

**REPORT  
TO THE  
GUSTAVUS CITY COUNCIL  
GUSTAVUS WATER ACTION COMMITTEE**

**BY  
WAYNE HOWELL**

**SUBJECT:  
HISTORIC USE OF AQUEOUS FIREFIGHTING FOAM IN AND AROUND GUSTAVUS, 1969-2015**

**SUBMITTED  
SEPTEMBER 19, 2019**

## PREFACE

Most of the information presented here – with the exception of a few tidbits harvested from paper records – was gathered during interviews with 11 people during the month of September, 2019. All of the people interviewed were quite open and willing to offer whatever information they could regarding this issue that is so important to Gustavus. In digging into this thirty-year history one thing stands out above all else, and that is the dedication service and countless hours that our firefighting volunteers have given to this community. Without their service Gustavus would be a very different, less welcoming place.

Also worth noting. I am a citizen volunteer lacking expertise in in the subject matter and with no training in proper survey procedures, methodologies or protocols. This is a volunteer effort on my part to bring together information that our community needed to know, and which may not have been gathered otherwise. Any errors or misrepresentations contained herein are entirely mine.

## INTRODUCTION

- The information presented here was gathered through interviews with 11 people who offered information relative to the history of rescue and firefighting preparedness and response at the Gustavus Airport and in the greater Gustavus area from the early 1970s until present. Three are local residents who have general knowledge or specific observations of the topic, while nine are firefighters or first responders with direct experiences.
- Some people requested anonymity in providing their responses. In order to maintain the anonymity of those individuals it was therefore necessary to keep the identities of all respondents anonymous.
- In addition to these interviews I also researched City of Gustavus and Gustavus Volunteer Fire Department (GVFD) records. In both cases records are thin but do provide sufficient information to answer certain questions, corroborate memories or correct dates.
- For the most part the information provided here is from personal memories. Oral history by its nature is variable, particularly as it relates to time. Often respondents could remember events or activities but only in general blocks of time like “in the late 80’s” or “around 1995”. This report reflects that vagueness.
- Also, the memories of the different people do not always correlate with one another, even for individuals who served on the GVFD at the same time. This could be due to the nature of human memory, but also may owe to the fact that training exercises and fire responses may have occurred when people were away or not available.
- However, for the most part the memories tend to support one another, are generally not in conflict and tell a fairly coherent story. However, some vagueness is inherent in stitching these memories together and that is reflected in this report.
- I include here only accounts of AFFF dispersal that are supported by more than one individual, or if recalled by only one individual, are corroborated by records.
- I followed up all leads and determined that three possible locations could not be corroborated. They are indicated in Figure 4 (discussed below).
- This report is organized to present the information in three formats.  
-First is this running narrative, organized as bullet points to make the information accessible to readers and not buried in a long narrative format.

-Second, I present a set of four figures that offer the following:

1 - A list of respondents showing the relative time periods for which they are able to provide information.

2 - A timeline showing the periods during which AFFF was deployed at different locations around the Gustavus Airport.

3 - A map showing the locations where AFFF was deployed at the Gustavus Airport during training exercises or during equipment tests.

4 - A map showing where AFFF was deployed throughout the greater Gustavus area, including three locations where respondents suspected where it might have been deployed but which could not be corroborated.

-Third, I present 3 Tables which include: 1- a matrix showing where respondents recalled AFFF being deployed around the Gustavus. 2 - a table listing the events off-airport where AFFF was used. This table includes 3 locations mentioned as possible locations where foam may have been used but which were determined not to have happened (n=2), or could not be verified (n=1). And 3, a table which is my best GUESS as to the relative amount of AFFF deployed during these events. This table simply attempts to show that less foam was sprayed during equipment tests as opposed to suppression exercises. It may be useless and at best conveys my perception of relative quantities.

