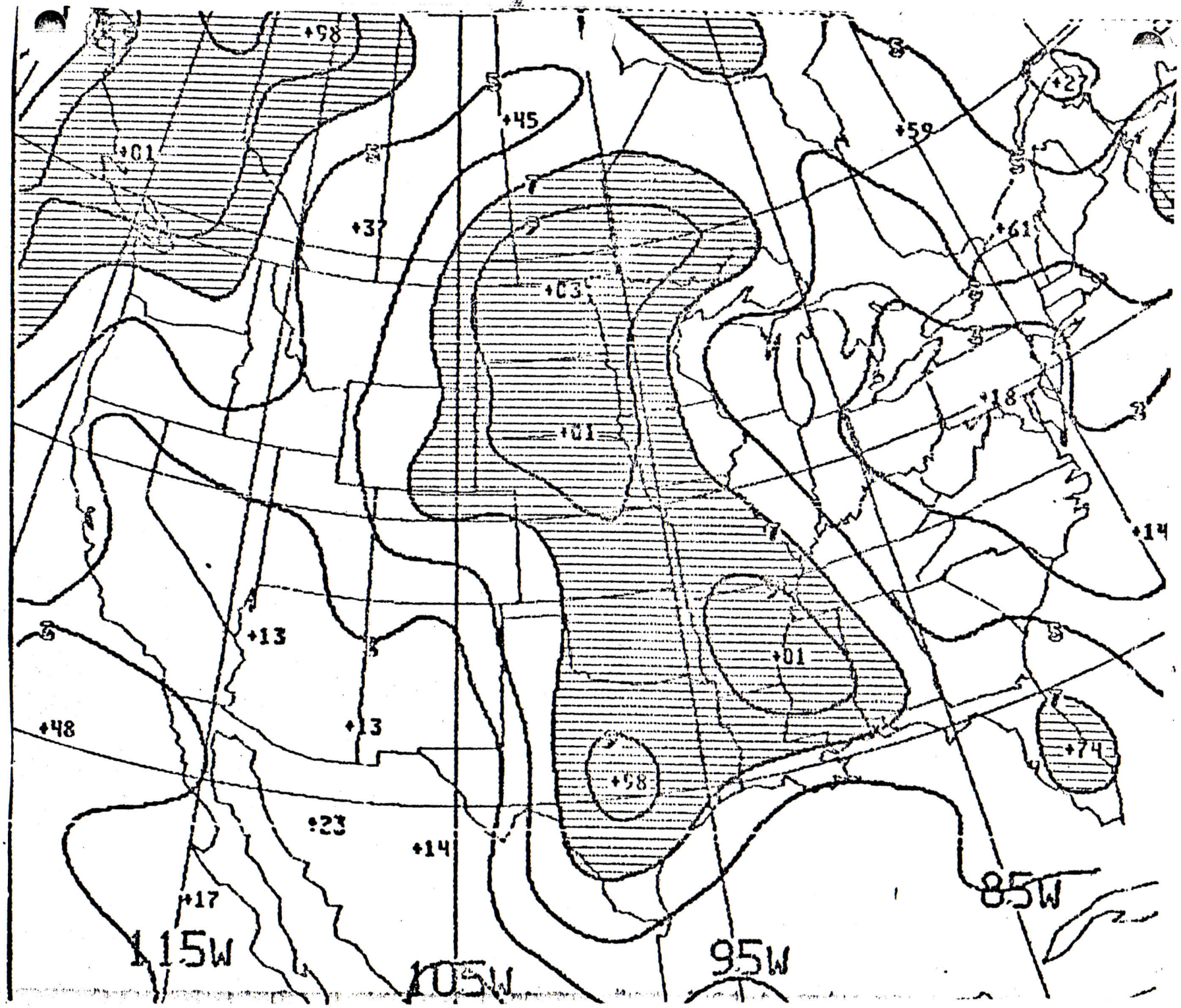
PRECIP.-VERTICAL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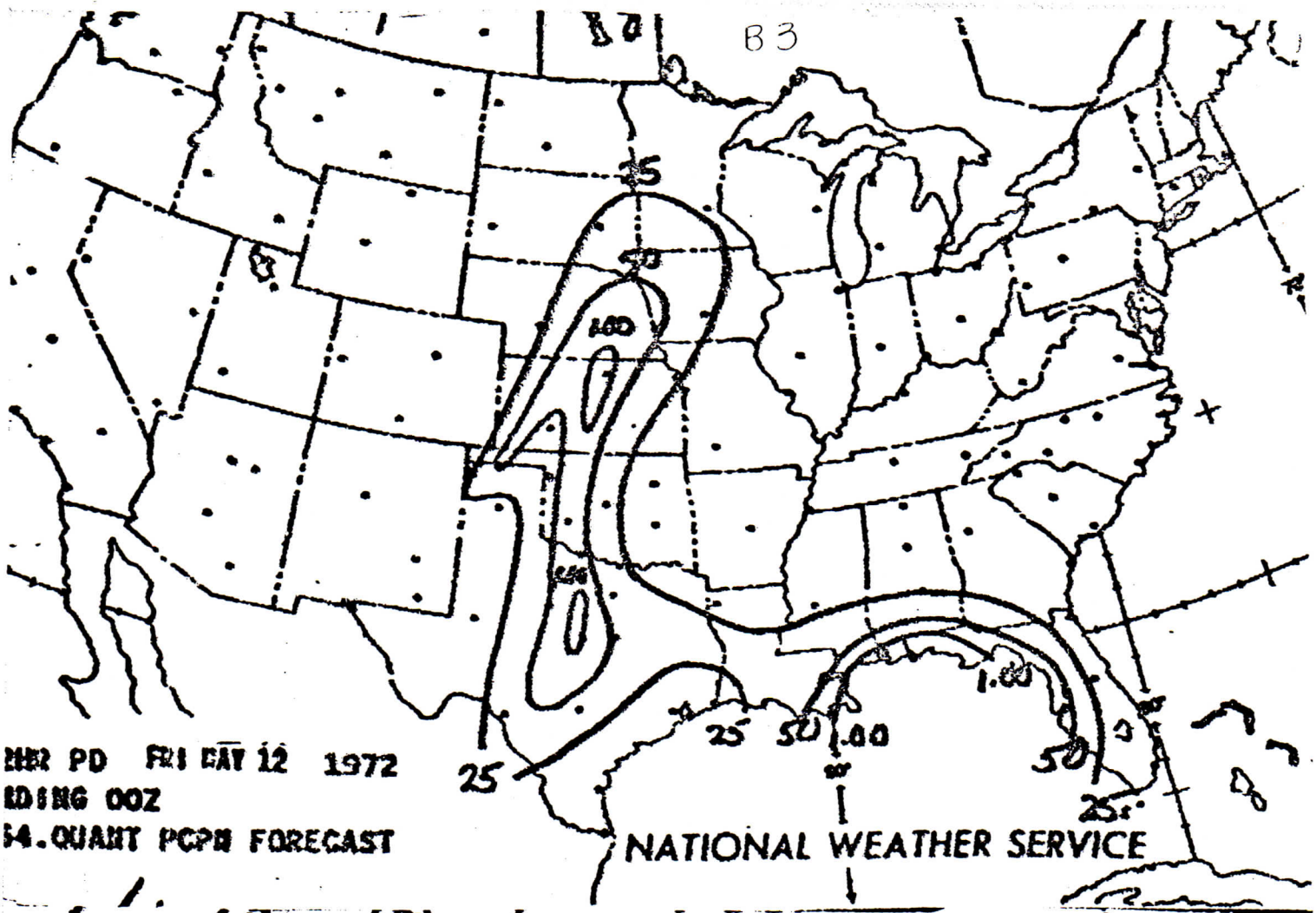
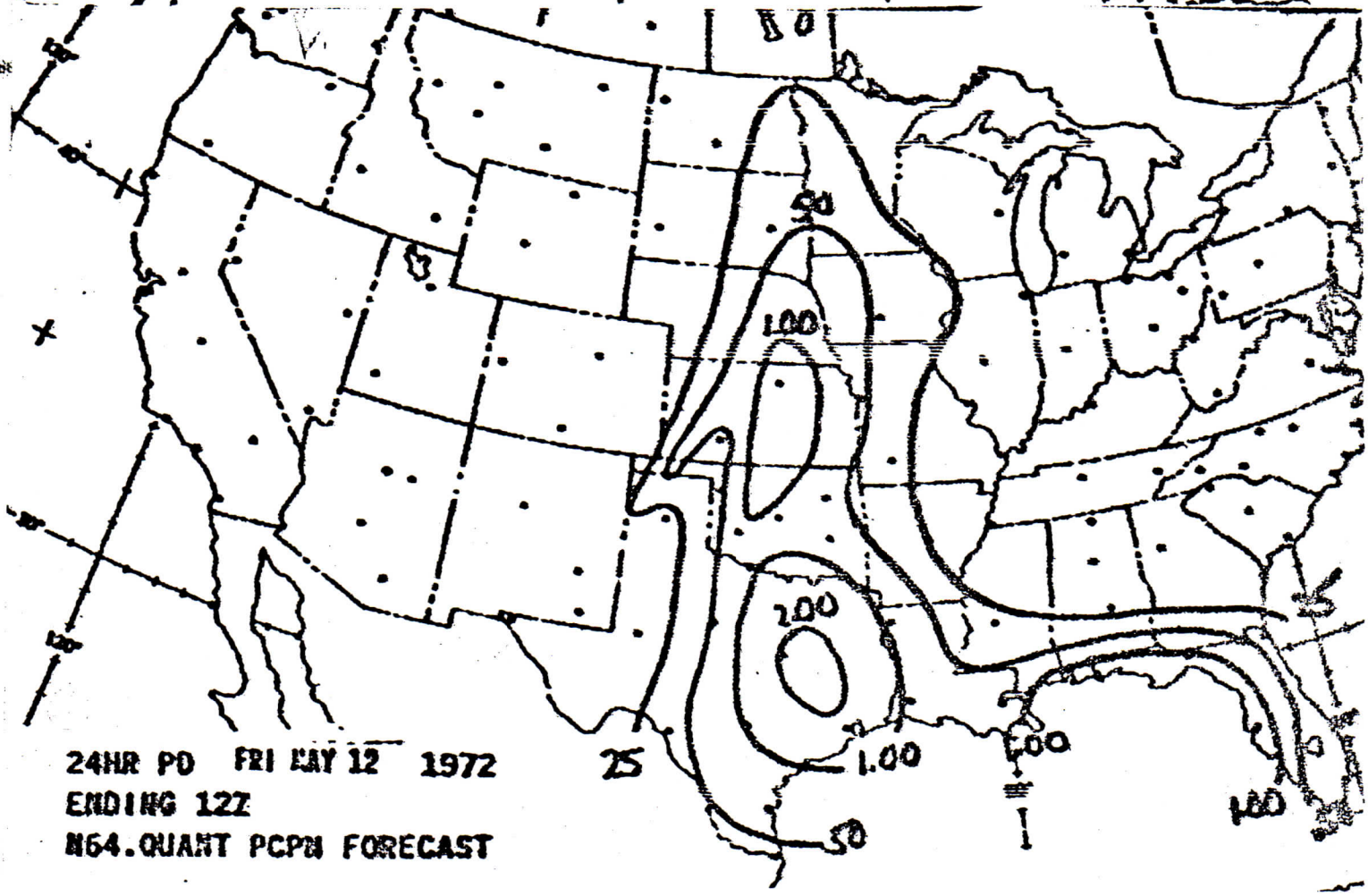
B3




HR PD FRI DAY 12 1972
DING 00Z
4.QUANT PCPN FORECAST




24HR PD FRI DAY 12 1972
ENDING 12Z
N64.QUANT PCPN FORECAST

FPUS1 KSAT 112210
SAT 1 510 PM CDT THURSDAY

SOUTH CENTRAL TEXAS
CLOUDY NORTH .. PARTLY CLOUDY SOUTH.. AND MILD TONIGHT AND FRIDAY
MORNING BECOMING PARTLY CLOUDY FRIDAY AFTERNOON AND NIGHT. CHANCE
OF SHOWERS AND THUNDERSHOWERS TONIGHT INCREASING FRIDAY AFTERNOON AND
NIGHT. SCATTERED THUNDERSHOWERS EAST PORTION... DECREASING CLOUDINESS
WEST PORTION AND CONTINUED MILD SATURDAY. LOWEST TONIGHT AND FRIDAY
NIGHT 62 TO 75. HIGHEST FIRDAY AND SATURDAY 76 TO 90.

