

6 PROTECTIVE MEASURES

In order to avoid, minimize, rectify, reduce, and eliminate the environmental impacts of current RDT&E activities, NSWCCD and NSF Dahlgren have developed environmental management processes, including the NSWCCD Environmental Management System (EMS) and Safety Program, the NSF Dahlgren Comprehensive Work Approval Process (CWAP), and protective measures. For the purposes of this chapter:

- *Protective measures* are actions taken by NSWCCD to protect sensitive resources, but that are not implemented in response to the impact findings of this EIS.
- *Mitigation measures* differ from protective measures in that they would be implemented specifically in response to the impact findings described in Chapter 4 of this EIS.

The protective measures already implemented for current No Action Alternative activities, which rely heavily on ongoing process improvements, would continue to be used as the means of mitigating environmental impacts for the Proposed Action alternatives. NSWCCD identifies environmental and safety risks for current No Action activities and responds with mitigation and protective measures based on experience from earlier RDT&E. Developing mitigation based on the projected risk when the RDT&E activity is being planned and then implementing these responsive measures when the activity takes place can effectively reduce the impact of the activity below that level at which the impact would be significant.

The impact findings described in Chapter 4 were determined in the context of the existing environmental management processes and protective measures that are integral to current and future NSWCCD RDT&E activities. Basically, mitigation is and would continue to be built into current activities and future activities under the Proposed Action. Because the protective measures in place reduce the impact of activities discussed in this EIS below the level at which the impact would be significant, no mitigation measures are necessary. NSWCCD is committed to applying the same processes used to mitigate safety and environmental impacts for current activities to all future activities under the No Action Alternative and Alternatives 1 and 2. NSWCCD's Safety and Environmental Office is responsible for carrying out these processes for NSWCCD's current activities and would do so for future activities.

Typically, there are substantial differences between protective and mitigation measures associated with a No Action Alternative and those developed for Proposed Action Alternatives. This is to be expected because the Proposed Action normally generates new and different impacts when compared to the No Action Alternative, driving the potential protective and mitigation measures developed. However, the Proposed Action activities in this EIS are in essence the same as those associated with the No Action Alternative. While the number of tests and events would increase and the conduct of some activities change somewhat under the Proposed Action, the activities and their impacts would remain similar under all three alternatives.

6.1 Environmental Management

NSWCDD's Environmental Policy is articulated as follows (NSWCDD, 2012):

The Naval Surface Warfare Center Dahlgren Division (NSWCDD) is committed to protecting the environment while carrying out its mission. All personnel share the responsibility to comply with environmental laws, regulations, and policies. Along with the Naval Support Activity South Potomac and Naval Air Station Oceana¹, through our Environmental Management System, we are committed to:

- *Integrating sound environmental practices into processes and business decisions, while maintaining efficient and successful mission execution.*
- *Complying with applicable federal, state, local, Department of Defense, and Department of Navy regulations and policies for which NSWCDD subscribes.*
- *Continuously improving environmental performance through effective environmental planning.*
- *Ensuring pollution prevention, preservation of our land, Chesapeake Bay sustainability, and protection of natural and cultural resources.*
- *Educating employees concerning their environmental protection responsibilities.*
- *Increasing public awareness of our commitment to protect the environment.*

6.1.1 NSWCDD Environmental Management System (EMS)

In accordance with Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, which was issued 24 January 2007, and subsequent Navy policy, NSWCDD has implemented an EMS. NSWCDD's EMS is a set of systematic processes and practices to ensure environmental compliance and improve environmental management built upon its environmental policy. NSWCDD works to minimize adverse environmental impacts from new RDT&E activities by integrating environmental management practices and procedures early in the planning process.

International Standard ISO 14001 is a worldwide standard that provides specifications for an EMS, and NSWCDD's EMS follows this standard. The ISO 14001 EMS Standard establishes requirements in 18 different element areas. These elements are grouped into five phases called Environmental Policy, Planning, Implementation and Operation, Checking, and Management Review.

NSWCDD's mission EMS provides the framework for reliably and consistently meeting Dahlgren's environmental obligations. EMS enables NSWCDD to:

- Identify and control the environmental impact of its activities.
- Improve its environmental performance continually.

¹ Naval Air Station Oceana is no longer applicable since Dam Neck has established their own EMS.

- Implement a systematic approach to setting and achieving environmental objectives and targets and to demonstrating that they have been achieved.

NSWCDD has implemented the EMS by identifying and ranking environmental aspects associated with activities, products, and services that are integral to the mission. These associated activities, products, and services include, for example, RDT&E activities, thermal treatment (Open Burn/Open Detonation) of explosive hazardous waste, training performed by qualified ordnance personnel, administrative activities, equipment maintenance, and typical office equipment use.

