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Relevant Reference	Area of Timbuktu, Mali
Request:	Forensic Video Analysis Comparison Analysis and Geolocation
Locations 1-7	Location 1) BMS Location 2) Place Sankoré Location 3) Petit Marché Location 4) Hôtel Azalaï Location 5) Gouvernorat Location 6) Hôtel Bouctou Location 7) Hôtel La Maison

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## **1. Introduction, Initial Information and Request**

In March 2020, at the time of this report, I am working as a Forensic Officer in the Forensic Science Section (FSS) of the Office of the Prosecutor (OTP) at the International Criminal Court (ICC). Part of my role in the FSS involves forensic video analysis.<sup>1</sup> I understand that my duty as a Forensic Officer and potential expert witness is to assist the ICC by providing impartial, objective, unbiased, and independent opinions uninfluenced by the requestor of services or any person who might be calling me as a potential witness. I have complied with and will continue to fulfil this duty to the best of my abilities.

On August 26th, 2019, I received a mission letter regarding a request for forensic video analysis (specifically geolocation) from Gilles Dutertre, Senior Trial Lawyer within the OTP of the ICC. Annexed to the mission letter was a list of multimedia files that needed to be examined and analysed for this analysis.<sup>2</sup> Mr. Dutertre also provided me with the priority designation for the locations 1 – 7 and this is how they are numbered in this report. They were as follows: 1) BMS,

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<sup>1</sup> Forensic video analysis is the scientific examination, comparison, and/or evaluation of video in legal matters.

<sup>2</sup> Annex 12: Mission letter.

2) Place Sankoré, 3) Petit Marché, and 4) Hôtel Azalaï, 5) Gouvernorat, 6) Hôtel Bouctou and 7) Hôtel La Maison.

On August 26th, 2019, I requested a copy of the original multimedia files listed in the Annex of the mission letter from the Information and Evidence Unit (IEU). On September 3rd, 2019, I received a removable hard drive containing the multimedia files for this request.

This report is intended to accompany Annexes 1-7, which contain the Microsoft Excel spreadsheet with technical information regarding the multimedia files and the Microsoft PowerPoint slides depicting the images examinations and the comparison analysis charts. All images depicted in Annexes 2-7 Microsoft PowerPoint slides are for illustrative purposes only and may not represent the full quality and detail of the original source multimedia. This report will outline the examination of the questioned digital multimedia evidence and will go on to document the steps taken in the comparison analysis<sup>3</sup> regarding the questioned and the known locations. A glossary of terms is provided in Annex 11.<sup>4</sup>

## 2. Technical Examination

This section of the report should be read in conjunction with Annex 1<sup>5</sup> and Annex 9,<sup>6</sup> which documents the relevant technical information of the multimedia files required for this examination.

I examined the removable hard drive provided to me by the IEU and found it to be in good physical condition. I plugged it into my computer and used the software “md5summer” and “FTK Imager” to generate hash values for the questioned files and the known imagery. I uploaded all video files and still images into the forensic video analysis software tool “Amped

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<sup>3</sup> Annex 8: Comparison Analysis Conclusion Scale and Definitions.

<sup>4</sup> Annex 11: Glossary of Terms.

<sup>5</sup> Annex 1: Technical Information of Multimedia Files\_MALI (Microsoft Excel Spreadsheet).

<sup>6</sup> Annex 9: Instructions and Forensic Video Analysis Tools.

FIVE". I thoroughly examined the metadata associated with each of the files using the file information, summary, EXIF, and "ffprobe" tools within the Amped FIVE software. The video files were first deinterlaced (if original coding was interlaced) according to the interlacing noted in the metadata information. For the requested image comparison analysis, it was also necessary to correct the video files for aspect ratio if there was a discrepancy between their storage aspect ratio (SAR) and the correct display aspect ratio (DAR). The video files were resized to the correct aspect ratio, if necessary, to ensure the shapes and sizes of the content were accurate for upcoming comparison analysis.

#### A. Location 1 - BMS

The following questioned video files labelled "BMS" Location 1 were examined for technical integrity: MLI-OTP-0018-0091, MLI-OTP-0018-0092, MLI-OTP-0018-0379, MLI-OTP-0041-0605, MLI-OTP-0012-1724, MLI-OTP-0012-1726, MLI-OTP-0018-0091, MLI-OTP-0018-0092, MLI-OTP-0018-0379, MLI-OTP-0018-0438, MLI-OTP-0041-0605, MLI-OTP-0041-0612.

The following questioned still image files labelled "BMS" Location 1 were examined for technical integrity: MLI-OTP-0001-7237, MLI-OTP-0001-7251, MLI-OTP-0001-7252, MLI-OTP-0001-7258, MLI-OTP-0001-7260, MLI-OTP-0001-7604, MLI-OTP-0001-7612, MLI-OTP-0060-0404, MLI-OTP-0060-0405, MLI-OTP-0060-0407.

Still images MLI-OTP-0001-7237, MLI-OTP-0001-7251, MLI-OTP-0001-7252, MLI-OTP-0001-7258, MLI-OTP-0001-7260, MLI-OTP-0001-7604, MLI-OTP-0001-7612 were all taken with a Canon EOS 5D Mark II camera and displayed the same resolution and format.

Still images MLI-OTP-0060-0404, MLI-OTP-0060-0405, MLI-OTP-0060-0407 also displayed the same properties to each other in terms of format and resolution, as illustrated in Annex 1. In addition, there was a [REDACTED].

Three of the video files (MLI-OTP-0018-0092, MLI-OTP-0018-0379, and MLI-OTP-0018-0438) displayed obvious editing of clips together which caused concern regarding the validity of the metadata information, (i.e. date modified, compression information-type of frames), which is modified if the files are transcoded or processed after original capture.

When examining the content of the video and still images, I did not see obvious areas where the content had been manipulated such as items being placed into the video that were not there in reality. The quality of the videos and still images was assessed and found to be of sufficient quality for image comparison analysis.

#### B. Location 2 - Place Sankoré

The following questioned video files labelled "Place Sankoré" Location 2 were examined for technical integrity: MLI-OTP-0001-6954, MLI-OTP-0018-0243, MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0247, MLI-OTP-0018-0248, MLI-OTP-0018-0251, MLI-OTP-0018-0252, MLI-OTP-0018-0253, MLI-OTP-0018-0254, MLI-OTP-0018-0255, MLI-OTP-0018-0256, MLI-OTP-0018-0286, MLI-OTP-0018-0291, MLI-OTP-0018-0292, MLI-OTP-0018-0408, and MLI-OTP-0039-0574.

The following videos were deinterlaced according to the information noted in the metadata of these files: MLI-OTP-0018-0243, MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0247, MLI-OTP-0018-0248, MLI-OTP-0018-0251, MLI-OTP-0018-0252, MLI-OTP-0018-0253, MLI-OTP-0018-0254, MLI-OTP-0018-0255, MLI-OTP-0018-0256, MLI-OTP-0018-0286, MLI-OTP-0018-0291, MLI-OTP-0018-0292. These files were also resized to correct the aspect ratio. MLI-OTP-0001-6954, MLI-OTP-0018-0408 and MLI-OTP-0039-0574 were progressive scan and, therefore, did not require deinterlacing and the aspect ratio was correctly displayed.

MLI-OTP-0018-0243, MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0247, MLI-OTP-0018-0248, MLI-OTP-0018-0251, MLI-OTP-0018-0252, MLI-OTP-0018-0253, MLI-OTP-0018-0254, MLI-OTP-0018-0255, MLI-OTP-0018-0256 are similar in technical elements, however all were edited to combine video clips except MLI-OTP-0018-0244 and MLI-OTP-0018-0245. MLI-OTP-0018-0286, MLI-OTP-0018-0291, and MLI-OTP-0018-0292 also displayed similar format, however the resolution was different, and the frame had black bars on the sides, which indicated that the video had been transcoded. The remaining two videos, MLI-OTP-0018-0408 and MLI-OTP-0039-0574, also had technical elements in common; for instance, both video files displayed at a 16:9 aspect ratio and were progressive scan. MLI-OTP-0039-0574 had been edited to combine multiple video clips.

Despite the fact that some of these videos had been edited to combine video clips, no obvious signs of content manipulation were observed in any of the questioned videos and all of the videos were of suitable quality for comparison analysis, as discussed in the comparison analysis section of this report.

### C. Location 3 - Petit Marché

The following questioned video files labelled "Petit Marché" Location 3 were examined for technical integrity: MLI-OTP-0018-0056, MLI-OTP-0018-0184, MLI-OTP-0018-0190, MLI-OTP-0018-0284, MLI-OTP-0018-0307, MLI-OTP-0018-0401, MLI-OTP-0018-0483, MLI-OTP-0018-0484, MLI-OTP-0018-0485, and MLI-OTP-0018-0744.

The following video files were deinterlaced according to the information noted in the metadata of these files: MLI-OTP-0018-0056, MLI-OTP-0018-0184, MLI-OTP-0018-0190, MLI-OTP-0018-0284, MLI-OTP-0018-0307, MLI-OTP-0018-0483, MLI-OTP-0018-0484, and MLI-OTP-0018-0485. These files were also resized to correct the aspect ratio. MLI-OTP-0018-0401 and MLI-OTP-0018-0744 were progressive scan and therefore did not require deinterlacing. The aspect ratio was correctly displayed.

MLI-OTP-0018-0056, MLI-OTP-0018-0190, MLI-OTP-0018-0307, MLI-OTP-0018-0056, MLI-OTP-0018-0483, MLI-OTP-0018-0484, and MLI-OTP-0018-0485 had all been edited to combine multiple video clips. When examining the content of the images, I did not see obvious areas where the content had been manipulated. The quality of the video files was assessed and found to be of sufficient quality for image comparison analysis.

D. Location 4 - Hôtel Azalaï and Location 6 - Hôtel Bouctou

The following questioned video files labelled "Hôtel Azalaï" Location 4 were examined for technical integrity: MLI-OTP-0012-1545, MLI-OTP-0012-1549, MLI-OTP-0018-0328, MLI-OTP-0018-0385, MLI-OTP-0018-0394, MLI-OTP-0018-0395, MLI-OTP-0018-0643, MLI-OTP-0018-0644, MLI-OTP-0018-0648, MLI-OTP-0018-0649, MLI-OTP-0018-0650, MLI-OTP-0018-0651, MLI-OTP-0018-0652, MLI-OTP-0018-0653, and MLI-OTP-0018-0658, MLI-OTP-0018-0661, MLI-OTP-0069-3577, MLI-OTP-0069-3578, MLI-OTP-0069-3579, MLI-OTP-0069-3580, MLI-OTP-0069-3581, MLI-OTP-0069-3646, MLI-OTP-0069-3649, and MLI-OTP-0069-3650.

The following questioned videos were duplicates: MLI-OTP-0069-3646 (same hash value as MLI-OTP-0069-3577), MLI-OTP-0069-3649 (same hash value as MLI-OTP-0069-3579), and MLI-OTP-0069-3650 (same hash value as MLI-OTP-0069-3580).

The following video files in Location 4 were deinterlaced according to the information noted in the metadata of these files: MLI-OTP-0012-1545, MLI-OTP-0012-1549, MLI-OTP-0018-0328, MLI-OTP-0018-0385, MLI-OTP-0018-0394, MLI-OTP-0018-0395, MLI-OTP-0069-3577, MLI-OTP-0069-3578, MLI-OTP-0069-3579, MLI-OTP-0069-3580, MLI-OTP-0069-3581. These files were also resized to correct the aspect ratio.

MLI-OTP-0018-0643, MLI-OTP-0018-0644, MLI-OTP-0018-0648, MLI-OTP-0018-0649, MLI-OTP-0018-0650, MLI-OTP-0018-0651, MLI-OTP-0018-0652, MLI-OTP-0018-0653, and MLI-OTP-0018-



0658, and MLI-OTP-0018-0661 were progressive scan and therefore did not require deinterlacing. The aspect ratio was correctly displayed.

Location 6: Hôtel Bouctou MLI-OTP-0012-1907 was a still image that appears to have been captured from a video file from Location 4, prior to deinterlacing.

I examined each of the videos for technical integrity. MLI-OTP-0018-0328, MLI-OTP-0018-0385, MLI-OTP-0018-0394, and MLI-OTP-0018-0295 had all been edited to combine multiple video clips. When examining the content of the images, I did not see obvious areas where the content had been manipulated. The quality of the video files were assessed and found to be of sufficient quality for image comparison analysis.

#### E. Location 5 – Gouvernorat

The following questioned video files labelled “Gouvernorat” Location 5 were examined for technical integrity: MLI-OTP-0069-3704, MLI-OTP-0069-3706, MLI-OTP-0069-3709, MLI-OTP-0069-3710, MLI-OTP-0069-3711, MLI-OTP-0069-3712, MLI-OTP-0069-3713, MLI-OTP-0069-3714, MLI-OTP-0069-3715, MLI-OTP-0069-3716, MLI-OTP-0069-3721, MLI-OTP-0069-3722, MLI-OTP-0069-3723, MLI-OTP-0069-3724, and MLI-OTP-0069-3767.

Each of these multimedia files were interlaced scanned and were therefore deinterlaced according to the information provided in the metadata information noted in Annex 1. They were correctly displayed and did not need the aspect ratio corrected. All of the files listed [REDACTED] [REDACTED] as the camera make and model. The files were all created or recorded between [REDACTED] however MLI-OTP-0069-3704, MLI-OTP-0069-3710, MLI-OTP-0069-3712, and MLI-OTP-0069-3714 all indicate that they were modified on [REDACTED]. These video files were all one consistent capture, without edit, rather than several video clips being edited together.

Also noted in the technical examination was the presence of GPS coordinates in the metadata information of four of the files, as noted in Annex 1. MLI-OTP-0069-3709 displayed the following GPS coordinates: Latitude 16° 46' 14.94 "N, Longitude 3° 0' 28.76" W. MLI-OTP-0069-3711 displayed the following GPS coordinates: Latitude 16° 46' 15.47" N, Longitude 3° 0' 28.76" W. MLI-OTP-0069-3713 displayed the following GPS coordinates: Latitude 16° 46' 15.49" N, Longitude 3° 0' 29.72" W. MLI-OTP-0069-3721 displayed the following GPS coordinates: Latitude 16° 46' 14.08" N, Longitude 3° 0' 29.13" W. MLI-OTP-0069-3723 displayed the following GPS coordinates: Latitude 16° 46' 15.49" N, Longitude 3° 0' 29.72" W. MLI-OTP-0069-3724 displayed the following GPS coordinates: Latitude 16° 46' 16.56" N, Longitude 3° 0' 29.17" W.

#### F. Location 7 – Hôtel La Maison

The following questioned still image files labelled "Hôtel La Maison" Location 7 were examined for technical integrity: MLI-OTP-0001-7369, MLI-OTP-0001-7382, and MLI-OTP-0001-7469.

The questioned still images were all consistent in metadata properties. The files state that they were each taken on [REDACTED]. The images were all taken using a [REDACTED] camera.

The following questioned video files labelled "Hôtel La Maison" Location 7 were also examined for technical integrity: MLI-OTP-0018-0102, MLI-OTP-0018-0249, and MLI-OTP-0018-0289. All three video files were interlaced scanned and were deinterlaced according to the information provided in the metadata information as indicated in Annex 1. MLI-OTP-0018-0102 and MLI-OTP-0018-0249 were resized to display at the correct aspect ratio. MLI-OTP-0018-0249 was edited to combine several different clips of video. MLI-OTP-0018-0289 also consisted of several video clips combine into one video file and appeared to have been transcoded to an incorrect 16:9 aspect ratio. Therefore, the video was cropped and resized to correctly display video.

### 3. Forensic Image Comparison

Forensic image comparison utilizes the same scientific methodology as other comparison sciences in the field of forensic science, including latent print, footwear and tire track examination. The scientific methodology is based on ACE-V(R) which stands for Analysis, Comparison, Evaluation, Verification and Report. Unlike some areas of forensic science where statistical databases exist (like forensic DNA typing), there is no empirical database for locations, structures, vehicles, people, etc. The role of the forensic video analyst is to assist the court in the understanding and interpretation of the technical elements of the multimedia and provide a qualitative image comparison analysis using scientific theory to mitigate potential biases. As a result, the work and experience of a qualified forensic video analyst allows the analyst to highlight similarities, differences and contrasting elements in the image but not necessarily to attribute absolute conclusions or identifications.

Once the technical assessment of the questioned videos was concluded, the forensic image comparison began. This process commenced with content examination of the questioned multimedia. The mission letter explained that a forensic image comparison was to be conducted regarding the locations viewed in the video and still image files. Therefore, this comparison analysis began by noting class characteristics of the structures, vegetation and other objects associated with the locations. Individualizing characteristics were noted (if available) that may further assist in identification of the location.

