Appendix H

2011 Norwegian Bay Memo

Memorandum

To: Beaver Dam Lake Management District (Board of Commissioners)
From: Barr Engineering Company (Meg Rattei)
Subject: Norwegian Bay 2011 Plant Data
Date: August 5, 2011
Project: 49030011.08
c: Lake Restoration Inc. (Kevin Kretsch)

In mid-July, I received an email from Commissioner Tony Curella voicing concerns that dense vegetation in the vicinity of his Norwegian Bay residence prevented navigation (boating). I indicated that I would respond to this concern when the 2011 plant survey data became available in early August. The purpose of this memorandum is to answer Tony's question of whether or not the whole bay herbicide treatment this spring reduced Eurasian watermilfoil (EWM) in Norwegian Bay and to discuss the types of vegetation growing in the vicinity of Tony's residence. The memorandum begins with a historical look at EWM changes in Norwegian Bay during 2008 through 2011 and then discusses the vegetation species currently growing on the West side of Norwegian Bay adjacent to Tony's residence. The herbicide treatment program completed by the Beaver Dam Lake Management District in the spring of 2011 was exclusively for the control of EWM and native vegetation was not impacted by the treatment. The discussion in this memorandum verifies the effectiveness of the herbicide treatment to control EWM in Norwegian Bay and verifies that native species were not impacted by the treatment and, hence, are thriving and growing densely in the vicinity of Tony's residence.

1.0 2008-2011 Herbicide Treatment Results from Norwegian Bay

As shown in Figure 1, Eurasian watermilfoil in Norwegian Bay has declined substantially during the 2008 through 2011 period. In 2008, EWM was found in 48 percent of sample points up to the 20 foot depth. In 2009, EWM frequency increased to 79 percent of sample points up to the 20 foot depth. Since 2009, EWM has steadily declined. EWM frequency was 34 percent in the summer of 2010. A fall treatment in 2010 further reduced EWM frequency to 28 percent. A whole bay treatment in the spring of 2011 reduced the frequency to 12 percent in July of 2011. Hence, the 2011 treatment was effective.

