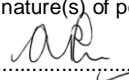




## Imagery Analysis Report

<b>LGC Reference No:</b> LGC-1105499-IMG-01
<b>Client Reference:</b> m_bok.jpg
<b>Client:</b> Expressen
<b>Contact:</b> Christian Holmen

<b>Number of Pages (Including Cover): 14</b>
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<b>EXHIBIT LABEL</b>
Laboratory Report Exhibit No: <b>LGC/11005499/AL1</b>
Description of Article:  <b>Imagery Analysis Report</b>
Reported by... <b>Andrew Philip Laws</b> ..... Signature(s) of person(s) identifying 1.  ..... 2..... 3..... 4.....
Court Use Only:
Court..... <b>Case</b> .....  Signature of Magistrate/Justice of the Peace/Clerk of the Court  Date.....

## Executive Summary

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### Introduction

We have been provided with a single image presented as an insert to a larger image. The image in question is presented as a video still; which we understand is alleged to have been recorded on a VHS video over 20 years ago.

### Instructions

I have been instructed by Christian Holmen to provide an imagery interpretation report in order to determine whether or not the inset image in question has been manipulated in any way.

### Summation

The large image provided is clearly a construct from a number of individual sources, including images and graphics. The inset image in question is not in its original form; as a consequence, it is very difficult to make definitive judgments from the material. There are however, a number of things which can be said about the inset image with confidence:

It is not of the standard aspect ratio for VHS material, nor is it of the same pixel dimensions. If the image is from a VHS source then unless the image area has been significantly cropped, the source image contains four times the amount of detail.

Parts of the image have clearly been subject to masking.

A part of the image may have been subjected to cloning.

The presence of a male person in a highlighted area of the image is incongruous with the rest of the image content. It is not possible to be certain from the information currently to hand, but the dubious integrity of this material dictates that it should not be relied on.

### Conclusions

The inset image in question has been subjected to extensive manipulation. In some cases content has been obscured, and in others it may have been changed. I cannot say for certain, but it is my opinion that a male person may have been electronically "pasted" into the scene.

It is important to note that my conclusions should be viewed with caution as I have not had access to the original material.

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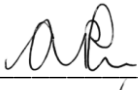
## Witness Statement

*(Criminal Procedure Rules, r. 27.2; Criminal Justice Act 1967, s. 9, Magistrates' Courts Act 1980, s.5B)*

**Statement of** Andrew Philip Laws  
**Age of Witness** Over 18  
**Occupation** Forensic Imagery Interpreter  
**Address** Digital and Document Forensics (Imagery/Audio)  
LGC Forensics  
Suite A3, Oakpark Business Centre, Alington Road  
Eynesbury, St Neots, Cambs, PE19 6WL

This statement, consisting of 1 page, signed by me, is true to the best of my knowledge and belief and I make it knowing that, if it is tendered in evidence, I shall be liable to prosecution if I have wilfully stated in it anything which I know to be false or do not believe to be true.

Dated 15<sup>th</sup> December 2011

Signed  \_\_\_\_\_

I am Andrew Philip Laws, Senior Forensic Imagery Interpreter and the Technical Adviser to LGC Forensics based in Cambridgeshire. I am an expert in Imagery Interpretation and Imagery Comparison and I have been requested to provide a statement. I have over 15 years experience of producing Imagery Analysis reports from all types of imagery, and have been instructed as an Expert in Imagery Interpretation and Comparison in over 150 cases a year for each of the last five years. Full details of my Experience and qualifications are given at Annex 1 of the exhibited report.

The results of the required analysis resulted in the production of the following exhibit:

Exhibit/Item Number	Description
LGC/11005499/AL1	Imagery Analysis Report

Signed  \_\_\_\_\_

## Forensic Analysis Report

### Information/Circumstances of Case

1. We have been provided with a single image presented as an insert to a larger image. The image in question is presented as a video still; which we understand is alleged to have been recorded on a VHS video over 20 years ago.

### Items Received

2. On 12<sup>th</sup> December 2011 a single .jpeg image [m\_bok] was received via email from Christian Holmen of Expressen.

