Environmental Toolbox for Deploying Forces

Developed by trilateral cooperation of defence environmental experts from Finland, Sweden and United States

Ministry of Defence of Finland
Community and Environment Unit
Planning Officer Sami Heikkilä
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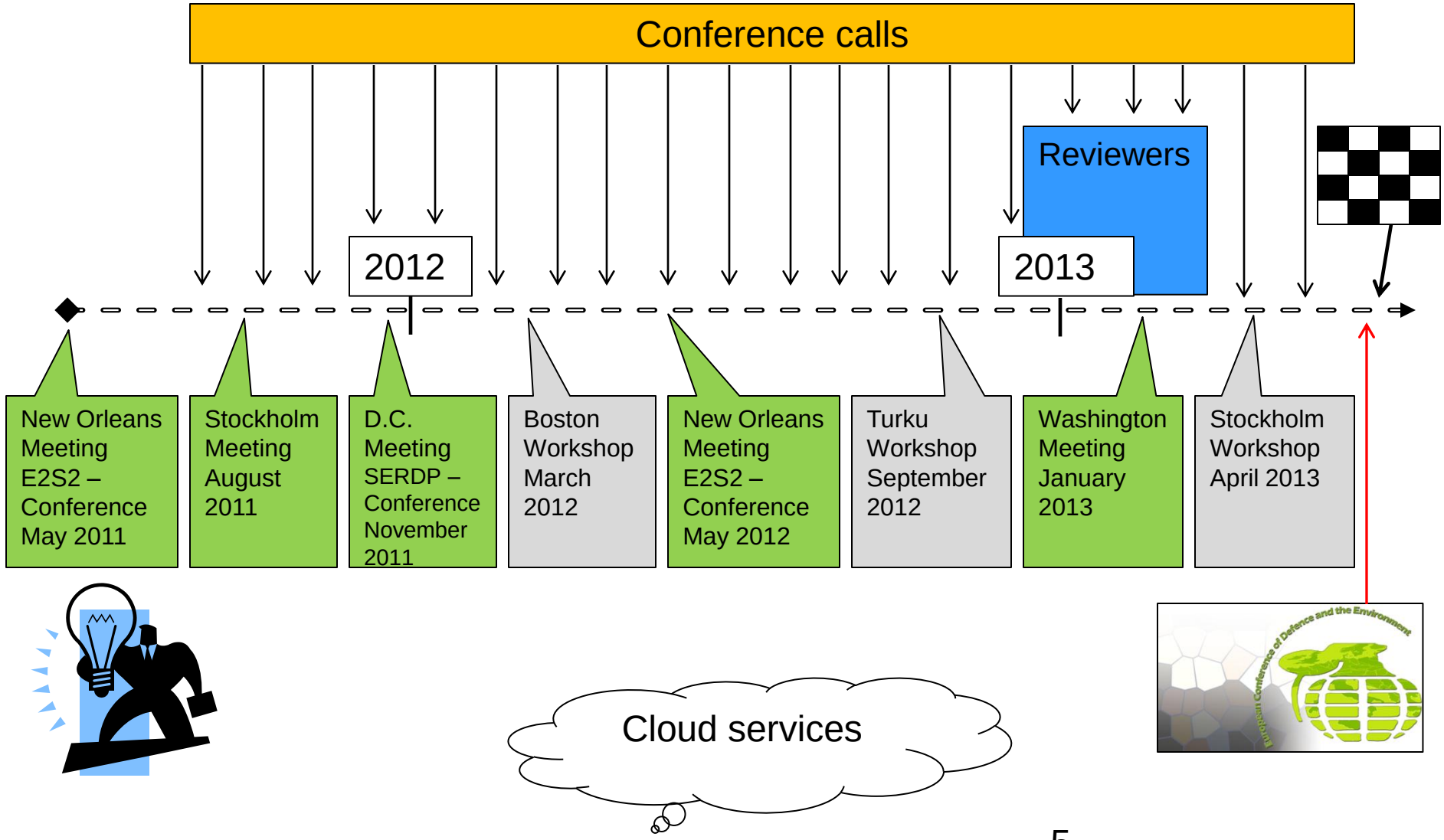
Goal

"*To provide a deploying military unit—specifically the commander, the environmental officer, and soldier/sailor/airman—a toolbox of environmental awareness training resources to plan and implement sound environmental practices*"

