OPCW

Technical Secretariat

S/1444/2016
21 December 2016
Original: ENGLISH

NOTE BY THE TECHNICAL SECRETARIAT

REPORT OF THE OPCW FACT-FINDING MISSION IN SYRIA REGARDING THE INCIDENT OF 2 AUGUST 2016 AS REPORTED IN THE NOTE VERBALE OF THE SYRIAN ARAB REPUBLIC NUMBER 69 DATED 16 AUGUST 2016

CS-2016-0139(E) distributed 21/12/2016

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1. EXECUTIVE SUMMARY

1.1 At its Forty-Eighth Meeting, the OPCW Executive Council (hereinafter "the Council") adopted a decision entitled "Reports of the OPCW Fact-Finding Mission in Syria" (EC-M-48/DEC.1, dated 4 February 2015) in which, inter alia, it requested the Director-General to provide information on the progress of the Fact-Finding Mission (FFM) and specific plans, schedules, and their implementation to the Council at its next regular session. In response to that request, the Technical Secretariat (hereinafter "the Secretariat") submitted a Note to address the future activities of the FFM (S/1255/2015*, dated 10 March 2015 and Add.1, dated 13 March 2015).

1.2 The Secretariat received Note Verbale 69 (dated 16 August 2016) from the Syrian Arab Republic, providing information about an incident in Al-Awamid, Aleppo, involving the alleged use of chemicals as a weapon. The note verbale included a request that the FFM "investigate a toxic gas attack which took place in Aleppo on August the 2nd, 2016".

1.3 Following this request, the Director-General dispatched a team to collect the facts pertinent to the alleged chemical incident as reported in the aforementioned note verbale. The FFM deployed on 4 September and 11 October 2016. The team was composed of OPCW inspectors and interpreters. During the deployment, the FFM conducted its investigation by collecting testimonies, reviewing documents and information provided by the Syrian authorities, and by visiting certain locations deemed of interest in the Damascus area. In total, the team conducted 25 interviews in relation to the reported incident.

1.4 Regarding the aforementioned alleged incident in Al-Awamid, the FFM is of the view that the persons affected in the incident may have, in some instances, been exposed to some type of non-persistent, irritating substance. The FFM considers that while the general clinical presentation of those affected in the incident is consistent with brief exposure to any number of chemicals or environmental insults, the visual and olfactory description of the potential irritant does not clearly indicate any specific chemical.

1.5 Furthermore, based on the evidence presented by the National Authority of the Syrian Arab Republic, the medical records that were reviewed, the results of the sample analyses, and the prevailing narrative from all of the interviews, the FFM cannot confidently determine whether or not a specific chemical was used as a weapon in the investigated incident. From the results of the analyses of the samples, the FFM is of the opinion that none of the chemicals identified are likely to be the cause of death of the casualties in the reported incident.

2. FACT-FINDING MISSION BACKGROUND INFORMATION

2.1 The Secretariat received Note Verbale 69 (dated 16 August 2016) from the Syrian Arab Republic requesting the OPCW to investigate a toxic gas attack that took place in Aleppo on 2 August 2016.

2.2 Contained in this note verbale was Letter No. 122 (dated 15 August 2016), which provided information regarding an incident that occurred in the Al-Awamid area of Aleppo on 2 August 2016. The information in this letter described an incident in which six people were killed and a further 20 people were injured when projectiles containing toxic gas were used. The note verbale further indicated that the casualties were transferred to the Zahi Azraq Hospital, Aleppo, where they were treated with oxygen, intravenous fluids, and antibiotics. The casualties were complaining of immediate burns in the face and eyes, with severe headaches and general lethargy, dryness of the mouth, and loss of consciousness. On arrival at the hospital, it appears that some of the casualties were agitated and exhibiting signs of a clouded consciousness. A number of laboratory analyses, including acetylcholinesterase analysis, were conducted. According to the letter, acetylcholinesterase levels were within normal range, and the possibility of Sarin was excluded. However, it was concluded that, due to the neurological symptoms, the likely agent was mustard, though a differential diagnosis could not exclude carbon monoxide or chlorine.

2.3 Letter No. 122 contained a request by the Syrian Arab Republic that the FFM should be tasked with looking into the allegations of the use of chemical weapons in the Syrian Arab Republic in order to investigate the described incident.

2.4 Letter No. 122 also contained the minutes of a meeting of a committee established by the Health Directorate to look into the described incident, a report from the Zahi Azraq Hospital (dated 4 August 2016), and an autopsy report issued by the Forensic Medicine Centre in the Aleppo Directorate.

2.5 The minutes of the meeting described the actions of the staff at the hospital and further details regarding areas that could improve the hospital’s response to any future incidents.

2.6 The medical report listed the 20 casualties who were admitted to the emergency department of the Zahi Azraq Hospital on 2 August 2016. The report described a diverse range of symptoms that were exhibited by the casualties, as well as the treatment that was given. The report indicated that, though unconfirmed, the likely agent was mustard, with a differential diagnosis of carbon monoxide or chlorine. All of the admitted patients were discharged from the hospital in good health on the morning of 3 August 2016.

2.7 The autopsy report provided a description of one of the fatalities with a list of toxicological signs. It stated the cause of death as heart and respiratory failure, caused by an inhalation of a toxic gaseous substance.

3. INITIAL DEPLOYMENT

3.1 The initial deployment was comprised of the mission team leader and three team members who carried out preparatory activities from 4 to 9 September 2016. This

team conducted several meetings with the National Authority of the Syrian Arab Republic to discuss details of a follow-on deployment, and gathered information associated with the incident that the National Authority provided. This included medical records of casualties, names of individuals affected, and hospital staff.

3.2 Additionally, the team was allowed access to the Scientific Studies and Research Centre (SSRC) in Barzi to inspect samples that were collected by the National Authority, and the team was able to take and secure splits of these samples for further analysis by the OPCW at a designated laboratory. A full list of collected documents and samples can be found in Annexes 2, 3, 5, and 8 to this report.

