

Weapons of Mass Destruction (WMD)

Iraq Survey Group Final Report

Key Findings

Iraq Survey Group (ISG) discovered further evidence of the maturity and significance of the pre-1991 Iraqi Nuclear Program but found that Iraq's ability to reconstitute a nuclear weapons program progressively decayed after that date.

- Saddam Husayn ended the [nuclear program](#) in 1991 following the Gulf war. ISG found no evidence to suggest concerted efforts to restart the program.
- Although Saddam clearly assigned a high value to the nuclear progress and talent that had been developed up to the 1991 war, the program ended and the intellectual capital decayed in the succeeding years.

Nevertheless, after 1991, Saddam did express his intent to retain the intellectual capital developed during the Iraqi Nuclear Program. Senior Iraqis—several of them from the Regime's inner circle—told ISG they assumed Saddam would restart a nuclear program once UN sanctions ended.

- Saddam indicated that he would develop the weapons necessary to counter any Iranian threat. **Initially, Saddam chose to conceal his nuclear program in its entirety, as he did with Iraq's BW program. Aggressive UN inspections after Desert Storm forced Saddam to admit the existence of the program and destroy or surrender components of the program.**

In the wake of Desert Storm, Iraq took steps to conceal key elements of its program and to preserve what it could of the professional capabilities of its nuclear scientific community.

- [Baghdad](#) undertook a variety of measures to conceal key elements of its nuclear program from successive UN inspectors, including specific direction by Saddam Husayn to hide and preserve documentation associated with Iraq's nuclear program.
- ISG, for example, uncovered two specific instances in which scientists involved in uranium enrichment kept documents and [technology](#). Although apparently acting on their own, they did so with the belief and anticipation of resuming uranium enrichment efforts in the future.
- Starting around 1992, in a bid to retain the intellectual core of the former weapons program, Baghdad transferred many nuclear scientists to related jobs in the Military Industrial Commission (MIC). The work undertaken by these scientists at the MIC helped them maintain their weapons [knowledge base](#).

As with other WMD areas, Saddam's ambitions in the nuclear area were secondary to his prime objective of ending UN sanctions.

- [Iraq](#), especially after the defection of Husayn Kamil in 1995, sought to persuade the IAEA that Iraq had met the UN's disarmament requirements so sanctions would be lifted.

ISG found a limited number of post-1995 activities that would have aided the reconstitution of the nuclear weapons program once sanctions were lifted.

- The activities of the Iraqi Atomic Energy Commission sustained some talent and limited research with potential relevance to a reconstituted nuclear program.
- Specific projects, with significant development, such as the efforts to build a rail gun and a copper vapor laser could have been useful in a future effort to restart a nuclear weapons program, but ISG found no indications of such purpose. As funding for the MIC and the IAEA

increased after the introduction of the Oil-for-Food program, there was some growth in programs that involved former nuclear weapons scientists and engineers.

- The Regime prevented scientists from the former nuclear weapons program from leaving either their jobs or Iraq. Moreover, in the late 1990s, personnel from both MIC and the IAEA received significant pay raises in a bid to retain them, and the Regime undertook new [investments](#) in university research in a bid to ensure that Iraq retained technical knowledge.

Key Findings

Saddam never abandoned his intentions to resume a CW effort when sanctions were lifted and conditions were judged favorable:

- Saddam and many Iraqis regarded CW as a proven weapon against an enemy's superior numerical strength, a weapon that had saved the nation at least once already—during the Iran-Iraq war—and contributed to deterring the Coalition in 1991 from advancing to [Baghdad](#).

While a small number of old, abandoned chemical munitions have been discovered, ISG judges that Iraq unilaterally destroyed its undeclared chemical weapons stockpile in 1991. There are no credible indications that Baghdad resumed production of chemical munitions thereafter, a policy ISG attributes to Baghdad's desire to see sanctions lifted, or rendered ineffectual, or its fear of force against it should WMD be discovered.

