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High-Definition X-ray Fluorescence Elemental Mapping of a Early Tudor Portrait of Henry VIII

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A Tudor portrait of Henry VIII on oak dating from 1540s is currently undergoing conservation treatment. This treatment includes the removal of restoration paint layers applied prior to its acquisition by the Art Gallery of New South Wales. Conventional imaging techniques, x-radiography, infrared reflectography and ultraviolet fluorescence suggested damages underneath the restorations. These include a break in the panel through the centre, the addition of an extra panel piece along the right edge and extensive overpaint by previous restorers. The addition of balsa wood strips to the verso of the panel using a wax and chalk adhesive caused significant interference in the conventional x-radiograph image.

High-definition XRF elemental mapping of the painting produced images of the distribution of original and non-original paint layers across the painting. Original and non-original paints were distinguished through historical studies of known pigments from the 16th century such as bone black, natural chalk vermillion, copper-based greens and blues, gold leaf, lead white and iron-based earth colours against those manufactured later, such as chrome greens.

The elemental maps are proving invaluable guides in the removal of restoration materials and the retrieval of original details previously obscured, and is providing unique insight into the making of the painting and suggests that miniature and manuscript illumination may have been important technical sources for the artist.

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