INFORMATIONAL REQUIREMENTS FOR AN ENVIRONMENTAL ANALYSIS

Applicant: Village of Germantown

Address: N112 W17001 Mequon Road, Germantown, WI 53022-0337

Title of Proposal: Lake Park Ponds Rehabilitation

Location: SW ¼, Section 22, Township 9 North, Range 20 East

PROJECT SUMMARY

1. General Description (brief overview):

The Village of Germantown proposes to rehabilitate the Lake Park Ponds, just north of Mequon Road in downtown Germantown. The development has a series of three constructed ponds flowing east to west with the last pond emptying into the Menomonee River. There are also two additional ponds located downstream in the Lake Park Golf Course. The rehabilitation of the three ponds in the development includes the dredging of 76,200 cubic yards from the East and West Ponds, regrading, native plantings and seeding to stabilize 11,500 linear feet of shoreline, and the planting of aquatic rootstock in the Extended East Pond. The rehabilitation will also include the construction of forebays at the inlet of the West and East Ponds to reduce and restrict future sedimentation throughout the ponds.

2. Purpose and Need (include history and background as appropriate):

The Lake Park Ponds were constructed between 1971 and 1974, according to aerial photographs. The pond complex is approximately 18 acres in size and has an average depth of 3-6 feet. Original construction depths of the ponds were 15-20 feet. Due to delays in construction in the 1970's, significant amounts of sediment eroded off of bare construction sites and deposited in the ponds, reducing the depths of the ponds. Problems with excessive aquatic plant and algal growth started soon after pond construction due to sedimentation and nutrient loading. These loadings have several sources in the watershed including construction site erosion, shoreline erosion, lawn fertilizers and goose guano. The proposed plan calls for a reduction in the watershed sources of nutrients, most notably by enforcing construction site erosion controls, limiting the use of lawn fertilizers and herbicides, and stabilization of the ponds' shorelines. The creation of buffer strips of heavier vegetation along the shoreline will also greatly aid in the reduction of nutrient loading into the ponds. The plan also calls for underwater rip rap check dams around the inlets of the East Extended and East Ponds for trapping sediment. In addition, dredging of the deep, soft sediment in the ponds will be done to eliminate a nutrient source, reduce winterkill and reduce the growth of rooted aquatic plants. In September 1999, Moraine Environmental took seven sediment samples throughout the pond complex to determine if

any contaminants exceeded WDNR NR 347 action levels. The results were that only the Extended East Pond's sediment exceeded NR 347 action levels, and thus only aquatic rootstock will be planted in the Extended East Pond.

The original purpose of these ponds was to provide drainage, an aesthetic benefit, and fill for the surrounding construction sites. The Ponds have now become the primary retention basin for the entire Lake Park watershed. The ponds were not designed for this purpose, but it is in the Village's best interest to improve these ponds to better serve the community for this need. Currently the ponds do not do an acceptable job of stormwater retention as was proven during the storms of 1996 when several basements of surrounding homes were flooded. In addition, the water quality of the ponds has become an increasing concern because of sediment accumulation and excessive aquatic plant growth. Other problems include winter fish kills, bank slumping, and erosion problems.

3. Authorities and Approvals (list local, state and federal permits and approvals required):

The permit required for this project is the WDNR Chapter 30 and the Village approval.

4. Estimated Cost and Funding Source:

The estimated cost for the project is $1,052,675.00 for site preparation and land construction.

PROPOSED PHYSICAL CHANGES (Describe the proposal in greater detail)

5. Manipulation of Terrestrial Resources (include relevant quantities - sq. ft., cu. yds., etc.):

The Village would like to begin construction of the project as soon as possible, likely January or June 2001.

The topsoil in the bank grading area will be stripped and regraded at 3:1 slopes, per the typical cross section, Sheet 6 of 6 of the plan set. The slopes, grading limits and grading tie-in points will have to be adjusted at different locations around the ponds in order to accommodate the preservation of trees, other vegetation and buildings. Three inches of topsoil will be placed back on the pond banks after grading is complete.

There is an existing gravel path that encircles the ponds that will not be disturbed. The typical cross-sections will be adjusted to avoid contact with this path. The three foot bridges connecting the two islands to the mainland in the west pond will not be disturbed. The grade will be set so as to not cut back the banks in their vicinity.

All earth slopes will be constructed to gradually merge with adjacent terrain, existing landscape features, and standing trees.

The wetland plantings around the pond and the pond buffer would include plants and seeds that are adapted to clay soils. This vegetation will stabilize the soils to help prevent and reduce shoreline erosion. A combination of live plantings along the water's edge and seeding in all areas where grading occurs will accomplish this purpose. The buffer seed mix will be composed of Big bluestem, Redtop grass, Switchgrass, Virginia wild rye, Purple prairie clover, Purple coneflower, Blue vervain, Sneezeweed, Blackeyed Susan, and Annual rye.