- The scale of the Iraqi conventional munitions stockpile, among other factors, precluded an examination of the entire stockpile; however, ISG inspected sites judged most likely associated with possible [storage](#) or deployment of chemical weapons.

Iraq's CW program was crippled by the Gulf war and the legitimate chemical industry, which suffered under sanctions, only began to recover in the mid-1990s. Subsequent changes in the management of key military and civilian organizations, followed by an influx of funding and resources, provided Iraq with the ability to reinvigorate its industrial base.

- Poor policies and management in the early 1990s left the Military Industrial Commission (MIC) financially unsound and in a state of almost complete disarray.
- Saddam implemented a number of changes to the Regime's organizational and programmatic structures after the departure of Husayn Kamil.
- [Iraq's](#) acceptance of the Oil-for-Food (OFF) program was the foundation of Iraq's economic recovery and sparked a flow of illicitly diverted funds that could be applied to projects for Iraq's chemical industry.

The way Iraq organized its chemical industry after the mid-1990s allowed it to conserve the knowledge-base needed to restart a CW program, conduct a modest amount of dual-use research, and partially recover from the decline of its production capability caused by the effects of the Gulf war and UN-sponsored destruction and sanctions. Iraq implemented a rigorous and formalized system of nationwide research and production of chemicals, but ISG will not be able to resolve whether Iraq intended the system to underpin any CW-related efforts.

- The Regime employed a cadre of trained and experienced researchers, production managers, and weaponization experts from the former CW program.
- Iraq began implementing a range of indigenous chemical production projects in 1995 and 1996. Many of these projects, while not weapons-related, were designed to improve Iraq's infrastructure, which would have enhanced Iraq's ability to produce CW agents if the scaled-up production processes were implemented.

- Iraq had an effective system for the procurement of items that Iraq was not allowed to acquire due to sanctions. ISG found no evidence that this system was used to acquire precursor chemicals in bulk; however documents indicate that dual-use laboratory equipment and chemicals were acquired through this system.

Iraq constructed a number of new plants starting in the mid-1990s that enhanced its chemical infrastructure, although its overall industry had not fully recovered from the effects of sanctions, and had not regained pre-1991 technical sophistication or production capabilities prior to Operation Iraqi Freedom (OIF).

- ISG did not discover chemical process or production units configured to produce key precursors or CW agents. However, site visits and debriefs revealed that Iraq maintained its ability for reconfiguring and 'making-do' with available equipment as substitutes for sanctioned items.
- ISG judges, based on available chemicals, infrastructure, and scientist debriefings, that Iraq at OIF probably had a capability to produce large quantities of sulfur mustard within three to six months.
- A former nerve agent expert indicated that Iraq retained the capability to produce nerve agent in significant quantities within two years, given the import of required phosphorous precursors. However, we have no credible indications that Iraq acquired or attempted to acquire large quantities of these chemicals through its existing procurement [networks](#) for sanctioned items.

In addition to new investment in its industry, Iraq was able to monitor the location and use of all existing dual-use process equipment. This provided Iraq the ability to rapidly reallocate key equipment for proscribed activities, if required by the Regime.

- One effect of UN monitoring was to implement a national level control system for important dual-use process plants.

Iraq's historical ability to implement simple solutions to weaponization challenges allowed Iraq to retain the capability to weaponize CW agent when the need arose. Because of the risk of discovery and consequences for ending UN sanctions, Iraq would have significantly jeopardized its chances of having sanctions lifted or no longer enforced if the UN or foreign entity had discovered that Iraq had undertaken any weaponization activities.

- ISG has uncovered [hardware](#) at a few military depots, which suggests that Iraq may have prototyped experimental CW rounds. The available evidence is insufficient to determine the nature of the effort or the timeframe of activities.
- Iraq could indigenously produce a range of conventional munitions, throughout the 1990s, many of which had previously been adapted for filling with CW agent. However, ISG has found ambiguous evidence of weaponization activities.

