



STATE FIRE MARSHAL'S OFFICE • TEXAS DEPARTMENT OF INSURANCE

## FIRE INVESTIGATION REPORT

2018 OCT 24 AM 10:44 *jc*

Case # 18-591-06	Priority 1	Investigator Paul Ayres	Status Closed
Day of Fire Tuesday	Date of Fire 06/26/2018	Time of Fire 2:20 pm	Cause of Fire Undetermined
Date of Request 06/26/2018	Date Case Assigned 06/26/2018	Date of Investigation 06/26/2018	
City of Fire Gatesville	County of Fire Coryell		
Location of Fire 1507 West Main Street			
Type of Fire Investigation Origin and Cause	Injuries 13	Deaths 3	

## OWNER

Full Name Coryell Memorial Hospital	Phone # (254) 865-8251
Address 1507 West Main Street, Gatesville, Texas	
Race N/A	Sex (select)
Age N/A	DOB N/A
Social Security # N/A	Driver's License # N/A
Insurance Yes	Insurance Company Name CNA Insurance - Continental Casualty Company
Policy # 6014678998	Effective Dates 04/11/2018 - 04/11/2019
Amount of Policy: Structure	Amount of Policy: Contents
Adjuster's Name	Adjuster's Phone #
Agent's Name	Agent's Phone #
Agent's Address	

## OCCUPANT

Full Name Same as Owner	Phone #
Address	
Race	Sex (select)
Age	DOB
Social Security #	Driver's License #
Insurance	Insurance Company Name
Policy #	Effective Dates
Amount of Policy: Structure	Amount of Policy: Contents
Adjuster's Name	Adjuster's Phone #
Agent's Name	Agent's Phone #
Agent's Address	

☒ DISCOVERED ☒ REPORTED FIRE

Full Name Coryell Memorial Hospital EMS	Phone # 254-248-622
Address 222 Memorial Drive, Gatesville, TX 76528	
Race	Sex (select)
Age	DOB
Social Security #	Driver's License #

## REQUESTOR

Full Name Nathan Gohlke - Police Chief	Phone # 254-223-4216
Address	
Race White	Sex Male
Age	DOB
Social Security #	Driver's License #

## MOTOR VEHICLE

Type N/A	Year N/A	Make N/A	Model N/A
Vehicle Use N/A	Color N/A	V.I.N.# N/A	L.P.# N/A

## OTHER INFORMATION

Other Investigating Agencies Gatesville Police Department
Responding Fire Departments Gatesville, all fire departments in Coryell County
Weather Conditions Partly Cloudy, Temp: 95 F, Dew Point: 66 F, Humidity: 39%, Winds: S @ 12 mph

## ADMINISTRATIVE SECTION

Arson Lab Utilized? Yes	Canine Utilized? Yes	If YES, Agency Used? SFMO
Smoke Alarms Present? Yes	Approved By <i>[Signature]</i>	Date 11/01/18





**STATE FIRE MARSHAL'S OFFICE**  
INVESTIGATION REPORT  
TEXAS DEPARTMENT OF INSURANCE  
**SENSITIVE**



Case Number: 18-591-06

Investigator: Paul Ayres

1. Undetermined
2. 1507 West Main Street, Gatesville, TX
3. Coryell Memorial Hospital
4. Tuesday, June 26, 2018

#### SYNOPSIS

- 1.1 On Tuesday, June 26, 2018 at approximately 2:20 pm, Gatesville Fire Department responded to an explosion at 1507 West Main Street, Gatesville, Texas. The explosion was observed and reported via 9-1-1 by multiple parties. Upon arrival, fire department personnel observed a severely damaged portion of the hospital that was under construction. The structure had collapsed and its contents were on fire because of the explosion. Firefighters searched for victims inside the building and began suppression efforts. Coryell Memorial EMS set up a triage area and began treating and transporting injured occupants. Initially, fifteen people were injured and one person was deceased because of the explosion. Two of the injured would later succumb to their injuries, bringing the total to three fatalities and thirteen injured. Gatesville Police Department assisted with the scene as necessary and began preparations for an investigation. Police Chief Nathan Gohlke contacted the State Fire Marshal's Office to conduct an origin and cause investigation. Using the information supplied by Chief Gohlke, an incident number was initiated and I was assigned to the investigation.
- 1.2 Based on observations made during the forensic scene examination and information obtained in the subsequent investigation, I determined the area of origin to be in the boiler and mechanical rooms. A pocket of natural gas within the flammability limits was contained in the mechanical room, which caused the large explosion. The first fuel ignited was natural gas. I could not identify the ignition source, although multiple competent ignition sources existed in the area of origin. This fire is **UNDETERMINED** and the investigation will be **CLOSED**.
- 1.3 The investigation was conducted in a systematic approach in accordance with applicable sections of NFPA 921, NFPA 1033 and other applicable treatises.

#### ASSESSMENT AND PLANNING

- 1.4 On Tuesday, June 26, 2018 Sergeant Paul Ayres and Sergeant Chris Ford responded to the scene to conduct an initial assessment. The scene examination began upon their arrival and was conducted under exigent circumstances until right of entry could be obtained from an appropriate party. Police Chief Nathan Gohlke provided State Fire Marshal Investigators with a briefing of the incident. The explosion involved a two-story hospital of non-combustible (type II) construction. The portion of the hospital that was involved in the explosion was new construction and included a boiler room, mechanical room, and two electrical rooms. This area was constructed of cinder block walls, steel I-beams, and a membrane roofing assembly. The explosion caused major structural damage, collapsing exterior walls and deforming steel I-



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beams. A debris field extended approximately 1,100 feet from the epicenter of the explosion and crossed a roadway.

- 1.5 Responding agencies included Coryell Memorial EMS; Gatesville Fire Department; Gatesville Police Department; Coryell County Emergency Management; Coryell County Sheriff's Office; Coryell County Precinct 4 Justice of the Peace; Texas State Fire Marshal's Office; Texas Division of Emergency Management (TDEM); Texas State Troopers; Texas Ranger Division; Texas State Game Wardens; US Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF); Federal Bureau of Investigation (FBI); Texas Task Force 1 Urban Search and Rescue; and Lone Star K9 Search and Rescue. A communications plan was developed to ensure interoperability between all agencies throughout the investigation.
- 1.6 The investigative team consisted of local, state and federal investigators. The following is a list of the persons involved and their assignments.

#### State Fire Marshal's Office (SFMO)

Lt. Brian Fine	SRT Incident Command
Sgt. Paul Ayres	SRT Lead Investigator Origin and Cause
Sgt. Heath Mahlmann	SRT Investigator Origin and Cause
Sgt. David Vesely	SRT Interview Coordinator/data collection
Inv. Jeremy Roth	Safety and photography
Sgt. Chris Ford	K-9 and evidence collection
Kelley Stalder	Electrical Engineer – building systems/appliances
Sgt. Steve Walt	Inspector - building construction and fire protection systems

#### U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF)

Brian Garner	Interviews
John Lora	Interviews
Nathan Shelton	Interviews
Leigh Cochran	Interviews
Jason Liebler	Interviews
Cole Flores	Interviews
Rey Alatorre	Interviews
Daniel Mueller	Interviews





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## Local Agencies

Chief Nathan Gohlke

Lt. Cody Lee

Scott Williams

Bob Harrell

Gatesville Police Department

Gatesville Police Department (CID)

Coryell County Sheriff

Coryell County Emergency Management

- 1.7 Stakeholders were identified early in the investigation. This included Coryell Memorial Healthcare System administrators; Adolfson & Peterson Construction administrators; Lochridge Priest administrators; insurance providers; private-sector investigators; Texas Department of Licensing and Regulation (TDLR); Railroad Commission of Texas (RRC); Texas Commission on Environmental Quality (TCEQ); Atmos Energy; Occupational Safety and Health Administration (OSHA); State Representative J.D. Sheffield - 59<sup>th</sup> District; and US Congressman Roger Williams – 25<sup>th</sup> District. Incident objectives were achieved with consideration of the needs of stakeholders. Regular briefings were conducted with stakeholders to maintain an open line of communications with private-sector investigators and other interested parties.
- 1.8 Based on the initial assessment, investigators identified incident objectives and developed a plan for the investigation. Because of the size and complexity of the incident, the State Response Team of the Texas State Fire Marshal's Office was activated, consisting of five investigators, one canine handler, one inspector, and a forensic engineer.
- 1.9 A safety assessment was conducted to ensure the safety of all personnel operating on the scene. Atmos Energy had already responded and isolated natural gas supply to the area. A multi-gas monitor was used to verify safe environmental conditions. Electrical service had been disconnected to the affected area by Texas-New Mexico Power. There were three generators along the east side of the mechanical room, but all were damaged and non-functioning.
- 1.10 The scene was secured with yellow barrier tape and chain link fencing. A single access point was established on the north side of the hospital near the command post. The perimeter around the hospital was guarded by Gatesville Police Department and Texas State Troopers. The roadway north of the hospital, "Brandy Lane," was located within the debris field and was closed until the entire debris field could be searched and documented.