6. Manipulation of Aquatic Resources (include relevant quantities, cfs., acre feet, MGD, etc.):

Activities include pond dredging, creation of sediment forebays, placement of underwater rip rap check dams, and placement of navigational buoys.

The dredging and bank grading activities will generate approximately 76,200 cubic yards of sediment. The banks will be graded to approximately 5:1 slopes with a 10:1 ten-foot safety-planting shelf. All excess material will be the Contractor's responsibility to haul offsite.

Dredging will be an average of four feet throughout the West Pond and the East Pond and two deep holes will be created (one in each pond). The hole in the West Pond is located on the eastern end of the pond and the hole in the East Pond is located just to the west of the island. Both holes will be approximately 8 feet deep and 100-120 feet wide. These holes will serve in the reduction of winterkill and growth of aquatic plants. In addition, the removal of the excess sediment in these areas will aid in the reduction of the sediment nutrient source.

A combination of hydraulic and mechanical dredging is proposed for this project. The proposed dredging process consists of beginning by bypassing the flow from the East Extended Pond to the West Pond and pumping down the East Pond. The West Pond will then be hydraulically pumped to the East Pond. Material placement will be from east to west to allow for natural drainage and drying of the material. Once all the material from the West Pond is removed, mechanical dredging of the East Pond will be done. All the while, bypass of flow from the East Pond is required. Any change in this process by the contractor would have to be approved by the WDNR.

There will be two sediment forebays constructed; one in the East Pond and one in the West Pond. The flow will be westerly for each forebay. The East forebay is triangular in shape, approximately 396 cubic yards and approximately 5 feet deep. The West forebay is also triangular in shape, approximately 320 cubic yards and 6 feet deep. These forebays will serve as sediment traps by allowing the sediment to settle out in this area. In order to remain functional, these forebays will have to be cleaned out approximately every 7 years or when 3 feet of sediment has accumulated, whichever comes first.

Rip rap for the rip rap check dams will be 12-24 inches in diameter underlain with filter fabric. The check dams will be placed on solid hard pack clay.

DNR approved navigational buoys will be installed on the rock rip rap check dams as specified in the DNR permit.

The Extended East Pond sediment exceeds NR 347 action limits and therefore the dredge material cannot be land spread. The results are shown in the table below:

SEDIMENT QUALITY RESULTS								
Sample I.D.	#1	#2	#3	#4	#5	#6	#7	Action Levels (NR 347)
Collection Date	9/23/99	9/23/99	9/23/99	9/23/99	9/23/99	9/24/99	9/24/99	
Metals, Total (mg/kg)								
Arsenic	4.9_Q	2.9_Q	1.5_Q	<1.4	$<1.1_Q$	1.5_Q	<1.1	10
Barium	140	83	26	48	16	52	23	500
Cadmium	0.88	0.22_Q	<0.064	0.12_Q	<0.056	0.072_Q	0.078_Q	1.0
Chromium	21	12	2.6	8.5	4.4	9.6	4.1	100
Copper	50	40	19	47	23	23	23	100
Lead	81	23	5.8	8.1	2.8	7.4	4.4	50
Mercury	0.35	0.075	0.021_Q	0.05	0.023_Q	0.03	0.01472_Q	0.1
Nickel	23	15	7.0	9.1	7.0	13	5.5	100
Selenium	<1.8	<1.4	<1.1	<1.3	<0.96	<1.1	<1.0	1.0
Silver	<0.13	<0.098	<0.079	<0.093	<0.07	<0.078	<0.074	0.25
Zinc	140	48	19	29	19	29	21	100
Other								
Oil and Grease (mg/kg)	3,300	<610	<500	<580	<440	<490	<460	1,000

Notes:
mg/kg = Milligrams per kilogram = parts per million (ppm)
ug/kg = micrograms per kilogram = [arts per billion (ppb)
Q = detected between LOD (Level of Detection) and LOQ (Level of Quantification)

Aquatic rootstock is to be planted in the Extended East Pond to aid in the filtering of nutrients. The rootstock plantings will be composed of Water arum, Arrowhead, Blue flag iris, Yellow water buttercup, Floating leaf pondweed, Water shield, American lotus, Pickerelweed, River bulrush, Yellow water lily, White water lily and Lake sedge.

7. Buildings, Treatment Units, Roads and Other Structures (include size of facilities, road miles, etc.):

None.

8. Emissions and Discharges (include relevant characteristics and quantities):

During construction, water elevation will be controlled to limit outflows. This will be accomplished by using Best Management Practices dewatering methods.

Staging has been designed such that water and materials are being pumped and hydraulically dredged upstream and then mechanically dredged. Any suspended sediments and sediment discharge will be caught in the downstream forebays.

