Directions on how to complete the Transport Canada Aquatic Site Classification System (TCACS) Ranking Form

Site Information

General information on the site must be entered to complete the form. The name of the site, a description of the site location, the name of the person who completed the classification as well as the date of the assessment or the date of completion of the form must be entered.

Minimum Assessment Information Requirement

Prior to completing the classification, the assessor must have a minimum of information available to him/her. The system requires that the following information be available:

- Topographic, hydrographic or aerial photo of the area;
- Analytical chemistry results from samples taken from the site;
- A list of the facility users and uses of the site;
- History of dredging and/or construction activities at the site;
- Proximity to shellfish or fish harvesting areas;
- Location of parks, ecological reserves, fish migration paths; and
- Location of outfalls, water courses or discharges at site.

The form requires that the assessor places a "Y" in the box. In the event that any information is missing or not verified, the site should be assessed further prior to completing the classification.

Threshold Criteria

The assessor must place an "X" if the site meets any of the threshold criteria. If any of the threshold criteria are satisfied, the site automatically becomes high priority. The TCACS threshold criteria include:

- Analytical results from site exceeding Canadian Sediment Quality Guidelines "Probable Effects Levels" (see note below);
- Past fish or shellfish kills or poisonings within 500 metres from site;
- Completion of vessel maintenance including mechanical or hull repairs on site;
- Storage of petroleum products directly over water; and,
- Discharge or disposal of unknown effluents or solids on the site or on property adjacent to site.

Note: the rationale behind the setting of sediment PELs, according to the *CCME Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (2001)* (CSQGs) is to evaluate chemical data to determine an association between chemical concentrations in the sediment and adverse observed biological effects. The PEL value is

the upper value, which defines the level above which adverse effects are expected to occur frequently (i.e. more than 50% of the time).

Balancing Criteria

The system provides a set of "Balancing Criteria" which, consist of materials that may contaminate water and sediments. The three broad categories for scoring include: 1) Severity of Hazard; 2) Likelihood of Contamination; and, 3) Proximity of Receptors – they are analogous to the Contaminant Characteristics, Exposure pathways and Receptors categories of the CCME terrestrial classification system.

Severity of Hazard

Type of Wastes Contaminating Site

The assessor must determine if the following wastes are contaminating the site:
- Unknown contaminants;
- Paint, chippings and hull repair products;
- Petroleum products; and
- Domestic wastes.

If the assessor determines that any of the above-mentioned wastes are found to be contaminating the property, a score is assigned for each of the category (Unknown Contaminants – 10, Paint, chippings and hull repair products – 5, Petroleum Products – 3, and Domestic Wastes – 2). A score of 0 is assigned where the waste is not found to be contaminating the site. The assessor must also indicate in the box to the right of the evaluation box whether the data was assessed or the degree of hazard assigned is based on an assumption.

In reviewing the histories of water lot contamination, frequently encountered contaminants (and their scores) are:

- Arsenic - 3
- Cadmium - 3
- Chromium - 3
- Construction Debris - 2
- Copper - 3
- Domestic Waste - 2
- HEPH - 3
- Lead - 3
- Mercury - 3
- Nickel (not in CSQGs) - 2
- PAHs (eg. Phenanthrene, Pyrene) - 3
- PCBs - 5
- Petroleum Hydrocarbons - 3
- Zinc - 3

These contaminants will be present below PEL levels, otherwise the site would have automatically been classified as high priority. If a score is being completed for sites classified as high priority, and chemicals at concentrations exceeding their PEL are present, then they should be scored at 5 – 10, depending on the degree of exceedance, at the professional discretion of the assessor.

Scoring for the Severity section has to account for the worst type of contaminant, the volume of contaminant present, and the method of operation of the site, bringing together the physical and management portions making up severity of hazard. The quality of information available is also taken into account through use of a weighting factor.

Waste Ranking = (Type x Weight) x (X Volume x Weight/10)
Method of Operation = (Evaluation x Weight/10)
Severity of Hazard = Waste Ranking x Method of Operation

Note that only one type of waste is selected, that being the highest scoring one present. Volume, however, refers to all contaminants on the list that are present. Weights are placed against the type of waste, against the applicable volume, and the applicable method of operation – the three weight factors must sum to 20.

X Volume

The assessor must enter a value of 2 if the volume of contaminated material is unknown or if the volume of the contaminated material is greater than 1,000 m3. A value of one is assigned if the volume of contaminated material is less than 1,000 m3.

Method of Operation

The assessor must determine whether or not the site is operated with a guiding set of standards, procedures and practices. In the event that the site is managed with Best Management Practices a score of 1 is assigned or in the event that the site is not operated using Best Management Practices, the site is assigned a score of 2. The value assigned is either 1 or 2, both not both.

Likelihood of Contamination (Likelihood that Criteria Exceeded)

This section assesses whether the site presents a likelihood of direct or indirect contamination. Direct contamination includes evidence of contamination in historical data and any observed contamination. Indirect contamination includes evidence of contamination from adjacent properties and known contamination events from upstream. A score between 1 to 10 is assigned for each category. A score of 10 indicates that contamination is likely and a score of 1 indicates that contamination is unlikely.

The sum of the likelihood evaluations multiplied by their weights is then totalled and entered in the box Sum of Contamination. The "Sum of Contamination" is calculated as follows:

$$\text{Contamination (C)} = \frac{\sum(\text{Evaluation} \times \text{Weight})}{2}$$

When using the electronic form, this calculation is performed automatically.

Proximity of Receptors

The proximity of receptors is also assessed. The receptors included in the assessment include:

- Water body used as water source for drinking water or agriculture;
- Surrounding land and water uses (recreation, industrial); and
- Proximity to fish or shellfish harvesting areas.

A score between 1 and 10 must be assigned. The closer the receptor, the greater is the score assigned. The sum of the proximity to the receptors is then calculated and must be entered in the appropriate box.

The "Proximity to Receptors" score is calculated as follows:

$$\text{Proximity to Receptors (PR)} = \frac{\sum(\text{Evaluation} \times \text{Weight})}{2}$$

Summary

The assessor must indicate in the summary section whether or not further assessment information is required and whether the threshold criteria passed or failed. The balancing criteria total scores must be entered for each category (Severity of Hazard, Likelihood of Contamination and Proximity of Receptors). The sum of the overall ranking of the site must then be calculated – again, these steps are performed automatically using the spreadsheet.

The Overall Ranking of Site score is the geometric mean of the Severity, Likelihood and Proximity sections, and is analogous to the CCME terrestrial ranking in its interpretation. Note that as a risk-based score, individual sections should not be interpreted in isolation.