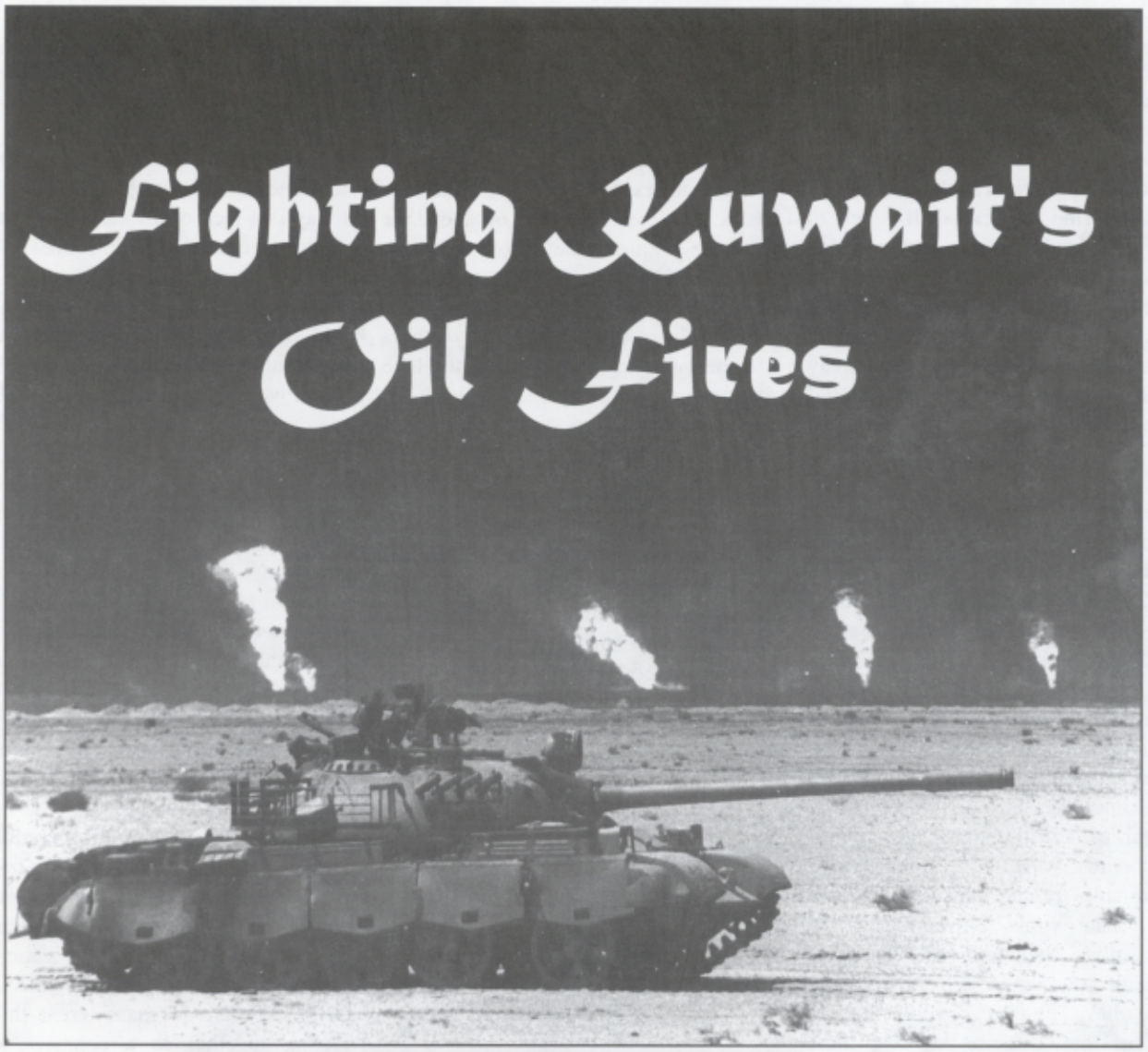
Fighting Kuwait's Oil Fires



By Janet A. McDonnell

During the Gulf War, the U.S. Army supported what was by all accounts the largest oil-fire-fighting campaign in history. Overall responsibility for fire-fighting operations rested with the Kuwaiti government and its Ministry of Oil. Kuwaiti leaders decided early on that the Kuwait Oil Company would manage and direct all fire-fighting operations.

