
Overhead Imagery for Emergency Response

Chemical fires and spills of hazardous substances into the environment are a continuing problem throughout the nation. The EPA's National Exposure Research Laboratory, with facilities in Las Vegas and in Reston, Virginia, assists in the Agency's efforts to contain or clean up these emergency conditions by providing aerial photography services to EPA response teams.

Emergency responses must be tailored to the specific needs of each incident, and aerial photographs can provide a quick overview of the existing situation. Support provided by the Laboratory, using nationwide commercial flying services and film processing facilities includes immediate acquisition, processing, and analysis of aerial photographs; telephone relay of critical information to the on-scene response teams; and prompt preparations of annotated photographs and maps for the on-scene teams.

Analysis of aerial photographs provides information on conditions at the site such as the location and extent of visible spillage, vegetation damage and potential transport of chemicals via drainage conduits. Annotated overlays to the photographs can show this information in relation to nearby locations threatened by the emergency, and they can aid in planning cleanup or hazard mitigation efforts. Follow-up aerial photographs taken after the initial emergency response can be used to judge the effectiveness of cleanup operations and the amount of damage to the environment. Specialists at the Laboratory have responded to several types of emergencies involving hazardous materials.

Figure 1 is an aerial photograph taken of an explosion at a plastics manufacturing plant after the fire was extinguished. Analysis of the photograph showed that extensive damage to the plant occurred and that the potential for release of contaminants to the surrounding environment was great.

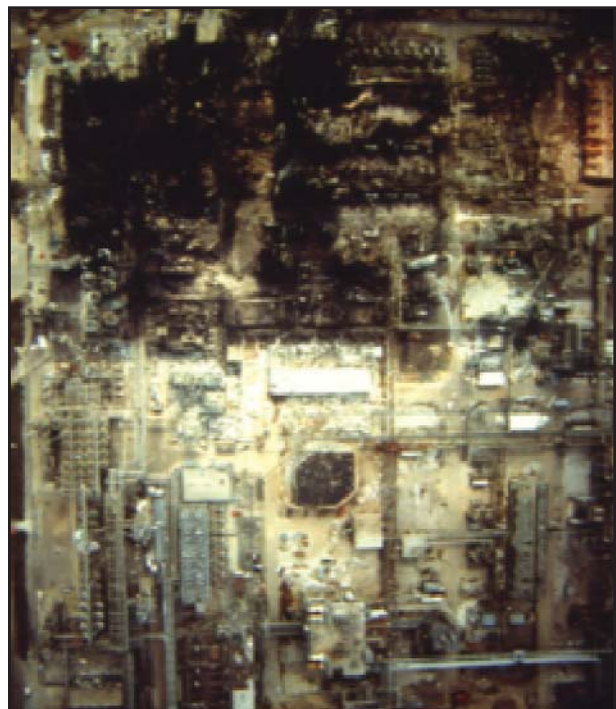


Figure 1

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Figure 2

Figure 2 (above left) shows an oil spill discharging from a docked oil tanker and the ease of detecting oil on the surface of a water body using natural color aerial photographs. The spill in this image appears uncontained and is affecting the shoreline in the immediate vicinity of the tanker. **Figure 3** (above right) shows an oil spill in a run near Manassas, Virginia. Several thousand barrels of oil entered a nearby creek and then flowed into the connecting river and a reservoir. Oil containment booms have been placed across the run in order to entrap the oil and make it easier to clean up. Aerial photographs taken over the next few days followed the path of the oil spill movement. The photographs guided the on-scene coordinator in selecting locations for containment booms and pinpointing areas of oil accumulation. Subsequent photographs verified the adequacy of the containment and cleanup of the spill.



Figure 3

A third kind of emergency occurred when 43 of 101 cars of a freight train derailed near Livingston, Louisiana. Many of these were tank cars carrying explosives and toxic chemicals that caused an intense fire and several explosions. The variety of chemicals carried in the tank cars made firefighting difficult.

Aerial photographs of the type shown in **Figure 4** helped to pinpoint particular cars, the exact location of fires, accumulation of hazardous materials, and the extent of damage and contamination to the surrounding area. These aerial photographs also provided valuable information for safety planning, including population evacuation, reoccupancy and determination of a control area.

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Figure 4

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