NNNN
FPUS3 KSAT 120200
PRELIMINARY
WV ACTIVITY ON E W FNT MOVG NWD INTO CNTRL TEX EXPCD TO PRODUCE LCLY
HVY TSHWRS WITH ADNL RAINFALL AMTS OF 1 TO 4 INCHES NEXT FEW HRS
MAINLY NRN PTNS S CNTRL TEX. CHC FEW LCLY SVR TSTMS NRN HALF
S CNTRL TEX DURG NGT SPRDG EWD INTO SERN TEX BY FRI MRNG.
FLASH FLOOD WRNGS SHD BE IN EFFECT AND SVR TSTM WATCH NR 220
IS IN EFFECT TIL 06Z. OTRW 500 MB TROF ABQ ELP LN SHD CONT EWD
WITH PCPN AND CLDNS DCRG FM THE W OVR SWRN TEX TNGT AND FRI AM
OVR S CNTRL TEX FRI AND SERN TEX FRI NGT. ELP000 MAF210 SJT321 DRT211
SAT851 CRP532 BRO122 IAH553

NNNN
ZCZC
FPUS3 KSAT 120359
KKCC FTWC A KSAT 422 KELP
AT 500 MB MAJOR TROF NMEX SWD OVR EXTRM W TEX EXPCD TO MOV EWD OVR
SWRN TEX FRI RCHG E TEX FRI NGT AS STG IMPLS MOVS THRU IT. AT THE
SFC WVS LKLY ON E W FNT SERN TEX WWD OVR DIST WITH SIG . WV EXPCD
E TEX BY FRI AFTN CONTG EWD SAT. LCLY SVR TSTMS WITH ADNL RAINFALL
AMTS OF 2 TO 5 INCHES EXPCD N PTNS S CNTRL TEX AND INTO W PTNS
SERN TEX TNGT AND FRI MRNG. PCPN ENDG CLDNS DCRG FM THE W OVR
SWRN TEX TNGT AND FRI OVR S CNTRL TEX FRI AND SERN TEX FRI NGT.
ELP000 MAF100 SJT310 DRT210 SAT530 CRP531 BRO331 IAH582

NNNN

ZZC
RWUS RWRB 120210
AWXAW
ZZZZZ
BULLETIN
FLASH FLOOD WARNING
EANS REQUESTED
NATIONAL WEATHER SERVICE SAN ANTONIO TEXAS
ISSUED 8000 PM CDT MAY 11 1972

A FLASH FLOOD WARNING IS IN EFFECT UNTIL MIDNIGHT CDT FOR PERSONS IN BEXAR BANDERA REAL KERR KENDALL COMAL MEDINA FRIO ATASCOSA WILSON KARNES GUADALUPE AND GONZALES COUNTIES IN TEXAS.

HEAVY RAIN WAS INDICATED BY RADAR NORTH OF SAN ANTONIO AND OTHER HEAVY RAIN WAS REPORTED BY THE SHERIFF'S OFFICE IN ATASCOSA COUNTY AT 7045 PM CDT.

THE HEAVY RAINS WILL BE MOVING NORTHWARD OVER THESE COUNTIES TONIGHT AND FLASH FLOODING IS LIKELY. PERSONS SHOULD BE ALERT THROUGHOUT TONIGH FOR POSSIBLE FLOODING ALONG STREAMS AND LOW WATER CROSSINGS.

---

BULLETIN
FLASH FLOOD WARNING
EANS REQUESTED
NATIONAL WEATHER SERVICE SAN ANTONIO TEXAS
ISSUED 940PM CDT...THURSDAY...MAY 11 1972

A FLASH FLOOD WARNING IS IN EFFECT UNTIL 140AM CDT FOR PERSONS ALONG CIBOLO CREEK.

HEAVY RAIN WAS REPORTED BY AN OBSERVER AND DPS AT BULVERDE TEXAS AT 900PM CDT. MORE THAN 4 INCHES OF RAINFALL WAS REPORTED IN ONE HOUR PERIOD.

THESE FLOOD WATERS ARE MOVING DOWN THE CIBOLO CREEK TOWARD CIBOLO TEXAS.

ALL PERSONS LIVING IN LOW PLACES ARE SUBJECT TO FLOODING SHOULD BE PREPARED TO LEAVE IMMEDIATELY WITH A SUDDEN RISE IN WATERS.

THIS WARNING WILL BE EXTENDED AFTER 140AM....

---

BULLETIN
FLASH FLOOD WARNING
EANS REQUESTED
NATIONAL WEATHER SERVICE SAN ANTONIO TEXAS
ISSUED 1130PM CDT MAY 11 1972

A FLASH FLOOD WARNING IS IN EFFECT UNTIL 4 AM CDT FOR PERSONS IN COMAL AND GUADALUPE COUNTIES OF TEXAS.

FLASH FLOODING AND HEAVY RAIN WAS INDICATED BY RADAR AND REPORTED BY POLICE AT NEW BRAUNFELS AND SEGUIN AT 1118 CDT WHERE MORE THAN 7 INCHES OF RAIN WAS REOPRTED AT NEW BRAUNFELS.

THESE FLOOD WATERS ARE MOVING DOWN THE TRIBUTARIES OF THE GUADALUPE RIVER AND THE MAINSTREAM OF THE RIVER TOWARD GONZALES TEXAS.

PERSONS IN LOW AREAS SUBJECT TO FLOODING SHOULD MOVE TO HIGHER GROUND IMMEDIATELY IN ADVANCE OF RAPIDLY RISING WATERS.

B6

BULLETIN
FLASH FLOOD WARNING
IMMEDIATE BROADCAST REQUESTED
WEATHER SERVICE OFFICE AUSTIN TEXAS
ISSUED 10:10PM CDT MAY 11 1972

A FLASH FLOOD WARNING IS NOW IN EFFECT FOR PEROSNS IN HAYS COUNTY IN TEXAS AND ESPECIALLY THE CITY OF SAN MARCOS.

A HEAVY THUNDERSTORM THAT WILL PRODUCE AS MUCH AS 4 INCHES OF RAIN IN A SHORT PERIOD OF TIME IS MOVING INTO THE SAN MARCOS AREA AT THIS TIME.

SERSONS IN THE VICINITY OF SMALL CREEKS AND OTHER PLACES OF POOR DRAINAGE SHOULD BE ON THE ALERT FOR FLOODING FOR THE NEXT TWO HOURS OR UNTIL 12:15AM CDT FRIDAY MORNING.

XW [illegible] IMPROVING CONDITIONS ARE SIGHTED..

Z Z Z Z Z

BULLETIN
SEVERE WEATHER BULLETIN
IMMEDIATE BROADCAST REQUESTED
ISSUED 11:13PM CDT MAY 11 1972

THE SEVERE THUNDERSTORM WARNINGS FOR BURNET AND WESTERN WILLIAMSON COUNTIES IN TEXAS ARE NO LONGER IN EFFECT.

THE SEVERE THUNDERSTORM WARNING CONTINUES IN EFFECT FOR LAMPASAS COUNTY. A SEVERE THUNDERSTORM HAS DEVELOPED TO THE WEST OF LAMPASAS AND IS MOVI TO THE NORTHEAST AT 20MPH.

THE FLASH FLOOD WARNINGS CONTINUE IN EFFECT FOR HAYSCOUNTY AND ESPECIAL EXTENDED UNTIL 2AM CDT FRIDAY MORNING.

THE FLASH FLOOD WARNINGS ARE ALSO IN EFFECT UNTIL 2AM CDT FOR TRAVIS AND CALDWELL COUNTYIES.

The City of San M

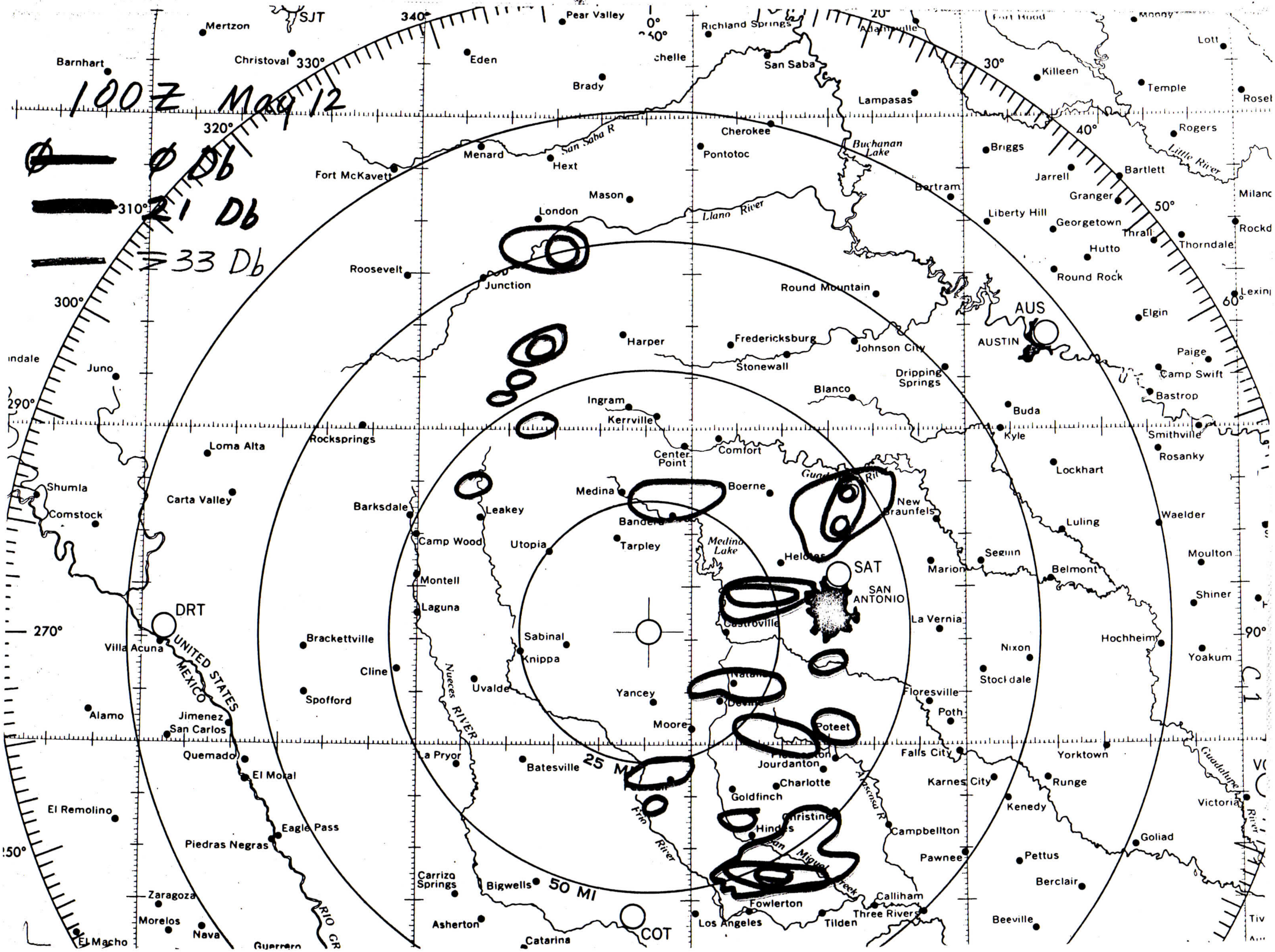
XAW

Z Z Z Z Z
WARNING
TORNADO WARNING
EANS REQUESTED
WEATHER SERVICE OFFICE AUSTIN TEXAS
ISSUED 11:30PM CDT MAY 11 1972

A TORNAO WARNING IS NOW IN EFFECT FOR CALDWELL COUNTY IN TEXAS AND ESPECIALLY THE CITY OF LULING.