Before the Iraqi invasion (in August 1990), Kuwait had roughly 1,300 producing wells in its primary oil fields. Approximately 75 of them were high-pressure wells in the important Burgan field that produced from 20,000 to 50,000 barrels of oil a day. Kuwait had a production quota of 1.5 million barrels per day, set by the Organization of Petroleum Exporting Countries (OPEC), though it could produce much more.

As Iraqi soldiers withdrew from Kuwait, they blew up more than 600 oil wells, resulting in the loss of an estimated 5 to 6 million barrels per day. Roughly 520 of the wells, or 85 percent, burned at temperatures as high as 2,000 degrees Fahrenheit. The rest gushed thousands of barrels of crude oil into large, dark, lifeless "lakes" that were up to six feet deep. Onlookers hundreds of feet away could feel the intense heat and hear the roar of the burning wells, similar to the sound of a jet engine. Thick smoke shrouded the fields. To further complicate matters, unexploded ordnance and Iraqi land mines littered the oil fields. The country's three refineries—Shuaiba, Mina Abdulla, and Mina al Ahmadi—were also damaged.

The Kuwait Oil Company directed the early planning for the fire fighting in Washington. The Kuwaitis requested U.S. Army civil affairs support in the planning effort. Members of the Kuwait Task Force (a small group of reserve officers from the 352nd Civil Affairs Command) helped the Kuwaitis gather information about the well fires, plan logistics support, and develop an emergency plan of action. The Kuwait Oil

Company hired O'Brien, Goins and Simpson as the executive agent to coordinate fire-fighting activities. It signed contracts with Red Adair Company, Boots and Coots, and Wild Well Control, Inc., all skilled Texas-based, world-renowned firms; and with Safety Boss of Calgary, a well-qualified Canadian firm. The Kuwait Oil Company eventually hired Bechtel to reconstruct the oil infrastructure and to provide food, housing, and other support to the firefighters, but Bechtel had no direct role in putting out the fires.

It took the Kuwaitis four months to award the first fire-fighting contract, and they hired firefighters before hiring a contractor to support them. A severe shortage of heavy equipment, such as bulldozers, backhoes, and trucks, hampered the fire-fighting effort. Because of theft and Iraqi destruction, virtually everything needed to support the operation had to be imported. The challenges of feeding, housing, and equipping a workforce that eventually grew into the thousands were staggering.

Firefighters arrived to survey the damage, assess their personnel requirements, and determine where they could stage their equipment. The first experts from Red Adair, Boots and Coots, and other companies arrived in Kuwait City on 4 March and toured the burning oil fields by helicopter. They estimated that extinguishing the fires and repairing the wells could take two years.

Initially, the contractors could not bring in workers because they had no way to feed or house them. The companies also had trouble getting the necessary equipment. The Kuwaitis initially were reluctant to invest the tens of millions of dollars needed for equipment, even though the fires consumed roughly $100 million worth of oil each day.

Members of the Kuwait Task Force provided immediate logistics and communications support to the fire-fighting teams. They also provided ground and air transportation to assess damage in the burning fields. Civil affairs troops coordinated the use of C-5A aircraft to bring in heavy fire-fighting equipment from Texas and to provide firefighters with food, water, lodging, and helicopter and truck transportation. This gave the Kuwaiti government enough time to bring Bechtel personnel on-site to take over the support operations. The Kuwait Task Force also provided explosive ordnance disposal support and training and coordinated engineer support until Kuwaiti equipment arrived. Army explosive ordnance disposal specialists steered the firefighters safely through unexploded ordnance to the wellheads and checked the wellheads for explosives.

An estimated 5 to 6 million barrels of oil a day were lost.

Kuwait Task Force members, Major Tom Wilson, a procurement specialist with Hunt Oil Company in civilian life, and Lieutenant Colonel Phil Huber, focused on fire issues. Task force members coordinated between the firefighters and Ambassador Edward Gnehm. They also coordinated between contractors looking for work and Bechtel or the Kuwait Oil Company.