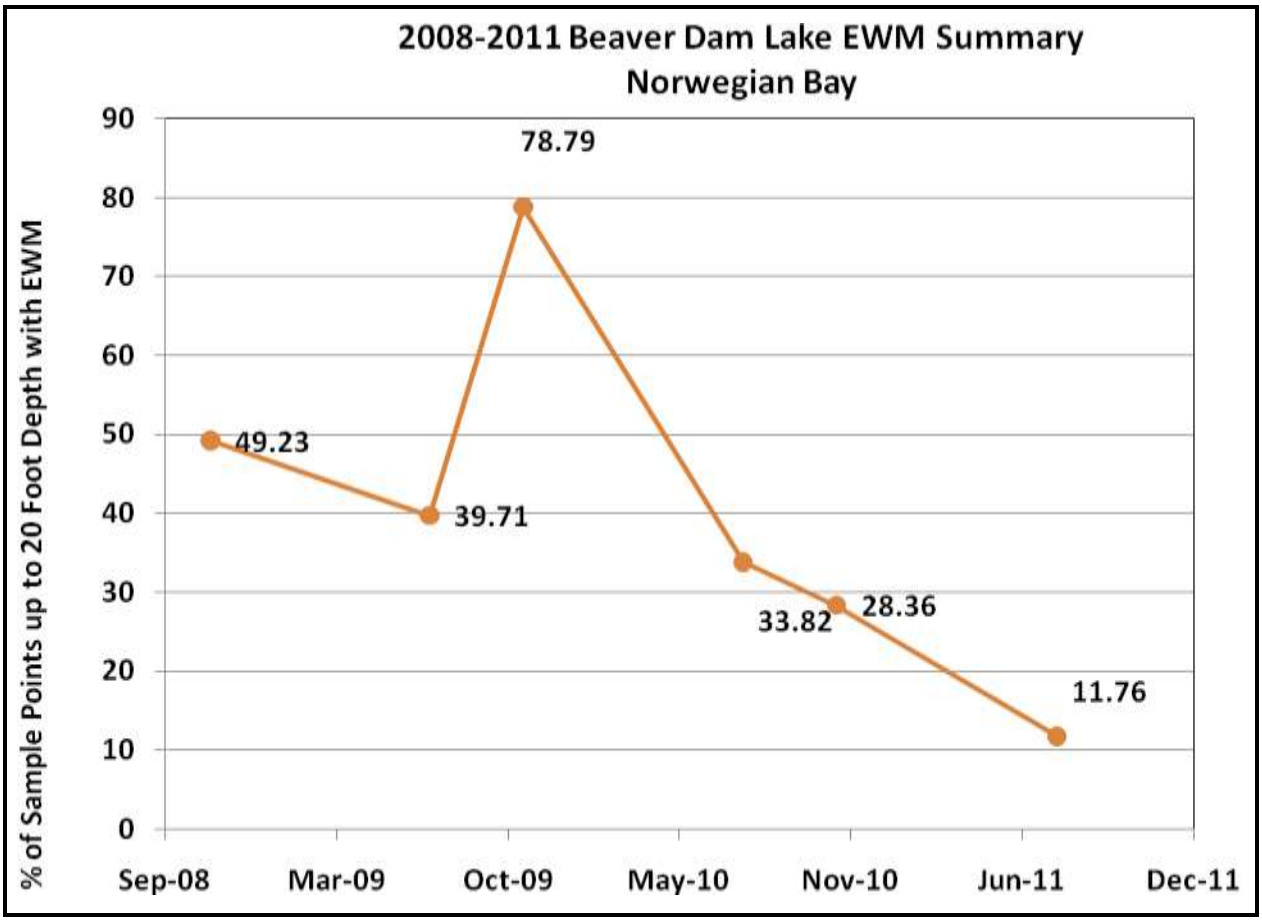

Figure 1 2008-2011 Beaver Dam Lake EWM Summary: Norwegian Bay

2.0 Native Vegetation near Tony Curella's Residence

Norwegian Bay is shallow and the bay's sediments are rich in nutrients. This combination results in a dense growth of vegetation throughout the bay. EWM frequency in the bay has been reduced by herbicide treatment, but native vegetation has taken over the areas formerly occupied by EWM. This exchange has maintained a dense vegetative growth in Norwegian Bay. The current vegetation community in Norwegian Bay consists of 22 native species and two non-native species (EWM and curlyleaf pondweed). Neither non-native species grows very densely in the bay. The densest growth for each of the species is a 2 on a scale of 1 through 3. However, several native species grow very densely in the bay. A total of 14 native species were observed within 300 feet of Tony Curella's residence. The

dense growth of these native species in the vicinity of Tony's residence interferes with recreational use, including boating. To understand the dense vegetation growth in the vicinity of Tony Curella's residence, I looked at the vegetation species collected from sample points within 100 feet of the residence, within 200 feet of the residence, and within 300 feet of the residence (Figure 2). None of the sample points within 300 feet of Tony's residence contained EWM in July of 2011. However, an abundant growth of native vegetation was observed throughout this area.

2.1 Sample Point Within 100 Feet of Tony Currella's Residence

One sample point, 1065, (Figure 2) was located within 100 feet of Tony's residence and a very dense growth of native species was observed at this sample point. The overall plant density at sample point 1065 was 3 on a scale of 1 to 3 with 3 being the maximum density rating. The most densely growing native species at sample point 1065 were common bladderwort and broad-leaved cattail, both noting a density of 3 or maximum density on the rating scale. Five additional native species were also found at this sample point – creeping bladderwort, water shield, small duckweed, large duckweed, and white water lily. EWM was not found at sample point 1065, only native species.

2.2 Sample Points within 200 Feet of Tony Curella's Residence

Two sample points were located within 100 to 200 feet of Tony's residence, 1079 and 1080 (Figure 2). EWM was not found at either sample point, but a total of 7 native species were found at each sample point. The non-native species curlyleaf pondweed was not collected on the rake at either sample point, but was visually observed at sample point 1080. The overall plant density at sample point 1080 was 3 or maximum density and the overall plant density at sample point 1079 was 2 on a scale of 1 to 3. Native species observed at sample point 1079 were watershield, Canada waterweed, water stargrass, Nitella, white waterlily, creeping bladderwort, and common bladderwort. Native species observed at sample point 1080 were Canada waterweed, water stargrass, slender naiad, white waterlily, small pondweed, creeping bladderwort, and small bladderwort.