NSWCDD has developed objectives and targets necessary to manage those environmental aspects that have been identified as significant. Since EMS is a process of continual improvement, additional objectives and targets are developed as part of an ongoing EMS cycle at NSWCDD.

Each individual working or visiting NSWCDD, including full-time, part-time, and contract employees must be aware of the NSWCDD Environmental Policy and must comply with applicable federal, state, local, Department of Defense, and Department of the Navy regulations and policies. Depending on the nature of their work or visit, additional EMS training and responsibilities may be required. NSWCDD's EMS facilitates the reduction of environmental impacts and increases operating efficiency, thereby supporting the mission while ensuring compliance with all legal and other requirements. In addition, the EMS provides rigorous oversight and is a useful way of integrating monitoring efforts associated with the mitigation commitments/protective actions (CEQ, 2011), as described in the following sections.

6.1.2 NSWCDD Safety Program

This section summarizes NSWCDD's safety program and procedures associated with RDT&E activities. A full discussion of the safety measures employed to protect human health is provided in Section 3.8.

Safety measures cover occupational safety and health (OSH) as well as the general public and the environment. NSWCDD's OSH policy (NSWCDD, 2011) is to:

- Develop and maintain a safe and healthful workplace for all employees by integrating safety awareness and Operational Risk Management into all aspects of workplace activities and business decisions.
- Continuously improve workplace safety and health through process improvements and elimination of potential hazards to reduce injuries.
- Educate employees concerning their safety and health rights and responsibilities.
- Provide employees with controls and equipment essential to safe mission accomplishment
- Ensure compliance with relevant regulatory standards and laws.
- Foster communication and encourage participation throughout all organizational levels to achieve and maintain a safe and healthful workplace.

NSWCDD's OSH is in compliance with Navy policies (US Navy, 2010, 2011).

As described in Chapter 3.8, measures used by NSWCCD to protect human health and the environment can be divided into three main types:

- Safety procedures
- Protective equipment
- Safety zones.

The development and rigorous implementation of Risk Hazard Assessments (RHAs), Standard Operating Procedures (SOPs) or General Operating Procedures (GOPs) with associated Operation Procedures Supplements (OPSs) form the planning basis of NSWCCD's safety approach for hazardous operations. An RHA is prepared for every type of operation that has the potential to be hazardous. SOPs/GOPs/OPSs that spell out safety procedures are developed for operations for which hazards are identified in order to minimize risks. Every SOP/GOP/OPS undergoes an extensive review, validation, and approval process so that the documents meet all applicable requirements and are complete, accurate, and effective. Safety procedures ensure that activities are safely conducted and consider environmental issues so that RDT&E activities result in the least impact practicable.

The measures contained in SOP/GOP/OPSs are implemented every time the operation covered by the document is performed. Prior to the operation, personnel who will be directly involved are provided with the SOP/GOP/OPS and must sign and date a statement certifying they have read and understood the document and have received and understood the corresponding Hazard Control Brief. Within the same time frame, non-performing personnel are given the Hazard Control Brief and must sign a statement that they have received and understood the brief.

As specified in the SOP/GOP for each operation, to reduce exposure hazards to acceptable levels, personnel may be required to use personal protective equipment (PPE) if they are going to be near the site at which a hazardous operation is taking place. Health and safety concerns decrease rapidly as personnel move away from the operational sites to the point where PPE is no longer required. PPE may include one or more of the following: protective suits, coveralls, hoods, goggles, gloves, boots, respiratory equipment, eye protection, or ear protection.

Designated safety zones, that is areas with special access and land use restrictions designed to protect persons and property from the risks associated with certain facilities and operations, that have been established at NSF Dahlgren include:

- Potomac River Test Range (PRTR) – Upper Danger Zone (UDZ), Middle Danger Zone (MDZ), and Lower Danger Zone (LDZ)
- Airfield Safety Zones and Special Use Airspace (SUA)
- Explosive Safety Quantity Distance (ESQD) arcs
- Electromagnetic (EM) Hazard Arcs.

Safety zones typically are only in effect when an operation is taking place, but some safety zones bar access all the time.

6.1.3 NSF Dahlgren Comprehensive Work Approval Process (CWAP)

NSF Dahlgren's CWAP is an official work approval procedure for all proposed actions at NSF Dahlgren. While primarily used to coordinate construction and demolition – which is not the subject of this EIS – it also focuses on operational changes. The CWAP serves to:

- Document the NEPA review process for all actions.
- Establish an agreement among commands to define roles and responsibilities.
- Facilitate the planning process through efficient work review and approval.
- Prevent delays in project implementation/execution.
- Ensure informed decision making.