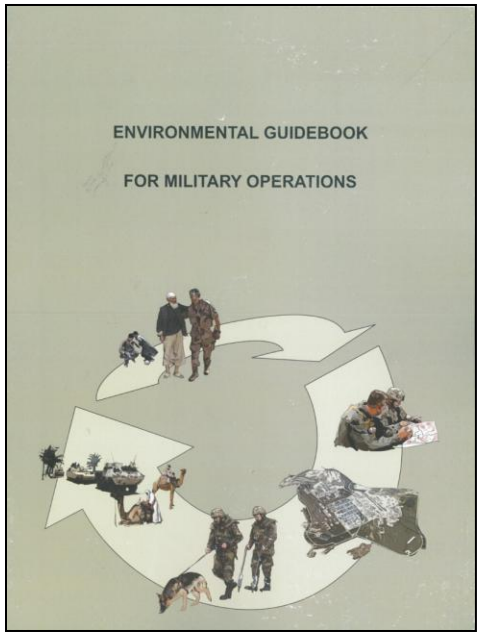
Motivations

- Appropriate awareness training tools do not currently exist in as complete or integrated manner
- Synchronize and harmonize procedures, thereby facilitating interoperability
- Educate new personnel quickly and efficiently in these matters prior to deployment
- Standardize environmental requirements and considerations in technical procedures
- To save time and money

Timeline and Working Method



Environmental Toolbox for Deploying Forces



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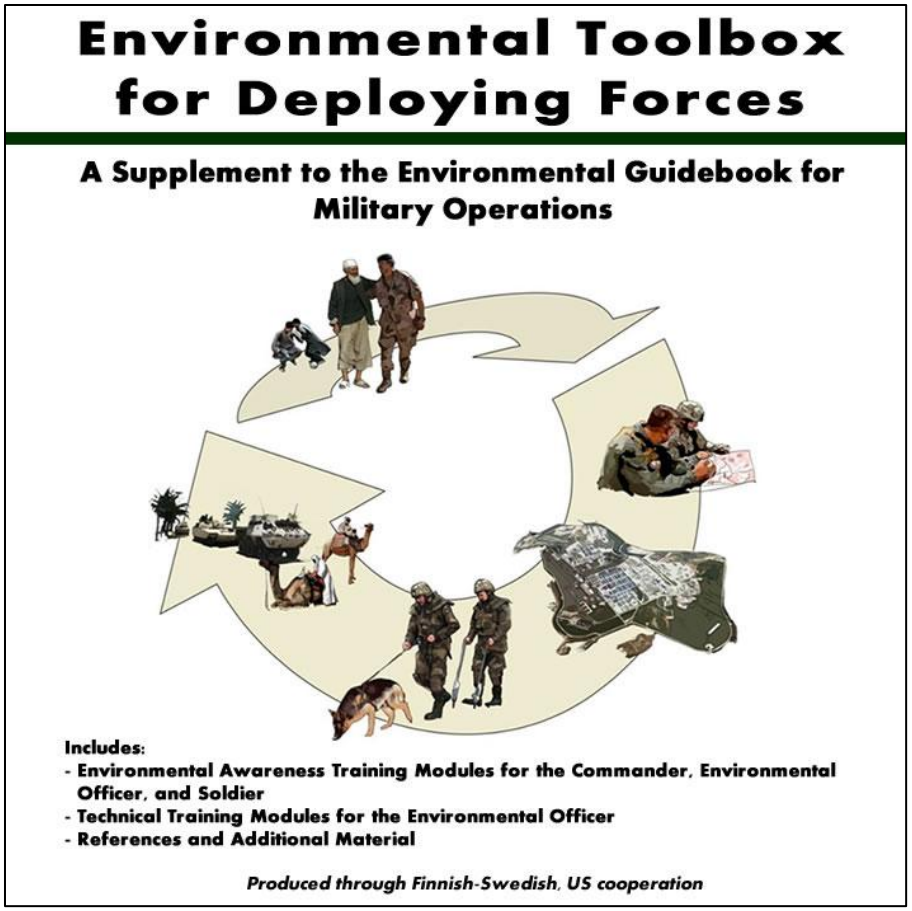

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Why Environmental Considerations are Important in Military Operations

- Ensure mission execution
- Protect the safety and health of deploying troops, host nation troops, civilian personnel, and local nationals
- Facilitate coalition and international cooperation and interoperability
- Promote efficient use of resources
- Ensure legal compliance
- Contribute to environmental protection in the deployment area and more generally raise environmental awareness in military operations
- Foster good will with the local government and community

