

## Annexe 9

Central Unit, National Crime Squad (DLR)

### OFFICIAL REPORT ON THE PHOTOGRAPH OF THE SMOKE TRAIL

My name is Gerardus Wilhelmus Christiaan THIRY, chief inspector with the National Crime Squad of the Dutch National Police. I have been working as coordinating team leader of the criminal investigation since the start of the investigation into the downing of MH17.

I have over 42 years' experience with combating organised and international crime, gathering criminal intelligence, infiltration, and murder investigations. In addition I have been stationed abroad on several occasions as a liaison officer.

The investigation team I lead consists of investigators and experts with specific skills or knowledge, such as aviation experts, high-tech crime specialists and analysts. In addition, as and when necessary, use was made of experts sworn in by the examining magistrate. On the basis of the findings of the investigation and my knowledge of the facts. I declare as follows:

#### 1. Introduction

Detectives in my investigation team investigated the two photographs of a smoke trail probably caused by the launching of a Buk missile at around 16:20 on 17 July 2014. The investigation team was assisted by the Royal Netherlands Meteorological Institute (KNMI) in evaluating the photos. A KNMI staff member was appointed as expert by the examining magistrate to answer a range of questions arising from the investigation on the basis of meteorological expertise.

#### 2. Publication of photo of the smoke trail

On 17 July 2014, at 19:23:38 local Ukrainian time, the photograph of the smoke trail shown below was posted to a Twitter account under the name @WowihaY.<sup>1</sup> The person concerned enhanced the photo because the smoke trail was barely visible.

*Image 1: enhanced photograph of the smoke trail published by @WowihaY*  
<image>

##### 2.1. Seizure of camera

The camera used to take the photo of the smoke trail and its memory card were seized by a member of my investigation team on 12 August 2014 for the purposes of the investigation. In addition to the photo of the smoke trail referred to above (shown below in its unedited form as image 2), another photo of the smoke trail and a photo of the column of smoke originating from the site where flight MH17 crashed were taken with the same camera. The smoke trail is indicated by a red arrow. The quality of the images as reproduced in this official report are significantly inferior to the same images seen on a screen.

*Image 2: first photograph of the smoke trail*  
<image>

*Image 3: second photograph of the smoke trail*  
<image>

*Image 4: photograph of smoke column at crash site*  
<image>

##### 2.1.2. Camera settings

On 13 August 2014, a member of the investigative team checked the system date and time of the digital camera using the control buttons. In the display of the digital camera referred to above, this team member saw the following date and time: 13/08/2014 12:01 (dd/mm/yyyy and hh:mm) for the UTC+2 time zone, whereas the actual date and time at that moment was 13/08/2014 11:02 (dd/mm/yy hh:mm) for the UTC+1 time zone. Because this investigation was being conducted in the Netherlands during Dutch summer time, another hour

must be added. The reference time was thus UTC+1 +1, in other words UT02. Since there was one hour's time difference in the time given in the display and the Dutch reference time, an hour must also be added to the time shown in the display, so UTC+2+1, or UTC+3. This corresponds to local Ukrainian summertime on 17 July 2014.

### 2.1.3. The camera's metadata

An examination of the camera and memory card revealed the following metadata relating to the three photos referred to above:

Photo 1 smoke trail (image 2): "DSC\_9266.NEF", 2014:07:17,16:25:48 Photo 2 smoke trail (image 3): "DSC\_9265.NEF", 2014:07:17,16:25:41 Photo 3 smoke column from crash site (image 4): "DSC\_9267.NEF", 2014:07:17,16:30:07

## 2.2. Verification of photos by NFI

On 20 August 2014 the Netherlands Forensic Institute (NFI) examined the camera and memory card. The NFI secured the photographs on the memory card. In its report, the NFI stated that the metadata revealed that the photo files from 'DSC\_9265.NEF' to 'DSC\_9267.NEF' (inclusive) were made on 17 July 2014, at around 16:30 according to their time stamps. With regard to the authenticity of the metadata associated with the photo files, the NFI concluded as follows. The file names contain ascending numbers as would be expected in photos taken successively. When a photo is taken, the camera adds a time stamp to the file that corresponds to the current setting of the camera's clock. On the basis of the material supplied to it, the NFI was unable to determine whether the time to which the clock was set diverged from the actual date and time the photos were taken. Both the file names and the metadata belonging to the photo files can be modified. The NFI sees no means of investigating whether the file names and metadata were modified after the photos were taken by the source camera. In this context, it should be noted that the date and time of the three photos referred to above *are* consistent with other findings such as cell tower locations and witness statements.