3.3 The composition of the team deployed from 4 to 9 September 2016 was as follows:

Advance team of the Fact-Finding Mission

No.	Function	Speciality
1.	Team Leader	Inspection Team Leader
2.	Confidentiality Officer	Analytical Chemist Inspector
3.	Logistics Officer	Chemical Weapons Munitions Specialist
4.	Interpreter	N/A

3.4 The advance team returned to OPCW Headquarters and commenced preparations for the second deployment, which included the development of the mandate, equipment and interview kit preparation, and other routine logistic and operational planning.

4. SECOND DEPLOYMENT

4.1 The second deployment was comprised of the Inspection Team Leader, Deputy Team Leader, three subteam members, and two interpreters; the team deployed from 11 to 20 October 2016.

Main composition of the Fact-Finding Mission

No.	Function	Speciality
1.	Team Leader	Inspection Team Leader
2.	Deputy Team Leader	Chemical Weapons Munition Specialist Inspector
3.	Interview subteam member	Analytical Chemist Inspector
4.	Interview subteam member	Analytical Chemist Inspector
5.	Interview subteam member	Advance Health and Safety Specialist Inspector
6.	Interpreter	N/A
7.	Interpreter	N/A

4.2 Upon arrival, the team met with the National Authority of the Syrian Arab Republic to hand over the mandate and discuss the mission plan for the coming days. This included notification of those to be interviewed, scheduled times for movements to the SSRC in Barzi to repackage and take custody of the previously secured samples, and the development of the investigative steps moving forward.

4.3 Over the course of the deployment, the team conducted 25 interviews with various individuals involved in the full scope of the incident. These individuals were chosen based on their qualifications and relationship to the incident, based on information

provided by the National Authority of the Syrian Arab Republic during the first deployment. They included casualties, medical treatment personnel, National Authority representatives who retrieved samples from the hospital and incident site, as well as SSRC personnel who conducted the initial analysis of the collected samples. A list of those interviewed can be found in paragraph 4.4 below and Annex 3 to this report.

4.4 List of interviews conducted between 12 and 19 October 2016

List of Interviewees			
DCN	**Profession**	**DCN**	**Profession**
10000	Soldier	10038	Civil Defence member
10001	Civil Defence member	10043	Resident doctor
10002	Firefighter	10045	Nurse
10003	Firefighter	10046	Civil Defence member
10004	Soldier	10047	Doctor, toxicologist
10005	Civil Defence member	10048	Emergency department doctor
10006	Firefighter	10049	Nurse
10013	Lab staff	10051	Internal medicine doctor
10032	Firefighter	10052	Firefighter
10034	Firefighter	10041	Chemist
10035	Firefighter	10040	Senior officer, Syrian Arab Army
10036	Firefighter	10044	Senior staff member, SSRC
10037	Senior firefighter		

4.5 The FFM was provided with additional documentation, including X-rays and photographs, for this reported incident (see Annex 2 to this report).

4.6 The data analysis and methodology for interviews employed by the FFM was consistent with OPCW standard operating procedures and is further discussed in Section 5 of this report.

5. DATA ANALYSIS

Data analysis methodology employed by the Fact-Finding Mission

5.1 The FFM inspectors conducted an analysis of the alleged incident, with a focus on identifying aspects related to the use of chemicals as a weapon. The analysis methodology used by the team to evaluate interviews and documents provided by the authorities of the Syrian Arab Republic is described in this report in paragraphs 5.4 to 5.7 under “Interview Analysis Methodology” and paragraph 5.37 under “Analysis of Information Provided to the Fact-Finding Mission in the Form of Documents and Services”.

5.2 The analysis of the medical information provided to the FFM in the form of records, services, and testimonies collected by the team was carried out by the medical personnel within the FFM.

5.3 Both of the analyses specified in paragraphs 5.1 and 5.2 were taken into account in fulfilling the FFM's mandate.

Interview analysis methodology

5.4 The interview analysis methodology employed by the FFM allowed individual accounts to be collated into a prevailing narrative, where factual content could be extracted and reported according to the mandate. The various steps of this methodology are described in the paragraphs below.

5.5 First, the audio and video records of each interview conducted by the team were translated and transcribed into English by qualified interpreters in order to facilitate their thorough analysis.

5.6 Then, the verbal content of each interview (the video, audio, and transcripts thereof) was carefully reviewed by at least two FFM inspectors. In order to organise the individual responses, a timeline-based analysis table was produced. This allowed each respondent's description of locations, sights, sounds, smells, and actions to be categorised according to relevant variables. During the interview review process, the FFM inspectors matched the interviewees' responses with their respective variables in the analysis table. The result for each interview was a unique description of the evolving, sequential event, from the perspective of that individual interviewee. Once all relevant narratives had been individually assembled, they were compared against one another to identify commonalities and discrepancies.

5.7 Commonalities formed the basis of the prevailing narrative, and discrepancies were analysed to determine their significance. Given that some of the interviewees were themselves casualties and that there were significant ongoing combat operations in the area, the FFM anticipated reasonable discrepancies in the events recalled from respondents. In cases where discrepancies were minor or of little consequence to establishing a prevailing narrative (i.e., the recollection of general timings and distances), they were disregarded. In cases where discrepancies were more significant or starkly deviated from the prevailing narrative, they were noted and assessed further in the context of other evidence to see if they could be reconciled. If reconciliation with the prevailing narrative was not possible, the discrepant narrative could be considered limited in value and therefore difficult to objectively address the FFM's mandate aims.

5.8 The information and services provided to the FFM by the authorities of the Syrian Arab Republic are listed in this report under Annexes 2 and 5. The FFM reviewed the information provided in order to gather facts regarding the incident involving the alleged use of toxic chemicals.

