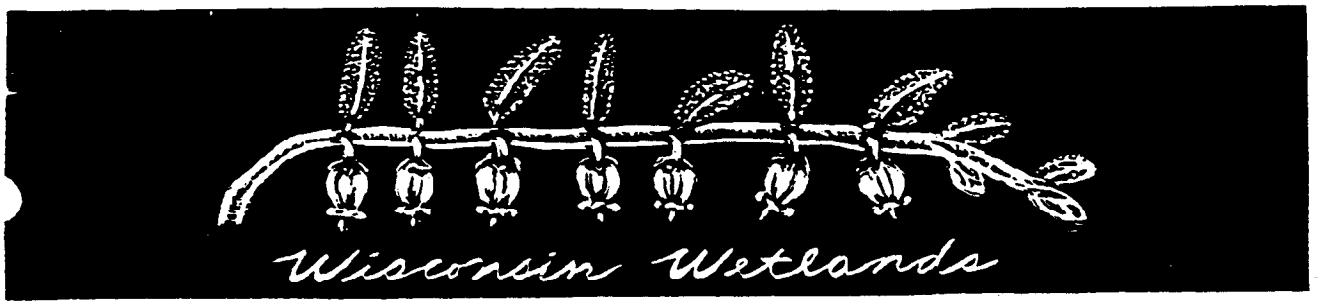

WATER QUALITY STANDARDS FOR WETLANDS

A Guide to NR 103

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INTRODUCTION

Background

Chapter NR 103 of the Wisconsin Administrative Code became effective on August 1, 1991, establishing water quality standards for wetlands. In accordance with s. 144.025 (2)(b), Wis. Stats and s. NR 103.01(2), "water quality standards are intended to protect public rights and interest, public health and welfare and the present and prospective uses of all waters of the state for public and private water supplies, propagation of fish and other aquatic life and wild and domestic animals, preservation of natural flora and fauna, domestic and recreational uses, and agricultural, commercial, industrial and other u[illegible] These water quality standards are specific to wetland ecosystems.

The NR 103 Wetland Water Quality Standards serve as a basis for Department of Natural Resources (DNR) decisions in regulatory, permitting, planning or funding activities that affect wetlands. These standards contribute to the protection of the functions and values of wetlands including biological diversity and wildlife habitat, sediment and pollution attenuation, storm and flood water retention, hydrologic cycle maintenance, shoreline protection, and human uses such as recreation and education.

This document provides information on the background of the rule and guidance for its implementation. Consistent application of NR 103 on a statewide basis will contribute to the protection and preservation of the state's important wetland resources.

What are Water Quality Standards for Wetlands?

Water quality standards consist of designated uses and criteria necessary to protect those uses in the waters of the state. "Waters of the state" are defined in s. 144.01 (19), Wis. Stats., as:

> ...those portions of Lake Michigan and Lake Superior within the boundaries of Wisconsin, and all lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, watercourses, drainage systems, and other surface and ground water, natural or artificial, public or private, within the state or its jurisdiction.

NR 103 is Water Quality Standards for Wetlands. Wetlands are included in the above definition in the terms "marshes" (a lay term for "wetland") and "other surface and ground water".

The term "wetland" is defined in s. 23.32(1), Wis. Stats., as "...an area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions." This definition includes, but is not limited to, wooded swamps, floodplain forests, bogs, cedar swamps, fens, shrub carrs, alder thickets, deep and shallow marshes, sedge meadows, fresh wet meadows, low prairies, and seasonally flooded basins.

NR 103 sets standards to "protect, preserve, restore and enhance the quality of waters in wetlands and other waters of the state influenced by wetlands." Water quality criteria are established to protect the functional values of wetlands (discussed in detail later in this document).

Because of the hydrologic and ecological variations within different types of wetlands, it is not feasible to establish specific numerical criteria, which is normally the approach in water quality standards. Instead, narrative water quality criteria or conditions are established to assure that wetland functions and values are maintained.

HISTORY

Wetland Losses

Wisconsin is a state with an abundant supply of natural resources. Wetlands were plentiful in pre-settlement times, making up an estimated ten million of the state's thirty-five million acres. According to the Wisconsin Wetland Inventory program, approximately 5.3 million acres of wetlands remain in the state-- a loss of almost half of the pre-settlement resource.

Wetlands in Wisconsin were historically drained mainly for agricultural use. The federal government subsidized wetland drainage to create farm land out of what was then considered wasteland. Residential, commercial and industrial development have also displaced large acreages of wetland and continue to be a major factor in wetland losses.

Only recently have wetlands been recognized as natural resources to be protected. Various state laws have been enacted to protect the quality of all waters of the state, including some wetlands. Primary emphasis has been to protect navigable rivers and lakes from the pollution and impacts caused by human activity, thus preserving and enhancing the use of the water resources for recreational, commercial or aesthetic interests. Wetlands associated with navigable waters have therefore received some level of regulation and protection, while isolated wetlands lack comprehensive protection in Wisconsin.

Why Develop NR 103?

Water quality standards are required for all "waters of the state" under Wisconsin law by Section 144.025(2)(b), Wis. Stats. As discussed previously, wetlands are included in the definition of waters of the state.

Section 303 of the Clean Water Act and 40 CFR Part 131 of the Federal Regulations require states to develop standards for "waters of the United States" subject to review and approval by the U.S. Environmental Protection Agency (USEPA). Federal guidelines include wetlands as "waters of the United States."

In 1989, the Natural Resources Board directed the Department to develop water quality standards for wetlands, reacting partly to a 1981 petition by the Wisconsin Public Intervenor's office requesting that the Department develop wetland water quality standards to serve as a basis for water quality certification decisions under section 401 of the Clean Water Act. Also, USEPA has established program guidance calling for all states to develop wetland water quality standards by 1993, in order to comply with the provisions of the Clean Water Act.

NR 103 was developed to create a definitive state process for making decisions regarding impacts to wetlands. These decisions come into play in several Department programs, including the water quality certification process under the federal 404 permitting program.