Class characteristics are elements visible within the image that are not unique to a particular item, object or location but place items and objects into general groups. Examples of class characteristics are the colour of a piece of clothing, make and model of a vehicle, and urban versus forested locations.

Individualizing characteristics are elements present in the image that can narrow down the item, object, or location to a specific, single source. Individualizing characteristics can be used in isolation or as a group of many characteristics by utilizing their relationship and proximity to each other.

The questioned videos and still images in all seven locations were compared and contrasted with and against each other in the attempt to determine whether the questioned multimedia was in fact depicting the same (or similar) location as the known multimedia.

The comparison analysis section of the report should be read in conjunction with Annexes 2-7 Microsoft PowerPoint slides.

#### A. Location 1 - BMS

##### *Questioned Multimedia Content Analysis*

This section of the report should be read in conjunction with Annex 2.<sup>7</sup>

##### **Interior Scenes**

Questioned Image: MLI-OTP-0001-7237

Analysis of the interior scenes began with an examination of questioned image MLI-OTP-0001-7237 content. Class and individualizing characteristics were noted including light coloured flooring and walls. There was a darker coloured item of furniture (possibly blue in colour) placed along the wall in view. There was damage and stain patterns noted on the wall and on the item of furniture [slide 3].

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<sup>7</sup> Annex 2 Location 1 Comparison Analysis Charts (PowerPoint Slides).

Questioned Image: MLI-OTP-0001-7251

MLI-OTP-0001-7251 appeared to be taken from the inside of a building, with a view through a window to the exterior. Class characteristics included a window grate covering the window that had a cross pattern with circle in the centre of the cross [slide 4]. Class characteristics of this window grate appeared similar to the class characteristics noted in the exterior views of the building in MLI-OTP-0012-1724 Frame 2366 [slide 26] and MLI-OTP-0012-1726 Frame 568 [slide 27].

Questioned Image: MLI-OTP-0001-7252

Class characteristics in this image included a wood-coloured and wood grain pattern door. The walls around the door were light in colour. Individualizing characteristics included damage spots on the wall and [REDACTED] on the door [slide 5].

Questioned Image: MLI-OTP-0001-7258

Class characteristics in this image included what appears to be a light-coloured wall. Individualizing characteristics included damage and stains on the wall. There was a large, dark-coloured stain that had what appeared to be drip marks [slide 6].

Questioned Image: MLI-OTP-0001-7260

Class characteristics in this image included a light-coloured wall with reflective moulding around a darker-coloured area (possibly a door). Individualizing characteristics included stains of a darker colour, damage to the wall, and writing or drawings on the wall [slide 7].

Questioned Image: MLI-OTP-0001-7604

Class characteristics in this image included a [REDACTED]  
[REDACTED]  
[REDACTED] [slide 8].

Questioned Image: MLI-OTP-0001-7612

Class characteristics in this image showed what appeared to be a [REDACTED]  
[REDACTED] There was what appeared to be [REDACTED] the image. Class characteristics of the book appeared to be similar to [REDACTED]  
[REDACTED] in the previous image MLI-OTP-0001-7604 [slide 9].

Questioned Video: MLI-OTP-0018-0091

Class characteristics in this video included a light-coloured wall and a dark-coloured chair. Individualizing characteristics included damage and stains on the wall [slide 10].

Questioned Video: MLI-OTP-0018-0092

Class characteristics included a light-coloured wall and [REDACTED]  
[REDACTED] Individualizing characteristics included damage and stains to the wall as well as a wood grain pattern on the desk [slide 11]. Class characteristics noted in this image were similar to those in MLI-OTP-0018-0091 [slide 48].

Questioned Video: MLI-OTP-0018-0379

Class characteristics in this video included light-coloured walls and what appeared to be a [REDACTED] on the right side of the frame. A [REDACTED] was also present in this scene. Individualizing characteristics included horizontal damage to the wall and marks on the wall showing various shapes [slide 12].

The interior scene of MLI-OTP-0018-0379 displayed similar class characteristics to Location 5 MLI-OTP-0069-3716 Frame 172 and MLI-OTP-0069-3710 Frame 698. The horizontal damage on the wall was also of similar shape [slide 49].

Questioned Video: MLI-OTP-0041-0605

Class characteristics in this video included light-coloured walls and doors with glass. Windows, a [REDACTED] were present in this room. [REDACTED]

[REDACTED] Individualizing characteristics consisted of damage to the wall near the window behind the desk [slide 13].

### Exterior Scenes

Questioned Video: MLI-OTP-0012-1724

Analysis of the exterior scenes began with a thorough examination of the class and individualizing characteristics visible in the questioned video MLI-OTP-0012-1724. A selection of class and individualizing characteristics were noted in slides 17 to 20. This is not an exhaustive list of characteristics.

Questioned Video: MLI-OTP-0012-1726

Analysis of class and individualizing characteristics in MLI-OTP-0012-1726 showed a similar location to MLI-OTP-0012-1724. A selection of class and individualizing characteristics was shown in slides 22 to 25.

Questioned Video: MLI-OTP-0018-0438

Examination of this video showed that this multimedia file contains several clips of videos edited together. Therefore, this video is not the original multimedia and the technical details, including the metadata information, may not be reliable as original technical information. For instance, the date modified information is likely the date the video clips were edited together and exported as one video and may or may not be the same as the date that the original video clips were recorded. However, the quality of the visual content information is sufficient for an image comparison; there does not appear to be any obvious content manipulation.

I analysed the video and noted many similar class and individualizing characteristics as in the two previously described videos [slide 29]. The sign is different in this video, but the signs were

mounted in a similar location on the exterior wall as observed in the previous videos. I have noted several individualizing characteristics that correspond with the characteristics from the previous questioned video files [slide 30]. The angle of the camera in this video does make comparison of individualizing characteristics difficult, particularly the damage and/or holes in the bricks of the centre columns; however, the shapes and layout of the bricks appear similar.

Questioned Video: MLI-OTP-0041-0612

Analysis determined that this file is a continuous recording and may be the original video file. Class and individualizing characteristics were noted in slides 32 and 33; however, the field of view and angle of the camera is fairly close to the exterior of this building. In order to compare the previous video files, I have cropped and displayed the image from MLI-OTP-0012-1724 next to an image from MLI-OTP-0041-0612 and used geometrical shapes to note, and to compare and contrast the class and individualizing characteristics [slide 34].

Each of the characteristics noted in MLI-OTP-0041-0612 appeared to be similar in shape, except the damage or stain denoted with the red box [slides 34 and 35]. The shape is different and there is a dark coloured circle or hole near the bottom right of the shape that is not viewed in MLI-OTP-0012-1724.

Questioned Images: MLI-OTP-0060-0404, MLI-OTP-0060-0405 and MLI-OTP-0060-0407

MLI-OTP-0060-0404 was consistent in technical elements to MLI-OTP-0060-0405 and to MLI-OTP-0060-0407. They each had a [REDACTED]

[REDACTED]. Metadata information supports the fact that these images were taken within minutes of each other, see Annex 1. MLI-OTP-0060-0404 displayed [REDACTED]

[REDACTED] as viewed in the MLI-OTP-0018-0438 video file. MLI-OTP-0060-0404's displayed [REDACTED]

[REDACTED] MLI-OTP-0060-0407 clearly displayed t [REDACTED]



Class and individualizing characteristics of MLI-OTP-0060-0405 were noted in slides 36 and 37. MLI-OTP-0012-1724 was placed next to MLI-OTP-0060-0404 [slide 38 and 39] as a reference to previously observed characteristics. It should be noted that in this comparison the damage or stain indicated with a green box does in fact have a similar shape in both images of this comparison analysis [slide 39].

Class and individualizing characteristics relating to MLI-OTP-0060-0405 were noted on slide 40 and the side-by-side comparison with MLI-OTP-0012-1724 was displayed on slide 41. Class and individualizing characteristics were noted on slide 43 for MLI-OTP-0060-0407 and the side-by-side comparison with MLI-OTP-0012-1724 were displayed on slide 44.

Questioned Video: MLI-OTP-0018-0379

In addition to the previously discussed interior scene viewed in MLI-OTP-0018-0379, this video also included an exterior scene with a building [slide 45]. Exterior building class characteristics included light-coloured brick pillars half-way up an exterior wall, painted arches that appeared to be mauve in colour, wall and balcony railings that appeared to be yellow or tan in colour, and a circular reflective object mounted on the exterior wall [slide 46]. Class characteristics noted in the video were clearly different and contrasted with the class characteristics noted in the other videos and still images in Location 1.

#### *Comparison Analysis of Questioned Multimedia with Known Multimedia*

Once the comparison analysis between the questioned multimedia was complete, the analysis proceeded to compare the questioned multimedia to the known multimedia (folders labelled "Panoramas", "Photographs" and "Drone Imagery Drone\_Site 13"). In addition to the provided known multimedia, I obtained satellite images of Timbuktu, Mali from FSS colleague [REDACTED] Associate Analyst (Geographic Information Systems). Assumptions were made on my part regarding the known multimedia, specifically the satellite images that were requested and my own location searches using Google Earth Pro. I was informed that other FSS staff

member(s) had travelled to Timbuktu in reference to the Situation in Mali; therefore, I had previous knowledge that the locations were likely located somewhere in the city of Timbuktu, Mali, and the names of the location folders also provided some indication of where the location may be within Timbuktu.

An example image from each of the known multimedia folders was presented on slides 51 to 53. Still images were captured from the drone video using Amped FIVE. It was explained to me that a technical examination of the known images was not necessary because the multimedia was captured by FSS staff members.

The comparison analysis between questioned and known multimedia focused on elements in the scene that appeared to be permanent. I chose to use these elements in the scene due to the potential length of time between the capture of the questioned and the known images. There were notable differences in the buildings between the questioned and the known images. One difference was that the ground level on the way to the front door is open under the awning of the first level in the questioned images. In the known drone video images and the panoramas, there was a wall enclosing this area, resulting in a cohesive wall from the first level balcony down to the ground floor. There were also differences in the fixtures on the exterior wall. The large sign and the existence of items mounted to the wall (possibly air conditioners or fans) also appeared to be different.

Different-coloured arrows are utilized to point out individualizing characteristics between questioned video MLI-OTP-0012-1724 and the known imagery [slides 55 to 57].

The comparison of MLI-OTP-0012-1726 and the known imagery can be viewed on slides 58 to 60. The comparison of MLI-OTP-0018-0438 and the known imagery can be viewed on slides 61 to 63. The comparison of MLI-OTP-0018-0612 and the known panorama images and the known photographs can be viewed on slides 64 and 65. The comparison of MLI-OTP-0060-0404 and the known imagery can be viewed on slides 66 and 67. I was unable to compare MLI-OTP-0060-

0404 with drone imagery due to the field of view. The drone imagery does not pan far enough to the left to capture the pillar that is captured in MLI-OTP-0060-0404.

A side-by side comparison of questioned still images MLI-OTP-0060-0405 and MLI-OTP-0060-0407 can be viewed on slide 68. A comparison analyses of MLI-OTP-0060-0405 can be viewed on slides 69 to 73 and analyses of MLI-OTP-0060-0407 to the known imagery can be viewed on slides 69 and 74.

*Comparison Analysis MLI-OTP-0060-4310 and Known Drone Video and Satellite Images*

The satellite image in slide 76 was one of several images provided to me by FSS staff member [REDACTED] Associate Analyst (Geographic Information Systems). The side-by-side comparison analysis of an image captured from MLI-OTP-0060-4310 Site 13 drone video with the satellite image, which was captured as the drone rose above the area can be viewed on slides 78 to 81.

When searching for the area of interest in Timbuktu satellite and Google Earth images, a distinctive triangular building was used as a location marker [slide 82]. Characteristics were noted with arrows, boxes and circles which depicted dark-coloured shapes, likely voids, chimneys, cut-outs or courtyards, and appeared to be elements of the building construction. The shapes and sizes of characteristics were utilized in the search and comparison analysis. For instance, the element noted with a blue arrow (left) in slide 79 appeared to be parallelogram in shape, the blue arrow (middle) showed a square and the blue arrow (right) noted a thin rectangle shaped element. Also noted is the relative spacing between each element, which were also consistent and similar, in both images.

The yellow box in slide 80 showed the large rectangular building with different shapes, likely due to various elevations in construction (possibly a centre courtyard, etc.). The green lines noted that buildings next to each other were not parallel. Rather, they were on an angle, in reference to each other. The orange lines highlighted one side of the triangular building and

what appeared to be a wall that extended after an opening into a possible courtyard area in line with the exterior, triangular wall of the building.

The red ovals in slides 79 and 80 denoted contrasting areas between the two images. In slide 79, in the right-side of the satellite image, there was a closed area of buildings and, in the left drone image, the building appeared to be open without a roof. In slide 80, the “L” shaped building in the right satellite image could not be viewed in the left drone image. Images are also shown without annotations for reference [slide 81]

The triangular building located in satellite images is located at latitude 16.774908° and longitude -3.010078° [slide 82].

## B. Location 2 - Place Sankoré

### *Questioned Multimedia Content Analysis*

This section of the report should be read in conjunction with Annex 3.<sup>8</sup>

#### Questioned Video: MLI-OTP-0018-0243

The analysis of MLI-OTP-0018-0243 noted several class characteristics relating to the buildings viewed in the background. The building shapes, railing and brick shapes and colours, pillars, electrical wires are all class characteristics noted in this questioned video [slide 3].

#### Questioned Video: MLI-OTP-0018-0244

The analysis of MLI-OTP-0018-0244 noted several class characteristics related to the buildings and structures viewed in the background. Slides 4 and 5 list these characteristics including the shapes of the buildings, the location of electrical poles, and the presence of electrical wires.

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<sup>8</sup> Annex 3 Location 2 Comparison Analysis Charts (PowerPoint Slides)

Questioned Video: MLI-OTP-0018-0245

The analysis of MLI-OTP-0018-0245 noted a similar open area with sand on the ground, to MLI-OTP-0018-0244, see slides 6 and 7. Class characteristics included building shapes, fence shapes, electrical poles and wires.

Questioned Video: MLI-OTP-0018-0246

The analysis of MLI-OTP-0018-0246 noted background class characteristics of building shapes, and electrical poles and wires, see slides 8 and 9.

Questioned Video: MLI-OTP-0018-0247

A similar scene was observed in questioned video MLI-OTP-0018-0247; including the appearance [REDACTED] the building shapes in the background. This video appeared [REDACTED] as MLI-OTP-0018-0246 [slides 9 and 10].

Questioned Videos: MLI-OTP-0018-0248, MLI-OTP-0018-0251, MLI-OTP-0018-0252 and MLI-OTP-0018-0253

The analysis of MLI-OTP-0018-0248, MLI-OTP-0018-0251, MLI-OTP-0018-0252 and MLI-OTP-0018-0253 noted similar class characteristics related to building shapes, electrical poles, wires, vegetation and various structures [REDACTED] [slides 11 to 18]. These locations included (a) road(s) that appeared to be paved along with sandy open areas.

Questioned Video: MLI-OTP-0018-0254

This video depicted a [REDACTED]. Class characteristics of the building included shapes of bricks, various colours and tonalities, shapes and patterns of doors and window coverings [slide 19 and 20].

Questioned Video: MLI-OTP-0018-0255

Limited class characteristics of the area can be viewed in this video due to the tight field of view. Class characteristics included building and brick shapes and electrical wires [slide 21].

Questioned Video: MLI-OTP-0018-0256

Class characteristics observed in this video appeared similar to those in previously described videos including the wide, open sandy area, the shapes of buildings in the background and the electrical poles and wires [slide 22].

Questioned Video: MLI-OTP-0018-0286

Background class characteristics including the building shapes, the triangular structure, electrical poles and electrical wires could be viewed in slides 23 and 24. Also observed was the wide-open area with sand underfoot, [REDACTED] similar to previously viewed characteristics in MLI-OTP-0018-0246 and MLI-OTP-0018-0247 [slides 8 to 10].

Questioned Video: MLI-OTP-0018-0291

Class characteristics observed in this video included the shapes of buildings, electrical poles and wires, and what appeared to be a paved road with sandy areas on either side [slide 25]. Class characteristics appeared similar to those of MLI-OTP-0018-0253 [slide 16].

Questioned Video: MLI-OTP-0018-0292

Class characteristics observed in this video included the shapes of buildings, the lack of bricks in the walls of the building in the foreground, pole structures, and doors [slide 26].

Questioned Video: MLI-OTP-0018-0408

Class characteristics observed in this video including the building shapes, signs, fencing, electrical poles and electrical wires were noted [slides 27 and 28].