Saddam's Leadership Defense Plan consisted of a tactical doctrine taught to all Iraqi officers and included the concept of a "red-line" or last line of defense. However, ISG has no information that the [plan](#) ever included a trigger for CW use.

- Despite reported high-level discussions about the use of chemical weapons in the defense of Iraq, information acquired after OIF does not confirm the inclusion of CW in Iraq's tactical planning for OIF. We believe these were mostly theoretical discussions and do not imply the existence of undiscovered CW munitions.

Discussions concerning WMD, particularly leading up to OIF, would have been highly compartmentalized within the Regime. ISG found no credible evidence that any field elements knew about plans for CW use during Operation Iraqi Freedom.

- Uday—head of the Fedayeen Saddam—attempted to obtain chemical weapons for use during OIF, according to reporting, but ISG found no evidence that Iraq ever came into possession of any CW weapons.

ISG uncovered information that the Iraqi Intelligence Service (IIS) maintained throughout 1991 to

2003 a set of undeclared covert laboratories to research and test various chemicals and poisons, primarily for intelligence operations. The [network](#) of laboratories could have provided an ideal, compartmented platform from which to continue CW agent R&D or small-scale production efforts, but we have no indications this was planned. (See Annex A.)

- ISG has no evidence that IIS Directorate of Criminology (M16) scientists were producing CW or BW agents in these laboratories. However, sources indicate that M16 was planning to produce several CW agents including sulfur mustard, nitrogen mustard, and Sarin.
- Exploitations of IIS laboratories, safe [houses](#), and disposal sites revealed no evidence of CW-related research or production, however many of these sites were either sanitized by the Regime or looted prior to OIF. Interviews with key IIS officials within and outside of M16 yielded very little information about the IIS' activities in this area.
- The existence, function, and purpose of the laboratories were never declared to the UN.
- The IIS program included the use of human subjects for testing purposes.

ISG investigated a series of key pre-OIF indicators involving the possible movement and storage of chemical weapons, focusing on 11 major depots assessed to have possible links to CW. A review of documents, interviews, available reporting, and site exploitations revealed alternate, plausible explanations for activities noted prior to OIF which, at the time, were believed to be CW-related.

- ISG investigated pre-OIF activities at Musayyib Ammunition Storage Depot—the storage site that was judged to have the strongest link to CW. An extensive investigation of the facility revealed that there was no CW activity, unlike previously assessed.

Key Findings

The Biological Warfare (BW) program was born of the Iraqi Intelligence Service (IIS) and this service retained its connections with the program either directly or indirectly throughout its existence.

- The IIS provided the BW program with security and participated in biological research, probably for its own purposes, from the beginning of [Iraq's](#) BW effort in the early 1970s until the final days of Saddam Husayn's Regime.

In 1991, Saddam Husayn regarded BW as an integral element of his arsenal of WMD weapons, and would have used it if the need arose.

- At a [meeting](#) of the Iraqi leadership immediately prior to the Gulf war in 1991, Saddam Husayn personally authorized the use of BW weapons against Israel, Saudi Arabia and US forces. Although the exact nature of the circumstances that would trigger use was not spelled out, they would appear to be a threat to the leadership itself or the US resorting to “*unconventional harmful types of weapons.*”
- Saddam envisaged all-out use. For example, all Israeli cities were to be struck and all the BW weapons at his disposal were to be used. Saddam specified that the “*many years*” agents, presumably anthrax spores, were to be employed against his foes.

ISG judges that Iraq's actions between 1991 and 1996 demonstrate that the state intended to preserve its BW capability and return to a steady, methodical progress toward a mature BW program when and if the opportunity arose.

- ISG assesses that in 1991, Iraq clung to the objective of gaining war-winning weapons with the

strategic intention of achieving the ability to project its power over much of the Middle East and beyond. Biological weapons were part of that plan. With an eye to the future and aiming to preserve some measure of its BW capability, Baghdad in the years immediately after Desert Storm sought to save what it could of its BW [infrastructure](#) and covertly continue BW research, hide evidence of that and earlier efforts, and dispose of its existing weapons stocks.