APPLICABILITY OF NR 103

NR 103 applies to DNR decisions and activities where a decision on wetland impacts is required. Some activities that have significant effects on wetlands may fall outside the jurisdiction of the Department, as established by state law, and thus not be regulated by the standards found in NR 103. NR 103 does not apply to other state agencies, unless DNR is involved in a decision.

What programs are affected by NR 103?

NR 103 is not a permitting program. The rule establishes water quality standards for all wetlands of the state. These are statewide and DNR program-wide standards for review of projects affecting wetlands. The standards must be applied where a specific activity requires authorization or reauthorization after the effective date of the rule (August 1, 1991).

The standards include a review process for addressing projects that may affect wetlands. "All Department regulatory, planning, resource management, liaison and financial aid determinations that affect wetlands... and which are subject to the requirements of statute or rule requiring a Department determination concerning effects on water quality or wetlands" must comply with the NR 103 process and standards (s. NR 103.06).

In many cases, coordination with other Department programs is essential. Certain activities may not require review under NR 103 for one aspect of a project, while other aspects do. In order to avoid confusion for applicants, the regulator should consider a broad view of what will be required to allow a project to proceed.

Table 1 lists the types of Department activities that will likely require NR 103 consideration.

TABLE 1: Activities Affected by NR 103

AIR MANAGEMENT
- Construction permits for major sources in non-attainment areas [s. 144.393 (2)(d), Wis. Stats.]

COMMUNITY ASSISTANCE
- Grants require or can be conditioned for compliance with NR 103.

ENDANGERED RESOURCES
- Acquisition, management and research in State Natural Areas including master plans and feasibility studies, wetland restorations, exotic and problem species plant control, and boardwalks and pedestrian bridges
- Species introduction and management activities including hydrologic manipulations, island construction, rip-rapping, and nesting platforms

ENVIRONMENTAL ANALYSIS AND REVIEW
- Preparation of EIS's and EA's [NR 150]
- Review of DOT/DNR non-highway bridge projects for airports, railroads, and harbor facilities

ENVIRONMENTAL LOANS
- Loans administered by DNR for wastewater treatment projects [NR 162]

TABLE 1 (cont'd): Activities Affected by NR 103

FISH MANAGEMENT
- Spring pond dredging
- Fish barriers
- Lake or stream alterations
- Species introduction
- Public access development projects

FORESTRY MANAGEMENT
- Pest control [s. 26.30, Wis. Stats.]
- Access roads for silviculture
- Log and pulp landing construction
- Logging road stream crossings
- Skidding and pre-hauling of forest products
- Dry hydrant construction

PARKS AND RECREATION
- New property acquisition
- Public access development
- Flowage construction, operation, maintenance or abandonment
- Facilities construction (including beaches, picnic areas, camping areas, roads, parking areas, buildings, boat landings, trails, special use areas, piers, bridges, boardwalks, overlooks, drainage fields, and wells)

PROPERTY MANAGEMENT
- Feasibility Studies for new properties or modified boundaries
- Master Plans for property management including the river systems like the Mississippi River, the Lower Wisconsin State Riverway, the Chippewa, Turtle, and Flambeau Flowages, and Wild and Scenic Rivers
- Planning, design and construction of facilities including roads, trails, and buildings
- Non-DNR road grants

RESEARCH
- Habitat management research projects
- Land manipulation projects

SOLID AND HAZARDOUS WASTE MANAGEMENT
- All solid waste facilities, except containerized storage and incinerators must meet wetland locational criteria. [NR 500]
- Landfill Related Activities including footprint, surface/subsurface drainage system, borrow sources, land spreading, sludge ponds, compost sites [NR 500]
- Power Plant Siting [NR 500]
- Landfill expansions [NR 500]
- Corrective actions-Solid Waste [NR 500]
- Hazardous Waste facilities siting [NR 600]
- Corrective actions-Hazardous Waste [NR 600]
- Superfund remediation [Applicable or Relevant and Appropriate Requirement (ARAR)]
- Environmental Repair Program (ERR) [currently NR 550, Pending NR 700]
- Leaking Underground Storage Tanks (LUST) [Pending NR 700]
- Spills [s. 144.76 and NR 158]

TABLE 1 (cont'd): Activities Affected by NR 103

WATER REGULATION AND ZONING

- Water Quality Certification of proposed federal actions, including permits and licenses [s. 401 and 404 Clean Water Act, Ch. 147, Wis. Stats., and NR 299]
- Approval of submerged lands lease [s.24.39(4), Wis. Stats.]
- Approval of barge fleeting areas [s. 30.10, Wis. Stat.]
- Approval of bulkhead lines [s.30.11]
- permit for structure in navigable waters [s. 30.12(2)]
- Permit for riprap, sand blanket, fish crib, ford, boat ramp, or boat shelter [s. 30.12 (3)]
- Municipal bridge approval [ss. 30.123 (1)/84.01(23) and TRANS 207]
- Permit for bridge construction [s. 30.123]
- Approval of pier construction or pierhead lines [ss.30.13 and 30.12]
- Permit for surface water diversion/withdrawal [s. 30.18]
- Permit for waterway enlargements, ponds, grading [s. 30.19]
- Permit to change course of stream [s. 30.195]
- Permit to enclose a stream [s. 30.196]
- Permit/contract to remove bed material [s. 30.20]
- Approval/MOU for COE disposal sites for Miss. R. dredged material [s. 30.202]
- Issuance of general permits for certain activities [s. 30.206]
- Establishing water levels and flows [s.31.02]
- Permit to construct a dam [ss. 31.05 and 06]
- Approval of plans for a dam [s. 31.12]
- Permit to raise/enlarge a dam [s. 31.13]
- Order approving modification/alteration of a dam [s. 31.18]
- Permit to transfer ownership/abandon a dam [s. 31.185]
- Permits for dams on non-navigable streams [s. 31.33]
- Grants to repair/remove dams [s. 31.385]
- Approval of DNR projects that would require permits/approvals for non-DNR applicants [M.C. 3565.1]