Environmental Toolbox for Deploying Forces

General Introduction

General Training Module

Three target audiences:

- Commander Awareness
- Environmental Officer (EO) Awareness
- Soldier Awareness

Technical Module

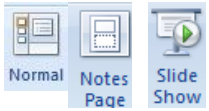
Subject-specific training material for EO and special target groups

- Module Introduction
- Solid Waste Management
- Hazardous Material and Hazardous Waste Management
- Water and Wastewater Management
- Spill Prevention and Response Planning
- Cultural Property Protection
- Natural Resource Protection

Reference Module

References and additional material

- General References
- Technical Module References
- Examples of:
  - Checklists
  - Templates
- Informational Aids
- Acronyms
- About the Authors



General Training Module

For Soldiers, Sailors, Airmen, Marines, and everyone in a base camp

Environmental Considerations in Military Operations (ECOps)

Sound environmental management during military operations helps you and your commander accomplish the mission by enhancing force protection and reducing the logistical burden on the force.

Overview of This Briefing

- Your environmental responsibilities
- Why environmental considerations matter
- Examples of good and bad practices
- Handout materials, instructions, education

Responsibilities

- Be familiar with policies, SOPs, field cards
- Use resources responsibly, use only what is needed
- Sort your waste
- Recycle and reuse when possible
- Handle hazardous material and waste carefully and use personal protection equipments (PPE)
- Conduct regular inspections and checks of your equipment and workspace
- Act in case of any environmental incident and report spills, releases and contamination. Know the procedures!
- Protect natural resources and cultural property
- Ask questions if in doubt

Everyone has responsibility to protect the environment!

Why ECOps Matters to you

- Protects soldier health
- Reduces number of supply convoys needed
- Reduces logistical requirements and costs
- Reduces legal and financial liability
- Promotes sustainability
  - For the current mission
  - For future deployments
  - For the host nation
- Enhances relations with local community and host nation

Reducing demand, reuse and recycling all help improve force protection!

Good and Bad Examples

The following slides show a number of pictures of both good and bad environmental practices, from camp set-up to handling different kinds of wastes to protecting natural and cultural resources

Bad Hazardous Waste Storage

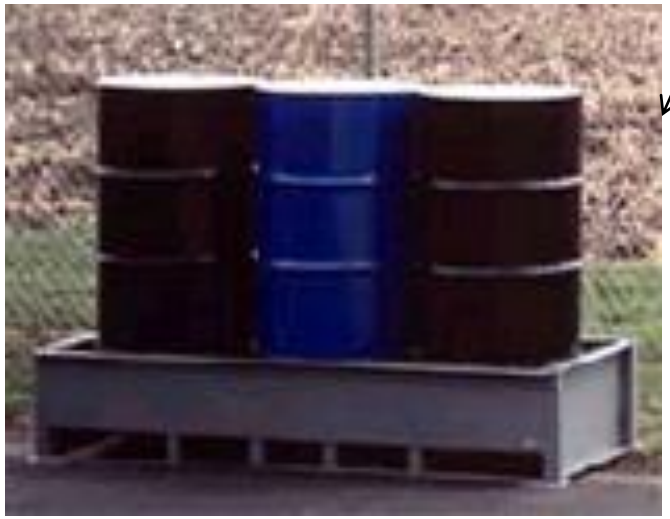
Drums not labeled, materials not segregated, no secondary containment, no covered storage

No secondary containment; leakage has contaminated soil

Uses secondary containment, but it is too small and not durable. Canisters improperly stored

Good Hazardous Waste Storage

Good secondary containment, but should be labeled and covered



Wastes well marked, segregated; good overhead protection. Secondary containment could be better.

Well marked, fenced off. Good secondary containment, protective gear handy

Bad Solid Waste Storage

Rusting and leaking containers

No segregation of materials

Bad Spill Containment

Oil leaking onto ground, no containment or clean-up

Oil contamination; taking samples to determine extent of contamination

What to Do in Case of Spill or Leak?

REACT!

