Shoreline Treatment Feasibility Analysis – A Decision Support Tool Job Aid

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A user-friendly Decision Support Tool (DST) Job Aid for Shoreline Treatment Methods has been developed to synthesize hundreds of pages of text from the many international field guides and technical manuals that describe a wide range of oiled shoreline treatment and cleanup options. The knowledge in these documents has been synthesized into a digital database for an application that can provide easy access to data and information layers that are increasingly more informative for the interested user. The DST was developed through the Multi-Partner Research Initiative (MPRI) program and addresses the question posed by a spill management team regarding the most practical options to mitigate the potential impacts when a shoreline has been oiled or is expected to be oiled.

The Decision Support Tool Application has four components:

Feasibility Analysis Job Aid	Analyses shoreline treatment feasibility in terms of shore type, oil type, surface and subsurface oiling, "small amounts of oil", and treatment methods.
Decision Support Item # 1: **Feasibility Rationale**	Identifies feasible options and explains why a method is inappropriate with respect to compatibility, environment concerns, practicality, and/or safety.
Decision Support Item # 2: **Treatment Considerations**	Summarized the potential consequences of each feasible option in terms of four "trade off" or "primary concern" categories: effort, environmental concerns, waste, and time to completion.
Decision Support Item # 3: **Shore Types and Treatment Methods**	The Application has a library of information with access to summary Fact Sheets and to published manuals and guides which provide increasing levels of detail regarding shore types and shoreline treatment methods.

The **Feasibility Analysis** for **Shoreline Treatment (FAST)** Job Aid Application is an analytical tool created to assess the operational practicality of the range of shoreline treatment options. This application provides a rapid approach to accessing industry-standard and verified knowledge that has been concentrated and reduced to the appropriate shoreline treatments using an accessible and straight-forward digital platform. Planners and decision makers in a spill management team then combine the feasibility information with other key considerations such as oil persistence, ecological and socio-economic sensitivity, vulnerability, and recovery time in the assignment of treatment priorities, the development of concerns and operational constraints, and the definition of treatment criteria (end-point targets).

The FAST Job Aid Application provides information to (a) help understand the potential consequences and trade-offs associated with the feasible options and (b) let users know why other methods do not qualify for a specific shoreline oiling scenario.

The first step for each query in the FAST Application includes building a specific scenario based on the user input combination of one of (a) five oil types and (b) fifteen shoreline type with subsets for (c) "small amounts of oil" and (d) surface oiling and subsurface oiling conditions. Twenty-two shoreline treatment methods are evaluated in the Application with respect to these four scenario inputs for feasibility based on text information and tables in existing internationally recognized field guides and manuals. The evaluation is a stepwise process that considers, in order:

- safety,
- compatibility with respect to oil type and shoreline type,
- potential environmental consequences, and
- practicality.

The outcome is that the treatment method is determined for most situations to be either: (i) feasible, (ii) feasible for small amounts of oil, or (iii) not feasible or not applicable.

The first decision support component of the FAST Job Aid provides four categories of reasons to identify why an option is Not Feasible or Not Applicable and does not qualify for the input scenario. More than one disqualification reason may apply for a given shoreline type/treatment option combination and only the primary category is identified. The four disqualification categories, alphabetically, are:

- **Environmentally inappropriate or unacceptable** includes a range of cultural, ecological, economic, and social reasons that disqualify an otherwise feasible treatment option. In many cases this is a subjective evaluation that is incident-specific and may vary seasonally and geographically.
- Methods considered **operationally impractical:** could be technically feasible, but considered as being of little or no value, including for small amounts of oil.
- **Operationally incompatible** refers to techniques which are either unrealistic or are feasible but unreasonable.
- **Safety:** situations where the treatment method poses a potential risk to response personnel or the public.

The second decision support component of the Job Aid provides information when more than one treatment method is feasible (practical, appropriate, reasonable, and environmentally acceptable) to help understand the potential consequences associated with each option. These potential consequences are described in terms of four "trade off" or "primary concern" categories:

- **Effort**: The relative level of effort, including labour, and logistics or infrastructure required to support a treatment option.

- **Environmental Concerns**: The general level of ecological, geomorphological, or habitat disturbance associated with that option that might delay or otherwise affect the recovery potential of an oiled area or affect the integrity of an archaeological, cultural, or historic feature.
- **Time**: The relative operational speed with which a section of oiled shoreline can be treated or cleaned to a target level of oil reduction.
- **Waste**: The amount of waste that is generated relative to the other treatment methods and the type(s) of waste material.

The third support component of the FAST Job Aid is the layered approach in the design of the application platform which provides a library of materials and allows access to increasing levels of detail regarding shoreline treatment. The Job Aid provides a set of Fact Sheets related to the shore types and treatment methods that, in turn, reference the detailed field guides and manuals upon which the feasibility analysis is based.

The feasibility database, in tandem with the electronic application, are both designed so that the datasets regarding the input parameters and the data used to analyze and provide the most suitable approach/treatment can be updated, interchanged, or revised. This provides the app with the flexibility to be used in a range of coastal environments and oil spill scenarios.