

EVIDENCE IRAQ USED CHEMICAL WEAPONS DURING THE 1991 PERSIAN GULF WAR

by Jonathan B. Tucker

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Did Iraqi forces employ chemical weapons during the 1991 Persian Gulf War? The U.S. Department of Defense (DOD) and Central Intelligence Agency (CIA) have long insisted that they did not. In a memorandum to Gulf War veterans dated May 25, 1994, Defense Secretary William J. Perry and General John M. Shalikashvili, Chairman of the Joint Chiefs of Staff, declared, "There is no evidence, classified or unclassified, that indicates that chemical or biological weapons were used in the Persian Gulf."¹ In May 1996, CIA representative Sylvia Copeland testified, "To date, we have no intelligence information that leads us to conclude that Iraq *used* chemical, biological, or radiological weapons."² Similarly, the Presidential Advisory Committee on Gulf War Veterans' Illnesses concluded in its *Final Report*, "Based on information compiled to date, there is no persuasive evidence of intentional Iraqi use of [chemical-warfare] agents during the war."³

The absence of severe chemical injuries or fatalities among Coalition forces makes it clear that no *large-scale* Iraqi employment of chemical weapons occurred. Even if Iraq intended to make extensive use of chemical weapons, a number of factors precluded this option. The re-

markable speed of the Coalition advance, combined with the effectiveness of the strategic bombing campaign in disrupting Iraq's military command-and-control system, made it difficult for Iraqi commanders to select battlefield targets for chemical attack. Furthermore, the prevailing winds, which for six months had blown from the northwest out of Iraq, shifted at the beginning of the ground war to the southeast, towards the Iraqi lines.

Nevertheless, circumstantial evidence from a variety of sources suggests that Iraq deployed chemical weapons into the Kuwait Theater of Operations (KTO)—the area including Kuwait and Iraq south of the 31st Parallel, where the ground war was fought—and engaged in sporadic chemical warfare against Coalition forces. The London *Sunday Times* reported during the war that intercepts of Iraqi military communications indicated that Iraqi President Saddam Hussein had authorized front-line commanders to use chemical weapons at their discretion as soon as Coalition forces began their ground offensive.⁴ For example, a British signals officer who had been monitoring the Iraqi command net "heard them give the release order to the front-line troops to use chemical weapons against Rhino [Coalition] force if it crossed the border."⁵ *Newsweek* also reported in its March 4,

1991 issue:

Saddam had ordered his commanders to fire chemical munitions as soon as the allies launched a ground offensive, according to U.S. intelligence sources. The U.S. Central Command also believes that chemical-rocket units were moved from Kuwait City to positions near the Saudi border. Iraqi Frog-7 missiles can carry chemical warheads up to 43.5 miles; mortar and artillery pieces can deliver the same chemical agents up to 18 miles.⁶

Other sources of evidence for sporadic Iraqi chemical warfare include U.S. intelligence reports on the presence of Iraqi chemical weapons in the KTO; military log entries describing the discovery by U.S. units of chemical munitions in Iraqi bunkers during and after the ground war; incidents in which troops reported acute symptoms of toxic chemical exposure; and credible detections of chemical-warfare agents by Czech, French, and American forces. Most of these incidents are described in declassified intelligence reports, operations logs, and command chronologies obtained under the Freedom of Information Act or posted on GulfLINK, a DOD website containing information relevant to Gulf War illnesses.⁷

Chemical-warfare agents detected by Coalition forces during the Gulf War include the nerve agents tabun (GA), sarin (GB), and cyclosarin (GF) and the blister agents sulfur-mustard and lewisite. Many of these detections were made with analytical technologies that are considered reliable and have a low false-alarm rate, such as the gas chromatograph/mass spectrometer onboard the FOX chemical reconnaissance vehicle, the M256 chemical agent identification kit, and the M21 Remote Sensing Chemical Agent Alarm (RSCAAL). In response to these detections, U.S. troops were frequently ordered to don their gas masks and protective suits. The term Mission Oriented Protective Posture (MOPP) refers to the amount of protective gear that troops are ordered to wear in response to an assessed chemical-warfare threat, and ranges from MOPP-0 (no protection) to MOPP-4 (the entire protective ensemble).

The table below summarizes the available evidence for the presence of Iraqi chemical weapons in the KTO and the sporadic use of chemical weapons by Iraqi forces during the Gulf War. Additional incidents may become known as more intelligence and operational documents from the war are declassified and released to the public.

¹ William J. Perry and General John Shalikashvili, "Memorandum for Persian Gulf Veterans, Subject: Persian Gulf War Health Issues," May 25, 1995.

² Sylvia Copeland, Central Intelligence Agency, "Briefing Before the Presidential Advisory Committee," Washington, D.C., p. 3.

³ Presidential Advisory Committee on Gulf War Veterans' Illnesses, *Final Report* (Washington, D.C.: Government Printing Office, December 1996), p. 39.