Questioned Video: MLI-OTP-0039-0574

Class characteristics of the building shown in the background of this video included brick shapes, railings and the overall shape of the building. Slide 29 showed similar class characteristics to the open area and sand underfoot, as noted previously in MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0247, MLI-OTP-0018-0248, MLI-OTP-0018-0252, MLI-OTP-0018-0256, and MLI-OTP-0018-0286. Additional class characteristics noted were building shapes, railings, and a distinctive, large, triangular structure [slide 29]. It should be noted that this video was edited to combine several different video clips. Building, bricks and other class and individualizing characteristics were noted in a later clip of the video that appeared similar to those in Location 1 [slides 32 and 33].

Questioned Video: MLI-OTP-0001-6954

MLI-OTP-0001-6954 is a [REDACTED]  
[REDACTED] Questioned video clips shown [REDACTED] appeared to be similar to the following: MLI-OTP-0039-0574, MLI-OTP-0018-0243, MLI-OTP-0018-0244, MLI-OTP-0018-0246, MLI-OTP-0018-0253, MLI-OTP-0018-0254, and MLI-OTP-0018-0286.

*Comparison Analysis of Questioned Multimedia with Questioned Multimedia*

Class and individualizing characteristics observed in questioned video MLI-OTP-0018-0243 were also noted in MLI-OTP-0018-0245, MLI-OTP-0018-0248, MLI-OTP-0018-0252 and MLI-OTP-0039-0574. See slides 35 to 38 for side by side comparison analyses.

Class and individualizing characteristics observed in questioned video MLI-OTP-0018-0247 were also noted in MLI-OTP-0018-0246 and MLI-OTP-0018-0286. See slides 39 and 40 for side by side comparison analyses. Individualizing characteristics observed included [REDACTED]  
[REDACTED] in the frame.

Class and individualizing characteristics of the buildings and vegetation in the background of MLI-OTP-0018-0248 were also observed in MLI-OTP-0018-0251 and MLI-OTP-0018-0252. See slides 41 and 42 for side by side comparison analyses.

Class characteristics of the distinctive triangular structure observed in MLI-OTP-0018-0246 were also noted in MLI-OTP-0018-0286 and MLI-OTP-0039-0574. See slides 43 and 44 for side by side comparison analyses.

Class characteristics of the building and electrical poles and wires observed in MLI-OTP-0018-0256 were also noted in MLI-OTP-0018-0244. See slide 45 for side by side comparison analyses.

#### *Comparison Analysis of Questioned Multimedia with Known Multimedia*

Once the comparison analysis between the questioned items was completed, the analysis continued to compare the questioned multimedia to the known multimedia (folders labelled "Panoramas" and "Drone Imagery Drone\_Site 18"). Slide 47 showed one of the known panorama images that appeared to have similar class characteristics to the questioned videos in MLI-OTP-0018-0243, MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0247, MLI-OTP-0018-0248, MLI-OTP-0018-0251, MLI-OTP-0018-0252, MLI-OTP-0018-0253, MLI-OTP-0018-0256, MLI-OTP-0018-0286, MLI-OTP-0018-0291, and MLI-OTP-0039-0574 with a wide-open area, similar buildings and structures, electrical poles and wires, and sand underfoot. When analysing and comparing the video locations related to Location 2, the same assumptions were made as described during comparison analysis of Location 1.

A side-by-side comparison analyses with the known panorama images was shown on slides 49 to 56. The comparison analyses highlighted similar class and individualizing characteristics using different-coloured arrows, boxes, and circles. The comparison analysis between MLI-OTP-0039-0574 Frame 24334 and Location 1 known photograph MLI-OTP-0006-1441 can be viewed on slide 57. Similar individualizing characteristics noted in the Location 1 comparison analysis were also noted in this comparison analysis.



Some notable features outlined in the Location 2 comparison analyses were the relative proximity of electrical poles and wires, as well as building shapes and features (shutters, windows, railings, and pillars). The large triangular structure with dark-coloured circles was noted, along with what appeared to be a speaker mounted on the exterior façade [slides 52 and 56]. Another tall structure with a half circle was noted along with similar structures surrounding it and electrical poles and wires [slide 53].

There were also contrasting items noted, most notably a triangular-shaped pillar-top that runs along the railing [slide 55 red box] present in the known multimedia. However, it was not observed in MLI-OTP-0039-0574.

The known multimedia content was searched to locate the class and individualizing characteristics that were noted in the questioned videos MLI-OTP-0018-0254, MLI-OTP-0018-0255, MLI-OTP-0018-0292, and MLI-OTP-0018-0408, however the search was unsuccessful and no comparison analysis was conducted.

#### *Comparison Analysis of Questioned Multimedia and Known Drone Video*

A side-by-side comparison analyses of the same still images captured from the questioned videos and the still images that were captured from the Site 18 drone video can be viewed on slides 63 to 67. Different-coloured arrows, boxes and circles were again used to highlight class and identifying characteristics.

#### *Comparison Analysis of Known Drone Video, Known Panorama Images, Satellite and Google Earth Pro Images*

The comparison analysis of the known panorama image and a still image captured from the known Site 18 drone video can be viewed on slide 69. A side-by-side comparison analysis of an image from the Site 18 drone video, previously compared to the still images taken from the questioned video, was then compared to known satellite images at latitude 16.776023° and

longitude -3.00521° and can be viewed on slides 70 and 71. The same known Site 18 drone video images were then compared with Google Earth Pro images at approximately latitude 16.776925° and longitude -3.005702° and can be viewed on slides 72 and 73.

### C. Location 3 - Petit Marché

#### *Questioned Multimedia Content Analysis*

This section of the report should be read in conjunction with Annex 4.<sup>9</sup>

#### Questioned Video: MLI-OTP-0018-0056

Class characteristics observed in this video included building shapes and colours, vegetation, electrical poles and wire locations, and what appeared to be a dirt road. This video showed the same building from different vantage points [slides 3 and 4].

#### Questioned Video: MLI-OTP-0018-0184

Class characteristics observed in this video included building shapes, metal grates or fences in various colours, electrical poles and wires, sand on the ground and bushes [slides 5 and 6]

#### Questioned Video: MLI-OTP-0018-0190

Class characteristics visible in this video included building shapes and colours, window shapes, electrical poles and wires [slides 7 to 10].

#### Questioned Video: MLI-OTP-0018-0284

Similar class characteristics as in Location 2 were visible in this questioned video which included building shapes, railings, sand on the ground, electrical poles and wires [slides 11 and 12].

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<sup>9</sup> Annex 4 Location 3 Comparison Analysis Charts (PowerPoint Slides)

Questioned Video: MLI-OTP-0018-0307

Class characteristics in this video included building, window and brick shapes. Class characteristics also include the vegetation and dirt on the ground [slide 13]. In addition, there was another building viewed with balcony and railings. This building appeared to be yellow in colour and had grey doors and pillars [slide 14].

Questioned Video: MLI-OTP-0018-0401 and Questioned Video: MLI-OTP-0018-0744

Class characteristics observed in both of these questioned videos included the building structures and colours, poles, and sand on the ground [slides 15, 16 and 22].

Questioned Videos: MLI-OTP-0018-0483, MLI-OTP-0018-0484 and MLI-OTP-0018-0485

Class characteristics observed in all three videos included a building with brick pillars, light-coloured walls, windows that open from the bottom, and light-coloured grate patterns [slides 17 and 18, 20 and 21].

MLI-OTP-0018-0484 video also panned to show different building shapes, signs, electrical poles and wires.

#### *Comparison Analysis of Questioned Multimedia with Questioned Multimedia*

A side-by-side comparison analysis between MLI-OTP-0018-0184 Frame 0 with MLI-OTP-0018-0190 Frame 792 can be viewed on slide 24. Several class characteristics are annotated using different-coloured arrows, boxes and circles.

A building and some vegetation were observed on the right side of MLI-OTP-0018-0190 Frame 792 [slide 24]. Similar class characteristics were visible in MLI-OTP-0018-0056 Frame 1155 which was compared with MLI-OTP-0018-0307 Frame 471. Several class characteristics were noted between these images including a square and circular item on the exterior wall annotated with a square and circle [slide 25]. Additional, similar characteristics including pillars, window shapes, signs, brick shapes, and the shape of the tree were also noted.

MLI-OTP-0018-0483, MLI-OTP-0018-0484, and MLI-OTP-0018-0485 showed similar class characteristics as was highlighted on slide 26 and 27. In fact, the same windows were open and closed in these video frames. Several characteristics were marked with circles, arrows and squares.

The comparison analysis between MLI-OTP-0018-0401 Frame 108 and MLI-OTP-0018-0744 Frame 95 can be viewed on slide 28. Only two class characteristics were highlighted with an oval and an arrow; however, the sign and logos, colour and tonality of the building, and the shapes of poles and structures were also in agreement.

*Comparison Analysis of Questioned Multimedia with Known Imagery*

A side-by-side comparison analysis of MLI-OTP-0018-0284 Frame 949 with Location 2 known panorama images MLI-4926 and MLI-4931 could be viewed on slide 35. Several class characteristics were highlighted using different-coloured arrows, boxes and circles. Class characteristics included the shapes of the structures, pipes protruding from the exterior wall of the building, electrical poles and wires. Two of the known panorama images were used to show the full length of the building and area.

The comparison analysis of MLI-OTP-0018-0307 Frame 795 and known panorama image MLI-3018 shows similar class characteristics including the light-coloured walls, the decorative protrusions (ovals), and shapes of railings and pillars on the balcony. In the known panorama MLI-3018 grates or fences were placed in front of the building so that the ground level was obscured. This is a difference that was noted with a red box when the panorama was compared to MLI-OTP-0018-0307 [slide 36].

The comparison analysis of MLI-OTP-0018-0184 Frame 0 and Location 3 known panorama image MLI-3006 can be viewed on slide 37. Several class characteristics were noted including electrical pole shapes and locations, overhead streetlights, electrical wires, building and

window shapes and sand on the ground. There were differing areas noted, as well, including the coloured signs and building structures in the left-side foreground highlighted with a red box.

MLI-OTP-0018-0056 Frame 1155 was compared to known panorama image MLI-3009 on slide 38 and to known panorama image MLI-3013 on slide 39. Several characteristics were highlighted including the electrical pole and streetlights, window shapes, railings and wall protrusions. There is a large tree that appeared to be of a similar size as that viewed in slide 38. Known panorama image MLI-3013 showed an angle of the building without the tree in view [slide 39]. The square pillar in the front middle of the building was noted in this image and annotated with an orange box.

MLI-OTP-0018-0056 Frame 747 shows a view of this building from the opposite angle and a comparison analysis with the known drone image from site 15 was conducted [slide 40]. The drone image showed the rear side of a building that had two tall central pillars and a railing with short pillars around the roof. The electrical poles and wires were also visible in the drone images in a similar position.

#### *Comparison Analysis of Known Panorama Images, Known Drone Video, and Google Earth Pro Images*

The comparison analysis between Location 3 known panorama image MLI-3002 and the still images captured at timestamp 01:55 of the known Site 15 drone video can be viewed on slide 42. Class characteristics noted are the shapes of the buildings, including the arched second floor of the building on the right in the panorama image. Additional class characteristics included similar colouring of signs and the exterior walls of buildings, as well as windows, pipes protruding from the exterior walls, and awnings.

The comparison analysis of the known Site 15 drone video and a Google Earth Pro still image captured at latitude 16.775857° and longitude -3.009324° can be viewed on slides 43 and 44.

#### D. Location 4 - Hôtel Azalaï and Location 6 - Hôtel Bouctou

##### *Questioned Multimedia Content Analysis*

This section of the report should be read in conjunction with Annex 5.<sup>10</sup>

MLI-OTP-0012-1545, MLI-OTP-0012-1549, MLI-OTP-0018-0385, MLI-OTP-0018-0394, MLI-OTP-0018-0395, MLI-OTP-0018-0643, MLI-OTP-0018-0644, MLI-OTP-0018-0648, MLI-OTP-0018-0649, MLI-OTP-0018-0650, MLI-OTP-0018-0651, MLI-OTP-0018-0652, MLI-OTP-0018-0653 and MLI-OTP-0018-0658, MLI-OTP-0018-0661, MLI-OTP-0069-3579, MLI-OTP-0069-3580, and MLI-OTP-0069-3581 all depicted what appeared to be a similar location [slides 3 to 7 and 9 to 32]. Class characteristics included an open area with sand on the ground, bushes and similarly coloured structures in the background. A fence with similar class characteristics was observed in MLI-OTP-0018-0394 [slides 10 and 11] and MLI-OTP-0069-3581 [slide 31 and 32]. A structure with light-coloured arches was noted in MLI-OTP-0018-0394, MLI-OTP-0018-0644, and MLI-OTP-0018-0648 [slides 12 and 13, 18 and 19].

Location 6 Hôtel Bouctou: MLI-OTP-0012-1907 was a still image that appeared to be similar to a still frame of video from Location 4 Hôtel Azalaï MLI-OTP-0012-1549-Frame 494. The individuals, buildings and vegetation are in the same positions and the interlacing lines are viewed in both images [slide 36].

##### *Comparison Analysis of Questioned Multimedia with Questioned Multimedia*

The comparison analysis of questioned videos MLI-OTP-0018-0644 and MLI-OTP-0018-0648 can be viewed on slide 37. Class characteristics noted in these images included a wall, sand on the ground in front of the wall and light-coloured arches behind the wall. Also present in both images was a truck with similar class characteristics parked in the same relative position.

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<sup>10</sup> Annex 5 Location 4 Comparison Analysis Charts (PowerPoint Slides)

In addition to similar light-coloured structure with arches, MLI-OTP-0018-0394, MLI-OTP-0018-0644, and MLI-OTP-0018-0648 also showed a square structure with a diagonal support to the left of the light-coloured structure with arches, indicated by yellow boxes in slide 38.

MLI-OTP-0069-3581 and MLI-OTP-0018-0394 showed similar class characteristics to each other regarding the fence pattern [slide 39].

In addition [REDACTED] another clip in MLI-OTP-0018-0385 Frame 350 showed similar class characteristics to Location 2 including building shapes, the road and the sand. A comparison was made to Location 2: MLI-OTP-0018-0385 and several class characteristics were shown on slide 40.

#### *Comparison Analysis of Questioned Multimedia with Known Imagery*

Comparison analyses showing the light-coloured structure with arches in MLI-OTP-0018-0644 and MLI-OTP-0018-0648 can be viewed on slides 42 and 43. The known panorama image appeared to be taken from inside the wall and showed a structure, a wall, sand on the ground and bushes. The questioned images appear to have been taken directly outside of the wall, with the structure (light coloured building) on the other side of the wall.

A comparison of the light-coloured structure with arches was also made with the known drone image from Site 17 which included two areas with rounded structures and possible light-coloured arches [purple ovals on slide 43].

The fence noted in MLI-OTP-0069-3581 and MLI-OTP-0018-0394 were compared with a known drone Site 17 image that also included a fence [slide 44]. The pattern of the fence was not uniform; wide rails were marked with a blue, yellow and black arrow and in between were thin rails at various distances. The distance between the thin rails and the wide rails differs creating a distinct pattern. I have used white lines to point out the thin rails and their pattern in reference to the wide rail.

The known satellite image at latitude 16.773821° and longitude -3.014276° appeared to be the same area referenced as Hotel Boutou on Google Earth Pro (located at latitude 16.775574° and longitude -3.014322°) [slides 45 and 46]. Round structures with a light-coloured exterior wall were noted in this area and the entire area was enclosed by what appeared to be a wall. Also noted were dark, contrasting, coloured dots within the exterior wall that appeared to be vegetation (perhaps bushes or trees). The dots appeared to be spaced in regular intervals. Vegetation of varying size outside the exterior wall was also visible [slide 46].

Comparison analysis of this area of questioned video MLI-OTP-0018-0644, the known panorama, and the satellite image can be viewed on slide 47. The vegetation located inside the exterior wall is highlighted with blue arrows on slide 48.

#### *Comparison Analysis Known Drone Video and Google Earth Pro Images*

A comparison analysis was conducted between the known drone Site 17 video and the known Google Earth Pro image at latitude 16.775574° and longitude -3.014322° [slide 49].

### E. Location 5 – Gouvernorat

#### *Questioned Multimedia Content Analysis*

This section of the report should be read in conjunction with Annex 6.<sup>11</sup>

#### **Interior Scenes**

Questioned Videos: MLI-OTP-0069-3704, MLI-OTP-0069-3710, MLI-OTP-0069-3712, MLI-OTP-0069-3714, MLI-OTP-0069-3716 and MLI-OTP-0069-3767

Class characteristics in these videos included light-coloured interior walls, [REDACTED] [slide 3, 6, 8, 10, 13, and 20].