CWAP approval is required for projects that include the following:

- New construction (e.g., construction of buildings, parking lots, roads, equipment pads, training courses)
- Demolition (e.g., demolition of buildings, roads, parking lots, exterior equipment)
- Exterior and major interior building renovations (e.g., exterior door/window replacement, painting, roof renovations, asbestos abatement)
- Other outdoor work involving earth work (e.g., utility installation, road resurfacing, grading, tree clearing, fence installation)
- Operational changes (e.g., changes in waste generation, product output, new outdoor testing or training exercises)
- Personnel relocation (e.g., new personnel from another installation, new supported command).

The CWAP is initiated as early in the project planning process as possible to address potential project constraints (e.g., environmental, land use) and to fully define compliance requirements (e.g., explosives site approval, wetland permitting, site contamination cleanup) that could affect the schedule. The identification of potential issues early in the planning process assists in preventing delays and identifying additional project costs.

Completed CWAP applications are sent to an Interdisciplinary Review Team for review and approval, with a review period of typically one to two weeks, but can vary depending on the complexity of the project and project constraints. Once all questions and comments have been addressed, conditions of approval are included with either a preliminary or final signed CWAP approval document. A project is given preliminary CWAP approval if the scope of the project is not clearly defined and/or additional requirements must be met prior to final CWAP approval. A project receives final CWAP approval once the project scope is defined and requirements identified by the Interdisciplinary Review Team (e.g., full explosive site approval, archeological survey completion) are met.

6.2 Protective Measures

In order to minimize potential impacts, and consistent with NSWCCD's Environmental Policy and current environmental procedures, NSWCCD would include protective measures in the planning and implementation of activities under the Proposed Action.

6.2.1 General Safety and Environmental Protective Measures

NSWCCD would ensure that:

- All activities proposed under the Proposed Action strictly adhere to all health, safety, and environmental protocols, including RHAs, SOPs, GOPs and OPSs that cover RDT&E activities.
- All activities proposed strictly adhere to all safety zones – i.e., PRTR danger zones, Airfield Safety Zones and SUA, ESQD arcs, Unexploded Ordnance (UXO) areas, EM hazard arcs, and laser safety buffer zones.
- Members of the public and personnel not involved in a test are excluded from ranges and the Mission Area prior to and during tests on the waters of the PRTR through the use of patrol boats and range restrictions and on land through the use of lookouts, road barriers, and signs.
- The Range Operations Center (ROC) in general notifies the public in advance of upcoming range activities through the NSWCCD website and a toll-free telephone recording. The information given includes daily range schedules, types of tests, use of substances such as smoke or lights, hours of testing, where on the PRTR tests will take place, whether tests are on schedule, whether noise will be made, and contact numbers to obtain more information.
- The ROC notifies the public specifically of any activities that will restrict access within and from Upper Machodoc Creek or when any test is scheduled to take place before or after normal PRTR operating hours of 8 am to 5 pm weekdays. The ROC notifies the public through NSWCCD's range website, its toll-free information line, and by placing notices in local newspapers.
- The ROC coordinates with the operators of private vessels via the range control boats or marine radio to minimize delays when activities are taking place on the PRTR and public access to an operational area is restricted. The ROC allows vessels to pass through the operational area on the PRTR during lulls in testing; delays for smaller craft are normally no longer than one-half hour, and, for larger vessels that must use the shipping channel in the middle of the range, are normally no longer than one hour (and in most cases, less than these times).
- In accordance with the operating agreement the Navy has reached with Mirant Corporation and its barge unloading facility (J.L. McGettigan and J.L. Smith, letter, April 24, 2007), ROC coordinates alternate barge schedules with Mirant when PRTR operations would pose undue hardship to barge shipments; takes precautions to minimize limitations to commercial boat traffic, stopping barge traffic for up to one hour or advising barges to slow so that they do not reach the range until operations are

completed; and participates in a communication protocol established collaboratively with Mirant to minimize conflicts between Navy activities and barge activities.