## THE EARLY YEARS

- Alaska airline jets began to arrive in 1969, requiring the presence of fire response capabilities.
- In the early 1970s DOT managed all regional airports (Metlakatla-Yakutat) based out of Gustavus. In 1973 DOT hired a dedicated maintenance man and it became a 1-man operation. This one-man operation continued until 1985.
- The DOT area of operations was centered on the old WWII era compound. The DOT Shop and maintenance facility was the old 2-bay shed just south of the generator shed. Staff lived in the housing nearby.
- Fire suppression equipment consisted of “an old yellow Dodge” pickup with a tank of water in the bed, and a wheeled cart with a cannister of “Purple K”, a dry chemical, on-hand for petroleum fires. There is no indication that the Purple K was ever used.
- The first AFFF capable equipment arrived in 1983 with DOT’s Engine 27. AFFF came in 5-gallon jugs and could be injected into the water stream by an induction device placed in the jug, or by filling a dedicated tank on the fire truck itself. It was mixed at 3% solution, so 22.5 gallons would treat a 750 gallon tank, the capacity of Engine 27. Engine 27 equipment may have been tested at that time but it is unlikely there were fire suppression exercises, as it was a one man operation.
- In 1985 DOT ended their one-man operation, and from 1985-1991 DOT contracted out road and airport maintenance. Soon after contracting out the road and runway maintenance responsibility, DOT shifted rescue and firefighting responsibility to the GVFD.

## THE AIRPORT RESCUE AND FIREFIGHTING (ARFF) ERA BEGINS

- The Gustavus Volunteer Fire Department (GVFD) was founded in 1982 in response to a house fire on Tong Road. The first fire engine, #7(?), was not AFFF capable.
- The GVFD, designated as the Gustavus Emergency Response (GER) signed the first Airport Rescue and Firefighting (ARFF) contract with DOT in 1987 or 1988. Engine 27 began to be used

by GER in exercises with AFFF foams. It is unlikely that many (or any) exercises using AFFF happened before 1987.

- One fire fighter asked at DOT or FAA inspector if there was any concern for AFFF being a hazardous material but was told to treat it as you would dish soap.
- The main exercises would occur in the spring after the snow melted but before the jets arrived.
- All respondents who worked on the ARFF contract mentioned the requirement to do a 40 hour training every 3 years and a 10 hour training the intervening years, with major mass casualty exercises occurring during the 3 year events. Sometimes these events happened at the Gustavus Airport, but other times they happened at other airports, with Kenai the most often mentioned.
- An FAA inspector would come and supervise the activities to ensure that the equipment worked and that all firefighters were properly trained and proficient in its use.
- The State of Alaska would also have one or two people on hand to supervise and observe, but the requirement for the exercises was mandated by the FAA and supervised by that agency.
- From 1987 until 1995 the exercises were limited to two areas:

“The Pit” – A shallow basin was excavated at the northeast part of the airport area on the north side of the approach and used specifically for petroleum firefighting exercises. Diesel would be spread onto the pooled water and ignited multiple times, with the flames suppressed at first with water, then for the last test, foam would be used. Most respondents recalled practicing at The Pit, and it was the most commonly used area for practice up until about 1995, when it was discontinued because of concern for the cloud of black smoke.

Runway Intersection - At the intersection of the two runways, off to the side but in the fenced-in area. This area seems to have been used at the direction of the FAA inspector to test to ensure that the equipment was working, but firefighting exercises do not appear to have happened there. Respondents recall that only a small amount of foam would be sprayed.

#### **ARFF TRAINING AND EQUIPMENT TESTING MOVE TO THE NEW DOT SHOP**

- In the early-mid 1990s DOT built a new shop near Runway 22. With the new shop and discontinuation of The Pit, ARFF training and equipment testing shifted to that area. Fire suppression exercises using AFFF were carried out on the asphalt in front of the shop and in front of the adjacent hangar, as well as the sandy area outside the fenced area. A Gustavus School group recalls being invited to witness suppression of a car fire using AFFF in about 2004 in this sandy area outside the fence.
- In addition, the end of Runway 22 was used for mass casualty training events but also for practice using foam. This area was chosen because it was seldom used by airplanes. The practices would happen at the end of the tarmac (in the area of the chevrons) as they did not want to get the foam (soap) on the runway. Only two of eight respondents recalled using this area, even though the times of service of all eight overlapped. This could indicate that not all volunteers were present each year. But the two respondents did agree that some of the exercises were intensive and considerable foam was deployed, sometimes moving around a large buoy ball with the water and/or foam, other times laying down a bed of foam and advancing through it. One respondent stated that on several occasions the FAA inspector directed that the entire tank be emptied as the foam had a shelf-life and needed to be replaced.