- From 1992 to 1994, Iraq greatly expanded the capability of its Al Hakam facility. Indigenously produced 5 cubic meter fermentors were installed, electrical and water utilities were expanded, and massive new construction to [house](#) its desired 50 cubic meter fermentors were completed.
- With the economy at rock bottom in late 1995, ISG judges that Baghdad abandoned its existing BW program in the belief that it constituted a potential embarrassment, whose discovery would undercut Baghdad's ability to reach its overarching goal of obtaining relief from UN sanctions.

In practical terms, with the destruction of the Al Hakam facility, Iraq abandoned its ambition to obtain advanced BW weapons quickly. ISG found no direct evidence that Iraq, after 1996, had plans for a new BW program or was conducting BW-specific work for military purposes. Indeed, from the mid-1990s, despite evidence of continuing interest in nuclear and chemical weapons, there appears to be a complete absence of discussion or even interest in BW at the Presidential level.

Iraq would have faced great difficulty in re-establishing an effective BW agent production capability. Nevertheless, after 1996 Iraq still had a significant dual-use capability—some declared—readily useful for BW if the Regime chose to use it to pursue a BW program. Moreover, Iraq still possessed its most important BW asset, the scientific know-how of its BW cadre.

- Any attempt to create a new BW program after 1996 would have encountered a range of major hurdles. The years following Desert Storm wrought a steady degradation of Iraq's industrial base: new equipment and spare parts for existing machinery became difficult and expensive to obtain, standards of maintenance declined, staff could not receive [training](#) abroad, and foreign technical assistance was almost impossible to get. Additionally, Iraq's infrastructure and public utilities were crumbling. New large projects, particularly if they required special foreign equipment and expertise, would attract international attention. UN monitoring of dual-use facilities up to the end of 1998, made their use for clandestine purpose complicated and risk laden.

Depending on its scale, Iraq could have re-established an elementary BW program within a few weeks to a few months of a decision to do so, but ISG discovered no indications that the Regime was pursuing such a course.

- In spite of the difficulties noted above, a BW capability is technically the easiest WMD to attain. Although equipment and facilities were destroyed under UN supervision in 1996, Iraq retained technical BW know-how through the scientists that were involved in the former program. ISG has also identified civilian facilities and equipment in Iraq that have dual-use application that could be used for the production of agent.

ISG judges that in 1991 and 1992, Iraq appears to have destroyed its undeclared stocks of BW weapons and probably destroyed remaining holdings of bulk BW agent. However ISG lacks evidence to document complete destruction. Iraq retained some BW-related seed stocks until their discovery after Operation Iraqi Freedom (OIF).

- After the passage of UN Security Council Resolution (UNSCR) 687 in April 1991, Iraqi leaders decided not to declare the offensive BW program and in consequence ordered all evidence of the program erased. Iraq declared that BW program personnel sanitized the facilities and destroyed the weapons and their contents.
- Iraq declared the possession of 157 aerial bombs and 25 missile warheads containing BW agent. ISG assesses that the evidence for the original number of bombs is uncertain. ISG judges that Iraq clandestinely destroyed at least 132 bombs and 25 missiles. ISG continued the efforts of the UN at the destruction site but found no remnants of further weapons. This leaves the possibility that the fragments of up to 25 bombs may remain undiscovered. Of these, any that escaped destruction would probably now only contain degraded agent.

- ISG does not have a clear account of bulk agent destruction. Official Iraqi sources and BW personnel, state that Al Hakam staff destroyed stocks of bulk agent in mid 1991. However, the same personnel admit concealing details of the movement and destruction of bulk BW agent in the first half of 1991. Iraq continued to present [information](#) known to be untrue to the UN up to OIF. Those involved did not reveal this until several months after the conflict.
- Dr. Rihab Rashid Taha Al 'Azzawi, head of the bacterial program claims she retained BW seed stocks until early 1992 when she destroyed them. ISG has not found a means of verifying this. Some seed stocks were retained by another Iraqi official until 2003 when they were recovered by ISG.