- Noise from an activity does not exceed the standards in the Outdoor Noise Management Process (NSWCDD, 2011, included as Appendix C). When noise levels that may be higher than policy standards may be generated, mitigation measures are implemented to ensure that installation personnel and the public are not exposed to hazardous noise levels. Potential mitigation measures may include avoiding testing when weather conditions are likely to result in higher noise levels to avoid exposing the public to increased noise levels and/or single and double hearing protection for on-installation personnel conducting the testing.
- Impacts to wildlife during testing are avoided when possible or minimized. Before an activity begins, trained observers look for wildlife in the target area or test area, and alert operators if any are present. Either the test is postponed temporarily or the wildlife is startled using legally allowable means to encourage movement out of the area. Trained observers watch for wildlife that may move into the target area or operations area during tests, and the test is stopped while they clear the area. Dead animals are removed prior to tests on land to limit the chances of scavenging wildlife's entering the test area.
- Bald eagle protection zones around active bald eagle nests are respected during the planning and execution of test activities. Coordination with the US Fish and Wildlife Service (USFWS) and the Virginia Department of Game and Inland Fisheries (VDGIF) would take place if a new nest is established near a testing area.
- Testing of new ordnance and EM directed energy and high-energy (HE) laser equipment scales up gradually, and monitoring takes place to ensure that higher intensity levels do not generate impacts.
- Trees, shrubs, and taller grasses and herbaceous plants that grow in range and Mission Area operating areas and are obscuring lines-of-sight are trimmed prior to tests.

6.2.2 Activity-Specific Protective Measures

NSWCDD would ensure that for chemical/biological (chem/bio) defense activities under the Proposed Action:

- Weather conditions are monitored and stimulant releases modeled before chem/bio simulant tests to ensure that simulant releases stay on ranges and the Mission Area.
- Simulant concentrations are monitored during and after releases to provide feedback for future modeling and to verify that modeled levels are not exceeded. The SOP includes the distance at which vapors and aerosols are diluted to a safe level based on the simulants and maximum quantities used. It also specifies that release point will be selected so that the simulant cloud must travel this distance before landfall.
- Simulant releases are spaced so that no land or water area would be exposed multiple times to the same simulant.
- Prior to each chem/bio simulant operation, coordination takes place with the NSF Dahlgren Environmental, the Maryland Department of the Environment (MDE) and the

Virginia Department of Environmental Quality (VDEQ), as applicable, concerning the types and quantities of simulants proposed for use.

In addition, NSWCDD is developing and will implement a Project Environmental Review and Monitoring Process for new ordnance, EM energy, HE laser, and chemical and biological defense projects under the Proposed Action before a Record of Decision is issued for the Proposed Action. NSWCDD's Safety and Environmental Office will be responsible for carrying out the new process. The Project Environmental Review and Monitoring Process will utilize the NSWCDD SOP process, the NSF Dahlgren CWAP process, and other NSWCDD process to ensure that:

- New proposed outdoor RDT&E projects either will be covered under the scope of this EIS or will have sufficient independent environmental planning (NEPA) documentation.
- New proposed outdoor RDT&E projects will incorporate all applicable protective measures, as agreed to in the EIS record of decision and other decision documents and authorizations.
- Ordnance, EM energy, HE laser, and chemical and biological defense activity tempos and intensities will be tracked and compared to those analyzed in this EIS.

Protective measures will be implemented, continually assessed to determine effectiveness, and revised as needed to increase their effectiveness.

6.2.3 Summary

Implementation of the Proposed Action would enable NSWCDD to meet current and future mission-related warfare and force-protection requirements by expanding existing RDT&E of ordnance, EM energy systems, HE lasers, and chem/bio defense. As stated in the NSWCDD Environmental Policy, NSWCDD is committed to protecting the environment while carrying out its mission. Developing and applying a new, formalized Project Environmental Review and Monitoring Process and incorporating existing environmental and safety processes and protective measures into the implementation of the Proposed Action will ensure that environmental impacts from the Proposed Action remain below the level at which the impact would be significant..

The protective measures already implemented for current No Action Alternative activities, which rely heavily on ongoing process improvements, would continue to be used as the means of mitigating environmental impacts for the Proposed Action alternatives. The impact findings described in Chapter 4 were determined in the context of the existing environmental management processes and protective measures that are integral to current and future NSWCDD RDT&E activities. Mitigation is and would continue to be built into current activities and future activities under the Proposed Action, resulting in no significant impacts. NSWCDD is committed to applying the same processes used to mitigate safety and environmental impacts for current activities to all future activities under the No Action Alternative, and Alternatives 1 and 2. NSWCDD's Safety and Environmental Office is responsible for carrying out these processes for NSWCDD's current activities and will do so for future activities.

If at any point, monitoring under the Project Environmental Review and Monitoring Process indicates that mitigation commitments have not been implemented or have not had the results predicted, NSWCDD will work to remedy inadequacies by implementing remedial steps,

preparing supplemental NEPA analysis and/or documentation, consulting with appropriate agencies, or considering past experience in future actions, as outlined in CEQ guidance (CEQ, 2011).

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