The amount of sediment discharged will be less than the amount allowed by the WDNR under the WDNR WPDES permit that has been applied for this project.

9. Other Changes:

None.

10. Identify the maps, plans, and other descriptive material attached:

Attachment	A	County map showing the general area of the project
Attachment	B	USGS topographic map
Attachment	C	Wisconsin Wetland Inventory Map
Attachment	D	Construction Documents

AFFECTED ENVIRONMENT

Describe existing features that may be affected by the proposal. Indicate the basis of this information. For example, if you use published reports, articles or personal correspondence, specify major sources and include a list of references. If any information is based on field analysis or past experience with the site, include a list of the persons involved, the activity and the dates.

11. Biological

a. Describe the dominant aquatic and terrestrial plant and animal species and habitats:

Typical aquatic plants in these ponds are coontail, elodea, curly leafed pondweed, and filamentous algae, which floats on the water surface. Herbicides have been used to control aquatic plant growth almost yearly over the past 20 years.

The ponds have a productive warm water fishery, with an abundant but stunted bluegill population and large mouth bass. There has been stocking of bass in the ponds. Several fish kills have occurred during the winter, but its direct cause is unknown.

The ponds provide good wildlife habitat in the areas of natural vegetation where the lawns do not go right down to the water's edge. There are numerous frogs, clams, crayfish and birds such as Green Herons and Belted Kingfishers. Wetland vegetation includes Arrowhead, Blue Flag Iris, sedges and bulrushes. The ponds have also become a popular rest stop for migrating Canada Geese, with approximately 500-600 stopping in the fall. In addition, there is a gaggle of urbanized geese that stay year round.

The two pictures below are typical of the shoreline of the pond bank areas that are eroding. These banks will be cut back, regraded and revegetated with a native buffer. The existing vegetation is primarily mowed lawn with scattered trees. These pictures also show the obvious overgrowth of aquatic vegetation in the ponds.


West Pond


West Pond

The picture below shows the shoreline typical of areas that will not be disturbed. These areas are wooded and have extensive forest vegetation along the shore.

West shore of the East Pond

b. List recorded or probable Federal and/or State listed threatened and/or endangered species and describe their habitats:

There were no Federal or State threatened or endangered species observed during field investigations performed by Brian Lennie, Environmental Scientist with Bonestroo, Rosene, Anderlik & Associates. In addition, an informational request was submitted to the Bureau of Endangered Resources' Wisconsin Natural Heritage Inventory on May 4, 2000. Cathy A. Bleser, WDNR Planning & Protection Specialist, responded to this request in a letter dated June 27, 2000 indicating that NHI data files contain no occurrence of Endangered, Threatened, or Special Concern Species, natural communities, or State Natural Areas that would be impacted by the project, nor for the actual project area. Ms. Bleser also indicated that she did not believe that further surveys of the area were warranted.

c. Describe wetland location, size, type, hydraulic value and hydroperiod:

There are no wetlands mapped on the site on the Wisconsin Wetlands Inventory Map. There are wetlands mapped both upstream and downstream of the project area. The downstream wetland is classified as a riparian forested wetland. This wetland has the potential to be impacted by this project, however measures have been taken in both the erosion control plan and the staging plan to reduce or eliminate the negative impacts that may be associated with this type of project. The upstream wetlands will not be impacted by this project.

12. Cultural

a. Land use (include dominant features and uses including zoning):

The five Lake Park Ponds were constructed in the early 1970s. Three of the ponds were built within the Lake Park multi-family residential development, which is located in the central portion of the Village. The remaining two ponds are located just west of the subdivision in the Lake Park Golf Course. The ponds were dug in what was the original location of the stream drainage for the area. The original purpose of these ponds was to provide drainage, an aesthetic benefit, and fill for the surrounding construction sites. The Ponds have now become the primary retention basin for the entire Lake Park watershed. The continued use of these ponds as stormwater retention facilities is in the best interest of the Village.

b. Social/Economic (include any ethnic and cultural groups):

The Village and Town of Germantown will see its population grow from 12,000 in 1985 to 27,500 in the year 2010-a 129.2% increase. With this added urban growth there will be an increase in the volume of surface water runoff quantity and pollutants. The Lake Park Subwatershed is a 525-acre drainage area (approximately 1 square mile). This area contains most of the urban development in the Village of Germantown.

The plan provides for improved aesthetics of the Lake Park Ponds in addition to increasing stormwater retention capacity. The basin acts as a filter for removing sediment and chemicals from the water before it reaches the Menomonee River. If the Ponds continue to fill up, this retention basin is gone and another basin must be created to replace it as the Village and the WDNR require that plans be made for handling stormwater runoff for any water reaching the Menomonee River. Replacement of this basin is a more costly option than maintenance of the existing basin. Given that the ponds have become the primary retention basis for this watershed, the continued use of the ponds for this purpose, combined with routine pond maintenance, is the best economic alternative.

c. Archaeological/Historical:

An informational request has been submitted to the Division of Historic Preservation, Wisconsin State Historical Society. A response is forthcoming.

