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July 21, 2010

Meadowbrook Condominium Association
c/o Mr. Scott Locke
7868 Ashbrook Drive
Haslett, MI 48840-8854

Re: Wetland Site Assessment and Recommendations
(JFNew Project # 1005009.00)

Dear Scott:

Per your recent email I have inserted the additional information and put it into a more formal report format. The report includes an introduction, our professional opinions and summarizes our meeting, discussions, and recommendations for potential improvements for each section of the wetland/detention basin complex.

Last week I also spoke with John Morrison, Deputy to the Clinton County Drain Commissioner, about your wetland complex/detention basins and our recommendations to have one or more of the discharges and/or the road catch basins cleaned out. He looks forward to hearing from you and seeing our report.

I trust this information will be useful to your association and should you wish to discuss any of the aforementioned items in further detail, please don't hesitate to contact me.

Sincerely,

Stuart Kogge
Vice President, Technical Services
Sr. Wetland/Aquatic Biologist

Attachment: Wetland Complex Assessment Report, inclusive of representative photographs

Meadowbrook Condominium Association Wetland Complex Assessment Report

Prepared For:

Meadowbrook Condominium Association

Prepared by:



11181 Marwill Avenue
West Olive, Michigan 49460
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July 21, 2010

JFNew Project File No. 1005009.00

Introduction

On May 5, 2010 Mr. Stu Kogge of JFNew met with several people from the Meadowbrook Condominium Association to assess and discuss the wetland complex that is part of the association property. The wetland complex is relatively shallow in water depth (less than 4 feet deep) and contains a mixture of open water, floating leaved, submergent, emergent, scrub shrub and forested wetlands. It is a diverse system but one in which reed canary grass (*Phalaris arundinacea*) is quickly becoming a dominant non-native invasive plant species around much of its borders.

JFNew opines that the wetland complex is currently of great aesthetic and wildlife value, to both terrestrial and aquatic life. Overtime this wetland complex will continue to get shallower from the build up of organic matter from plant decomposition. In the proceeding sections JFNew provides some recommendations for addressing this build up of organics, control of invasive plant species, such as reed canary grass and common reed grass (*Phragmites australis*), means of reducing sediment and pollutants from entering the wetland complex and providing some alternatives for possibly setting back or delaying the inevitable succession and eutrophication of the wetland complex.

Recommendations and discussions are covered for each geographic area of the wetland complex in a bulleted format for ease of reading and capturing the main points of discussion.

Southern portion of wetland complex

- Mostly submergent and scrub shrub wetland
- Shallow water wetland complex less than 4 feet deep
- Most properties maintaining a vegetative buffer between mowed lawns and wetland complex
- Vegetation within this portion of the wetland complex dominated by:
 - Water milfoil (*Myriophyllum sibiricum*), touch-me-not/jewelweed (*Impatiens capensis*), duckweed (*Lemna minor*), and reed canary grass. The latter two species are the dominant species in this wetland complex.
 - ➔ Recommend NOT using dyes (e.g. Aquashade) or herbicides such as 2,4-D or copper sulfate to reduce light penetration and/or to prevent the growth of duckweed. This is a native plant species that provides valuable food and attachment sites for other aquatic organisms that waterfowl and other animals/wildlife feed on.
 - ➔ If duckweed growth becomes excessive and aesthetics becomes a driving force, then here are two options that should be attempted on a small area of the wetland complex

on a test/pilot basis before implementing throughout the wetland:

- Aeration – use of bottom substrate bubblers to aerate the water column. This will result in (1) increased microbial activity in the bottom substrates and some level of breakdown and (2) ripples within the water surface that will move floating duckweed to the sides of the aeration areas. A list of aeration companies you may want to contact are provided in Appendix B.
- Dredging – use of mechanical equipment (e.g. backhoe) or hydraulic dredging equipment to remove bottom substrates and deepen a given area. This will promote vertical mixing of the water column and result in movement of duckweed to the outer edges of the deeper, open water area. This alternative would require a permit from the Michigan Department of Natural Resources and Environment (MDNRE) Land and Water Management Division (LWMD) pursuant to Part 303, Wetland Protection, of the Natural Resources and Environmental Protection Act (NREPA), P.A. 451 of 1994, as amended.
- ➔ Recommend treating small reaches of the shoreline dominated by reed canary grass with an aquatic-approved herbicide containing the active ingredients of glyphosate (a.k.a. RODEO) or imazapyr followed by a planting with native vegetation. Native plant species that should compete well against reed canary grass and provide a good diversity of color and wildlife habitat include:
 - Cardinal flower (*Lobelia cardinalis*)
 - Duck potato/Arrowhead (*Sagittaria latifolia*)
 - Pickerelweed (*Pontederia virginica*)
 - Blue-flag iris (*Iris virginica*)
 - Bur-reed (*Sparganium eurycarpum*)
 - New England aster (*Symphyotrichum novae-angliae*)
- There are two stormwater discharges into the southern portion of this wetland complex. The southernmost outfall (between Lots 16 & 17) shows signs of previous discharge of sediment (Photograph No. 1 of

Appendix A)¹. A small channel going north into the wetland complex divides the sediment load. Reed canary grass has colonized this sediment load.

