***State of Minnesota***
***DEPARTMENT OF NATURAL RESOURCES***
***Trails & Waterways***

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***Subject*** ***Virginia OHV Recreation Area***
***Wetland Resource Assessment***

## *I. RESOURCE DESCRIPTION*

### Surficial Hydrology

Surface water flow in the Rainy River Watershed is defined by the horseshoe-shaped Laurentian Divide which opens to the northeast. Surface water flows are directed southeastward towards intermittent streams located near the southeast corner of the landfill. Once surface flow reaches the streams, the flow turns eastward. Here, the water enters the Pike River flowage which heads northeasterly discharging into Lake Vermilion. Despite mining activity in the region, water quality is thought to fall within normal ranges for Minnesota waters.

### Groundwater Hydrology

Portions of this site are considered a groundwater recharge area located immediately east of the Laurentian Divide. Locally, groundwater flows from the crest of the Divide, and east-southeast to lower slopes. Flattened bedrock slopes and depressions on the bedrock surface allow ponding of groundwater where the water-table is reflected by headwater wetlands. Groundwater continues to migrate east towards a major bedrock fault below the Pike River, then northeast out of the Virginia Horn. Regionally, groundwater continues north towards the border lakes area separating Minnesota and Canada.

### Wetland Hydrology

Prior to mining activities, a forested wetland was mapped in Section 10. This wetland appears to have been a main outlet into sections 14 and 15. An additional overflow outlet still flows northeast into Section 11. More than half of this forested wetland was buried during mining operations. The first level of mine dump embankments was placed at nearly right angles to surface and groundwater flow direction. Placement of this embankment began to back up water against the slope of the Divide. Two impounded ponds eventually formed west of the embankment. Water from the ponds is thought to migrate east-southeast where it seeps from beneath the mine dump. This has given rise to visible wetlands in Sections 11, 14 and 15 of the project area. An unconfirmed aquifer also exists beneath the area with its water table within the mine dump material. Bedrock forms the lower confining unit leading to a saturated thickness of approximately 18-47 feet.

**Wetland Classification**

The following wetland types were identified on-site and classified by type using the National Wetlands Inventory Map, large-scale aerial photography, and topographical maps. Wetland types are approximated and mapped, along with streams, rivers, tributaries and major drainages located on the 3,500 acre project area. The following wetland types are described using the USF&WS *Circular 39* definitions, and the Cowardin System in parentheses, to delineate and map wetland basins. Where a particular coding contains two wetland definitions (types) under the Cowardin system, the coding was repeated under each wetland type.

**TYPE 3: Shallow Marsh** (PEM5C, PEM5Cb, PSS/EM5C, PSS/EM5C, PSS/EM5Cb)
Soil is usually waterlogged early during the growing season and may be covered with as much as 6 inches or more of water. Type 3 shallow marshes may nearly fill shallow lake basins or sloughs, or may border deep marshes on the landward side. These are common as seepage areas on irrigated lands. Vegetation includes grass, bulrush, spikerush and various other marsh plants such as cattail, arrowhead, pickerelweed and smartweed.

**TYPE 4: Deep Marsh** (PEM5K, PEM/UBFb, PEMFb)
Soil is usually covered with 6" to 3' or more of water during growing season. These deep marshes may completely fill shallow lake basins, potholes, limestone sinks and sloughs, or they may border open water in such depressions. Vegetation includes cattail, reed, bulrush, spikerush and wildrice. In open areas, pondweed, naiad, coontail, water-milfoil, waterweed, duckweed, waterlilly or spatter-dock may occur.

**TYPE 5: Open Water** (PUBHx, PUBFx, PUBK, L1UBHx, PUBFb, PEM/UBFb)
Shallow open water, including ponds and reservoirs. Water is usually less than 10' deep and fringed by emergent vegetation similar to open areas of **Type 4.**

**TYPE 6: Shrub Swamp** (PSSB, PSSC, PSSCb, PSSC, PSS/EM5C, PSS/EM5Cb, PFO4/SSB, PFO/SSC, PFO6/4B, PFO6/SSB, PFO/SSB)
Soil is usually waterlogged during growing season and is often covered with as much as 6" of water. These occur mostly along sluggish streams and occasionally on flood plains. Vegetation includes alder, willow, buttonbush, dogwood, and swamp-privet.

