



**Australian Government**

# **PUAFIR603A Determine origin and cause of wildfire**

**Release 3**

## PUAFIR603A Determine origin and cause of wildfire

### Modification History

Release	TP Version	Comments
2	PUA12 V2.1	Editorial changes.
2	PUA12 V2	Layout adjusted. No changes to content
1	PUA00 V8.1	Primary release on TGA

### Unit Descriptor

This unit covers the competency required to undertake wildfire scene examination and assessment to determine the path, origin and cause of a wildfire based on fire behaviour, weather conditions, topography and fuel load.

It includes identifying and recovering evidence relevant to a wildfire investigation, packaging items of evidence for examination and conducting an analysis of evidence to identify the cause and origin of a wildfire.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

### Application of the Unit

Application of this unit is relevant to wildfire fire investigators who are required to determine the origin and cause of a wildfire.

The unit focuses on the skills and knowledge required to develop and apply a systematic approach to fire investigation in a wildfire context.

### Licensing/Regulatory Information

Not applicable.

## **Pre-Requisites**

PUAFIR303B Suppress wildfire (Fire sector specific)

PUALAW001B Protect and preserve incident scene (Fire sector specific)

PUALAW002B Conduct initial investigation at incident scene (Fire sector specific)

## **Employability Skills Information**

This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency.

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

## Elements and Performance Criteria

### ELEMENT

### PERFORMANCE CRITERIA

- |  |   |
|--|---|
| <p><b>1. Coordinate wildfire investigation</b></p>       | <p>1.1 Roles and responsibilities of <b><i>support personnel</i></b> from the various <b><i>agencies</i></b> in a wildfire investigation are confirmed</p> <p>1.2 Cooperation of personnel from a range of agencies consistent with their designated roles and responsibilities for a wildfire investigation is achieved</p> <p>1.3 Information required by fire investigator from personnel from other agencies is identified, sought and received</p> <p>1.4 Activities of all personnel involved are coordinated to enable an efficient and effective investigation</p> <p>1.5 Protective clothing and equipment are used in accordance with agency procedures</p> <p>1.6 Occupational health and safety procedures appropriate to the incident are followed</p> |
| <p><b>2. Secure fire scene and preserve evidence</b></p> | <p>2.1 Legal obligations of fire investigators are adhered to throughout the investigation</p> <p>2.2 Methods of scene security prior to examination are implemented</p> <p>2.3 Procedures to monitor and log access to a wildfire scene are established and applied</p> <p>2.4 Strategies for locating, <b><i>collecting</i></b> and processing evidence are implemented</p> <p>2.5 Methods of preservation of evidence at a wildfire scene are implemented</p> <p>2.6 Scene is protected from unnecessary damage, destruction or contamination</p>  |
| <p><b>3. Conduct scene investigation</b></p>             | <p>3.1 Investigation activities are coordinated with the Incident Controller, when active fire management operations are still occurring in relation to the incident</p> <p>3.2 Fire incident information, data and records are collected and assessed</p>  |

- 3.3 **Witness** information and other related information is obtained in accordance with jurisdictional requirements
  - 3.4 Survey of scene is conducted to identify hazards and to preserve areas or items of evidential value
  - 3.5 Effect of fuels, weather and topography on wildfire development and spread are identified
  - 3.6 Effects of firefighting actions on fire scene and investigation are assessed
  - 3.7 Scene is reviewed to determine areas of interest and to record observation of factors which may have a bearing on the determination of the origin, cause or development of a wildfire
  - 3.8 Physical indicators relating to the path of fire travel or development of the wildfire are identified, assessed and recorded
  - 3.9 Indicators of damage or destruction of assets caused by wildfire are identified
  - 3.10 **Origin and cause determination** options are developed and assessed using a scientific method
  - 3.11 Cause of the fire, based on recognised cause categories, is determined by wildfire investigation
4. **Identify and collect evidence to investigate a wildfire**
    - 4.1 Control, comparison and residual samples are identified and extracted according to agency requirements
    - 4.2 Samples are protected to avoid contamination and to ensure continuity of evidence
    - 4.3 Samples are recorded, collected packaged and secured in accordance with continuity of evidence protocols and procedures
    - 4.4 Procedures for capturing **fire scene records** are implemented
    - 4.5 Forensic and physical evidence is interpreted
    - 4.6 Agency and legal reports and requirements are implemented
5. **Analyse information to determine origin and cause of fire**
    - 5.1 Collected information and evidence is analysed and interpreted
    - 5.2 Findings are reported and documented according to required practice and agency policy
    - 5.3 Evidence is secured for subsequent action
    - 5.4 Wildfire investigation report is completed and forwarded to appropriate authorities/stakeholders

## Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

### Required Skills

- apply methods and techniques to collect, handle and store evidence
- apply scientific method to wildfire investigation
- conduct a scene assessment
- conduct witness interviews
- identify, document and preserve physical evidence
- identify potential ignition sources and follow processes for elimination of cause
- package, label and store evidence for transport
- present evidence
- preserve evidence to avoid damage (spoliation) or contamination
- record information appropriately and accurately
- take notes to support the recording of information
- use equipment to collect, handle and store evidence
- write reports