13. Other Special Resources (e.g. State Natural Areas, prime agricultural lands):

None.

ENVIRONMENTAL CONSEQUENCES (Probable adverse and beneficial impacts including primary, indirect and secondary impacts)

14. Physical

a. Soils and Topography:

Soils and topography will be temporarily adversely affected by the project. During construction, excavation of the ponds as well as grading activities will expose large areas of soil.

The Dredge/Bank Grading Plan is detailed on Sheet 3 of 6 and the Erosion Control Plan is detailed on Sheet 5 of 6 of the plan set. These plans include the staging of the work and the erosion control measures to be used. The pond dredging is staged into two segments. Soil staging is designed so that minimal bank area will be exposed at one time.

Erosion controls to be used include erosion mat, hay bales, bio-logs at the toe of the bank slope, silt fence at the top of the bank (at the edge of the disturbed limits), tracking pads, and rip rap at footbridge locations. The distance between the bio-logs at the toe of the slope and the silt fence at the edge of the disturbed limits is to be 10-12 feet or less.

Sediment control measures will be in working order at the end of each working day and will be inspected after significant rainfalls. Any damage to these structures will be repaired immediately.

b. Groundwater:

There will be no adverse effects to the groundwater on the site. The dredging activities and the construction of the deep holes will not intercept groundwater flows as the proposed depths are all less than the original construction depths of the ponds.

c. Surface Water:

The surface water will be positively impacted by the project. The possible negative impact of increased erosion potential would be temporary and limited by the implementation of construction site as well as permanent erosion control measures.

The ponds will be vegetated along the shoreline with a native seed mix and planted with rootstock in the submergent aquatic zone. Additionally, permanent bio-logs will be installed at the time of construction at the toe of the bank slope all

the way around the three ponds. These measures will increase the ponds value and function in addition to providing a buffer and filter strip for runoff.

The construction of the fore bays is designed to restrict and reduce future sedimentation into the ponds. These forebays allow for a concentrated area for sediment to settle out. The forebays then need to be cleaned out every 5-10 years in order to remain functional.

d. Air and Traffic:

Air and traffic will be temporarily adversely affected due to the use of construction equipment. During the construction period, equipment will be used that will increase air pollution and local traffic. These impacts are expected to last approximately 6 months. The people most affected will be those living in the adjacent condominiums. These residents are aware and in support of this project as they are contributing cost-sharing dollars with the Village.

Upon construction completion, these impacts will cease.

e. Noise Impacts:

Noise impacts will be temporarily adversely affected due to the use of large construction equipment. This impact is expected to last approximately 6 months. Those residents most affected will be those living in the adjacent condominium units.

These noise impacts will cease upon project completion.

f. Aesthetic Impacts:

Aesthetics will be adversely impacted during construction, but will be beneficially impacted in the long run. The native seeding of the shoreline, planting of the submergent zone, and reduced sedimentation into the ponds will be long-term beneficial aesthetic impacts of the project.

15. Biological

a. Woodland Impacts:

None. (No woodlands to impact)

b. Wetland Impacts:

There are no wetlands within the project site. There are wetlands mapped both upstream and downstream of the project area. The downstream wetland is

classified as a riparian forested wetland. Measures have been taken in both the erosion control plan and the staging plan to reduce or eliminate the negative impacts that may be associated with this project on the downstream wetlands. The upstream wetlands will not be impacted by this project.

c. Impacts to Fish and Other Aquatic Life:

The major problems in the ponds are excessive loading of nutrients, sedimentation, and the shallow pond depth. The shallowness provides a good habitat for rooted aquatic macrophytes and also increase the chances for winterkill of fish. High sediment loadings decrease the pond depths even further. The plan proposes to deepen the ponds and decrease the amount of sedimentation and nutrient loadings into the ponds thereby improving the habitat for fish and other aquatic life. Planting native vegetation, reducing the amount of noxious aquatic plant growth, decreasing algae levels, and increasing depths will improve habitat for fish and aquatic insects.

d. Wildlife Impacts:

Wildlife will benefit in a number of ways from the proposed plan. The ponds will be deepened which will create a healthier system that will require fewer chemicals to maintain. The planting of a native buffer around the pond will decrease sedimentation, direct runoff and therefore nutrient loading into the pond. This buffer strip will also serve to limit the number of geese on the pond. It has been shown in studies that geese prefer ponds that have open access to the shoreline (i.e. manicured lawns). Geese in general, are less likely to exit a waterbody is there is at least a 10-foot wide band of high vegetation. By planting a native buffer around the ponds, not only is the habitat being enhanced for other wildlife, the geese are discouraged from leaving the water to feed or rest on maintained lawn areas adjacent to the ponds. They will not move through tall vegetation. Beneficial submergent and emergent zone vegetation will also be planted that will further increase wildlife habitat function and value.