Analysis of the incident in the Al-Awamid area of Aleppo on 2 August 2016

5.9 The prevailing narrative established by a review of all of the interviews relating to this reported incident is as follows:

(a) The information provided by the testimonies of those interviewed is that some form of combat operation was ongoing in the Al-Awamid area of Aleppo (Al-Hamam Point in the Al-Aqaba area). Soldiers of the Syrian Arab Army

(SAAR) were engaged in a battle, which reportedly had begun two to three days before 2 August 2016, with members of an armed opposition group.

(b) Between 16:00 and 17:00 on 1 August 2016, SAAR soldiers were alerted to the presence of a tunnel, which was approximately 25 metres long and 7 metres deep. The armed opposition group attempted to blow up the tunnel, but it appears that only a small section collapsed.

(c) At 21:00 on 1 August 2016, SAAR soldiers were ordered to destroy the remaining sections of the tunnel, as it could still be used by armed opposition groups. SAAR soldiers dug several metres into the tunnel in order to set the explosive charges. They used six explosive cylinders which had been seized from armed opposition groups, or unexploded devices which had been fired at SAAR positions. These cylinders had been described as “hell cannons” or mortars, which comprised a gas cylinder (approximately 25 kg in weight and 1 metre in length) with a detonator.

(d) Prior to the initiation of the main charges by the SAAR, soldiers were dispatched to inspect a portion of the tunnel. It appears that the soldiers were able to enter and return from this inspection with no ill effects. The SAAR detonated the main charges at approximately 4:00 on 2 August 2016.

(e) The SAAR waited until between 11:30 and 12:00 on 2 August 2016 before sending two soldiers into the tunnel to ensure that the desired effect had been achieved and that the tunnel could no longer be used by armed opposition group forces. It appears that the soldiers entered the tunnel without any respiratory protection and did not return to the surface when called. While these soldiers were in the tunnel, another soldier, stationed in the area near the opening of the tunnel, described a strange, strong odour coming up from the tunnel.

(f) A decision was made to send an additional two soldiers with masks and canisters into the tunnel, and these soldiers also did not reply to calls. A total of four soldiers were now down in the tunnel and not responding to calls.

(g) Rescue operations then commenced with the assistance of the Syrian Civil Defence and firefighters. The first person from the Civil Defence entered the tunnel equipped with a self-contained breathing apparatus (SCBA) and two ropes to assist in bringing the victims out. Within one minute of entering the tunnel, both ropes went slack and there was no response to verbal calls. There were now five individuals in the tunnel.

(h) Firefighters then arrived and were briefed on the ongoing situation. A firefighter entered the tunnel equipped with an SCBA and two ropes to attempt a rescue. A minute to a minute and a half after entering the tunnel, this firefighter failed to respond to verbal calls and both ropes appeared to be unattached. There were now six individuals in the tunnel.

(i) It is assessed that these individuals were unconscious at that point, and were presumed to have become fatalities. When they entered into the tunnel, the first two victims had no respiratory protection, the second two wore facemasks

and canisters, and the last two were equipped with SCBAs, the cylinders of which were reportedly filled with oxygen.

(j) At this point of the operation, four oxygen cylinders were lowered into the tunnel one at a time, in an attempt to increase oxygen levels. Water was also sprayed into the mouth of the tunnel.

(k) Between 15:30 and 16:00, a third rescuer, a member of the Civil Defence, entered the tunnel again equipped with an SCBA and two ropes. While being lowered into the tunnel, he complained of dizziness and tightness in his chest, and was then pulled out. After a short rest, he was again lowered into the tunnel. When he reached the bottom of the tunnel, he indicated to be taken out of the tunnel. Upon extraction, he reported there was no strength in his hands; he was given water and then collapsed. Afterwards, he was transported to Al-Razi Hospital for treatment.

(l) A fourth rescuer, a member of the Civil Defence, entered the tunnel, again equipped with an SCBA and two ropes. He attached the rope to a victim; he was then extracted, followed by the victim. This victim was still wearing his SCBA and appeared to be unresponsive.

(m) A firefighter, who was part of a rescue team but did not enter into the tunnel, began performing mouth-to-mouth resuscitation, while another firefighter attempted chest compressions on a rescued victim. One of these firefighters started to feel tightness in his chest and developed a headache, and dizziness. It was reported that “a strange smell was coming off the casualty, and a heat was radiating out of him”. The rescuer who was performing the resuscitation touched his own face with his hands (which had been holding the casualty) and his face and hands started to burn and itch.

(n) The fourth rescuer, who was involved in the retrieval of four casualties from the tunnel, reports that he collapsed, short of breath, and his verbal response was not normal. He was sent to the Al-Razi Hospital for further treatment.

(o) A fifth rescuer, a firefighter, entered the tunnel and attached the rope to the fifth casualty, who was reported to have been wearing a face mask with a filter. This firefighter repeated the same process for the sixth casualty; as he was tying up the last casualty, he started to get a headache and experienced shortness of breath. This rescuer then collapsed while walking to the ladder at the base of the tunnel, and he too was retrieved by the attached rope and sent to the Al-Razi Hospital.

(p) None of those interviewed could describe the smell, except to say that it was a strange, weird, or strong smell that they had never experienced before and could not identify. The smell increased closer to the entrance of the tunnel and when the oxygen cylinders were lowered into the tunnel. A particularly strong smell came off the bodies of the casualties when they were retrieved from the tunnel. It was not a gunpowder or explosive smell that any of the interview participants had experienced before.

(q) Throughout the whole incident, there was ongoing intense fighting, including with a number of mortars and projectiles landing in close proximity to the tunnel. This fighting hindered and prolonged the rescue operation.

(r) Many of the interviewees had difficulty identifying the exact incident location on a map. However, there was consistency in that the interviewees could identify local landmarks, which were corroborated by the Syrian Arab Republic National Authority's reporting of the GPS coordinates of the incident location.