### Required Knowledge

- common causes of wildfire:
  - camp fire
  - debris burning
  - electrical
  - equipment use
  - incendiary
  - juvenile
  - lightning
  - machinery
  - miscellaneous
  - power lines
  - rail
  - smoking
  - vehicles
- deliberate fire lighting motives and methodology
- determinants of fire cause
- evidence preservation
- fatal fire and crime scene management
- fire behaviour
- fire scene examination
- how to distinguish between accidental, negligent, deliberate and natural cause of fire
- how to optimise eye witness accounts from professional witnesses such as first

responders

- implications of insurance involvement
- indicators of fire cause
- indicators of fire spread
- interviewing protocols and their application
- legal definitions of interviews and statements
- matching of evidence to point of proof and offence provisions
- methods for recording documentary and witness evidence, and their application
- note taking processes and procedures
- principles of investigation based on scientific method
- principles of wildfire spread
- procedures for collection of physical evidence i.e. handling and packaging
- procedures for recording of physical evidence i.e. photographs, drawings, samples
- relevant legislation such as the Fire Service Act, Coroner's Act, Criminal Code and Evidence Act
- role of expert witnesses
- roles, responsibilities and limits of authority of personnel and agencies at a wildfire investigation
- rules of evidence including identification, collection, continuity, and admissibility
- scene preservation and security
- standard operating procedures for conducting investigations
- use of deductive evidence to determine point of origin

## Evidence Guide

### Critical aspects of assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to:

- identify area/point of origin and suspected cause of fire
- apply relevant laws, legislation, codes of practice and standards to fire investigation
- apply a systematic approach to the examination of wildfire scenes based on scientific method
- interpret and analyse forensic data and physical evidence
- conduct interviews appropriately and accurately record information.

### Consistency in performance

Competency should be demonstrated over time and across a range of workplace and/or simulated situations.

### Context of and specific resources for assessment

#### Context of assessment

Competency should be assessed in the workplace and in a simulated workplace environment.

#### Specific resources for assessment

Access is required to:

- legislation, policy, procedures and protocols relating to gathering and managing evidence
- case studies and workplace scenarios to capture the range of offences likely to occur for which evidence needs to be gathered and managed.

### Guidance information for assessment

Assessment methods suitable for valid and reliable assessment of this unit may include a combination of:

- case studies
- demonstration
- observation
- questioning
- scenarios
- authenticated evidence from the workplace.



## Range Statement

<p>The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. <b><i>Bold italicised</i></b> wording in the Performance Criteria is detailed below.</p>	
<p><b><i>Support personnel</i></b> may include:</p>	<ul style="list-style-type: none"> <li>• Government and private forensic chemists</li> <li>• Insurance investigators and assessors</li> <li>• Statutory bodies</li> <li>• Technical specialists (e.g. fire behaviour, meteorological experts)</li> </ul>
<p><b><i>Agencies</i></b> may include:</p>	<ul style="list-style-type: none"> <li>• Coronial services</li> <li>• Electrical authorities</li> <li>• Fire services</li> <li>• Gas authorities</li> <li>• Insurance investigators and assessors</li> <li>• Land management agencies</li> <li>• Other statutory authorities</li> <li>• Police</li> <li>• State/territory forensic services</li> </ul>
<p><b><i>Evidence collection</i></b> may include:</p>	<ul style="list-style-type: none"> <li>• Admissibility</li> <li>• Collection and preservation</li> <li>• Continuity</li> <li>• Identification</li> </ul>
<p><b><i>Witnesses</i></b> may include:</p>	<ul style="list-style-type: none"> <li>• Emergency services personnel</li> <li>• Members of statutory agencies</li> <li>• Members of the public</li> <li>• Property owners/occupants</li> </ul>
<p><b><i>Origin and cause determination</i></b> must include:</p>	<ul style="list-style-type: none"> <li>• Burn indicators:             <ul style="list-style-type: none"> <li>• advancing/head fire</li> <li>• backing/heel fire</li> <li>• lateral/flanking fire</li> </ul> </li> <li>• grass stem indicators</li> <li>• protection indicators</li> <li>• transition zone</li> <li>• damage differential indicators</li> <li>• foliage/leaf freeze indicators</li> <li>• angle of char indicators</li> <li>• depth of char indicators</li> <li>• ash indicators</li> <li>• cupping indicators</li> <li>• curling indicators</li> </ul>

	<ul style="list-style-type: none"> <li>• die-out pattern indicators</li> <li>• sooting indicators</li> <li>• staining indicators</li> <li>• V-Pattern indicators</li> <li>• Identification of ignition sources</li> <li>• Scene observation and interpretation</li> <li>• Scene processing</li> <li>• Wildfire behaviour factors (weather, fuel load and topography)</li> <li>• Wildfire spread</li> </ul>
<i>Fire scene records</i> may include:	<ul style="list-style-type: none"> <li>• Audio</li> <li>• Maps</li> <li>• Meteorological records</li> <li>• Notes</li> <li>• Photography (thermal, digital, multimedia, closed circuit television [CCTV], other media images)</li> <li>• Sketches and plans</li> </ul>

## Unit Sector(s)

Not applicable.