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- 1.11 At the request of Coryell County Emergency Management, the Federal Aviation Administration (FAA) established a 24-hour temporary airspace restriction over the scene to prevent news media from capturing images of the deceased victim on the roof and to ensure safety while flying unmanned aerial vehicles (UAVs) to document the scene.
- 1.12 The portion of the hospital most heavily damaged in the explosion was structurally unstable and posed a significant risk of secondary collapse. All hospital patients and employees were evacuated until inspectors could ensure the safety of surrounding structures. Texas Task Force 1 Urban Search and Rescue Team provided assistance by shoring the collapsed structure, making it safe for investigators to enter. All responders operating in the collapse zone were required to wear appropriate PPE.
- 1.13 Responders tasked with recovering the deceased victim were required to use universal precautions when working around biological hazards. In addition, the area was decontaminated after the body was recovered.
- 1.14 Lieutenant Brian Fine and Sergeant Paul Ayres were designated as scene medics. Weather conditions throughout the investigation were very hot with temperatures over 95° Fahrenheit each day. Appropriate measures were taken to ensure all participants remained hydrated and maintained a healthy core body temperature.
- 1.15 There was a considerable amount of new media coverage of the incident. Local emergency management personnel established a staging area for news media and coordinated press conferences for regular updates to the public. Local emergency management also coordinated logistics for the duration of the investigation, including food, beverages, and lodging.

#### PREPARATION

- 1.16 Weather data was obtained from Gatesville Municipal Airport (KGOP), located approximately 1.42 miles southwest of the scene. At 2:15 pm on the day of the explosion, weather conditions were described as partly cloudy. The temperature was approximately 95° Fahrenheit, the dew point was approximately 66° Fahrenheit, and humidity was approximately 39%. Winds were 12 miles per hour from the south.<sup>1</sup>

<sup>1</sup> See historical weather data report



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1.17 According to the Coryell County Appraisal District, Coryell County Memorial Hospital Authority has 100% ownership of the property at 1507 West Main Street, Gatesville, Texas. The hospital was approximately 121,672 square feet and was built in 1972. The portion of the structure that was directly involved in the explosion was new construction (see Figures 1 & 2). The appraised value of the property is \$10,737,190.00.<sup>2</sup> At approximately 8:02 pm on Tuesday, June 26, 2018, a written consent to search was signed by David K. Byrom, who was identified as an administrator of the Coryell Memorial Hospital System.

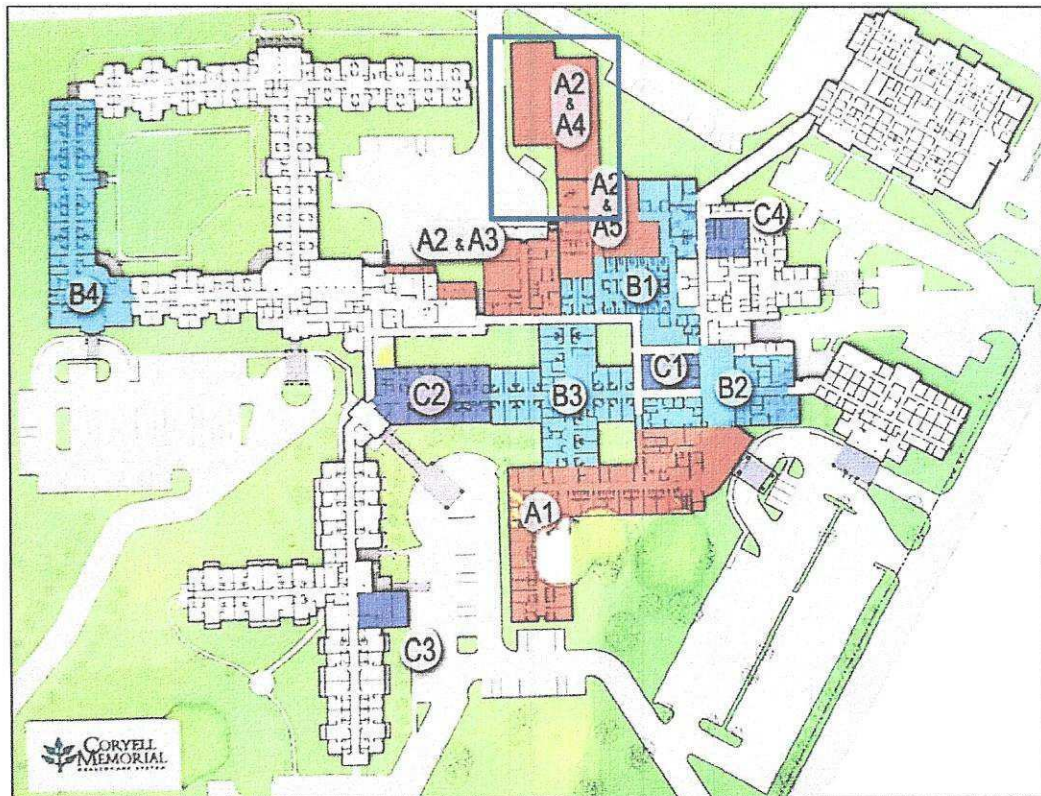


Figure 1: Site Plan of Coryell Memorial Hospital; see boxed area for further detail.

<sup>2</sup> See Coryell County Appraisal District records





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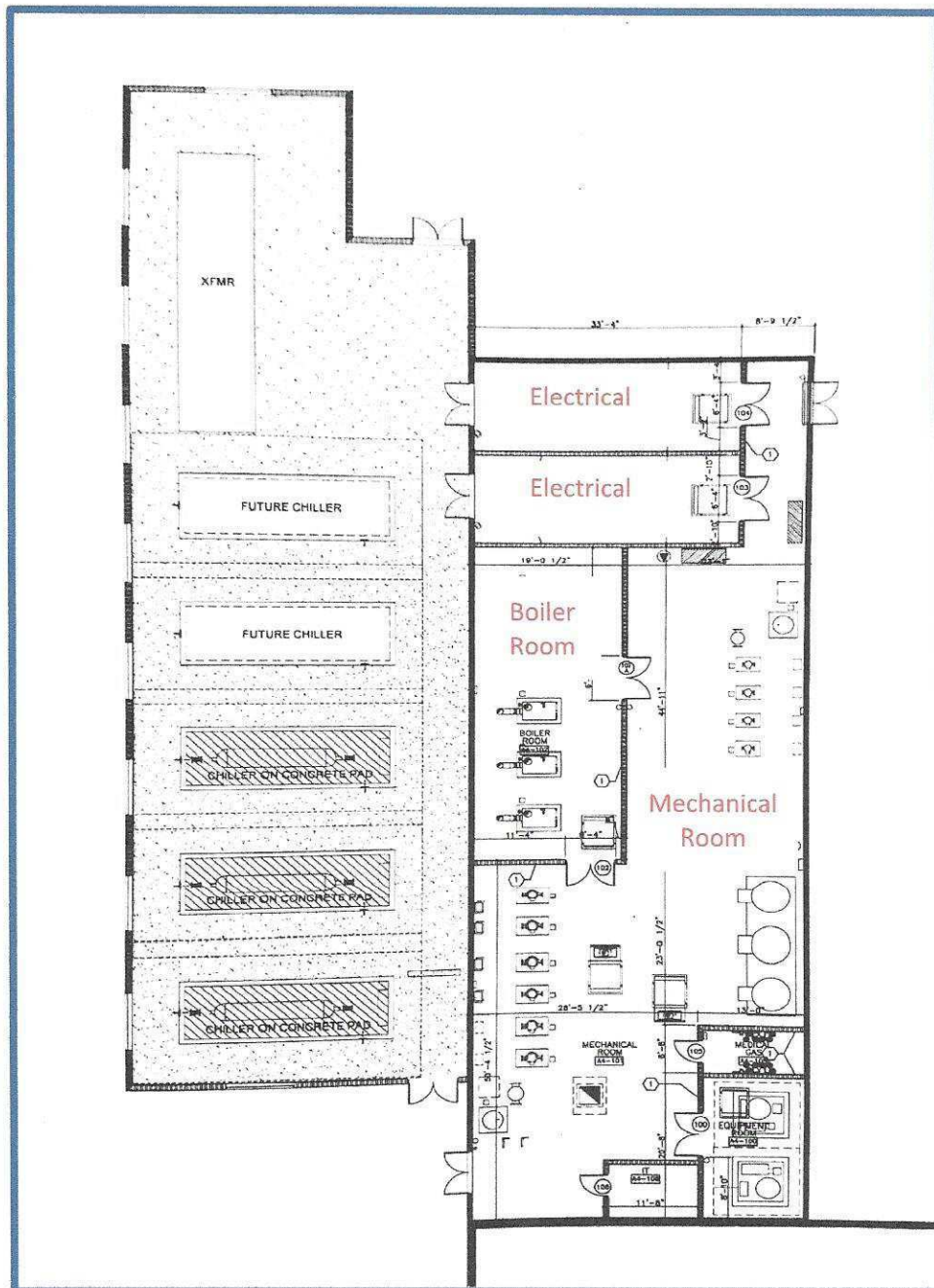