(s) As previously described, captured enemy "hell cannon mortars" were used to assist in demolishing the tunnel. The actual content of these munitions is unknown.

Discrepancies

5.10 Some soldiers stated they could smell the odour with face masks/filters on, while others could not smell anything.

5.11 The exact timeline of the incident is not entirely clear. It was reported that there was a "fierce battle raging" for several days with intense shelling of the area. What is clear is that, at some point, the tunnel was discovered and an attempt was made to destroy it. There is no clear indication of what was in or around the tunnel prior to the attempt to destroy it.

Hospital phase of the alleged event

5.12 Between 16:00 and 16:30 on 2 August 2016, the first patient arrived, closely followed by additional casualties with similar symptoms: e.g., headache, dizziness, shortness of breath, dry mouth, and itchy skin. The last case arrived at approximately 19:00 on 2 August 2016. In total, 20 patients were treated.

5.13 It appears that not all of the patients entered the tunnel; some had been outside.

5.14 All patients were stripped of their clothes, washed with soap and water, and dressed in hospital gowns. The majority of the patients were washed in the emergency department prior to going to the ward for further treatment.

5.15 Acetylcholinesterase (AChE) levels for some of the patients were checked to rule out the use of sarin. They also received atropine injections due to the agitation and constricted pupils, but when the blood results returned within normal limits, these tests were ceased.

5.16 Overall, oxygen saturations, blood pressure, and pulse readings were normal, as were all blood results (AChE, complete blood count, glucose, urea, and creatinine). Chest X-rays were also conducted on some patients and appeared normal.

5.17 No smell or any visual signs of skin irritation were noted, despite the patients complaining of itchiness.

5.18 The patients displaying altered consciousness generally woke up within four to five hours after arriving to the hospital, and were complaining of dizziness and headache. Prior to loss of consciousness, these patients complained of headache, dizziness, dry mouth, burning sensation, limb fatigue, nausea, vomiting, and overall varied symptoms. No patients were admitted to the intensive care unit or required intubation.

5.19 The medical staffs involved in the treatment were unable to identify any toxic substance that may have affected the patients.

5.20 The clothing from three of the casualties was stored in the director's office and handed over to the National Authority representatives on 28 August 2016, when they visited the hospital. The team was later granted access to the clothing for sampling purposes.

Described symptoms and treatment

5.21 In general, all patients were decontaminated with soap and water.

5.22 In some cases, intravenous access was gained with oxygen, saline fluids, and symptomatic drugs being administered on a case-by-case basis.

5.23 Some patients were prescribed antibiotics to prevent pneumonia, ranitidine for stomach complaints, and salbutamol inhalers for respiratory relief.

5.24 Despite normal oxygen saturations readings prior, it appears that shortness of breath or tightness in the chest was resolved with oxygen and salbutamol treatment where indicated.

5.25 Unconscious patients were monitored closely, but no definitive airway treatment was required.

5.26 Many patients were discharged either on the same day or within one to two days. The longest hospital stay was three days. Many patients continued with symptomatic medications for one to two weeks following the event.

5.27 Some patients were still complaining of symptoms (fatigue, shortness of breath, bitter taste in mouth, thirst, and headache) at the time of the interviews in October 2016.

Discrepancies

5.28 Some patients had no ongoing symptoms, while others complained of fatigue or had headaches, dry mouth, or were thirsty for weeks following the alleged event.

5.29 There was no specific pattern in the presentation of signs and symptoms in the patients. Some were confused and highly agitated, while others were calm. Other signs and symptoms included: altered consciousness, conjunctivitis, headache, irritated airways, shortness of breath or a feeling of suffocation, fatigue, dizziness, dry mouth, and burning sensation or itchiness of the skin, along with red eyes and red skin.

Sampling committee phase of the alleged event

5.30 A group comprised of three National Authority representatives was tasked with travelling to Aleppo between 27 and 29 August 2016 to conduct a preliminary investigation into the incident. This included travelling to the site, collecting samples, interviewing individuals connected with the incident, and collecting applicable medical data.

5.31 The committee travelled to the impact site and Al-Razi Hospital and interviewed soldiers, Civil Defence members, firefighters, and medical staff who were directly involved in the incident. They were handed samples that were reported to have come from the deceased, the patients, and the soil from the site (this soil was taken from the surface above the tunnel, as the latter was no longer accessible).

5.32 The chemical specialist in the group tested the samples for traces of chemical agents, chlorine, carbon monoxide/dioxide, nitrogen monoxide/dioxide, phosgene, hydrogen sulfide, hydrogen cyanide, cyanogen chloride, ammonia, and amines. The specialist could only report that there were increased ammonia readings on the tested clothing from the hospital (3 to 6 parts per million).

Discrepancies

5.33 There was a small variance in dates and times reported by the National Authority committee members; overall, however, their narratives were consistent.

Scientific Studies and Research Centre phase of the alleged event

5.34 The laboratory conducted a preliminary screening of the samples for mustard, cyanide, phosgene, chlorine, carbon monoxide, and nerve agents. A Dräger XAM 7000 device and colorimetric tubes were used for the screening of the above-mentioned substances. In addition, gas chromatography-mass spectrometry (GC-MS) and Fourier transform infrared spectroscopy (FTIR) were used to analyse the samples. Several compounds were identified in the samples, but no final conclusion was reached.

5.35 It was reported that the analytical chemistry laboratory at the SSRC is not specialised in the analysis of Chemical Weapons Convention-related substances.