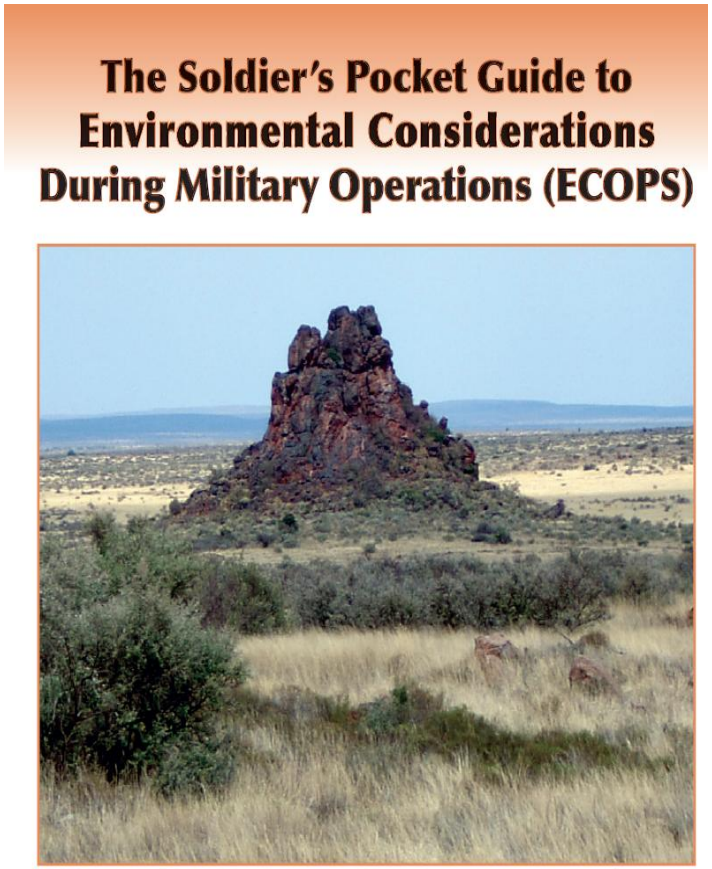
- **Remove the source**
- **Envelop the spill**
- **Absorb /Accumulate**
- **Containerize / clean-up**
- **Tell your supervisor or transmit a Report**

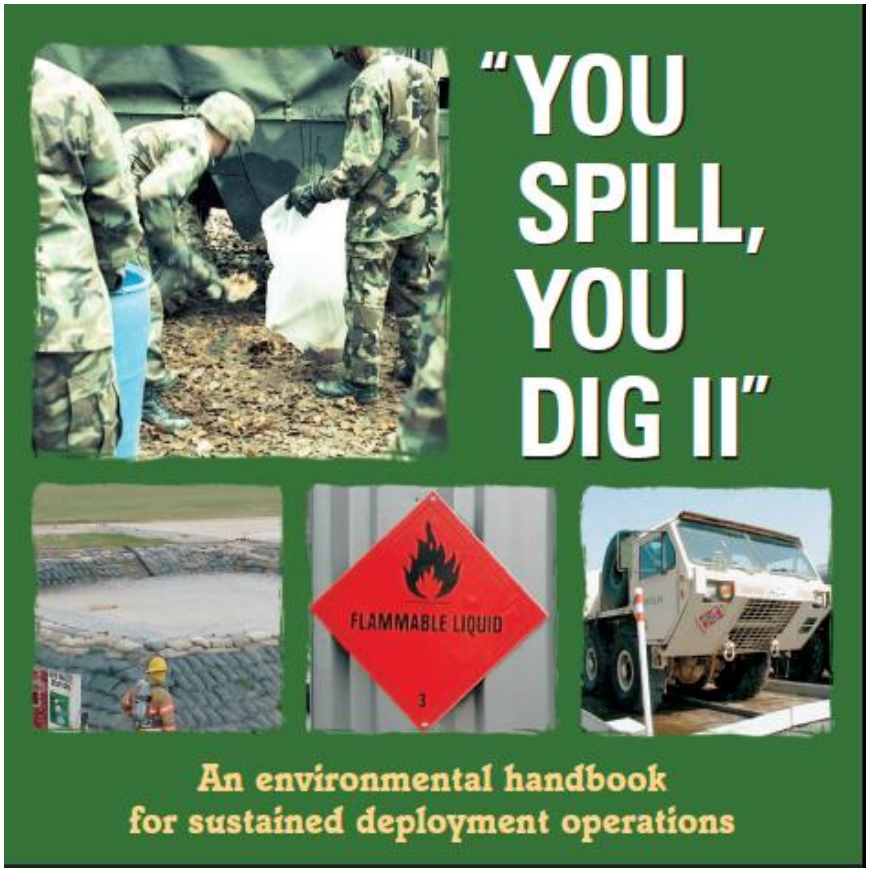
Cultural Property Protection

Damage done to burial site

Proper marking of burial site, old well

Handout material, instructions, education





Conclusion

- Your actions and awareness about environmental considerations during the military operation will ensure your safety and health, proper execution of the mission, protection of the environment, and the wise use of resources

