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Standard Guide for Terminology and Indices to Describe Oiling Conditions on Shorelines¹

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1. Scope

1.1 This guide covers the standardized terminology and types of observational data and indices appropriate to describe the quantity, nature, and distribution of oil and physical oiling conditions on shorelines that have been contaminated by an oil spill.

1.2 This guide does not address the mechanisms and field procedures by which the necessary data are gathered; nor does it address terminology used to describe the cultural resource or ecological character of oiled shorelines, spill monitoring, or cleanup techniques.

1.3 This guide applies to marine shorelines (including estuaries) and may also be used in freshwater environments (rivers and lakes).

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

F 1686 Guide for Surveys to Document and Assess Oiling Conditions on Shorelines²

3. Terminology

3.1 Definitions:

3.1.1 *asphalt pavement*—a naturally formed cohesive mixture of weathered oil and sediments. Sediments in the mixture are usually in the sand/granule/pebble size range. In appearance, natural asphalt pavement may resemble the mixture artificially created to surface roads.

3.1.2 *lower-swash zone*—the area between the lowest annual water level and the mean annual water level, the lower

half (approximate) of the zone of wave activity.

3.1.3 *supra-swash zone*—the area above the highest annual water level that experiences wave activity only occasionally, as during a storm event.

3.1.4 *supra-tidal zone*—the area above the mean high tide that experiences wave activity occasionally.

3.1.5 *upper-swash zone*—the area between the highest annual water level and the mean annual water level, the upper half (approximate) of the zone of wave activity.

3.1.6 *weathered oil*—the oil that has had an alteration of physical or chemical properties, or both, through natural processes such as evaporation, dissolution, oxidation, emulsification, and biodegradation.

4. Significance and Use

4.1 In order to ensure data consistency, it is important to use standardized terminology and definitions in describing oiling conditions. This guide provides a template for that purpose.

4.2 Data on oiling conditions at a shoreline are needed to provide an accurate perspective of the nature and scale of the oiling problem and to facilitate spill-response planning and decision making. Data on oiling conditions would be used in assessing the need for cleanup actions, selecting the most appropriate response technique(s), determining priorities for cleanup, and evaluating the endpoint of cleanup activities.

4.3 Mechanisms by which data are collected may vary (see Guide F 1686).^{3,4} They may include aerial videotape surveys or ground-level assessment surveys. The composition and responsibility of the survey team will depend on the response organization and objectives. The magnitude and type of data sets collected may likewise vary with the nature of the spill and operational needs.⁵

4.4 Consistent data sets (observations and measurements) on shoreline oiling conditions are essential within any one spill in order to compare the data between different sites or

³ *Oilspill SCAT Manual for the Coastlines of British Columbia*, Prepared by Woodward-Clyde Consultants, Seattle for the Environmental Technology Branch, Environment Canada, Edmonton, Alta., 1992.

⁴ *Shoreline Countermeasures Manual—Tropical Coastal Environments*, Hazardous Materials Response and Assessment Division, National Oceanic and Atmospheric Administration, Seattle, WA, 1993.

⁵ Source: Owens, E. H., and Sergy, G. A., *Field Guide to the Documentation and Description of Oiled Shorelines*, ISBN 0-662-22048-X, Environment Canada, Edmonton, Alta., 1994.

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² *Annual Book of ASTM Standards*, Vol 11.04.

observers, and to compare the data against existing benchmarks or criteria that have been developed to rate the nature or severity of the oiling. To the extent possible, consistency is also desirable between different spills, in order to benefit from previous experiences and cleanup decisions.

4.5 It is recognized that some modifications may be appropriate based on local or regional geographic conditions or upon the specific character of the stranded oil.

5. General Considerations

5.1 Shoreline conditions can be described in terms of the length, width, depth, distribution, quantity, and character of oil contamination. These six different types of data are collected by direct measurement or direct visual estimates calibrated against existing scales or indices. Standard definitions and descriptors of these data have been developed (Sections 6 and 7). Second-order applications of the basic data are further used to aid response planning (Sections 8 and 9).

5.2 Descriptions of shoreline oiling conditions are typically referenced to the lateral (seaward to landward) shoreline

zonation. The location of the stranded oil within the intertidal zone affects operational access time and oil persistence.