ISG is aware of BW-applicable research since 1996, but ISG judges it was not conducted in connection with a BW program.

- ISG has uncovered no evidence of illicit research conducted into BW agents by universities or research organizations.
- The work conducted on a biopesticide (*Bacillus thuringiensis*) at Al Hakam until 1995 would serve to maintain the basic skills required by scientists to produce and dry anthrax spores (*Bacillus anthracis*) but ISG has not discovered evidence suggesting this was the Regime's intention. However in 1991, research and production on biopesticide and single cell protein (SCP) was selected by Iraq to provide cover for Al Hakam's role in Iraq's BW program. Similar work conducted at the Tuwaitha Agricultural and Biological Research Center (TABRC) up to OIF also maintained skills that were applicable to BW, but again, ISG found no evidence to suggest that this was the intention.
- Similarly, ISG found no information to indicate that the work carried out by TABRC into Single Cell Protein (SCP) was a cover story for continuing research into the production of BW agents, such as *C. botulinum* and *B. anthracis*, after the destruction of Al Hakam through to OIF.
- TABRC conducted research and development (R&D) programs to enable indigenous manufacture of bacterial growth media. Although these media are suitable for the bulk production of BW agents, ISG has found no evidence to indicate that their development and testing were specifically for this purpose.
- Although Iraq had the basic capability to work with variola major (smallpox), ISG found no evidence that it retained any stocks of smallpox or actively conducted research into this agent for BW intentions.

The IIS had a series of laboratories that conducted biological work including research into BW agents for assassination purposes until the mid-1990s. ISG has not been able to establish the scope and nature of the work at these laboratories or determine whether any of the work was related to military development of BW agent.

- The security services operated a series of laboratories in the Baghdad area. Iraq should have declared these facilities and their equipment to the UN, but they did not. Neither the UN Special Commission (UNSCOM) nor the UN Monitoring, Verification, and Inspection Commission (UNMOVIC) were aware of their existence or inspected them.
- Some of the laboratories possessed equipment capable of supporting research into BW agents for military purposes, but ISG does not know whether this occurred although there is no evidence of it. The laboratories were probably the successors of the Al Salman facility, located three kilometers south of Salman Pak, which was destroyed in 1991, and they carried on many of the same activities, including [forensic](#) work.
- Under the aegis of the intelligence service, a secretive team developed assassination instruments using poisons or toxins for the Iraqi state. A small group of scientists, doctors and technicians conducted secret experiments on human beings, resulting in their deaths. The aim was probably the development of poisons, including ricin and aflatoxin to eliminate or debilitate the Regime's opponents. It appears that testing on humans continued until the mid 1990s. There is no evidence to link these tests with the development of BW agents for military use.

In spite of exhaustive investigation, ISG found no evidence that Iraq possessed, or was developing BW agent production systems mounted on road vehicles or railway wagons.

- Prior to OIF there was information indicating Iraq had planned and built a breakout BW capability, in the form of a set of mobile production units, capable of producing BW agent at short notice in sufficient quantities to weaponize. Although ISG has conducted a thorough investigation of every aspect of this information, it has not found any equipment suitable for such a program, nor has ISG positively identified any sites. No documents have been uncovered. Interviews with individuals suspected of involvement have all proved negative.
- ISG harbors severe doubts about the source's credibility in regards to the breakout program.
- ISG thoroughly examined two trailers captured in 2003, suspected of being mobile BW agent production units, and investigated the associated evidence. ISG judges that its Iraqi makers almost certainly designed and built the equipment exclusively for the generation of hydrogen. It is impractical to use the equipment for the production and weaponization of BW agent. ISG judges that it cannot therefore be part of any BW program.