Figure 2: Floor plan of physical plant (new construction)



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## ORIGIN AND CAUSE EXAMINATION

- 1.18 Prior to the arrival of the State Response Team, Sergeant Paul Ayres and Sergeant Chris Ford focused on documenting and removing the deceased victim. State Fire Marshal Investigators were assisted by Coryell County Sheriff's Office, Coryell County Precinct 4 Justice of the Peace, and Gatesville Fire Department. The body was photographed in place by the Coryell County Sheriff's Office and aerial photographs were taken by Texas Game Warden Matthew Bridgefarmer. Coryell County Precinct 4 Justice of the Peace Coy Latham pronounced the victim at the scene and made a request for autopsy. Members of Gatesville Fire Department were tasked with packaging and removing the remains. After the victim was removed, Gatesville Fire Department decontaminated the roof to eliminate any biological hazards.
- 1.19 After documenting and removing the deceased victim, Sergeant Paul Ayres and Sergeant Chris Ford developed an Incident Action Plan (IAP) for the next day. The priorities identified in the IAP included documenting the debris field, documenting the exterior of the structure, and beginning to assess the structural stability of the explosion site. Investigators made preparations for the State Response Team to arrive on scene and begin the scene examination. Upon their arrival, the team focused on searching and documenting the debris field, reopening Brandy Lane to authorized personnel, searching the relatively unaffected portions of the hospital for evidence, and documenting the exterior portions of the explosion site.
- 1.20 On Wednesday, June 27, 2018 investigative teams began examining the debris field which extended approximately 1,100 feet north and 440 feet west of the epicenter, encompassing approximately 6.7 acres. A line search was conducted to search for any evidentiary items. No items of significant evidentiary value were found and there was no evidence of any explosive devices. Debris located in the debris field consisted of tools and structural components of the hospital. Once the debris field had been searched and documented, Brandy Lane was re-opened to authorized emergency personnel. The diagram below illustrates the size of the debris field, with pink markers indicating lightweight debris and green markers indicating heavyweight debris. An analysis of the debris field indicated that lightweight debris was likely carried to the north by prevailing wind.





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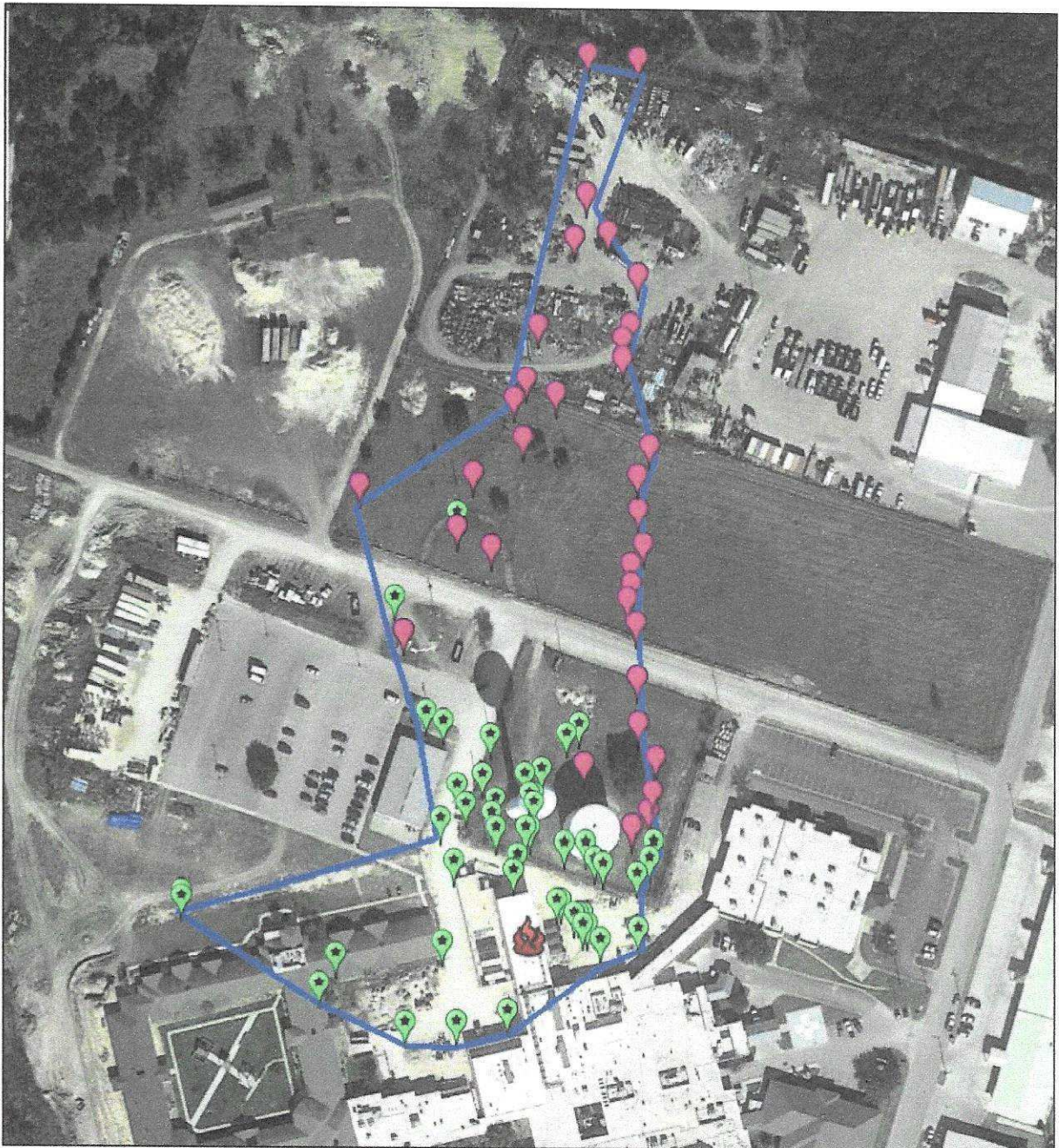


Figure 3: Diagram of Debris Field





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- 1.21 After examining the debris field, investigators focused on damage that was visible from the exterior and to surrounding structures. The existing hospital wing directly west of the explosion site sustained structural damage with buckling observed at the gable and at the eaves. Multiple windows were broken by the positive pressure front and glass was pulled back into the courtyard/loading dock area by negative pressure. Minor damage was observed inside a corridor just east of the explosion site, consisting of broken ceiling tiles and damaged ductwork.



