

## Initial Investigation Completed

The initial investigation (Site Inspection) of Former Bomb Target 2 (BT-2) has been completed. The Site Inspection Report is being developed now and will be available to the public in early 2010, after it has been reviewed by the North Carolina Department of Environment and Natural Resources (NCDENR).

This fact sheet summarizes the results of the Site Inspection and the next steps.

### Site History

BT-2 was located in the vicinity of Wood Island in Bogue Sound, offshore of a point about ½-mile north of 24th Street in the town of Emerald Isle (Figure 1, page 2). The target was used for training military pilots in the 1940s and 1950s. Records from that period show three aerial bombing targets on and around Wood Island. Historical surface danger zones were associated with those targets.

BT-2 has not been used as a target since about 1955 and there are no plans to reactivate it. Around 1957, military explosive ordnance disposal technicians removed munitions from the surface of the island. No attempt was made to remove subsurface munitions because of the limitations of technology at that time.

### About the Investigation

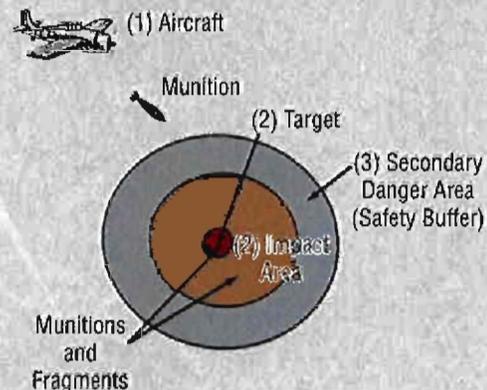
The Navy and Marine Corps Air Station (MCAS) Cherry Point are investigating potential impacts of past training operations conducted at BT-2 as part of a nationwide evaluation of historic military training sites. The Naval Facilities Engineering Command is leading the investigation, in partnership with MCAS Cherry Point and NCDENR. The U.S. Environmental Protection Agency (USEPA) and other federal and state agencies are providing technical support.

The Site Inspection began in 2008 with a review of historical records. During site visits to Wood Island, remnants of old munitions and fragments were observed on the surface, along the shoreline, and partially buried on the island.

A **Surface Danger Zone (SDZ)** is an area associated with a training range. It may include land, water, and airspace.

An SDZ is comprised of three parts:

- 1. Weapons Firing Position:** At BT-2, the aircraft from which munitions were fired
- 2. Impact Area:** The target(s), where munitions and munitions fragments were expected to land
- 3. Secondary Danger Area:** A safety buffer, where some fragments from munitions might have landed



*Illustration of a Surface Danger Zone for Munitions Delivered from Aircraft*

In spring 2009, a digital geophysical mapping (DGM) survey was conducted, using a commercial helicopter, over the part of Bogue Sound that surrounds Wood Island (Figure 1). The purpose of the survey was to detect and accurately map metallic items (referred to as magnetic anomalies) within the SDZ around BT-2. The patterns of anomalies identified by the aerial DGM survey will be used to focus future stages of the investigation.

In addition, samples of soil, surface water, and sediment were collected and analyzed for munitions-related chemicals, such as metals and explosives residues.