⁴ Jon Swain and James Adams, "Saddam Gives Local Commanders Go-Ahead for Chemical Attacks," *Sunday Times* [London], February 3, 1991, p. 1.

⁵ Reuter, "British Paper Says Saddam Hussein Approved the Use of Chemical Weapons," February 2, 1991.

⁶ Tom Masland and Douglas Waller, "Are We Ready for Chemical War?" *Newsweek*, March 4, 1991, p. 29.

⁷ The URL for the GulfLINK website is <http://www.dtic.dla.mil/gulfink/>.

Chemical Weapons-Related Incidents Before, During, and After the Persian Gulf War

Date/Time	Location	Description	Source
02 Aug 90		Iraq invades Kuwait.	
Sept 90	Southern Iraq near Kuwait border	A Defense Intelligence Agency (DIA) report describes two Iraqi chemical decontamination sites in southeastern Iraq close to the Kuwait border one about 10 kilometers east of Safwan Airfield.	DIA, "Second Chemical Decontamination Site Identified," September 1990, GulfLINK file no. 73562277
Sept 90	Southeastern Iraq and Kuwait	A U.S. intelligence report states that during August 1990, the Iraqis "reportedly moved chemical munitions into Kuwait. At that time, the munition were said to be ready for use." Possible chemical weapons activity observed at a suspect S-shaped storage bunker at Tallil Airfield in southern Iraq i similar to the type of activity noted at this location during the Iran/Iraq War prior to Iraqi chemical use.	"Chemical Warfare Activity in Kuwait," September 2, 1990, GulfLINK file no. 0168pgv.00d.
13 Dec 90	Ar Rumaylah Republican Guard Ammunition Storage Facilities 1 and 2, located about 28 kilometers west of Basra and 45 kilometers north of the Kuwait border	An intelligence report provides information on the possible storage of Iraqi chemical munitions in two rectangular storage bunkers surrounded by dual defensive berms. Since November 26, Iraqi troops have dug V-shaped decontamination trenches outside both of the bunkers and installed concertina wire along the berms. In addition, a multiple rocket launcher battalion has been deployed adjacent to each bunker. The report concludes, "The presence of decontamination trenches and heavy security suggests that the Ar Rumaylah bunkers contain chemical munitions under the control of the Iraqi Republican Guard."	"Possible CW Munitions Storage Facilities at Ar Rumaylah," December 13, 1990, GulfLINK file no. 4023317
27 Dec 90	Mutlaah Ridge northwest of Kuwait City	A source reports that the Iraqi Republican Guard has deployed 60 Scud missiles with chemical and biological warheads along the Mutlaah Ridge. The missile sites are reportedly well camouflaged and defended with tanks and anti-aircraft weapons.	DIA, "Alleged Iraqi Chemical/Biological Scud Missiles Located on the Mutlaah Ridge in Kuwait," December 27, 1990, GulfLINK file no. 60290408.91r
Dec 90	Kuwait	A U.S. intelligence report states that Iraqi troops in Kuwait and along the Iraqi-Saudi and Kuwait-Saudi borders are equipped with chemical weapons (nerve and mustard agents) and protective gear	"Iraqi Gas and Chemical Weapons," December 1990, GulfLINK file no. 60040.91s.
Jan 91	Kuwait	A U.S. intelligence report states that six Iraqi missiles with binary chemical warheads have been deployed in the area of Abraq Al Habari, Kuwait	"Iraqi Chemical Munitions," January 1991 GulfLINK file no. 60041.91s.
17 Jan 91 0238 hour		The Coalition air campaign against Iraq begins with an Apache helicopter strike	
18 or 19 Jan 91	King Khalid Military City (KKMC), Saudi Arabia	Sgt. George C. Vaughn, serving with a military intelligence battalion near KKMC, comes under Scud attack. During the alert, he has trouble sealing his gas mask, experiences a bitter-almond taste, and begins choking. Within a few days, he and others in his unit develop nausea, diarrhea, and severe fatigue. Gastrointestinal symptoms persist after their return from Gulf, along with the development of fatty skin tumors (angioliomas)	U.S. House, Committee on Armed Services, Subcommittee on Military Forces and Personnel, Hearing <i>Desert Storm Mystery Illness/Adequacy of Care</i> , 103rd Congress, 2nd session, March 15, 1994 (HASC No. 103-58), pp. 5-11.
19 Jan 91 0300 hour	Al Jubayl, Saudi Arabia	Seabees of Naval Mobile Construction Battalion 24, stationed near the port of Al Jubayl, report a bright flash in the night sky followed by a powerful detonation-concussion. Chemical alarms sound, and troops don MOPP gear. After the all clear troops unmask and experience an acrid smell, choking, profuse nasal secretions, facial numbness, a burning sensation on exposed skin and a metallic taste in the mouth. Two M256 detection kits are positive for chemical blister agent. During the weeks following the incident, many of the exposed troops develop skin rashes and chronic ailments.	Philip Shenon, "Many Veterans of the Gulf War Detail Illnesses from Chemicals," <i>The New York Times</i> , September 20, 1996, pp. A1, A12; Affidavit by Thomas L. Harper Communications Chief, Air Detachment, Naval Mobile Construction Battalion 24 filed in Merriwether County, Georgia, on June 7, 1993.