A TORNADO IS INDICATED BY RADAR 18 MILES SOUTHWEST OF LULING AND IS MOVING NORTHEASTWARD AT 20MPH.

PERSONS IN THIS AREA SHOULD BE ALERT FOR A POSSIBLE TORNADO UNTIL 1AM C FRIDAY MORNING.


100Z May 12
Ø Db
21 Db
≥33 Db
SJT
AUS
AUSTIN
SAT
SAN ANTONIO
DRT
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40°
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270°
290°
300°
310°
320°
330°
340°
Mertzon
Barnhart
Christoval
Eden
Pear Valley
Brady
Richland Springs
San Saba
Lampasas
Killeen
Temple
Lott
Rogers
Cherokee
Pontotoc
Buchanan Lake
Briggs
Jarrell
Granger
Bartlett
Little River
Menard
Hext
San Saba R
Fort McKavett
Mason
London
Llano River
Bertram
Liberty Hill
Georgetown
Thrall
Thorndale
Hutto
Round Rock
Roosevelt
Junction
Round Mountain
Elgin
Harper
Fredericksburg
Johnson City
Stonewall
Dripping Springs
Paige
Camp Swift
Bastrop
Juno
Blanco
Ingram
Kerrville
Buda
Kyle
Smithville
Rosanky
Rocksprings
Loma Alta
Center Point
Comfort
Lockhart
Shumla
Comstock
Carta Valley
Barksdale
Medina
Boerne
New Braunfels
Leakey
Luling
Waelder
Camp Wood
Utopia
Bandera
Tarpley
Medina Lake
Helotes
Seguin
Marion
Moulton