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<sup>11</sup> Annex 6 Location 5 Comparison Analysis Charts (PowerPoint Slides).



Individualizing characteristics included damage to the wall, dark and light-coloured marks on the walls, and damage [REDACTED]

Questioned Video: MLI-OTP-0069-3715

Class characteristics in this video included an interior scene with an open door to what appears to be the immediate outside, light-coloured walls with an arch, and light-coloured flooring with a pattern (appeared to be linoleum flooring). [REDACTED] and an open door leading to another interior room were also visible [slides 11 and 12].

### **Exterior Scenes**

Questioned Video: MLI-OTP-0069-3706, MLI-OTP-0069-3709, MLI-OTP-0069-3711, MLI-OTP-0069-3713, MLI-OTP-0069-3721, MLI-OTP-0069-3722, and MLI-OTP-0069-3723

There were many class characteristics noted in these exterior scenes. They included a two-tone exterior wall, building shapes, the vegetation, electrical poles and wires, patterns on gates, the sign, and pipes protruding from the building wall [slides 4, 5, 7, 9, 14-16].

Questioned Video: MLI-OTP-0069-3724

Many class characteristics could be noted in this video. The video pans to provide the viewer with a wide field of view. This video appears to be taken from inside the exterior wall noted in the previous exterior scenes. Class characteristics included several different building shapes and colours, pillars and arches, doors and windows, balcony railings and pillars, vegetation, electrical poles wires, and towers [slides 17 to 19].

### *Comparison Analysis of Questioned Multimedia with Questioned Multimedia*

#### **Interior scenes**

MLI-OTP-0069-3715 showed a door leading into another interior room [slide 22]. A [REDACTED]  
[REDACTED] in MLI-OTP-0069-3767, which also showed an interior room with door to another interior room. The patterned,

light-coloured floor appeared similar to each other in both videos. The interior walls appeared to be of a similar colour and texture, as well [slide 23].

The interior rooms noted in MLI-OTP-0069-3704, MLI-OTP-0069-3710, MLI-OTP-0069-3712, MLI-OTP-0069-3714, MLI-OTP-0069-3716 and MLI-OTP-0069-3767 were each compared with one another [slides 24 to 28]. Class characteristics were in agreement in each of these videos. Individualizing characteristics including damage and marks on the walls were also noted in each of the videos.

MLI-OTP-0069-3716 was also compared to Location 1 MLI-OTP-0018-0379. Class and individualizing characteristics were also in agreement to this Location 1 questioned video. There was what appeared to be a similarly [REDACTED] Th [REDACTED] [REDACTED] and the damage to the wall were similar in size and shape [slide 29].

### **Exterior Scenes**

The building inside the exterior wall viewed in MLI-OTP-0069-3709 Frame 404 was compared to MLI-OTP-0069-3724 Frame 10. They had many class characteristics in common including the two-tone colours of the pillars, the arches, the balcony and railings, the circular reflective objects mounted to the wall and the vegetation [slide 31].

Location 1 MLI-OTP-0018-0379 Frame 5810 was also compared to MLI-OTP-0069-3709 and MLI-OTP-0069-3724. Similar class characteristics were noted in this video including the two-tone colours of the pillars, the circular reflective object on the wall, the balcony and railings and the vegetation. Pink or red-coloured flowers were noted in both MLI-OTP-0069-3724 and Location 1 MLI-OTP-0018-0379 [slide 32].

MLI-OTP-0069-3706, MLI-OTP-0069-3711, MLI-OTP-0069-3713, MLI-OTP-0069-3721, MLI-OTP-0069-3722, MLI-OTP-0069-3723 all showed a similar exterior scene. Class characteristics included the two-tone exterior wall, pointed pattern on the exterior wall, gates, tree branch

shape, electrical poles, wires and towers. There was a dark coloured vehicle with light coloured screen with a logo in the rear window, parked next to the same sign, observed in all of these videos [slides 33 to 36].

#### *Comparison Analysis of Questioned Multimedia with Known Imagery*

The known panorama images and the known drone Site 11 images were used in the comparison analysis of questioned videos to the known images of the exterior scenes. There were no known images to use for comparison analysis on the interior scenes.

MLI-OTP-0069-3706, MLI-OTP-0069-3709, MLI-OTP-0069-3711, and MLI-OTP-0069-3724 were compared to known panorama images MLI-1925, MLI-1929 and known drone Site 11 images. Class characteristics noted in the questioned media content analysis were also noted in the known images, including building shapes, pillars, varying colours, electrical poles, wires, and towers [slides 45 to 52].

Differences noted between these images included the reflective patterns on the gates, the shape of the gates, large trees, the sign and the exterior wall colours [slides 45 to 48].

#### *Comparison Analysis Known Panorama Images, Known Drone Video, and Google Earth Pro Images*

Four different approximate GPS coordinates were provided in the metadata of MLI-OTP-0069-3709, MLI-OTP-0069-3711, MLI-OTP-0069-3713, and MLI-OTP-0069-3724 [slides 54 to 57]. All four coordinates were plotted on the Google Earth Pro map on slide 58.

A comparison was then made from the known drone Site 11 image and the Google Earth Pro images at the different coordinates listed in the metadata [slide 59 and 60]. Class characteristics highlighted in these images included the shapes of the buildings and their relative proximity to each other.

F. Location 7 – Hôtel La Maison

*Questioned Multimedia Content Analysis*

This section of the report should be read in conjunction with Annex 7.<sup>12</sup>

Questioned Still Image: MLI-OTP-0001-7369 and MLI-OTP-0001-7382

Class characteristics of these images included an [REDACTED]  
[REDACTED] The class characteristics of the [REDACTED]  
[REDACTED] slides 3 and 4].

Questioned Still Image: MLI-OTP-0001-7469

Class characteristics of this image included [REDACTED] The class characteristics of this rug were different from the previous rug a [REDACTED] [slide 5].

Questioned Videos: MLI-OTP-0018-0102, MLI-OTP-0018-0249, and MLI-OTP-0018-0289

Class characteristics of these videos included an interior room without furniture. The walls were light in colour. A window with a [REDACTED]  
[REDACTED] slides 6 to 8].

*Comparison Analysis of Questioned Multimedia with Questioned Multimedia*

MLI-OTP-0018-0289 was compared with MLI-OTP-0001-7369 and MLI-OTP-0001-7381 questioned still images. The class characteristics of the rug in all three images appeared to be similar in colour and pattern [slide 10 and 11]. The rug noted in MLI-OTP-0001-7469 clearly showed a different pattern and could be excluded [slide 12].

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<sup>12</sup> Annex 7 Location 7 Comparison Analysis Charts (PowerPoint Slides)

## *Comparison Analysis of Questioned Multimedia with Known Imagery*

There was no known imagery for these interior locations.

### **4. Evaluation**

I found the quality of all of the images and videos suitable for conducting a forensic image comparison. The images showed many characteristics that could be utilized to assist in the potential identification of these locations. After the initial examination of the questioned images, comparisons were conducted between the questioned to questioned multimedia, meaning that the questioned multimedia was compared to each other first. In the next step, the questioned multimedia was compared with known multimedia (panorama images, still image and drone videos). Finally, both questioned and known multimedia were compared to known satellite and Google Earth Pro images (if available). A logical linear methodology was then utilized which posits that if Questioned Image A is similar to Questioned Image B, and Questioned Image A is similar to Known Image C, then all images (A, B and C) are similar.

#### **A. Location 1 - BMS**

##### **Interior scenes**

The interior scenes were difficult to compare due to limited characteristics within the frames. Known images were not provided for interior locations. However, the questioned interior scenes were compared to the other questioned interior scene multimedia.

MLI-OTP-0001-7251 depicted a window with what appeared to be a decorative grate in a cross pattern with a circle in the middle. The specific grate observed in this image showed three crosses covering two windowpanes. A similar grate pattern was shown on the exterior images in questioned videos MLI-OTP-0012-1724 and MLI-OTP-0012-1726. There were several windows in view, and the window grates varied in the number of crosses. MLI-OTP-0012-1724

showed a window with two windowpanes and a similar three-cross pattern above [REDACTED] on the exterior wall. There are likely several windows associated with this building that shared these class characteristics.

MLI-OTP-0018-0091 and MLI-OTP-0018-0092 depicted a similar interior scene in terms of wall and chair colour. Similar class and individualizing characteristics were noted in [REDACTED] and the existence of damage and stains on the wall [REDACTED]

MLI-OTP-0018-0379 also showed an interior scene. This scene included light-coloured walls, a dark-coloured chair with a [REDACTED] and horizontal damage marks on the wall behind the desk. These characteristics were similar and consistent with interior views observed in questioned videos MLI-OTP-0069-3716 and MLI-OTP-0069-3710 in Location 5.

#### **Exterior scenes**

MLI-OTP-0012-1724 and MLI-OTP-0012-1726 videos were the same in technical elements (codec, format, file extension, aspect ratio, etc.) and visual elements (lighting, colour balance, signage viewed on the exterior wall, brick shapes and damage, etc.). Examination of these elements did not develop any concerns about the integrity of the files; they were of sufficient quality for comparison analysis, and the videos were likely taken with the same or similar model of cameras, within a short time period, which was consistent with the metadata information. Comparison analysis between these videos also showed compelling evidence to support that these two locations were in fact the same [Annex 2, slides 15 to 25].

Questioned video MLI-OTP-0018-0438 showed a similar-style building with brick pillars as viewed in MLI-OTP-0012-1724 and MLI-OTP-0012-1726. The sign was different from the MLI-OTP-0012-1724 and MLI-OTP-0012-1726, and [REDACTED]. The comparison analysis showed similar individualizing characteristics

including the three round, dark circles on the exterior wall, the two light-coloured horizontal areas on the wall, and the round, dark-coloured circles in the brick pillar [Annex 2, slide 30]. The angle of the camera made it difficult to discern some of the brick shapes for the comparison with MLI-OTP-0012-1726.

Questioned video MLI-OTP-0041-0612 captured tighter field of view with close-ups of people in the foreground and a building and more people in the background. Class characteristics noted on the building façade in the background were similar to the previous class characteristics including protrusions (indicated with a blue oval in Annex 2, slides 32 to 34), the presence of damage or stain on the wall near the lower right corner of the sign, and shapes of bricks and dark-coloured circles noted in the wall [Annex 2, slide 34]. Due to the closer camera position, not as many characteristics were noted that could be compared; however, despite the angle of view, several characteristics were still in agreement.

As noted in the analysis section of this report, the shape indicated with a green box (see Annex 2, slides 32 and 33) appeared to be of a different shape than that noted in MLI-OTP-0012-1724 (image on the right) in Annex 2 slide 34 and 35 (denoted by a red box). There could be two reasons why these shapes may appear different in these two videos: the damage or stain may have been changed during the time that had passed between the two pictures or this was a different location. However, several other characteristics were similar, including the shapes of the bricks, the dark-coloured circles in the bricks (orange arrows) and their alignment with the dark circles on the exterior wall. Therefore, it was more likely that the damage or stain changed during the timeframe between video/image captures. There were also significant lighting and colour balance differences in these two images, which was viewed in the colours of the bricks and the walls. The light-coloured horizontal lines did not appear at all in MLI-OTP-0041-0612, likely due to the bright lighting conditions.

Questioned images MLI-OTP-0060-0404, MLI-OTP-0060-0405 and MLI-OTP-0060-0407 all showed a similar building façade as the previous videos including the brick pillars, the window

placement, the protrusions, the items mounted on the exterior of the wall and the damage to the wall and bricks as shown in Annex 2, slides 36, 40 and 42. T [REDACTED] [REDACTED] were different when compared with MLI-OTP-0012-1724. However, the damage or stains noted with green and yellow boxes were of similar shape [Annex 2, slide 39]. The lighting and colour balance were different in the comparison analysis with MLI-OTP-0012-1724 [Annex 2, slides 38, 39 and 41]. This difference was also noted in the colour of the wall and bricks. MLI-OTP-0060-0404 showed the light-coloured horizontal lines [Annex 2, slides 37 to 39] that were not observed in the previous video MLI-OTP-0041-0612.

MLI-OTP-0018-0379 video file was composed of clips edited together and the last clip of this video showed an outdoor scene that clearly presented a different building. Consequently, this building was excluded from being the same building viewed in the other videos labelled Location 1 [Annex 2, slides 45 and 46].

Annex 2 slides 55 to 74 showed the comparison analysis between the questioned and known images. The damage to the bricks, exterior wall and the relative positioning of characteristics are individualizing characteristics. Similar individualizing characteristics were noted between the questioned images, and then also noted in the known images.

Comparison analysis of the known drone images with the known satellite images highlighted several class characteristics including the shapes of buildings and similar relative positioning [Annex 2, slides 78 to 81]. The comparison analysis showed the logical progression from the questioned, to the known images, and finally to the known satellite image and Google Earth Pro image with GPS coordinates.

#### B. Location 2 - Place Sankoré

Questioned videos MLI-OTP-0018-0243, MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0247, MLI-OTP-0018-0248, MLI-OTP-0018-0251, MLI-OTP-0018-0252,



MLI-OTP-0018-0253, MLI-OTP-0018-0256, and MLI-OTP-0018-0286, MLI-OTP-0018-0291, and MLI-OTP-0039-0574 all appeared to depict a similar open area. There was sand on the ground and what appeared to be a paved dark-coloured road in several of these videos.

MLI-OTP-0018-0243, MLI-OTP-0018-0245, MLI-OTP-0018-0252, MLI-OTP-0018-0248, and MLI-OTP-0039-0574 all showed a similar building in the background and the characteristics of this building were used in the comparison analysis [Annex 3, slides 35 to 45].

MLI-OTP-0018-0246, MLI-OTP-0018-0247 and MLI-OTP-0018-0286 [REDACTED] [REDACTED] are in fact the same clip of video that has been edited into another video and transcoded [Annex 3, slide 40].

Annex 3 slides 49 to 56 showed the comparison analysis between the open areas noted in questioned images MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0253, MLI-OTP-0018-0286 and MLI-OTP-0039-0574 and the known Location 2 Panorama Images. The panorama images depicted a sandy open area surrounded by buildings and structures. Paved roads were visible on the sides of the open area. Class characteristics noted in the questioned videos corresponded to class characteristics described in the known panorama images. Analysing these questioned videos pieced together the various buildings and structures in the background as the field of view pans. Buildings and structures were similar in location and relative positioning.

One characteristic that was not viewed in MLI-OTP-0039-0574, highlighted with a red box in Annex 3 slide 55, was the triangular structure on top of the railing pillar. This could be explained by its removal during the time elapsed between questioned and known video capture or it could be a different location. The bricks on the right side of the building viewed on MLI-OTP-0039-0574 frame 2197 [slide 55] appeared to be two-toned. The same feature was not as pronounced in the known MLI-4932 panorama image below on the same slide. This difference could be explained by the lighting and reflection differences along with the angle of the camera.

Annex 3 slides 63 to 67 showed the comparison analysis between MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0253, and MLI-OTP-0039-0574 and the known Location 2 Site 18 drone video images. Several class characteristics were noted and were in agreement in these comparison analyses. The known Site 18 drone video was then compared to Google Earth Pro images at latitude 16.776925° and longitude -3.005702° and surrounding areas.

It should be noted that MLI-OTP-0039-0574, as previously discussed, was an edited video that combined several video clips. One of the video clips in MLI-OTP-0039-0574 appeared to be from a similar location to Location 1 and therefore a comparison analysis with the Location 1 known images was performed [Annex 3, slide 57].

Similar locations regarding MLI-OTP-0018-0254, MLI-OTP-0018-0255, MLI-OTP-0018-0292, and MLI-OTP-0018-0408 were not located and no comparison analysis was completed. These videos had a tighter field of view that made locating a similar area in the known images for comparison analysis difficult.

### C. Location 3 - Petit Marché

Comparison analysis of the questioned videos for Location 3 Petit Marché revealed three distinctive areas.

MLI-OTP-0018-0184 and MLI-OTP-0018-0190 appeared to be similar in class characteristics including similar electrical poles and wires, building shapes and relative locations of structures. The building and large tree observed on the right side of the frame in MLI-OTP-0018-0190 [Annex 4, slide 24] appeared to be similar to the building and the large tree observed in MLI-OTP-0018-0056 and MLI-OTP-0018-0307 [Annex 4, slide 25]. Electrical poles and wires noted in MLI-OTP-0018-0056 were also observed in MLI-OTP-0018-0190.

MLI-OTP-0018-0483, MLI-OTP-0018-0484, and MLI-OTP-0018-0485 all capture a similar building and dirt roadway. There are many class characteristics in agreement, as well as individualizing characteristics including the same windows opened and closed in all three videos [Annex 4, slides 26 and 27].

