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DEVELOPMENT OF FUEL SPILL REMEDIATION GUIDELINES FOR ANTARCTICA

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Although fuel spills are widely recognised as being amongst the most significant threats to the Antarctic environment, there are no widely accepted guidelines that proscribe how much fuel is too much. Similarly there is no agreement on what monitoring is required, or what target concentration should be sought for environmental remediation. Contemporary regulatory practices elsewhere make some allowance for site specific characteristics, usually based on scant empirical data from a few well studied sites – almost invariably from temperate soils. In the Arctic, individual nations have developed or adopted their own guidelines, often with little (if any) modification from domestic legislation. Some schemes have scope for risk-based evaluation, whereas others are more prescriptive. Guideline values for permissible diesel-range fuel concentrations in soil vary from 100 mg kg^{-1} (e.g. Norway) to 1000 mg kg^{-1} (e.g. Finland). Some countries or States also have legislation that prohibits the dispersal of free-product in surface or subsurface water, and the presence of hydrocarbon sheen is often used as a trigger to enforce remedial action.

Guidelines are urgently needed to assist Antarctic national operators in their response to fuel spills. As an interim measure, they could adopt the best practices from the Arctic. However, in the long-term a detailed environment-specific approach that incorporates a component of risk-based decision making is required. Researchers in Australia and Canada are currently investigating what factors are common to polar and sub-polar soils that could influence ecosystem sensitivity to fuel spills. Low temperatures, repeated freezing and thawing, patchy and disconnected soil ecosystems, anaerobic tundra, extremes of unfrozen water and humic content (peat to inorganic lithic gravels), and generally low nutrient and water contents, are some of the factors that could effect how much of an impact a fuel spill might have on soil ecosystems. Preliminary data from Antarctica and sub-Antarctic Macquarie Island indicate that such soils probably are very sensitive to pollution. This information will help develop meaningful fuel spill guidelines.