Montell
Belmont
Shiner
Laguna
Castroville
La Vernia
Villa Acuna
UNITED STATES
MEXICO
Brackettville
Sabinal
Knippa
Nixon
Hochheim
Yoakum
Cline
Nueces RIVER
Uvalde
Stockdale
Floresville
Poth
Yancey
Spofford
Alamo
Jimenez
San Carlos
Moore
Poteet
Quemado
La Pryor
Falls City
Yorktown
Batesville
Jourdanton
Karnes City
Runge
El Moral
Charlotte
Goldfinch
Kenedy
Victoria
Guadalupe River
El Remolino
Eagle Pass
Christine
Hindes
Atascosa R
Campbellton
Goliad
Piedras Negras
Frio River
San Miguel Creek
Pawnee
Pettus
Carrizo Springs
Bigwells
Berclair
Calliham
Three Rivers
Fowlerton
Zaragoza
Morelos
Nava
Asherton
Los Angeles
Tilden
Beeville
El Macho
Guerrero
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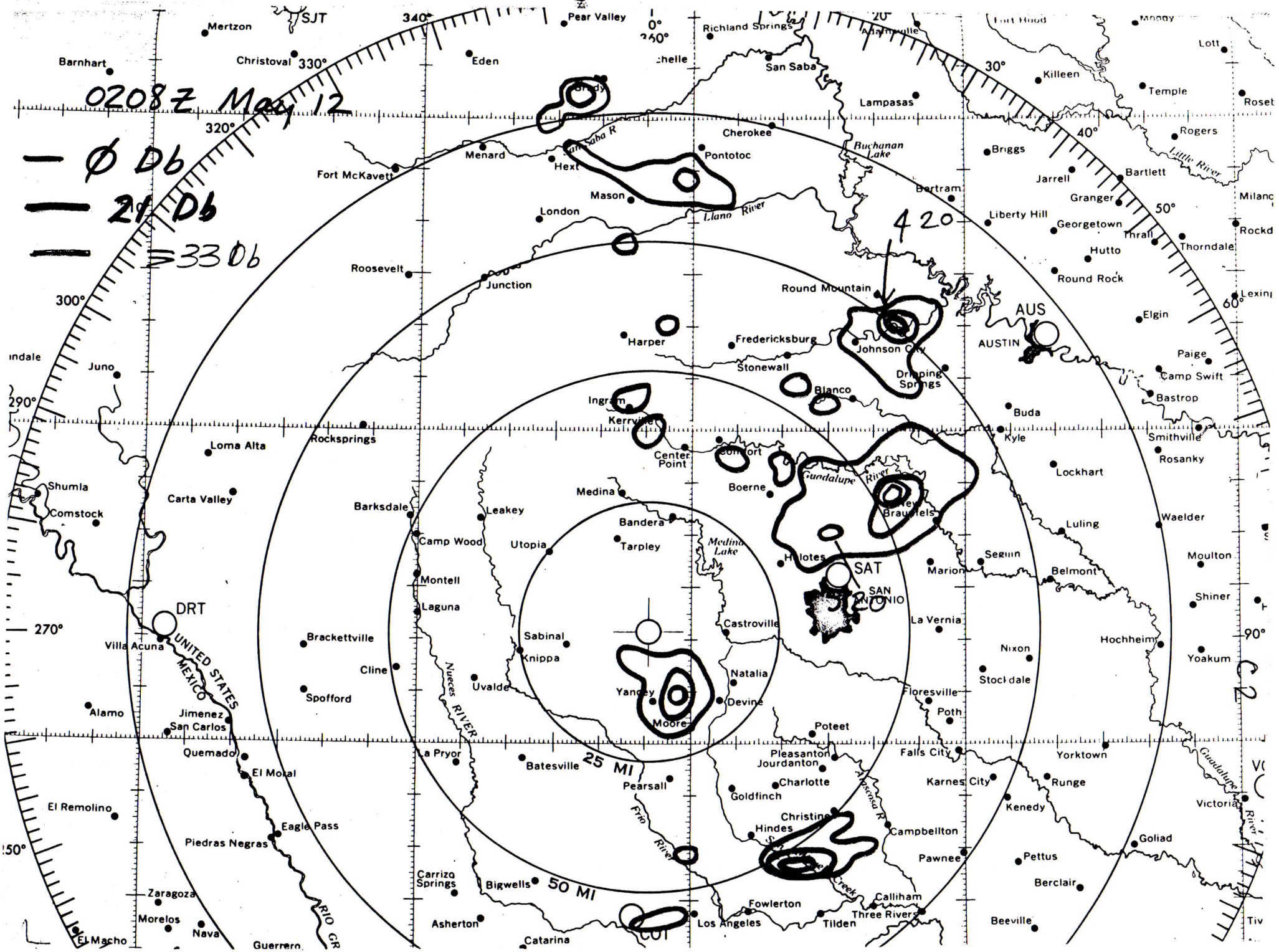
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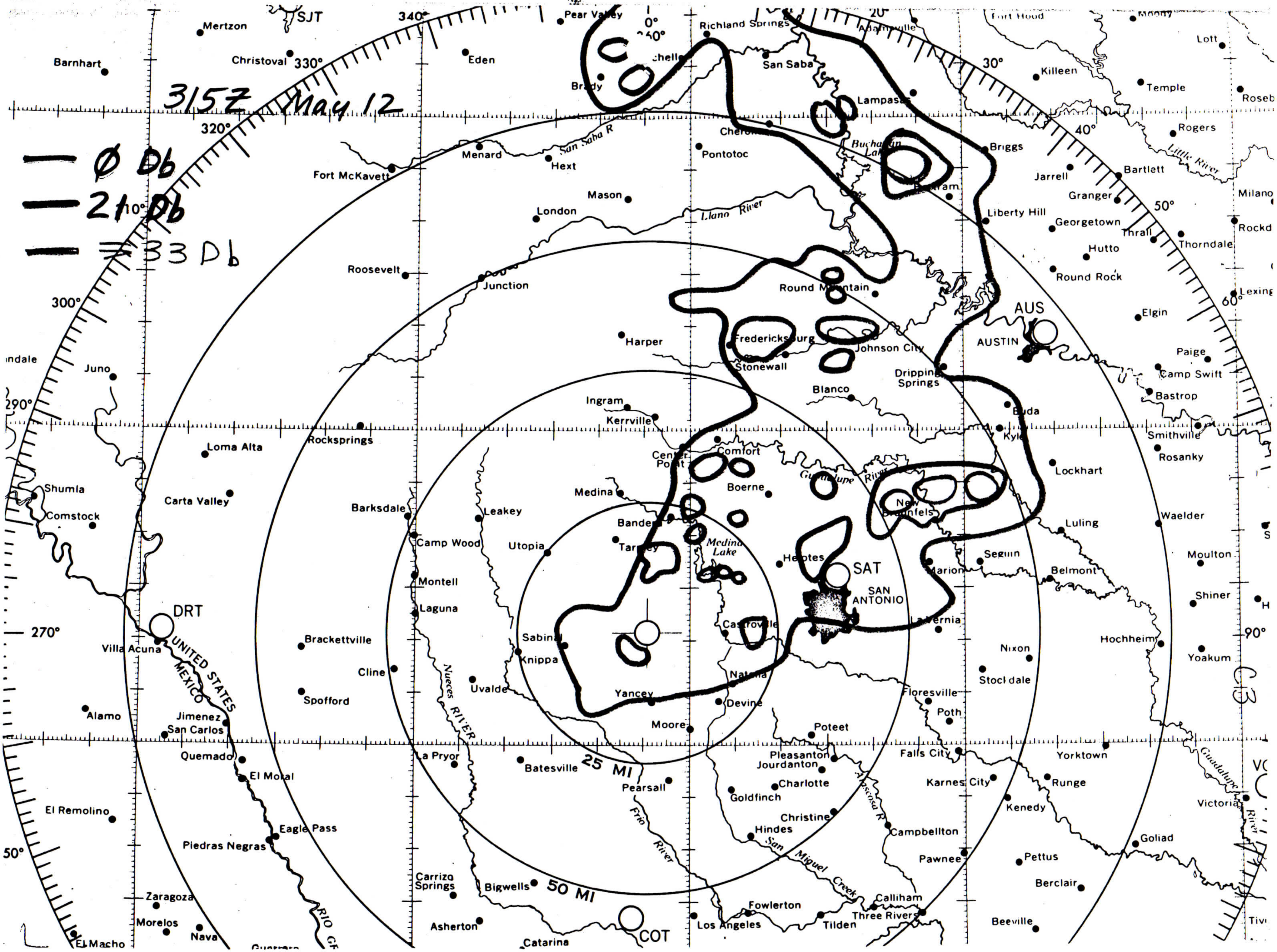
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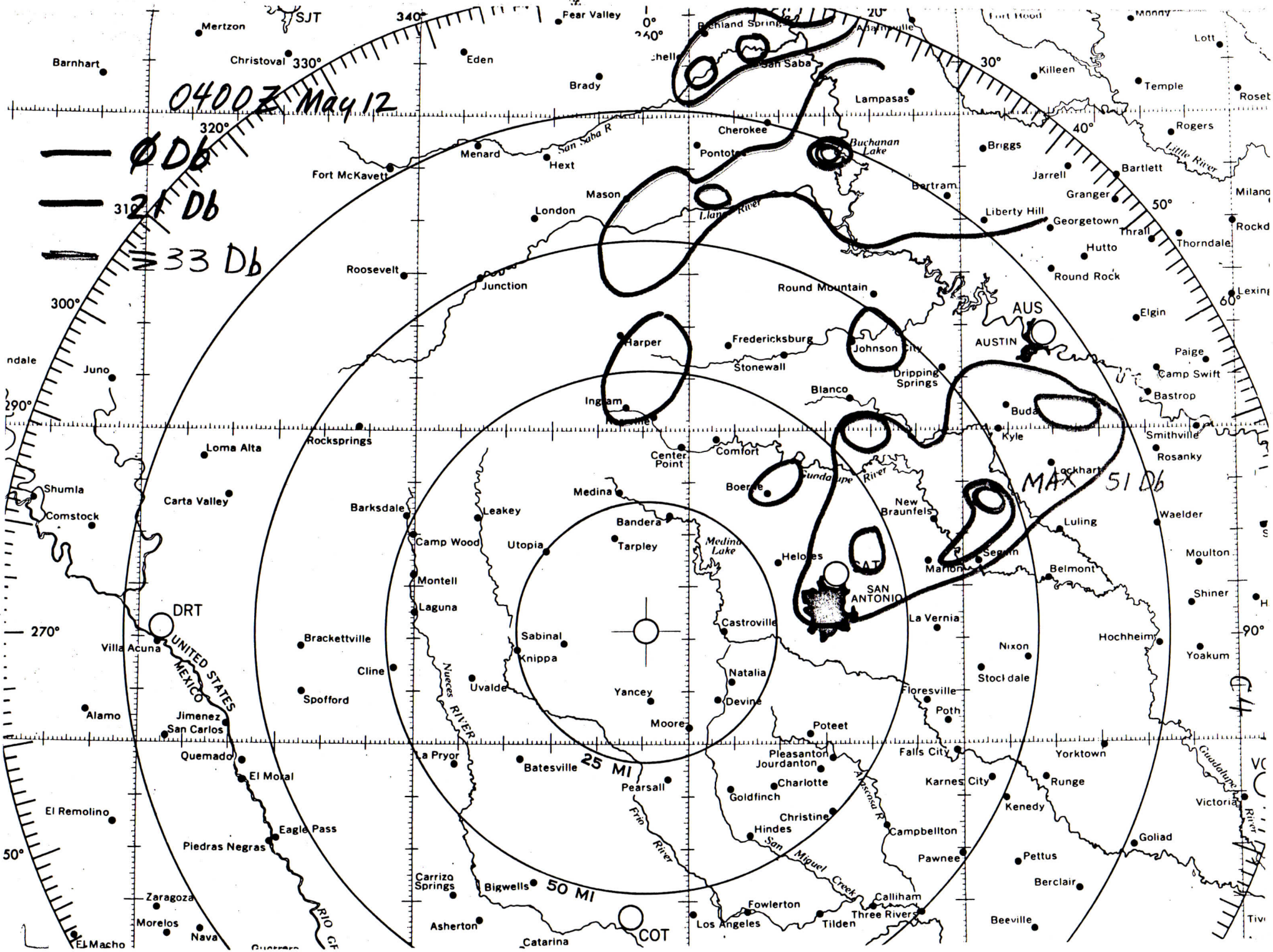
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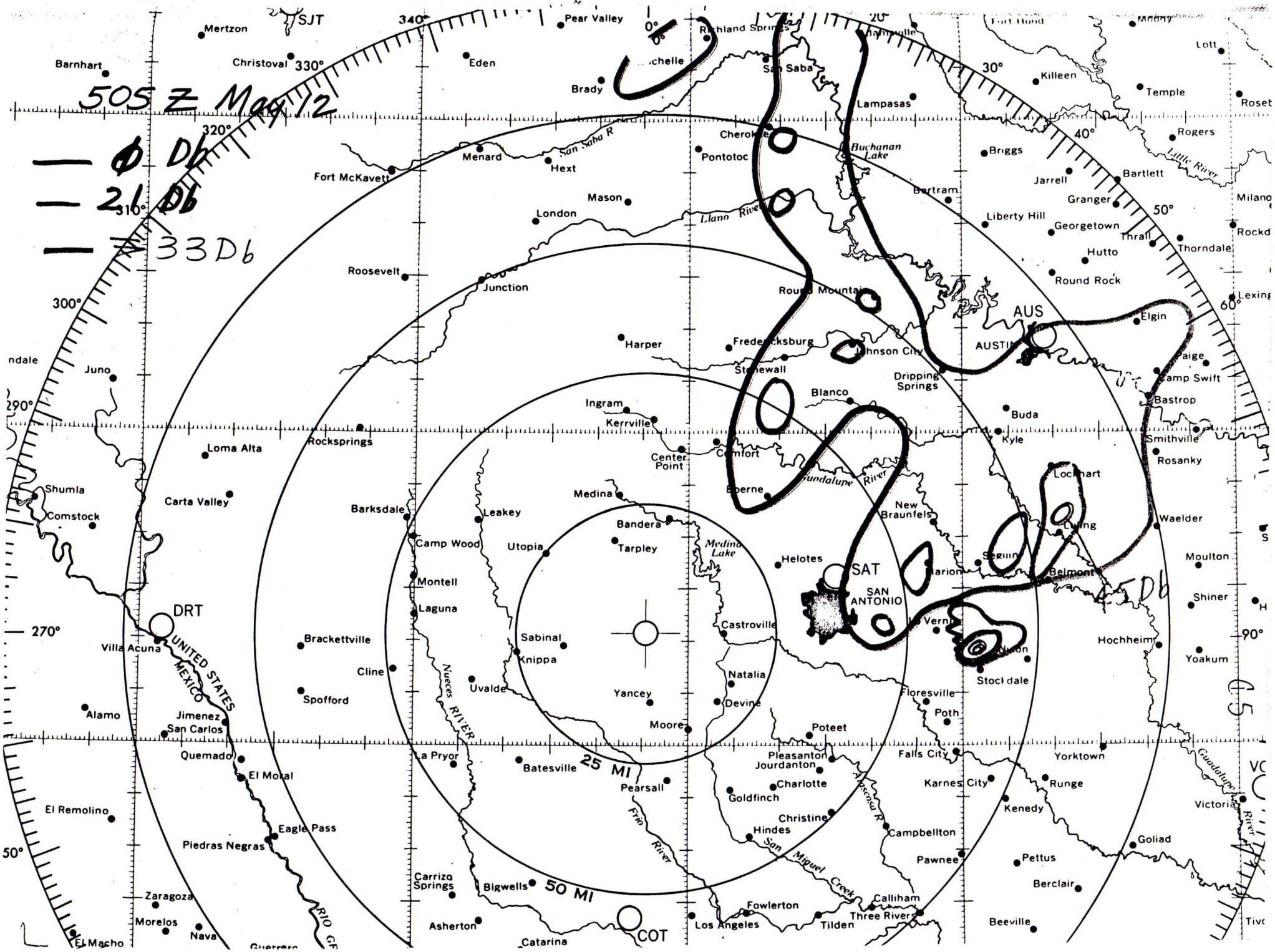
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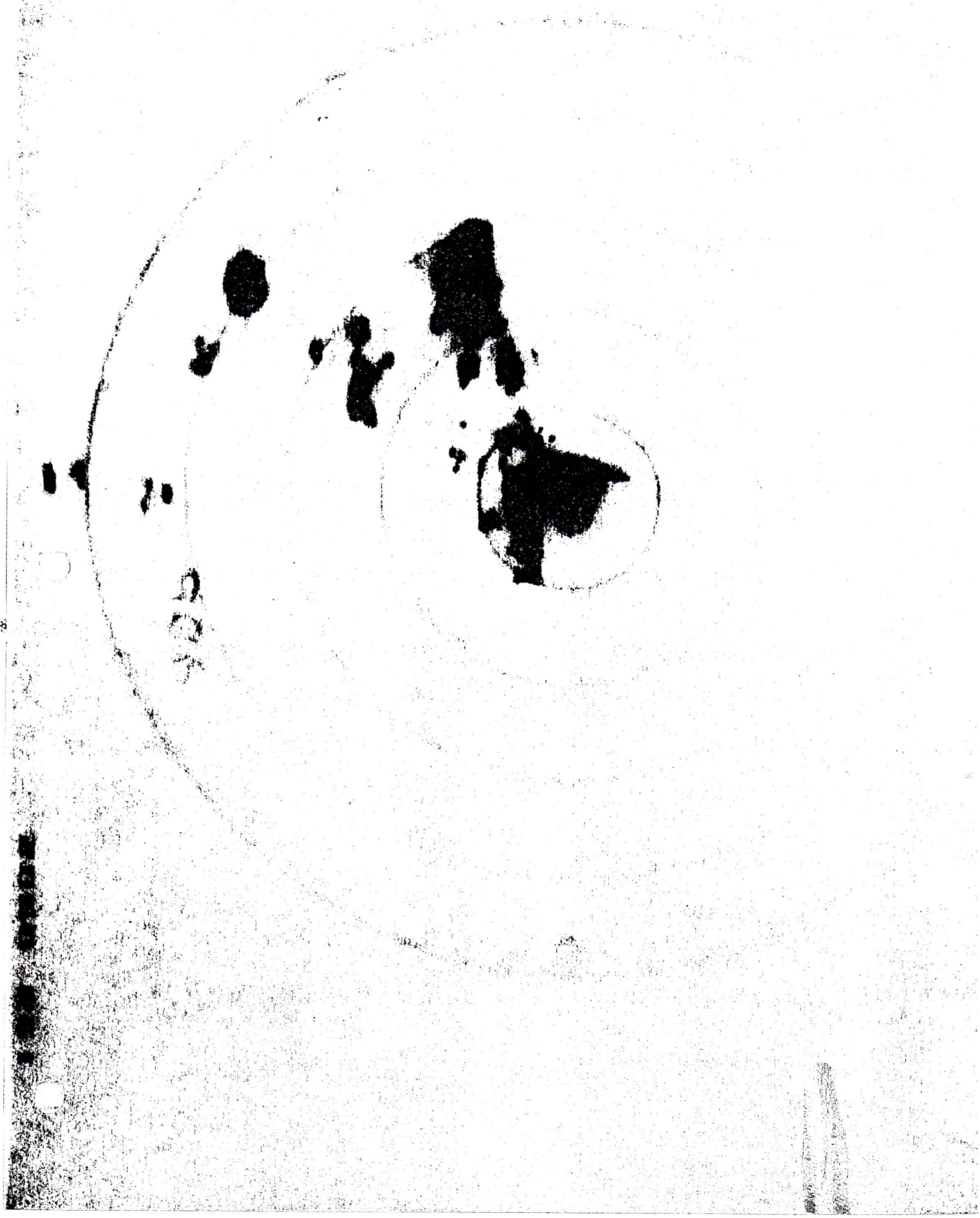

