



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Green River, Utah	<b>Accident Number:</b>	WPR14FA158
<b>Date &amp; Time:</b>	April 6, 2014, 12:15 Local	<b>Registration:</b>	N13HG
<b>Aircraft:</b>	ROBINSON HELICOPTER R22 BETA	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Fuel contamination	<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot's family reported that the purpose of the flight was to look for shed elk antlers. When the helicopter did not return, a search was initiated. The wreckage was located the following day on the side of a gully in rough terrain.

Onsite wreckage documentation revealed that the main rotor blades did not show evidence of rotation at the time of ground contact, and the rotating components of the airframe exhibited little damage. The gascolator container was stained an orange/brown color at the bottom and along the sides. Fluid drained from the gascolator was colorless but murky and had a faint smell of gasoline. A water/alcohol-indicating paste test revealed water contamination in the sample. If the pilot had drained fuel from the helicopter's fuel tank or gascolator before the flight, he would most likely have discovered the contamination. Other than the contaminated fuel, postaccident examination of the airframe and engine revealed no evidence of any anomalies that would have precluded normal operation of the helicopter.

The pilot kept aviation fuel in a barrel on his property, and he would pump the fuel into 5-gallon plastic cans, which he used to fuel the helicopter. Testing of the fluid in some of the cans revealed significant water contamination. One of the cans contained a mixture of about 50 percent aviation fuel and 50 percent water, and another contained a mixture of about 85 percent aviation fuel and 15 percent water.

The lack of damage to the main rotor blades and the rotating components of the airframe indicate that it is likely that the engine experienced a loss of power due to water contamination of the fuel. In order to spot antlers, the pilot was likely maneuvering at a low altitude; therefore, he had little time to react to a loss of engine power or locate a suitable landing site in the rough terrain.

# Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A loss of engine power due to fuel contamination while maneuvering at a low altitude and the pilot's inadequate preflight inspection, which failed to detect the contamination.

## Findings

Aircraft	Fuel - Fluid condition
Personnel issues	Preflight inspection - Pilot
Aircraft	Altitude - Not specified
Environmental issues	Rough terrain - Contributed to outcome

## Factual Information

### History of Flight

<b>Maneuvering-low-alt flying</b>	Fuel contamination (Defining event)
<b>Maneuvering-low-alt flying</b>	Off-field or emergency landing
<b>Landing</b>	Hard landing

On April 6, 2014, about 1215 mountain daylight time, a Robinson R22 Beta II, N13HG, collided with terrain near Green River, Utah. The pilot was operating the helicopter under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91. The commercial pilot and one passenger sustained fatal injuries. The helicopter sustained substantial damage during the accident sequence. The local personal flight departed from private property near Green River about 1115. Visual (VMC) meteorological conditions prevailed, and no flight plan had been filed.

The family reported that the intention of the flight was to look for shed elk antlers. They reported that the helicopter was overdue about 1800 on April 6, and the Utah Highway Patrol initiated a search. Using signals from a cell tower and an emergency locator transmitter (ELT), they discovered the wreckage about 1300 the following day.

### Pilot Information

<b>Certificate:</b>	Commercial; Flight instructor	<b>Age:</b>	38
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Helicopter	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	March 24, 2014
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	7800 hours (Total, all aircraft)		

A review of Federal Aviation Administration (FAA) airman records revealed that the 38-year-old pilot held a commercial pilot certificate with ratings for airplane single-engine land and helicopter. The pilot held a certified flight instructor (CFI) certificate with a rating for rotorcraft-helicopter.

The pilot held a second-class medical certificate issued on March 24, 2014, with no limitations or waivers.

No personal flight records were located for the pilot. The National Transportation Safety Board (NTSB) investigator-in-charge (IIC) obtained the aeronautical experience listed in this report from a review of

the FAA airmen medical records on file in the Airman and Medical Records Center located in Oklahoma City, Oklahoma. The pilot reported on his medical application that he had a total time of 7,800 hours with 200 hours logged in the previous 6 months.

#### Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	ROBINSON HELICOPTER	<b>Registration:</b>	N13HG
<b>Model/Series:</b>	R22 BETA II	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>	1996	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	2603
<b>Landing Gear Type:</b>	N/A; Skid	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	April 26, 2013 100 hour	<b>Certified Max Gross Wt.:</b>	1370 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	2889 Hrs at time of accident	<b>Engine Manufacturer:</b>	LYCOMING
<b>ELT:</b>	C91A installed, activated, aided in locating accident	<b>Engine Model/Series:</b>	O-360-J2A
<b>Registered Owner:</b>	ROTORTRENDS INC	<b>Rated Power:</b>	145 Horsepower
<b>Operator:</b>	ROTORTRENDS INC	<b>Operating Certificate(s) Held:</b>	None

The helicopter was a Robinson R22 Beta II, serial number 2603. A review of the helicopter's logbooks revealed that the helicopter had a total airframe time of 2,828.6 hours at the most recent 100-hour inspection on April 26, 2013. The logbooks contained an entry for an annual inspection dated June 28, 2012, at a total airframe time of 2,440.8 hours. The hour meter read 2,889.6 hours at the wreckage examination.

The engine was a Lycoming O-360-J2A, serial number L-34900-36A. Total time on the engine was 2,889.6, and time since major overhaul was 744.7 hours.