The locations shown in MLI-OTP-0018-0401 and MLI-OTP-0018-0744 also had many class characteristics in agreement including similar shapes and colours of buildings, poles, signs and structures [Annex 4, slide 28].

MLI-OTP-0018-0284 appeared to be similar to videos from Location 2 and a comparison analysis was conducted with known Location 2 panorama images [Annex 4, slide 35]. Several class characteristics were noted and were in agreement between the two images, including the shapes and colours of buildings, locations of pipes protruding from exterior walls, and the location of electrical poles and wires.

In addition to the three locations mentioned above, an additional building was noted in MLI-OTP-0018-0307 that appeared to be yellow in colour. It was compared to known panorama image MLI-3018. There were several class characteristics in common, however the known panorama image showed fences and other items that obscured the lower level of the building. This is likely due to changes between the time of the questioned video capture and the known image capture. Regardless, this is difference between the questioned video and the known panorama image [noted in red box Annex 4, slide 36].

MLI-OTP-0018-0184 was compared to the MLI-3006 known panorama image and several class characteristics were found to be in agreement. An area that showed some differences was present on the left and highlighted with a red box [Annex 4, slide 37]. Some signs on the structures in the panorama image were not be located in the questioned image. Again, this

could be due to construction and development that took place between the time frame of the questioned image capture and the known panorama image capture.

MLI-OTP-0018-0056 was compared to two known panorama images MLI-3009 and MLI-3013, which showed the building from opposite directions [Annex 4, slides 38 and 39]. MLI-3013 was particularly useful because this view showed the left and centre of the building shapes and characteristics without the large tree obscuring the view. This comparison analysis also connects MLI-OTP-0018-0184 with MLI-OTP-0018-0190, MLI-OTP-0018-0056, and MLI-OTP-0018-0307.

MLI-OTP-0018-0056 was compared with the known drone image Site 15. The building with two central pillars was captured from behind in the drone video. However, the two central pillars and the fence pillars that surround the roof were visible and similar to the characteristics noted in MLI-OTP-0018-0056 [Annex 4, slide 40].

The comparison conducted between known panorama image MLI-3002 (captured in a similar location as the known panorama image utilized in the comparison analysis with MLI-OTP-0018-0184) and the known Site 15 drone video highlighted many similar class characteristics [Annex 4, slide 42].

The known Site 15 drone video image was then compared to the Google Earth Pro image located at latitude 16.775856° and longitude -3.009324° [Annex 4, slide 43 and 44].

The locations noted in MLI-OTP-0018-0483, MLI-OTP-0018-0484, MLI-OTP-0018-0485 and MLI-OTP-0018-0401 and MLI-OTP-0018-0744 were not located in the known imagery.

#### D. Location 4 - Hôtel Azalaï and Location 6 - Hôtel Bouctou

As previously discussed in the analysis section, Location 6 Hôtel Bouctou: MLI-OTP-0012-1907 and Location 4 Hôtel Azalaï MLI-OTP-0012-1549-frame 494 displayed the same content. The

individuals, buildings and vegetation were in the same relative positions and the interlacing lines were viewed in both images. Location 6 Hôtel Bouctou: MLI-OTP-0012-1907 still image was an image that was captured from Location 4 Hôtel Azalaï MLI-OTP-0012-1549 at frame 494 of this video prior to deinterlacing the video.

Two distinctive areas were noted in the questioned videos of Location 4, which were used for comparison analysis; the light-coloured structure with arches and the fence with non-uniform patterns of rails.

MLI-OTP-0018-0394, MLI-OTP-0018-0644 and MLI-OTP-0018-0648 all depicted the light-coloured arches [REDACTED]. There also appeared to be a similar truck noted in the images. [REDACTED] the angle of the camera was directed upward toward the arches. The arches viewed in the questioned videos appeared to be just arches and not a building, because the central part of the building was not clearly visible, and the buildings appeared to be of the same light colour. The central part of the building was visible only in MLI-OTP-0018-0394 Frame 1296 [Annex 5, slide 38]. A dark-coloured rectangular structure could be noted in all of these questioned videos and appeared to be located just inside the exterior wall to the left of the light-coloured arches. This characteristic is individualizing because it did not appear to be a permanent structure.

These images were compared to the Group 6 known panorama image and a rounded structure was observed [Annex 5, slide 42]. A similar wall and vegetation could be observed near the rounded structures. The rounded building in the known panorama group 6 images is painted in two colours rather than one light colour as shown in the questioned videos. This may be different due to painting of the building between the time the questioned videos and the known images were taken. The comparison analysis of these structure was difficult because the angle of view was different; the questioned videos were captured from outside the exterior wall and the known panorama images were taken from inside the exterior wall.

There were rounded structures observed in the known drone images that also had vegetation and an exterior wall circling the area. There were two areas of light coloured round structures observed on the known drone image Site 17 that were potentially the same location viewed in MLI-OTP-0018-0394, MLI-OTP-0018-0644 and MLI-OTP-0018-0648 [Annex 5, slide 43].

The same questioned images were then compared to the known satellite images and two areas with rounded structures and light-coloured walls were noted in the satellite image and circle with purple circles in slide 46. There was what appeared to be an exterior wall surrounding several buildings and there were darker coloured dots that may be vegetation planted in regular intervals [Annex 5, slide 48].

The other distinctive feature noted in the questioned videos of Location 4 was the non-uniform fence. MLI-OTP-0069-3581 and MLI-OTP-0018-0394 both showed views of the fence. A wide rail with a triangle in the centre and thin rails in between made up the fence. The rails are not uniform. For instance, the wide rail was flanked by two thin rails in one area of the fence and in another area it had two thin rails on the left side. On slide 44 of Annex 5, the wide rails with triangles were indicated by blue, yellow and black arrows. The thin rails were noted with white lines.

The comparison analysis using the known drone Site 17 image and the known Google Earth Pro image was able to show the different areas noted in Location 4 including the specific light-coloured structure with arches, the exterior wall surrounding those buildings, the fence and the elevation changes [Annex 5, slide 49].

#### E. Location 5 – Gouvernorat

The Gouvernorat location included questioned videos that depicted interior and exterior scenes. Most of the interior scenes depicted a room [REDACTED]  
[REDACTED] Furthermore, an object was present [REDACTED]

[REDACTED] As discussed in the comparison analysis portion of this report, questioned videos MLI-OTP-0069-3704, MLI-OTP-0069-3710, MLI-OTP-0069-3712, MLI-OTP-0069-3714, MLI-OTP-0069-3716, MLI-OTP-0069-3767, and Location 1 MLI-OTP-0018-0379 all displayed similar class characteristics. In addition to the corresponding class characteristics were similar individualizing characteristics; including the shapes of damage to the wall and dark and light-coloured marks on the walls. The good quality, resolution, and close field of view of these questioned videos allowed for a detailed comparison analysis of the shapes and relative position of these individualizing characteristics [Annex 6, slides 25 to 29].

Questioned video MLI-OTP-0069-3715 showed a different interior scene. However, it did have some class characteristics in common with the previous interior scenes including light-coloured walls with a similar texture and the light-coloured, patterned flooring. Furthermore, this video showed a door that led into another interior room [REDACTED] [REDACTED] observed in MLI-OTP-0069-3767 and could be a viewed from either side of the interior door [Annex 6, slides 22 to 24].

Comparison analysis showed that the same exterior location was likely depicted in questioned videos MLI-OTP-0069-3706, MLI-OTP-0069-3709, MLI-OTP-0069-3711, MLI-OTP-0069-3713, MLI-OTP-0069-3721, MLI-OTP-0069-3722, and MLI-OTP-0069-3723. Numerous class characteristics noted in this exterior scene and were in agreement in all of the questioned videos. [REDACTED] exterior wall that surrounded the buildings in these videos. In addition to the class characteristics in agreement, there were also individualizing characteristics in agreement including the dark-coloured vehicle with a light-coloured screen (with logo) in the rear window that was parked in a similar, if not the same, location in all of these videos were also consistent. There was also a light-coloured substance on the ground with a similar shape in MLI-OTP-0069-3706, MLI-OTP-0069-3711, and MLI-OTP-0069-3723. These individualizing characteristics also indicated that the videos were likely taken within a short period of time.

In questioned video MLI-OTP-0069-3724, 1 [REDACTED] within the exterior surrounding wall, which provided a better view of building class characteristics. The centre building, with two-tone colours on the façade, pillars, arches central stairs, balcony with rails, and circular reflective objects mounted on the walls was similar to MLI-OTP-0069-3709 and Location 1 MLI-OTP-0018-0379 [Annex 6, slide 32] (that was excluded as being located at Location 1 BMS). These questioned videos showed the best views of the central building, whereas it was partially obscured by trees in the other videos.

The questioned videos were compared to known drone Site 11 images as well as to the images taken for the panorama images. Several differences were most notable in the drone Site 11 images. The front view of this location was quite different because in the questioned videos large trees obscured the view of the central building whereas in the drone images no trees were visible and the view of the centre building is clear. Other differences involve the exterior wall and gates. The exterior wall that surrounds the buildings in the questioned videos was painted in two colours and had a pattern, whereas the wall in the drone video appeared to be grey in colour and showed a different texture [Annex 6, slides 45 to 49]. The gates and doors in the questioned video had a straight horizontal top, whereas they had a semi-circle shape in the known images. The gates in the questioned video had fewer reflective ornaments than the known drone gates [slide 48]. Despite the differences in the gates, there were ornaments that corresponded as well. Some of these were highlighted by a green box and blue arrows in slide 48. All of these differences could be explained by renovations taking place between the time frame of questioned video capture and known drone Site 11 image capture.

Despite the differences noted, the class characteristics highlighted on the central building behind the exterior surrounding wall agree with the known panorama image MLI-1925 [Annex 6, slide 50]. Class characteristics of the buildings located on either side of the centre building were also in agreement [Annex 6, slides 45 to 49, 51 and 52].



As previously noted, questioned videos MLI-OTP-0069-3709, MLI-OTP-0069-3711, MLI-OTP-0069-3713 and MLI-OTP-0069-3724 all included approximate GPS coordinates in their metadata information. Annex 6 slides 54 to 57 showed the location of the coordinates on Google Earth Pro satellite images. Annex 6 slide 58 showed all four coordinate locations on the Google Earth Pro image. The coordinates did not indicate the exact same location, although they are all fairly close to one another. A comparison of the drone Site 11 image with each of the coordinates was performed to narrow down which coordinates were correct [Annex 6, slide 59]. This analysis showed that MLI-OTP-0069-3724 had the most accurate GPS coordinates (Latitude: 16°46'16.56" N (16.770126666°) and Longitude: 3° 0' 29.17" W (-3.00810277°) for Location 5 Gouvernorat.

#### F. Location 7 – Hôtel La Maison

This location consisted of three questioned still images and three questioned videos, all of which showed interior scenes. No known imagery was available for comparison analysis.

Questioned videos MLI-OTP-0018-0102, MLI-OTP-0018-0249 and MLI-OTP-0018-0289 all appeared to be the same interior room. MLI-OTP-0018-0102 and MLI-OTP-0018-0249 both showed a wide field of view that included the window [redacted] [Annex 7, slides 6-7] [redacted]

[redacted] was consistent in all three videos, which enables the third video (MLI-OTP-0018-0289) to be included in this location despite the narrow field of view that does not include the window [redacted] [Annex 7, slide 8]. The class characteristics [redacted] were similar in all three questioned videos, as well.

The only possible comparison to the questioned still images was conducted [redacted] [redacted] appeared to be similar in class characteristics in MLI-OTP-0018-0289, MLI-OTP-0001-7369 and MLI-OTP-0001-7382 [Annex 7, slides 10-11].

## 5. Conclusions

This section of the report should be read in conjunction with Annex 8.<sup>13</sup>

### A. Location 1 - BMS

#### *Questioned with Questioned*

There is very strong evidence to support that videos MLI-OTP-0012-1724 and MLI-OTP-0012-1726 are depicting the same location.

There is strong evidence to support that video MLI-OTP-0018-0438 is depicting the same location as MLI-OTP-0012-1724 and MLI-OTP-0012-1726.

There is evidence to support that video MLI-OTP-0041-0612 is depicting the same location as MLI-OTP-0012-1724 and MLI-OTP-0012-1726.

There is strong evidence to support that images MLI-OTP-0060-0404, MLI-OTP-0060-0405 and MLI-OTP-0060-0407 are depicting the same location as MLI-OTP-0012-1724 and MLI-OTP-0012-1726.

There is very strong evidence to exclude MLI-OTP-0018-0379 from depicting the same location as observed in videos MLI-OTP-0012-1724 and MLI-OTP-0012-1726.

#### *Questioned with Known*

There is very strong evidence to support that the locations observed in questioned videos MLI-OTP-0012-1724 and MLI-OTP-0012-1726 are the same location as the locations observed in the Location 1: known Site 13 drone video, known photograph MLI-OTP-0006-1441 and the panorama image MLI-4688.

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<sup>13</sup> Annex 8: Comparison Analysis Conclusion Scale and Definitions

There is very strong evidence to support that the location observed in questioned video MLI-OTP-0018-0438 is the same location as the locations observed in the Location 1: known Site 13 drone video, known photograph MLI-OTP-0006-1441 and the panorama image MLI-4688.

There is very strong evidence to support that the location observed in questioned videos MLI-OTP-0041-0612 is the same location as the location observed in the Location 1: known photograph MLI-OTP-0006-1441 and panorama image MLI-4688.

There is very strong evidence to support that images MLI-OTP-0060-0404, MLI-OTP-0060-0405 and MLI-OTP-0060-0407 is the same location as the locations observed in the Location 1: known Site 13 drone video, known photographs MLI-OTP-0006-1441 and MLI-OTP-0006-1433 and known panorama images MLI-4688 and MLI-4788.

There is very strong evidence to support that the triangular building (Location 1) is located at approximately latitude 16.774932° and longitude -3.010078°.

#### B. Location 2 - Place Sankoré

##### *Questioned with Questioned*

There is very strong evidence to support that MLI-OTP-0018-0243, MLI-OTP-0018-0245, MLI-OTP-0018-0252, MLI-OTP-0018-0248, and MLI-OTP-0039-0574 are all depicting the same building in the background.

There is very strong evidence to support that MLI-OTP-0018-0243, MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0247, MLI-OTP-0018-0248, MLI-OTP-0018-0251, MLI-OTP-0018-0252, MLI-OTP-0018-0253, MLI-OTP-0018-0256, and MLI-OTP-0018-0286,

MLI-OTP-0018-0291, and MLI-OTP-0039-0574 are all depicting the same open area surrounded by buildings and structures.

*Questioned with Known*

There is very strong evidence to support that MLI-OTP-0018-0244, MLI-OTP-0018-0245, MLI-OTP-0018-0246, MLI-OTP-0018-0253, MLI-OTP-0018-0286, and MLI-OTP-0039-0574 are the same areas observed in the known Location 2 Site 18 drone video and known panorama images MLI-5029, MLI-4926, MLI-4931, MLI-4932, MLI-4977, MLI-4922, and MLI-4940.

*Known with Known*

There is very strong evidence to support that the known Location 2 known panorama images MLI-5029, MLI-4926, MLI-4931, MLI-4932, MLI-4977, MLI-4922, and MLI-4940 are depicting the same location as the known Location 2 Site 18 drone video.

There is very strong evidence to support that Location 2 is located at latitude 16.776925° and longitude -3.005702° and the immediate, surrounding area.

In addition, a second clip noted in MLI-OTP-0039-0574 (Frame 24334) displayed very strong evidence to support that this location is located at Location 1: latitude 16.774932° and longitude -3.010078°.

C. Location 3 - Petit Marché

*Questioned with Questioned*

There is evidence to support that questioned videos MLI-OTP-0018-0184 and MLI-OTP-0018-0190 are depicting the same location.

There is strong evidence to support MLI-OTP-0018-0056 and MLI-OTP-0018-0307 are depicting the same location.

There is strong evidence to support MLI-OTP-0018-0483, MLI-OTP-0018-0484 and MLI-OTP-0018-0485 are depicting the same location.

There is very strong evidence to support that questioned videos MLI-OTP-0018-0401 and MLI-OTP-0018-0744 are depicting the same location.

*Questioned with Known*

There is evidence to support that questioned videos MLI-OTP-0018-0284 and Location 2 known panorama images MLI-4826 and MLI-4931 are depicting the same location.

There is evidence to support that questioned videos MLI-OTP-0018-0307 and Location 3 known panorama image MLI-3018 are depicting the same location.

There is strong evidence to support that questioned videos MLI-OTP-0018-0184 and Location 3 known panorama image MLI-3006 are depicting the same location.

