

**Accident Investigation  
Factual Report**

**Loss of Fire Engine 3662  
During High Water Crossing of  
Gila River**



**Arizona  
Bureau of Land Management  
Colorado River District**

**September 6, 2009**

COVER PICTURE IS POST SUBMERGING OF ENGINE 3662 IN GILA RIVER.

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Loss of Engine 3662  
Fire Operations at Yuma, Arizona

**Investigative Team:**

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## EXECUTIVE SUMMARY:

On Sunday September 6, 2009, Engine 3662 (3662) a type 6 engine from the Colorado River District stationed in the Yuma Field Office was involved in an accident while attempting to cross a flooded portion of the Gila River North of Yuma. As a result a large portion of 3662 was submerged in four to five feet of water for approximately one hour. The accident was caused as 3662 attempted to make a high water crossing of a normally passable river ford. Heavy rains from the day before had left the river well above its normal levels and the engine was submerged in the Gila River to the bottom of the windshield. There were no injuries to the crew. Damage to the engine is still being ascertained. **(See Cover Picture)**

The weather for September 6, 2009 was forecasted to be partly sunny with a slight chance of showers and thunderstorms in the afternoon. After morning briefing 3662 was assigned by the Fire Operations Specialist (FOS) to do a fire prevention patrol in the area around the Yuma Field Office.

The crew of 3662 consisted of:

- Engine Operator (ENOP)
- Engine Operator (T) (ENOP)
- Fire Fighter (FFT2)

The Fire Operations Specialist (FOS) was assigned to 3662 for the day as the Engine Captain and was in a separate chase vehicle also patrolling the area.

At approximately 1000 hours 3662 approached the Gila River crossing near 12 E. and Gila River- (Lat/Long N 32 44 36.3 W114 26 30.8) and found that heavy rains from the past several days had raised the water to an exceptionally high level. At this time ENOP(T) was driving the engine, ENOP riding in the right front seat with FFT2 in the back seat.

ENOP(T) stopped 3662 at the edge of the water for the crew to observe the condition of the crossing and look at the level of the water. ENOP(T) and ENOP discussed the fact that they had crossed the river at this location the day before. ENOP also discussed with ENOP(T) that he had crossed the river numerous times after rain storms in the past and didn't have any problems.

To determine how soft the surface of the road was ENOP(T) drove the engine into the water and backed out. It was then agreed by ENOP and ENOP(T) that the engine could make it across the river. As 3662 approached the deepest point in the river crossing the motor ingested water through the air intake and quit. The total distance from the edge of the water to the point where the motor stopped was approximately 220 feet. The depth of the water at this point was approximately five feet (as determined by the location of the water level in the post incident photographs) **(See Diagrams 1 & 2)**. At this point, ENOP(T) turned the ignition and the battery switches off as the cab started to fill with water. The crew then exited 3662 through the windows.

FOS was contacted by Arizona Dispatch Center and informed of the incident and responded to the scene. After making an evaluation of the conditions, he decided to extract 3662 from the water using the winch system of 3662.