2.3 Sample Points within 300 Feet of Tony Curella's Residence

Four sample points were located within 200 to 300 feet of Tony's residence, 1078, 1081, 1095, and 1096 (Figure 2). None of these sample points contained EWM in July of 2011. However, three of the four sample points noted an extremely dense growth of native vegetation.

The overall plant density at sample point 1078 (Figure 2) was 3 or maximum density. The most densely growing species was Canada waterweed that noted a density of 3 or maximum density. Five additional native species were observed at this location – watershield, water stargrass, white waterlily, white stem pondweed, and creeping bladderwort.

The overall plant density at sample point 1081 (Figure 2) was 3 or maximum density. The most densely growing species were swamp loosestrife and common bladderwort, both noted a density of 3 or maximum density. Six additional native species were observed at this location – Canada waterweed, small duckweed, white waterlily, large duckweed, creeping bladderwort, and small bladderwort.

The overall plant density at sample point 1095 (Figure 2) was 2 or medium density. Two native species were observed at this location – Canada waterweed with a density of 2 and nitella with a density of 1.

The overall plant density at sample point 1096 (Figure 2) was 3 or maximum density. The most densely growing species was Canada waterweed that noted a density of 3 or maximum density. Two additional native species were observed at this location – water stargrass and nitella.

3.0 Recommendations

WDNR will not allow the removal of native vegetation in lakes except to provide navigation when documentation of impaired navigation has been submitted to WDNR. The following excerpt from "Aquatic Plant Management Strategy: Northern Region WDNR, Summer 2007" provides current WDNR policy regarding the documentation that must be submitted to WDNR to obtain permission to remove native plants to attain a navigation channel through a plant infested area such as the area adjacent to Tony's residence:

From "Aquatic Plant Management Strategy: Northern Region WDNR, Summer 2007"

DOCUMENTATION OF IMPAIRED NAVIGATION AND/OR NUISANCE CONDITIONS
Navigation channels can be of two types:

- Common use navigation channel. This is a common navigation route for the general lake user. It often is off shore and connects areas that boaters commonly would navigate to or across, and should be of public benefit.

- Individual riparian access lane. This is an access lane to shore that normally is used by an individual riparian shore owner.

Severe impairment or nuisance will generally mean vegetation grows thickly and forms mats on the water surface. Before issuance of a permit to use a regulated control method, a riparian will be asked to document the problem and show what efforts or adaptations have been made to use the site. (This is currently required in NR 107 and on the application form, but the following helps provide a specific description of what impairments exist from native plants).

Documentation of *impairment of navigation* by native plants must include:
a. Specific locations of navigation routes (preferably with GPS coordinates)
b. Specific dimensions in length, width, and depth
c. Specific times when plants cause the problem and how long the problem persists
d. Adaptations or alternatives that have been considered by the lake shore user to avoid or lessen the problem
e. The species of plant or plants creating the nuisance (documented with samples or a from a Site inspection)

Documentation of the *nuisance* must include:
a. Specific periods of time when plants cause the problem, e.g. when does the problem start and when does it go away.
b. Photos of the nuisance are encouraged to help show what uses are limited and to show the severity of the problem.
c. Examples of specific activities that would normally be done where native plants occur naturally on a site but cannot occur because native plants have become a nuisance.

Based upon this policy, my recommendation is to submit documentation of the current navigation problem to WDNR staff (Mark Sundeen) and request permission to treat a navigation channel from Tony's residence through the vegetated area. Lake Restoration could then work with Tony to treat a navigation channel so that Tony could get his boat out and attain boating use of the lake.