There is strong evidence to support that questioned videos MLI-OTP-0018-0056 and Location 3 MLI-3009 and MLI-3013 known panorama images are depicting the same location.

There is evidence to support that questioned videos MLI-OTP-0018-0056 and the known drone image Site 15 are depicting the same location.

*Known with Known*

There is very strong evidence to support that Location 3 known panorama image MLI-3002 and known Site 15 drone video are depicting the same location.

There is strong evidence to support that the known Site 15 drone video and the Google Earth Pro Image at latitude 16.775856° and longitude -3.009324° are depicting the same location.

D. Location 4 - Hôtel Azalaï and Location 6 - Hôtel Bouctou

*Questioned with Questioned*

Location 6 Hôtel Bouctou: MLI-OTP-0012-1907 still image is an image that was captured from Location 4 Hôtel Azalaï MLI-OTP-0012-1549, at frame 494 of this video, prior to deinterlacing the video. This is a positive identification.

There is very strong evidence to support that questioned videos MLI-OTP-0018-0394, MLI-OTP-0018-0644 and MLI-OTP-0018-0648 are depicting the same location.

There is strong evidence to support that questioned videos MLI-OTP-0069-3581 and MLI-OTP-0018-0394 are depicting the same location.

There is very strong evidence to support that questioned videos MLI-OTP-0018-0328 and Location 2 MLI-OTP-0018-0248 are depicting the same location.

*Questioned with Known*

There is limited evidence to support that questioned videos MLI-OTP-0018-0394, MLI-OTP-0018-0644, and MLI-OTP-0018-0648 and the Location 4 Group 6 known panorama images and the known drone Site 17 image are depicting the same location.

There is evidence to support that questioned videos MLI-OTP-0069-3581 and MLI-OTP-0018-0394 and the known drone Site 17 image are depicting the same location.

There is evidence to support that questioned videos MLI-OTP-0018-0644 and the known satellite image at latitude 16.773821° and longitude -3.014276° are depicting the same location.

There is strong evidence to support that the known drone Site 17 image and the Google Earth Pro image at approximate coordinates latitude 16.774878° and longitude -3.014043 are depicting the same location.

E. Location 5 – Gouvernorat

*Questioned with Questioned*

There is very strong evidence to support that MLI-OTP-0069-3704, MLI-OTP-0069-3710, MLI-OTP-0069-3712, MLI-OTP-0069-3714, MLI-OTP-0069-3716, MLI-OTP-0069-3767, and Location 1 MLI-OTP-0018-0379 all depict the same interior location.

There is limited evidence to support that MLI-OTP-0069-3715 is the same interior location as MLI-OTP-0069-3767.

There is very strong evidence to support that MLI-OTP-0069-3706, MLI-OTP-0069-3709, MLI-OTP-0069-3711, MLI-OTP-0069-3713, MLI-OTP-0069-3721, MLI-OTP-0069-3722, and MLI-OTP-0069-3723 all depict the same exterior scene.

There is strong evidence to support that MLI-OTP-0069-3724, MLI-OTP-0069-3709 and Location 1: MLI-OTP-0018-0379 are all depicting the same building.

*Questioned with Known*

There is strong evidence to support that MLI-OTP-0069-3706, MLI-OTP-0069-3709, MLI-OTP-0069-3711, MLI-OTP-0069-3713, MLI-OTP-0069-3721, MLI-OTP-0069-3722, and MLI-OTP-0069-3723, known panorama images MLI-1925 and MLI-1929, and known drone Site 11 images all depict the same location.

*Known with Known*

There is very strong evidence to support that known drone Site 11 Frame 1290 is the same location as Google Earth Pro image GPS coordinates Latitude 16.770126666° and Longitude 3.00810277°.

F. Location 7 – Hôtel La Maison

There is evidence to support that MLI-OTP-0018-0102, MLI-OTP-0018-0249 and MLI-OTP-0018-0289 all depict the same location.

There is limited evidence to support that MLI-OTP-0018-0102, MLI-OTP-0018-0249, MLI-OTP-0018-0289, MLI-OTP-0001-7369 and MLI-OTP-0001- 7382 all depict the same rug.

The rug noted in MLI-OTP-0001-7469 was excluded as being the same as the rug noted in MLI-OTP-0018-0289.

I hereby certify that this is a report of the results of an examination performed by me. My professional experience is outlined in my *curriculum vitae* (Annex 10).



AmyLynn Hak, Forensic Officer  
Certified Forensic Video Analyst (CFVA)

End of report.



*Annex 1: Technical Information of Multimedia Files\_MALI (Excel Spreadsheet)*

*Annex 2: Location 1 - BMS Comparison Analysis Charts (PowerPoint Slides)*

*Annex 3: Location 2 - Place Sankoré Comparison Analysis Charts (PowerPoint Slides)*

*Annex 4: Location 3 - Petit Marché Comparison Analysis Charts (PowerPoint Slides)*

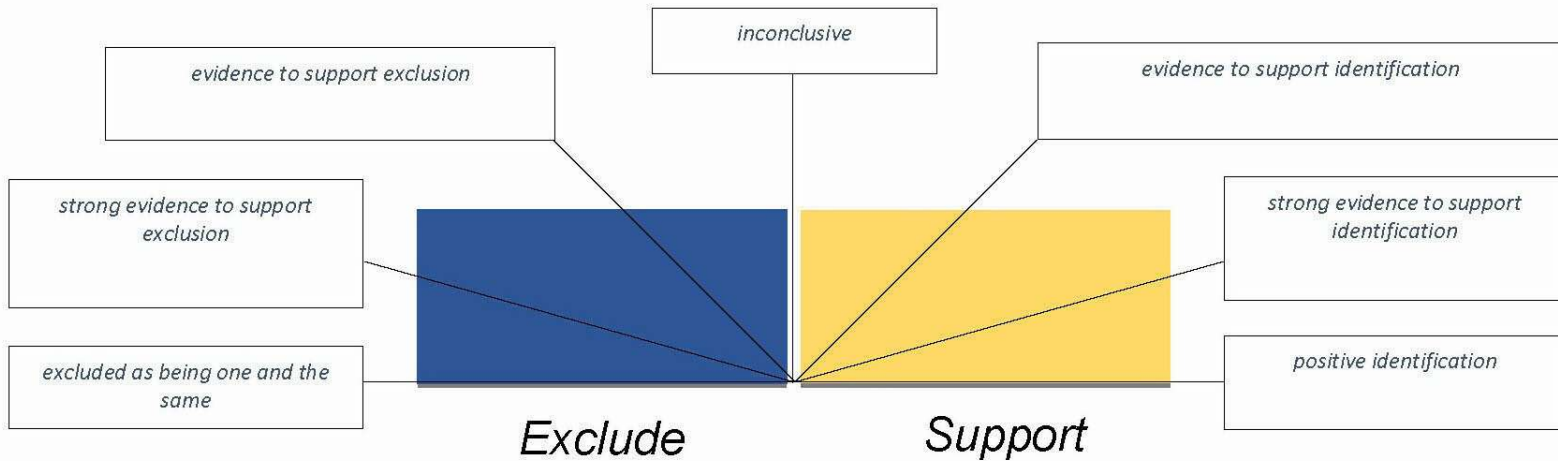
*Annex 5: Location 4 - Hôtel Azalaï and Location 6 Hôtel Bouctou Comparison Analysis Charts (PowerPoint Slides)*

*Annex 6: Location 5 - Gouvernorat Comparison Analysis Charts (PowerPoint Slides)*

*Annex 7: Location 7 - Hôtel La Maison Comparison Analysis Charts (PowerPoint Slides)*

*See external files for Annexes 1-7.*

## Annex 8: Comparison Analysis Conclusion Scale and Definitions



### Descriptions of Identification Support

#### Inconclusive:

Not enough evidence for either identification or exclusion. Limited evidence to support or exclude falls near inconclusive.

#### Evidence to Support Identification:

Class characteristics are present in both questioned and known item. Class characteristics are similar and in agreement between the questioned item and the known item.

#### Strong Evidence to Support Identification:

Class characteristics are present in both questioned item and known. Class characteristics are similar and in agreement between the questioned item and the known item.

Individualizing characteristics are noted in questioned item and known. Individualizing characteristics are similar and in agreement between the questioned and the known item.

Very strong evidence to support falls near a positive identification.

#### Positive Identification:

There is an abundance of both class and individualizing characteristics that are similar and in agreement with the known item. All characteristics agree. The questioned item is in fact one and the same as the known item.

## *Annex 9: Instructions and Forensic Video Analysis Tools*

This report should be read alongside Annex 1, Microsoft Excel spreadsheet detailing pertinent technical information relating to the questioned multimedia files and Annexes 2-7, Microsoft PowerPoint slides that illustrate and explain the comparison analyses.

The files will run better if they are copied and saved to your computer's hard drive rather than accessing them from a removable hard drive or USB drive. The comparison analysis charts are digital and are intended to be viewed on a monitor (computer or television), rather than printed on paper, for the best possible image quality.

### Forensic Video Analysis Tools Used

Amped FIVE Professional

Build date: 20190613

Revision: 13609

EXIF Tool

Version: 11.26

Adobe Creative Cloud Applications

Version 5.0.0.354

Microsoft Office

Word: Version 16.31 (19111002)

PowerPoint: Version 16.31 (19111002)

Excel: Version 16.32 (19120802)

Md5summer

Version: v1.2.0.11

FTK Imager

Version: 2.9.0.1385

## Annex 10: AmyLynn Hak Curriculum Vitae

# AmyLynn Hak, CFVA

## CURRENT EMPLOYMENT



### **International Criminal Court, Office of the Prosecutor**

Identification Division, Forensic Science Section

Oude Waalsdorperweg 10, 2597 AK

The Hague, The Netherlands

### *Forensic Officer (May 2018 – Present)*

- Forensic Science Section, Imagery Unit
  - perform technical examinations of multimedia files
  - perform forensic video analysis and examination of digital evidence
  - perform geolocation and comparison analysis of objects in multimedia evidence
  - advise on general forensic science tasks and processes
  - assist with development of quality management framework and SOPs
  - assist with open source investigation and intelligence
  - present expert reports and collaborate with integrated team members
  - design and present learning opportunities for investigators, analysts and lawyers
  - research emerging trends, risks and analytical tools in digital forensic science
  - testify in Court, as needed
- Information Management and Program Evaluation
  - design and implement forensic video analysis workflow program
  - draft forensic video analysis program evaluation framework policy
  - e-Disclosure (Nuix/Ringtail) redaction process evaluation
  - contributing member of the Hague Evaluation Network

## CURRENT EDUCATION

Master of Information Management (*September, 2019*)

Dalhousie University - Halifax, Nova Scotia, Canada

Courses:

*Program Evaluation*

*Information Policy*

*Knowledge Management*

*Capstone Research: eDisclosure (Nuix Ringtail) Redaction Process Program Evaluation*

*Information, People and Society*

*Project Management*

*User Experience*

*Organization of Information*

*Information Systems and Technology*

*Management of Privacy*

## EMPLOYMENT HISTORY

### ALH. Forensic Video Analysis Ltd.

*Owner Operator (May 2014 – May 2018)*

*Certified Forensic Video Analyst*

#### *Duties include:*

- analyze digital evidence for quality and investigative suitability
- provide digital video redaction for investigators, as well as the trier of fact
- provide analysis, comparison and evaluation of video evidence
- provide speed estimation analysis
- provide 2D/3D scene mapping analysis
- provide a detailed report of the scientific method used in image comparison analysis
- give expert witness testimony in the field of Forensic Video Analysis
- provide expert analysis and opinion of video and still images for civil matters
- provide archival services and evidence retention for future court proceedings

#### *Equipment and Software used:*

- Adobe Premiere non-linear editor
- Amped FIVE, iNPUT ACE, ffmpeg, Quicktime
- Ocean systems forensic video analysis software
- Microsoft PowerPoint, Word and Excel
- Adobe Acrobat and Creative Cloud (including Photoshop)
- numerous proprietary digital video players and converters



### Law Enforcement and Emergency Services Video Association Intl.

*Certification Committee Board Member (June 2015 - September 2017)*

*Appointed Volunteer Position*



### YMCA Calgary

#### Gray Family Eau Claire YMCA

*Digital Strategist (January 2018 – May 2018)*

*Administration Director Part-Time (April 2017 – January 2018)*

*Duty Manager Part-Time (August 2011 – Present)*

*Duties Included:*

- performed all digital strategy for YMCA Calgary branches
- performed Open Y website and mobile app development and support
- developed content for digital boards and calendars in the branches
- performed accounting, payroll, human resources, and procurement functions utilizing several enterprise resource planning database platforms
- updated WordPress website, push notifications and Facebook pages
- implemented technological solutions for scheduling, information sharing and knowledge management within the duty manager and administration teams
- supervised, trained and managed 20 duty managers
- organized and maintained inventory for the association
- assisted with the health and safety of all members and staff within the facility



**Calgary Police Service - Technological Crimes Unit**

*Forensic Video Analyst (November 2011 - May 2016)*

*Duties included:*

- analyzed analog and digital video for quality and investigative suitability
- provided analog and digital conversions for investigative and trier of fact usage
- provided analog and digital video editing for investigators, as well as the trier of fact
- provided analysis, comparison and evaluation of digital evidence
- provided a detailed report of the scientific method used in image comparison analysis
- gave expert witness testimony in the field of Forensic Video Analysis
- evaluated current work flow and provide innovative solutions for the unit
- assisted with archives and evidence retention for future court proceedings

*Equipment and Software used:*

- AVID and Apple Final Cut Pro non-linear editors
- Ocean systems forensic video analysis software
- Microsoft PowerPoint, Word and Excel
- Adobe Acrobat and Creative Cloud (including Photoshop)
- numerous proprietary digital video players and converters



## **Minneapolis Police Department**

*Forensic Scientist (April 2001 - July 2007 and December 2007 - December 2008)*

*Crime Scene Investigator and Latent Print Examiner*

### ***Forensic Scientist***

#### *Duties Included:*

- documented crime scenes through 35 mm and digital photography, digital video and sketching
- processed various types of crime scenes and physical items for latent print evidence
- collected biological and physical evidence from crime scenes
- provided scientific analysis, comparison and evaluation of latent print evidence
- provided scientific and technical expertise in examinations and comparison analysis in the fields of crime scene investigation and latent print analysis
- gave expert testimony in crime scene processing and latent print analysis in court
- supervised and trained forensic scientists and police officers in the areas of crime scene analysis and latent print examination
- researched emerging technologies within the laboratory and performed experimentation to verify techniques
- assisted in writing standard operating procedures and quality assurance documents for ASCLD certification

### ***Forensic Video Analyst***

#### *Duties Included:*

- analyzed analog and digital video surveillance video evidence
- provided scientific and technical expertise in examinations and comparison analysis of forensic video evidence
- gave expert testimony in forensic video analysis and comparison analysis in court
- assisted in writing standard operating procedures and quality assurance documents for ASCLD certification



## Saint Cloud Police Department

*Forensic Specialist (July 2007 - December 2007)*

*Duties included:*

- provided crime scene investigation and latent print analysis
- provided forensic video analysis
- supervised sworn members within the crime laboratory and ensured they remain current with training and certifications
- researched equipment and new scientific processes for implementation within the laboratory and in the field
- oversaw the expansion of the new crime lab and assisted in acquiring appropriate crime lab equipment
- developed strategic plans for acquiring ASCLD accreditation and drafted standard operating procedures
- ensured health and safety guidelines were in place and being followed



## Hennepin County Medical Examiners' Office

*Health Care Trainee (2000-2001)*

*Duties included:*

- assisted in death investigations within Hennepin County, Minnesota



## 3M

*Microbiology Technician (temporary full-time) (2000-2001)*

*Duties included:*

- performed microbiological laboratory work within the sterilization unit



## Boston Scientific SCIMED

*Quality Assurance Technician in Microbiology Laboratory (1999-2000)*

*Research and Development Technician in Chemistry Laboratory (1998-1999)*

*Duties included:*

- performed air and water quality testing within a clean room environment



- *performed wet chemistry testing*

## **TEACHING AND SPEAKING ENGAGEMENTS**

### **Institute for International Criminal Investigations**

*The Hague, The Netherlands*

*December 12, 2019*

Open Source Investigations Course

- *forensic video analysis for intelligence gathering and online investigations*

### **Forensic Intelligence Network of Excellence**

*The Hague, The Netherlands*

*November 21, 2019*

- *“A.I. and Forensic Science” panel member*

### **International Criminal Court, Office of the Prosecutor**

*The Hague, The Netherlands*

*November 6, 2019*

Online Intelligence and Investigations Training (Level 2)