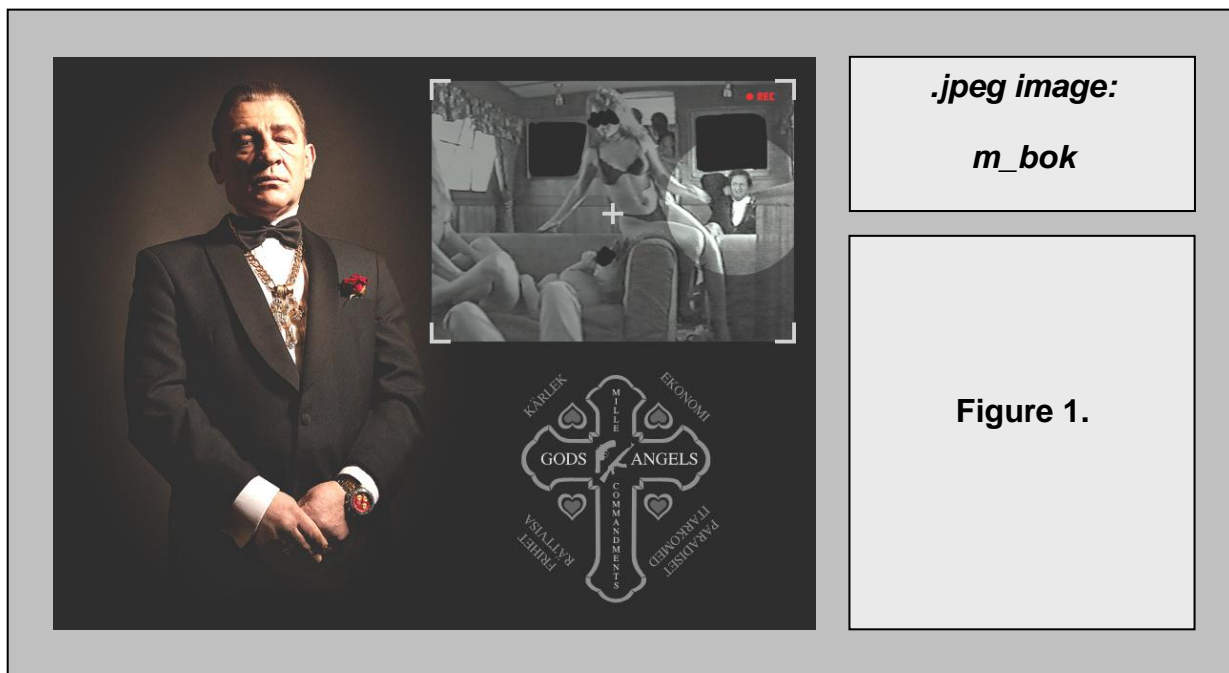
### Purpose of Examination

3. I have been instructed by Christian Holmen to provide an imagery interpretation report in order to determine whether or not the inset image in question has been manipulated in any way.

### Imagery Limitations

#### Incident Imagery

4. The single image provided in .jpeg format is quite clearly a composite image [Figure 1], in general it is of fair to good quality. The area of particular interest is a greyscale portion of the composite, with corner marks and a centre cross: this portion is of fair quality.



## Imagery Interpretation

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5. The image has been examined using Adobe Photoshop CS software. This industry-standard software allows the technical properties of constituent pixels of the image to be examined. It also allows the image to be examined on screen at maximum detail to provide the best appreciation of any changes by way of manipulation.

6. **Use of Assistants.** In this case I was assisted by other members of the Laboratory staff. Their involvement is described in the case file and I have taken their contributions into account when I prepared this report, which is countersigned by the assisting staff member/s.