19 Jan 91 1045 hours	KKMC, Saudi Arabia	A Czech chemical-defense detachment reports a unspecified chemical agent in the air at a concentration of 0.003 milligrams per cubic meter. The all-clear is given three hours later.	DIA, "Military Intelligence Digest: Saudi Arabia: Detection of CW Agents in Desert Shield/Desert Storm," November 4, 1993, GulfLINK file no. 042300nv.93.
19 Jan 91 PM	37 kilometers northwest and 45 km northeast of Hafar-al-Batin, Saudi Arabia	Two Czech chemical-defense units attached to Saudi forces on patrol detect low levels of nerve agent in the air at a concentration of between 0.05 and 0.003 milligrams per cubic meter. The agent is detected for about an hour before it dissipates.	<i>Ibid.</i>
20 Jan 91 1710 hours	Vicinity of KKMC	A Czech chemical-defense unit reports detecting low levels of nerve agent and suggests that th "hazard is flowing down from factory/storage bombed in Iraq."	Central Command NBC Desk Log; Phili Shenon, "Czechs Say They Warned U.S. Of Chemical Weapons in Gulf," <i>The New York Times</i> , October 19, 1996, pp. 1, 7.
21 Jan 91 0845 hours	Vicinity of KKMC	French 6th Division forces report detecting vapors of two nerve agents (tabun, sarin) and mustard agent in "sublethal quantities" in the air.	101st Airborne Division, Intelligence Spot Report, "Reference reports of chemical agents in French sector," Jan. 22, 1991.
21 Jan 91 1540 hours	Near ammunition storage facility at KKMC	French chemical alarms sound. Czech chemical-defense units confirm the presence of low levels of nerve and mustard agent vapors in the air.	DIA, "Military Intelligence Digest: Saudi Arabia: Detection of CW Agents in Desert Shield/Desert Storm," November 4, 1993, GulfLINK file no. 042300nv.93.
24 Jan 91	Vicinity of KKMC	A Czech chemical-defense detachment detects low levels of mustard agent vapor in the air. Th detection is confirmed with a mobile laboratory.	<i>Ibid.</i>
24 Jan 91	French base south of KKMC	French chemical agent alarms sound after a storm blows winds out of Iraq. Chemical agent detection badges on French troops' protective suits change color, indicating the presence of nerve agent in air.	Associated Press, "France Says Gulf Troops Detected Chemicals," <i>The Washington Post</i> , December 5, 1993, p. A24.
24 Jan 91	Six miles north of KKMC	Saudi officials summon Czech chemical-defense detachment to investigate a "suspicious" wet patch of sand measuring 60 by 200 centimeters. Using two techniques, the Czechs detect low levels of mustard agent. The source of the contamination is unknown, as no munition fragments, craters, or other signs of military activity are found near site.	DIA, "Military Intelligence Digest: Saudi Arabia: Detection of CW Agents in Desert Shield/Desert Storm," November 4, 1993, GulfLINK file no. 042300nv.93.
25 Jan 91	Saudi-Iraq border	Sergeant First Class David W. Stone reports "From [18th Airborne] Corps G-3, ACR [Armored Cavalry Regiment] reports a 1 [round] airburst w/yello cloud at 500 [meters] from their TOC [tactical operations center]." The report is passed to G-2 intelligence staff and logged.	Declassified operations log, 101st Airborne Division.
28 Jan 91 0045 hours	Saudi-Iraq border	"Vulcan" air defense artillery battalion detects nerve agent; detection is confirmed with M256 kit.	Daily Staff Journal/Duty Officers Log, 1st Brigade, 101st Air Assault, Jan. 28, 1991.
28 Jan 91 0130 hours	Saudi-Iraqi border	D Company, 3rd Battalion, 327th Infantry, 101st Airborne Division detects nerve agent; detection is confirmed with two M256 kits.	<i>Ibid.</i>
28 Jan 91 1615 hours	Saudi-Iraq border	G-2 [intelligence staff] of the 101st Airborne Division reports that Saddam Hussein has authorized chemical-weapons use at brigade level.	Declassified operations log, 101st Airborne Division.
01 Feb 91	Kuwait Theater of Operations (KTO)	A DIA intelligence assessment on the potential for Iraqi chemical warfare states: "DIA assesses that in the Kuwaiti Theater of Operations, the [chemical weapons] stockpile probably has been distributed to the general support ammunition depots with chemical storage bunkers and field supply areas for the deployed units. The northern S-shaped bunkers associated with airfields still may contain significant quantities of chemical weapons."	DIA, "Iraq: Potential for Chemical Weapon Use," February 1, 1991, GulfLINK file no. 71726882.
04 Feb 91 2200 hours	Saudi-Kuwait border	24th Infantry Division reports that Iraqi troops have been observed placing 55-gallon drums at specific locations along the border. The Iraqis may have worn masks and gloves while emplacing drums.	Intelligence Spot Report from 24th Infantry Division Nuclear/Biological/Chemical (NBC) section to 101st Airborne Division NBC.
09 Feb 91 0832 hours		101st Airborne operations log entry: "MS [message]/XVIII/081530 Feb 91/Collection an transportation of suspected chemical agents."	Declassified operations log, 101st Airborne Division.
10 Feb 91 1537 hours		101st Airborne operations log entry: "Received a secret [message] in distribution concerning collection and transportation of suspected chemical and biological agents."	<i>Ibid.</i>