5.2.1 Tidal zonation is described in terms of the supra-tidal, upper/mid/lower intertidal, and sub-tidal zones.

5.2.2 Non-tidal shoreline zonation is described in terms of the supra/upper/lower swash zone for lacustrine (lake) environments and the over/upper/lower/midstream bank for riverine (river) environments.

5.3 Oil persistence and the choice of cleanup options will be different for subsurface oil as opposed to surface oil. Descriptions of shoreline oiling conditions should distinguish between the oiling of surface sediments from that on the subsurface sediments (vertical zonation). On coarse sediment beaches, it can be difficult to differentiate the vertical boundaries. Fig. 1 illustrates an approach for discriminating those boundaries.

5.4 For beaches with fine sediments (that is, pebble, granule, sand, and mud), the subsurface begins at 5 cm below the surface. If a pit were to reveal oiling in sand from the surface down to 20 cm, the upper 5 cm would be classified as surface oil and the remainder as subsurface. However, the oiled

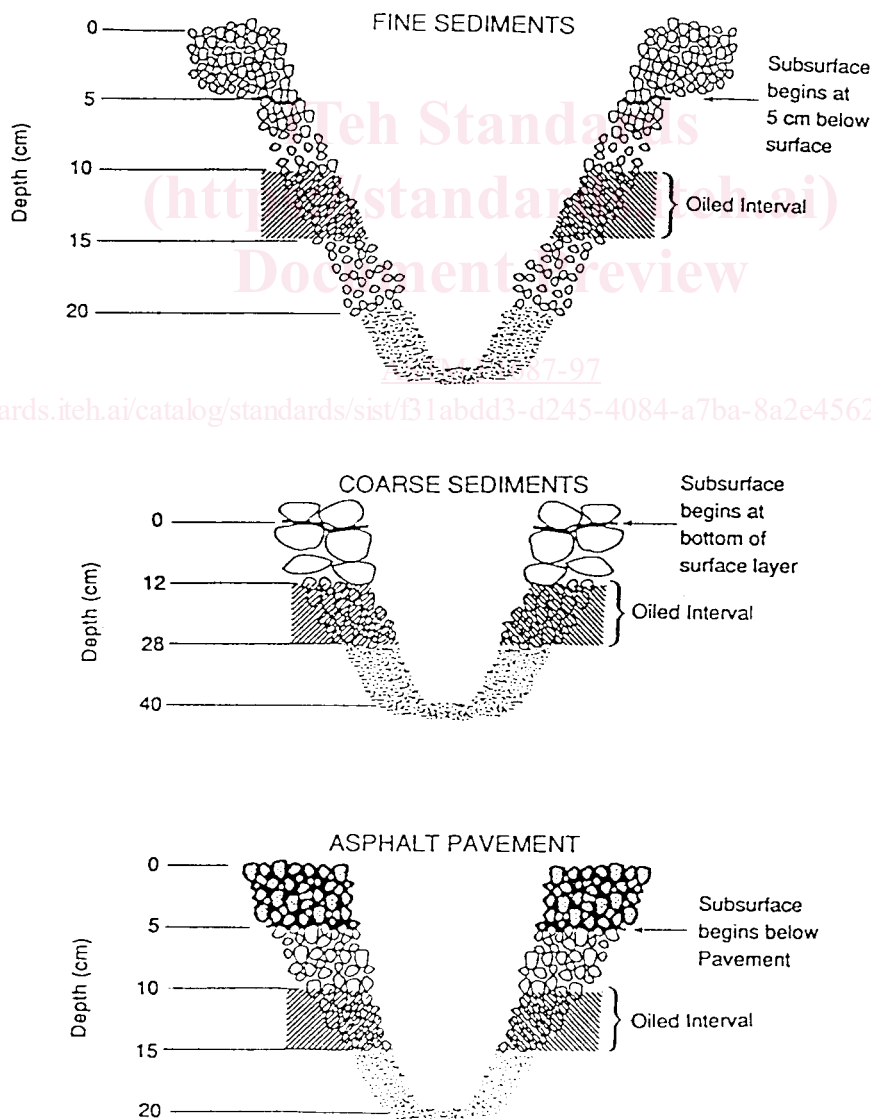


FIG. 1 Subsurface Boundaries for Various Beach Types⁵