

## APPENDIX D – ELEMENTS OF A BUSHFIRE

The shape of a bushfire is defined by the fire's perimeter, which is the outside edge of the burnt area. Within the perimeter there can be burning areas, smouldering areas and blackened areas, as well as pockets of unburnt fuel. There will also be a point of origin, which might or might not be identifiable without detailed investigation. As Figure D.1 shows, the following are parts of a bushfire:

- the head
- the flanks or sides
- fingers or tongues
- the rear or heel—sometimes referred to as the back
- spot fires ahead of the main fire
- unburnt pockets or islands
- the point of origin.<sup>1</sup>

Figure D.1 Parts of a bushfire



Source: Exhibit 269 – Statement of Russell, Annexure 1.<sup>2</sup>

The head of a fire—also called the firefront—is where the fire is making greatest progress (usually downwind), as measured by its forward rate of spread. Flames are tallest and the intensity of the fire is greatest at this point. The head of the fire is affected by wind direction, fuel and topography and can change as these factors change.<sup>3</sup>

The sides of the fire between the head and the rear are called the flanks. They are roughly parallel to the main direction of spread. The intensity of the fire on the flanks is less than at the head. The flanks are described by their geographic location (for example, the eastern or western flank) or by their orientation as viewed from the point of origin or the rear of the fire (for example, the left or right flank).<sup>4</sup> A wind change can result in the flank of a fire becoming the head. Many of the fires that burned on 7 February 2009 developed north-east and south-west flanks under the influence of a north-westerly wind, but after the south-westerly wind change the north-easterly flanks became the heads of the fires.

Fingers are long, narrow slivers of advancing fire. They can extend beyond the head or flanks and are caused by varying wind direction or variations in fuel or topography.<sup>5</sup> Fingers are also referred to as tongues.

The rear, or heel, is the section of the perimeter opposite to and usually upwind of the head of a fire. It is the least intense part of the fire's perimeter, having the lowest flames and the slowest rate of spread. It can be described as the back of the fire.<sup>6</sup>

The point of origin is where the fire started.<sup>7</sup>

Spot fires are new fires that occur ahead of the main fire. They are usually started by embers which are wind-borne pieces of burning bark and other materials.<sup>8</sup>

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- 1 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0041–0042
  - 2 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0041–0042
  - 3 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0041–0042
  - 4 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0041–0042
  - 5 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0041–0042
  - 6 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0041–0042
  - 7 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0041–0042
  - 8 Exhibit 142 – National Inquiry on Bushfire Mitigation and Management (TEN.049.001.0001) at 0440