11 Feb 91	KTO	A situation update contains information provided by three defectors from Iraqi VII Corps, which has the mission of defending against a Coalition ground assault into southern Iraq. Two of the defectors report knowledge of chemical munitions deliverable by RPG-7 shoulder-fired rockets. One claims the munitions have been deployed in the KTO with his former unit for attacking company-sized units. Another describes chemical munition storage boxes with a skull and warning message.	DIA, "Iraq-Kuwait: Situation Update," February 11, 1991, GulfLINK file no. 74526000.
12 Feb 91	KTO	An Iraqi source provides first-hand information on the types and amounts of chemical rounds held by Iraqi artillery batteries in Kuwait. "Each brigade in the 20th Infantry Division has organic artillery units... [and] eight mustard and binary chemical rounds... The maximum range for these rounds is 43 km when the artillery gun is cold, but after it warms up the range drops to 17 km, with the range decreasing as the gun gets hotter." The field report concludes, "Source believes that the [Iraqi] commanders will order the use of such weapons if they are attacked by an invading ground force."	DIA, "Chemical Munitions in the 20th Infantry Division," February 12, 1991, GulfLINK file no. 60290705.91r.
17 Feb 91	KTO	A DIA assessment states that several Iraqi defectors have reported that chemical munitions have been delivered to divisional artillery units in the KTO. Iraqi units "will probably be given two different contingencies under which they can fire chemical munitions. In a prepared fire, units will fire only those types of rounds which the core fire plan requires. However, if the division is under threat of being overrun, the division commander has probably been given authority to use any means, including chemical munitions, to defend his unit. Despite Coalition emphasis on degrading Iraqi artillery, there are still more than enough artillery tubes and [multiple rocket launchers] available to all divisions and corps to fire a high-priority chemical delivery mission."	DIA, "Iraqi Chemical Threat Reassessment," February 17, 1991, GulfLINK file no. 0407pgf.91.
mid-Feb 91	Riyadh, Saudi Arabia	A U.S. intelligence report describes growing fear in Riyadh over possible Iraqi use of chemical weapons. "Coalition forces had detected systems placed near the border with Saudi Arabia to create toxic clouds. At least one element believed that some of the Scuds intercepted over Riyadh might have been armed with binary [chemical] weapons."	"Fear in Saudi Arabia of Chemical Weapons Attack," February 1991, GulfLINK file no. 60078.91s.
22 Feb 91	Kuwait City	A U.S. intelligence report describes a chemical weapons experiment or handling accident in Kuwait City in which six Iraqi soldiers were killed.	DIA, "Iraqi Activities in Kuwait," February 22, 1991, GulfLINK file no. 60290730.91d.
22 Feb 91 1113 hours	Saudi-Kuwait border	2nd Light Armored Infantry, 2nd Marine Division detects mustard agent.	Central Command NBC Desk Log.
24 Feb 91 0400 hours		The Coalition ground campaign begins.	
24 Feb 91 0600 hours	Saudi-Kuwait border	Tactical intelligence reports indicate that enemy might use chemical weapons at Al Jaber Airfield. Condition "yellow" (attack probable) put into effect.	2nd Battalion, 7th Marine Regiment, 1st Marine Division, Command Chronology, March 9, 1991.
24 Feb 91 0635 hours	Saudi-Kuwait border, U.S. Marine Corps breaching operations	During the crossing of an Iraqi minefield, a FO chemical reconnaissance vehicle with Task Force Ripper, operated by Chief Warrant Officer Joseph P. Cottrell, detects mustard agent in the vicinity of Lane Red I at "trace" concentrations below an immediate threat to personnel. The alarm is sounded and troops go to MOPP-4.	"Prepared Statement of Chief Warrant Officer Joseph P. Cottrell," U.S. House, Committee on Armed Services, Oversight and Investigations Subcommittee, Hearing, <i>Use of Chemical Weapons in Desert Storm</i> , 103rd Congress, 1st session, November 18, 1993, p. 9.
24 Feb 91 0656 hours	Saudi-Kuwait border	6th Marine Regiment, 2nd Marine Division sends a second FOX vehicle to the Iraqi minefield, and it confirms the presence of mustard agent. An official Marine Corps history states: "Unknown in origin, [the chemical agent] was still sufficiently strong to cause blistering on the exposed arms of two AAV [amphibious assault vehicle] crewmen."	Lt. Dennis P. Mroczkowski, <i>U.S. Marines in the Persian Gulf, 1991: With the 2nd Marine Division in Desert Shield and Desert Storm</i> (Washington, D.C.: History and Museums Division, Headquarters U.S. Marine Corps, 1993), p. 45.