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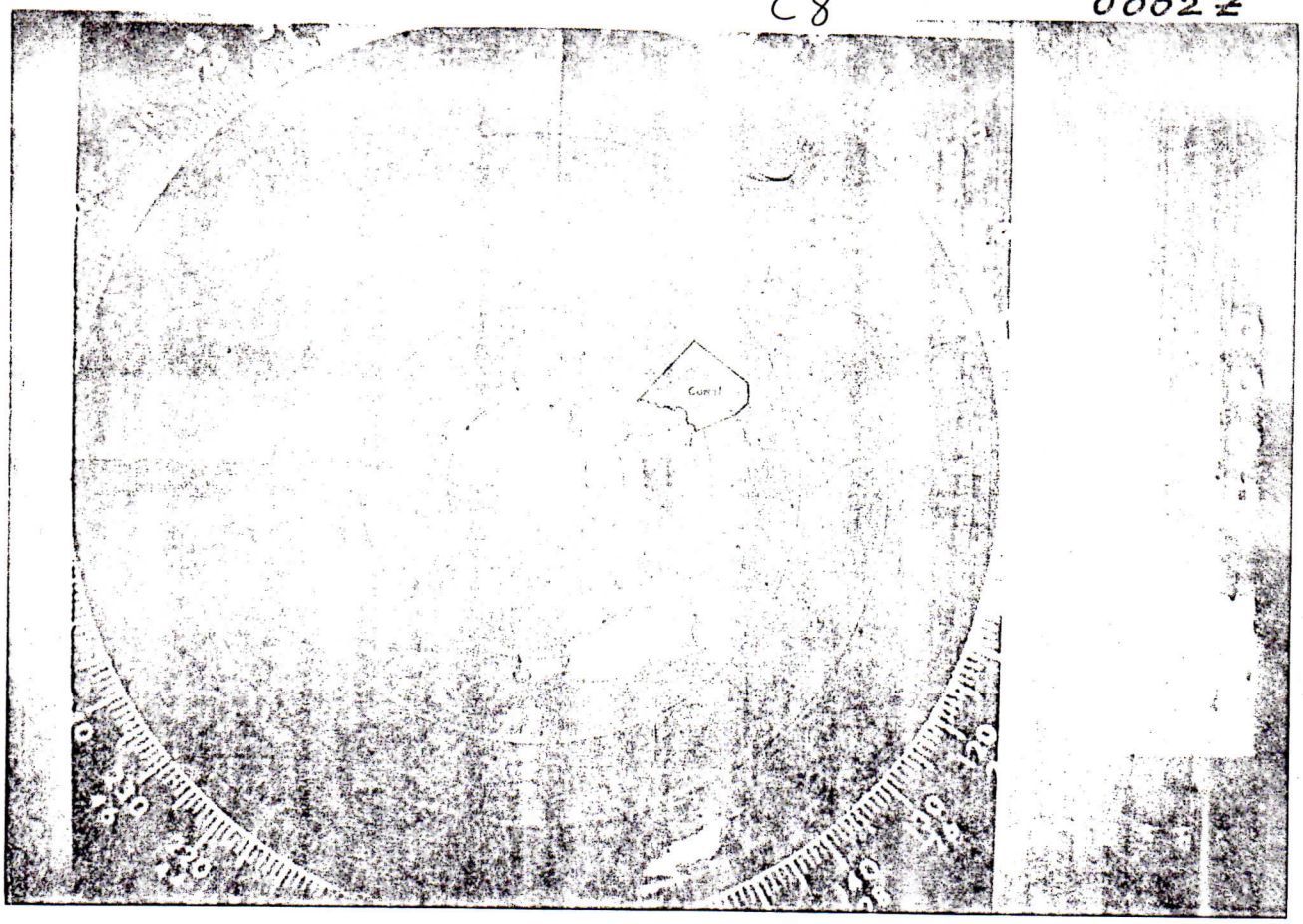

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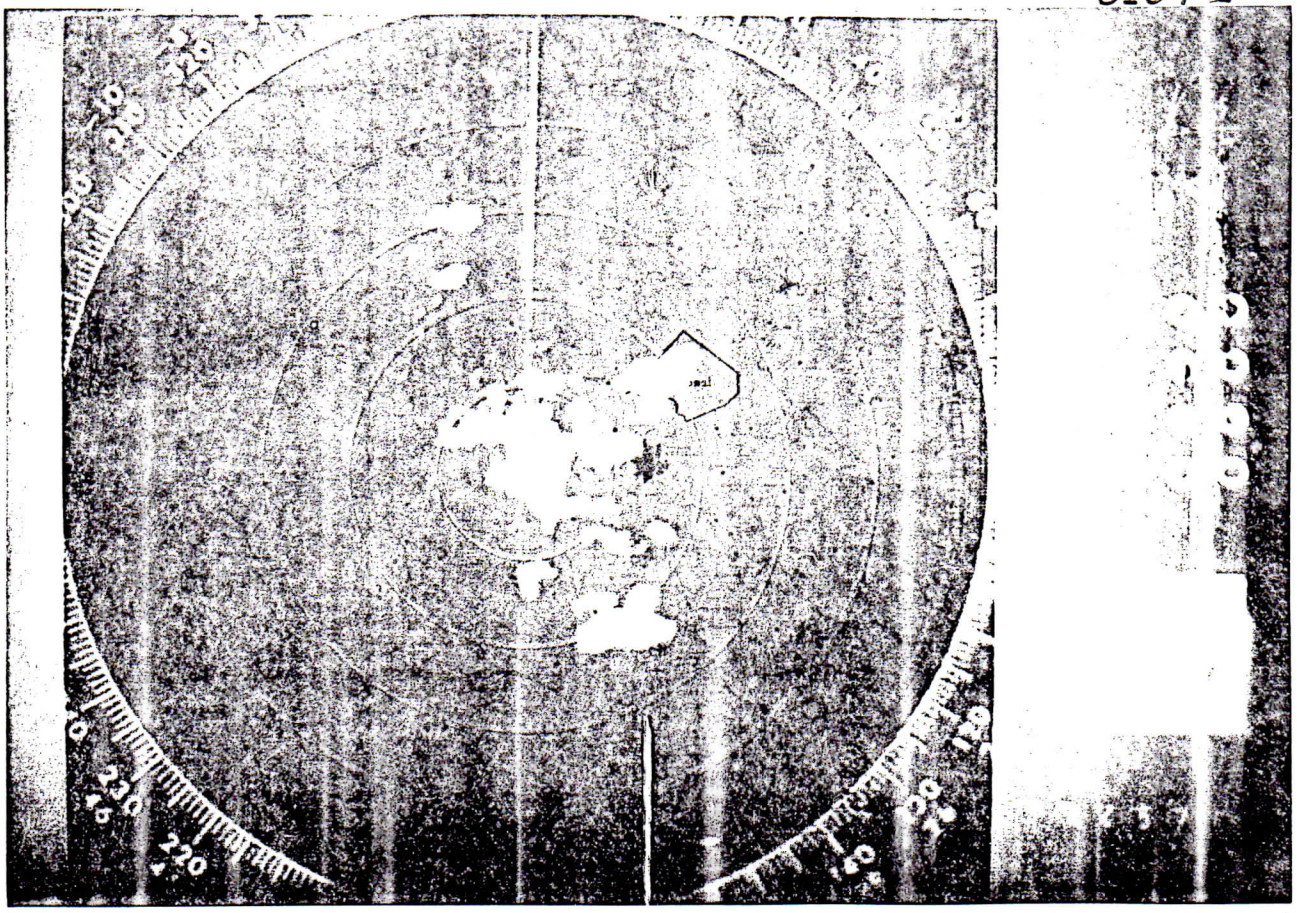

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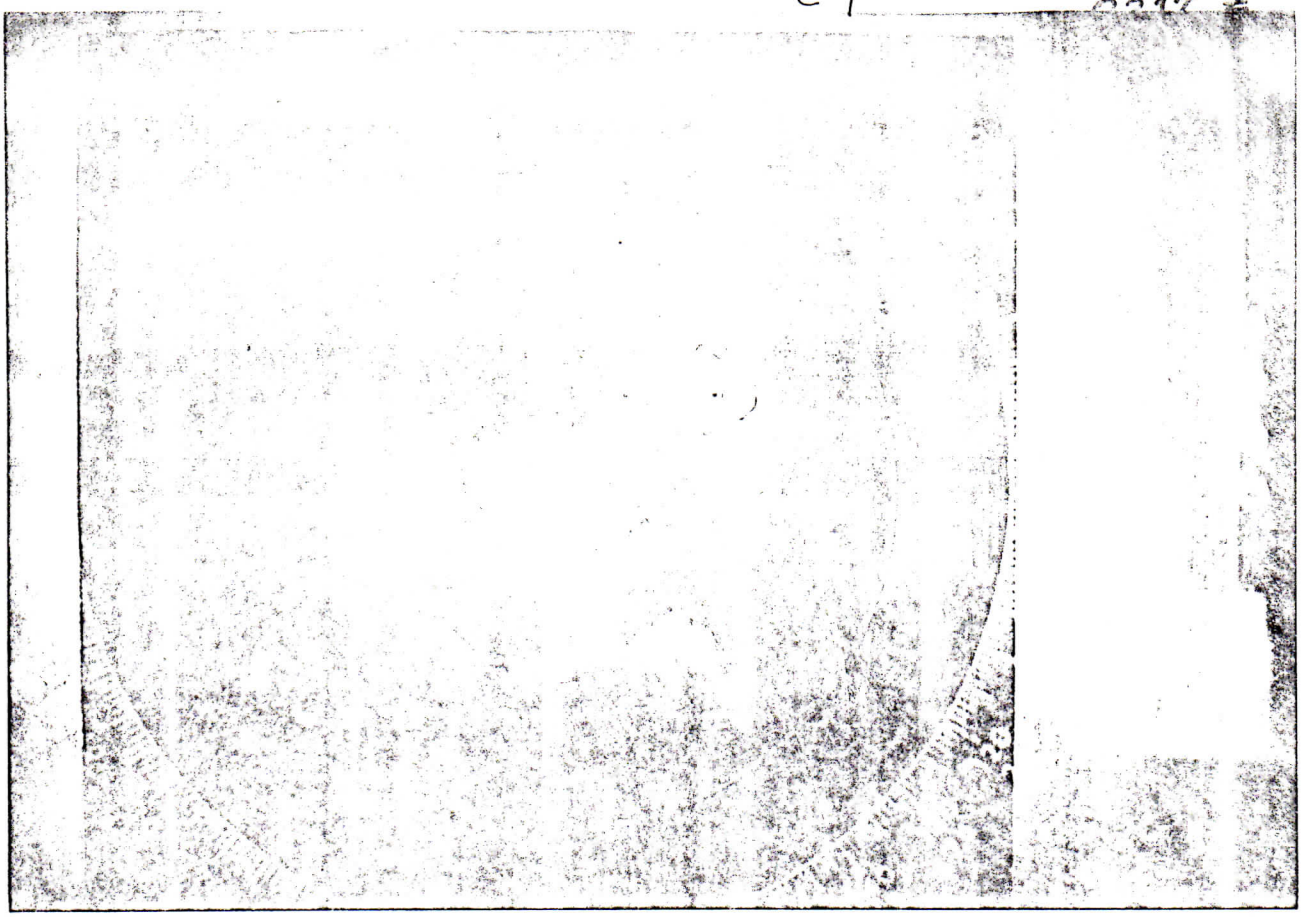

