

Conference Programme - Thursday, October 27TH

- 09:00-09:15 Welcome
Kenn Bille Iversen - Assistant Deputy Permanent Secretary - Deputy Defence Policy Director
- 09:15-09:30 Key-note
Henrik Sørensen – Head of Division at the Danish Ministry of Defence Estate agency
- 09:30-10:15 Masterplan for management of oil contaminated hot spots at the naval station Grønnedal – Part 1
Uffe Storm Boe, Geologist, Project Manager, NIRAS A/S (DK)
Since 2008, the Danish Ministry of Defence Estate Agency has worked on investigating, monitoring and assessing various oil contaminated sites at the former naval base Station Grønnedal. The studies were made on land in soil, water and interstitial air and in the marine recipient in water, sediment and mussels. In the period 2020 to 2022 a large amount of data from the investigations has been processed by consultants as well as employees of the Defence Estate Agency. Objectives have been worked out for an overall Master Plan for management of oil contaminated sites in Grønnedal. The talk will introduce Grønnedal, the process of preparing the master plan, most optimal remediation solution and LCA analysis.
- 10:15- 10:30 Break
- 10:30- 11:15 Masterplan for management of oil contaminated hot spots at the naval station Grønnedal – Part 2
Henrik Engdal Steffensen, MSc in Engineering, Senior Consultant, NIRAS A/S (DK)
Continuation of the above post.
- 11:15- 11:45 Passive and active ex-situ soil remediation, Station Nord 2018 and Land farming Mestersvig 2012-2017 - New data from 2021
Peter Henriksen, Geologist, Senior Consultant, NIRAS A/S (DK)
From 2012 to 2018 an experiment with different stimulation of natural degradation of oil contamination in 3 soil stacks were carried out at Station Nord (N 81°). The land farm in Mestersvig (N72°) was established in 2012 and the project was shut down in 2017. In 2021, new soil samples were collected from the land farm. Data from the two projects will be presented.
- 11:45-12:45 Lunch
- 12:45-13:15 Mussels as a media for monitoring discharge of Total Petroleum Hydrocarbon (TPH)
Dr. Martin Emil Blicher, Marine Biologist, Senior Specialist, NIRAS A/S (DK)
In the Arctic, the primary recipient is the marine environment and monitoring on volatile compounds such as hydrocarbons in this biotope is difficult. Specific techniques have been tested with varying success. Onsite tests have shown that by using local mussels as a monitoring organism, it is possible to monitor even volatile compounds in the marine environment.
Several approaches are available and tests have shown that exposing unpolluted mussels in the flux discharge zone of a polluted site, contaminants are incorporated in the individuals within 4 weeks. This could provide a viable method to evaluating the effects of a remediation effort in the marine recipient.

- 13:15- 13:45 Natural Attenuation (NSZD) Grønnedal
Dr. Charles Newell, Vice President of GSI Environmental Inc. in Houston, Texas, (USA)
- Monitored Natural Attenuation (MNA) is a classic way of addressing risk of and managing contaminated sites for groundwater plumes. Emerging research have shifted focus from reduction of contaminants in the plume to the Natural Source Zone Depletion (NSZD), where mass reduction by NSZD in the source zone can be 10-100 time the rate of MNA in the plume. Recent preliminary studies at the naval base Grønnedal in Greenland show that NSZD is potential technology for managing some of the contaminant hot spots at the site.
- 13:45-14:15 Break
- 14:15-14:45 Finding - Pilot trial Thermal remediation ex-situ in Grønnedal 2019
Camilla Bacher Kiming – Chemist/Project Manager, Arkil A/S (DK)
A pilot trial using ex-situ thermal remediation at Grønnedal investigated the cleanup of three types of oil-contaminated soil: helicopter fuel, marine diesel and heavy fuel. Each soil batch was heated to three target temperatures, respectively 100°C, 200°C and 325°C. The pilot trial showed that the technique works and is able to remediate soil pollution, with a facility being built and operated during a short arctic summer.
- 14:45- 15:15 Containment of contaminants in the Arctic and sub-Arctic using frozen barriers
Dr. Anna Wagner - Cold Regions Research and Engineering Laboratory (USA)
A general overview of the use of thermosyphons, an artificial freezing technique, for containment of contaminants in soil will be presented. Thermosyphons are broadly used as a passive freezing method for arctic infrastructure to maintain frozen ground. Additionally, this method can be used to create a frozen barrier to contain contaminants. This technology is an effective and environmentally friendly application for the containment of contaminants in a quickly changing Arctic and subarctic climates.
- 15:15-15:30 Break
- 15:30-16:00 Update on learnings from 12 years of remediation of fuel spill sites in Antarctica
Tim Spending - Section Leader and Remediation Manager, Australian Antarctic Division (AUS)
Follow up presentation from 2018 Conference with summary of new remediation trials and update on results from the remediation of 4 fuel spill sites.
- 16:00- 16:30 Antarctic site characterisation and understanding health of remediated Antarctic soils
Dr. Daniel Wilkins - Environmental Scientist at Australian Antarctic Division (AUS)
Characterising diesel spill migration under thick snow and ice and the challenges of defining health in Antarctic soils – towards a holistic approach in determining environmental risk in Antarctica.
- 16:30-17:00 Wrap up of the day - Next ROPSA?
Henrik Sørensen – Head of Division at the Danish Ministry of Defence Estate agency.