Figure 4: Damage to surrounding structures

- 1.22 The west side of the explosion site was mostly intact with one area of significant damage. The west wall of the chiller yard was structurally intact, although a few vent panels for chiller ventilation were bulged or broken away from their brackets. A doorway and exterior wall at the southwest corner of the mechanical room, just south of the chiller yard, was significantly damaged with the top portions of the wall collapsed and the metal doors buckled and broken off their hinges (Figure 5; marked in blue).

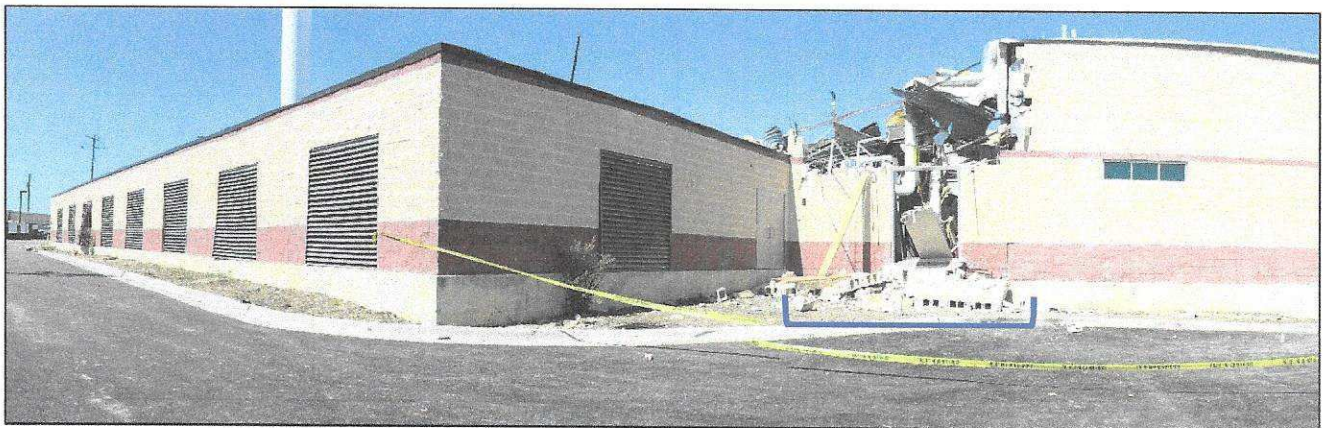


Figure 5: Damage to West Side





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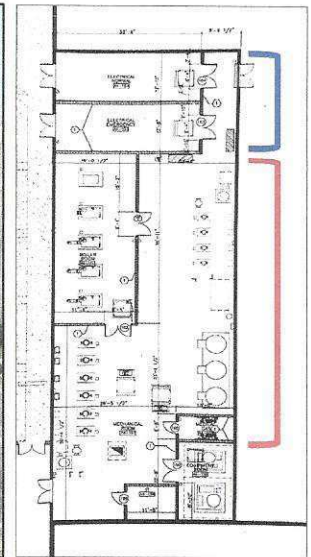
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- 1.23 From the north, damage appeared relatively minor. While a large amount of debris was projected to the north, the northern wall of the structure was still intact and only leaning slightly at the top.
- 1.24 On the east side, the exterior wall of the mechanical room was collapsed. The most severely damaged portion of the wall was between a corridor at the south end of the mechanical room and the electrical rooms at the north end of the mechanical room (Figure 6; marked in red). This section of the wall appeared as though it had been pushed out at the top with the bottom being anchored and acting as a hinge. The wall had collapsed onto three emergency generators on the east side. A section of the same wall that was directly east of the electrical rooms was only collapsed at the top (Figure 6; marked in blue).



Figure 6: Damage to East Side



- 1.25 The entire roof over the mechanical room, boiler room, and electrical rooms had been destroyed by the explosion. Lightweight insulating material was launched into the air and was carried by prevailing winds. This explains the large debris field to the north of the explosion which is mostly lightweight materials. Metal roofing panels were scattered around the perimeter of the structure and some were still lying on the roof. Portions of the membrane covering were observed in the debris field. No portion of the roof over the mechanical room, boiler room, or electrical rooms was intact (Figure 7).





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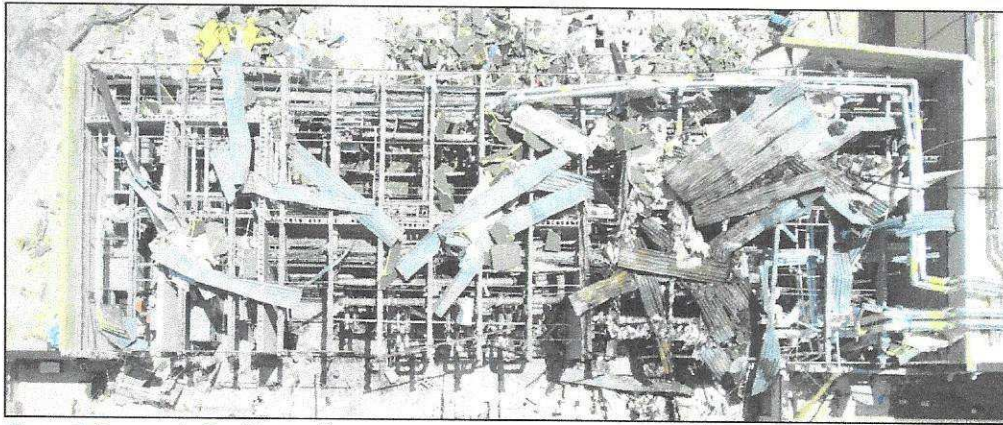


Figure 7: Damage to Roof Assembly

- 1.26 From the exterior, it was apparent that the most severely damaged portion of the structure was the mechanical, boiler, and electrical rooms. After completing the exterior examination, investigators began to examine the interior portions of the structure.
- 1.27 Investigators entered the chiller yard through a doorway on the north side. Once inside the chiller yard, investigators observed the western wall of the mechanical, boiler, and electrical rooms had completely collapsed into the chiller yard. The portion of the wall adjacent to the electrical rooms was mostly collapsed at the top with less damage to the lower sections of the wall (Figure 8; marked in blue). The portion of the western wall adjacent to the boiler room and mechanical room was completely collapsed with the top pushed out and the bottom acting as a hinge (Figure 8; marked in red). The western wall adjacent to the mechanical room was pushed further into the chiller yard than other portions of the wall. Based on these observations, it appeared that the majority of force was exerted at the south end of the mechanical room.





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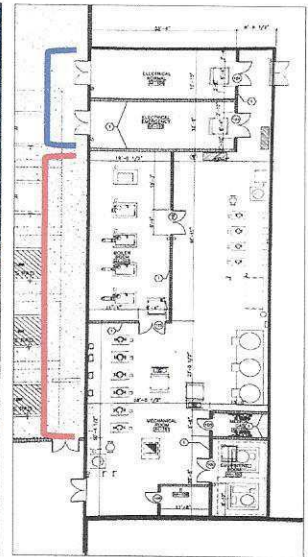


Figure 8: Damage to Western Wall of Mechanical, Boiler, and Electrical Rooms

- 1.28 From the west, the interior portions of the electrical rooms, boiler room, and south end of the mechanical room were exposed. The interior walls of the electrical rooms were leaning significantly to the north. Because of the collapse hazard of these walls, it was unsafe to access the electrical rooms. These rooms were documented as much as possible from safe areas. Damage to the electrical rooms indicated the explosion occurred to the south. There was no fire damage in the electrical rooms. Documentation of electrical utilities will occur in the "building systems" section of this report.
- 1.29 The mechanical and boiler rooms were unstable and susceptible to secondary collapse. These rooms were made safe by shoring operations conducted by Texas Task Force One. At the north end of the boiler room, investigators observed a large stack of air filters that were burned. There were three A-frame fiberglass ladders in the boiler room. Two of those ladders were along the north wall and were undamaged. The other ladder was in the upright position next to the north boiler and was burned at the top. Pipe insulation installed in the boiler room was singed on all sides, but more intensely at the tops. Fire damage in the boiler room suggested a flash fire occurred at the upper portions of the room. Explosion damage on the interior of the boiler room was minimal.
- 1.30 The mechanical room sustained moderate fire damage and severe explosion damage. At the north end of the mechanical room, fire damage consisted of burned pipe insulation and insulation from the roof assembly. Fire damage at the south end of the mechanical room was most severe and concentrated near





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the chiller pumps. Fuel items in this area consisted of fiberglass ladders and insulation material from the roof assembly. The explosion caused severe damage to the mechanical room. At the north end, the glycol system for the chillers had broken free of its hangers and was pushed in an easterly direction at the top, buckling at lower levels. At the south end, structural I-beams running in an east to west direction were bowed to the north and south, indicating gas expansion between the I-beams. The spray-applied fire-resistive material applied to the I-beams was blown off in this area but was intact in all other portions of the structure. Investigators also noted the electrical conduit and glycol system were pushed down in this area. Explosion damage indicated a fuel gas had collected in the space between the two I-beams and ignited. Considering that all I-beams ran east to west, any fuel gas that had collected in these pockets would have channeled expanding gasses to the east and the west. Investigators hypothesized that this may be a reason the east and west walls of the mechanical and boiler rooms were collapsed while the walls to the north and south were considerably less damaged.