**Task: Determine whether or not the inset image in question has been manipulated in any way.**

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## Technical Issues

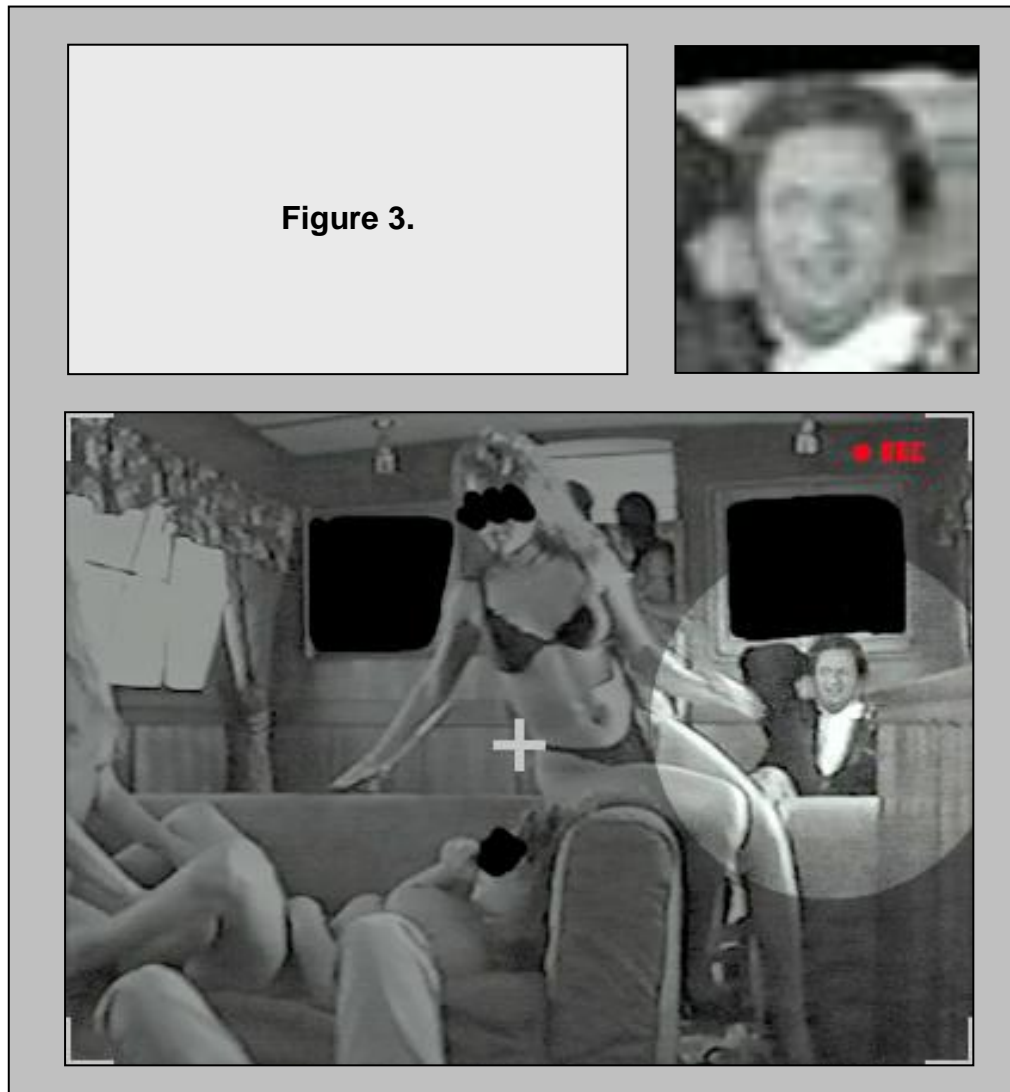
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### Aspect Ratio and Pixel Resolution

7. To examine the construction of the inset image, the relevant portion was cropped from the overall presentation [Figure 2]. The resultant image has pixel dimensions of 380 [horizontal] by 273 [vertical]. These dimensions give an aspect ratio of 1.39, as opposed to the standard VHS aspect ratio of 1.33. There are two explanations for this: either the image has been cropped and its aspect ratio altered, or it is not from a VHS video source.



8. The image dimensions of a standard VHS frame should be 768 [horizontal] by 576 [vertical]. These dimensions would provide approximately four times the pixel resolution as the inset image. If the inset image is from a VHS source, then considerable processing [down sampling] has taken place, probably reducing the level of detail significantly. This course of action would appear to be illogical if the intent of the image is to suggest the presence of a particular person, whose face could potentially be shown in much greater detail. It is possible that the inset image could be one quarter of a video still, but the content suggests that this is unlikely.



9. The frame markers at the corners of the image, the centre crosshair and the red "REC" [recording] annotation in the top right of the image have most likely been added to give the image the "feel" of a video still. It would not be usual for a red "REC" logo to appear on a greyscale recording. If a colour still had been rendered in greyscale then the "REC" annotation would also be rendered in greyscale.

10. These technical issues all strongly indicate that the image has been manipulated. Unless there are other factors outside my knowledge, they do not necessarily indicate that the image content is not genuine.