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24 Feb 91 0730 hours	Saudi-Kuwait border	6th Marine Regiment's intelligence officer (S-2) reports to 2nd Marine Division headquarters that Lane Red I is contaminated for the first 300 meters only. The commanding officer determines that rapid movement through the breach sites will not pose a threat to continued combat operations or require decontamination, but exposure times of individual soldiers are not tracked or limited. Mine clearance continues, and the chemical protection level is reduced to MOPP-2 after about a half-hour.	6th Marine Regiment, "Operation Desert Storm, Battle Assessment Documentation," undated; Mroczkowski, <i>U.S. Marines in the Persian Gulf</i> ; "Prepared Statement of Chief Warrant Officer Joseph P. Cottrell."
24 Feb 91 1004 hours	Saudi-Kuwait border	An intelligence officer (S-2) with 1st Battalion, 7th Marine Regiment reports an enemy radio intercept indicating that Iraqi units north of Al Jaber Airfield are donning their chemical protective gear.	"Command Chronology for the Period January to 28 February 1991," 1st Battalion, 7th Marine Regiment, April 5, 1991, p. 2-20.
24 Feb 91 1024 hours	Saudi-Kuwait border	An intelligence officer (S-2) with 1st Battalion, 7th Marine Regiment reports an enemy radio intercept indicating that a self-propelled artillery unit with Iraqi III Corps has been ordered to fire chemical weapons at 0945 hours. Thus far, friendly forces have not reported any incoming chemical rounds.	<i>Ibid.</i>
24 Feb 91 1135 hours	Saudi-Kuwait border	XVIII Airborne Corps log entry states: "Flash... [Iraqi] III Corps preparing chemicals."	Daily Staff Journal/Duty Officers Log, XVIII Airborne Corps G-3, item number 70.
24 Feb 91 1143 hours	Saudi-Kuwait border	Marine Air Group 26 reports the detection of nerve agent at 28 degrees North, 47 degrees East on the Saudi-Kuwait border.	Command Chronology, 1st Battalion, 7th Marine Regiment, April 5, 1991, p. 2-20.
24 Feb 91 1507 hours	Inside Kuwait	5th Battalion, 11th Marine Regiment, 1st Marine Division (Task Force Ripper) detects nerve agent with an M21 Remote Sensing Chemical Agent Alarm (RSCAAL), a passive-infrared detector that monitors for clouds of nerve or blister agent out to a range of five kilometers and has a very low false-alarm rate. The 11th Marines go to MOPP-4. The all-clear is sounded at 1541 hours.	Combat Chronology, Task Force Ripper, 1st Marine Division.
24 Feb 91 1908 hours	Vicinity of Ahmed Al Jaber Airbase, Kuwait	As Task Force Ripper holds positions around Al Jaber Airbase, the mass spectrometer on the FO vehicle operated by CWO Joseph Cottrell detects vapors of lewisite blister agent. Cottrell reports his findings to 1st Marine Division headquarters and is told to send the detection record up the chain of command. Headquarters responds that the detection was a false alarm, caused by oil smoke. But Cottrell separates the petroleum peaks from the agent spectrum, confirming the detection. According to the 1st Marine Division log, "Ripper 6 believes that chemical weapons were used, but not sure if Ripper was the target. These chemical munitions could have been exploded by our own artillery, thus causing secondary explosions."	U.S. Senate, Committee on Banking, Housing and Urban Affairs, Hearing, <i>United States Dual-Use Exports to Iraq and Their Impact on the Health of Persian Gulf War Veterans</i> , 103rd Congress, 2nd sess., May 25, 1994 (Senate Hearing 103-900), pp. 303-304; 1st Marine Division, operations log, February 25, 1991.
24 Feb 91 "late in day"	Inside Kuwait	An intercept of Iraqi military communications reveals that "an element of Iraqi III Corps was concerned about the possible existence of chemical traces in the area and that the element's chemical detection gear was not working."	"Possible Chemical Presence," February 24, 1991, GulfLINK file no. 60046.91s.
25 Feb 91 0319 hours	Inside Kuwait	Task Force Ripper detects unspecified chemical-warfare agent at grid coordinate 756862.	Command Chronology, 1st Battalion, 7th Marine Regiment.
25 Feb 91 1735 hours	Inside Kuwait	3rd Tank Battalion, 11th Marine Regiment, a Task Force Ripper unit, reports the detection of mustard agent. According to FOX vehicle operator George Grass, "As the mass spectrometer was monitoring for chemical agent vapor contamination with the usual readings from the oil fires, the alarm went off and the monitor showed a lethal vapor concentration of the chemical agent S-mustard." When Grass reports the detection to the Division NBC Officer, he is told that the reading was a false alarm caused by the oil-fire vapors.	1st Marine Division, After Action Review; Command Chronology, 1st Battalion, 7th Marine Regiment; Testimony by Gunnery Sergeant George J. Grass (U.S. Marine Corps) before the Presidential Advisory Committee Panel on Chemical and Biological Warfare Issues, Washington, D.C., May 1, 1996.
25 Feb 91 1900 hours	Inside Kuwait	An Iraqi prisoner of war reports a chemical minefield at Jalib Ash Shuyukh Police Post west of Kuwait International Airport.	Command Chronology, Tiger Brigade.