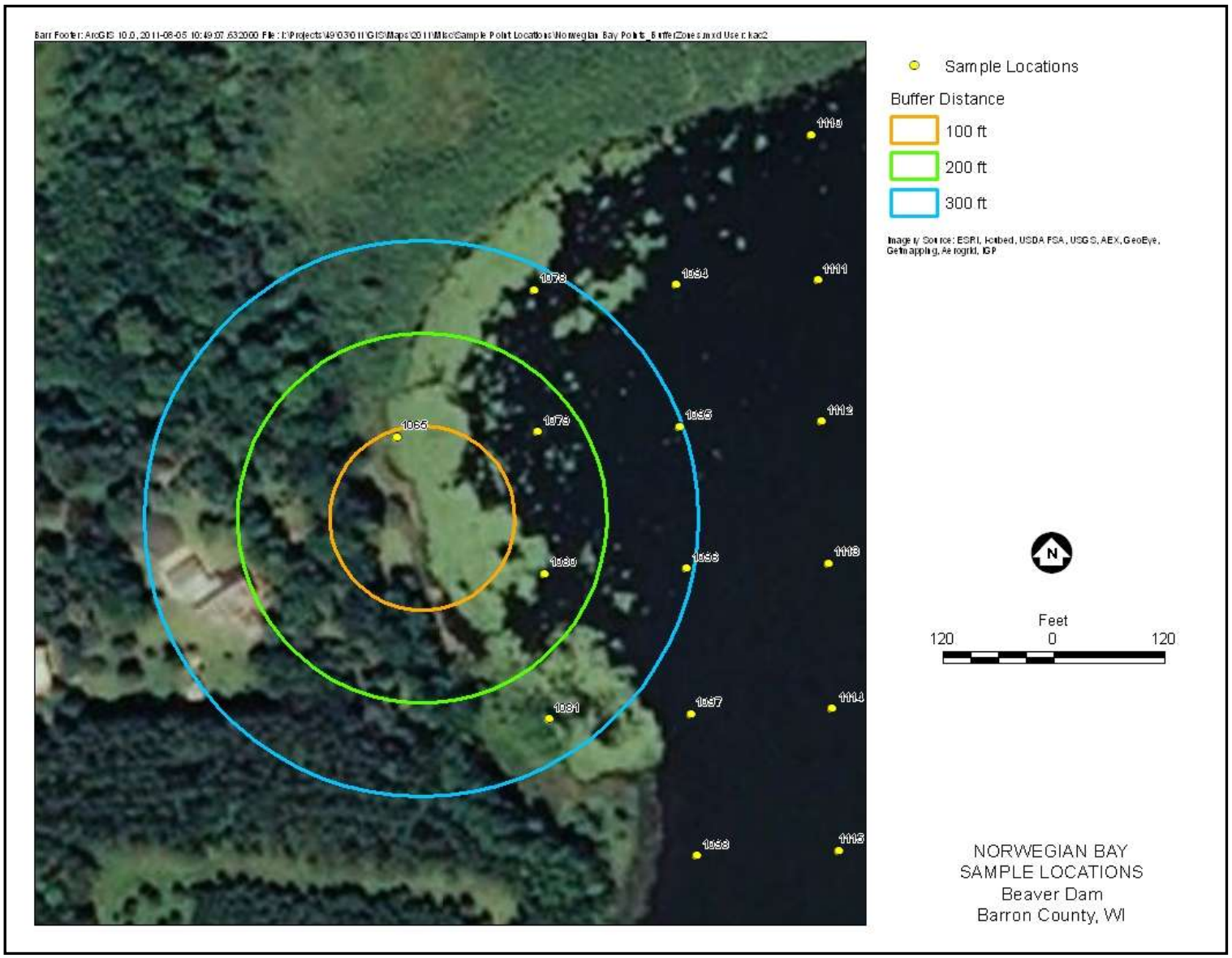

Figure 2. Norwegian Bay Sample Locations Adjacent to Tony Currella's Residence

Table 1. Pictures of Native Species Observed within 300 Feet of Tony Curella's Residence

Scientific Name	Common Name	Picture
Brasenia schreberi	**watershield**	
Decodon verticillatus	**swamp loosestrife**	
Elodea Canadensis	**Canada waterweed**	

Heteranthera dubia	**water stargrass**	
Lemna minor	**small duckweed**	
Najas flexilis	**slender naiad**	
Nitella sp.	**Nitella**	

Nymphaea odorata	**white waterlily**	
Potamogeton praelongus	**white stem pondweed**	
Spirodela polyrhiza	**large duckweed**	
Typha latifolia	**broad-leaved cattail**	

Utricularia gibba	**creeping bladderwort**	
Utricularia minor	**small bladderwort**	
Utricularia vulgaris	**common bladderwort**