WATER RESOURCES MANAGEMENT

- Basin plans [NR 121]
- Remedial action plans [Clean Water Act, Great Lakes Water Quality Agreement]
- Sewer service area plans [NR 121]
- BMPs/priority watersheds [NR 120]
- Detention basins [NR 120]
- Streambank easements [NR 120]
- Lake Protection and Wetland restoration grants [s. 144.254, Wis. Stats.]
- WPDES permit limit calculations [Ch. 147, Wis. Stats.]
- Remedial demonstration projects
- Monitoring projects
- FERC projects
- Surface water classification
- Power plant siting
- Superfund discharges
- Aquatic plant management [NR 107]
- Stormwater limits [Ch. 147, Wis. Stats.]
- Water Quality Standards [NR 102 - 106]

TABLE 1 (cont'd): Activities Affected by NR 103

WASTEWATER MANAGEMENT
- WPDES Permits
- Plan and Spec Approvals
- Sludge Management
- Facilities Plan Approvals

WILDLIFE MANAGEMENT
- Beaver abatement
- Dike construction
- Creation of ditches
- Plan and construct potholes
- Construction of habitat development projects including nesting structures, cookie cutters, and flowages
- Reintroduction of aquatic plants
- Water level manipulation
- Dike repair
- Maintenance dredging
- Boat ramp maintenance
- Rough fish control activities
- Emergency spillway maintenance
- Maintenance of shallow lakes and bays
- Purple loosestrife control

Are there any activities where NR 103 does not apply?

Some activities have been exempted in the rule (NR 103.06). Exemptions from NR 103 include:

1. Local Shoreland-Wetland Zoning Decisions.

Chapter NR 115 requires counties to adopt zoning ordinances for the regulation of wetlands in the shoreland zone for unincorporated areas. Chapter NR 117 requires similar ordinances for villages and cities. The shoreland zone is defined as those areas located within 1000 feet of the ordinary high water mark (OHWM) of a navigable pond, lake, or flowage or within 300 feet of the OHWM of a navigable river or stream (or to the landward side of the floodplain, whichever is greater). The state administrative codes require regulation of all wetlands, or portions of wetlands, located within the shoreland zone that are greater than 5 acres in size and are shown on final adopted Wisconsin Wetland Inventory maps. Local ordinances may be more restrictive than the state requirements. Some municipalities presently regulate all shoreland wetlands 2 acres or more in size. The shoreland/wetland zoning ordinances include a number of permitted and prohibited uses.

2. Metallic mineral prospecting and metallic mining projects.

Specific legislation that regulates mining in the state addresses the concerns for direct impacts to wetlands due to metallic mining activities. Chapters NR 131 and NR 132 set forth specific requirements for considering impacts to wetlands from these types of activities. The metallic mining laws and administrative codes were developed through a consensus process involving government officials, environmental groups representatives, and mining interests. Evaluations of alternatives and wetland functions and values associated with a project are required. The codes also set forth provisions for when

mining activities may have adverse impacts on wetlands and still be permitted. This provision is similar to the practicable alternatives test in NR 103.

3. Activities exempt from regulation under state and federal law.

Again, if the Department has no specific jurisdiction over an activity, NR 103 does not apply. For example, certain agricultural activities are specifically exempt from permit requirements under Chapter 30 of the state statutes and Section 404 of the Clean Water Act.

4. DNR/DOT Liaison Agreement

Section 30.12 (4) of the state statutes set forth procedures under which a liaison agreement was entered into between the Departments of Natural Resources and Transportation for addressing wetland concerns for state highway projects. The liaison agreement between the two agencies sets forth specific requirements for dealing with wetland impacts. The DOT is exempt from any permit requirements but must meet the substantive requirements of certain regulations, including the NR 103 standards.

Does NR 103 supersede NR 1.95?

NR 1.95 was promulgated in 1978 to establish the Department policy on wetlands preservation, protection and management. The rule sets forth the policy of the Natural Resources Board that "wetlands shall be preserved, protected, and managed to maintain, enhance or restore their values in the human environment." The rule requires that impacts to wetlands be considered in all Department regulatory and management actions. NR 1.95 also includes a listing of wetland functions and values.

Section NR 103.05(2) specifically covers this issue of supersedence. This section states that "whenever the procedures [of NR 103] are applicable to an activity, they shall supersede the regulatory provisions of s. NR 1.95 (5)." NR 103 is very similar to NR 1.95, but creates a specified process for decision making. NR 1.95 is still applicable to DNR decisions where no formal NR 103 decision is required. The older rule can still be used as a reference for the Department's policy on protecting wetland functional values.

THE NR 103 DECISION PROCESS

The NR 103 process establishes sound project planning by requiring that project proponents consider alternatives that avoid wetland impacts. If wetlands must be affected, it must be shown that there are no significant adverse impacts to the wetland functional values.

Figure 1 outlines the process for making decisions under NR 103. **The burden of proof is on the applicant/sponsor to show compliance with the standards.** Therefore, much of the De artment's involvement will be through the review of applicant and consultant derived information a documentation.

Early meetings should occur to ensure proper documentation and to head off projects tha ill not comply with NR 103. In fact, section NR 103.08 specifically requires the Department, when re sted, to meet with project proponents (applicants and/or consultants) and other interested parties to dis s potential for compliance with the standards early in project planning.

FIGURE 1: THE NR 103 DECISION PROCESS

STEP 1. WILL THE PROJECT AFFECT A WETLAND?

Will there be any
direct or indirect effects?

Yes: Proceed to Step 2.

No: You need not continue with the NR 103 process.

STEP 2. IS THE PROPOSED ACTIVITY WETLAND DEPENDENT?

Does it require a wetland location
to fulfill its basic purpose?

Yes: Proceed to Step 4.

No: Proceed to Step 3.

STEP 3. DOES A PRACTICABLE ALTERNATIVE EXIST?

Is there an affordable, available option
which will not harm wetlands or cause other
significant harm to the environment?

Yes: NR 103 standards are not met.
Your project cannot be approved.

No: Proceed to Step 4.

STEP 4. WILL THE PROJECT HAVE SIGNIFICANT ADVERSE IMPACTS ON WETLAND FUNCTIONAL VALUES?

After considering alternatives to avoid and/or minimize
impacts and other factors listed in NR 103.08 (3) (b to f),
will there be a significant adverse impact upon wetlands,
water quality, or other significant environmental consequences?