- 1.31 After documenting the fire and explosion damage to the interior, investigators determined the area of origin was the boiler room and mechanical room. Fire damage in the area of origin suggest that a fuel gas with a vapor density of less than one was present at the upper portions of the rooms. It is believed that the fuel gas-air mixture ignited in the boiler room and propagated to the mechanical room, where a larger pocket of fuel gas was located. The large explosion occurred when the propagating flame front reached the large pocket of fuel gas at the south end of the mechanical room.
- 1.32 After determining the area of origin, investigators began searching for sources of fuel gas. A small oxy-acetylene torch unit was located in the mechanical room, but all valves were closed and the pressurized vessels were intact. Investigators focused on the appliances in the area of origin, which included an HVAC unit, chiller pumps, domestic water pumps, three water heaters, and three boilers. Of these appliances, only the water heaters and boilers used natural gas for fuel. There were no other sources of fuel gas.
- 1.33 Further examination of the boilers indicated that the explosion was not caused by a catastrophic failure of the boiler units. The boiler units were relatively intact and only sustained damage as a result of the explosion and collapsing debris. The exterior shell of each boiler was comprised of several sheet metal panels. These panels had been removed prior to the explosion and laid next to each boiler. The holes for the screws were not stripped, indicating that these panels had been removed from the boilers prior to the explosion. Investigators also discovered multiple double-walled ducts that were being installed on the boiler vents. In addition, the panel for a low voltage control unit on the north wall had been removed and set aside. Based on these findings, it appeared that the boiler units and the low voltage control panel were





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being worked on at the time of the explosion. Gas valves to the boilers were open and a 3/8-inch bleeder valve was open on the north boiler unit.

- 1.34 Further examination of the water heater units in the mechanical room revealed that the natural gas pipe supplying them had been disconnected at the coupling to the north and south units. These couplings were not sheared and did not exhibit any evidence of forceful separation. It was determined that the couplings were disconnected prior the explosion. The valves on both pipes were open, allowing natural gas to flow freely into the mechanical room. It is important to note that the most significant damage to the I-beams, electrical conduit, and glycol system was aligned with the location of the water heaters.
- 1.35 Within the area of origin, investigators identified multiple potential ignition sources. These items included two scissor lifts, multiple fluorescent light fixtures, three HVAC units, multiple cell phones, a BIC lighter, a striker for an oxy-acetylene torch, battery powered tools, domestic water pumps, and chiller pumps. Investigators were unable to determine which item triggered the explosion.
- 1.36 A canine trained to detect odors of hydrocarbons found in ignitable liquid substances was used to search the scene. One item of evidence was collected by Sergeant Chris Ford. See the canine handler's report for further detail.

Evidence #: K1  
Description: Fire Debris  
Date/ Time: 06/29/2018 @ 12:00 pm  
Address: 1507 West Main Street, Gatesville, Texas  
Location: Mechanical Room: 12'1" N of S wall, 12'11" E of W wall  
By: Chris Ford (K9 Gabby)  
Note: Submitted to the State Fire Marshal's Forensic Arson Laboratory for analysis

- 1.37 Based on a systematic fire and explosion scene examination, I determined the area of origin to be the mechanical and boiler rooms. The first material ignited was natural gas. Competent ignition sources included two scissor lifts, multiple fluorescent light fixtures, three HVAC units, multiple cell phones, a BIC lighter, a striker for an oxy-acetylene torch, battery powered tools, domestic water pumps, and chiller pumps. The scene examination did not reveal which potential ignition source was the cause of ignition.





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## BUILDING SYSTEMS

- 1.38 The structure had a fire sprinkler system (wet) and fire alarm system installed, but the sections in the damaged area were not yet operational because it was new construction. The valve at the base of the riser and an isolation valve were both in the closed position (Figure 9). Wiring had been pulled for the Initiating Device Circuit (IDC), but IDC modules for waterflow (alarm) and tamper (supervisory) were not yet installed (Figure 9). Wiring had also been pulled for the Notification Appliance Circuit (NAC), but not all notification devices were installed. Deputy State Fire Marshal Steve Walt conducted a comprehensive inspection of the fire protection systems on site. See the inspection report for further detail.

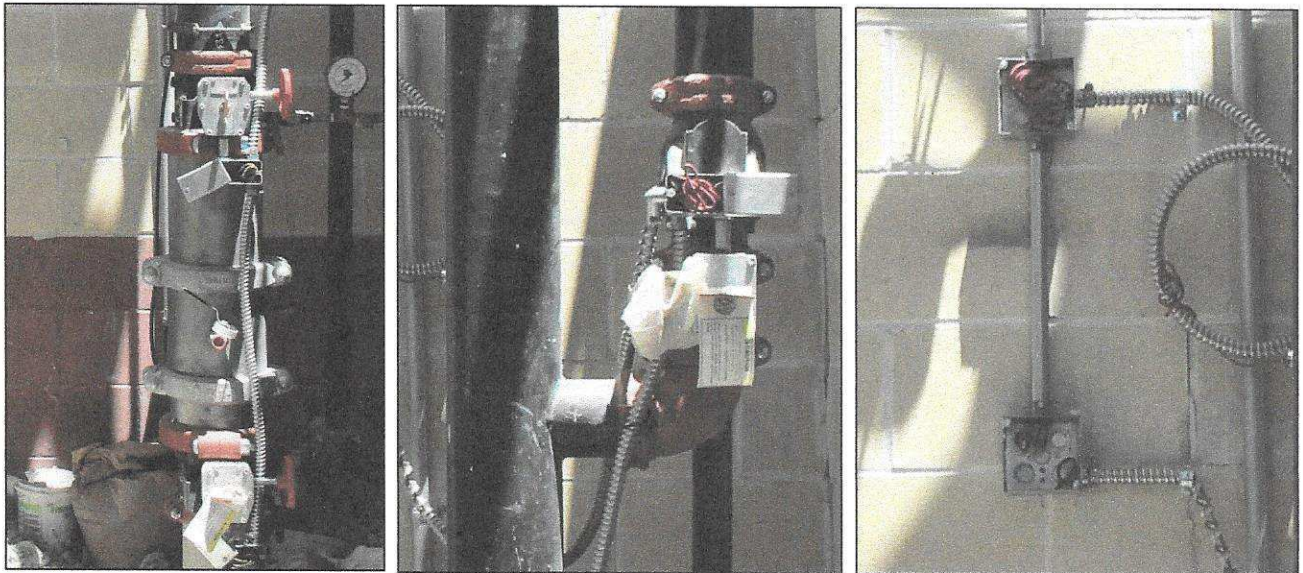


Figure 9: Fire Protection Systems

- 1.39 Electricity entered the property via overhead electrical service lines provided by Texas-New Mexico Power. The fuse legs from the high-voltage lines to the transformer were in an open position. It is unknown if this was caused by the explosion or if a power company disconnected the fuse legs. The transformer (#C24774) serving the property was located on the ground approximately 60 feet east of the structure. An electric meter was adjacent to the transformer. The meter was intact and documented as it was found. Examination of the meter base revealed no evidence of tampering. From the meter, an underground service lateral extended to the electrical rooms inside the structure. The structure had two separate electrical rooms: one for normal power and one for emergency power. Both rooms were unsafe to enter, which significantly limited photographic documentation of the electrical system. There was a series of





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transformers and breaker panels inside each electrical room. Three Generac generators were located on the east side of the structure and provided emergency power to the secondary electrical room.

