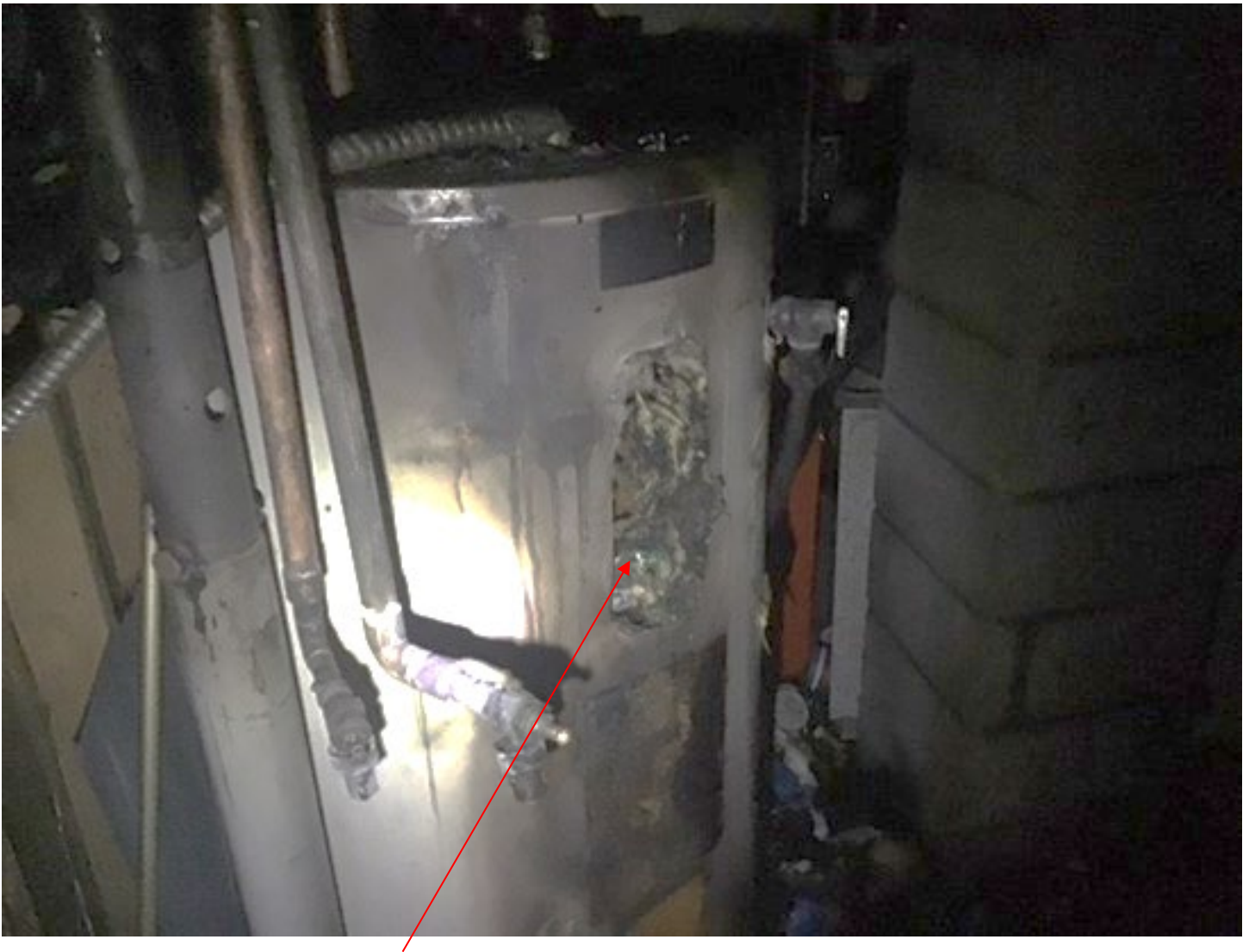
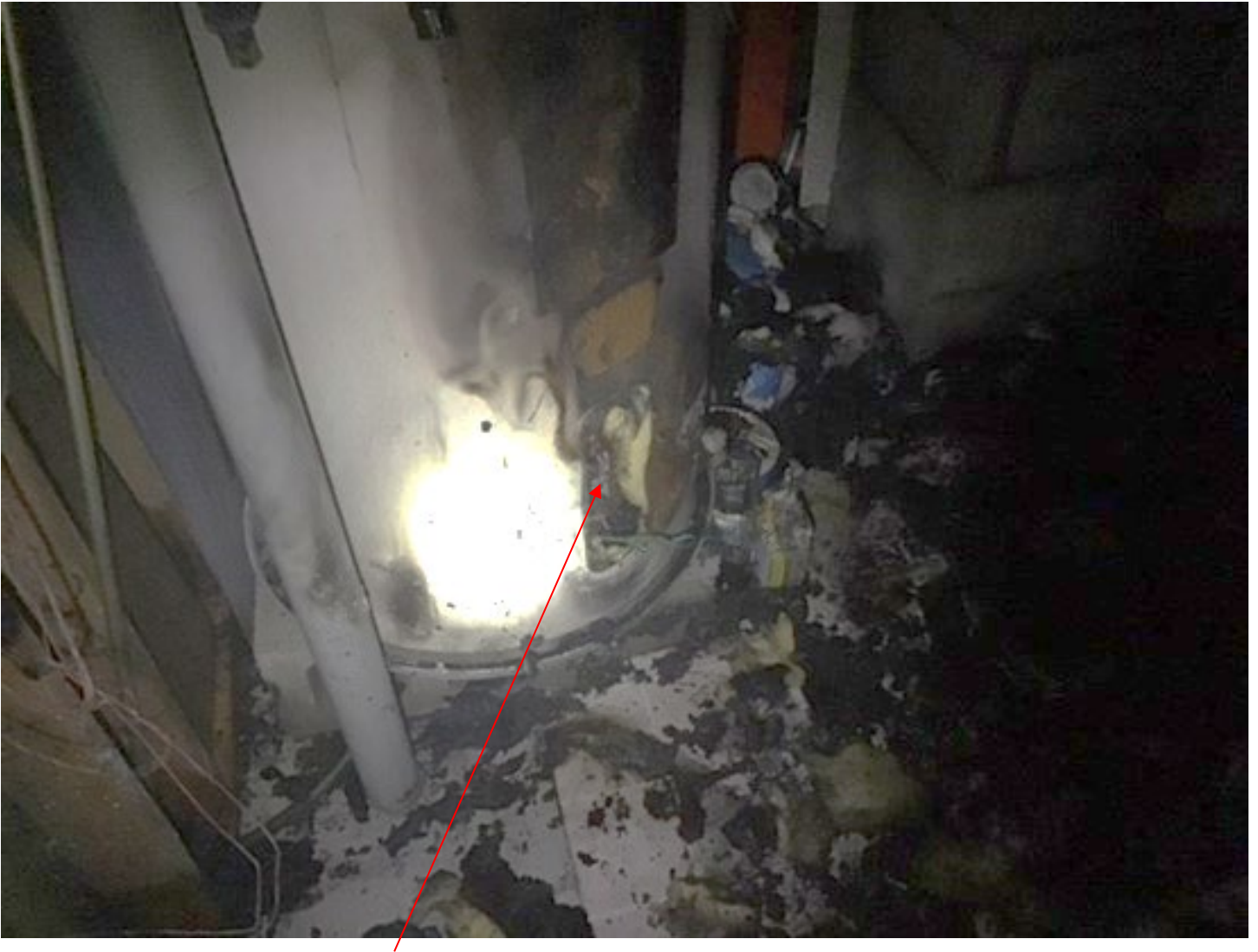