25 Feb 91 1908 hours	Inside Kuwait	3rd Battalion, 11th Marine Regiment (Task Force Ripper) detects blister agent. A FOX vehicle is called in to confirm. Sergeant Robert A. Maison, member of the FOX team, observes an artillery attack to the northwest at a distance of about four kilometers. About five minutes later, the mass spectrometer on the FOX vehicle sounds an alarm. The agent detected is lewisite "in a concentration considered to produce casualties but not death." Because of strong, steady winds (40-50 knots), the detection lasts only about three minutes.	1st Marine Division After-Action Review; U.S. Senate, Committee on Banking, Housing and Urban Affairs, <i>Hearing</i> , May 25, 1994, p. 304.
25 Feb 91 1922 hours	Inside Kuwait	A FOX vehicle attached to Tiger Brigade detects lewisite at a location miles from Task Force Ripper.	Command Chronology, Tiger Brigade.
26 Feb 91 0213 hours	Inside Kuwait	A Company, 1st Battalion, 11th Marine Regiment (Task Force King) reports the detection of blister agent, confirmed with two separate M256 kits. A majority of the 11th Marines assume MOPP-4. The all-clear is sounded at 0245 hours.	1st Marine Division, After Action Review, p. 28; Command Chronology, Task Force King, 1st Marine Division.
26 Feb 91 0327 hours	Inside Kuwait	A Company, 1st Battalion, 11th Marine Regiment (Task Force King) detects mustard agent at 032 hours, confirmed with an M256 kit. Majority of 11th Marines assume MOPP-4. An M256 test at 0410 is also positive. Test at 0421 is negative, and after selective unmasking, the all-clear is sounded.	Command Chronology, Task Force King, 1st Marine Division.
Late Feb 91	KTO	A prisoner from the 36th Infantry Division, a regular Iraqi Army unit deployed near the Kuwait-Saudi border, claims that his brigade possessed "a type of tear gas, another type of concentrated gas, mustard gas, and a binary chemical weapon, which is able to deliver two types of gas. There is also a gun that can launch these gas weapons."	"Interrogation Translation: Chemical Weapons and the Armament of the 36th ID," GulfLINK file no. 0415pgf.91.
26 Feb 91 1045 hours	Inside Kuwait	Task Force Shepherd finds an Iraqi ammunition bunker that may contain mustard agent.	Command Chronology, 1st Battalion, 7th Marine Regiment.
26 Feb 91 1046 hours	Inside Kuwait	Task Force Ripper reports "dusty mustard found stored in bunker in vicinity QT 9015."	Operations log, Task Force Ripper.
26 Feb 91 1055 hours	Inside Kuwait	1st Battalion, 5th Marine Regiment finds low berms with signs in Arabic that Kuwaiti interpreters read as "Collection point for NBC casualties." Two lanes are marked for vehicle decontamination.	Command Chronology, 1st Battalion, 7th Marine Regiment.
26 Feb 91 1105 hours	Inside Kuwait	Task Force Ripper reports "NBC [decontamination] point found at grid QT 714281."	Operations log, Task Force Ripper.
26 Feb 91 1149 hours	Inside Kuwait	As Marine units approach Kuwait City, 1st Battalion, 11th Marine Regiment with Task Force Ripper detects gas.	Command Chronology, 1st Battalion, 7th Marine Regiment; 1st Marine Division, After Action Review.
26 Feb 91 early PM	Inside Kuwait	A FOX vehicle with the 8th Marines detects gas.	Command Chronology, 8th Marines.
26 Feb 91 1500 hours	Inside Kuwait	1st Battalion, 11th Marine Regiment detects gas in vicinity of Kuwait International Airport.	1st Marine Division, After Action Review.
26 Feb 91 1527 hours	Inside Kuwait	3rd Battalion, 23rd Marine Regiment reports that the 3/23rd is under chemical attack and in MOPP-4; the remainder of 8th Marines are in MOPP-2.	Battle Assessment Documentation, 6th Marine Regiment.
26 Feb 91 1735 hours	Inside Kuwait	3rd Battalion, 11th Marine Regiment reports chemical detection.	1st Marine Division, Maneuver Chronology.
27 Feb 91 1545 hours	U.S. Central Command Headquarters, Saudi Arabia	Message from Central Command (CENTCOM) Commander-in-Chief makes reference to "[Commander's] guide for disposition of captured chemical and biological munitions."	Central Command NBC Desk Log.
27 Feb 91 1800 hours	U.S. Central Command Headquarters	Responding to a query about explosive demolition of found Iraqi chemical agents and munitions, CENTCOM states that JCS-J5 (the policy division of the Joint Chiefs of Staff) believes "destruction of small quantities using field method is OK. 'Bulk' (not defined) destruction is not approved because it may have great international implications. More guidance to follow. For the time being, bulk must be secured and await further instructions."	Central Command NBC Desk Log.