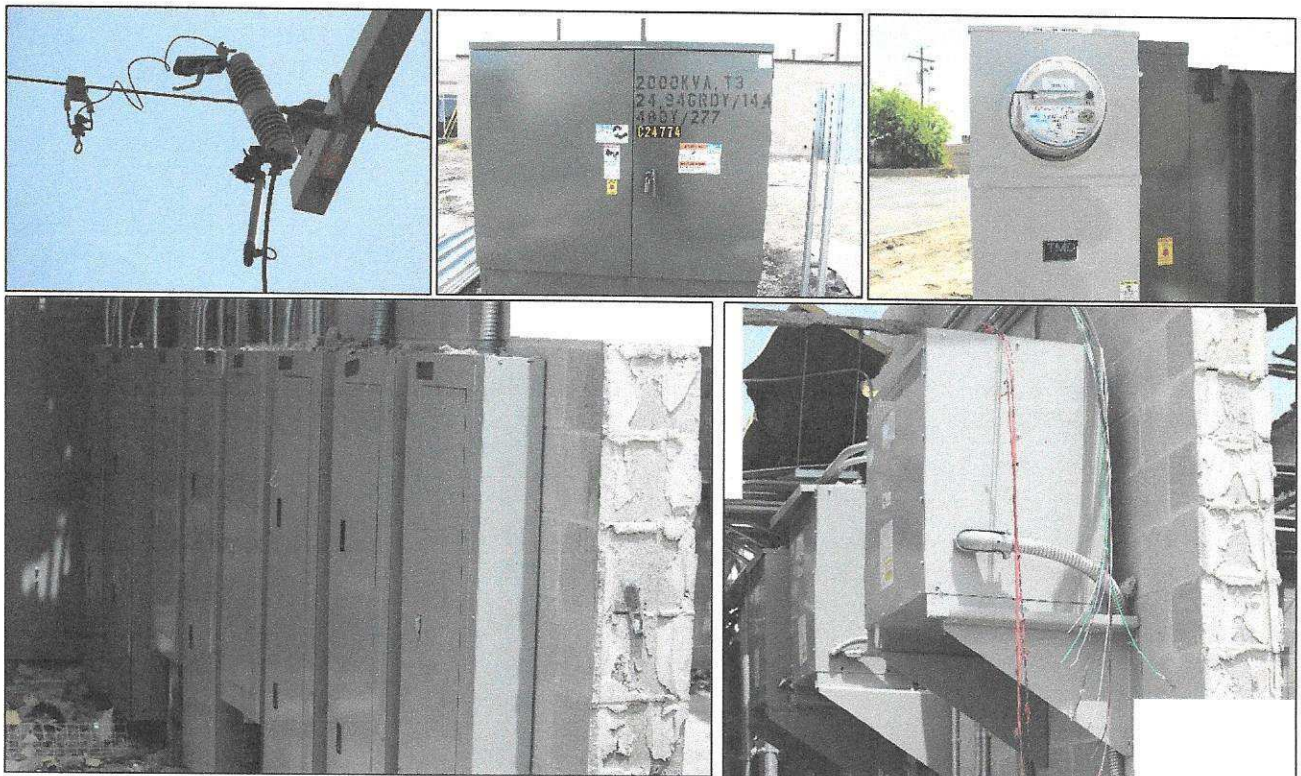


Figure 10: Electrical Utilities

- 1.40 A natural gas line entered at the southeast corner of the property. The meter and main valve were located on the east side of the hospital along Memorial Drive. The gas line extended underground from the meter to the eastern wall of the hospital where a riser then extended to the roof. The gas line then proceeded toward the mechanical and boiler rooms. The first evidence of damage to the gas line was approximately 130 feet southeast of the explosion site, where a small diameter pipe had become disconnected at the coupling. Beyond this point in the gas line, the pipe was significantly damaged. The pipe had dislodged from its roof supports and had multiple bends and fractures. The gas line directly over the mechanical room was folded over itself and found lying south of the explosion site. As the force of the explosion pushed the piping on the roof in an upward direction, the risers to the boilers and water heaters were ripped out and launched to the exterior of the structure. Multiple components of the natural gas system were found





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in the courtyard and loading dock area. Each section of the natural gas system was accounted for and documented. After assessing the natural gas system, investigators determined the most probable location of a natural gas leak was the open valves and disconnected couplings serving the water heaters. Detailed documentation of the natural gas system is provided below:

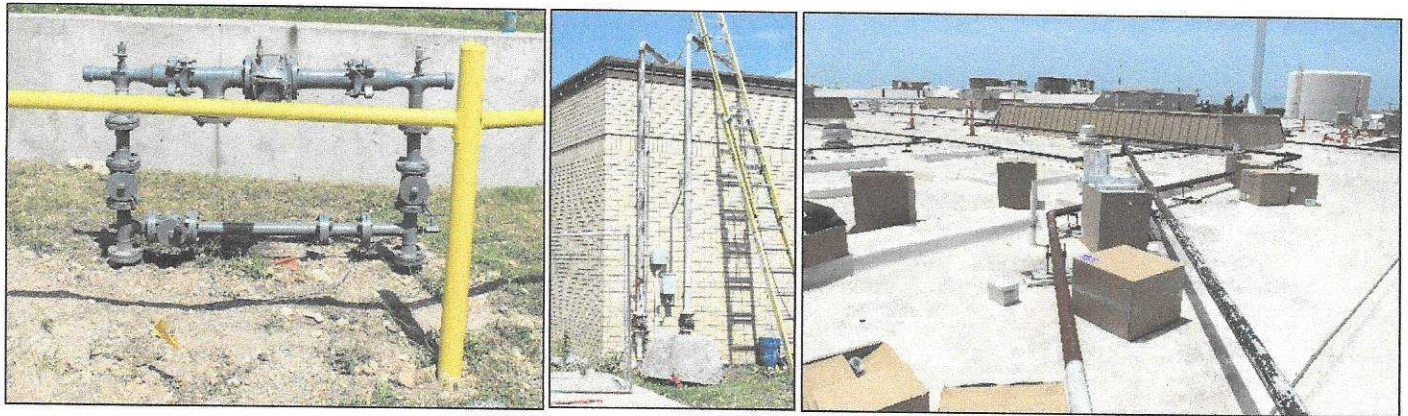


Figure 11: Natural gas meter, riser, and gas line on the roof.

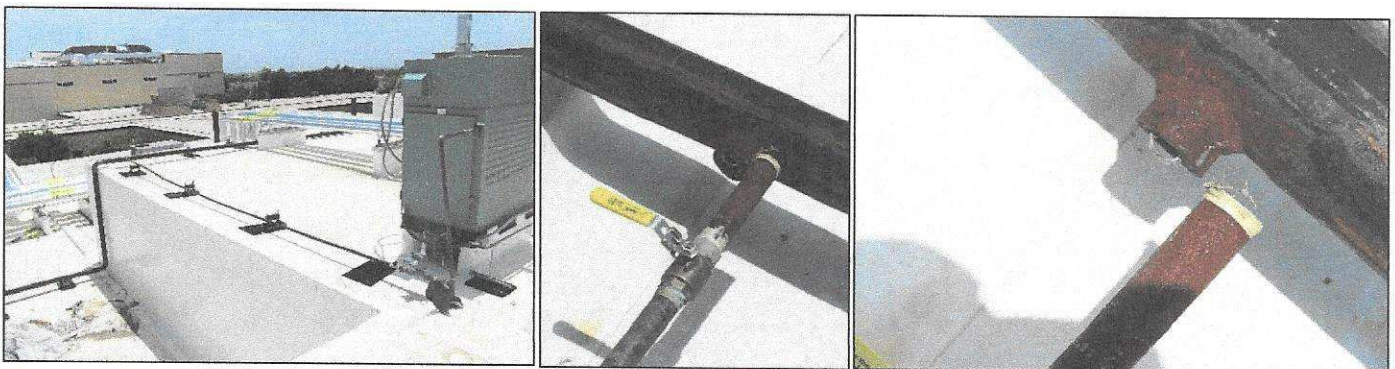


Figure 12: First indications of damage to the natural gas line were observed approximately 130 feet southeast of explosion site. The threads to the small diameter pipe were stripped and it became disconnected from the supply.