Because of the shortage of equipment and firefighters, the work got off to a painfully slow start. The Kuwait Oil Company initially used nine teams that represented the four fire-fighting companies. Fire-fighting equipment began arriving in Kuwait on military aircraft throughout March, and on 7 April a Boots and Coots team used liquid nitrogen and water to extinguish the first oil-well fire. Fighting the wellhead infernos was dangerous and difficult. The firefighters worked in intense heat, amid blowing sand and smoke, and their brightly colored jumpsuits quickly became coated with an oily mist.

In April, Kuwait's oil minister, Dr. Rashid Al-Amiri, announced that the national oil company would bring in fire-fighting teams from several different companies, breaking up the American and Canadian monopoly. With only 25 well fires extinguished, he wanted to

Firefighters cap an oil well in Kuwait in August 1991.

quicken the pace. The Kuwaiti government later brought in teams from three additional U.S. companies as well as British, German, French, Russian, Chinese, and Iranian firms. Ultimately, however, teams from the original American and Canadian firms put out most of the fires. Meanwhile, firms and individuals from around the world continued to inundate U.S. and Kuwaiti officials with proposals for extinguishing the fires.

The slow pace of the fire fighting worried U.S. officials. In April, the Office of the Principal Deputy Undersecretary of Defense for Strategy and Plans hosted a meeting for representatives of the Army, Navy, Air Force, and Department of Energy to address this issue. The Deputy Assistant Secretary of Energy for Export Assistance, George Helland, warned that the Bush administration would come under attack if it did not act quickly to put out the oil fires. The participants decided to forward all proposals for extinguishing the fires to the Undersecretary of Energy. He would screen the proposals before forwarding them to David Tarbell, the Director of International Economic and Energy Affairs, in the Office of the Principal Deputy Undersecretary of Defense for Strategy and Plans. The participants, however, made no attempt to define the problem. They failed to develop any specific format or guidance for drafting proposals and failed to develop any initiatives to get support from high levels in the Pentagon or the Bush administration. These were important oversights.

After Task Force Freedom ceased operations, the Army continued to support the fire-fighting effort through the Defense Reconstruction Assistance Office. Neither the Kuwaiti government nor any of the commercial firms could quickly bring in needed supplies and heavy equipment. As a result, with little legal or funding authority, the Military Airlift Command found itself flying the cargo on U.S. Air Force C-5A transports. The Defense Reconstruction Assistance Office later helped broker more than $13 million in transportation expenses between the Military Airlift Command and the Kuwaiti government. Other Defense Department agencies provided support through satellite imagery photographs, airfield repair, and environmental surveys.

Major General Patrick Kelly, Commander of the Defense Reconstruction Assistance Office in Kuwait, and his staff monitored the work, gathered information, and kept the U.S. Ambassador to Kuwait, Edward W. Gnehm, informed. Gnehm had no environmental specialists on his staff, so he relied on Kelly's environmental officer, Lieutenant Colonel Christopher Werle, to advise him and coordinate environmental issues. Where appropriate, Kelly's staff helped coordinate the delivery of heavy equipment on C-5A transports, the tracking of oil fires and spillage with Landsat imagery, and the stabilization of work sites with airfield matting. Werle, who performed much of the day-to-day coordination with the fire-fighting organizations, developed a particularly good rapport with the firefighters and their support crews. Kelly and his staff considered all activities related to the environment and the oil-well fires to be "embassy business" and took no action without the ambassador's approval.

The Army also provided combat engineer vehicles (CEVs). These vehicles are tanks with turret-mounted demolition guns and hydraulically operated debris blades. They give engineers in forward combat areas a versatile means of clearing rubble and filling tank ditches. More

than 80 Kuwaiti oil fires were encircled by huge, hardened mounds of coke (solids produced when unburned oil mixed with sand), which had to be removed before the firefighters could work. Firefighters used dynamite and backhoes to remove the searing mounds, but the process was hazardous and slow. Werle developed a plan to use existing CEVs to fire rounds of high explosive plastic at mounds to break them up so the firefighters could remove the debris. This plan, he argued, would speed the capping effort and save the Kuwaiti government $300,000 per well. Moreover, it would provide unique training for the CEV crews and positive Army public relations. The Kuwait Oil Company covered the costs of using the CEV crews and equipment.