## Image Content

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### Masking

11. There are a number of areas where image content has clearly been masked. This masking can be conducted in a number of ways. In essence, the appearance of a selected area of the image is obscured to hide the original detail. Those areas that have clearly been subject to this process are delineated by red dotted boundaries at Figure 4 below.



**Figure 4.**

## Cloning

12. Cloning is a process where pixels from one part of an image can be replicated in another area. These replications can be relatively subtle pixel-for-pixel changes [often used in image restoration], or less subtle “brush” effects that effectively leave a signature appearance on the image. An area to image right of the woman sitting on the back of the sofa shows hallmark signs of cloning. The area which has been adjusted is shown at Figure 5 below with a red dotted outline. It should be noted that smoke could cause a similar appearance to this evidence of cloning; given the proximity of the area to the left hand I cannot discount a coincidence of this nature.



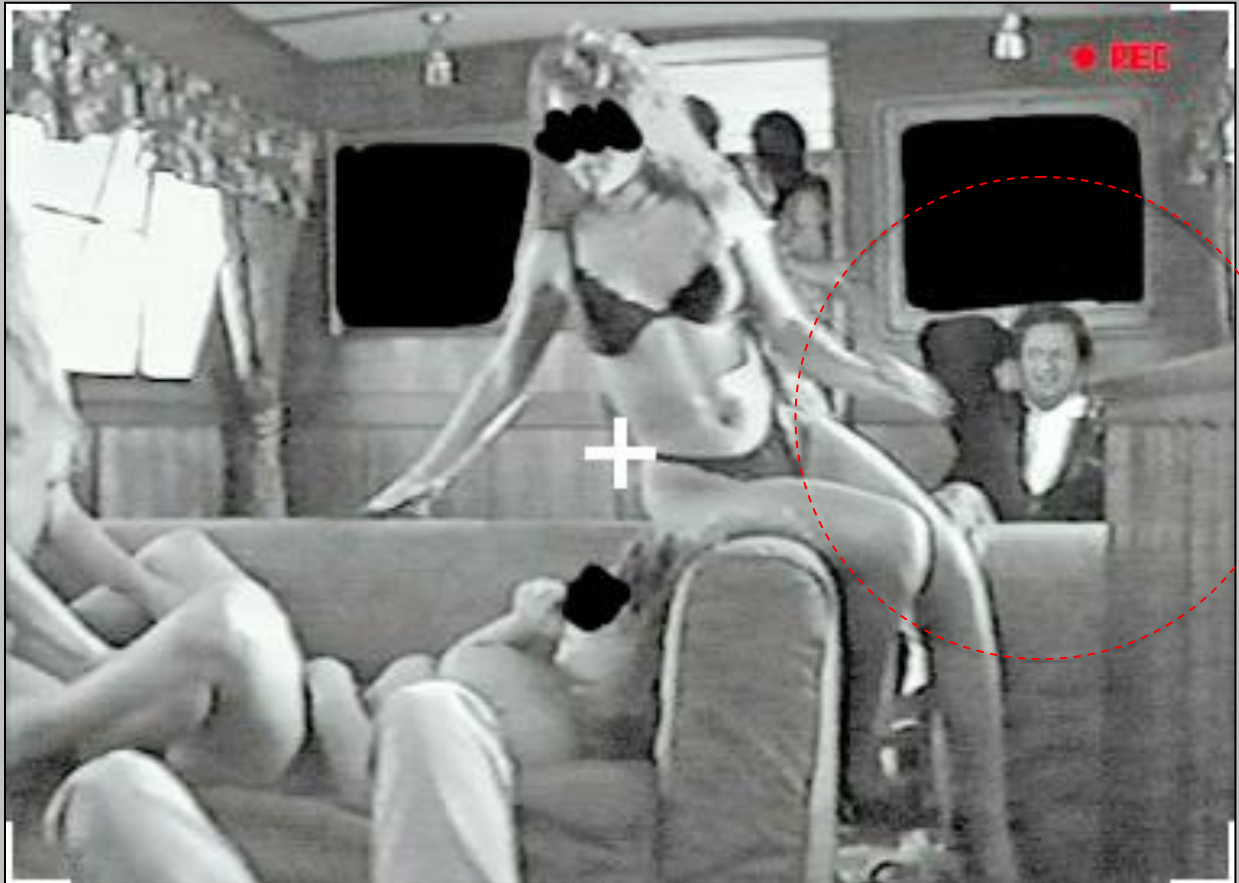
## Highlighting

13. A circular area of the image has been adjusted in terms of brightness/contrast, probably to draw the eye to a person within that area [Figure 6, red dotted oval]. Such adjustments to images are normally referred to as “highlights”. These features inherently involve some manipulation of the image, even if the integrity of the data within is preserved. This highlight may have been applied to the image before or after the masking that appears within it [Figure 6, yellow dotted lines].