Yes: NR 103 standards are not met.
Your project cannot be approved.

No: NR 103 standards are met.
Your project is in compliance with
wetland water quality standards.

What are the specific steps required in the NR 103 process?

The following is a step-by-step explanation of the NR 103 process. Important issues are addressed for each of the steps.

- **STEP 1: Will the activity affect wetlands?**

A. What is a wetland?

As discussed above, the term "wetland" is defined in section 23.32, Wis. Stats., as:

> ...an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions.

This definition was established to guide the Wisconsin Wetland Inventory (WWI) mapping proj[illegible] term wetland describes an area where hydrology, vegetation and soils interact to form a unique community of plants and animals.

Due to variability of climatic and geologic conditions, many different types of wetlands can be found in Wisconsin, ranging from bogs to marshes to lowland hardwood swamps. NR 103 applies to all wetlands of the state, regardless of size and quality. This is important to note since the WWI only maps and classifies wetlands down to 5 or 2 acres, depending on the county. The inventory also utilizes point symbols to denote wetlands smaller that 2 acres, but not all small wetlands are included on the maps. NR 103 applies to all wetlands in the state, regardless if they are designated on WWI maps or not.

The 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands established a scientifically sound methodology for delineation of wetland areas based on the three criteria of hydrology, vegetation, and soils. This manual provides an excellent scientific framework for making wetland determinations, however the state definition is more inclusive than the federal approach, especially in assessing wetland soils. The federal methodology requires that a wetland meet the hydric soil criterion, whereas the state definition allows for somewhat poorly drained, poorly drained, and very poorly drained soils to qualify as wetland soils. The presence of a predominance of hydrophytic vegetation may also be used as evidence of wetland hydrology necessary to meet the state definition.

B. What does "affect" mean?

Wetlands can be affected directly by filling, draining, dredging, mowing, and plowing, or indirectly by altering the watershed or changing the wetland's hydrology. NR 103 requires that an activity avoid wetland impacts if possible or practicable.

According to the federal NEPA regulations (40 CFR 1508.8), "effects include: a) Direct effects which are caused by the action and occur at the same time and place [and] b) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."

Activities which result in chemical and physical changes to the wetland can cause changes in water clarity, color, odor, and taste. These alterations can eliminate, reduce, or change populations of aquatic organisms and impact water for human consumption, recreation and aesthetics. Nutrient and organic matter inputs can result in an increase in biochemical oxygen demand (BOD) which can cause reduced dissolved oxygen (DO) levels. This affects the survival of aquatic organisms and may lead to increases in nuisance aquatic vegetation such as algae which may cause adverse health effects and other changes.

Activities which result in increases in suspended particulates can reduce water clarity which can affect plant growth and may reduce or eliminate feeding by sight-feeding organisms. Suspended materials may react with dissolved oxygen (DO) and reduce or deplete the oxygen in the water column. Toxic materials and pathogens which are adsorbed or absorbed on particulates may become biologically available. Turbid water conditions within wetlands can adversely impact aesthetics and change plant species composition.

Water current changes can result in changes in location, structure and dynamics of aquatic communities. They can also affect shoreline and substrate erosion and deposition rates, deposition of suspended particulates, the rate and extent of mixing of dissolved and suspended components of the wetland and water stratification.

Activities which change the natural water fluctuation patterns (referred to as the hydroperiod) within a wetland, either by exaggerating the highs and lows or by eliminating natural fluctuation patterns can alter erosion and sedimentation rates, aggravate water temperature extremes and upset the nutrient and DO balance of the aquatic ecosystem. Also, changes to hydrology can destroy communities and populations of aquatic organisms, modify habitat, reduce the food supply, restrict the movement of aquatic fauna, destroy spawning areas, and change the plant and animal character of adjacent, upstream and downstream areas.

Some project proponents may propose artificially supplementing surface water flows to maintain wetland hydrology and therefore avoid "affecting" a wetland. It may be argued that such a proposal would avoid the need of going through the NR 103 process. Engineering the hydrology or similar measures are strategies for minimizing impacts to wetlands and should be considered later during the "review other factors" portion of the review process during STEP 4. Alternatives that avoid wetland impacts altogether are preferred over alternatives where wetland impacts are minimized through engineering.

A simple method for determining if a project does not need to be evaluated under NR 103 (i.e. a showing that there will be no affect on wetlands) involves the delineation of the subject wetland's primary drainage basin. For most activities, if the proposal will avoid any work within the topographic drainage basin, it can be concluded that no effect to wetlands will occur. This does not mean that any project located in the drainage basin will definitely affect a wetland. A project proponent may show that the activity will not have a measurable affect on the hydrology of a wetland through hydrologic budget, run-off and groundwater calculations. The Department may determine that there is no potential for effects to wetlands due to the type of project, size of project activity, distance to wetlands or other conditions,

As with other aspects of the NR 103 process, decisions on what constitutes an effect on the wetland will need to be determined by the Department on a case-by-case basis.

STEP 1 CONCLUSION: IF THE ACTIVITY MAY AFFECT WETLANDS, PROCEED TO STEP 2. IF NO EFFECT ON WETLANDS, THEN NR 103 DOES NOT APPLY.

- **STEP 2: Is the activity wetland dependent?**

A. What does "wetland dependent" mean?

"Wetland dependency" is defined in section NR 103.07(2) and means "the activity is of a nature that requires location in or adjacent to ... wetlands to fulfill its basic purpose."

B. What is the difference between "wetland dependent" and "water dependent"?

For the purposes of NR 103, WATER DEPENDENT = WETLAND DEPENDENT.

The "Definitions" section of the rule (NR 103.07) includes both terms-- wetland and water dependency. In order to maintain some consistency with federal terminology, as used in the 404 (b)(1) guidelines that were developed by USEPA for administration of the Section 404 permit program, the term "water dependent" was also included in NR 103. The federal definition of water dependent connotes a necessity to be located in an aquatic site to meet the project's basic purpose. The state definition of water dependency is to be used interchangeably with the term wetland dependency.

The key is to remember that the focus of the NR 103 standards is wetlands and thus the determination section of the rule requires a decision of whether or not the proposed activity must be located in or adjacent to a wetland to fulfill its basic purpose (NR 103.08 (3)(a)).