- *taught forensic video analysis for online investigations*

### **International Criminal Court, Office of the Prosecutor**

*The Hague, The Netherlands*

*July, August and September 2018*

- *presented on forensic video analysis for intelligence and investigations*

### **LEVA Forensic Video Analysis and the Law, Level 2**

*Honolulu, Hawaii, USA*

*September 2017*

- laboratory instructor

### **LEVA Forensic Video Analysis and the Law, Level 1**

*Honolulu, Hawaii, USA*

*February 2017*

- laboratory instructor

### **Lancaster House Labour and Arbitration Conference**

*Vancouver, British Columbia*

*November 2015*

- presented on the technical aspects of forensic video analysis

### **Alberta Justice Crown Prosecutor's Office**

*Calgary, Alberta*

*October 2015*

- presented on the technical aspects of forensic video analysis

### **Saskatchewan Justice Public Prosecution Spring Conference**

*Regina, Saskatchewan*

*May 2014*

Forensic Video Analysis: Overcoming challenges in leading and defending video evidence

- co-presented on the technical issues dealing with forensic video analysis

### **LEVA: Digital Multimedia Evidence Processing**

*Indianapolis, Indiana*

*May 2012*

- laboratory instructor

### **Minneapolis Community and Technical College**

*Minneapolis, Minnesota*

*Spring Semester 2007*

- taught booking procedures, crime scene processing and fingerprinting techniques

### **LEVA: Basic Forensic Video Analysis and the Law**

*Indianapolis, Indiana*

*July 2006, February and Sept 2007*

- lab assistant

### **Hamline University, St Paul, Minnesota**

*Saint Paul, Minnesota*

*May 2002 – 2006*

- presented crime scene investigation techniques through case studies

## Metropolitan State University, Minneapolis Minnesota

*Minneapolis, Minnesota*

*October 2002 -2006*

- presented crime scene investigation techniques through case studies

## CERTIFICATIONS

*Law Enforcement and Emergency Services Video Association  
Forensic Video Analyst (October 2006 - Present)*

*International Association for Identification  
Crime Scene Analyst (July 2005)  
Crime Scene Technician (September 2002)*

## PROFESSIONAL MEMBERSHIPS

*Law Enforcement and Emergency Services Video Association (2002 – Present)  
International Association for Identification (IAI) (2001 –2008 and 2014 – 2016)  
Minnesota Division of the IAI (2001 – Dec 2008)*

## PREVIOUS EDUCATION



Southern Alberta Institute of Technology (SAIT) 2016  
*3D Modeling & Design Fundamentals I and II  
Revit Architecture Fundamentals and Intermediate  
AutoCAD I, II, and III  
CADD System Management I*



Mount Royal University 2010  
*General Chemistry  
Cell Biology  
Digital Multimedia  
Technical Writing*



St Cloud State University 2007  
*Graduate Level Biochemistry*



Anoka-Ramsey Community College 2004-2005  
*Organic Chemistry 1 and 2*



Post-Baccalaureate Coursework  
Hamline University, St Paul, Minnesota 1999  
*Evidence and the Law*  
*Forensic Archaeology*  
*Survey of Forensic Science*



Bachelor of Arts Degree - 1998  
Hamline University, St Paul, Minnesota  
*Biology Major / Anthropology Minor*  
*Leaders Scholar*

## **PROFESSIONAL TRAINING**

Southern Alberta Institute of Technology (SAIT) - Calgary, Alberta Canada  
*3D Modeling and Design Fundamentals 2 - Intermediate (January 2017)*

- 24 hours of specialized training in 3D modelling and animation
- specialized training utilizing Autodesk 3DS Max software
- intermediate training in the 3D environment, massing, etc.

Law Enforcement and Emergency Services Video Association (LEVA) - Phoenix, Arizona USA  
*Forensic Video Analysis with Amped FIVE (November 17-18, 2016)*

- specialized training utilizing the forensic software Amped FIVE
- specialized training in advanced analysis techniques: macro block analysis, measurements for reverse projection, deblurring, clarification, etc.

Law Enforcement and Emergency Services Video Association (LEVA)  
25th Annual Conference and Digital Multimedia Training Symposium  
**November 2016 Phoenix, Arizona USA**

*Specialty Workshops Attended:*

Validation/Verification

Software Instruction: Adobe Premiere Pro and Adobe Acrobat

Southern Alberta Institute of Technology (SAIT) - Calgary, Alberta Canada

*3D Modeling and Design Fundamentals 1 (September - November 2016)*

- 24 hours of specialized training in 3D modelling and animation
- specialized training utilizing Autodesk 3DS Max software
- fundamental training in the 3D environment, lighting, photorealistic rendering

Southern Alberta Institute of Technology (SAIT) - Calgary, Alberta Canada  
*Revit Architecture Fundamentals (April 2016)*  
*Revit Architecture Intermediate (June 2016)*

- 68 hours of specialized training
- specialized training in 3D modelling of structures and families
- BIM management training and template, worksheet, phasing, design option creation

Alberta Institute of Technology (SAIT) - Calgary, Alberta Canada  
*AutoCAD Training Series (May 1-30, 2016)*

- specialized training in 2D and 3D modelling of various objects and structures
- advanced level of training in the utilization of the powerful AutoCAD software for computer aided design and drafting

Forensic Video Solutions - Edmonton, Alberta Canada  
*Reverse Projection - On Site Instruction (August 10, 2015)*

- practical instruction on Traditional Reverse Projection
- practical instruction on 3D Laser Scanning

Forensic Video Solutions - Spokane, Washington USA  
*ffmpeg- A Dynamic Forensic Video Workflow (February 23 - 27, 2015)*

- specialized training utilizing the ffmpeg framework for multimedia evidence
- advanced level of training in the forensic video analysis workflow
- specialized training in utilizing the command line of the computer's operating system

Imaging Forensics - Anaheim, California USA  
*Forensic Video Analysis with Adobe Photoshop (January 12-15, 2015)*

- advanced level of training utilizing Adobe Photoshop techniques in the areas of still image clarification, frame averaging
- advanced training in the use of a non-destructive workflow

- advanced level of training utilizing Photoshop techniques in the areas of video image clarification, editing, and correction of aspect ratio
- training provided in court presentation of video and still images

International Association for Identification (IAI)  
*99th International Education Conference*

**August 2014** Minneapolis, Minnesota USA

Specialty Workshops Attended:

Introduction to Gait Analysis

Forensic Digital Image Processing Tips and Techniques using Adobe Photoshop

Law Enforcement and Emergency Services Video Association (LEVA) - Indianapolis, Indiana USA

Digital Multimedia Evidence (**May 7-11, 2012**)

- lab assistant

Law Enforcement and Emergency Services Video Association (LEVA)  
*Video Evidence Symposium and Training Conferences*

**November 2015** Clearwater Beach, Florida USA

Specialty Workshops Attended:

Software Instruction: Adobe Premiere Pro, Adobe Photoshop and

AVID Media Composer

**October 2014** Coeur d'Alene, Idaho USA

Specialty Workshops Attended:

Software Instruction: Adobe Premiere Pro, Adobe Muse, Adobe Photoshop and

AVID Media Composer

Photogrammetry and Reverse Projection

**September 2013** Asheville, North Carolina USA

Specialty Workshops Attended:

DAC Audio

Image Compression

Omnivore Software Specific Training

**October 2012** San Diego, California USA

Specialty Workshops Attended:

Image Authentication, Software Instruction: Adobe Premiere Pro and

AVID Media Composer

**October 2008** Orlando, Florida USA

**October 2007** Calgary, Alberta Canada

Photoshop Techniques 2-day course

**October 2006** San Francisco, California USA

William Westfall, Gallagher-Westfall Group, Inc. - Minneapolis, Minnesota USA  
*Leadership, Liability & Performance Management (October 3-4, 2007)*

- learned strategies for leadership and supervisory skills in law enforcement

Law Enforcement and Emergency Services Video Association (LEVA) - Indianapolis, Indiana USA  
*Processing Digital Multimedia Evidence (May 7-11, 2007)*

- advanced level of training in the processing of digital multimedia, compression schemes, forensic workflow and legal precedence
- training in the best practices for the acquisition of digital multimedia evidence

Law Enforcement and Emergency Services Video Association (LEVA) - San Francisco, California USA  
*Courtroom Testimony for Forensic Video Analysts (October 22-24, 2006)*

- advanced level of training in courtroom testimony techniques which included a moot court situation.

Law Enforcement and Emergency Services Video Association (LEVA) - Indianapolis, Indiana USA  
*Advanced Forensic Video Analysis and the Law (May 1-5, 2006)*

- advanced level of training in forensic video technology as well as the science involved in the collection of analog and digital video evidence
- advanced level of training in the background of forensic video analysis in US and Canadian court systems
- trained in expert testimony in a moot court setting

British Columbia Institute of Technology (BCIT) - Vancouver, British Columbia Canada  
*Forensic Video Analysis: Photographic/Video Comparison (August 22-26, 2005)*

- trained in scientific methodology of identification

- gained experience analyzing, comparing, and evaluating video images and photographic evidence
- toured a garment manufacturing plant to demonstrate class vs. unique characteristics

Northwestern University - Center for Public Safety - Minneapolis, Minnesota USA  
*Shooting Incident Reconstruction & Officer-Involved Shootings (June 13-17, 2005)*

- specialized training in the reconstruction of a shooting crime scene

Ron Smith & Associates Incorporated - Minneapolis, Minnesota USA  
*Courtroom Testimony Techniques (September 15-16, 2003)*

- trained in courtroom techniques for the expert witness

*Demystifying Palm Prints (September 17-19, 2003)* - Minneapolis, Minnesota USA

- gained training in the analysis, comparison and evaluation of latent palm print evidence
- gained experience in recognizing the location of latent palm print evidence

Ocean's Systems (**March 2003**) - Burtonsville, Maryland USA  
*Vendor Specific Training using AVID Media Composer*

Law Enforcement/Emergency Services Video Association (LEVA) - Quantico, Virginia USA  
*Basic Forensic Video Analysis and the Law (September 24-27, 2002)*

- gained basic training in forensic video analysis technologies
- trained in US and Canadian case law pertaining to forensic video analysis

Northwestern University - Center for Public Safety - Minneapolis, Minnesota USA  
*Investigative Photography Workshop (June 17-21, 2002)*

- trained in crime scene and copy stand photography using 35 mm camera

Crime Scene Technology Workshop (**June 24-28, 2002**) - Minneapolis, Minnesota USA



- gained advanced training in various latent print enhancement techniques through chemical processes

Federal Bureau of Investigation Training School - Minneapolis, Minnesota USA  
*Fingerprint Pattern Recognition and Comparison (April 23-25, 2002)*

IAI Conference: Mid-States Division Conference - Peoria, Illinois USA (**March 25-29, 2002**)

IAI Conference: Minnesota Division Fall Conference - Hinkley, Minnesota USA (**October 19-21, 2001**)

Ridgeology Consulting Services, David Ashbaugh - Minneapolis, Minnesota USA  
*Forensic Ridgeology Course (September 24-28, 2001)*

- gained advanced training in the analysis, comparison, and evaluation of ridges and pore structure of latent prints
- gained advanced training in the scientific process of comparison evidence

The Institute for Forensic Imaging - Minneapolis, Minnesota USA  
*Crime Scene Photography (May 22-25, 2001)*

*Forensic Digital Imaging, Phase 1 (June 12-15, 2001)*

- trained in 35 mm still photography
- trained in the application of Adobe Photoshop to still images

## **EXPERT QUALIFICATIONS AND COURT TESTIMONY**

*I have been qualified as an expert witness in the following fields: crime scene analysis, latent print examination and forensic video analysis. I have given testimony, as well as testified as an expert witness many times, including the following cases:*

### ***R. v. Sandoval-Barillas***

*Alberta Court of Queen's Bench*

*Justice A. McLeod*

*Expert Witness in Forensic Video Analysis*

*(Comparison Analysis and Timeline Analysis)*

*January 11th, 2016*

***R. v. Smith***

*Saskatchewan Court of Queen's Bench  
Justice C. Dawson  
Expert Witness in Forensic Video Analysis  
(Motion Tracking Analysis and Comparison Analysis)  
November 10th, 2015*

***R. v. Piche***

*Alberta Court of Queen's Bench  
Justice S. Brooker  
Expert Witness in Forensic Video Analysis  
(Comparison Analysis and Timeline Analysis)  
October 15th, 2015*

***R. v. Apetrea***

*Alberta Court of Queen's Bench  
Justice E.C. Wilson  
Expert Witness in Forensic Video Analysis  
(Comparison Analysis, Compression, Infrared Cameras, Blooming)  
March 17 and 18, 2015*

***Calgary Police Service - Professional Standards Section***

*Cst. Huitt Hearing  
Westwinds Campus  
Expert Witness in Forensic Video Analysis  
September 18th, 2013*

***R. v. Jeha***

*Alberta Provincial Court  
Forensic Video Analysis Testimony  
February 13th, 2013*

***State of Minnesota vs. Amani J. Fardan***

*State of Minnesota, County of Hennepin, District Court, Fourth Judicial District  
Expert Witness in Crime Scene Processing  
and Latent Print Processing and Examination  
May 15<sup>th</sup>, 2008*

***State of Minnesota vs. Antwon Williams***

*State of Minnesota, County of Hennepin, District Court, Fourth Judicial District  
Expert Witness in Shooting Crime Scene Analysis  
and Latent Print Processing and Examination  
February 23rd, 2007*

***State of Minnesota vs. David Grady***

*State of Minnesota, County of Hennepin, District Court, Fourth Judicial District  
Expert Witness in Forensic Video Analysis  
November 15, 2006*

***State of Minnesota vs. Chandan Prentiss Hurd***

*State of Minnesota, County of Hennepin, District Court, Fourth Judicial District  
Expert Witness in Shooting Crime Scene Analysis  
and Latent Print Processing and Examination  
November 13, 2006*

***State of Minnesota vs. Prentis Cordell Jackson***

*State of Minnesota, County of Hennepin, District Court, Fourth Judicial District  
Expert Witness in Homicide/Shooting Crime Scene Analysis  
October 31, 2006*

***State of Minnesota vs. David William Allen***

*State of Minnesota, County of Hennepin, District Court, Fourth Judicial District  
Expert Witness in Forensic Video Analysis  
June 20, 2006*

***State of Minnesota vs. James Clinton Wren***

*State of Minnesota, County of Hennepin, District Court, Fourth Judicial District  
Expert Witness in Video Image Comparison Examinations  
April 3, 2006*

***State of Minnesota vs. Pierre Lamont Leake***

*State of Minnesota, County of Hennepin, District Court, Fourth Judicial District  
Expert Witness in Homicide/Stabbing Crime Scene Analysis  
September 2003*

## **FORENSIC IMAGE ANALYSIS PROJECTS**

**Jonathan Daniels, Civil Rights Activist**

*March on Washington Image*

*April 2015*

- still image examination and comparison analysis

## Annex 11: Glossary of Terms and Acronyms

Terms	Definition
Aspect Ratio	The aspect ratio of an image describes the proportional relationship between its width and height.
Authentication	Authentication is the process of substantiating that the data is an accurate representation of what it purports to be.
Display Aspect Ratio	The aspect ratio that the video should be played back at to retain accurate shapes and sizes of content in the video frame.
Forensic Video Analysis	Forensic Video Analysis is the scientific examination, comparison and /or evaluation of video in legal matters.
Geolocation	Geolocation is the process of finding, analyzing and providing the identification or estimation of the real-world geographic location of an electronic device, such as mobile phone or video camera. Geolocation commonly uses Global Positioning System (GPS) and other related technologies and analyses to assess and specify geographical locations.
Hash Value	A hash value is an alphanumeric chain representing a 'signature' of a digital file. A has value, sometimes refered to as a checksum, is the result of a mathematical function known as a hash algorithm that takes an input and maps this into a fixed property that makes it almost impossible to find two files that have different content and that compute to the same shah value.
Image Comparison Analysis	image comparison analysis is the process of comparing images of questioned objects or persons to known objects or persons or images therof, and making an assessment of the correspondence between features in these images for rendering an opinion regarding identification or elimination.
Interlaced/Deinterlaced	An interlaced signal or scan contains two fields of a video frame that are captured consecutively, (even field scanned first and then odd field). Interlaced video signals are commonly found in analog television. Deinterlacing is the process of converting the interlaced video into a non-interlaced or progressive form.
Metadata	Metadata is basic information pertaining to a file, for example the file size, file type, date and other technical information.
Multimedia	Multimedia is the integration of multiple forms of media, including text, graphics, audio, animations, video, and still images.
Pixel Aspect Ratio	Pixel aspect ration refers to the aspect ratio of the pixels themselves.
Progressive	Progressive scan is one of two methods used to "paint" an image (the other is an interlaced scan), where the lines are drawn one at a time in sequential order.
Storage Aspect Ratio	The aspect ratio that the video file is stored at when coded, which is often not the same as the display aspect ratio.
Transcode	Transcoding is the digital-to-digital conversion from one form of coded representation to another.
Video	Video is the electronic representation of a series of still images used to capture and recreate either a stationary or moving scene in the real world.