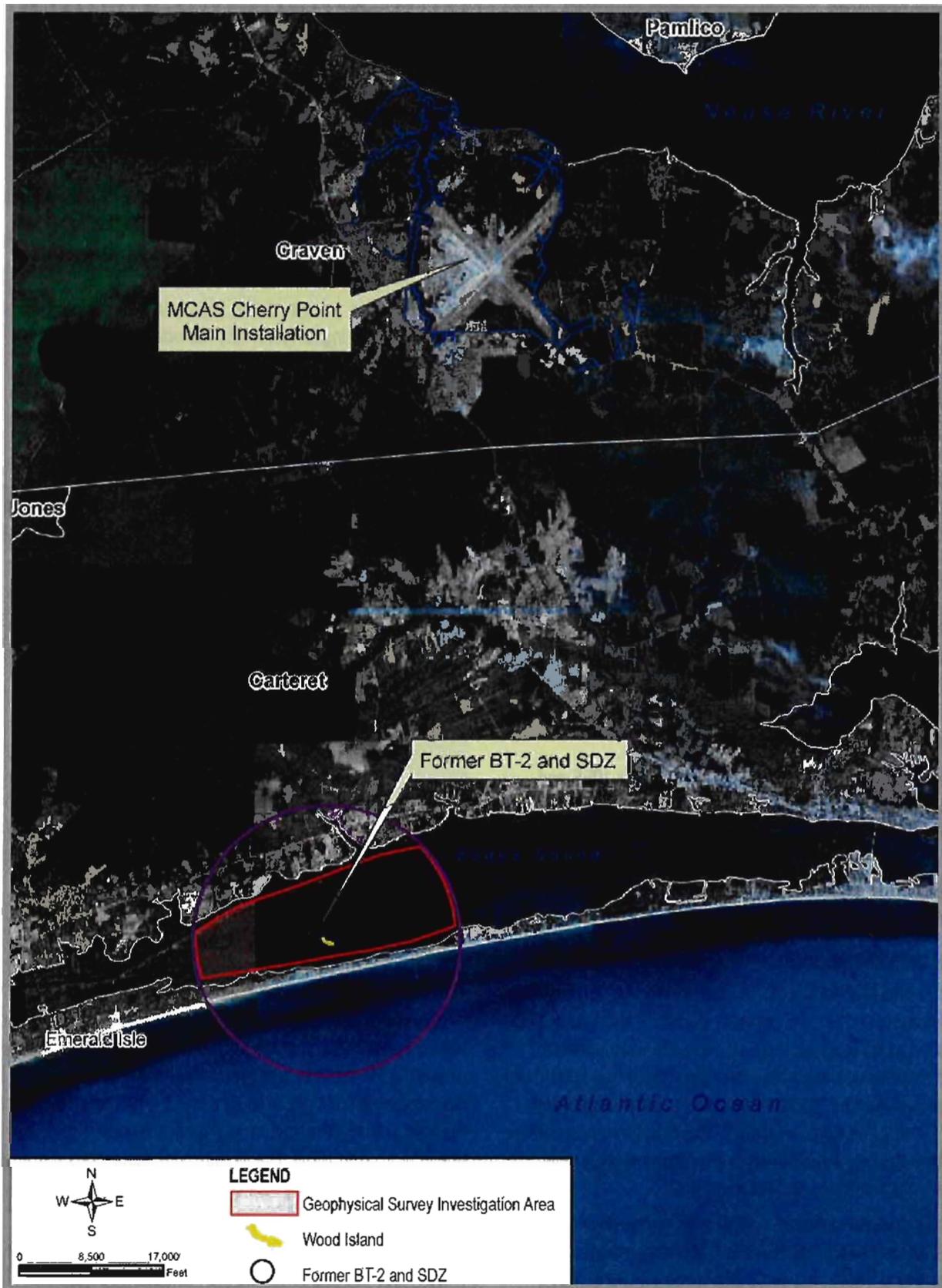


Figure 1 – Investigation Area

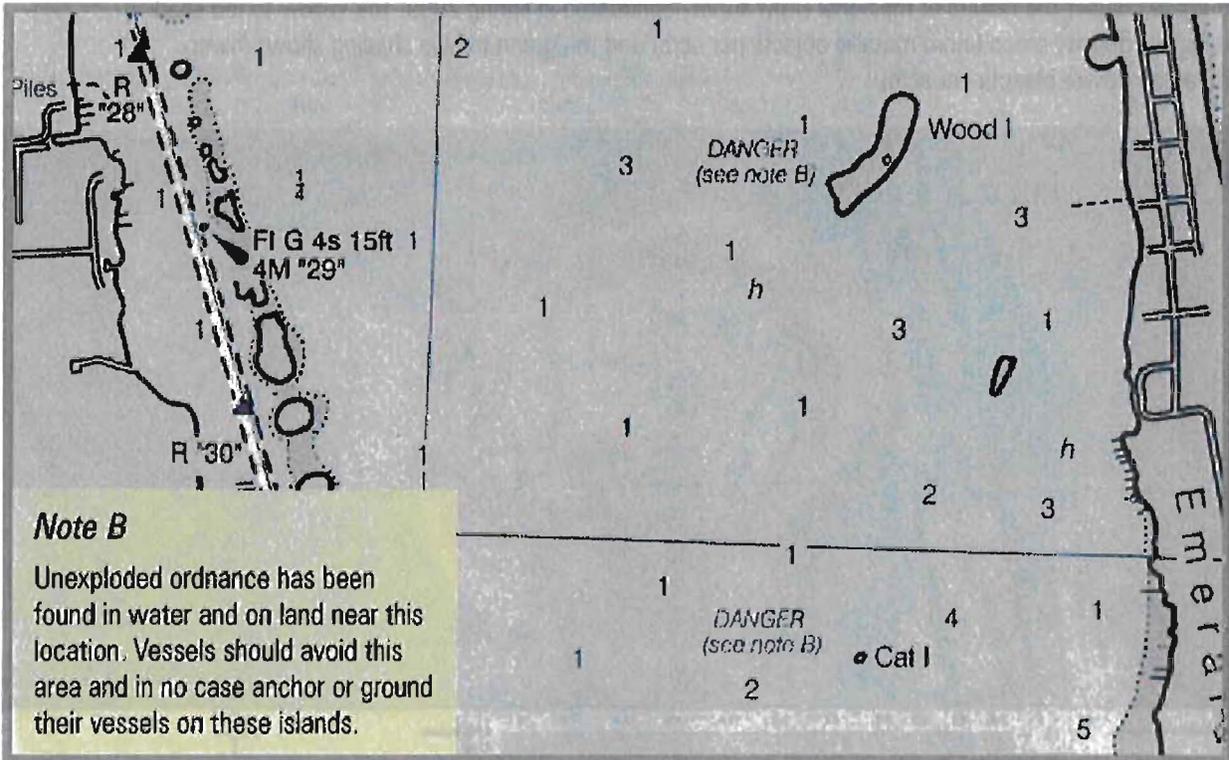


Figure 2 – Nautical chart 11541 around Wood Island

### Danger – Unexploded Ordnance!

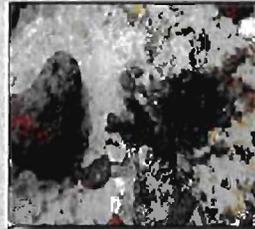
Although MCAS Cherry Point has not used Wood Island as a target for nearly 50 years, explosive hazards make it unsafe for any kind of civilian use.

Wood Island is posted with danger signs. The official nautical chart (see Figure 2) for this area clearly states “Unexploded ordnance has been found in water and on land near this location. Vessels should avoid this area and in no case anchor or ground their vessels on these islands.”

Looks are deceiving when it comes to munitions. Even small items can injure or kill. With age and weather, safety devices may no longer work. Old explosives may become unstable and unusually sensitive. Large or small, new or old, shiny or rusty, clean or dirty; all of it can be dangerous!

***For your own safety, please do NOT anchor boats near Wood Island, or go onto the island at any time!***

If you find munitions **ANYWHERE**, contact your local law enforcement. **DO NOT HANDLE** any munitions.



These figures depict the results of the aerial DGM survey conducted in spring 2009. The yellow to red shading shows higher-density areas (more metallic objects per acre) and the green to blue shading shows lower-density areas (fewer objects per acre).