On 31 July, the Kuwaiti government and Bechtel conducted a very successful experiment: firing the large-caliber gun on a CEV to remove coke mounds from wellheads. Rounds from the vehicle shattered four out of five of the coke-mound targets. Soldiers cleared two wells using this method. Soon after the initial experiment, however, the focus of the fire-fighting effort shifted to Burgan, Kuwait's densest oil field. Officials concluded that using the CEVs there would be too dangerous because the wells were so close together.

As the oil fires continued to burn, the U.S. Army and other agencies became increasingly concerned about the short- and long-term health risks of the smoke and other emissions. In March 1991, an interagency team headed by the Environmental Protection Agency collected samples at several sites in Kuwait, Saudi Arabia, and elsewhere in the Middle East. They attempted to ascertain the presence of potentially harmful air pollutants, specifically carbon monoxide, sulfur dioxide, and hydrogen sulfide gases and particulates—tiny particles that lodge in the lungs. The team found each of these gases but not in concentrations that exceeded current standards. The Environmental Protection Agency subsequently concluded that no imminent health risk existed.

Some experts questioned the validity of the agency's study because it included only samples the team could collect within 20 minutes, rather than samples collected over 18 to 24 hours. The team found an abnormally high level of particulates. "Soldiers may become concerned because they find soot in their nostrils," they conceded, but the smoke was "only an irritant and a nuisance." For the long term, though, scientists needed to know more about the composition of the smoke to determine the potential health hazards. Meanwhile, at the request of the Deputy Assistant Secretary of Defense for Environment, a special health-risk assessment team from the Army Environmental Hygiene Agency conducted a 60-day study. The agency coordinated its effort with the Environmental Protection Agency's interagency assessment team to exchange information and prevent duplication of effort.

At the request of President George Bush, the administrator of the Environmental Protection Agency, William K. Reilly, traveled to Kuwait in June to assess environmental damage from the Iraqi invasion. "The horrors endured by the people of Kuwait and the unprecedented level of intentional environmental destruction," Reilly reported, "remind us all that there is still evil in the world." He praised the "environmental sensitivity" of the soldiers he met. "One of the untold stories," he added, "is the dazzling performance of the Army Corps, which essentially jump-started the infrastructure of a county." The military, he informed Secretary of Defense Richard Cheney, had greatly assisted scientists working in Saudi Arabia and Kuwait and those responsible for sewage treatment and pollution control. Upon his return, Reilly reported that the environmental damage was not as great as predicted. He cited the interagency team's finding that the levels of sulfur and heavy metals in the air were not abnormally high. Environmental groups, however, questioned those findings.

On 2 June, Kuwait resumed oil production in an offshore field, averaging 130,000 barrels a day. Later that month, it began producing 30,000 barrels a day onshore. On 25 July, Kuwait announced that for the first time since the Iraqi invasion it would resume exporting crude oil, though only on a small scale. Half of the oil fires had been extinguished. Firefighters were snuffing out more than six fires a day. By November 1991, all of Kuwait's oil wells had been capped. On 6 November, the emir attended a ceremonial capping in the Burgan field of the final oil well. The Kuwaitis, delighted to see the end of this tragic and costly episode, celebrated the event as a national holiday.

Kuwait lost more than 1 billion barrels of oil (or 1 percent of its sole natural resource) as a result of the Gulf War, but its huge reserves escaped lasting damage. The country still retained 10 percent of the world's crude oil reserves. With assistance from the U.S. Army and the dedicated, skilled private contractors, the Kuwaiti government had extinguished the oil fires and recapped the wells in record time.

Note: The above article is from a new book, "*After Desert Storm: The U.S. Army and the Reconstruction of Kuwait,*" by Janet A. McDonnell. The book, a joint publication by the U.S. Army Corps of Engineers and the U.S. Army Center of Military History, is scheduled for distribution in the spring of 1999. To obtain a copy, write to: U.S. Army Corps of Engineers Publications Depot, 2803 52nd Avenue, Hyattesville, Maryland 20781-1102.

Records of references used in the article are available in the research collections of the Office of History, U.S. Army Corps of Engineers, 7701 Telegraph Road, Alexandria, Virginia 22315-3865.

All photographs by Jonas N. Jordan, U.S. Army Corps of Engineers, Savannah District.

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