Incident Summary #II-1257863-2021 (#24115) (FINAL)

SUPPORTING INFORMATION	Incident Date	September 19, 2021	
	Location	Castlegar, BC	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	None
		Injury rating	None
	Damage	Damage description	Single family dwelling sustained fire, smoke and fire suppression damage on basement level, smoke, and fire suppression damage on main level
		Damage rating	Moderate
	Incident rating	Moderate	
Incident overview	All indications point toward an electrical component failure in a domestic hot water tank which may have contributed to an arcing event and ignition source for combustible material in contact and adjacent to the hot water tank.		
INVESTIGATION CONCLUSIONS	Site, system and components	A domestic hot water tank is typically supplied with 240-volt, 30 ampere branch wiring. The tank is fitted with two equally sized heating elements located near the top and near the base of the tank. At any one time only one element is in service to heat the water in the tank. The elements alternate the duty cycle and are thermostatically controlled. The branch wiring terminations, the heating elements, the thermostat and associated element and thermostat conductor terminations are accessible through covered openings. When the covers are secured in place, the installation is electrically safe.	
	Failure scenario(s)	All indications point toward the domestic hot water tank providing an ignition source to adjacent, stored combustible materials. The ignition source likely being a failed heating element or heating element conductor termination; resulting in a high impedance electrical arcing, electrical overtemperature condition.	
	Facts and evidence	Evidence obtained from photographs and interviews indicate the fire incident area of origin to be in and about the area of the domestic hot water tank. Photographs obtained by the Regional Fire/Rescue personnel during fire suppression reveal the heating element and thermostat covers were previously removed and placed on top of the hot water tank.	
	Causes and contributing factors	Though not conclusive, all indications point toward a component failure on the domestic hot water tank which resulted in a high impedance electrical arcing, overtemperature condition which in turn ignited a large volume of stored tissues, paper towel, toilet paper. The combustibles were placed in contact with and adjacent to the hot water tank. The hot water tank heating element and thermostat covers had been previously removed and not secured back into position at some point prior to the incident. Had the covers been secured into position any electrical arcing or sparking likely would be contained behind the cover, not projecting past the tank enclosure and not providing an ignition source to combustible material.	



Domestic hot water tank – top element area, cover missing.



Domestic hot water tank - bottom element area, cover missing.



Area around base of domestic hot water tank – burnt toilet paper, tissue, paper towels.



Area and main level floor joists above domestic hot water tank – fire and smoke damage.



Dwelling subdistribution – 100A 120/240V panel board, located adjacent to domestic hot water tank.



Photograph obtained by Regional Fire/Rescue – upper element and thermostat as found during fire suppression, cover previously removed.



Photograph obtained by Regional Fire/Rescue – upper element and thermostat as found during fire suppression, cover previously removed.