**TYPE 7: Wooded Swamps** (PFOB, PFO5Fb, PFO4/SSB, PFO4B, PFO/SSC, PFO4B, PFO6/4B, PFO6/SSB, PFO/SSB, PFOB)
Soil is waterlogged at least to within a few inches of surface during the season and is often covered with as much one foot of water. Type 7 wooded swamps occur mostly along sluggish streams, on old riverine oxbows, on flat uplands and in ancient lake basins. Forest vegetation includes tamarack, arborvitae, black spruce, balsam fir, red maple and black ash. Deciduous swamps frequently support beds of duckweed and smartweed. Other wetland plant community types include lowland hardwood swamps and coniferous swamps.

## *II. NARRATIVE*

Wetlands on this site provide food and habitat for fish and wildlife; water quality improvement; water storage; groundwater recharge; erosion control; and opportunities for recreation and aesthetic appreciation. Within the proposed 3,500 acre project area are a number of wetlands. The larger wetland areas are identified on the attached National Wetland Inventory (NWI) Map. In addition to these areas, smaller pockets of wetlands not included in the NWI survey still need to be delineated and mapped.

The identification of wetlands is a valuable tool for planning trail layout. Impacts to these sensitive wet areas must be avoided and minimized to the extent possible. On-site wetland identification will be undertaken prior to construction to identify smaller wetlands and to verify areas shown on wetland inventory maps. A technical delineation panel will need to re-evaluate the site once proposed trails are located and flagged. This panel will be comprised of representatives from the DNR, the Soil and Water Conservation District and the U.S. Army Corp of Engineers.

Development of this site must comply with provisions of the *Minnesota Wetland Conservation Act (WCA, 1991),* the *Governor's Executive Order on No Net Loss of Wetlands (No. 91-3),* and is subject to U.S. Army Corps of Engineers' regulatory authority *(GP-18-MN).* Any draining or filling of a wetland, partially or wholly, is subject to strict regulation, although not all such projects require wetland replacement. Fill is defined as any solid material added to or redeposited in a wetland that alters its cross-section or hydrological characteristics, obstructs flow patterns, changes the wetland boundary, or converts the wetland to a non-wetland.

DNR protected waters found inside the Virginia OHV park include the Pike River and an un-named tributary to the Pike River. (See "Riparian Area Assessment"). Wetlands within the flood plain of the Pike River, while providing for flood protection and erosion control, also influence an aquatic ecosystem which includes game fish populations.

## *III. RESOURCE MANAGEMENT OBJECTIVES*

According to the Wetland Conservation Act and the Governor's No Net Loss Executive Order, wetland impacts must be avoided or minimized whenever possible. Unavoidable impacts must be mitigated. Water Quality Best Management Practices (BMP'S) must also be followed to protect riparian resources impacted by proposed site development. The DNR intends to avoid, minimize or appropriately mitigate wetland impacts associated with the development of the Iron Range OHV Recreation Area.

## *IV. ISSUES AND CONCERNS*

1. Trail treadways in wetland areas should be continuously monitored for any change in wetland characteristics including: vegetative changes, soil compaction or rutting, or any alterations to normal hydraulic functioning. Trail users must remain on trail treadways in order to minimize impacts to the larger trail corridors.

2. Wetland impacts result if you fill, grade or excavate. Hand clearing is not considered an impact under U.S. Army Corps or Wetland Conservation Act (WCA) **regulations if the impact is less than 0.5 acres** (U.S. Army Corps of Engineers, GP-18-MN). Army Corp of Engineers regulations require mitigation for projects impacting more than 1/3 acre of wetland, thereafter requiring an individual permit. Moreover, all wetland impacts for the project are cumulative.

