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## First Steps to Limiting Conflict Pollution in Central Vietnam

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**Image 1.** A PMC Engineer prepares a remote cut on a 500 lb bomb.  
*Image courtesy of Golden West.*

# FIRST STEPS TO LIMITING CONFLICT POLLUTION IN Central Vietnam

By Allan Vosburgh [ Golden West Humanitarian Foundation ]

**A**wareness and concern are growing worldwide regarding pollution resulting from conflicts. In Vietnam, decades of wars have left a legacy of contaminated land and increasingly polluted water. Golden West Humanitarian Foundation (Golden West) believes future success in eliminating explosive remnants of war (ERW) will depend on highly-skilled, dedicated Vietnamese technicians who can apply training, tools, and techniques that mitigate ERW without unnecessarily adding new contaminants to the environment. Open detonations always contribute steel fragments and particles of explosive residue in the ground along with smoke and detonation products in the air. Golden West is helping to develop facilities, technology, and initiatives that reduce pollution from humanitarian mine action (HMA) operations.

Quảng Trị is arguably Vietnam's province most impacted by ERW, but positive measures are beginning to reduce environmental impacts of HMA operations. The civilian population of Quảng Trị has endured decades of wars and conflict resulting in trauma and slow recovery from widespread ERW contamination. Cooperation between Quảng Trị's Provincial Military Command (PMC) Engineers and Golden West,<sup>1</sup> is making HMA operations safer and limiting damage to the environment. Golden West believes that building indigenous capacities in enduring institutions that can solve their own ERW challenges without foreign assistance is a long-term key to success for HMA.

A vital element of this partnership has been an effort to nurture and encourage growing Vietnamese environmental awareness, and to develop and enhance techniques that address ERW while incorporating environmental concerns. These include specialized explosive ordnance disposal (EOD) tools such as cartridge-powered demers, shaped charges, and mobile cutters that attack fuzes and can prevent unwanted

detonations. These tools manage unexploded ordnance (UXO) while mitigating the need for open detonations. By controlling solid waste and upgrading facilities, we pursue the goal of enhancing safety and acknowledging community concerns regarding air and water quality.

The Quảng Trị PMC is an integral part of the People's Army of Vietnam, tasked with the mission of protecting the people of Quảng Trị Province from a wide range of threats, including exposure to UXO and other ERW. Golden West recognizes that regardless of outside funding or level of international assistance, the PMC Engineers will always be there and will strive to support the population of Quảng Trị. Because we believe in this concept, Golden West is self-funding Quảng Trị PMC training and mentoring programs, building PMC capacity to conduct EOD operations to an international standard of excellence as central Vietnam transitions to a reactive model of residual ERW response.<sup>2</sup>

**Image 2.** Construction of the Cam Lộ Ordnance Detection Testing and Training Area.  
*Image courtesy of Golden West.*





**Image 3.** Golden West and PMC team assisting Cam Lộ neighbors.

*Image courtesy of the Quảng Trị Department of Foreign Affairs.*

## Cam Lộ EOD Range

In 2019, the Quảng Trị Provincial Peoples Committee provided their PMC with 400 acres of land in Cam Lộ District for use as a dedicated EOD training facility. The PMC partnered with Golden West and the US Army's Humanitarian Demining Research and Development Program (HD R&D) to develop this site into a world-class EOD testing, training, and demolition range. Access was improved by expanding the range road network, upgrading gravel road surfaces, and increasing drainage. Several existing structures were developed into modern classrooms with new windows, improved lighting, and classroom furnishings. Demolition areas were improved with proper pits for open demolitions and separate pits for white phosphorus projectile disposal, and other areas for open burns of munitions cut by the Mobile Cutting System (MCS). These improvements greatly improved the overall safety of the range.

The Cam Lộ EOD Range is important because it provides a permanent site for both PMC EOD training and application of safe and environmentally conscious demilitarization of UXO. Centrally located in Quảng Trị Province, the range accommodates treatment of recovered UXO from PeaceTrees Vietnam in the western districts and PMC operations in the rest of Quảng Trị. ERW from other HMA organizations

in the province can also be processed if requested by the Quảng Trị Mine Action Center (QTMAC).

In early 2020, with generous support from HDR&D, a purpose-built Ordnance Detection Training and Testing Area was constructed by the PMC Engineers and Golden West on the Cam Lộ EOD Range. This training and testing area incorporates three test lanes, consisting of representative soils from the iron-rich west, native Cam Lộ soil, and sandy soil from Quảng Trị's eastern coastal districts, all seeded with free-from-explosives (FFE) munitions—produced using Golden West's MCS—that represent commonly-found UXO. These were recovered by the PMC in Quảng Trị Province, made inert, and emplaced by Golden West EOD operators and geophysicists. The site provides PMC EOD operators with outstanding experience locating and characterizing real UXO targets in all soil conditions, and provides opportunities to test and evaluate new detection equipment and technologies in an indigenous environment. Detection equipment used for training included Vallon handheld detectors—provided by a previous U.S. Department of State grant to Golden West—and Ebinger large loop detection tools. Moreover, we hope to obtain the resources to expand the site to include various types of landmines and additional munitions.