With regard to the authenticity of the photos, the NFI concluded that it had found no indications that the photo files had been manipulated and that the NFI was unaware of any method for targeted manipulation of the image content of this type of photo file.

## 2.3. Verification of photos by KNMI

A total of 13 photos of the smoke trail and crash site were sent to the KNMI for evaluation. Some of these were zoomed-in and zoomed-out photos of the event referred to above. The KNMI first evaluated the photos of the smoke column rising from the crash site (including image 4) and concluded that the photo had been taken facing north. About 10 kilometres away in a northerly direction lies the crash site of flight MH17 (Grabove). The logical conclusion, according to the KNMI, is that the photo was taken shortly after the crash, at 13:20 UTC (16:20 local Ukrainian summer time). The KNMI could not verify this using the position of the sun, as no shadows are visible in the photo. It further stated that the sky is clearly visible in the photos. It is partly cloudy to overcast, and the clouds are predominantly at medium altitude (altocumulus). This matches the analysis of the cloud cover visible in satellite images.

The KNMI subsequently studied the second photo of the smoke trail (image 3) because this showed the most geographical landmarks. The KNMI enhanced the photograph to increase the contrast.

*Image 5: photo as edited by the KNMI*

<image>

On the basis of this photo the KNMI concluded that this is neither a natural cloud formation nor the contrail (vapour trail) of an aircraft flying at high altitude. In these weather conditions (overcast), an aircraft contrail would not be visible on the horizon but only somewhere near the zenith<sup>2</sup> and then possibly partially merged into the cirrus clouds. According to the KNMI, the phenomenon is clearly vertically oriented and most strongly developed close to the ground (on the horizon). To the left of the vertical trail, smoke can also be seen on the ground, clearly of a different colour.

The KNMI also stated that the photos of the smoke trail (in some cases, after enhancement) show a part of the

sky that is overcast with cirrus clouds. An analysis of the cloud cover in satellite images showed that such a cloud formation could have been present on the afternoon of 17 July 2014. The KNMI pointed out that it was not possible to establish the time the photo was taken on the basis of the direction of shadows, since no shadows are visible either in this photo or in the other photos in the series. Using Google Earth, the KNMI established the left (northerly) and right (southerly) limits of the photo in the satellite image. The vertical trail is roughly in the middle of the photo. This sight line is shown by the KNMI in the image below.

*Image 6: image from the KNMI report*  
<image>

In a new report the KNMI then determined whether conclusions could be drawn from the images of the smoke trail with regard to wind direction and speed, and the illumination of the vertical trail by the sun. The KNMI stated that wind direction at the time of the crash was 60°-90° (northeast to east) in the wider surroundings of the crash site. On the basis of the film

'RAW\_First\_moments\_after\_MH17\_crash\_caught\_on\_camera\_hd720' the KNMI was able to establish that the direction of movement of the smoke trail was approximately 250° (wind direction 70°/northeast to east). In addition, the KNMI stated that in the images the trail was illuminated from the right. The white colour could have been caused by particles in the trail or by illumination by the sun. In the latter case, the image is not incompatible with the weather conditions and the position of the sun on 17 July 2014 at around 13:20 UTC, or 16:20 UTC+3 local Ukrainian summer time.

## **2.4. Investigation into the location**

A member of my investigative team established that it is highly plausible that the photos of the smoke trail referred to were taken from one of the apartment buildings to the north of Torez, looking in a southeasterly direction. In the image below the location where the photos were taken is indicated by the pink camera inside a red square. The orange arrow indicates the direction. This part of the investigation was based on witness statements, the location cited in the article written by the Bellingcat investigative collective entitled 'Examining the MH17 launch smoke photographs',<sup>3</sup> and a comparison of geographical landmarks in satellite photos with those in the photos showing the smoke trail.