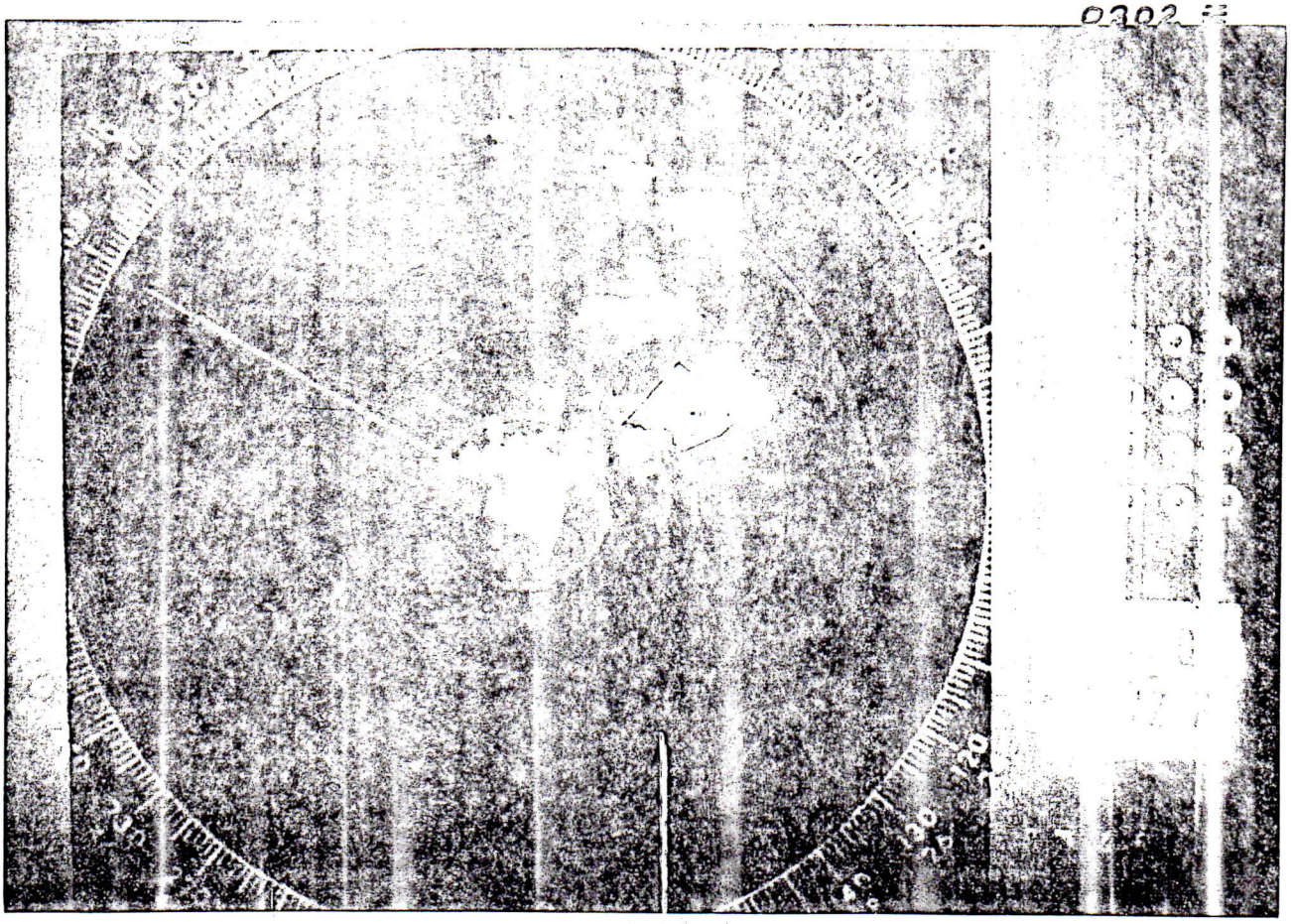

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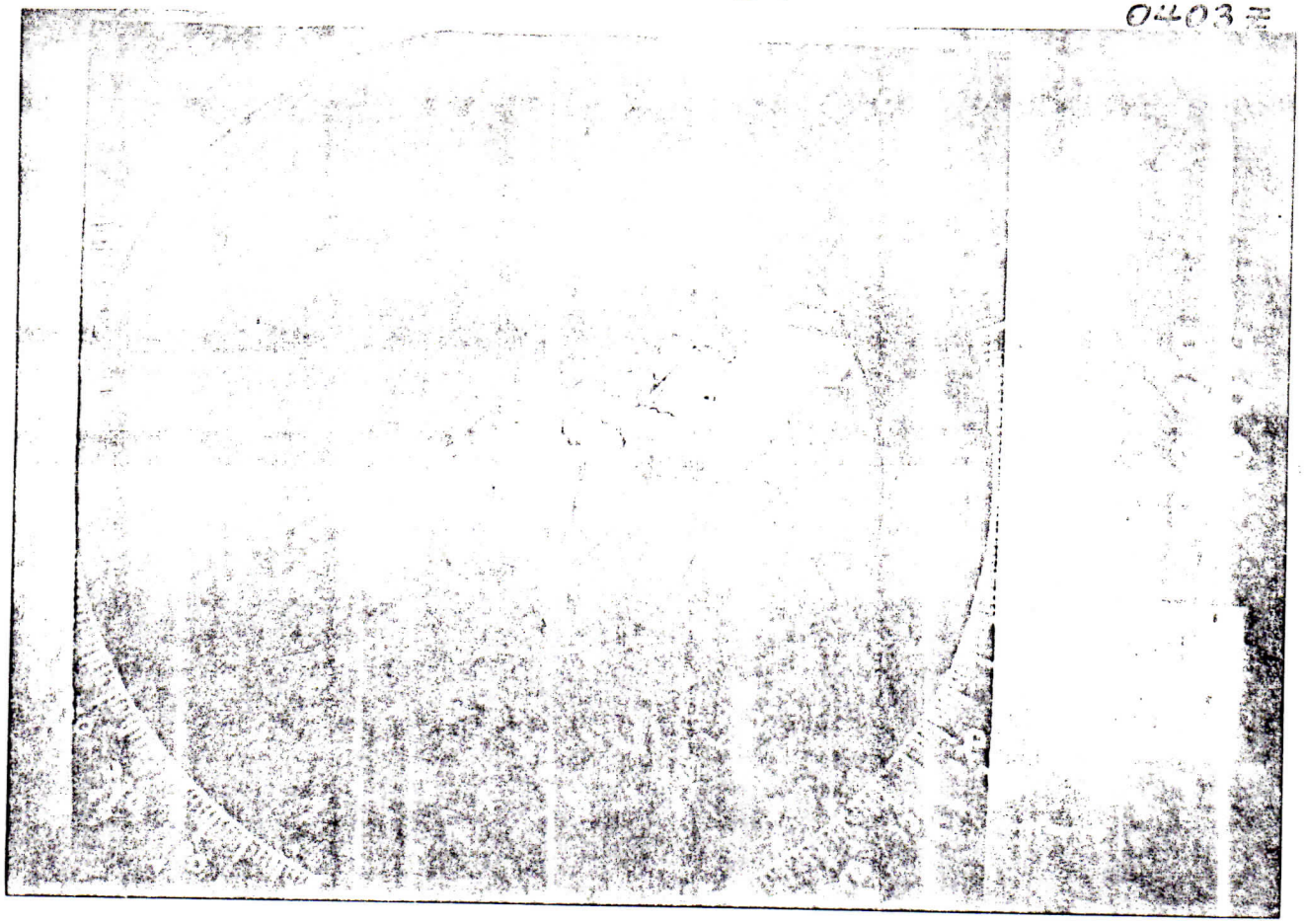

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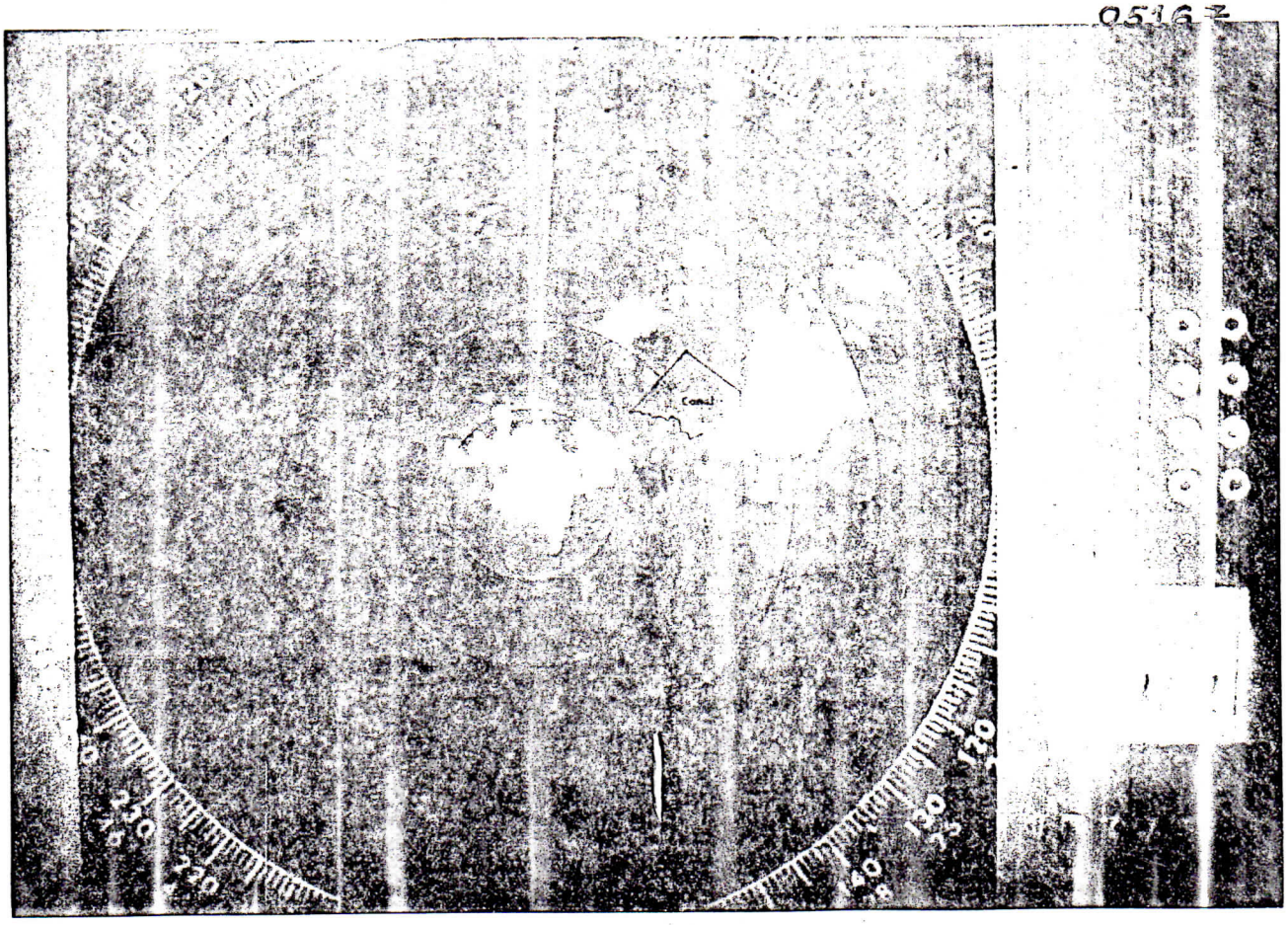