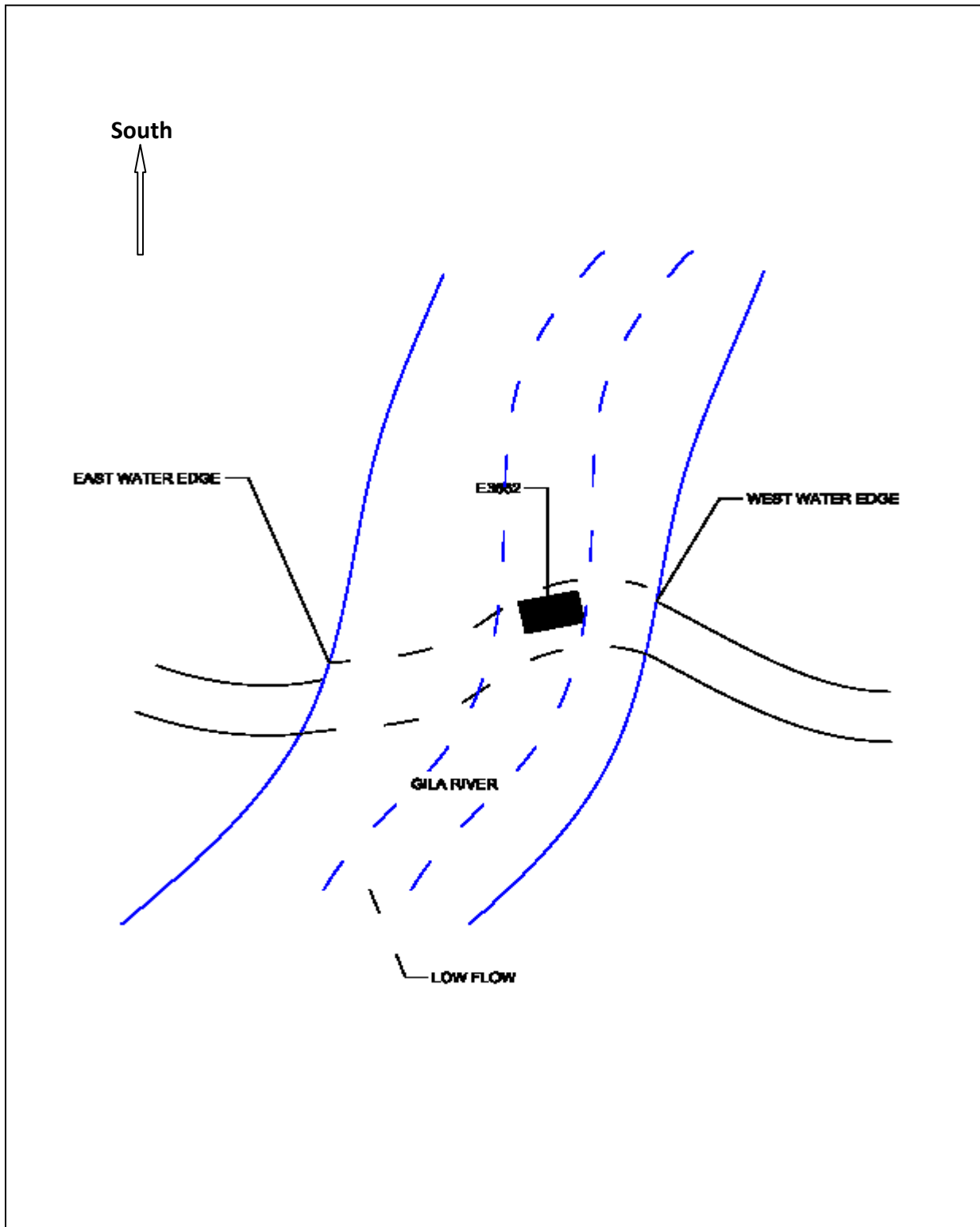


**Gila River Crossing at normal flow level**



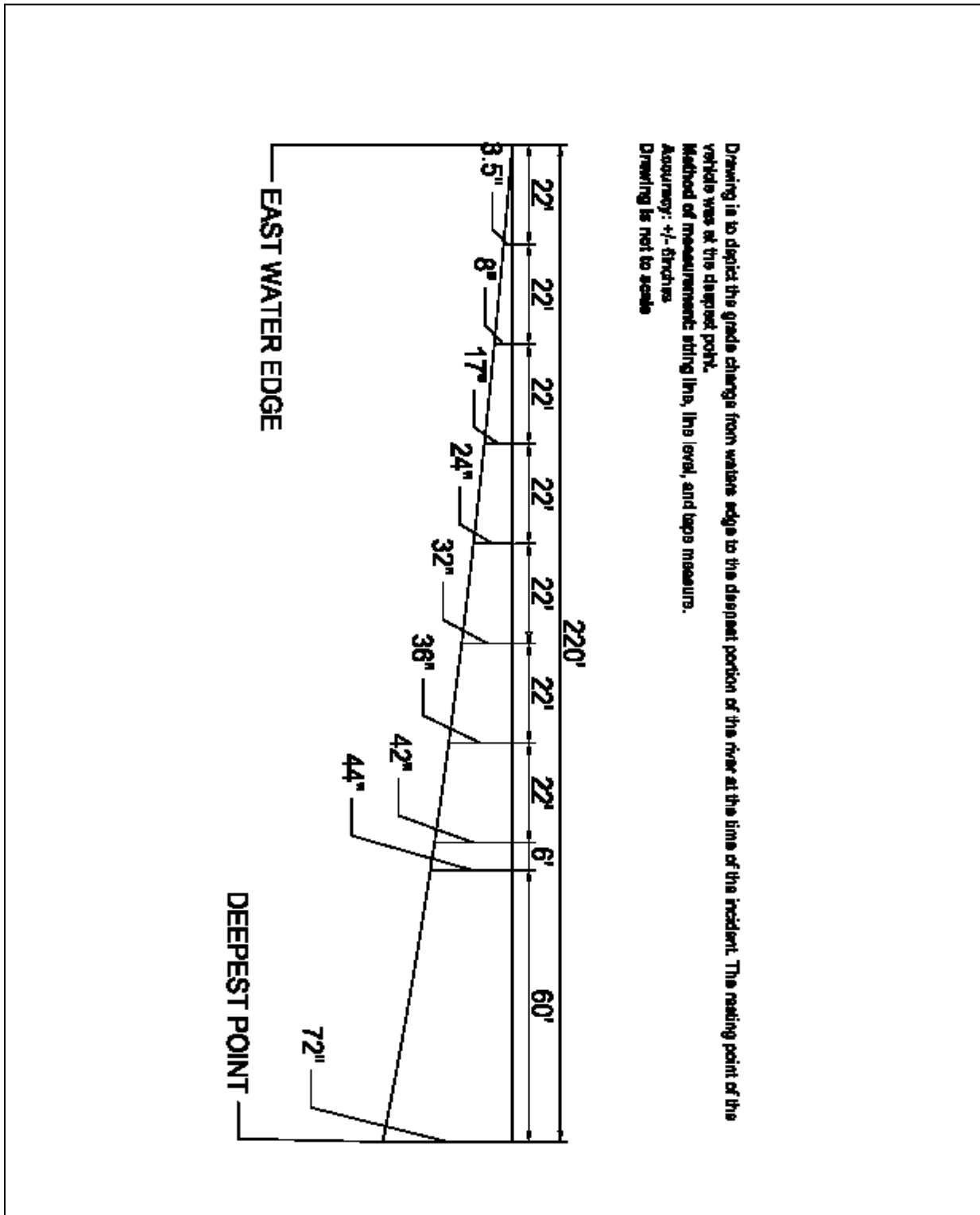
**Aerial View of Gila River Crossing**

# Diagram No. 1



River crossing terrain in plan view

Diagram No. 2



Road slope from high water edge to center of Gila River Channel

## **NARRATIVE:**

## **INVESTIGATIVE PROCESS:**

The team convened on Wednesday September 9, 2009 in Yuma, Arizona to investigate the events and conditions that led to 3662 being submerged in the Gila River.

The process was:

The Chief Investigator in-briefed with the Colorado River District Manager after being requested by the State Fire Management Officer.

- Visit the site and reconstruct the accident
- Meet as a team and determine the investigation plan
- Acquire personal statements from those involved
- Review qualification and Training
- Develop Direct Causes and Contributing Factors
- Provide Recommendations to prevent recurrence
- Review Lessons Learned from investigation
- Out-brief with State Office Fire Management Officer

## **Findings:**

### **Policy compliance of operational actions and choices**

- All the members of 3662 present at the time of the incident were qualified for the positions they held.
- Their assignments for the day were within their operational scope and they were operating within the policies of the BLM Fire Program.

As the crew of 3662 approached the water crossing they made the following choices and took the following actions:

- They entered the water (approximately 5 feet) to assess the road condition and then backed out to assess the overall situation.
  - *Both these actions fall into the agencies excepted best practices for this type of situation.*

After backing out of the water:

- The driver and Engine Operator (ENOP) reviewed and discussed the situation before making the determination that 3662 could make the crossing safely.
  - *While this decision proved to be erroneous, with the crews experience at using this crossing, their choice to attempt the crossing was understandable and valid.*
- As 3662 was driven toward the low point in the crossing, the water depth increased to a level above the motors air intake stalling the motor and rendering the truck inoperable.
  - *See Finding No.1.*

**Finding No.1:** Once the decision was made to proceed through the water crossing, the Driver and Engine Operator (ENOP) did not continue to reassess the changing situation relative to their vehicles capabilities. They continued to operate past the point that was reasonable and prudent resulting in the loss of 3662.

**Finding No. 2:** There are no Bureau, state or national level training or operational standards for vehicle operations in high water situations.