27 Feb 91 2300 hours	Inside Kuwait	5th Battalion, 11th Marine Regiment is ordered to move south out of Task Force Ripper's zone to enable Task Force Ripper to reposition units away from "ammunition/chemical hazard areas."	1st Marine Division, After Action Review, p. 31
28 Feb 91 0800 hours	KTO	The cease-fire takes effect.	
28 Feb 91 1627 hours	Inside Kuwait	3rd Battalion, 7th Marine Regiment reports "Mustard agent at QT 753393910. Localized vapor hazard. Detected by FOX vehicle."	3/7 Marines Staff Journal, entry for 281627 Feb 91
28 Feb 91 1845 hours	Occupied Iraq	Lt. Col. Rick Jenkins reports interest in inspecting suspected chemical/biological munitions bunkers in the occupied portion of Iraq. CENTCOM log states: "Advised him to identify his requirements to 513th [Military Intelligence Brigade], as they have the mission and already have some assigned tasks (i.e., chem [chemical] rounds for exploitation.)"	Central Command NBC Desk Log.
28 Feb 91 1930 hours	Just outside Kuwait City	A FOX vehicle with Task Force Ripper, 1st Marine Division, surveys an Iraqi 3rd Armored Corps ammunition bunker complex just outside Kuwait City that Iraqi prisoners-of-war say contains suspected chemical munitions. During the survey, the FOX mass spectrometer alarms with a clear spectrum for a lethal vapor concentration of sulfur mustard. FOX operator Gunnery Sergeant George Grass makes additional detections of sulfur mustard and benzene bromide within 100 yards of each other. CENTCOM log states: "The FOX [mass spectrometer] has come up with indications of small [concentrations] of sulfur mustard after numerous tests. All possible interferences with petroleum products ruled out.... Area is cordoned off, all their people in the area have been warned."	Testimony by Gunnery Sergeant George J. Grass before the Presidential Advisory Committee Panel on Chemical and Biological Warfare Issues, Washington, D.C., May 1, 1996; Central Command NBC Desk Log.
28 Feb 91 2155 hours	Kuwait City	Major Chapman, intelligence officer with XVIII Airborne Corps, says Special Operations Central Command (SOCCENT) and Marines Central Command (MARCENT) have both reported finding Iraqi chemical-filled mines in Kuwait City. The mines are gray with a yellow stripe.	Central Command NBC Desk Log.
Following cease-fire	KTO	A 2nd Marine Division FOX team detects low levels of chemical agent contamination and collects soil samples from a suspected chemical munitions filling site in their Tactical Area of Responsibility. The samples are passed through proper chain of custody to the Joint Captured Material Exploitation Center (JCMEC) in Dhahran, Saudi Arabia, for confirmation analysis at the U.S. Army Chemical Research, Development and Engineering Center in Aberdeen, Maryland. Despite requests, 2nd Marine Division never receives the results of the laboratory analyses.	Capt. T. F. Manley, <i>Marine Corps NB Defense in Southwest Asia</i> (Quantico, VA: Marine Corps Research Center, Research Paper No. 92-0009, July 1991), p. 18.
1 Mar 91 1700 hours	Enemy bunker complex in southern Iraq, 3 kilometers north of Kuwait border	PFC David Allen Fisher, a scout with 4/8 Cavalry, 2nd Brigade, 3rd Armored Division, is inspecting an Iraqi bunker complex in southern Iraq when he brushes up against some wooden crates. At 0100 the next morning, he feels a stinging pain on his left upper arm and notes that it has a sunburned appearance. He sleeps from 0300 to 0400 and observes on waking that blisters have formed on his upper arm. Fisher is examined by a chemical casualty specialist, who supports a diagnosis of mustard agent exposure. Fisher is then evacuated to Germany for treatment.	Col. Michael A. Dunn, "Information Paper: Chemical Agent Exposure, Operation Desert Storm," SRGD-UV-ZA, March 5 1991; Thomas D. Williams, "Veteran's Story Counters Official One on Gas War," <i>The Hartford Courant</i> , September 21, 1994, p. A2.
01 Mar 91 2045 hours	Inside Kuwait	A soldier from the 3rd Armored Division, VII Corps throws a thermite grenade into an Iraqi armored personnel carrier. There is a secondary explosion, he smells garlic and is overcome by gas. The soldier is hospitalized in critical condition. Army Central Command (ARCENT) believes the cause was an exploding battery.	Central Command NBC Desk Log.