3. The Governors Executive Order requires a no net loss of wetlands on all state projects. This means that impacts of 1/10th of an acre, or greater, must be mitigated. For projects exempt under the WCA, but requiring replacement under the Executive Order, a minimum 1:1 replacement ratio is required. Replacement can take place anywhere in the state. Although Executive Order 91-3 has technically lapsed with the election of Governor Jesse Ventura; the DNR will continue to hold DNR projects to this higher standard of wetland protection.

## *V. IMPACT AVOIDANCE, MINIMIZATION AND MITIGATION STRATEGIES*

It is the goal of the DNR's Trails and Waterways Unit to avoid or minimize wetland impacts through careful planning, design, construction and operation of both motorized and non-motorized trails in Minnesota. The DNR must comply with state and federal permit requirements, and with Executive Order 91-3 which requires no net loss of wetlands. The DNR acts as its own Local governmental Unit (LGU) in ensuring compliance with the executive order and WCA.

**Minimizing Wetland Encroachment**
Trails that must cross wetlands should consider the design alternatives outlined below:

1. **Boardwalk** - Boardwalks are constructed by installing piles and attaching decking above the wet area. This would allow for water movement under trails and helps avoid compaction of soils.

2. **Floating Boardwalk -** This type of crossing would work well in applications where anchoring of poles would be difficult. A floating structure properly installed through wet areas allows for some water movement, minimally impacting wetland characteristics.

3. **Bridges -** Bridge structures can be used to cross small wet areas. Abutments should be secured on each side of a wet area and the bridge should span the entire wetland in order to minimize impacts.

4. **Culverts and Fill -** Culverts can be placed under trail treadways along with fill, filter fabric and other materials. This application works for all types of trails, but can significantly impact wetland function and water quality. Water flows are reduced and may be functionally altered. Some compaction of soils and vegetation may result. These and other possible impacts would need to be mitigated consistent with provisions of the Wetland Conservation Act (WCA) and the Governor's No Net Loss Executive Order.

5. **Fill -** Filter fabric and fill may be used to build up low spots in the trail treadway. This can work well for smaller wet areas, but may result in some wetland impact. Again, such impacts would need to be mitigated according to state and federal wetland rules.

6. **No Treatment of Trail Surface -** Trails that run directly through small wetland areas without the benefit of the above methods should be closely monitored for wetland degradation over time. Such trails may have to be closed or rerouted if trail surfaces become wet or rutted, or should environmental conditions warrant.

**Mitigating Unavoidable Wetland Impacts**
When the DNR proposes to fill, drain or otherwise modify a wetland, application must be made to the DNR Area Team for a sequencing determination and approval of a wetland replacement plan to compensate for wetland losses. After Interdisciplinary Team review, Regional Managers must approve this application.

Mitigation is required for all impacts that exceed exemptions specified in the Wetland Conservation Act (exceeding the di-minimus). The Governor's No Net Loss Executive Order, however, has no di-minimus clause. Consequently, the DNR'S internal policy is more restrictive requiring mitigation after just a 1/10th acre impact. Moreover, mitigation is not allowed on State Permanent School Trust Fund Land (Section 16), and wetland banking credits require pre-approval. Without banked credits, the DNR must find appropriate mitigation projects. Mitigation can be done off-site or through the wetlands "bank" established by the State B.W.S.R.

Trails or public use areas that cross, or impact wetlands need to be monitored on a continual basis. These facilities may require periodic repair or reconstruction. If necessary, areas may need to be temporarily closed and rehabilitated. Other areas may need to be permanently retired from public use.

## *VI. REFERENCES*


1. National Wetlands Inventory Map, U.S. Department of the Interior, 1982.
2. MN Wetlands Conservation Act of 1991, Revised 1996.
3. Administrative Guidelines / Wetland Regulations, MN Dept of Natural Resources, 1994.
4. Wetland Types and Definitions in MN, 1996. U.S. Fish & Wildlife Service Circular 39.
5. MN Wetland Restoration Guide, MN Board of Water and Soil Resources, 1992.
6. Governors Executive Order - No Net Loss of Wetlands (Number 91-3).
7. MN DNR Protected Water Inventory Map, 1996.


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