C. What is the significance of a decision that an activity is wetland dependent?

A determination that an activity is wetland dependent means that alternatives are considered as part of several other factors in determining the significance of the project impacts (See STEP 4). If the activity can be located or configured to avoid wetland impacts, the project should be changed to do so.

Activities that are not wetland dependent need not be located in or near wetlands, and thus the pursuit of alternatives that avoid adverse wetland impacts must be more substantial (See STEP 3). For these projects, the evaluation of alternatives must occur prior to and independent of the other factors listed in STEP 4 below, including the significance of the expected impacts.

Department staff must be careful not to confuse the NR 103 process with similar processes in the 404 program. While the Corps of Engineers does not usually require the applicant to provide an evaluation of practicable alternatives for projects determined to be water dependent, the DNR will need to consider practicable alternatives for a wetland dependent project under NR 103 (See STEP 4).

D. Does the Department have a definitive list of wetland dependent activities?

No. The determination of wetland dependency must be made on a case-by-case basis with the focus being on the overall project purpose.

The evaluator must look at each case on its own merits. It may be that certain portions of a large project will be wetland dependent. Such a determination would not make the entire project wetland dependent. Certain projects are very site specific activities (e.g. remediation of a contaminated wetland) and thus would be considered wetland dependent. Other examples of activities that may be considered wetland dependent activities under certain circumstances include aquatic plant management actions, construction of bridge abutments through a wetland, and construction of a boardwalk through a wetland for educational purposes.

STEP 2 CONCLUSION: IF THE ACTIVITY IS WETLAND DEPENDENT, PROCEED TO STEP 4. IF THE ACTIVITY IS NOT WETLAND DEPENDENT THEN PROCEED TO STEP 3 FOR A FULL ANALYSIS OF PRACTICABLE ALTERNATIVES.

- STEP 3: Are there practicable alternatives that avoid wetland impacts?

A. What is the definition of "practicable" ?

The term "practicable alternative" is defined in NR 103.07(1) and means an alternative that is "available and capable of being implemented after taking into consideration cost, available technology and logistics in light of overall project purpose." As with the definition of wetland dependency, this term was adapted from the federal 404(b)(1) guidelines. Federal case law related to the 404 program has provided some standards for considering practicable alternatives. In order to make federal and state wetland regulatory programs as consistent as possible, the Department has decided to follow appropriate Wisconsin and Federal case law on wetland regulation.

B. How does the Department decide if an alternative is practicable?

The practicable alternatives test is a key element of the NR 103 process. The need for sound planning up front should be strongly emphasized early in the project development process. Alternatives that avoid wetland impacts should be considered early in the project planning. Early consultation with Department staff should be encouraged to discuss potential for compliance with NR 103 requirements (NR 103.08 (1)).

Practicability of alternatives must be defined in the context of the specific activity proposed. Due to the large variety in the types of projects that are affected by NR 103, it is difficult to derive specific criteria for an alternatives analysis. Each Department program may want to develop guidance for the practicable alternatives review. The NR 103 Citizens Technical Advisory Committee is currently preparing information regarding practicability of alternatives for specific project types.

The burden of proof is on the applicant to show that no practicable alternative exists that will not adversely impact wetlands. Department review of documentation will need to employ some element of best professional judgement based on staff knowledge of the types of projects, associated technological constraints, cost considerations, and the local availability of alternative sites. For complex projects, staff may need to rely on special consultant resources to help determine the viability of certain alternatives.

Figure 2 is an attachment that is sent to Corps of Engineers permit applicants and sets forth a suggested outline for evaluating alternatives. At a minimum, the Department should require and receive a letter, or preferably a report format, that addresses practicable alternatives. The applicant's report should state the project purpose, determine the wetland dependency of the activity, list alternatives considered, evaluate the alternatives based on costs, logistics and technology, and justify the selected option. The report should be substantial enough to show that if the selected alternative will impact a wetland, no practicable alternative exists that would avoid wetlands. If a project proponent is not able to provide sufficient information, the application for the activity may be denied.

It is important to remember that the practicable alternative test includes the evaluation of costs, logistics and technology. Therefore, even if an upland site is available, other factors may make the alternative not practicable. A wide array of arguments can be expected and applicants should be encouraged to put forth all viable explanations and issues surrounding the practicability of various alternatives. Department staff may need to suggest certain alternatives for consideration based on staff knowledge of a particular area.

STEP 3 CONCLUSION: IF NO PRACTICABLE ALTERNATIVE EXISTS, PROCEED TO STEP 4. IF THERE IS A PRACTICABLE ALTERNATIVE, THEN COMPLIANCE WITH NR 103 IS NOT ACHIEVED.

FIGURE 2: INFORMATIONAL REQUIREMENTS FOR PRACTICABLE ALTERNATIVES ANALYSIS UNDER NR 103

I. Detailed Outline of the Background of Project

A. Describe the purpose and need for project.

B. Is your project an expansion of existing work or is it new construction?

C. When did you start to develop a plan for your project?

D. Explain why the project must be located in or adjacent to wetlands.

II. Alternatives (Your analysis should address the following questions.)

A. How could you satisfy your needs in ways which do not affect wetlands?

B. How could the project be re-designed to fit the site without affecting wetlands?

C. How could the project be made smaller and still meet your needs?

D. What other sites were considered?

1. What geographical area was searched for alternative sites?

2. How did you determine whether other non-wetland sites are available for development in the area?

3. In recent years, have you sold or leased any lands located within the vicinity of the project? If so, why were they unsuitable for the project?

E. What are the consequences of not building the project?

III. Comparison of Alternatives

A. How do the costs compare for the alternatives considered in II above?

B. Are there logistical (location, access, transportation, etc.) reasons that limit the alternatives considered?

C. Are there technological limitations for the alternatives considered?

D. Are there other reasons certain alternatives are not feasible?

IV. If you have not chosen an alternative which would avoid wetland impacts, explain:

A. Why your alternative was selected, and

B. What you plan to do to minimize adverse effects on the wetlands impacted.

• **STEP 4: Considering several factors, will the activity have significant adverse impacts on wetland functional values or other significant adverse environmental consequences?**

A. What other factors need to be reviewed?

Section NR 103.08 (4)(b) requires that several factors be considered in making the determination concerning significance of impacts. These factors include: practicable alternatives to the proposal that will avoid and/or minimize impacts to the wetland; impacts to the wetland standards (functional values); cumulative and secondary impacts; and adverse impacts to areas of special natural resource interest.