C11

SHOWERS AXA

HONDO...RADAR WEATHER...7:45 PM CDT...THURSDAY MAY 11,1972

SHOWERS AND A FEW THUNDERSTORMS CONTINUE THEIR MOVEMENT TO THE NORTH AT 20 MILES AN HOUR INTO THE CENTRAL PORTION OF THE STATE. THIS 50 MILE WIDE AREA IS FROM THE LLANO RIVER NORTHEAST OF JUNCTION TO HEBBRONVILLE...HALF WAY BETWEEN LAREDO AND ALICE. THE HEAVIEST THUNDERSTORMS ARE LOCATED 20 MILES WEST OF ALICE AND AND CHARLOTTE IN ANTASCOSA COUNTY OR ABOUT 45 MILES SOUTHWEST OF SAN ANTONIO. THESE STORMS HAVE A RAINFALL RATE OF THREE QUARTERS TO ONE INCH PER HOUR.

B4

A SOLITARY THUNDERSTORM IS NOTED ABOUT 15 MILES NORTH OF ABILENE. THIS STORM IS MOVING TO THE NORTH AT 20 MILES AN HOUR.

FOR AVIATION...MAX TOPS 50 THOUSAND FEET 45 MILES SOUTHWEST OF SAN ANTONIO AND 40 THOUSAND FEET 20 MILES WEST OF ALICE.

B4

AXA

HONDO...RADAR WEATHER...8.45PM CDT

SCATTERED SHOWERS AND THUNDERSHOWERS SOME HEAVY ARE INDICATED IN AN AREA..75 MILES WIDE..FROM 40 MILES SOUTH OF BROWNWOOD SOUTHWARD TO 75 MILES SOUTH OF SAN ANTONIO. TWO HEAVY THUNDER STORMS WITH RAINFALL RATES IN THE EXCESS OF ONE INCH PER HOUR ARE LOCATED 10 MILES NORTHWEST OF NEW BRAUNFELS AND 50 MILES SOUTH OF SAN ANTONIO. RAINSHOWERS FROM KERVILLE NORTHWARD ARE INCREASING IN INTENSITIES AND HAVE RAINFALL RATES NEAR ONE HALF INCH PER HOUR. PRECIPITATION IS MOVING NORTHWARD AT 20 MPH.

FOR AVIATION INTEREST..MAX TOPS ARE 51 THSD FEET 50 MILES SOUTH OF SAN ANTONIO AND 50 THSD FEET 10 MILES NORTHWEST OF NEW BRAUNFELS

B4

C .12

BG

AXA

HONDO...RADAR WEATHER...9:45 PM CDT...THURSDAY MAY 11, 1972

THUNDERSTORMS CONTINUE TO SOAK THE HILL COUNTRY FROM HONDO TO FREDRICKSB 50 MILES WEST OF AUSTIN. THESE STORMS ARE MOVING TO THE NORTH AT 20 MILES AN HOUR. TWO STORMS..LIKELY SEVERE ARE LOCATED 10 MILES EAST OF MEDIAN LAKE AND 15 MILES SOUTH OF FREDRICKSBURG. THE RAINFALL RATES IN THESE STORMS IS IN EXCESS OF ONE INCH PER HOUR.

FOR AVIATION..MAX TOP 52 THOUSAND FEET 15 MILES WEST OF SAN ANTONIO..AND 48 THOUSAND FEET 50 MILES NORTHEAST OF HONDO.

AXA

HONDO...RADAR WEATHE....10:45 AM CDT THURSDAY M. 11, 1972

AN AREA OF THUNDERSTORMS FROM SOUTH OF MINERAL WELLS TO 25 MILES SOUTHEAST OF HONDO ARE MOVING TO THE NORTH AT 20 MILES AN HOUR. THE HEAVIEST STORM IS CENTERED OVER 1PASAS...60 MILES SOUTHWEST OF WACO. LARGE HAIL AND WINDS WERE REPORTED IN THIS STORM. ANOTHER SEVERE THUNDERSTORM IS INDICATED SOME 15 MILES SOUTHWEST OF AUSTIN.

THE MAX PRECIPITATION IS IN EXCESS OF ONE INCH PER HOUR BETWEEN AUSTIN AND SAN ANTONIO ON THE GUADALUPE RIVER.

FOR AVIATION...MAX TOPS 52 THOUSAND FEET 20 MILES NORTH AND 30 MILES NORTHEAST OF SAN ANTONIO.

BG

HONDO...RADAR WEATHER...11:45 PM CDT...THURSDAY MAY 12,1972

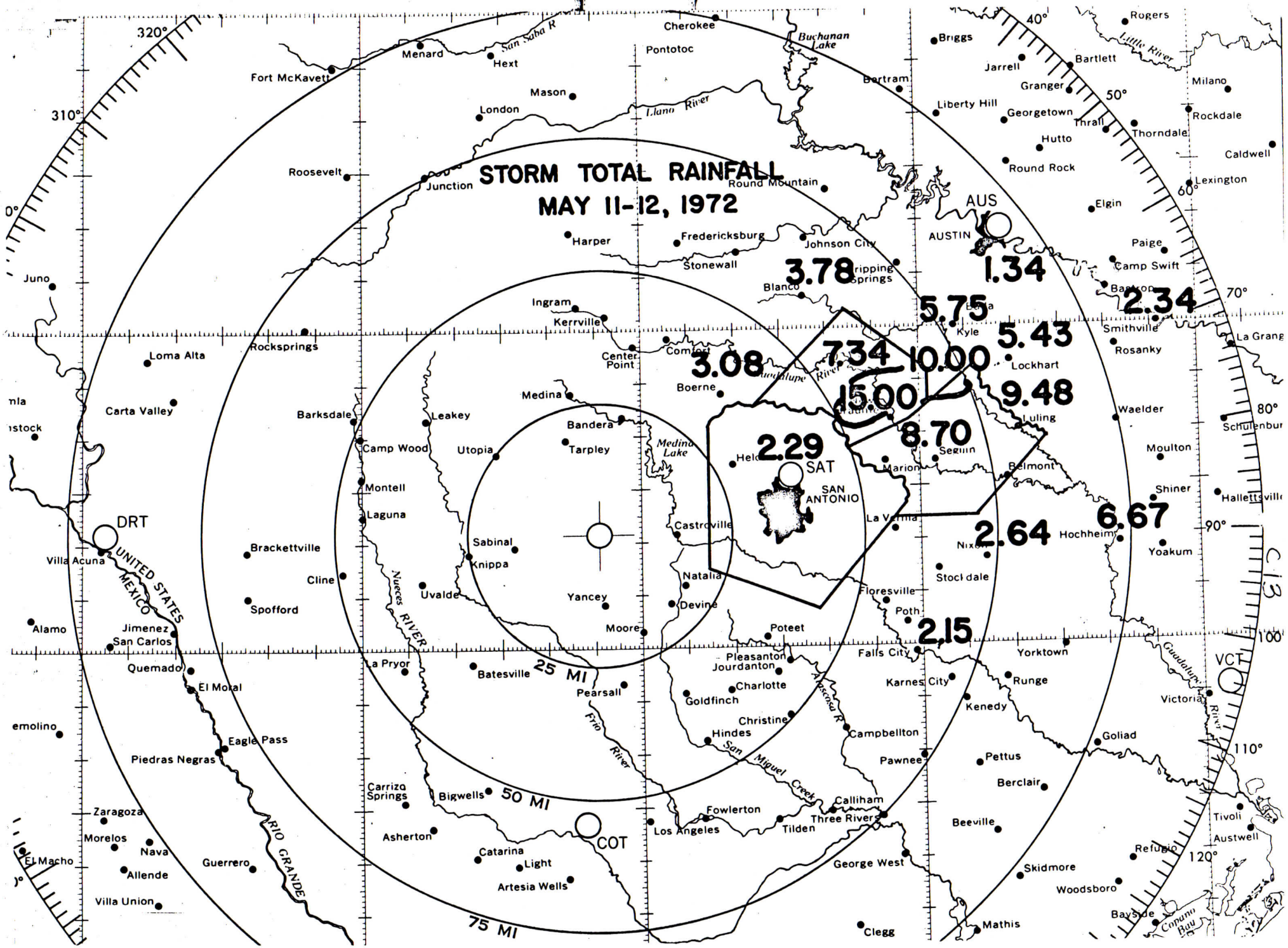
A SEVERE THUNDERSTORM WITH DAMAGING WINDS IS IN PROGRESS NEAR THE TOWN O LULING...45 MILES EAST NORTH EAST OF SAN ANTONIO.

THUNDERSHOWERS AND A COUPLE OF SEVERE THUNDERSTORMS IS NOTED BETWEEN AUSTIN AND SAN ANTONIO..ONE BEING JUSE WEST OF SEGUIN. THE THUNDERSTORMS ARE MOVING TO THE EAST AT 20 MILES AN HOUR. THE HEAVIEST PRECIPITATION IS NEAR LULING AND SEGUIN. THESE STORMS INDICATE IN EXCESS OF ONE AND ONE HALF INCHES PER HOUR.

.HER THUNDERSHOWERS ARE ROAMING THE HILL COUNTRY FROM SAN SABA TO 35 MILES NORTHEAST OF HONDO.

FOR AVIATION...MAX TOP 57 THOUSAND FEET 45 MILES NORTHEAST OF SAN ANTONIO.

BWG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MAY 11-12, 1972
AUS
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VCT
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5.75
5.43
7.34
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15.00
9.48
8.70
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2.64
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Catarina
Light
George West
Refugio
El Macho
Allende
Guerrero
Artesia Wells
Skidmore
Woodsboro
Villa Union
Clegg
Mathis
Bayside
Copano Bay
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Frio River
San Miguel Creek
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MA

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Admini
NATIONAL WEATHER SERVICE

Date: 5/15/72

Reply to Attn of: MIC, WSFO, San Antonio

Subject:

To: Regional Hydrologist, SRH, Ft. Worth

On the night of May 11, 1972, there were two communications made with the Sheriff's Office at Comal County that I know of.

At 2150 CDT I was unable to reach this office directly because of heavy telephone traffic. The DPS was contacted and asked to relay flash flood and severe thunderstorm warnings to the Sheriffs at Comal and Bexar Counties. This was based on radar data and the report of heavy rainfall, more than 4 inches, and flooding at Bulverde, Texas. The DPS verified that contact was made.