Discrepancies

5.36 The laboratory equipment used to conduct the analyses is lacking calibration and maintenance logs.

Analysis of information provided to the Fact-Finding Mission in the form of documents and services

5.37 The information and services provided by the National Authority of the Syrian Arab Republic assisted the FFM in clarifying the following:

(a) the document entitled “Report on Poisoning with Toxic Gases on 02/08/2016”, which offered a brief description of the alleged incident that took place on

2 August 2016, in Aleppo (referred to in Letter No. 122, dated 15 August 2016). This document provides an overview of the incident, as well as information regarding the location of the incident, the name of an armed opposition group reported to have been involved in the incident, photos of the location, images of some of the deceased persons, and the names of the casualties and patients. The document also describes the rescue operation, the hospital treatment, the type of blood samples, and casualty signs and symptoms;

(b) several samples were collected by the National Authority committee but not all were analysed. The results of those that had been analysed were provided to the FFM;

(c) images from Google Earth were also provided by the National Authority of the Syrian Arab Republic detailing the location related to the reported incident in Aleppo on 2 August 2016; and

(d) the National Authority provided the FFM with medical records of patients treated at Al-Razi Hospital.

6. CONCLUSIONS

6.1 While the prevailing narrative provided by the testimonies of those interviewed describes some form of ongoing combat operations in the Al-Awamid area of Aleppo (Al-Hamam Point in Al-Aqaba area), the FFM is of the view that those affected in the alleged incident may have, in some instances, been exposed to some type of non-persistent, irritating substance.

6.2 However, the FFM considers that while the general clinical presentation of those affected in the incident is consistent with brief exposure to any number of chemicals or environmental insults, the visual and olfactory description of the potential irritant does not clearly indicate any specific chemical.

6.3 Based on the evidence presented by the National Authority of the Syrian Arab Republic, the medical records that were reviewed, the results of the sample analyses, and the prevailing narrative of all of the interviews, the FFM cannot confidently determine whether or not a specific chemical was used as a weapon in the investigated incident. From the results of the analyses of the samples, the FFM is of the opinion that none of the chemicals identified are likely to be the cause of death of the casualties in the reported incident.

7. FACT-FINDING MISSION MANDATED AIMS

7.1 Gather facts regarding the incident of alleged use of toxic chemicals as a weapon, as detailed in Letter No. 122 from the Syrian Arab Republic (dated 15 August 2016), mindful that the task of the FFM does not include the question of attributing responsibility for the alleged use.

7.2 Report to the Director-General upon conclusion of FFM activities.

8. OPERATIONAL INSTRUCTIONS

8.1 Review and analyse all available information pertaining to the reported incident of alleged use of toxic chemicals as a weapon.

8.2 Collect testimonies from persons alleged to have been affected by the use of toxic chemicals as a weapon, including those who underwent treatment, eyewitnesses of the alleged use of toxic chemicals, medical personnel, and other persons who had treated or come into contact with persons who may have been affected by the alleged use of toxic chemicals, as detailed in Letter No. 122 from the Syrian Arab Republic (dated 15 August 2016).

8.3 If possible, and where safe to do so, visit the hospitals and other locations as deemed relevant to the conduct of its investigations.

8.4 Examine and, if possible, collect copies of the hospital records, including patient registers, treatment records, and any other relevant records, as deemed necessary.

8.5 Examine and, if possible, collect copies of any other documentation and records deemed necessary.

8.6 Take photographs and examine and, if possible, collect copies of video and telephone records.

8.7 Recover the samples held on behalf of the FFM at the Scientific Studies and Research Centre (SSRC) in Barzi, Damascus.

8.8 If possible, and deemed necessary, physically examine and take samples from remnants of cylinders, containers, etc. alleged to have been used during the incident under investigation.

8.9 If possible, and deemed necessary, collect environmental samples at the alleged point of the incident and surrounding areas.

8.10 Provide the Government of the Syrian Arab Republic with a duplicate or a portion of each environmental sample, if any, and, to the extent possible, a duplicate or portion of each of the biomedical samples collected in the course of the mission.

8.11 Cooperate fully with the relevant Syrian authorities with regard to all aspects of the mission.

8.12 Conduct all activities of the FFM in accordance with the relevant procedures of the Secretariat relating to the conduct of inspections during contingency operations, as applicable.

9. SIGNATURE

This Fact-Finding Mission report was submitted on 20 December 2016 in English.

[Signed]
Steven Wallis
Mission Leader

Annex 1

LIST OF CORRESPONDENCE WITH THE NATIONAL AUTHORITY OF THE SYRIAN ARAB REPUBLIC

Name	DCN	Date	Info
Letter No. 122 SAR	#0185197	15/08/2016	Correspondence regarding toxic gas attack
NL 69 SAR	#0156350	16/08/2016	Correspondence regarding toxic gas attack
Letter to SAR, L/ODG/205745/16	#6568/023	30/08/2016	Advance team deployment
NV/ODG/206055/16	#6568/024	19/09/2016	Request to provide more information about alleged incident on 06/09/16
Letter to SAR, L/ODG/206193/16	#66568/025	26/09/2016	FFM main body deployment
SAR NV 96	#0125532	02/11/2016	Response to L/ODG/CDB/206391/16
NV/ODG/206802/16	#6597/059	03/11/2016	Request to provide more information about alleged incidents
SAR NV 106	#0125539	16/11/2016	Response to L/ODG/HP/206055/16

Annex 2

LIST OF INFORMATION RECEIVED/HANDED OVER DURING DEPLOYMENTS

First Deployment				
No.	**DCM**	**Description**	**Date Received/Handed Over**	
1.	6568/012	SD card - copies of photos from sampling	07/09/2016	Handed over
2.	6568/013	List of the seals applied on the samples	07/09/2016	Handed over
3.	6568/014	Copies of 20 medical records	07/09/2016	Received
4.	6568/015	Preliminary laboratory results of analysis	07/09/2016	Received
5.	6568/016	Report on poisoning with toxic gases on 02/08/16	07/09/2016	Received
6.	6568/017	Package of documents Aleppo 02/08/16	07/09/2016	Received
7.	6568/018	X-ray images	07/09/2016	Received
8.	6568/019	Package - CD with photos and lab results	07/09/2016	Received
Second Deployment				
No.	**DCM**	**Description**	**Date Received/Handed Over**	
1.	6597/012	Comparative list of names in English	12/10/2016	Handed over
2.	6597/013	Comparative list of names in Arabic	12/10/2016	Handed over
3.	6597/037	List of medical staff to be interviewed	12/10/2016	Handed over
4.	6597/038	List of interviewees	12/10/2016	Handed over
5.	6597/043	20 medical records - original	16/10/2016	Received
6.	6597/044	Copy of 1 medical record	16/10/2016	Received
7.	6597/046	List of seals - samples in joint custody	17/10/2016	Handed over
8.	6597/047	List of seals - samples for off-site analysis	17/10/2016	Handed over
9.	6597/049	SD card - copies of photos of samples packing	18/10/2016	Handed over