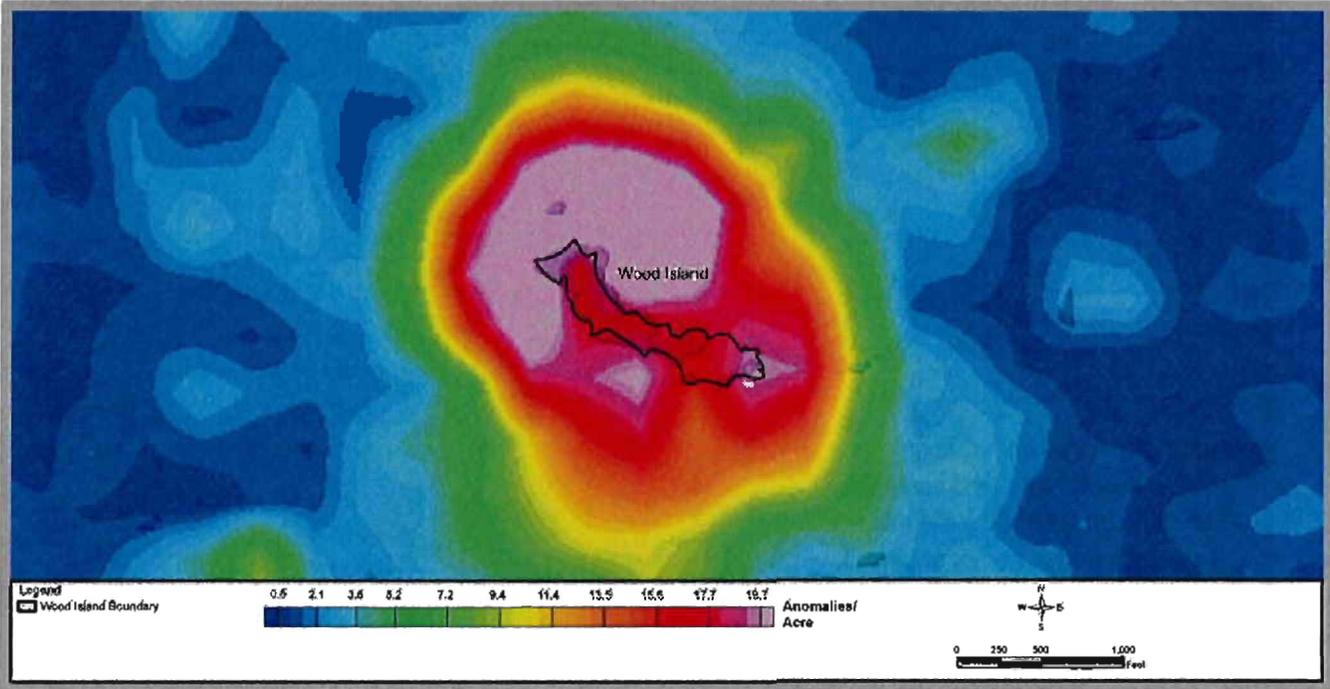


Figure 3 – Aerial DGM results near BT-2

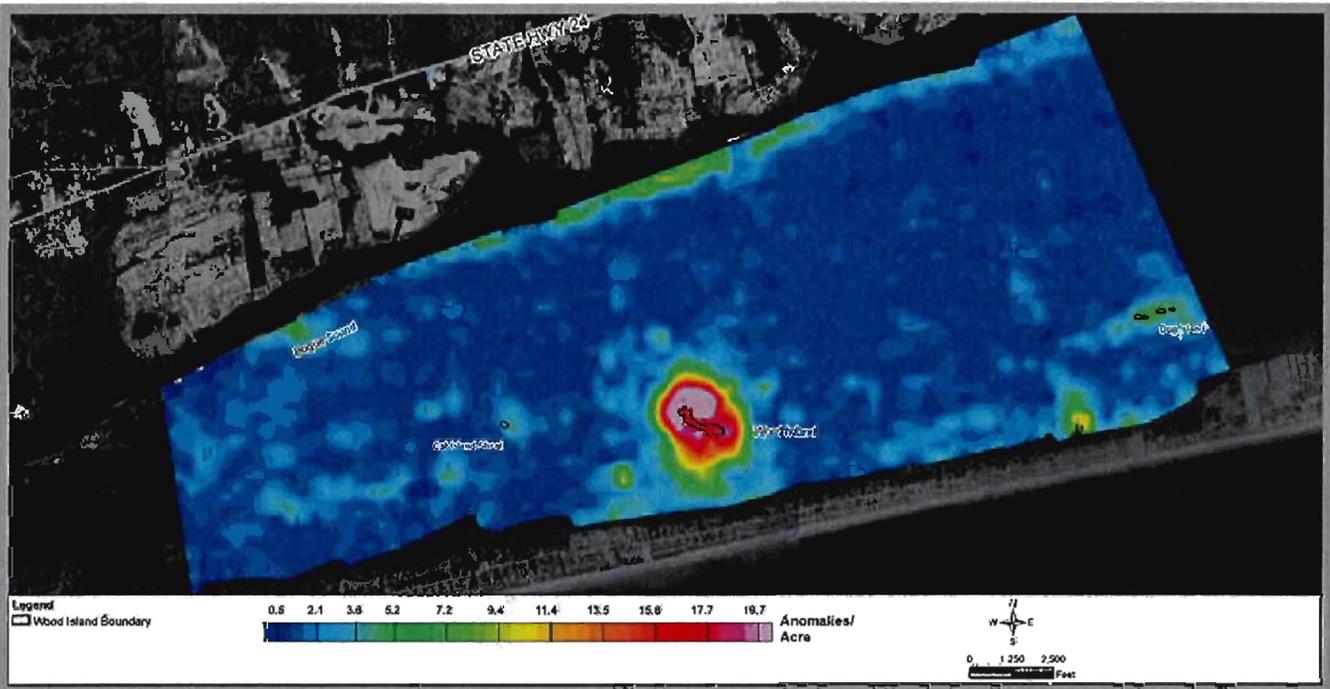


Figure 4 – Aerial DGM results in the investigation area

## Investigation Results

### Aerial Survey

In the aerial DGM survey of Bogue Sound, magnetometers were mounted on booms attached to the helicopter.

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*Magnetometers are geophysical instruments that measure the strength or direction of the earth's magnetic field. A mass of metal creates a detectable disturbance in the magnetic field.*

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The helicopter flew back-and-forth passes at four to five feet above the water to locate and create a digital map of magnetic anomalies (metallic objects). These anomalies could be munitions submerged under water or buried under the surface of the ground, or they could be unrelated metallic objects related to recreational or commercial use of Bogue Sound: crab pots, for example, or items dropped overboard from boats, such as anchors, engine parts, tools, and fishing gear.

The survey identified approximately 10,400 magnetic anomalies. There are several clusters of concentrated anomalies near Wood Island. The rest are irregularly distributed throughout the 10-square-mile (6,600-acre) investigation area (Figures 3 and 4).

The highest concentration of metallic objects is clustered within approximately 650 feet of Wood Island. This mass of closely-spaced magnetic anomalies is similar to the expected results for an aerial bombing target.

Three much smaller clusters of metallic objects were found in the investigation area, further away from Wood Island in Bogue Sound (Figure 4).

- One cluster is located approximately 2,500 feet southwest of Wood Island.
- The second cluster is located about 2.5 miles east of BT-2, directly off the northern shoreline between 1st and 2nd Streets in Emerald Isle, near some docks and piers that extend into Bogue Sound.
- The third cluster is located near Dog Island, about 3,000 feet north of the shoreline near the Emerald Isle/Indian Beach town boundary.

Except for these small clusters, the density of metallic objects decreases as you move from Wood Island toward Emerald Isle (see Figure 4).

Many munitions remnants and fragments were observed on the surface of the island during site visits to Wood Island.

