



Physical Anthropology Section - 2012

H71 San Bruno Gas Pipeline Explosion: Responding to a Neighborhood-Wide Disaster

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The goal of this presentation is to examine the complexity of applying forensic archaeological methods to a neighborhood-wide disaster. This presentation will include an overview of the recovery efforts following a gas pipeline explosion in San Bruno, California and highlight the challenges of working within various local, environment, and personnel constraints.

This presentation will impact the forensic science community by providing an example of a complex forensic recovery and the collaboration with various local first responders. As disasters requiring the assistance of forensic anthropologists are difficult to anticipate, this presentation addresses the need for outreach efforts to connect forensic scientists to other individuals and agencies involved in the recovery efforts before, during, and after a disaster occurs.

On September 9, 2010, a Pacific Gas and Electric (PG&E) natural gas pipeline exploded in a neighborhood located in San Bruno, California. The explosion occurred at 6:11 p.m. and quickly engulfed surrounding houses in the residential area. Escaping natural gas was ignited for more than an hour as PG&E personnel worked to shut down valves above and below the line rupture. Fires associated with individual homes were brought under control within 24-hours of the initial explosion. In total, the explosion destroyed 38 homes, damaged 70 other residences, and resulted in eight fatalities.

The California State University, Chico Human Identification Laboratory (CSUC-HIL) was contacted on September 11, 2010 to assist in the recovery efforts. A team of six faculty and staff members from CSUC-HIL and San Francisco State University, and 13 California State University, Chico students and alumni arrived on-site on September 12, 2010. Other agencies involved in recovery operations for the San Bruno area included the National Transportation Safety Board, the San Mateo County Coroner's Office, San Bruno Fire and Police, San Mateo County Search and Rescue, and personnel from PG&E. The focus of the CSUC-HIL forensic recovery was a single residence near the scene of the explosion.

The CSUC-HIL recovery efforts included locating and mapping the remains of three individuals found in the residence. As a result of the exposure to intense and prolonged heat, the remains recovered were highly fragmented and calcined, making the distinction between the osseous material and the surrounding matrix extremely difficult. The residence, like all the homes in proximity to the initial blast site, was completely destroyed with no standing structures except for the chimney and an exterior concrete fence. The matrix from the collapsed structure was contained in the footprint of the house and was between one and two feet in depth. No interior walls or supporting structures survived the fire.

Several factors encountered added to the complexity of the recovery operation. First, the destruction from the gas pipeline explosion was a neighborhood-wide disaster with dozens of residences completely destroyed. As a result, the recovery operations took place in a large area with no existing infrastructure, such as clear streets, electricity, phones, or running water. Second, the length of time of the fire and the intensity of the heat from the ignition of the natural gas main created a large debris field up to three feet high across the neighborhood. The attempts to control the fire in the two days prior to the recovery included several fire departments and aerial fire suppression efforts, which greatly disturbed this scene. Third, the nature of the fire created a scene unlike those normally encountered by local fire personnel. As a result, early efforts to recover victims of the house were halted when the highly fragmented condition of the remains became apparent. The subsequent recovery by the CSUC-HIL team included examining remains *in situ* within the residence, and also identifying which elements had been recovered the previous day during the initial search for remains. This ensured maximum recovery of human remains from the site. Lastly, the lack of surrounding infrastructure and the duration of the recovery effort hindered the acquisition of proper safety equipment for the CSUC-HIL team. This limited the number of personnel the CSUC-HIL team could actively have conducting the forensic archaeological operations at any given time, which became a concern given a timeframe of less than 10 hours for the recovery.

This presentation will discuss the approach and recovery methods used by the CSUC-HIL team and will examine the lessons learned from the limitations encountered. The collaboration with local personnel will also highlight the role of forensic anthropologists in communicating proper recovery methods to a larger community of first responders.

Forensic Anthropology, Forensic Archaeology, Fire Scene Recovery