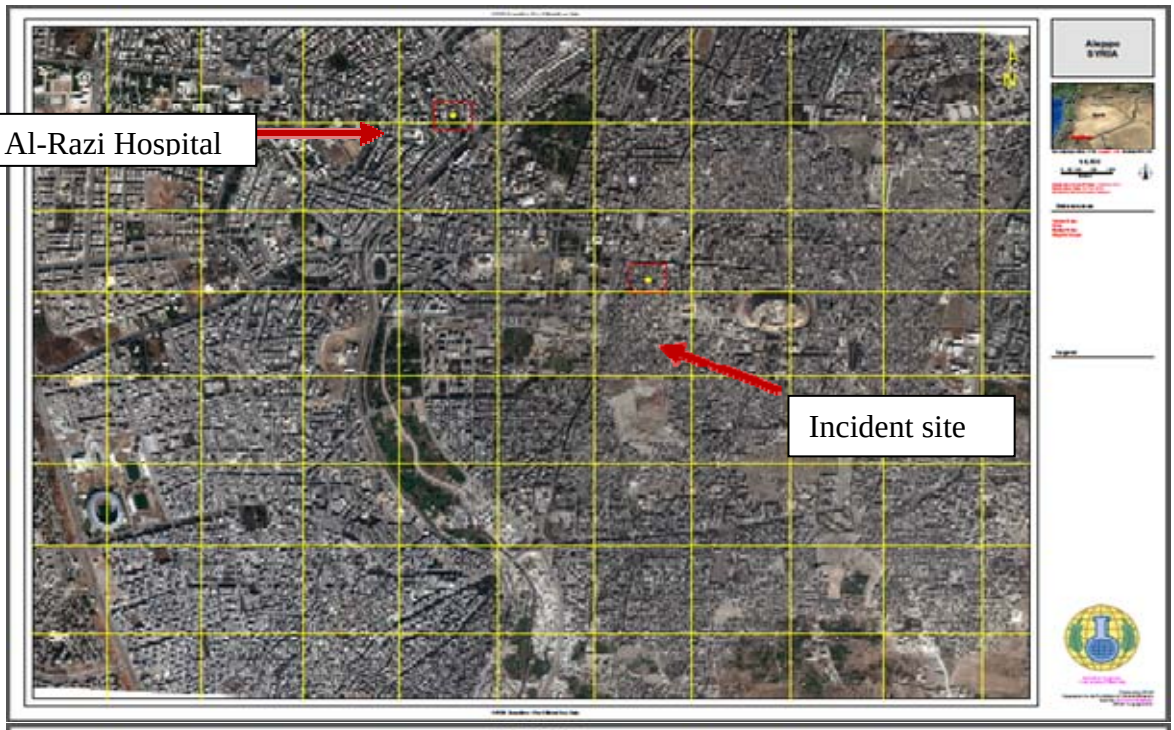
Annex 3

LIST OF INTERVIEWEES FROM THE SECOND DEPLOYMENT

DCN	Profession	Date of interview	DCN	Profession	Date of interview
10000	Soldier	13/10/2016	10038	Civil Defence member	15/10/2016
10001	Civil Defence member	13/10/2016	10043	Resident doctor	14/10/2016
10002	Firefighter	13/10/2016	10045	Nurse	14/10/2016
10003	Firefighter	13/10/2016	10046	Civil Defence member	15/10/2016
10004	Soldier	13/10/2016	10047	Doctor, toxicologist	14/10/2016
10005	Civil Defence member	13/10/2016	10048	Emergency department doctor	14/10/2016
10006	Firefighter	13/10/2016	10049	Nurse	14/10/2016
10013	Lab staff	17/10/2016	10051	Internal medicine doctor	14/10/2016
10032	Firefighter	15/10/2016	10052	Firefighter	15/10/2016
10034	Firefighter	15/10/2016	10041	Chemist	18/10/2016
10035	Firefighter	15/10/2016	10040	Senior officer, Syrian Arab Army	18/10/2016
10036	Firefighter	15/10/2016	10044	Senior staff member, SSRC	18/10/2016
10037	Senior firefighter	15/10/2016			

Annex 4

MAPPING OF INCIDENT LOCATION



Annex 5

LIST OF SAMPLES

No.	Sample Code	Description
1.	SD06S	Unheated carbon from canister
2.	SD07S	Heated carbon from canister
3.	SD13B	Canister (blank)
4.	SD08S	Filter content - metal oxide
5.	SD09S	Filter content - mixed carbon/metal oxide
6.	SL04S	Soil sample
7.	SL05S	Soil sample
8.	SD01S	Textile sample (black)
9.	SD02S	Textile sample (black/green)
10.	SD03S	Textile sample (orange hi vis)
11.	WP11S	Wipe sample from filter
12.	WP12S	Wipe from respirator face piece
13.	WP10B	Cotton and DCM (blank)
14.	WP10S	Wipe from O cylinder

Annex 6

SELECT SAMPLE PHOTOGRAPHS

Samples as initially received during first deployment:

Post-packaging for storage

Second deployment: Samples repackaged for transport to OPCW Laboratory

Annex 7

LIST OF MATERIAL GATHERED DURING THE INTERVIEW PROCESS

Entry	ERN	DCN	Interviewee Name / Code	Evidence Description	Evidence Collected/Received	
					When (Date and Time)	Where
1.	201610141004701	10047	10047	1 x MSD Audio Recording	14/10/2016 16:30	Damascus
2.	201610141004702	10047	10047	1 x SD Card Video Recording	14/10/2016 16:30	Damascus
3.	201610141004301	10043	10043	1 x MSD Audio recording	14/10/2016 16:30	Damascus
4.	201610141004302	10043	10043	1 x SD Card Video Recording	14/10/2016 16:30	Damascus
5.	201610141004901	10049	10049	1 x MSD Audio Recording	14/10/2016 16:35	Damascus
6.	201610141004902	10049	10049	1 x SD Card Video Recording	14/10/2016 16:35	Damascus
7.	201610131000401	10004	10004	1 x MSD Audio Recording	14/10/2016 16:45	Damascus
8.	201610131000402	10004	10004	1 x SD Card Video Recording	14/10/2016 16:45	Damascus
9.	201610131000403	10004	10004	Drawing 1 page	14/10/2016 16:46	Damascus

Entry	ERN	DCN	Interviewee Name / Code	Evidence Description	Evidence Collected/Received	
					When (Date and Time)	Where
10.	201610131000501	10005	10005	1 x MSD Audio Recording	14/10/2016 17:05	Damascus
11.	201610131000502	10005	10005	1 x SD Card Video Recording	14/10/2016 17:05	Damascus
12.	201610131000503	10005	10005	Drawing 1 page	14/10/2016 17:05	Damascus
13.	201610131000601	10006	10006	3 x MSD Audio Recording	14/10/2016 17:10	Damascus
14.	201610131000602	10006	10006	1 x SD Card Video Recording	14/10/2016 17:10	Damascus
15.	201610131000101	10001	10001	1 x MSD Audio Recording	14/10/2016 17:15	Damascus
16.	201610131000102	10001	10001	1 x SD Card Video Recording	14/10/2016 17:15	Damascus
17.	201610131000001	10000	10000	1 x SD Card Video Recording	14/10/2016 17:20	Damascus
18.	201610131000002	10000	10000	1 x MSD Audio Recording	14/10/2016 17:20	Damascus
19.	201610131000201	10002	10002	1 x SD Card Video Recording	14/10/2016 17:20	Damascus
20.	201610131000202	10002	10002	1 x MSD Audio Recording	14/10/2016 17:20	Damascus

Entry	ERN	DCN	Interviewee Name / Code	Evidence Description	Evidence Collected/Received	
					When (Date and Time)	Where
21.	201610131000301	10003	10003	1 x SD Card Video Recording	14/10/2016 17:30	Damascus
22.	201610131000302	10003	10003	1 x MSD Audio Recording	14/10/2016 17:30	Damascus
23.	201610141004501	10045	10045	1 x MSD Audio Recording	14/10/2016 17:30	Damascus
24.	201610141004502	10045	10045	1 x SD Card Video Recording	14/10/2016 17:30	Damascus
25.	201610141004801	10048	10048	1 x MSD Audio Recording	14/10/2016 17:40	Damascus
26.	201610141004802	10048	10048	1 x SD Card Video Recording	14/10/2016 17:40	Damascus
27.	201610141005101	10051	10051	1 x MSD Audio Recording	14/10/2016 17:50	Damascus
28.	201610141005102	10051	10051	1 x SD Card Video Recording	14/10/2016 17:50	Damascus
29.	201610151003801	10038	10038	1 x SD Card Video Recording	15/10/2016 20:00	Damascus
30.	201610151003802	10038	10038	1 x MSD Audio Recording	15/10/2016 20:00	Damascus

Entry	ERN	DCN	Interviewee Name / Code	Evidence Description	Evidence Collected/Received	
					When (Date and Time)	Where
31.	201610151004601	10046	10046	1 x SD Card Video Recording	15/10/2016 20:30	Damascus
32.	201610151004602	10046	10046	1 x MSD Audio Recording	15/10/2016 20:30	Damascus
33.	201610151004603	10046	10046	1 x Drawing	15/10/2016 20:30	Damascus
34.	201610151003201	10032	10032	1 x SD Card Video Recording	15/10/2016 20:30	Damascus
35.	201610151003202	10032	10032	1 x MSD Audio Recording	15/10/2016 20:30	Damascus
36.	201610151005201	10052	10052	1 x SD Card Video Recording	15/10/2016 20:30	Damascus
37.	201610151005202	10052	10052	1 x MSD Audio Recording	15/10/2016 20:30	Damascus
38.	201610151003601	10036	10036	1 x MSD Audio Recording	15/10/2016 20:15	Damascus
39.	201610151003602	10036	10036	1 x SD Card Video Recording	15/10/2016 20:15	Damascus
40.	201610151003603	10036	10036	1 x Map	15/10/2016 20:15	Damascus
41.	201610151003501	10035	10035	1 x MSD Audio Recording	15/10/2016 20:20	Damascus

Entry	ERN	DCN	Interviewee Name / Code	Evidence Description	Evidence Collected/Received	
					When (Date and Time)	Where
42.	201610151003502	10035	10035	1 x SD Card Video Recording	15/10/2016 20:20	Damascus
43.	201610151003401	10034	10034	1 x MSD Audio Recording	15/10/2016 20:25	Damascus
44.	201610151003402	10034	10034	1 x SD Card Video Recording	15/10/2016 20:25	Damascus
45.	201610151003701	10037	10037	1 x MSD Audio Recording	15/10/2016 20:00	Damascus
46.	201610151003702	10037	10037	1 x SD Card Video Recording	15/10/2016 20:00	Damascus
47.	201610171001301	10013	10013	1 x MSD Audio Recording	17/10/2016 17:00	Damascus
48.	201610171001302	10013	10013	1 x MSD Audio Recording	17/10/2016 17:00	Damascus
49.	201610171001303	10013	10013	1 x SD Photos	17/10/2016 17:00	Damascus

Annex 8

RESULTS OF THE ANALYSIS OF SAMPLES RECEIVED FROM FFM/007/16 CONDUCTED AT THE OPCW LABORATORY

1 December 2016

Executive summary

1. As requested by FFM/007/16 and as approved by the Director-General on 4 November 2016 (the approval of the request is included in Memorandum M/VER/LAB/206849/16), the OPCW Laboratory conducted an analysis of the environmental samples received from the Fact-Finding Mission (FFM) team.