Therefore, the Site Inspection Report concludes that the large cluster of metallic objects on and surrounding the island would be associated with the former military training conducted at BT-2.

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*Data from an aerial DGM survey only shows whether or not metal is present. It does not distinguish between munitions and other metallic objects.*

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### Environmental Investigation

In March 2009, the project team collected soil samples from Wood Island, surface water samples from Bogue Sound and some of the water-filled depressions on Wood Island, and sediment samples from the bottom of Bogue Sound, near the historic target locations around Wood Island. These environmental samples were analyzed for explosives residues, perchlorate, and metals.

Additional surface water and sediment samples were collected from outside the SDZ boundary in Bogue Sound, to establish a background level for these chemicals.

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*Background levels are either concentrations of elements (metals) that are naturally-occurring or concentrations of chemicals that have been found to be typical of human activities in the surrounding area.*

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Metals (arsenic, iron, mercury, cadmium, or silver) were detected above regulatory screening levels in soil, sediment, and surface water samples from Wood Island. The concentration of metals, however, seems to be consistent with background levels.

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*If concentrations of chemicals are above the screening levels defined by environmental regulatory agencies, further evaluation of possible health or environmental risk is needed. If chemicals are below screening levels, it is generally agreed that little or no risk to human health or the environment is likely to result.*

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Perchlorate was detected below the screening level in sediment from Bogue Sound. Very low levels of explosives residues were found in some of the surface water samples; no screening levels exist for these chemicals.

## Assessing Environmental Risk

Although the obvious public risk on Wood Island is from munitions, the Site Inspection also considered potential environmental risks. Based on the environmental data collected and analyzed in 2009, little or no risk was identified. These findings will be presented in detail in the Site Inspection report.