- During these years the GVFD would also participate in call-out exercises to the Alaska Airlines Terminal (built in 1993-1994, about the same time as the DOT Shop) to replicate what an actual rescue and fire suppression event would entail in that location. These exercises included spraying AFFF onto the edge of the asphalt just east of the AA Terminal, or onto a pallet fire in the open grassy area in front of the terminal.

## **FIREFIGHTING EVENTS AWAY FROM THE AIRPORT**

- After the GVFD was formed in 1982 and they signed the ARFF contract (as GER) in 1987 or 1988, DOT and GVFD also entered into a cooperative agreement wherein both fire trucks could respond to fires. The GVFD Engine 7 (?) was not AFFF capable but the DOT Engine 27 was. Although records are incomplete, of the 97 records we do have for the period 1993-2012, Engine 27 (DOT) responded to at least 50% of the call-outs. There were two GVFD responses to fires off airport where AFFF was used during that time:
  - 1- Sometime between 1995 and 1999 (no record, but 2 respondents remembered it) a road grader caught fire on Rink Creek Road, about midway between the gravel pits and the end of the road, but away from any residential areas. The GVFD responded to this equipment fire and AFFF was deployed to suppress the fire. There is no paper record of this event.
  - 2- Only one respondent recalled a fire, in his memory in about 1999, which occurred on Benjamin Road where a grass fire got away from a burn barrel on a very windy day. He deployed AFFF from Engine 27 ahead of the flames to halt their advance. We do have a record of such an event recorded in 2001 in which wind is noted as a contributing factor, but it states that the fire did not threaten spreading. It makes no mention of use of AFFF. The record does list the names of volunteers who responded to this fire so there may be a way to further corroborate this event.
- Respondents also mentioned that there may have been four other events or locations where AFFF may have been used and I tracked these all down, with the following results:
  - 1 - One respondent recalled participating in an exercise during the 1980s or early 1990s where a Volkswagen was set on fire somewhere along Mountain View Road then extinguished, perhaps using AFFF. I contacted another person who was involved in that exercise who assured me that there was no AFFF used but the fire could not be put out using water (a flaming magnesium steering column would have caused an explosion) so a fire extinguisher was used instead.
  - 2- One respondent also mentioned that the gravel pits may have been used in a fashion similar to that described for The Pit (diesel on water) but he had no specific knowledge of that activity, only suggesting that it may have happened. No other respondents had any memories of such events and one offered that he thought it highly unlikely. He did offer that sometimes the fire trucks and tankers would use the gravel pits for fill-up, but that no exercises were ever conducted there to his knowledge.
  - 3- One respondent also suggested that there may have been car burning or casualty extraction exercises carried out at the Fire Hall where AFFF may have been used but no other respondents mentioned such activity and there is no record or evidence of such activities.
  - 4- A GVFD car burning exercise was reported having occurred at scrap metal yard on Chinook Drive. An eyewitness suggested that it had happened sometime within the past 2-3 years but a follow-up with another person familiar with the event could definitively confirm that it occurred sometime around 2011-2012. The eyewitness saw a cloud of black smoke rising up from the area and went to investigate but did not witness the use of AFFF. I spoke with Gustavus Fire Chief Travis Miller about how such an exercise would be conducted, and he stated that use of AFFF would be highly unlikely and that the fire could easily be extinguished using water.