- If you have concerns, comments or suggestions, be sure to let the appropriate people know

Technical Module

Solid Waste Management

Lesson objectives

- Understand the importance of waste management (WM)
- Be familiar with common waste management procedures
- Assemble data to make an informed choice for a waste management system
- Know the key steps in waste planning
- Develop knowledge about the risks, regulations and preventive measures in handling of waste
- Prepare for the most common obstacles of waste handling in operations

Know your responsibilities regarding waste management!

Definitions

- ***Solid Waste (SW):*** Any substance, material or object which the holder discards or intends to or is required to discard
- ***Hazardous Waste (HW):*** Any material considered discarded, abandoned, or unusable that may pose a real hazard to human health or the environment
- ***Recycling:*** The reprocessing in a production process of the waste materials for the original purpose or for other purposes, including organic recycling but excluding energy recovery
- ***Reuse:*** Use an item again for the same or different function
- ***Waste management:*** Collection, transport, recovery and disposal of waste, including the supervision of such operations and after-care of disposal sites

Significance and benefits

Good solid waste management can:

- Enhance mission accomplishment by improving base camp quality of life by minimizing:
  - Exposure to waste-related health issues
  - Unnecessary environmental damage
- Contribute to force protection
- Promote good relations with the Host Nation
- Free up resources for the mission (camp space, transportation, funds, etc.)

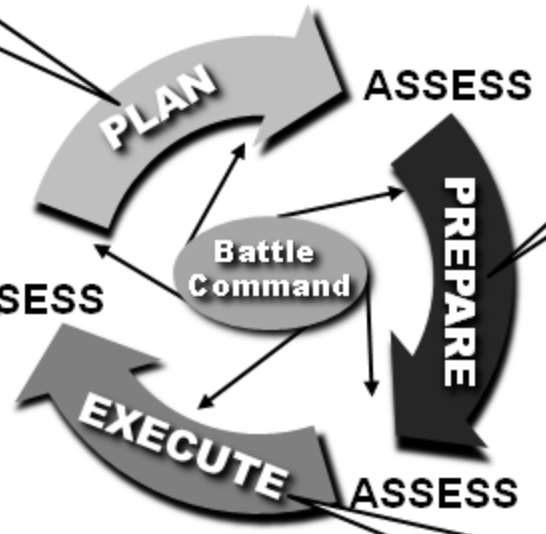
Waste management is usually one of most significant environmental aspects, but also one that can be greatly reduced

Negative consequences

- Poor waste and material management can cause:
  - Direct health problems through vermin, air pollution and contamination of drinking water
  - Large transportation and labor requirements
  - Increased waste management at closure
  - Potential security concerns
  - Increased costs

Waste Management Process Overview

- Apply the 6-step process for developing a waste management plan:
  - Analyze the situation.
  - Develop preliminary waste requirements.
  - Categorize waste requirements.
  - Evaluate waste management capabilities.
  - Generate solutions.
  - Integrate waste management tasks into plans and orders.



- Facilitate subordinates' planning.
- Refine the waste management plan based on new information and changes in the situation.
- Monitor the progress of ongoing waste management tasks.

- Manage the execution of the waste management plan:
  - Construction management.
  - Contract compliance.
  - Quality assurance/quality control.
- Monitor the situation:
  - Changes in the duration of the mission.
  - Base camp establishment, realignment, and closure.

- Monitor the performance of waste management systems.
- Assess effectiveness and appropriateness.

