Massachusetts Department of ENVIRONMENTAL PROTECTION

t e c h n i c a l u p d a t e

Ecological Value of Surface Water Features

Interim Technical Update
Valid through 2006

Update to: Section 9 of *Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan* (1996)

The purpose of this Interim Technical Update is to provide guidance to assist in differentiating between those man-made water bodies that require an ecological risk assessment from those that do not. DEP recommends eliminating certain man-made surface water bodies that do not function as an ecological resource from MCP ecological risk assessment and risk management requirements. Table 1 provides a list to assist the ecologist or ecological risk assessor in differentiating man-made water bodies that require an ecological risk assessment from those that may not.

A surface water body is functioning as an ecological resource if it is supporting or providing habitat for aquatic organisms or wildlife and it has become integrated into the natural landscape and the local hydrogeologic system. Some man-made surface water features may contain ecologically valuable habitat (e.g. a public drinking water reservoir). This habitat may be an intentionally designed into some man-made surface water bodies, or may develop unintentionally through colonization by native flora and fauna. Certain man-made water bodies may be specifically designed to preclude aquatic or wildlife habitat and are unlikely to contain ecologically valuable resources. Man-made dry detention basins and dry swales created for purposes of stormwater management are examples of water features that often fall into this category. Evaluations to determine whether a man-made surface water feature contains ecologically valuable habitat should be conducted by an ecologist or ecological risk assessor.

It is not possible to develop a rigid set of rules or a detailed decision process that would be well-suited for assessing the value of all, or even most, man-made surface water features As an alternative, DEP has developed the following list of characteristics and questions that should be considered when evaluating the ecological value of man-made surface water:

- **Presence of aquatic life**

  Is the water body inhabited or frequented by amphibians, reptiles or fish? Was the man-made water body specifically designed with a permanent wet pool with deeper depressions to provide aquatic habitat?

- **Nature of bottom substrate – natural or artificial**

  If the water body contains a permanent wet pool, is the substrate such that the water body could serve as a habitat for aquatic organisms? E.g. Does it contain mud, pebbles, or facultative wet or obligate emergent or submergent plants, versus an artificial bottom such as concrete?

- **Aquatic and Wildlife Habitat value**

  Is a permanent wet pool present or does it contain standing water present for most of the year? Do native flora and fauna grow on the pool bottom substrate? Do the edges of the water body above the normal pool elevation contain facultative wet plants?

- **Setting and surrounding land use – natural or developed**

  Is the water body contiguous to land that is not developed or landscaped and provides wildlife habitat?

- **Integration in surrounding landscape - physical and biological connections with surrounding area**

  Is the water body accessible to wildlife in the vicinity?

- **Hydraulic regime**

  Is the man-made water body designed to dewater between storm events?

- **Hydraulically Connected Water Bodies**

  Is the manmade water body connected hydraulically to another water body (e.g. a natural stream or wetlands) where an ecological risk assessment is necessary to assess impacts of hazardous wastes? Were wastes conveyed through a manmade water body to a natural water body? For example, in a roadway setting, manmade stormwater management structures such as drainage channels will receive spills from vehicle accidents that may be conveyed to natural water bodies by the time First Responders arrive on the scene. The drainage channel may contain edge features suitable for wildlife habitat at the river interface but may not contain those features elsewhere along the drainage channel. In such a circumstance, it may be appropriate to confine the ecological risk assessment to just that portion of the drainage channel with the wildlife habitat features and the river.

- **Size**

  Size by itself is not relevant, but it may be important to consider if other characteristics are “borderline” in terms of habitat value.

- **Management Practices**

  Is the manmade structure, basin or drainage swale maintained by removing plants and animals from the bottom, effectively eliminating potential habitat value? All manmade stormwater management features constructed pursuant to the Massachusetts Wetlands Protection Act through a final Order of Conditions issued after November 1996 should have an operations and maintenance plan on file with the municipal Conservation Commission that describes the management techniques to be used to maintain the structure.

When evaluating the ecological value of a surface water body, all of these factors should be considered. There is no set number or combination of conditions required to support a decision of no ecological value. Further, the relative weight given to each factor is likely to differ from site to site. In fact some factors may not be relevant at all in some cases. Flexibility, however, calls for accountability. The risk assessor must

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document the decision process and make a clear and compelling case for eliminating any surface water body from the risk assessment.