Acronyms	Definition
DAR	Display Aspect Ratio
FSS	Forensic Science Section
ICC	International Criminal Court
IEU	Information and Evidence Unit
OTP	Office of the Prosecutor
PAR	Pixel Aspect Ratio
SAR	Storage Aspect Ratio



**MISSION LETTER**

Ms Amy Hak

Forensics Science Section Office  
of the Prosecutor International  
Criminal Court The Hague

Re : Investigation in the situation of Mali

Date : 26 August 2019

Dear Ms Hak,

You are kindly requested, to the extent to which your expertise permits, to conduct an analysis for certain imagery taken in the area of Timbuktu that are referred to in the chart in the annex to this letter.

Your analysis should consist of a comparison of images listed in the column entitled "Questioned Material" against the images listed in the column entitled "Reference material" in the above mentioned annex. In order to set priorities, assets listed in the "Questioned Material" column have been divided into two categories, *i.e.* "Priority 1" (marked in bold) and "Priority 2".

Basing yourself on the reference material and other means necessary, such as *e.g. Google Earth*, the analysis should allow the geolocation of all the questioned material listed in the annex.

Should you face any trouble identifying the geolocation of some of the assets listed under "Questioned Material", you are allowed to use other assets contained in the same category for which you were able to determine the geolocation by using the reference material or any other means.



You are requested to present your analysis in an expert report. The report should preferably follow the structure as outlined below:

- (i) An introduction, indicating what your mission and instructions are;
- (ii) The methodology used in preparing the report, including (a) details on the material and computer software you used; (b) the source and quality of the images, (c) how you analysed the imagery, including the visual indicators you used and explaining the scope for and/or limitations in analysing the imagery in question;
- (iii) Your analysis of the imagery, containing at least for each site:
  - (a) the type of monuments depicted in the images together with the GPS coordinates to the extent possible;
  - (b) your assessment of the sites depicted in the imagery by way of comparing the images available to you. We ask you to structure your report on a site-by-site basis, incorporating for each site a contextual view identifying the location, and a close-up view of the images you analysed (with your mapping of points of comparison on the images);
  - (c) You are also asked to address any issues you might encounter with the materials listed in the chart annexed to this letter and if any, to clarify what the margin of error is in each case;
- (iv) General conclusions, providing an overview of the results you have obtained;
- (v) A glossary, in order to make sure that all technical terms and abbreviations will be understandable to a large audience.

You are also requested to attach to your expert report:

- (i) The present letter of instructions;

(ii) A statement acknowledging that you personally performed the analysis (in case you would need to resort to other people' input, these individuals would also need to provide such a statement explaining their exact contribution to the mission and provide their *curriculum vitae*);

(iii) Your *curriculum vitae*, emphasizing in particular prior experience you have in this field and if applicable, prior reports and/or testimonies you might have prepared for judicial bodies in relation to this area of expertise.

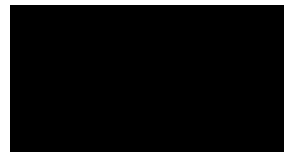
This mission letter allows you to access all the relevant materials <sup>1</sup> within the Information and Evidence Unit (IEU) vault.

We ask that you submit your expert report by 30 November 2019 and that you treat the information contained in these instructions as confidential. In the event where that deadline would be unfeasible, kindly prepare a report containing at least your results for the "Priority 1" assets and we shall set a new deadline for the remaining "Priority 2" assets.

Would you have any doubt as to your actual task or instructions to be followed, please do not hesitate to contact us for clarifications.

Yours sincerely,

Gilles Dutertre



P/O Sarah Coquillaud Senior

Trial Lawyer

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<sup>1</sup> Namely all the materials listed as questioned material and reference material, to be found under MLI-OTP-0068-3199, MLI-OTP-0067-1859 and MLI-OTP-0068-3199 together with their respective reports registered under MLI-OTP-0064-0806, MLI-OTP-0066-0559 and MLI-OTP-0069-1320, as well as all the individual videos and photographs that were used to built the drone images and the panoramas (see MLI-OTP-0064- 080

# ANNEX

Name and Site Number <sup>1</sup>	Reference Material			Questioned Material <sup>2</sup>
	Drone Imagery	Panoramas	Photographs	
<b>Gouvernorat (11)</b>	Drone_Site11	[Group 0]-MLI_1921_-_MLI-OTP-0060-3953_MLI_1934_-_MLI-OTP-0060-3966-14 images_CRP [Group 0]-MLI_2085_-_MLI-OTP-0060-4117_MLI_2115_-_MLI-OTP-0060-4147-31 images_CRP [Group 0]-MLI_2118_-_MLI-OTP-0060-4150_MLI_2144_-_MLI-OTP-0060-4176-27 images_CRP [Group 0]-MLI_2218_-_MLI-OTP-0060-4180_MLI_2223_-_MLI-OTP-0060-4185-6 images_CRP		<b>MLI-OTP-0069-3704</b> <b>MLI-OTP-0069-3706</b>  <b>MLI-OTP-0069-3709</b> <b>MLI-OTP-0069-3710</b> <b>MLI-OTP-0069-3711</b> <b>MLI-OTP-0069-3712</b> <b>MLI-OTP-0069-3713</b> <b>MLI-OTP-0069-3714</b> MLI-OTP-0069-3715 <b>MLI-OTP-0069-3716</b> MLI-OTP-0069-3721 MLI-OTP-0069-3722 MLI-OTP-0069-3723 <b>MLI-OTP-0069-3724</b> MLI-OTP-0069-3767
<b>BMS</b>	Drone_Site13		MLI-OTP-0006-1429	MLI-OTP-0001-7237

<sup>1</sup> Site numbers are related to previous mission letters where each site was attributed the said number.

<sup>2</sup> Within the questioned material category, Priority 1 assets are marked in **bold** – any other assets not in bold is considered to be Priority 2.

(13)		<p>[Group 0]-MLI_4474_-_MLI-OTP-0060-4330_MLI_4499_-_MLI-OTP-0060-4355-26 images_PIX_CRP</p> <p>[Group 0]-MLI_4684_-_MLI-OTP-0060-4540_MLI_4730_-_MLI-OTP-0060-4586-47 images_PIX_CRP</p> <p>[Group 0]-MLI_4859_-_MLI-OTP-0060-4715_MLI_4862_-_MLI-OTP-0060-4718-4 images_CRP</p> <p>[Group 4]-MLI_4564_-_MLI-OTP-0060-4420_MLI_4590_-_MLI-OTP-0060-4446-27 images_PIX_CRP</p> <p>[Group 5]-MLI_4593_-_MLI-OTP-0060-4449_MLI_4636_-_MLI-OTP-0060-4492-44 images_PIX_CRP</p> <p>[Group 6]-MLI_4639_-_MLI-OTP-0060-4495_MLI_4677_-_MLI-OTP-0060-4533-39 images_PIX_CRP</p>	<p>MLI-OTP-0006-1430</p> <p>MLI-OTP-0006-1431</p> <p>MLI-OTP-0006-1433</p> <p>MLI-OTP-0006-1435</p> <p>MLI-OTP-0006-1436</p> <p>MLI-OTP-0006-1441</p> <p>MLI-OTP-0006-1442</p> <p>MLI-OTP-0006-1445</p> <p>MLI-OTP-0006-1468</p> <p>MLI-OTP-0006-1510</p> <p>MLI-OTP-0006-1511</p> <p>MLI-OTP-0006-1514</p> <p>MLI-OTP-0006-1598</p> <p>MLI-OTP-0006-1599</p> <p>MLI-OTP-0006-1600</p> <p>MLI-OTP-0006-1661</p> <p>MLI-OTP-0006-1689</p>	<p>MLI-OTP-0001-7251</p> <p>MLI-OTP-0001-7252</p> <p>MLI-OTP-0001-7258</p> <p>MLI-OTP-0001-7260</p> <p>MLI-OTP-0001-7604</p> <p>MLI-OTP-0001-7612</p> <p><b>MLI-OTP-0012-1724</b></p> <p><b>MLI-OTP-0012-1726</b></p> <p><b>MLI-OTP-0018-0091</b></p> <p><b>MLI-OTP-0018-0092</b></p> <p><b>MLI-OTP-0018-0379</b></p> <p><b>MLI-OTP-0018-0438</b></p> <p><b>MLI-OTP-0041-0605</b></p> <p><b>MLI-OTP-0041-0612</b></p> <p><b>MLI-OTP-0060-0404</b></p> <p><b>MLI-OTP-0060-0405</b></p> <p><b>MLI-OTP-0060-0407</b></p>
<p><b>Hôtel Bouctou</b></p> <p>(14)</p>	<p>Drone_Site17</p> <p>Drone_Site14</p>	<p>[Group 4]-MLI_2315_-_MLI-OTP-0060-5591_MLI_2339_-_MLI-OTP-0060-5615-25 images_PIX_CRP</p> <p>[Group 5]-MLI_2342_-_MLI-OTP-0060-5618_MLI_2369_-_MLI-OTP-0060-5645-28 images_CRP</p> <p>[Group 7]-MLI_2394_-_MLI-OTP-0060-5670_MLI_2417_-_MLI-OTP-0060-5693-24 images_CRP</p> <p>[Group 9]-MLI_2453_-_MLI-OTP-0060-5728_MLI_2479_-_MLI-OTP-0060-5754-27 images_CRP</p> <p>[Group 12]-MLI_2539_-_MLI-OTP-0060-5814_MLI_2572_-_MLI-OTP-0060-5847-34 images_CRP</p>		<p>MLI-OTP-0012-1907</p>

<p><b>Petit marché (15)</b></p>	<p>Drone_Site15</p>	<p>[Group 0]-MLI_2745_-_MLI-OTP-0060-5957_MLI_2749_-_MLI-OTP-0060-5961-5 images_CRP  [Group 0]-MLI_2756_-_MLI-OTP-0060-5968_MLI_2757_-_MLI-OTP-0060-5969-2 images_CRP  [Group 0]-MLI_2759_-_MLI-OTP-0060-5971_MLI_2763_-_MLI-OTP-0060-5975-5 images_CRP  [Group 0]-MLI_2764_-_MLI-OTP-0060-5976_MLI_2777_-_MLI-OTP-0060-5989-14 images_PIX_CRP  [Group 0]-MLI_2782_-_MLI-OTP-0060-5994_MLI_2790_-_MLI-OTP-0060-6002-9 images_CRP  [Group 0]-MLI_2998_-_MLI-OTP-0060-6209_MLI_3010_-_MLI-OTP-0060-6221-13 images_CRP  [Group 0]-MLI_3011_-_MLI-OTP-0060-6222_MLI_3021_-_MLI-OTP-0060-6232-11 images_CRP  [Group 0]-MLI_3022_-_MLI-OTP-0060-6233_MLI_3033_-_MLI-OTP-0060-6244-12 images_CRP</p>		<p>MLI-OTP-0018-0056  <b>MLI-OTP-0018-0184</b>  <b>MLI-OTP-0018-0190</b>  <b>MLI-OTP-0018-0284</b>  MLI-OTP-0018-0307  <b>MLI-OTP-0018-0401</b>  MLI-OTP-0018-0483  MLI-OTP-0018-0484  MLI-OTP-0018-0485  <b>MLI-OTP-0018-0744</b></p>
<p><b>Hôtel Azalaï (17)</b></p>	<p>Drone_Site17</p>	<p>[Group 0]-MLI_3119_-_MLI-OTP-0060-6398_MLI_3147_-_MLI-OTP-0060-6426-29 images_PIX_CRP  [Group 0]-MLI_3303_-_MLI-OTP-0060-6581_MLI_3333_-_MLI-OTP-0060-6611-31 images_CRP  [Group 2]-MLI_3366_-_MLI-OTP-0060-6644_MLI_3393_-_MLI-OTP-0060-6671-28 images_CRP  [Group 4]-MLI_3213_-_MLI-OTP-0060-6491_MLI_3239_-_MLI-OTP-0060-6517-27 images_CRP  [Group 6]-MLI_3273_-_MLI-OTP-0060-6551_MLI_3301_-_MLI-OTP-0060-6579-29 images_CRP  [Group 10]-MLI_3847_-_MLI-OTP-0060-7121_MLI_3876_-_MLI-OTP-0060-7150-30 images_PIX_CRP</p>		<p><b>MLI-OTP-0012-1545</b>  <b>MLI-OTP-0012-1549</b>    MLI-OTP-0018-0328  <b>MLI-OTP-0018-0385</b>    MLI-OTP-0018-0394  MLI-OTP-0018-0395  <b>MLI-OTP-0018-0643</b>  <b>MLI-OTP-0018-0644</b>  <b>MLI-OTP-0018-0648</b>  <b>MLI-OTP-0018-0649</b>  <b>MLI-OTP-0018-0650</b>  MLI-OTP-0018-0651  <b>MLI-OTP-0018-0652</b></p>

				<b>MLI-OTP-0018-0653</b> <b>MLI-OTP-0018-0658</b> MLI-OTP-0018-0661 MLI-OTP-0069-3577 MLI-OTP-0069-3578 MLI-OTP-0069-3579 MLI-OTP-0069-3580 MLI-OTP-0069-3581 MLI-OTP-0069-3646 MLI-OTP-0069-3649 MLI-OTP-0069-3650
<b>Place Sankoré</b> <b>(18)</b>	Drone_Site18	[Group 0]-MLI_4907_-_MLI-OTP-0060-7741_MLI_4949_-_MLI-OTP-0060-7783-43 images_PIX_CRP [Group 0]-MLI_4952_-_MLI-OTP-0060-7786_MLI_4987_-_MLI-OTP-0060-7821-36 images_PIX_CRP [Group 0]-MLI_4988_-_MLI-OTP-0060-7822_MLI_5018_-_MLI-OTP-0060-7852-31 images_PIX_CRP [Group 0]-MLI_5020_-_MLI-OTP-0060-7854_MLI_5053_-_MLI-OTP-0060-7887-34 images_PIX_CRP [Group 0]-MLI_5054_-_MLI-OTP-0060-7888_MLI_5094_-_MLI-OTP-0060-7928-41 images_PIX_CRP		MLI-OTP-0001-6954 MLI-OTP-0018-0243 <b>MLI-OTP-0018-0244</b> <b>MLI-OTP-0018-0245</b> <b>MLI-OTP-0018-0246</b> MLI-OTP-0018-0247 MLI-OTP-0018-0248 MLI-OTP-0018-0251 MLI-OTP-0018-0252 <b>MLI-OTP-0018-0253</b> MLI-OTP-0018-0254 MLI-OTP-0018-0255

				MLI-OTP-0018-0256 <b>MLI-OTP-0018-0286</b> MLI-OTP-0018-0291 MLI-OTP-0018-0292 <b>MLI-OTP-0018-0408</b> <b>MLI-OTP-0039-0574</b>
<b>Hôtel La Maison (19)</b>	Drone_Site19	[Group 0]-MLI_5393_-_MLI-OTP-0060-8232_MLI_5446_-_MLI-OTP-0060-8285-54 images_PIX_CRP [Group 0]-MLI_5497_-_MLI-OTP-0060-8336_MLI_5545_-_MLI-OTP-0060-8384-49 images_PIX_CRP [Group 0]-MLI_5605_-_MLI-OTP-0060-8444_MLI_5658_-_MLI-OTP-0060-8497-54 images_PIX_CRP [Group 0]-MLI_5662_-_MLI-OTP-0060-8501_MLI_5727_-_MLI-OTP-0060-8566-66 images_PIX_CRP [Group 0]-MLI_6151_-_MLI-OTP-0060-8987_MLI_6159_-_MLI-OTP-0060-8995-9 images_CRP [Group 0]-MLI_6255_-_MLI-OTP-0060-9091_MLI_6262_-_MLI-OTP-0060-9098-8 images_CRP	MLI-OTP-0006-1456 MLI-OTP-0006-2057 MLI-OTP-0006-2081  MLI-OTP-0006-2082 MLI-OTP-0006-2083 MLI-OTP-0006-2084 MLI-OTP-0006-2085 MLI-OTP-0006-2086	MLI-OTP-0001-7369 MLI-OTP-0001-7382 MLI-OTP-0001-7469  <b>MLI-OTP-0018-0102</b> <b>MLI-OTP-0018-0249</b> <b>MLI-OTP-0018-0289</b>