## CONCLUSIONS

- During the years 1969 until 1983 it is unlikely that AFFF or similar materials were ever used at the Gustavus Airport. Although Purple K was present it was contained in one canister that was to be used when needed and probably would not have been “tested”.
- The first use of AFFF would not have occurred until the arrival of Engine 27 in 1983. From then until 1987-88 exercises would probably have not occurred as there was only one DOT employee present. He may have tested the equipment to make sure it was working, but we have no record of that.
- Beginning in 1987-88 DOT signed an ARFF contract with GER to provide rescue and firefighting support at the Gustavus Airport. At that point GER was required by FAA to ensure that all of their firefighters were trained and capable in the use of AFFF, and that the equipment for deploying AFFF on Engine 27 was operational.
- From 1987-88 until 1995 two areas were the main focus of FAA mandated GER exercises. The Pit was used for fire suppression exercises, as described above, and the runway Intersection area was used for equipment tests.
- After 1995 the area of activity for both suppression exercises and equipment tests shifted to the DOT Shop, the end of Runway 22 and near the Alaska Airlines Terminal. Most of the respondents who participated in these exercises report that they varied in intensity. Sometimes the FAA inspector only wanted to make sure that the firefighters knew how to use the equipment and that the equipment was working. Other FAA inspectors wanted the teams to conduct full suppression exercises with beds of foam being laid down and fires extinguished.
- It is impossible to determine exactly how much AFFF foam was used on any given event. It is possible to say that equipment tests used the least, while some exercises, such as those at The Pit, used more but probably not a lot, while some of the exercises at the DOT Shop, at the end of Runway 22 and at the Alaska Airlines building, likely used more. It is possible to estimate some quantities discharged for exercises when the FAA inspector or DOT supervisors instructed the GER volunteers to empty the tank (22-23 gallons of foam concentrate for 750 gallons of water), but unfortunately, I was unable to determine where, when or how often these events occurred.
- Away from the airport AFFF was likely discharged only rarely and was likely restricted to the events discussed herein. Two respondents with the GFVD and NPS explained why; that AFFF is expensive and hard to get in Alaska and was used only for brief equipment tests and was reserved for actual fires.