At 2330 CDT I personally talked with the Sheriff's Office of Comal County, warning them of flooding and severe thunderstorms. Some one there furnished me with information that very heavy rainfall, six inches or more, had occurred west of New Braunfels.

E. A. DiLoreto

E. A. DiLoreto

# SEVERE WEATHER LOG



WEATHER SERVICE FORECAST OFFICE
San Antonio, Texas

Date May 11, 1972

| TIME | INFORMATION RECEIVED OR TRANSMITTED | TIME TRANSMITTED ON: | | | | |
|---|---|---|---|---|---|---|
| | | NOAA WW | RAWARC | DPS | OTHER | INIT. |
| 2000 CDT | Flash flood warning, midnight, Bexar, Bandera, Kendall, Kerr, Karnes, Guadalupe, Gonzales, Real, Comal, Frio, Medina, Atascosa, Wilson | 2005C | 2010C | 2012C | San Antonio PD 2012, CD 2030 | |
| 2030<br>2035 | Hail 1-inch reported 10 WNW (Livesay). Severe thunderstorm warning and hail report | 2050C | 2105C | 2035C | PD 2040; DPS 2045 | |
| | Relayed message of rapid rise on Cibolo Creek | | | | Sheriff, CD Univ. City Pol. | |
| 2055 CDT | Severe thunderstorm watch #220 | | | | | |
| 2150 | Flash Flood warning Cibolo Creek | 2200 | | 2150 | to notify sheriffs, Bexar and Comal | |
| 2201 | DPS reports flooding at Bulverde, several stranded | | | | | |
| 2230 | Severe thunderstorm warning til 2 a.m. Kendall, Comal, Gonzales, Bandera, Bexar, Medina, Guadalupe | 10:25 | 10:30 | 10:35 | SAT Police 10:32 | |
| 2300 | Talked to Aus on large cell over NBF movg toward NE to San Marcos | | | | | |
| 2315 | TDO report New Braunfels, also called AUS | | 2320 | | | |
| 2305 | Talked to Converse Police requested move people out of Schertz and Cibolo areas of Cibolo Creek. | | | | | |
| 2320 | Tornado warning til 12 | 2330C | 2332C | 2335C | Luling Fire Dep. 1123 | |
| 2327 | Call Aus reference tornado heading to Luling | | | | | |
| 2330 | Flash flood warning 4 a.m. Guadalupe & Comal County | 2347 | 2355 | 2350 | | |

D2

E 1

# FLASH FLOOD

Most every county and community in the U. S. is susceptible to FLASH FLOODS in some form. Flash flood waves traveling at incredible speeds can move boulders, tear out trees, destroy buildings and bridges, and scour out new channels. Killing walls of water 15 to 20 feet high are unusual, but can and do happen. Many travelers lose their lives by driving into flooded highway dips and bridges.

(ARTESIA DAILY PRESS, N. M.)

Flash Flood

A dangerous rise in water level of a creek or over a land area in a few hours or less caused by heavy rain, ice jam, earthquake or dam failure.

Flash Flood WATCH

An announcement by the National Weather Service that heavy rains now occurring or expected may soon cause FLASH FLOODING in certain areas.

Flash Flood WARNING

A warning from the National Weather Service to the public and local safety authorities stating that FLASH FLOODING is occurring or imminent on certain streams or designated areas.

# INUNDACIONES RELAMPAGO

Casi todos los condados y comunidades de los Estados Unidos son susceptibles a las INUNDACIONES RELAMPAGO en una forma u otra. Las grandes olas que se forman en las cuencas de los rios, se mueven a velocidades increibles llevándose a su paso peñones, árboles, destruyendo edificios y puentes e inundando todas las áreas bajas que encuentran a su paso. Al no poder sostener los grandes volúmenes de agua, los riachuelos se desbordan y socavan nuevos canales. Muchos automobilistas pierden sus vidas al arriesgarse a pasar con sus vehículos por carreteras y puentes inundados por las aguas destructoras y traicioneras.

Inundaciones Relámpago - es un aumento peligroso en el caudal de un río o riachuelo o tambien sobre un area terrestre baja, que ocurre en términos de unas pocas horas o menos y que puede haber sido causado por lluvias torrenciales, el apiñamiento de desprendimientos de hielo, terremotos o debido al derrumbe de alguna represa.

Alerta de Inundaciones Relámpago - es una advertencia expedida por el Servicio Meteorológico Nacional al efecto de que estan ocurriendo lluvias torrenciales que pueden causar INUNDACIONES RELAMPAGO en ciertas áreas designadas. Todas las personas en las áreas indicadas deben mantenerse enteradas de la situación para tomar acción rápida en caso que se expida un AVISO.

Aviso de Inundaciones Relámpago - es un aviso expedido por el Servicio Meteorológico Nacional al efecto de que INUNDACIONES RELAMPAGO están ocurriendo o son eminentes en ciertos rios o areas designadas dentro de un periodo corto de tiempo y le indica a la poblacion a tomar o terminar las medidas de precaucion immediatamente.

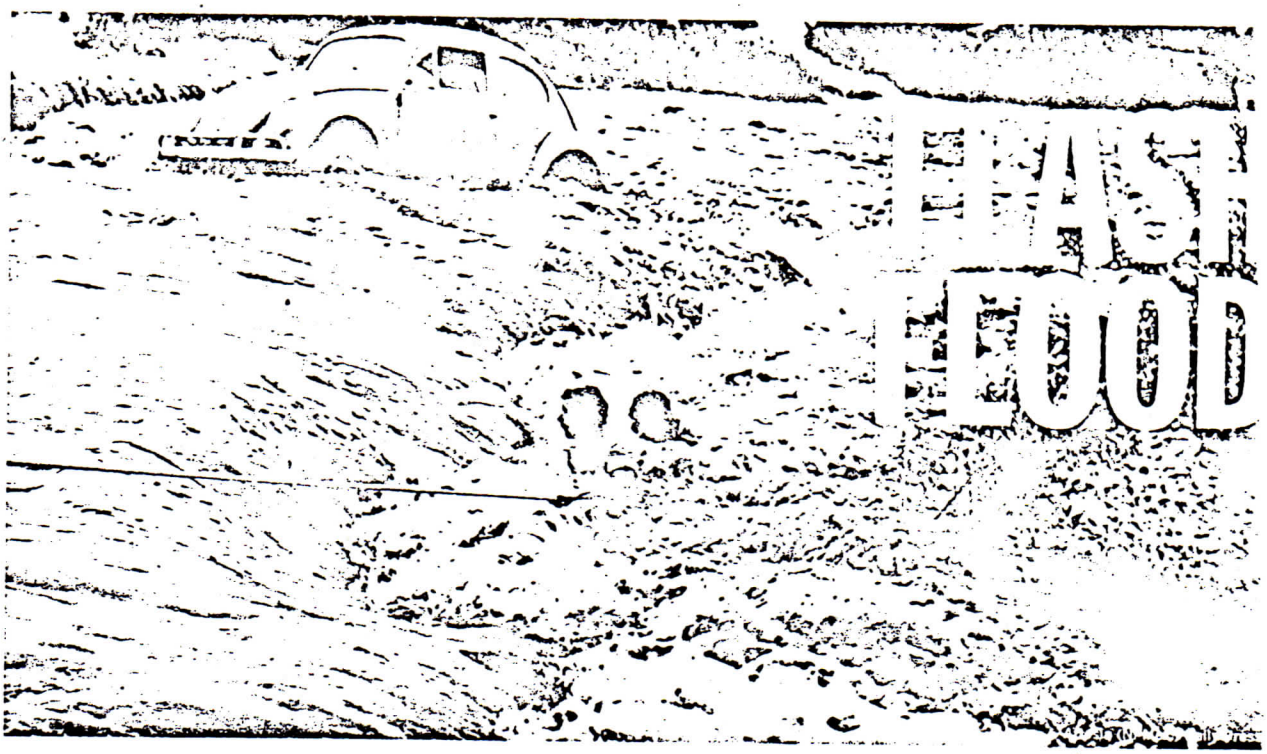
## Que Debe Hacerse Antes De La Inundación

Saber la elevación sobre el nivel del mar a que se encuentra su propiedad. Si está localizada en un sitio bajo debe localizar lugares altos en su vecindad a donde pueda moverse en caso de INUNDACIONES RELAMPAGO.

Conocer la historia de su area con respecto a pasadas inundaciones, los sitios que son afectados, y los cambios que ha hecho el hombre en dicha area que hayan podido cambiar o afectar el patrón de las inundaciones futuras.

Tener un plan de accion de que hacer en caso de emergencia debido a inundaciones relampago. En caso de que resida en un area que se inunda con facilidad debe conocer las rutas mas seguras para moverse fuera de esa area.

E3




# *The* TREACHEROUS TORRENT

FLASH FLOOD WAVES, MOVING AT INCREDIBLE SPEEDS, CAN ROLL BOULDERS, TEAR OUT TREES, DESTROY BUILDINGS AND BRIDGES, AND SCOUR OUT NEW CHANNELS. KILLING WALLS OF WATER CAN REACH 10 TO 20 FEET. YOU WON'T ALWAYS HAVE WARNING THAT THESE DEADLY, SUDDEN FLOODS ARE COMING. BUT YOU CAN SAVE YOURSELF —YOUR FAMILY—IF YOU KNOW WHAT TO EXPECT AND HOW TO REACT

**BEFORE THE FLOOD** know the elevation of your property in relation to nearby streams and other waterways. Investigate the flood history of your area and how man-made changes may affect future flooding. Make advance plans of what you will do and where you will go in a flash flood emergency.

**WHEN A FLASH FLOOD WATCH IS ISSUED** listen to area radio and television stations for possible Flash Flood Warnings and reports of flooding in progress from the National Weather Service and public safety agencies. Be prepared to move out of danger at a moment's notice. If you are on the road, watch for flooding at highway dips, bridges, and low areas due to heavy rain not observable to you, but which may be indicated by thunder and lightning.

**WHEN A FLASH FLOOD WARNING IS ISSUED** for your area act quickly to save yourself. You may have only seconds. Get out of areas subject to flooding. Avoid already flooded areas. Do not attempt to cross a flowing stream on foot where water is above your knees. If driving, know the depth of water in a dip before crossing. The road may not be intact under the water. If the vehicle stalls, abandon it immediately and seek higher ground — rapidly rising water may engulf the vehicle and its occupants and sweep them away. Be especially cautious at night when it is harder to recognize flood dangers. When you are out of immediate danger, tune in area radio or television stations for additional information as conditions change and new reports are received.

**AFTER THE FLASH FLOOD WATCH OR WARNING IS CANCELLED** stay tuned to radio or television for follow-up information. Flash flooding may have ended, but general flooding may come later in headwater streams and major rivers.

LEARN THESE FLASH FLOOD TERMS USED IN NATIONAL WEATHER SERVICE HYDROLOGIC FORECASTS AND WARNINGS:

FLASH FLOOD means the occurrence of a dangerous rise in water level of a stream or over a land area in a few hours or less caused by heavy rain, ice jam breakup, earthquake, or dam failure.

FLASH FLOOD WATCH means that heavy rains occurring or expected to occur may soon cause flash flooding in certain areas and citizens should be alert to the possibility of a flood emergency which will require immediate action.

FLASH FLOOD WARNING means that flash flooding is occurring or imminent on certain streams or designated areas and immediate precautions should be taken by those threatened.

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