- ➔ Recommend removal of this sediment load through the use of either hand shovels or a back-hoe. This activity may be able to be conducted under the auspices of the Clinton County Drain Commissioner's office as part of their maintenance activities of this alleged designated drain/detention basin. If this activity is not able to be completed as part of County drain maintenance, a permit from the MDNRE LWMD will be required prior to initiating any ground disturbing activities.
- The northernmost outfall (south of Lot 8) appears to be blocked with leaves and only a minimal amount of sediment or loading into the wetland complex was evident from this discharge/outfall (Photograph No. 2).
 - ➔ Recommend removal of leaves and other debris apparently blocking this discharge/outfall to the wetland complex.
- The overflow outlet pipe for this wetland complex is located just north of Lot 14 (Photograph No. 3). The outlet was not obstructed and appeared to be passing a small amount of water.
 - ➔ No recommendations for this outfall

Northern and northwestern portion of wetland complex (Photograph No. 4)

- mostly open water, submergent, emergent, and forested wetland
- Apparent deeper portions of the wetland complex - approx. 6 feet deep
- Most properties maintaining a vegetative buffer between mowed lawns and wetland complex
- Vegetation within this portion of the wetland complex dominated by:
 - Duckweed
 - Yellow pond lily (*Nuphar variegata*)
 - Fragrant white water lily (*Nymphaea odorata*)
 - Water milfoil
 - Reed canary grass
 - Touch-me-not/Jewelweed
 - Silver maple (*Acer saccharinum*) in forested wetland areas
- There are three storm water discharges into the northern portion of the wetland complex. The first one is located in the northern to northeastern

¹ All photographs are located in Appendix A
JFNew Project# 1005009.00

end between Lots 126 and 127 (Photograph No. 5). Efforts have apparently been made to control erosion and stabilize the outfall and discharge into the wetland complex.

- ➔ Recommend removing by hand and/or treating reed canary grass with an aquatic-approved herbicide to prevent its inevitable spread into other areas of the wetland complex.
- The second and largest discharge is at the far northwestern end of the wetland complex, is over 6 feet in diameter, and located between Lots 137 and 138 (Photographs No. 6, 7 and 8). This outfall allegedly transports water from Business I-69 and Marsh Road (vicinity of Speedway and McDonalds). Based on the type of debris visible in the waters and wetlands immediately east of this outfall, this source of storm water appears likely. No plantings are recommended here due to heavy tree canopy.
- The third discharge is located between Lots 51 and 52 and showed signs of recent discharge of sediment into the wetland complex (Photograph No. 9).
 - ➔ Recommend removing sediment from the end of the discharge pipe with a hand shovel and disposing of/stabilizing sediment in an upland area.
 - ➔ Recommend requesting assistance from the developer of the subdivision and/or the Clinton County Drain Commissioner to have ALL of the storm water catch basins around the wetland complex cleaned out. As we discussed, the Ingham County Drain Commissioner has equipment that can clean out these basins, and they may be interested in assisting Clinton County since this wetland complex discharges to the south into Ingham County. This drainage/detention basin system may also be part of an inter-county drain (between Ingham and Clinton) and if so, I would expect Ingham County would be interested in helping to reduce sediment loading and improving water quality.

Upland portions around old pump house

- Common reed grass (*Phragmites australis*) is becoming established on northeast end of the old burned down pump house
 - ➔ Recommend treating shoots/stems of common reed grass with an aquatic-approved herbicide such as glyphosate or imazapyr - similar to what is recommended for controlling reed canary grass

Equalization culvert

- There is an equalization culvert located north of Lots 29 and 30 that appears to convey water during high water periods between the northern and southern portions of the wetland complex (Photographs No. 10 and 11). This culvert appears to be blocked at its northern end where it is well vegetated in comparison to its southern end which appears unblocked and showing signs of standing water and wetland vegetation to the south.
 - ➔ Recommend cleaning out culvert

APPENDIX A

Representative Photographs



Photograph No. 1 - View south at storm water outfall located between Lots 16 and 17



Photograph No. 2 - View east at stormwater outfall located south of Lot 8
(Note: blockage within outfall and heavy growth of vegetation at discharge point)



Photograph No. 3 - View east at outfall located north of Lot 14



Photograph No. 4 - View west at northwestern open water portion of wetland complex



Photograph No. 5 - View northwest at storm water outfall located between
Lots 126 and 127



Photograph No. 6 - View west at storm water outfall located between Lots 137 and 138



Photograph No. 7 - View southwest at storm water outfall located between

Lots 137 and 138



Photograph No. 8 - View east from storm water outfall located between
Lots 137 and 138



Photograph No. 9 - View south at storm water outfall located between Lots 51 and 52



Photograph No. 10 - View northwest at south end of equalization culvert located north of Lots 29 and 30



Photograph No. 11 - View southeast at north end of equalization culvert located north of Lots 29 and 30

APPENDIX B

Aeration Contractors

Aquatic Control
P.O. Box 100
Seymour, IN 47274
(812) 497-2410 or (800) 753-LAKE
Email: sales@aquaticcontrol.com
contact person: Nathan Long

Lake-Savers LLC
c/o John Tucci
(269) 383-3400
Email: jtucci@lake-savers.com
contact person: John Tucci

Tri-County Aquatics, Inc.
P.O. Box 173
Washington, MI 48094
(586) 786-6234 telephone
(586) 207-1520 fax
Email: tricityaquatics@gmail.com
contact person: Nick Salvatore