e. Impacts to Threatened and Endangered Resources and Natural Areas:

There were no Federal or State threatened or endangered species observed during field investigations. In addition, an informational request was submitted to the Bureau of Endangered Resources' Wisconsin Natural Heritage Inventory on May 4, 2000. Cathy A. Bleser, WDNR Planning & Protection Specialist, responded to this request in a letter dated June 27, 2000 indicating that NHI data files contain no occurrence of Endangered, Threatened, or Special Concern Species, natural communities, or State Natural Areas that would be impacted by the project, nor for the actual project area.

16. Cultural

a. Land Use (include indirect and secondary impacts):

The existing degraded conditions of these ponds will be improved. The ponds will be more aesthetically pleasing while increasing wildlife habitat value and stormwater retention capacity.

The existing gravel path and foot-bridges will be kept intact for pedestrian use.

b. Social/Economic (include ethnic and cultural groups and zoning if applicable):

The plan will not only improve the aesthetics of the area, but the proposed native landscape design will also improve this habitat for local wildlife and aquatic organisms. The ponds will also have stabilized pond edges and forebays allowing for more efficient use as a stormwater facility, reducing cost for stormwater maintenance.

c. Archaeological/Historical:

The project will do nothing to improve either the archeological or historical significance of this location.

17. Other Special Resources (e.g. State Natural Areas, prime agricultural lands):

There are no special natural resources associated with the subject area or downstream of the subject area, so no direct adverse or beneficial effects are anticipated. There are also no secondary or cumulative effects anticipated.

18. Summary of Adverse Impacts That Cannot Be Avoided (more fully discussed in 15 through 18):

The adverse impacts that will occur will mostly come during the time of construction. Added noise, traffic, air pollution, and soil disturbance cannot be avoided during the construction period. Sediment discharge downstream will be another adverse impact that cannot be avoided. Steps have been taken through a staging plan, dredging plan, and erosion control plan to reduce and minimize these impacts. The amount of sediment discharged will be less than the amount allowed by the WDNR under the WDNR WPDES permit that has been applied for this project.

ALTERNATIVES

19. Identify, describe and discuss feasible alternatives to the proposed action and their impacts. Include alternatives such as enlarging, reducing or modifying portions of the proposal; using other location and/or methods; and the "no action" alternative. Give particular attention to alternatives that might avoid some or all of the adverse environmental effects.

Sediment Removal Options

The soft sediment varies throughout the ponds from just under one foot deep to 3.25 feet deep. The depth of water varies throughout the ponds from 3.1 feet in the east extended pond to 5.75 feet in the east pond. As a rule, and of course there are exceptions, aquatic plants (algae in this case) can survive in up to six feet of water. As can be easily seen, the water depth conditions in the entire pond complex are conducive to aquatic plant growth.

Previous studies recommended different treatments for sediment removal. The R.A. Smith Stormwater Management Plan recommended dredging the ponds to their approximate initial depth of 12 feet. Lieds proposed removing two feet of sediment from the whole complex. First, if the R.A. Smith recommendation were followed, it would solve the majority of the algae growth problem because the ponds would be deeper than aquatic plants can survive in. This method, however, would require the most dredging and be the most costly. In addition, since the Moraine Environmental study did find sediment with limits of lead, mercury, zinc, and oil & grease above the NR 347 action levels in the east extended pond, removing this sediment would be very costly. Secondly, the Lieds proposal, of removing two feet of sediment, will not solve the algae bloom problem. Most areas of the pond complex will barely be over the six-foot water depth to deter aquatic plant growth. Some areas will be less than six feet deep. To discourage aquatic plant growth, minimize sediment removal costs, and based on our investigation into sediment removal from this site, we have come up with two options for sediment removal and three alternatives for that removal. The three options for sediment removal are:

1) Remove three feet of sediment
2) Remove eight feet of sediment
3) Combination of 1 and 2.

A combination of hydraulic and mechanical dredge methods is recommended in all three options below. Costs for both methods done together to accomplish the project are assumed at $8.00/yard. For material hauled off site, trucking costs are assumed at $2.00/yard.

We are envisioning the following process for sediment removal, but also recommend that ultimately the method be left up to the contractor:

1. Bypass flow from the east extended pond to the west pond and pump down the east pond.
2. Begin hydraulic dredging in the west pond and pup to the east pond. Material placement

should be from east to west to allow for natural drainage and drying of the material.

3. When the east pond is filled, begin mechanical dredging of it. Some material may be able to be land spread, depending on availability, and some may need to be hauled off site.
4. Once all the dredged material from the west pond is removed, begin mechanical dredging on the east pond. All the while, bypass of flow from the east pond is required.