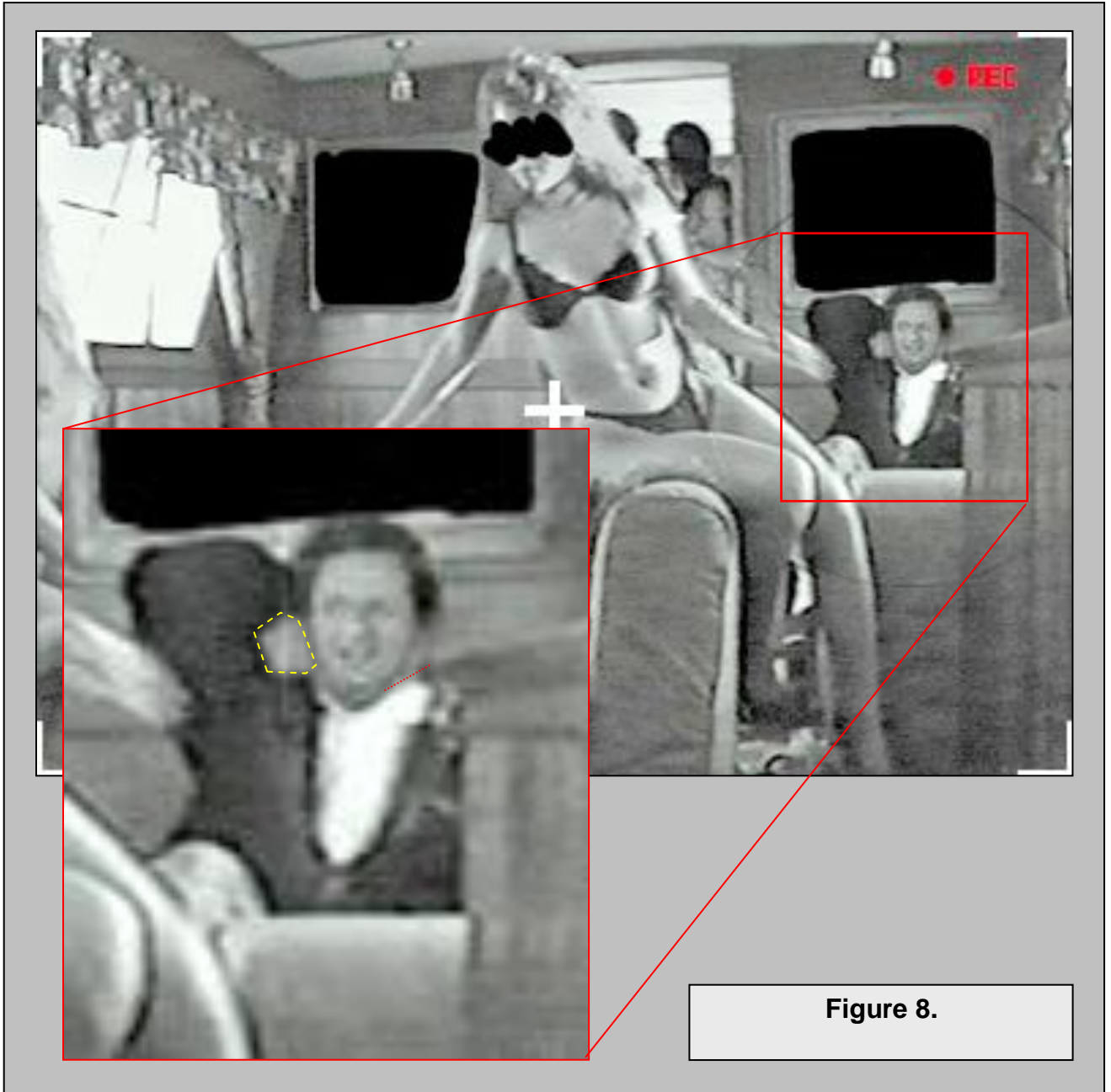
### Shadows and content

14. A male is depicted seated in the background of the scene, within the highlighted area. Figure 7 below has been adjusted to present the remainder of the image with brightness and contrast approximately equivalent to the highlighted area – still marked in red for clarity. This processing allows for a meaningful comparison of shadow and other lighting effects.