*Image 7: satellite photo marked to show location and direction*  
<image>

## **2.5. Two photos of the smoke trail from social media platform VKontakte**

On Thursday 24 March 2016 a member of my investigative team found two photos on the website of social media platform VKontakte showing a white, almost vertical smoke trail. After downloading, the two original photos displayed a 'file modification date'. This is probably the date and time the photo was uploaded to the VKontakte.com website. The date and time shown on the two photos is 17 July 2014, 15:22:23 and 15:22:33 UTC+2 respectively. That corresponds to 16:22:23 and 16:22:33 local Ukrainian time.

*Image 8: photo 1 of smoke trail found on VKontakte*  
<image>

*Image 9: photo 2 of smoke trail found on VKontakte*  
<image>

## **3. Calculations with regard to location**

Shortly after flight MH17 was downed @WowihaY, the Twitter user referred to above, posted an online message calculating the presumed location from where the missile was fired at 16:20 on 17 July 2014." A year later, in 2015, @WowihaY posted another calculation but this time relating to the site

identified by the Bellingcat investigative collective as the likely location from which the missile was fired.<sup>5</sup> This was an agricultural field south of Snizhne and west of the 10522, the road running southwards from

Pervomaiske. On the basis of a range of investigative findings, including witness statements, satellite images and telecommunications data, it was established that this field was the launch site for the missile fired from a Buk TELAR that brought down flight MH17.

### **3.1. First calculation by @WowihaY**

At 02:27 local Ukrainian time on 15 July 2014 @WowihaY posted a message on his/her Twitter account with the image shown below. The message concerned the results of the calculation relating to the conjectured launch site connected to the downing of flight MH17. Two white lines can be seen in the image. According to @WowihaY these lines cross at a point that lies between Snizhne and Chervoniy Zhovten. According to @WowihaY the point of intersection marks the calculated location from which a missile that downed MH17 may have been fired. The site lies in a field south of the city of Snizhne.

*Image 10: @WowihaY's first calculation*

<image>

### **3.2. Second calculation by @WowihaY**

On 18 July 2015 @WowihaY posted a second image showing where the location he/she estimates to be the launch site lies in relation to the burned field previously identified by the Bellingcat investigation collective. In this image, a yellow line can now be seen in addition to the white lines referred to above. According to @WowihaY, the yellow line indicates the distance between the estimated site (where the white lines cross) and the place regarded by Bellingcat as the probable launch site.

*Image 11: @WowihaY's second calculation*

<image>

### **3.3. Investigation with regard to location**

Investigations conducted by a member of my investigation team show that the distance between the location as calculated by @WowihaY in his first tweet and the location regarded both by Bellingcat and my investigation team to be the launch site (see @WowihaY's second tweet) is probably about 960 metres.

*Image 12: calculation of the distance between the locations identified by @WowihaY and Bellingcat*

<image>

## **4. Findings of the investigation**

On the basis of the findings set out above, it is presumed that the smoke trail shown in the photos came from a missile. Shortly after flight MH17 was shot down, an image was posted online on @WowihaY's Twitter account determining the probable launch site on the basis of two lines. The calculations pointed to a location south of Snizhne. A second set of calculations posted on the same account shows the distance between this location and the one considered by the investigative collective Bellingcat to be the launch site. This is also the site considered by this investigation to be the place from which a Buk missile was fired, bringing down flight MH17 at approximately 16:20 on 17 July 2014. The location which @WowihaY's calculations identified is less than a kilometre from this launch site. The above is confirmed by recorded telephone conversations, reports from the National Forensic Investigation Team, reports from external research institutions, cell tower locations, witness statements and an official report describing the sight lines to the smoke trail that was seen by a number of witnesses.

Done as an official report, drawn up under oath of office and concluded and signed by me in Driebergen on Thursday 16 May 2018.

[signed]

G.W.Chr. Thiry [handwritten]