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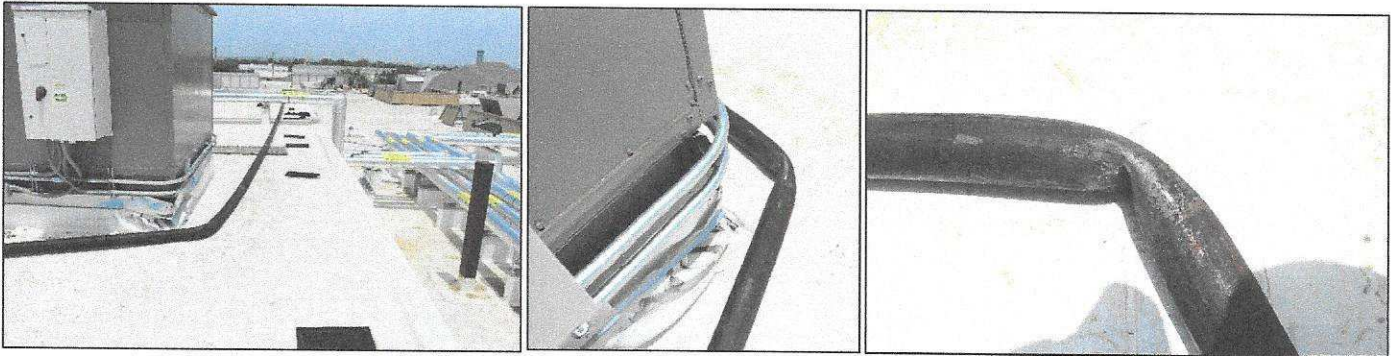


Figure 13: The natural gas line has dislodged from its support structures (black pads and rooftop rollers); severe bend/kink in gas line.



Figure 14: The natural gas line has dislodged from its support structures (black pads and rooftop rollers); fracture at a welded 90° elbow.

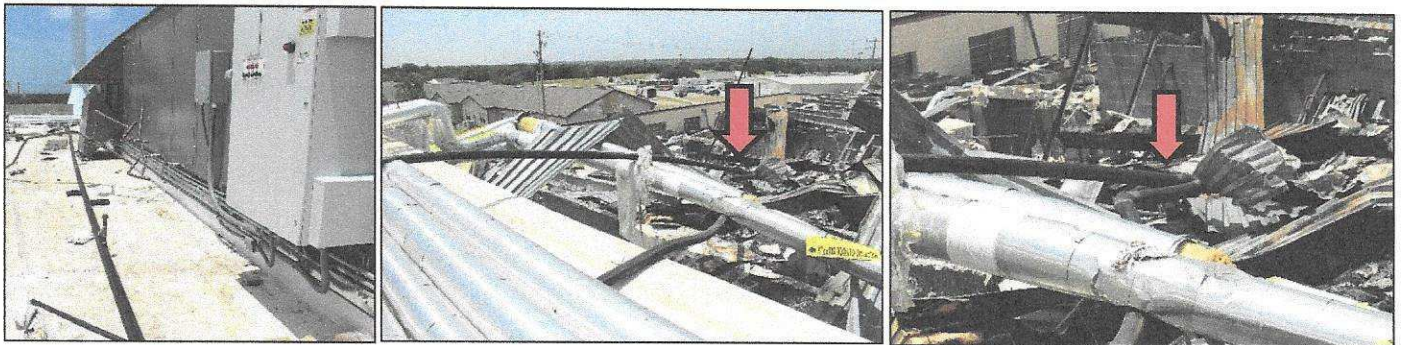


Figure 15: The natural gas line continued toward the mechanical room but was abruptly folded over by the force of the explosion.





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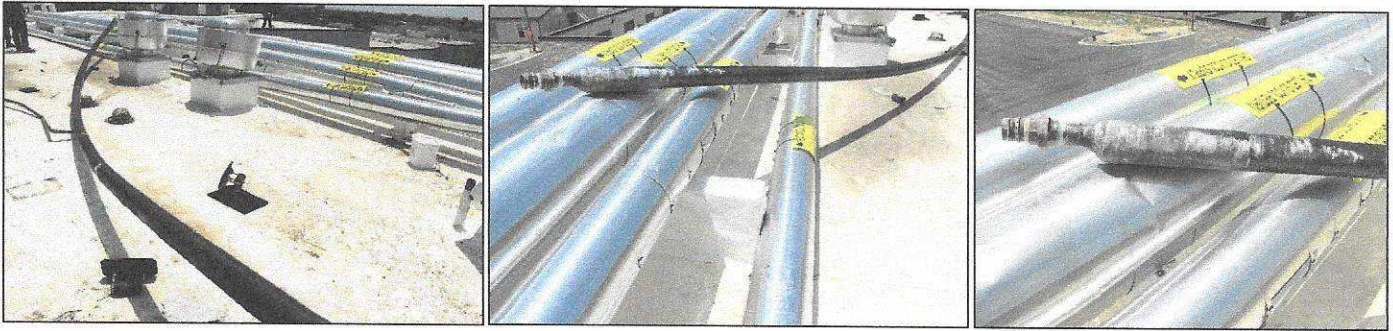


Figure 16: The portion of the natural gas line that was positioned over the mechanical room was thrown south of the explosion site. Note the slight bend caused by upward force of the explosion. A coupling was located at the end of this section.



Figure 17: A coupling and fractured section of piping was located at the end of the section for in-line valve and regulator.



Figure 18: The in-line valve and regulator were located in the courtyard/loading dock area. The valve was in the open position.





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Figure 19: The coupling on regulated side of natural gas line matched a section of pipe found in the courtyard/loading dock area.



Figure 20: A large section of natural gas line was located next to the loading dock and was identified as the "tee" which split gas supply between the boilers and the water heaters. The section of pipe from Figure 19 matches the weld of the "tee."



Figure 21: One side of the "tee" extended to the boiler room. The section above (marked in red) was identified as the riser to the boiler room. A "tee" was welded at the end of the riser with a fractured flange on each side of the "tee."





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Figure 22: The fractured flanges shown in Figure 21 matched the fractured cast iron plug valve housings in the boiler room.

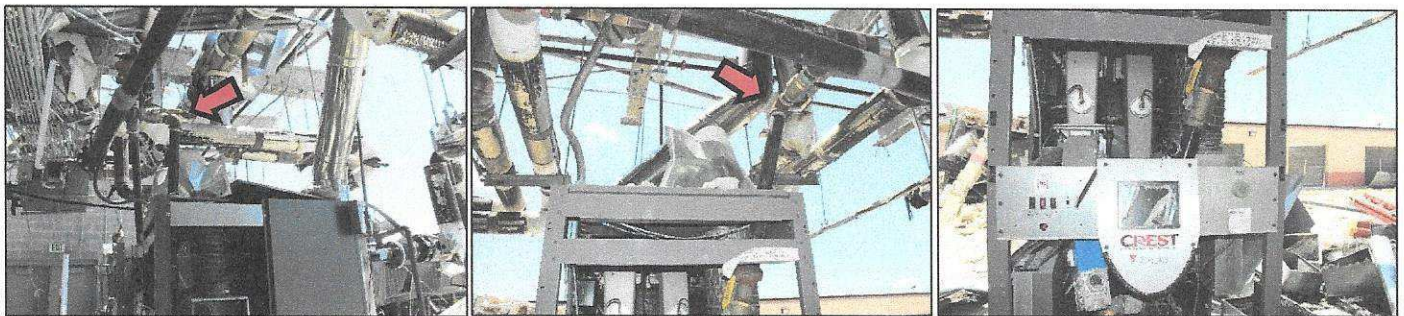


Figure 23: Natural gas lines extending from the supply to each boiler. In-line ball valves were in an open position.



Figure 24: At the other side of the "tee" on the roof provided natural gas to the water heaters.





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Figure 25: A riser extended from the "tee" on the roof to the mechanical room. A horizontal pipe then supplied natural gas to each water heater.



Figure 26: The natural gas line supplying the north and south water heater units were disconnected and the ball valves were in the open position.