**FIGURES AND TABLES**

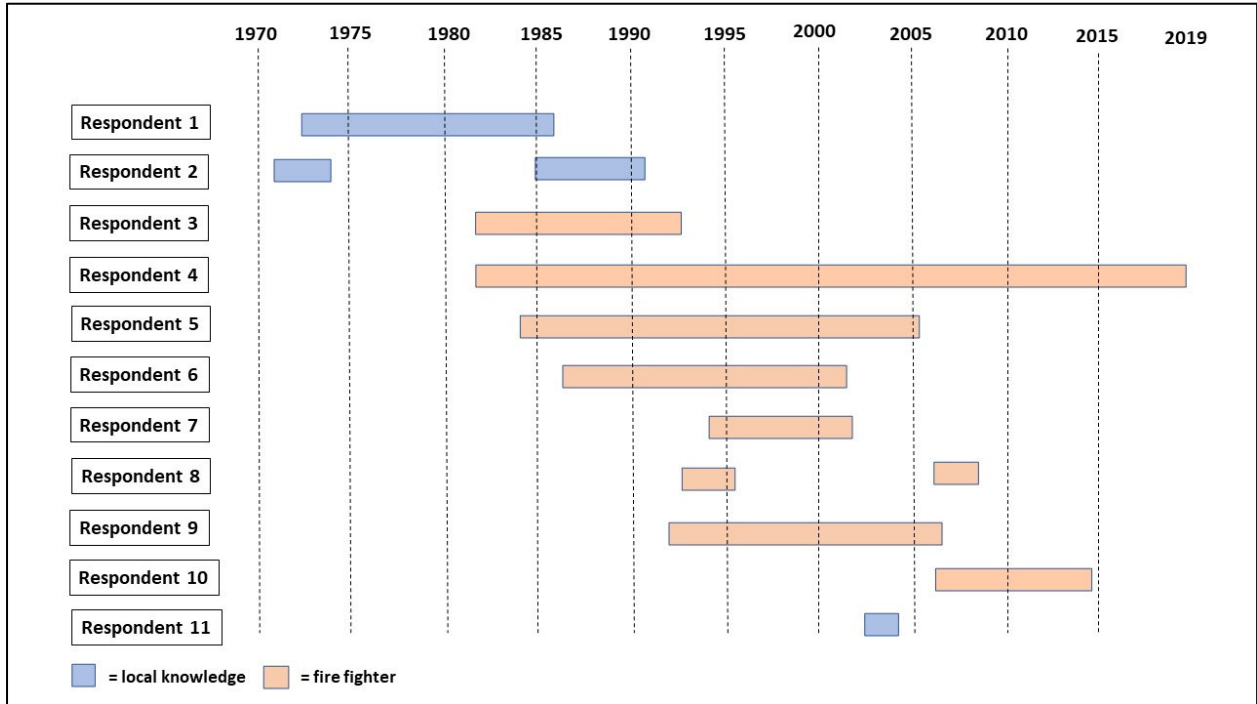


Figure 1 – Respondents to survey, and periods of their observations or involvement.

<b>Respondent</b>	<b>The Pit</b>	<b>Intersection</b>	<b>Runway 22</b>	<b>AA Terminal</b>	<b>DOT Shop</b>
1					
2					
3	X	X			
4	X				
5	X		X		
6	X			X	X
7	X	X	X	X	X
8	X				
9					X
10				X	X
11					X
<b>TOTAL</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>5</b>

Table 1 – Matrix showing where volunteers recalled exercises and equipment tests carried out at five locations around the Gustavus Airport.

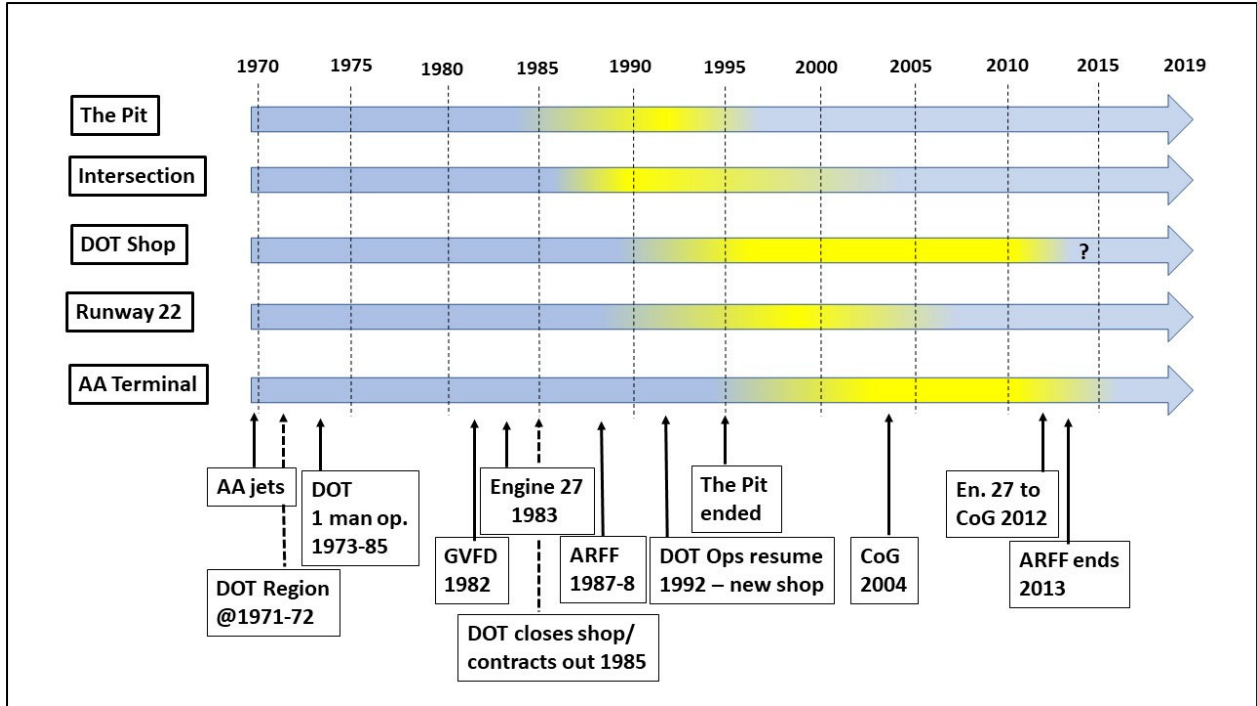


Figure 2 – Timeline of locations at Gustavus Airport where AFFF was used, and events affecting its use. Note that the yellow use periods are shaded to connote vagueness.