## Environmental Considerations

In 2020, at the behest of Golden West, initial baseline water quality testing was conducted around the Cam Lộ EOD Range by a commercial environmental company based in Da Nang. The baseline tests characterize the levels of contaminants that exist in ground water, establish acceptable levels of typical range contaminants, and enable control measures if future tests suggest these levels are being exceeded. Golden West has engaged this company to manage the waste lubricants and solid wastes from the MCS training site. A future program of regular water testing is being planned, monitoring the run-off from the range and protecting the water supplies of nearby farmers and communities. We are standardizing this testing and making it a routine training component at the range, with the aim that the PMC will continue the practices when we depart.

In late 2020, multiple tropical typhoons swept across the central region of Vietnam. The Quảng Trị PMC provided immediate assistance, responding to landslides and endemic flooding across much of the province. The Cam Lộ EOD Range was badly damaged by flooding and erosion, with the Ordnance Detection Training and Test Area eroded, demolition pits washed out, and access to the range disrupted.

Golden West responded by soliciting additional funds and real-locating funds from training support to the US Army Pacific's HMA training for Vietnam's National Mine Action Centre (VNMAC) and HDR&D to assist with urgent repairs to the Cam Lộ EOD Range. With materials from Golden West and equipment and manpower provided by the PMC Engineers, repairs began and access was restored over the next several weeks. Golden West also supported civilian neighbors of the range, providing emergency supplies for forty-six families living in Cam Lộ.

In the early stages of ERW clearance in Quảng Trị Province, blow-in-place open detonations of large UXO were the only safe means of disposal available. Since the war had recently ended, there was no

access to reliable EOD publications detailing United States' munitions and fuzing, often making trial and error render safe procedures and blow-in-place detonations necessary. We now know that open detonations generally endanger the public, contaminates areas with metal fragmentation, and deposits explosive residues. Noise from detonations, damage to crops, and disruptions from safety evacuations alienate local farmers and other residents. In many areas of the world, open detonations of residual ERW are no longer authorized except in emergencies when dangerous munitions cannot be safely moved.

Golden West has pioneered use of the MCS to effectively treat bombs and large projectiles. The MCS consists of an electric bandsaw, a generator, and various tools for lifting and positioning munitions, enabling safe separation of fuzes. Through the use of fixed cameras and airborne drones, Golden West uses video supported by high resolution imagery to ensure safety during remote cutting operations. X-ray imagery of suspected white phosphorus filled munitions will soon be incorporated as an additional safety measure, preventing damage to the equipment and a dangerous and messy cleanup. The key to safe and effective operation of the MCS is knowing how to cut, what to cut, and especially what not to cut.

Originally developed in Cambodia as a spinoff of Golden West's Explosive Harvesting System, the MCS has been used to great effect in the Pacific Islands where open detonations are not feasible due to small island land areas and at-risk populations. With more than fifteen years of experience, Golden West routinely cuts large aerial bombs and projectiles, removing fuzes and enabling munitions to be safely moved. The concept is simple, but the equipment is only a small part of the process. Detailed knowledge of munitions and fuze functioning resulting from IMAS EOD Level 3 training and mentoring combined with specific MCS training is required to safely cut munitions.

## Conclusion

Golden West constantly strives to develop training, tools, and techniques that make HMA operations faster, safer, and more cost-effective and environmentally conscious. In central Vietnam, Golden West will continue working with our Vietnamese partners to improve safety and eliminate ERW while improving techniques that protect the environment. We plan to continue working with the Provincial Government and PMC to further develop the Cam Lộ EOD Range, making it a model facility for training and destruction of ERW. By incorporating environmental considerations into the establishment of range operation procedures, Golden West aims to ensure the long-term viability of the range as a permanent PMC asset for management of residual ERW in the region. ©

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Allan Vosburgh has served as Chief Executive Officer of the Golden West Humanitarian Foundation since 2016. Vosburgh served thirty-six years in munitions and EOD in the U.S. military forces and an additional seven years as Chief of Munitions for the U.S. Army Pacific G-4. Since 2005, he has supported humanitarian mine action and physical security and stockpile management worldwide, and created Swim for Life Vietnam, a drowning prevention program for children in central Vietnam.

BIOGRAPHY