## VICTIM DOCUMENTATION

- 1.41 The explosion caused injury to a total of 16 individuals. Three of those individuals succumbed to their injuries, which consisted of thermal burns and blunt force trauma. Victim #1 was pronounced at the scene and Victims #2 and #3 were transported to medical facilities, where they later died.
- 1.42 Victim #1 was identified as Michael Bruggman (W/M; 08/03/1975) and was located on the roof of the hospital, just south of the explosion site (31.435610, -97.779554). The victim sustained severe blunt force trauma and had injuries incompatible with life. Justice of the Peace Coy Latham pronounced the victim at the scene and coordinated the body removal. The victim was transported to Southwestern Institute of Forensic Science in Dallas, Texas for autopsy (SWIFS Case #18-11862). Autopsy results indicated the





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decedent sustained mild thermal injury and succumbed to multiple blunt force injuries. A copy of the autopsy report is included in the case file.

- 1.43 Victim #2 was identified as Filiberto Morales (W/M; 02/21/1982) and was located at the south end of the mechanical room at the time of the explosion. The victim's helmet was found along the south wall of the mechanical room, just east of the exterior doors. Witness statements indicated the victim was found on top of the debris at the exterior doors and was moved into the courtyard/loading dock area by bystanders. One of the victim's boots was found on top of the debris at the exterior doors. The victim's reflective vest and clothing were found in the courtyard where the victim was moved to. The victim was transported to Scott & White Medical Center in Temple for medical treatment, where he succumbed to his injuries. An autopsy of the victim revealed the victim sustained blunt force trauma to the head (SWIFS Case #18-11985). A copy of the autopsy report is included in the case file.
- 1.44 Victim #3 was identified as Wilber Dimas (W/M; 06/28/1988) and was located in the boiler room. The victim's helmet was found along the east wall of the boiler room adjacent to the north boiler unit. The victim was transported to the Dell Seton Medical Center in Austin for medical treatment, where he succumbed to his injuries. Medical records indicate the victim's injuries included burns to 70% of his body, including thermal injuries to his lungs. A copy of the victim's medical records are included in the case file.
- 1.45 During debris excavation, investigators found several cell phones, wallets, and helmets that belonged to the victims. These items were collected as evidence and transferred to the custody of Gatesville Police Department. Personal items located in the scene helped investigators pinpoint where each victim was in the structure and corroborate that information with witness statements. A map indicating the location of each victim is included in the case file.

## INVESTIGATION

- 1.46 Atmos Energy responded to the scene and shut off gas to the hospital. Initially, the gas meters were removed and retained by Atmos, but were brought back to the scene and reinstalled for investigative purposes. A mercaptan test conducted during the scene examination indicated the odorant was detectable at the meter. During the investigation, there was public speculation that this may have been a case of migrant gas from an underground natural gas leak. There was no evidence of migrant gas being a source of fuel or a factor in the explosion.





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- 1.47 Gatesville Fire Department responded to the explosion incident and provided fire, rescue, and emergency medical services. A copy of their report is attached to the case file. Multiple firefighters were interviewed about their actions and observations. Firefighters were initially focused on getting all victims out of the structure and searching for any trapped victims. During the search, small fires involving insulation materials were spreading. Firefighters then focused their attention on extinguishing the fires and stabilizing the incident. Photos of the scene were made available by first responders which show the progress of the incident.

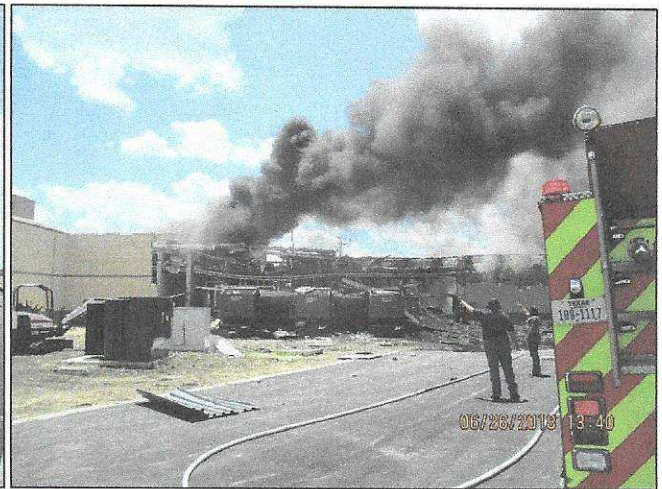
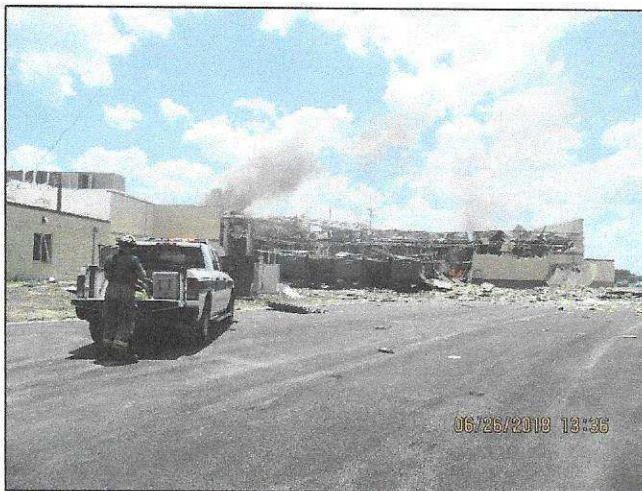


Figure 27: First responder photographs at 13:36 and 13:40 respectively

- 1.48 Special Agents with the U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) conducted field interviews of multiple witnesses to the explosion incident. Information was sent to Sergeant David Vesely who coordinated the collection of media and witness statements. A copy of witness statements and collected media are included in the case file.
- 1.49 Interviews conducted with construction employees revealed that plumbers were bleeding air off the natural gas lines. This information corroborated the open valves and disconnected gas lines observed during the scene examination. Witnesses denied smelling natural gas in the structure.
- 1.50 Construction employees also stated that work was being conducted on the boiler units to install stainless steel double-wall vent ducts. Victim #1 was known to be on the roof installing rain caps on the boiler vents. Surveillance video for jobsite security recorded the events prior to the explosion. In the video,





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Victim #1 is seen on the roof working with the vent ducts. Just prior to the large explosion, Victim #1 is observed running away from the vents over the boiler room. It is believed ignition occurred in the boiler room, alerting Victim #1 and causing him to run away from the boiler room. As the flame front propagated through the boiler room and mechanical room, Victim #1 managed to retreat to the roof over the mechanical room, unaware that natural gas had accumulated underneath him. At the time of the large explosion, Victim #1 is believed to have been positioned directly over the mechanical room.

- 1.51 AES provided photographs of the construction project at various phases in the construction schedule. They also provided surveillance video used for jobsite security. These are included in the case file.
- 1.52 Adolfson-Peterson Construction provided plans and other construction documents to assist in the investigation. As employees are brought to the job site, they are required to attend a safety course. At the end of this safety course, they receive a Safety Orientation Sticker to be applied to their helmet. Each sticker has a number unique to the employee. These stickers helped investigators determine which helmets in the explosion scene belonged to which employees. These records from Adolfson-Peterson are included in the case file.
- 1.53 State Fire Marshal Investigators attempted to get inspection records for the new construction project from the City of Gatesville, but the inspector did not generate records for any code inspections that may have occurred prior to the explosion. An interview was conducted with Inspector Robert Featherston during which he provided a written statement of his observations during inspections. The written statement is included in the case file.





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## CONCLUSION

- 1.54 Based on observations made during the forensic scene examination and information obtained in the subsequent investigation, I determined the area of origin to be in the boiler and mechanical rooms. A pocket of natural gas within the flammability limits was contained in the mechanical room, which caused the large explosion. The first fuel ignited was natural gas. I could not identify the ignition source, although multiple competent ignition sources existed in the area of origin.
- 1.55 Upon conclusion of the origin and cause investigation, the fire is classified as **UNDETERMINED**. Although the specific ignition source was not identified during the investigation, there was no evidence to suggest that this incident was the result of an intentional act or of natural causes. Evidence tended to suggest that this was a construction accident. The investigation will be **CLOSED**.
- 1.56 Upon receipt of new information regarding this case, I reserve the right to analyze the data and determine what, if any, bearing it may have on my opinion.

Sgt. Paul Ayres

CFEI, CVFI, FIT, CFE

Texas State Fire Marshal's Office