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*For a health risk to occur, people or wildlife have to be exposed to chemicals. This is called a complete exposure pathway.*

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A human health risk screening, considering the sampling data and potential exposure pathways, did not identify unacceptable short-term or long-term human health risks from exposure to surface soil, sediment, or surface water at BT-2.

Similarly, an ecological risk screening found that no significant risks are expected for wildlife that is exposed to surface soil, sediment, or surface water at BT-2.

## Next Steps

Based on the results of the preliminary human health and ecological risk screening, no further evaluation of chemicals in the surface soil, surface water, and sediment is recommended at BT-2 or in Bogue Sound at this time.

Unexploded ordnance, however, is a potential risk to human safety.

The old munitions visible on the surface of Wood Island and the high concentration of magnetic anomalies in the waters around the island show that further munitions investigation is needed.

After a Site Inspection, the next phase in a munitions investigation is to determine the nature (types and physical condition) and extent (affected areas, including depths) of the magnetic anomalies that are likely to be munitions and explosives of concern.

The Navy will evaluate alternative methods that would allow such an investigation to be safely carried out. The suspected munitions are mainly underwater or underground and are expected to be in poor condition—weathered or corroded, like the munitions observed on the surface. Those factors make this identification process complicated, as well as potentially dangerous for the investigation team. Because of this, considerable time will be required to plan and carry out the investigation.

## Planning for an Interim Removal Action

Meanwhile, MCAS Cherry Point and the Navy are considering how best to protect the public. Protective measures could include removing potentially hazardous munitions and fragments from the surface of Wood Island (to reduce the known explosive safety hazard), installing additional warning signs or restricting bottom-disturbing activities in the waters adjacent to the island (to reduce the chance of exposure to that hazard). The public will be consulted before interim actions are implemented.

To plan a surface removal action, a number of technical, logistical, and safety details must be documented and coordinated among MCAS Cherry Point, the Navy, ordnance safety organizations within the Department of Defense, USEPA, NCDENR, and other state and local agencies. Among other considerations, activities cannot take place on Wood Island during the nesting season for migratory birds (April through August).

When the planning process is nearly complete, an Engineering Evaluation/Cost Analysis (EE/CA) will be prepared for the interim removal action. The EE/CA will describe how and where munitions and fragments will be removed from the surface of Wood Island and will evaluate options for disposing of them. The EE/CA will be made available for public review and comment before a decision about the interim removal action is made.

At that time, MCAS Cherry Point will invite interested community members, as well as representatives of the involved agencies, to discuss the proposed removal action in a public meeting. Notices in local newspapers will advertise the availability of the EE/CA and the date and location of the public meeting.

## Contacts for More Information

Questions and comments from interested community members are welcome at any time during the investigation and planning process.

- Kirk Stevens, Naval Facilities Engineering Command Mid-Atlantic: 757-322-4589, [kirk.a.stevens@navy.mil](mailto:kirk.a.stevens@navy.mil)
- John Myers, MCAS Cherry Point Environmental Affairs Department: 252-466-4903, [john.s.myers@usmc.mil](mailto:john.s.myers@usmc.mil)



*Looking down on Wood Island from the helicopter*



*Helicopter with magnetometer array flies over Bogue Sound*

## What's Inside?

**This fact sheet provides an update on the investigation of munitions at Former Bomb Target 2 (BT-2) in Bogue Sound, where Marine Corps Air Station Cherry Point conducted training in the 1940s–1950s.**

**Important information for boaters is included – please read and share!**

This is the 3rd in a series of fact sheets about BT-2. Copies of the July 2008 and February 2009 fact sheets are available in the West Carteret Library, on the public website, or by contacting Kirk Stevens (see right).



If you haven't already, please send your e-mail or mailing address (with "BT-2 Wood Island Mailing List" in the Subject line) to [kirk.a.stevens@navy.mil](mailto:kirk.a.stevens@navy.mil), or write to:

CH2M HILL, Inc.  
(Attn: MCAS Cherry Point Team)  
5700 Cleveland Street, Suite 101  
Virginia Beach, VA 23462



Would you like to continue receiving information about the BT-2 investigation?



If you received this by mail, would you prefer to receive updates by e-mail instead?



Please visit our new website! New central address: <https://portal.navfac.navy.mil>  
Select Environmental (on left) ▶ Environmental Restoration (tab) ▶ Click on the interactive map ▶ North Carolina ▶ Cherry Point

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