B. Why consider practicable alternatives at this stage of the process?

This factor is very important for review of wetland dependent activities, as described in Step 2 above. Even if a project must be located in or adjacent to a wetland, there may be available alternatives to avoid the impacts. Alternatives to avoid or minimize impacts should be considered for all projects at this stage. Reconfiguration of the project, erosion control measures, slope restrictions, etc. may be required in order for the Department to conclude that no significant adverse impacts to wetland functional values will occur.

C. What are the functional values of wetlands?

Functions and values are the physical, chemical and biological attributes of a wetland and the associated benefits which wetlands provide to humans and the natural environment. As presented in section NR 103.03 (1) of the rule, wetlands are recognized for performing the following water quality related services and values:

1. Storm/flood water storage and retention and moderation of water level fluctuation extremes:

Peak flows from ground and surface water can be detained as they travel down slope and through wetlands. When several wetland basins perform this function within a watershed, they can individually release water gradually, causing a staggered or moderated discharge which reduces flood peaks. In studies throughout the state, flood flows are significantly lower in basins with substantial lake and wetland area than in basins with no lake and wetland area. This function provides a direct benefit to the public by reducing the need for structural flood controls such as dikes and levees and by reducing costly flood damage.

2. Hydrologic functions including maintenance of dry season stream flow, the discharge of groundwater to a wetland, the recharge of groundwater from a wetland to another area and the flow of groundwater through a wetland:

Groundwater recharge is the process by which surface water moves into the groundwater system. Although recharge usually occurs in the higher parts of the landscape, some wetlands can provide a valuable service of replenishing groundwater supplies. Groundwater discharge, which more commonly occurs in wetlands, can be important for stabilizing stream flows, especially during dry months. This results in an enhancement of the fish and aquatic life communities in the downstream areas.

3. Filtration or storage of sediments, nutrients or toxic substances that would otherwise adversely impact the quality of other waters of the state:

Wetlands can store or filter nutrients, such as phosphorus and nitrogen, which would otherwise flow into other ground or surface waters or wetlands. Wetlands can store the nutrients on a short term within wetland plants or a long term basis in sediments or peats. Even the short term storage of nutrients is beneficial as downstream waters may be highly sensitive to nutrients at the time of year that the wetland

is storing them. Also, wetlands can transform nitrogen to its gaseous state (denitrification), thereby removing it from the aquatic environment. Sediment storage often occurs in wetlands because of their low slope and flow characteristics (water retention capacity). Many toxic substances can also be stored or transformed to a less toxic state within wetland sediments.

Although a very important function of wetlands, the use of wetlands to filter or store sediments or nutrients for an extended period of time will result in changes to the wetland. Sediments will eventually fill in wetlands and nutrients will eventually modify the vegetation. Such changes may result in the loss of this function over time.

Conditions that allow a wetland to perform this functions can also be conditions that allow for serious impact to the system. For example, a riverine wetland that is downslope from a corn field is likely providing a significant water quality function as the wetland slows run-off waters and allows settling and uptake of nutrients before the materials can get to the surface water system. However, too much run-off can change the plant community and excess nutrients can affect the productivity of the system.

An evaluator of the functional value of a wetland for water quality purposes must consider the line between performing the function and being overloaded and thus adversely impacted.

4. Shoreline protection against erosion through the dissipation of wave energy and water velocity and anchoring of sediments:

Wetland vegetation can hold soil particles and reduce wave energy. Benefits include the protection of habitat, buildings, other structures, and land which may otherwise be lost to erosion. Also, a wetland which reduces erosion also reduces sedimentation to nearby waterways. If the waterway is a navigational channel, the reduction in sedimentation can reduce the frequency of dredging the channel.

5. Habitat for aquatic organisms in the food web including, but not limited to, fish, amphibians, crustaceans, mollusks, insects, annelids, planktonic organisms and the plants and animals upon which they feed and depend for their needs in all life stages:

Wetlands provide food and habitat for a tremendous variety of biota which in turn supports species of fish and other organisms. Most freshwater fish require shallow water for a part of their life cycle. Benefits include providing support for fish species which are important for both the sport and commercial fishing industries.

6. Habitat for resident and transient wildlife species, including mammals, birds, reptiles and amphibians for breeding, resting, nesting, escape cover, travel corridors and food:

Wildlife species may depend upon wetland habitats for their entire life cycle, as with most amphibians, waterfowl and muskrats, or they may rely upon wetlands to provide habitat needs during only a part of their life stage. Recreation such as bird watching and hunting are dependent upon a wetland's ability to provide habitat for wildlife species.

7. Recreational, cultural, educational, scientific, and natural aesthetic values and uses:

Wetlands provide areas for many forms of recreation including nature observation, hiking, biking, skiing, photography, hunting, fishing and canoeing. Wetlands provide educational and scientific research opportunities because of their unique combination of terrestrial and aquatic life and physical/chemical processes. Many species of endangered and threatened species are found in wetlands. Wetlands are also important for their cultural and historical values.

D. What are the criteria for the standards?

If a wetland is to continue to perform the above functions, certain water quality and quantity criteria or conditions must be met and are established in the rule. The criteria are qualitative standards for the discharge of materials, the protection of hydrologic conditions and the protection of habitat and are set forth in section NR 103.03 (2).

The criteria require that the following "may not be present in amounts which may cause significant adverse impacts to wetlands":

1. Liquids, fills or other solids or gas;

2. Floating or submerged debris, oil or other material;

3. Materials producing color, odor, taste or unsightliness;

4. Concentrations or combinations of substances which are toxic or harmful to human, animal or plant life when considered individually or cumulatively.