Even though ecological risk assessments are not needed in connection with remediating hazardous wastes located in certain man-made water bodies that lack habitat, all other requirements for assessing and managing spills, releases, and sites still apply.

Further, decisions made using this guideline apply only to the scope of MCP risk assessments. This guideline does not affect to the definition of surface water for any other program or purpose, and it does not place any limitations whatsoever on any other regulatory requirements or actions.

Table 1

Examples of Man-made Water Bodies In Relation to Ecological Risk Assessment

Type	Ecological Risk Assessment
Public Drinking Water Impoundment	Yes
Fire Pond	Possibly
Farm Pond	Possibly
Replicated Wetlands	Yes. These man-made wetlands were constructed as mitigation for natural wetlands allowed to be altered
Sewage Lagoons	No
Nutrient Attenuation Wetlands	Possibly, depending on design
Stormwater Mgt. Dry Detention Basin	No. These basins are designed to dewater between storms.
Stormwater Mgt. Extended Dry Detention Basin	No
Stormwater Mgt. Wet Retention Basin or Wet Pond	Possibly if designed with deep pool to provide fish habitat or edge wildlife habitat features. Fish habitat may be included in the design of a manmade wet basin or pond to reduce the likelihood of mosquito breeding.
Stormwater Mgt. Constructed Wetlands (including man-made shallow marshes, pocket wetlands, and pond/wetland designs)	Yes. Constructed wetlands are designed to include features that mimic the functions of natural wetlands, such as providing wildlife habitat.
Stormwater Mgt. Sedimentation Basin (used during construction)	No
Stormwater Mgt. Dry Water Quality Swale	No
Stormwater Mgt. Wet Water Quality Swale	Possibly
Stormwater Mgt. Infiltration Trench	No

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Table 1 (Contd.)	
Type	**Ecological Risk Assessment**
Stormwater Mgt. Infiltration Basin	No
Stormwater Mgt. Dry Well	No
Stormwater Mgt. Sand or Organic Filter	No
Stormwater Mgt. Catch Basin	No
Stormwater Mgt. Water Quality Inlet or Oil/Water Separator	No
Stormwater Mgt. Proprietary Treatment Devices	No, except for possibly proprietary wet swales
Stormwater Mgt. Sediment Trap or Forebay	No
Stormwater Mgt. Drainage Channels	Possibly, depending on design
Stormwater Mgt. Bioretention Cells	Possibly, depending on design
Stormwater Mgt. Rain Gardens	No
Waters of the Commonwealth, Natural Vegetated Wetlands, Banks, Land Under Water, and Vernal Pools regulated pursuant to the Clean Waters Act, Wetlands Protection Act and Regulations, and 401 Regulations	Yes

Notes:

- Detailed discussions of the types of man-made water bodies are provided in *Stormwater Management Volume II: Stormwater Technical Handbook*, Prepared by the Massachusetts Department of Environmental Protection and the Massachusetts Office of Coastal Zone Management, March 1997 (http://www.mass.gov/dep/brp/stormwtr/stormpub.htm).
- Definitions for stormwater bioretention cells and stormwater management rain gardens are not currently included in the Stormwater Technical Handbook and descriptions are provided below.
    - A bioretention cell is a shallow depression, typically 3-4 feet wide, with tree-size plantings.
    - A rain garden is found next to an elevated island of a parking lot. A rain garden is a depression that is several inches deep and planted with herbaceous shrubs and flowers.
    - Both bioretention cells and rain gardens are usually dry 72 hours after a storm event.
- This table is intended to provide examples. It may not include all types of man-made water bodies subject to this guidance.

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REFERENCES:

1. 310 CMR 40.0000, Massachusetts Contingency Plan
2. 310 CMR 10.00, Wetlands Protection regulations
3. DEP Stormwater Mgt. Policy, March 1997
4. DEP Wetlands Program Rare Species Policy, DWW 90-2
5. DEP Wetlands Program Inland Replication Guidelines, BRP/DWM/WetG02-2
6. DEP Wetlands Program Wildlife Habitat Guidance (currently in progress)

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