2. The scope of the analysis included scheduled chemicals, precursors, and degradation products. The analysis also aimed to gain a deeper understanding of the characteristics of the samples.

3. A total of 14 samples were received (including blanks), of which 13 were analysed (see main text for an explanation).

4. Only textile sample SD02S contained reportable chemicals or chemicals of interest for the purpose of the analysis.

5. Methyl diethanolamine (MDEA, Schedule 3.B.16), a precursor for nitrogen mustard, was identified in sample SD02S. This chemical is also found in commercial products such as certain detergents.

6. In addition, both benzylchloride and benzylbromide were found in sample SD02S. Both of these chemicals are strong irritants (lachrymators) and were used not only for that purpose as a warfare agent in World War 1, but also for training purposes due to their non-lethal nature. Exposure of casualties to these chemicals in larger amounts should have resulted in extensive eye irritation and watering eyes.

7. None of the chemicals found can serve as an explanation for the rapid death of victims in the related incident.

8. An analysis of a protective mask filter was inconclusive, as the provided blank filter turned out to be of a different type than the filter worn by one of the fatalities. This makes it impossible to rule out the chemicals used for impregnation of the filter.

Initial situation

9. FFM team FFM/007/16 handed over samples to the OPCW Laboratory on 1 November 2016 and provided background information on the samples. The team requested an analysis focusing on the presence of scheduled chemicals, precursors, and degradation products. This request was made in document FFM/001/16/6597/005.

10. The OPCW Laboratory submitted Memorandum M/VER/LAB/206849/16 to the Director-General, recommending that an analysis of the samples be conducted at the OPCW Laboratory as requested by the team. The Director-General approved this request on 4 November 2016.

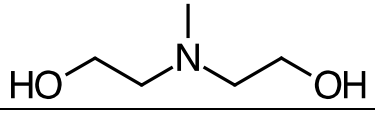
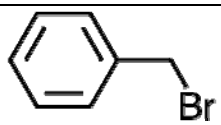
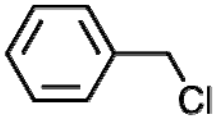
11. It is noted that no full chain of custody exists for the samples in question prior to the moment of receipt by the team. Information received from the team does not point to a specific toxic chemical or group of toxic chemicals responsible for the fatalities in the investigated incident.

12. No autopsy of fatalities was conducted and no biomedical samples are available. Based on available data, a targeted analysis was not possible.

Analysis results

13. The 14 samples received include activated carbon from a mask canister, powder (indicated as metal oxide) from a mask filter, soil textiles, and extracts from wipe samples. The samples include blanks. An intact and unused mask filter was provided to serve as a blank comparison for the charcoal from the filter of one of the fatalities. One of the samples was a slip of the charcoal from the mask filter that was heated in some previous experiments. As this sample was of less value than the unheated charcoal, no analysis was conducted on this sample (SD07S).

14. Chemicals of interest were only found in sample textile SD02S. (Methyl diethanolamine was identified by GC-MS(EI) as its TMS and TBDMS derivative, benzylbromide and benzylchloride were identified by GC-MS(EI) underivatised).

Chemical name	Structure	Sample code	Comments
Methyl diethanolamine		SD02S	Nitrogen mustard precursor, Schedule 3.B.16
Benzylbromide		SD02S	Lachrymator and irritant, not scheduled
Benzylchloride		SD02S	Lachrymator and irritant, not scheduled

Problems with the mask filter "blank"

15. An unused mask filter was provided (SD13B) as a "blank". The filter was opened and the activated charcoal from the filter was removed to serve as blank material. Charcoal used in such filters are impregnated with certain chemicals and the use of a blank would enable an analyst to differentiate between a chemical that was already on the charcoal from production, and one that had been deposited on the charcoal by the inhalation of contaminated air.

16. A visual inspection of both the charcoal from the blank SD13B as a well as the charcoal from sample SD06S revealed a different physical appearance (see photo below). Photos made available by the team then also revealed that the filters were not of identical make, but instead showed a somewhat different shape. Therefore, the above-mentioned comparison could not be conducted.

17. Thermal desorption of sample SD06S yielded a peak with prominent mask peaks at m/z 45 and m/z 60 (molecular ion). This is indicative of acetic acid. Only ions with m/z > 44 were recorded (to exclude the dominant influence of CO2). However, extracts of the same charcoal with polar and non-polar solvents did not confirm the presence of acetic acid.

Different appearance of charcoal from “blank” sample SD13B (left in both photos) and “real” sample SD06S (right in both pictures)

Conclusions

18. None of the identified chemicals are likely to be the cause of death of the fatalities in the incident. Methyl diethanolamine is a nitrogen mustard precursor, but is also found in commercial detergents. Signs of nitrogen mustard exposure were not apparent in the casualties.

19. The identified lachrymators and irritants benzylbromide and benzychloride are strongly harassing chemicals even at low concentrations. They are generally considered non-lethal and would—due to their irritating nature—trigger a strong urge to escape the exposure. As they are strong lachrymators, one would expect strong eye irritation and watery eyes. However, the presence of these chemicals at low concentration might explain the short-term skin and lung irritation reported by other witnesses of the incident.

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