**Figure 7.**

15. Taking account of the shadows evident throughout the image, the appearance of the highlighted man is incongruous. The shadow from his nose appears to run to the image right, whereas it should run to the left. Further, given his apparent proximity to the wall, the area of wall created by the arm should also be in shadow [Figure 8, yellow dotted area]. It is, however, difficult to be certain, as within that depth of the image there is little information from which to judge.



## Summation and Conclusions

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### Summation

16. The large image provided is clearly a construct from a number of individual sources, including images and graphics. The inset image in question is not in its original form; as a consequence, it is very difficult to make definitive judgments from the material. There are however, a number of things which can be said about the inset image with confidence:

- a. It is not of the standard aspect ratio for VHS material, nor is it of the same pixel dimensions. If the image is from a VHS source then unless the image area has been significantly cropped, the source image contains four times the amount of detail.
- b. Parts of the image have clearly been subject to masking.
- c. A part of the image may have been subjected to cloning.
- d. The presence of a male person in a highlighted area of the image is incongruous with the rest of the image content. It is not possible to be certain from the information currently to hand, but the dubious integrity of this material dictates that it should not be relied on.

### Conclusions

17. The inset image in question has been subjected to extensive manipulation. In some cases content has been obscured, and in others it may have been changed. I cannot say for certain, but it is my opinion that a male person may have been electronically “pasted” into the scene.

18. It is important to note that my conclusions should be viewed with caution as I have not had access to the original material.



Andrew Philip Laws  
Forensic Imagery Interpreter

Assisted by:



Christopher Martin Clift  
Lead Investigator

## Annex 1

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### Details of Qualifications and Experience

#### Andrew Philip Laws MBE



During my years as an Imagery Interpreter I have given Expert evidence many times at Crown and Magistrates Courts. This evidence has included comparative interpretation on faces, clothing, weapons, vehicles, as well as mensuration, together with chronological reports, amongst others. This evidence is usually supported by specialist techniques such as photogrammetry, and stereoscopy.

Initially I was an Officer in the Royal Air Force (RAF) graduating from College in 1983 and then employed on Intelligence duties until attending the Joint School of Photographic Interpretation (JSPI) when I qualified as an Imagery Analyst (IA) in, December 1992. I was trained in all aspects of optical, infrared and radar imagery analysis and then qualified as a Strategic IA serving at the Joint Air Reconnaissance Intelligence Centre (JARIC). During this time I was detached to Bosnia where I served as the Chief Targeting and Reconnaissance Officer and was awarded a Commendation for Meritorious Service. In January 1995 I was appointed as the OC Imagery Interpretation, of a Jaguar Recce Sqn, spending six months of each year on deployment conducting imagery analysis of tactical reconnaissance imagery of Bosnia in support of NATO Operations. In August 1996 I was promoted as OC Recce Support Sqn at JARIC. This unit was responsible for providing support to defence procurement programmes as subject matter experts on imagery analysis and for the functional design of next generation imagery exploitation workstations.

In December 1998 I was appointed to the post of UK Chief of Targeting at the UK military HQ, where I was responsible for all UK target selection during NATO Operations throughout the Kosovo crisis in 1999, and for the production of daily reports on operational progress, primarily from imagery. Prior to retiring from the RAF in May 2001, I was employed at the RAF Air Warfare Centre as the Imagery Intelligence and Targeting instructor. On retirement I became involved as a contractor providing specialist imagery analysis support and advice to government departments conducting various surveillance activities.

In 2000 I was awarded the MBE for services to Imagery Intelligence.

In July 2002 I joined Kalagate in the position of Operations Director and Partner responsible for all Expert report production.

I am currently registered with the appropriate Expert Witness bodies and am a member of the Forensic Imagery Analysis Group, which is a sub-group within the British Association for Human Identification (BAHiD).

I have lectured to the National Criminal Intelligence Service, courses at the National Specialist Law Enforcement Centre, in addition to many varied military and law enforcement courses throughout the UK.

***End of Report***

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