EO Responsibilities

- Develop the Waste Management Plan, using the 6-step Waste Management Process
- Train personnel on waste management requirements
- Coordinate with safety and health officers to ensure safe procedures and protocols
- Monitor performance of waste management systems
  - Segregation, storage, transportation, contractor activity as applicable, etc.
- Follow up and report
- Maintain documentation

Recycling and recovery options

Waste oil regeneration

- Advantages
  - Reduced transportation
  - Reduced logistics
  - Possible energy source
  - Saves resources
- Disadvantages
  - Oil quality not guaranteed for reuse
  - Spill risks
  - Skilled personnel
- Limitations
  - Amount of waste oil

Duration Suitability Index

Short	Medium	Long

Oil-contaminated soil composting

- Advantages
  - Does not leave contaminated soil
  - Useable end product
  - Reduced logistics
- Disadvantages
  - Land requirement
  - Skilled personnel (education/equipment)
  - Time
- Limitations
  - Available material for composting (manure)

Duration Suitability Index

Short	Medium	Long

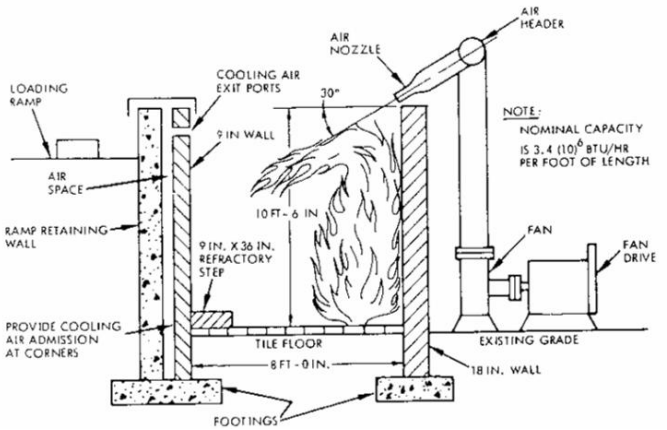
Disposal options

Air curtain & mobile incinerator

- Advantages
  - Effective
  - Smaller land requirement
  - Lower air emissions
  - Easier to set-up than larger incinerator
- Disadvantages
  - High Capital cost
  - Skilled operators
  - Higher O&M costs
- Limitations
  - Acquisition and delivery timeline
  - Suitable for smaller force

Duration Suitability Index

Short	Medium	Long



Air curtain & mobile incinerator

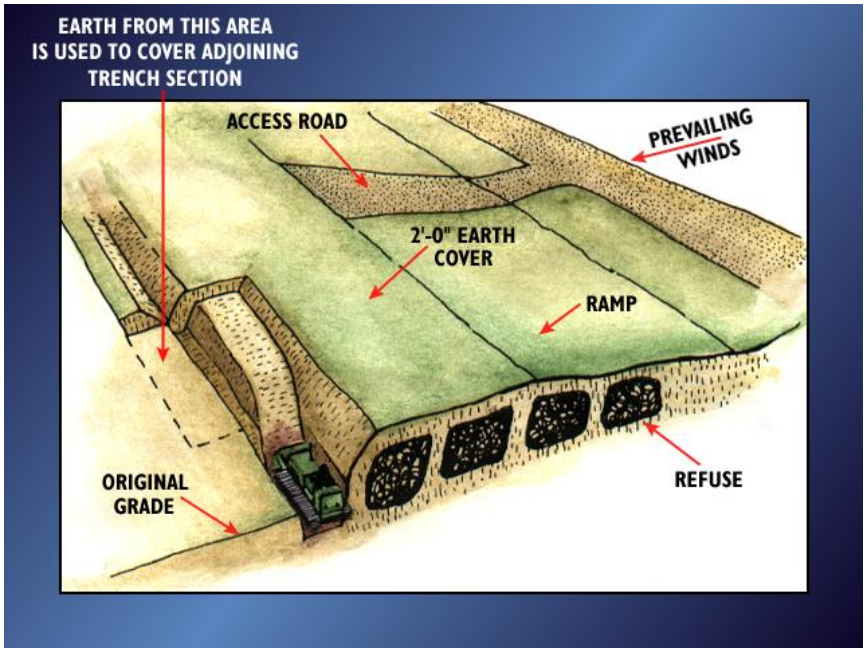
General Design Considerations	Locate downwind of inhabited areas Do not conduct burn operations during weather prohibitive conditions (e.g. during or after rain events, during inversions).
Limitations	Force Protection, land availability, base population, health concerns (vector-borne diseases) Cannot burn covered wastes (e.g. plastics, hazardous waste, medical waste, tires, treated wood, etc.)
Recordkeeping, Reporting	Location, contents of waste, dates of opening/closure, pictures, amount, air sampling
Capital Costs	Available space, incinerator
O&M Requirements	Earthmoving equipment, manpower
Transfer/Closure Requirements	Soil sampling, groundwater sampling (consideration) Bury any existing trash, cap existing area, dispose of ash Place a rectangular sign on top of the site indicating the incinerator operations, the date it was closed, and the unit designation if the situation allows. An 8-digit grid coordinate is recorded for each waste burial site and reported to high headquarters.
References	US: • Commander's Handbook on Waste Management for Deployed Forces •DODI 4715.05-G – Overseas Environmental Baseline Guidance Document