The criteria also establish standards for maintaining hydrologic conditions (NR 103.03 (2)(e)). Significant adverse impacts must be prevented for the following parameters: water currents; erosion or sedimentation patterns; water temperature; the chemical, nutrient and dissolved oxygen regimes; movement of aquatic fauna; pH; and water levels or elevations.

Further, the criteria state that existing habitats and populations of wetland animals and vegetation shall be maintained by protecting food supplies and reproductive and nursery areas and preventing conditions conducive to the establishment of nuisance organisms (NR 103.03 (2)(f)).

E. What techniques are available and acceptable for evaluating wetland functional values and the project impacts?

The rule lists examples of several wetland evaluation methodologies that have widespread acceptance. These methodologies range from simple rapid assessments to more sophisticated computer driven models. While the level of work required will likely be dictated by the scope of the project, it is best to use the DNR Rapid Assessment Methodology in most cases due to the complexities and time involved with using other techniques.

The following is a brief description of the methodologies listed in NR 103. Note that the list is not comprehensive, and any method that covers all wetland functions and values listed in NR 103, and appropriate to the subject wetland, can be employed. For the most part, the Department will be reviewing reports prepared by consultants using the approved methodologies.

1. Wisconsin DNR Rapid Assessment Methodology- An earlier version called the Wetland Evaluation Questionnaire or WEQUEST has been updated. Both are field checklists that require the investigator to focus on important indicator attributes of the wetland and watershed. Positive responses to checklist questions indicate a greater significance for that wetland fulfilling a given function. The method can also be used as a good summary of a site visit.

2. Wetland Evaluation Technique (FHWA/COE)- This methodology is also referred to as WET, WET 2, the Adamus Method, or the Federal Highway Administration Method. This is a fairly sophisticated methodology that is nationally applicable and can be completed on a computer. The model evaluates wetland functions and values on opportunity to fulfill a certain function;

effectiveness of the wetland to fulfill a given function based on its physical, chemical, and biological characteristics; and the social significance of the function.

The Corps of Engineers has begun an extended effort to develop a new methodology to replace WET.

3. Wisconsin Wetland Evaluation Methodology- This method is a shortened and modified version of WET 2, that was refined to address Wisconsin wetland types and conditions. As with the above, the Wisconsin WEM evaluates opportunity, effectiveness and social significance.

4. Hollands/Magee- Also referred to as the IEP or IEP/Normandeau methodology, this evaluation technique uses a condition weighted model to evaluate functions and values. The output is a numerical scoring and comparison to minimize/maximize model values. It can easily be adapted to spreadsheet use.

5. Minnesota Wetland Evaluation Methodology for the North Central United States - This method is also know as the Minnesota WEM and was developed as a regionalized version of WET 2. WDNR was involved early in the development of the methodology. This method is very similar to the Wisconsin WEM described in #3 above.

F. How does one determine if an impact is significant?

This term will necessarily be defined on a case-by-case basis. The term "significant impacts" is not new and has been the basis for many analyses under the Wisconsin Environmental Policy Act (WEPA), shoreland-wetland zoning, Chapter 30 water regulations, and federal environmental regulatory programs (including National Environmental Policy Act (NEPA) procedures).

NR 150, the Wisconsin Administrative Code for the WEPA program, defines "significant effects" as "considerable and important impacts...on the quality of the human environment."

Federal regulations (section 40 CFR 1508.27) state that "significantly, as used in NEPA, requires consideration of both context and intensity: a) context...means that the significance of the action must be analyzed in several contexts such as society as a whole..., the affected region, the affected interests, and the affected locality. Significance varies with the setting of the proposed action.... Both short- and long-term effects are relevant. b) Intensity ...refers to the severity of the impact...."

Due to the complex nature of wetland ecosystems, the great variety of types and quality of wetlands throughout the state, and the variable abundance of wetland resources in different regions of the state, significance of impacts cannot be specifically defined. Remember that the burden of proof is on the applicant to show that no significant adverse impacts will occur. The reviewer will need to consider all the above factors in his/her determination.

G. What are secondary and cumulative impacts?

It is often difficult to differentiate between primary and secondary effects of a project. The requirement to consider both direct and indirect impacts was included in NR 103 to focus the review on all potential impacts from the project. Activities that are near, but not directly in, wetlands may have very significant secondary impacts. Impacts to one wetland or portion of a wetland may have far reaching effects on other wetlands and surface waters. Secondary impacts may also occur over time. For example, filling a very small wetland area may allow for future building activities which will lead to increased erosion and sedimentation of other wetlands nearby. In such a scenario, the actual impacts of the immediate action were minor, but the secondary impacts in the future may be significant. Consideration of cumulative impacts requires evaluating the impacts of the current project in relation to past or reasonably anticipated

future actions. NR 150 requires that the Department consider the extent of cumulative effects of repeated actions of the same type, or related actions or other activities occurring locally that can be reasonably anticipated and that would compound impacts.

Federal regulations (40 CFR 1508.7) define cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency... or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Again, the evaluator must consider the ramifications of the action beyond the immediate scope of the proposed project. A very minor fill may set precedent for other minor fills in an area, thereby eventually causing the destruction of scarce habitat in an urbanizing setting.

H. What are areas of special natural resource interest?

Section NR 103.08 lists several areas for which any adverse impacts to wetlands should be especially avoided. This list includes wetlands directly associated with:

1) Cold water communities as defined in s. NR 102.04(3)(b), including all trout streams and their tributaries and trout lakes;

2) Lake Michigan and Superior and the Mississippi River;

3) State and federal designated wild and scenic rivers, designated state riverways, and the state designated scenic urban waterways;

4) Environmentally sensitive areas and environmental corridors identified in area-wide water quality management plans, special area management plans (SAMP), special wetland inventory studies (SWIS), advanced delineation and identification studies (ADID) and areas designated by the United States Environmental Protection Agency under s. 404(c), 33 USC 1344(c);

5) Calcareous fens;

6) Habitat used by state or federally designated threatened or endangered species;

7) State parks, forests, trails, and recreation areas;

8) State and federal fish and wildlife refuges and fish and wildlife management areas;

9) State and federal designated wilderness areas;

10) Designated or dedicated state natural areas;

11) Wild rice waters as listed in s. NR 19.09; and

12) Any other surface waters identified as outstanding or exceptional resource waters in ch. NR 102.