Option 1: Remove three feet of sediment

The least cost option, removal of three feet of sediment, was chosen as a potential option because it would allow for all areas of the pond complex to be at least seven feet deep. The seven-foot depth would provide a two-foot buffer to the five-foot depth where it is favorable for aquatic plants to grow. The downside of this option is that it only leaves a two-foot buffer. There could be some hardier aquatic plant that will survive in the seven-foot water depth. Also, some additional sedimentation should be expected to occur in these ponds over time. This could be expected even with forebays, although it would be much less than without forebays. The cost reflects dredging only of 85,000 cubic yards and ranges from total land spread on site to hauling all material off site.
Cost: $700,000-$960,000

Option 2: Remove eight feet of sediment

A more expensive option is removal of eight feet of sediment from the east and west ponds. This would essentially bring the ponds back to their original condition. It would be a good deterrent to aquatic plant growth and leave a lot of depth for any future sediment. The cost reflects dredging only of 232,000 cubic yards and ranges from total land spread on site to hauling all material off site.
Cost: $1,860,000-$2,560,000

Option 3: Combination of Options 1 and 2

A median option includes creating some deeper water holes as an effective safeguard against aquatic plant growth and possible winter habitat for fish, yet keeping costs down by only dredging three feet to create an adverse environment for aquatic plant growth. The cost reflects dredging only of 160,000 cubic yards and ranges from total land spread on site to hauling all material off site.
Cost: $1,280,000-1,760,000

It should be noted that in all three above options, the work could also be limited to key areas of the ponds, not necessarily the entire pond complex. For instance, currently, the east pond is 5.75 feet deep. This depth is in the middle where the boring was taken. If this pond is entirely 5.75 feet deep, it should not experience a lot of algae growth. We could say that this pond does not need to be dredged. However, we know it does experience algae growth, probably because it is not consistently 5.75 feet deep and at 5.75 feet deep it is right at the limit of favorable aquatic plant habitat. The point of this discussion is that there are certain areas that could be left alone. These areas, thought, are on the border of allowing algae growth.

The options laid out above gives the Village the option of high medium and low costs for accomplishing the goal of eliminating algae. In addition to these three options, there are two ways for accomplishing the work. The two ways are:

1) Complete all sediment removal at one time
2) Complete the sediment removal over a period of three years

Obviously, removing all the sediment at one time is the most costly way of accomplishing this project, but it allows for the project to be completed the quickest.

Forebay/Rock Dams

When the ponds were constructed, in the early 1970's, there really were no standards for pond design. These ponds were a perfect example, probably built to remove a "swamp" area that was not considered aesthetically pleasing for a condo development. The open water ponds were created with steep slopes and no forebays. Today, we know that steep slopes tend to slough and without forebays, sediment is not contained, but spread throughout the entire pond area; thus, making clean up hard and expensive. For this reason, we are recommending that we create forebays as part of this project. Since we are recommending that the pods be dredged, it makes sense to prevent further sedimentation throughout the entire pond.

Two forebays should be created. One should be built at the entrance to the east pond and one at the entrance to the west pond. The geometry of the forebays will be depicted on the plans, but they should be approximately nine feet deep (two feet deeper than the average pond depth of seven feet), extend approximately 60 feet from the entrance culvert, and ft into the pond's banks. In addition rock dams should be built around the outside perimeter of the forebays. This rock dam should be approximately two feet high and be shaped like a pyramid for stability. The purpose of this rock dam is to provide a little more barrier for sediment entering the main pond areas and to act as a filtering mechanism. A total cost for the forebay creation and rock dam is approximately $17,000 each. This assumes approximately 1,600 cubic yards of sediment removal to create the forebay.

Shoreline/Pond Treatment

Once sediment is removed from the pond, attention should then be turned toward prevention of further sediment entering the pond. Preventing all sediment from entering the pond cannot be achieved; however, the existing shorelines of the ponds are a contributor of sediment that can be reduced. The shorelines are experiencing significant erosion. The erosion has caused very steep slopes along much of the length of the shore. The eroded material from the banks is deposited into the ponds adding to the volume of sediment.

Treatment of these slopes can: (1) reduce erosion and therefore amount of sediment deposited into the pond; (2) enhance aesthetics of the ponds (3) reduce safety concerns;

and (4) deter geese entering the pond from the shore.

There are four options to the shoreline and pond treatment and they are as follows:

Option1: Pond slope grading with tall wetland plantings and seeding
This option would entail grading of the slopes along the length of the entire shoreline easing them to a grade of 4:1 or 5:1. Grading of the slopes at a grade of 5:1 will require approximately 12.5 feet of width around the ponds as grading limits. The slopes, grading limits, and grading tie in point will need to be adjusted at different locations around the ponds and the islands within the ponds for various reasons including preservation of trees, other vegetation, and buildings. This work would be performed by a back-hoe and the cut material may need to be hauled off site. Prices below assume hauling material off site.

The wetland plantings around the pond would include plants and seeds that are designed to bond with the clay soils near the shore of the ponds. This will stabilize the soils to help prevent shoreline erosion. Plantings will work the best for this purpose, however seeds can be used with mulch to cut costs. For this project some combination of live plantings along the water's edge and seeding would occur in a 10 foot wide strip in all areas where grading would take place to ease the slopes. Examples of live plants include New England Aster, Yellow Coneflower, and Sweet Black-eyed Susan. Grasses that perform well in clay include Big Bluestem and Canada Wild Rye. The plantings would also perform a secondary function. As the plants and grasses grow taller they will help to prevent geese from entering and exiting the pond from shore. Geese do not like to walk through vegetation over which they cannot see.

Costs for this alternative include grading along 10,000 lineal feet (LF) of shoreline around the outer edges of the ponds and 1,500 LF of shoreline surrounding the islands for a total of 11,500 LF. Live plantings would line the shoreline at a spacing of 15,000 plants per acre to a width of three feet from the shoreline for a total of 0.8 acres. Seeding would be done above the plantings to the edge of the disturbed area.

	Estimated cost
Grading	$ 46,000.00
Plantings	$36,000.00
Seeding	$ 6,500.00
Total	**$88,500**

Option 2: Pond slope grading with rock and lawn seed
This alternative entails the same grading as described in option 1. The difference in this alternative is that to help prevent erosion and further sediment deposits from the shoreline rock would be used. Riprap or fieldstone would line the shore at the water's edge to a point one to two feet above the normal water elevation of the pond. From this point lawn grass would be planted. This alternative provides an aesthetic appeal of the ponds for the residents of the area.

Costs for this alternative include the grading as described in option 1. Eighteen inches of rip rap or fieldstone to line the length of the shoreline. This will equal approximately 640 CY. Seeding costs would be for lawn seed grass applied over 2.6 acres around the shoreline.

	Estimated cost
Grading	$ 46,000.00
Rip rap	$785,000.00
Fieldstone	$ 1,740,000
Seeding	$ 500.00
Total	$831,500-$1,786,500

Option 3:Pond slope grading with a combination of wetland seeding, plantings, and rock

This alternative also would have grading performed as described in option 1. The method for preventing future shoreline erosion would combine the method of planting wetland plants and placing rip rap or fieldstone. This alternative would include one to two feet of rock along the water's edge (as in option 2) and wetland plantings and seeding along the length of the shoreline. This will provide erosion control and an aesthetic appeal.

Costs for this alternative include the grading as described in option 1. Eighteen inches of rip rap or fieldstone to line the length of the shoreline. This will equal approximately 640 CY. Live plantings would line the rock edge at a spacing of 15,000 plants per acre to a width of three feet from the rock edge for a total of 0.8 acres. Seeding would be done above the plantings to the edge of the disturbed area. This is a band of approximately 5.5 feet.

	Estimated cost
Grading	$ 46,000.00
Plantings	$ 36,000
Rip rap	785,000
Fieldstone	$ 1,740,000 -
Seeding	$ 5,000 -
total	$872,000-$1,827,000

Option 4: Tall wetland plantings and seeding around the ponds (no grading)

This option does not include any grading of the slopes. The wetland plants as described in option 1 will be the only method to prevent future erosion from the shoreline. This will also create the tall grass buffer for preventing geese from entering and exiting the pond from shore.

Costs for this option are as described for the plantings and seeding in alternative 1.

Estimated cost

Plantings	$ 36,000
Seeding	$ 6,500.00
Total	$42,500

Option 5: No Action
A "no action" alternative would leave a water quality problem unsolved. Modification of the proposal has already been incorporated into the plan design. The dredging includes fore bays, seeding and planting on a re-stabilized bank. In addition, the contaminants in the Extended East Pond will not be dredged, but instead an attempt will be made to bio-remediate the pond through intensive aquatic plantings.

EVALUATION OF PROJECT SIGNIFICANCE

20. Significance of Environmental Effects

a. Would the proposed project or related activities substantially change the quality of the environment (physical, biological, socio-economic)? Explain.

The proposed plan will amend the existing environment in a positive manner by improving a degraded water body. The project will decrease runoff and sedimentation into the ponds. The decreases sedimentation and nutrient loading will reduce the amount of noxious aquatic weed growth and algae. The ponds will become more aesthetically pleasing, increase stormwater retention capacity, and improve habitat for wildlife and aquatic organisms.

b. Discuss the significance of short-term and long-term environmental effects of the proposed project including secondary effects; particularly to geographically scarce resources such as historic or cultural resources, scenic and recreational resources, prime agricultural lands, threatened or endangered species or ecologically sensitive areas. The reversibility of an action affects the extent or degree of impact.

The short-term and secondary impacts include nonsignificant and unavoidable resuspension of sediments within the project area (causing temporary clouding of water), and noise and air quality impacts associated with the construction equipment.

The long-term effects include the aesthetically pleasing results, increased stormwater retention for the watershed and the enhanced natural habitat function and value of an improved pond complex.

The aquatic plant growth will be brought under control without the excessive use of chemicals, depth will be increased, and sedimentation and nutrient loading will be decreased enhancing the quality of the ponds as a whole.

There are no geographically scarce resources, prime agricultural lands, threatened or endangered species or ecologically sensitive areas on this site.

21. Significance of Cumulative Effects

Discuss the significance of reasonably anticipated cumulative effects on the environment. Consider cumulative effects from repeated projects of the same type. What is the likelihood that similar projects would be repeated? Would the cumulative effects be more severe or substantially change the quality of the environment? Include other activities planned or proposed in the area that would compound effects on the environment.

There are no reasonably anticipated cumulative effects on the environment as there are no other waterbodies within the watershed except for an un-named tributary to the Menomonee River. Historically, dredging is likely to have occurred given the channelized reached both upstream and downstream of the ponds.

Other similar projects would have a positive cumulative effect on the environment. This type of project is common, though it is not likely that an identical project would be repeated. This project, and others like it, will not substantially change the quality of the environment, but it will improve the quality of this water body.

22. Significance of Risk

a. Explain the significance of any unknowns that create substantial uncertainty in predicting effects on the quality of the environment. What additional studies or analyses would eliminate or reduce these unknowns? Explain why these studies were not done.

The Village hopes to begin construction as soon as January of 2001 with completion being the end of June 2001. The time of year for construction was selected to minimize risk of high spring groundwater levels and spring and early summer rains. Unexpected unknowns include the possibility of a 100- year flood event or significant rains during construction.

The amount of sediment discharged will be less than the amount allowed by the WDNR under the WDNR WPDES permit that has been applied for this project.

If a start date in January were not possible, construction start-up would be delayed until June1, 2001.

b. Explain the environmental significance of reasonably anticipated operating problems such as malfunctions, spills, fires or other hazards (particularly

those relating to health or safety). Consider reasonable detection and emergency response, and discuss the potential for these hazards.

There are no significant risks associated with the pond areas. The most significant risk for a pond in an urban setting is safety with regard to children. The original pond design had typical 3:1 slopes and manicured lawns up to the edge, which is dangerous if a child were to fall in. The proposed plan limits and discourages access by the planting of native vegetation along the shoreline. Also, shallow planting shelves have been included along the pond edge to eliminate risk of injury if anyone were to be near to the pond. The concept behind shallow planting shelves is that if anyone were to fall into the pond, it would be easy to get back out.

The most significant risks occur during the time of construction. These risks include fire, erosion, flooding, and spills from heavy equipment.

Erosion during construction could result in water pollution and sedimentation of the pond. There will be erosion control measures installed and staging implemented to prevent this from happening.

The Dredge/Bank Grading Plan is detailed on Sheet 3 of 6 and the Erosion Control Plan is detailed on Sheet 5 of 6 of the plan set. These plans include the staging of the work and the erosion control measures to be used. The pond dredging is staged into two segments. Soil staging is designed so that minimal bank area will be exposed at one time.

Erosion controls to be used include erosion mat, hay bales, bio-logs at the toe of the bank slope, silt fence at the top of the bank (at the edge of the disturbed limits), tracking pads, and rip rap at footbridge locations. The distance between the bio-logs at the toe of the slope and the silt fence at the edge of the disturbed limits is to be 10-12 feet or less.

Sediment control measures will be in working order at the end of each working day and will be inspected after significant rainfalls. Any damage to these structures will be repaired immediately.

Spills from heavy equipment such as hydraulic fluid, oil, gas, etc can be a source of groundwater, surface water, and soil contamination. In the event that a spill occurs, the contaminated area will be cleaned up immediately and/or removed from the site to an approved landfill location.

23. Significance of Precedent

a. **Would a decision on this proposal influence future decisions or foreclose options that may additionally affect the quality of the environment? Explain the significance.**

   A decision on this proposal would not influence or foreclose options that would affect the quality of the environment.

b. **Describe any conflicts the proposal has with plans or policy of local, state or federal agencies that provide for the protection of the environment. Explain the significance.**

   The proposal is not in conflict with local, state, or federal agencies because it has been proven that there is no practical alternative to the proposed plan that provides the associated increases in water quality, wildlife habitat function and value, and aesthetics.

24. Discuss the effects of the quality of the environment, including socio-economic effects, that are (or are likely to be) highly controversial, and summarize the controversy.

No controversy has been raised by the proposed project.

25. Explain other factors that should be considered in determining the significance of the proposal.

None.