Engineered landfill

- Advantages
  - Can handle all waste types
  - Low air emissions
- Disadvantages
  - High capital cost
  - Labor intensive
  - Larger space requirement
- Limitations
  - Not viable for small forces, short duration
  - Not viable in hostile environment
  - Siting distance from personnel and airfields

Duration Suitability Index

Short	Medium	Long



Engineered landfill

General Design Considerations	Must have an impermeable liner to prevent groundwater and soil contamination. Must have leachate and gas collection systems. Must not be sited within 3,050m of airfields to prevent the threat of bird strikes. A 4:1 ratio of waste to cover material is required. Daily cover is required to reduce risk from vectors and pests.
Limitations	Force Protection, land availability and exclusion zones, base population, health concerns (vector-borne diseases)
Recordkeeping, Reporting	Location, contents of waste, dates of opening/closure, pictures, amount, soil sampling, groundwater sampling
Capital Costs	Available space, impermeable liner, leachate and gas collection systems
O&M Requirements	Manpower to compact solid waste, provide daily cover and construct cells
Transfer/Closure Requirements	Three basic goals need to be achieved: 1) minimize the need for further maintenance at the site, 2) place the landfill in a condition that will minimize future environmental impacts, and 3) prepare the site for future use.
References	US: • Commander's Handbook on Waste Management for Deployed Forces • AFI 32-7042 – Solid Waste Management • DODI 4715.05-G – Overseas Environmental Baseline Guidance Document • FM 3-34.5 – Environmental Considerations • AFH 10-222, V4 – Environmental Considerations for Overseas Contingency Operations • TM 5-814-5 – Sanitary Landfill • Engineering Manual 1110-3-177

Host-nation collection

- Advantages
  - No land requirement
  - No capital investment
- Disadvantages
  - Force Protection
  - Lead time for contract procurement
- Limitations
  - Limited by Host-nation capability
  - Quality assurance inspection required
  - Not suitable for sensitive material

Duration Suitability Index

Short	Medium	Long

Host-nation collection

General Design Considerations	To protect base populace, site refuse collection points in a secure area with a route that does not pass by inhabited areas. Ideally, place the collection point near or outside the base perimeter.
Limitations	Force Protection
Recordkeeping, Reporting	Copy of performance work statement and contract to provide proper quality assurance
Capital Costs	Cost to initiate contract
O&M Requirements	N/A
Transfer/Closure Requirements	Close contact and ensure contractor has received all required payments.
References	US: • Commander's Handbook on Waste Management for Deployed Forces •FM 3-34.5 – Environmental Considerations • AFH 10-222, V4 – Environmental Considerations for Overseas Contingency Operations

Authors

FINNISH TEAM

Sami Heikkilä
MoD

Matias Warsta
MoD

Tytti Martikainen
Finnish Army Materiel Command Headquarters

Sara Kajander
Construction Establishment of the Finnish Defence Administration

SWEDISH TEAM

Hans-Björn Fischhaber
Swedish Armed Forces HQ

Anna Eriksson
Swedish Armed Forces Logistics

Naznoush Habashian
Swedish Armed Forces HQ

Sofia Jedholm
Swedish Armed Forces HQ

U.S. TEAM

H. Garth Anderson
United States Army Corps of Engineers

Susan Clark-Sestak
Institute for Defense Analyses (DoD)

Mikell Hager
US Army Engineer School

Steven Schuldt, P.E.
US Air Force

REVIEWERS

Experts from FIN, SWE, U.S., NATO, EU

Point of Contacts

- **Finland Point of Contact: Sami Heikkilä at sami.heikkila@defmin.fi**
- **Sweden Point of Contact: Hans-Björn Fischhaber hans-bjorn.fishhaber@mil.se**
- **US Point of Contact: Susan Clark-Sestak at sclark@ida.org**

Thank You!