Figure 3 – Locations at the Gustavus Airport where AFFF was used.



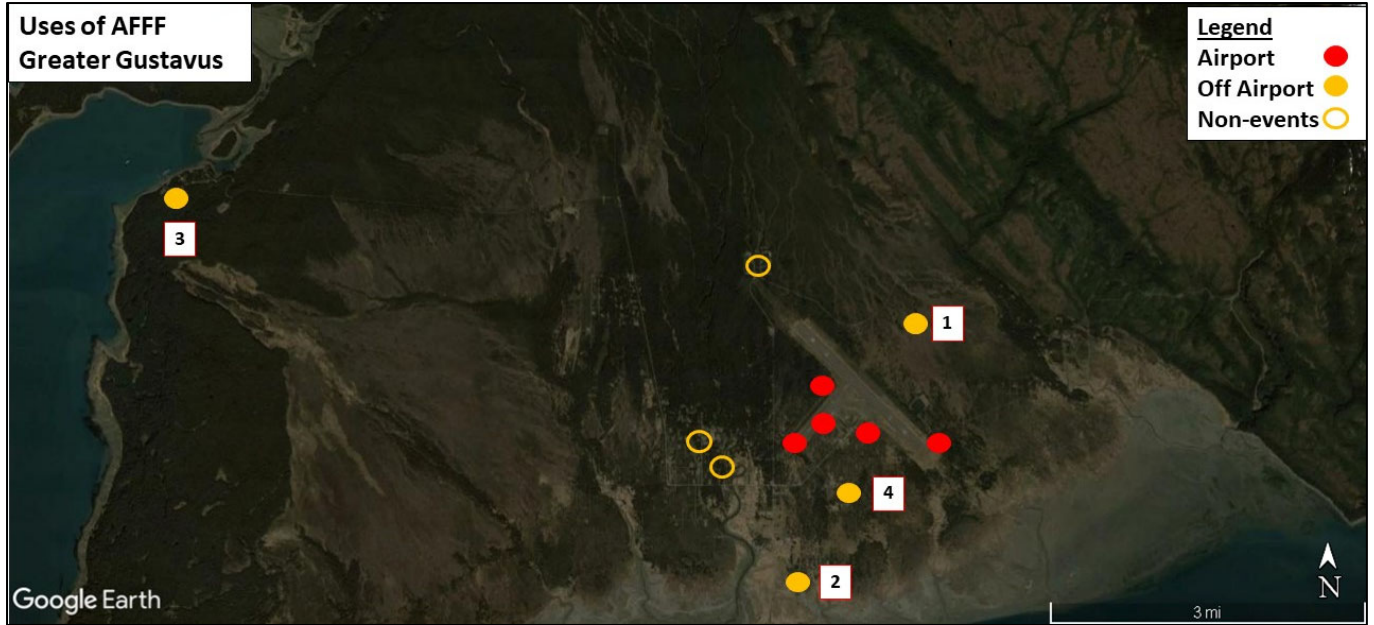


Figure 4 – Areas in the greater Gustavus area where AFFF was used, or suggested to have been used.

Number	Description	Volume	Date
1	Road grader fire, Rink Creek Road	Unknown - suppression	>1995 - <1999
2	Grass fire, Benjamin Road	Unknown - suppression	2001
3	NPS equipment tests, 3-5 times	Low	>1996 - <2011
4	Same Old Road	Unknown - suppression	2015

Table 2 – Locations off-airport where AFFF was used.

Volume	1 = Low Volume; 2 = Moderate Volume; 3 = High Volume (guess)				
Respondent	The Pit	Intersection	Runway 22	AA Terminal	DOT Shop
1					
2					
3	2	1			
4	2				
5	2		3		
6	2			2	2,3
7	2	1	3	2	1,2,3
8	2				
9					2, 3
10				2	2, 3
11					3

Table 3 – Table showing best guess estimate of relative amounts of AFFF volume used.