Report: Iraq's Use of CW in Gulf War

03 Mar 91	Kuwait	A DIA intelligence report states that during the Gulf War, Iraq deployed 250 "Ababil" missiles with chemical warheads in Kuwait. The missiles were deployed in Jaleeb and in Alshuykh, south of th Kuwait Airport, and targeted on Saudi Arabia. When the ground war began, the Iraqi commander responsible for the missiles, a Shi'ite, was ordered to launch them but refused and was said to have deserted. Iraqi troops then withdrew from the area, leaving the missiles and the chemical warheads behind.	DIA, "CW Agent Warheads in Kuwait During the Gulf War," March 3, 1993, GulfLINK file no. 23230089.93a.
03 Mar 91 1420 hours	Ar Rumuylah oil field, southeastern Iraq	Elements of 4/64 Armor, 24th Infantry Division, are conducting a reconnaissance mission northwest of Ar Rumaylah oil field near a major canal when they discover a "military jeep with chem amm [chemical ammunition] and documents."	Daily Staff Journal, 24th Infantry Division.
04 Mar 91 1400 hours	Khamisiyah, Iraq	Three companies of the 37th Engineer Battalion, assisted by two teams of the 60th Explosive Ordnance Disposal Detachment, destroy 37 Iraqi munitions bunkers. Among them is Bunker 73, which contains 122 mm rockets filled with 8.5 metric tons of nerve agents. At 1445 hours, a chemical alarm goes off but only some troops go to MOPP-4. M256 tests give "weak" positive results.	U.S. Department of Defense, "U.S. Demolition Operations at the Khamisiyah Ammunition Storage Point," paper posted on the GulfLINK website, February 21, 1997.
05 Mar 91		Colonel Michael A. Dunn, a former commander of the U.S. Army Medical Research Institute for Chemical Defense, writes a report on the Fisher incident (see March 1, 1700 hours) that ends with this statement: "I conclude that PFC Fisher's ski injury was caused by exposure to liquid mustard chemical warfare agent. The complete sequence of events is consistent with this conclusion. In particular, the latent period of 8 hours between exposure and first symptoms is characteristic of mustard exposure. No other corrosive or skin-toxic chemical that could reasonably be expected to have been present on the battlefield shows this latent period. The confirmatory FOX spectra findings are also consistent..."	Colonel Michael A. Dunn, "Information Paper: Chemical Agent Exposure, Operation Desert Storm," SRGD-UV-ZA, March 5, 1991.
09 Mar 91	Kuwait	An Iraqi source states that a chemical munitions storage bunker is located to the north of the Kuwaiti 6th Brigade Headquarters and that the bunker could be mined. The same source claims that the Iraqi 2nd, 8th, 11th, 19th, and 27th Infantry Divisions had chemical companies to store and distribute their chemical munitions, and that Iraqi chemical rounds for the 106 mm howitzer and 60 mm mortar are stored in cylindrical canisters marked with a red skull and crossed bones.	DIA, "Chemical Markings, Transport, Types and Location in Kuwait," March 9, 1991, GulfLINK file no. 23402901.91r.
10 Mar 91 1540 hours	Khamisiyah, Iraq	U.S. troops detonate crates of 122 mm rockets i the "pit" area of the Khamisiyah munitions depot, along with 60 remaining Iraqi bunkers. UN inspectors later determine that the 122 mm rockets contained a mixture of sarin and cyclosarin.	U.S. Department of Defense, "U.S. Demolition Operations at the Khamisiyah Ammunition Storage Point."
12 Mar 91 1620 hours	KTO	The CENTCOM log reports that Marines have located a suspected Iraqi filling site for chemical land mines. A FOX vehicle has obtained positive readings for tabun and lewisite. Troops have found containers resembling air tanks and min crates. The log entry states: "The area has been roped off and secured. I advised them to call 513th [Military Intelligence Battalion] and get sampling team into the area."	Central Command NBC Desk Log.
12 Mar 91 1940 hours	KTO	The CENTCOM log reports that Captain Napier of Army Central Command has called in the finding of possible chemical rounds in the 1st Armored Division area. The troops have come across 1 bunkers, some containing 82 mm rounds with three red bands and Jordanian markings.	Central Command NBC Desk Log.