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KCNY	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	11:53 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Few / 8000 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	/	<b>Turbulence Type Forecast/Actual:</b>	/ None
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.02 inches Hg	<b>Temperature/Dew Point:</b>	12°C / -8°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Green River, UT	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Green River, UT	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	11:15 Local	<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	39.311943,-110.073608(est)

The NTSB IIC, an NTSB investigator, and investigators from the FAA, Robinson Helicopters, Inc., and Lycoming Engines examined the wreckage on site.

The helicopter came to rest on its right side about a quarter way up the south slope of an east-west gully with a dry creek bed in the bottom. The slope changed at the midpoint of the fuselage; it was 55 degrees downhill below the wreckage and 40 degrees uphill above it. The creek bed was 30 feet away, and the bottom of the bluff was about 75 feet away. The first identified point of contact (FIPC) was a ground scar that was on a 255-degree magnetic heading. The vertical and horizontal stabilizer assembly separated, and was in a tree at the eastern end of the ground scar. A rock face was at the western end of the ground scar, and exhibited a 3-foot-diameter area of white marks with white paint shards at its base. The orientation of the fuselage was 180 degrees.

Both tail rotor blades separated a few inches from the hub. One blade was in the bottom of the gully; its fracture surface was angular and jagged. The other blade was in the tree with the stabilizer assembly; its fracture surface was angular and jagged and there was a dent in the leading edge near the tip. The aft skid crosstube was in the bottom of the dry creek about 30 feet from the tail rotor blade.

The main rotor blades were oriented north-south. The south blade did not exhibit any leading or trailing edge damage, but did have a puncture midspan and midchord that went through to the top of the blade. The north blade bent down about 2 feet from the hub; it did not exhibit any leading or trailing edge polishing or dents.

The engine did not show evidence of catastrophic failure. The exhaust exhibited ductile bending.

The bowl section of the carburetor separated, and was in the forward portion of the ground scar. Liquid was drained from the gascolator that was colorless, but murky, into two bottles. The fluid in one bottle had no smell; the other bottle had a faint smell of gasoline. A water/alcohol indicating paste was dipped into the liquid in both bottles; the paste changed color from pink to dark red, indicating water. The gascolator was removed; it contained an orange/brown colored fluid in the bottom and orange/brown colored stains along the sides. A water/alcohol indicating paste was dipped into the liquid; the paste changed color from pink to dark red, indicating water.

## **Medical and Pathological Information**

---

A postmortem examination of the pilot was conducted by the Office of the Medical Examiner, Utah Department of Health. The cause of death was reported as the effect of multiple blunt force injuries.

Toxicological tests on specimens recovered from the pilot were performed by the FAA Civil Aerospace Medical Institute Forensic Toxicology Research Team in Oklahoma City. Analysis revealed no findings for carbon monoxide or volatiles. Testing for cyanide was not accomplished.

The report contained the following findings for tested drugs: ibuprophen detected in urine.

Refer to the toxicology report included in the public docket for specific test parameters and results.

## **Tests and Research**

---

### **Global Positioning Satellite System (GPS)**

The airplane was equipped with a Garmin GPSMap 396 GPS receiver. The unit sustained impact damage, and was sent to the NTSB Office of Research and Engineering for data extraction. The extracted data revealed a flight on April 6th. The initial data point at 1140:05 was not at the known departure point. The recorded flight began in the mountainous area where the pilot and passenger were looking for elk sheds. The path meandered in the area, and ended at 1211:59, about 1.6 nm from the accident site.

### **Follow Up Examination**

Investigators from the NTSB, Lycoming, and Robinson Helicopters examined the wreckage in a hangar at Hurricane, Utah, on May 13, 2014. A detailed report is part of the public docket for this accident. No preimpact anomalies with the airframe or engine other than water in the fuel system were discovered.

### **Additional Information**

---

Friends of the pilot indicated that he kept a barrel of aviation fuel outside of a building on private property. He would pump fuel from the barrel into 5-gallon plastic cans, which he in turn used to fill the helicopter. Investigators syphoned a sample from the barrel, and observed a light blue fluid that smelled like aviation gasoline. Investigators went to the building housing the gas cans, and observed seven cans. Four cans had enough liquid to drain into bottles. Fluid from two of the cans was light blue, and smelled like aviation gasoline; dipping a water/alcohol indicating paste into the liquid did not change the color of the paste. About 85 percent of the liquid from one can was light blue, and smelled like aviation gasoline. The remaining 15 percent was dark and murky; a water/alcohol indicating paste dipped into the murky liquid changed color from pink to dark red, indicating water. About 50 percent of the liquid from the fourth can was light blue, and smelled like aviation gasoline. The remaining 50 percent was dark and murky; a water/alcohol indicating paste dipped into the murky liquid changed color from pink to dark red, indicating water.

## Administrative Information

**Investigator In Charge (IIC):** Plagens, Howard

**Additional Participating Persons:** Mathew Green; Federal Aviation Administration; Salt Lake City, UT  
Troy Helgeson; Lycoming; Williamsport, PA  
Ken Martin; Robinson Helicopters, Inc.; Torrance, CA

**Original Publish Date:** September 17, 2015

**Last Revision Date:**

**Investigation Class:** [Class](#)

**Note:** The NTSB traveled to the scene of this accident.

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=89019>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).