If the proposed project will have an adverse effect (not necessarily a significant adverse effect) on a wetland associated with an area of special natural resource value, this should be a red flag indicating the

need for very careful Department scrutiny of the project. The reviewer should strongly pursue the reason that the project must be located as proposed.

I. What is meant by "other significant adverse environmental consequences"?

This factor is included in the rule to balance concerns about other aspects of the environment outside of the wetlands. For some projects, the overall environmental good of the project or the potential for adverse impacts to other important natural resources may outweigh any adverse impacts to a wetland. An example would be a hazardous waste clean-up where the only alternative for preventing human health impacts and/or further damage to the ecosystem may require significant adverse impacts to a wetland. Such a determination will only be made in very special cases however.

STEP 4 CONCLUSION: IF IT IS DETERMINED THAT THE PROJECT WILL NOT HAVE SIGNIFICANT ADVERSE IMPACTS TO WETLAND FUNCTIONAL VALUES OR OTHER SIGNIFICANT ADVERSE ENVIRONMENTAL CONSEQUENCES, COMPLIANCE WITH NR 103 IS ACHIEVED. IF THERE WILL BE SIGNIFICANT ADVERSE IMPACTS TO WETLAND FUNCTIONAL VALUES OR OTHER SIGNIFICANT ENVIRONMENTAL CONSEQUENCES, THE PROPOSAL DOES NOT MEET NR 103 STANDARDS AND CANNOT BE COMPLETED AS PROPOSED.

DOCUMENTING DECISIONS UNDER NR 103

How are NR 103 decisions handled?

For most Department programs, the NR 103 decision will come at the time of a determination that compliance is not achieved or at the time an authorization is granted. Such determinations may be included as a finding of fact and conclusion of law, depending on the program requirements. The decision should state that the project has been reviewed in accordance with NR 103, Wis. Adm. Code. The following elements of NR 103 should be included in any formal finding of fact, as well as supporting field investigations:

COMPLIANCE WITH NR 103--

case 1: The proposed activity will not affect wetlands.

case 2: The proposed activity will affect wetlands, the project is wetland dependent, and the activity will not result in significant adverse impacts to wetland functional values, water quality, or other significant environmental consequences.

case 3: The proposed activity will affect wetlands, the project is not wetland dependent, no practicable alternative exists, and the activity will not result in significant adverse impacts to wetland functional values, water quality, or other significant environmental consequences.

NC COMPLIANCE WITH NR 103--

case 4: The proposed activity will affect wetlands, the project is wetland dependent, and the activity will result in significant adverse impacts to wetland functional values, water quality, or other significant environmental consequences.

case 5: The proposed activity will affect wetlands, the project is not wetland dependent, but a practicable alternative exists that would avoid wetland impacts.

case 6: The proposed activity will affect wetlands, the project is not wetland dependent, no practicable alternative exists, and the activity will result in significant adverse impacts to wetland functional values, water quality, or other significant environmental consequences.

The Department may determine that NR 103 standards are not met if the applicant fails to provide sufficient, required and/or requested information.

What appeal rights are available to applicants?

NR 103 provides the standards for making decisions regarding wetland impacts within existing Department regulatory and management programs. The appeals language for a given decision will be the same as employed by each program before NR 103 came into effect. Many of these decisions will have appeal rights under Section 227, Wis. Stats.

TRACKING NR 103 DECISIONS

In order to assure consistency and to be able to evaluate the losses and gains of wetland acreage statewide, it is important that diligent tracking of decisions take place. All Department decisions involving NR 103 determinations will be tracked using common data elements. Programs lacking a tracking data base will need to track information in manual written form. Figures 3 and 4 are examples of forms that may be used by Department programs for use in tracking NR 103 decision data.

Each program should maintain its own data base of NR 103 decisions. It is envisioned that at some point, the entire Department will have an automated database for tracking wetland decisions.

FIGURE 3: SAMPLE NR 103 TRACKING FORM #1

01 County Code #: _____/_____/_____

02 Project Docket Number:

03 Applicant Information
NAME: _____
ADDRESS: _____
_____
PHONE: _____

04 Location Description for wetland:
(___¼, ___¼, ___¼, ___¼, Section ___, Township____, Range____)

05 Project Type/Jurisdiction: _____

06 Will proposed project affect wetlands? (Y or N)

07 Type of Wetland Affected (WWI Classification): _____

08 Activity Wetland/Water Dependent? (Y or N)

09 Was there a practicable alternative? (Y or N)

10 Estimated acres of wetland impacted (direct and/or indirect): _____

11 Wetland impact beneficial (B), adverse (A), or significantly adverse (SA)?

12 Compliance with NR 103 achieved? (Y or N)

13 Date of Decision: _____

14 Other Comments:

FIGURE 4: SAMPLE NR 103 TRACKING FORM #2

01 Bureau/District/County Code #: _____/_____/_____

02 Project Number:

03 Applicant Information
NAME: _____
ADDRESS: _____
_____
PHONE: _____

04 Project Type/Jurisdiction: _____

05 Will proposed project affect wetlands? (Y or N)

06 Location Description for wetland:
(___¼, ___¼, ___¼, ___¼, Section ___, Township____, Range____)

07 Type of Wetland Affected (WWI): _____ or not mapped

08 Change in WWI classification required? (Y or N)

09 Estimated size of wetland affected in acres: _____

10 Activity Wetland Dependent? (Y or N)

11 Is there a practicable alternative? (Y or N)

12 Comments for Practicable Alternatives review

_____
_____
_____
_____

13 Adverse impacts to wetlands of special natural resource value expected? (Y or N).
List the affected resource: _____

14 Discuss Impacts Expected.

_____
_____
_____

15 Will there be Significant Adverse Impacts to Wetland Functional Values or Other Significant Environmental Consequences (Y or N)?

16 Compliance with NR 103 achieved? (Y or N)

17 Water quality certification decision (if applicable): (project dismissed, project withdrawn, project modified, granted conditionally, granted, or denied)

18 Wetland Loss or Gain Expected: + or - _____ acres

19 Date of Decision: _____

20 Other Comments: