Linnie Lac
Waukesha County, Wisconsin

Planning Grant Findings

1994

Prepared by
Aron & Associates
for the City of New Berlin

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ADDENDUMS:

The following items were included along with this report for the City of New Berlin:

Life on the Edge... Owning Waterfront Property

The Lake List 1994-1995

A Guide to Wisconsin's Lake Management Law, 1990 Edition

Model By-Laws for Voluntary Lake Associations

Starting A Lake Association

What is a Lake District?

What is a Qualified Lake Association?

Incorporation of Local Lake Associations

Sample Articles of Incorporation

Liability Protections Provided by Chapter 181, Wisc. Stats

Organizational Meeting Agenda Sample

Typical Local Lake Association Activities

In addition, one copy of the complete Nonpoint Source Control Plan for the Muskego-Wind Lakes Priority Watershed Project was included to the City of New Berlin, along with four Executive Summaries of the Watershed Plan.

Linnie Lac
Lake Planning Grant Project Summary

Purpose of the project:

- Conduct a community survey of residents and property owners.
- Conduct a sediment survey to determine the amount of sediment in the lake.
- Make recommendations based on the two projects to improve Linnie Lac.

Community Survey:

- 40 of 56 property owners responded to the survey
- Believe the "entire" lake should be dredged. For some that included the cattail marsh, for others it meant just the open water area.
- Believe the City should play a large role in improving Linnie Lac.
- Don't believe the dam should be removed.
- Prefer not to use chemicals on aquatic plants.
- Concerned about declining wildlife value.
- Concerned about decreasing water area and depth.
- Concerned about the high cost of remedies.
- Concerned that improvements may lead to higher taxes.
- Perception that the City of New Berlin isn't interested in Linnie Lac area.

Sediment Survey

- Approximately 18,000 cubic yards of soft sediment in the lake.
- Lake lined with hard blue clay.
- Average depth to blue clay is 5.5 feet.
- Is approximately 20,000 cubic yards of water in Linnie Lac.
- Approximate cost to remove soft sediments from open water and two channels is $300,000.

Recommendations

- Determine which organizational structure will suit the communities purposes and establish that organization.
- The new organization should work with the City to ensure the fullest participation in Priority Watershed Project.
- The organization should provide continuing educational materials in a variety of forms to reach as many as possible in the community. Initial efforts should focus on raising the awareness of elected officials to enhance their desire to protect water quality in the community.
- The organization should be a watchdog for land use decisions that could negatively impact Linnie Lac.
- The organization should also work with the DNR to ensure that the gravel pit complies with requirements in place to protect water quality.
- The entire open lake area of Linnie Lac should be dredged and two channels should be reopened for riparian access.
- Work to reduce the nuisance aquatic plants and plant more beneficial native plants.
- Wetlands upstream from Linnie Lac should be actively protected.

The community surrounding Linnie Lac has faced declining water quality, severe aquatic plant and algae problems, and decreased lake depth. Recreational use on the 7 acre Linnie Lac has been all but eliminated. Summer weed growths prevent all but the most determined from using the water. The surrounding agricultural impacts, as well as the burgeoning urban growth in the watershed is believed to be responsible for many of Linnie Lac's problems. Any attempts to remedy the problems rapidly lose ground because of the relatively small number of property owners faced with a significant task. Another major obstacle is the high cost of the remedies that have been presented to date. There is still hope among some residents and the community that something can be done to improve conditions on Linnie Lac. That hope, along with a number of other programs taking place in the watershed, has spawned new interest in the area.

In 1991 the City of New Berlin applied for, and received a Wisconsin Lake Management Planning Grant from the Wisconsin Department of Natural Resources (DNR). The grant program was developed to provide financial assistance and incentive to lake area residents in the hope that more local lake communities will begin working pro-actively to manage their lake.

The goals of the Linnie Lac Planning Project were:

- To develop various alternatives for dredging Linnie Lac, and to determine funding sources and options.
- To determine the level of support available from Linnie Lac residents and property owners for possible future projects, and to determine what type of organizational structure is best suited to the needs of the citizens.

To accomplish these goals the following would be undertaken:

- A survey of the lake bottom to assess the level of sediment deposition would be conducted through the ice. Cross sections of the lake would be drawn showing depth of sediment. A map would be prepared showing current conditions. Alternatives to whole lake dredging would be discussed. Potential dredge spoil site(s) would be identified, as well as any

funding sources. Sediment samples would be collected and analyzed for arsenic and nutrients.

- A community survey would be conducted of all lake property owners and residents. The goal of the survey would be to determine the level of acceptance for a dredging project, or other major improvement project. The survey would also attempt to determine what organizational structure would best suit the community and its problems.
- Recommendations for future educational efforts, planning projects and watershed management would be included in the final report.

Residents of the area are concerned that nothing will come of this latest attempt to rehabilitate Linnie Lac. Historical efforts (see news articles in the Appendix) never materialized into a serious project. This is very understandable. Without a persistent, viable organization to continue to push for changes, changes may never take place. If this effort is to succeed it will depend on the commitment and follow through of the local community.

This document will attempt to provide the information and the tools to become more organized. A list of additional contacts is included in the Appendix. Those who attempt to carry on from here should be sure to take full advantage of the information learned by those who have walked this path before. Many lake communities that have had similar problems are now organized and are working to solve their problems. These groups could be an excellent resource. The current directory of lake contacts in the state of Wisconsin has been provided with this report.

COMMUNITY SURVEY

Methodology

A community survey is often used in the problem definition phase to assess the true feelings, opinions and desires of residents prior to the development of any management recommendations. Recommendations can only provide results if community acceptance is there. The survey is an effective way of finding out how the 'silent majority' feel on issues.

The community survey for the Linnie Lac residents was developed following the protocol established by the DNR. Local residents, interested citizens, the University of Wisconsin Extension Stevens Point, and DNR collaborated with Aron & Associates to develop the survey. The survey was mailed by first class mail. A stamped return envelope was included to help improve the survey response rate. A copy of the survey is included in the Appendix. Newspaper articles and advance letters informed residents of the upcoming survey and asked for their ideas, comments and cooperation. After the survey was mailed, a follow-up reminder was mailed first class to all residents, asking them to be sure to return their completed survey.

A total of 56 surveys were mailed and 40 were completed and returned, for a response rate of 71%, a statistically significant sample. The responses were compiled and analyzed using a Lotus 1-2-3 spreadsheet program and was examined for content and trends. The complete results of the survey are included in the Appendix.

Results

Most of the homes in the Linnie Lac community are year round homes. Many of the respondents live in the community because of the cost of the property. Some are worried that significant improvements to the lake will diminish the affordability of the area. Respondents have lived here an average of 22 years and own less than 150 feet of frontage on Linnie Lac. Very few respondents own watercraft and those that do use them elsewhere. Only 11 of 40 respondents indicated they use Linnie Lac in the summer, five of those for fishing. More respondents (16) use the lake in the winter for activities such as ice skating (12). Off lake respondents were often not aware of any deeded

access rights to the lake. Most of the respondents (12) are retired. The fixed incomes will also affect the financial ability of the area to undertake a large scale project. Many of the homes are two person families with no children and a high school education. The Milwaukee Journal and the New Berlin Citizen are the most read papers. Most in the community (17) had not heard of the Priority Watershed Project (PWP) . The PWP was in its initial planning stages during the time the survey was conducted. At least half the residents believe there is more sediment in Linnie Lac than there used to be. Some residents mentioned areas of the lake at one time were 10 to 35 feet deep. The work conducted during the sediment survey was unable to locate any former deep holes in the lakebed of Linnie Lac.

Respondents also indicated that the cattail marsh continues to encroach into the open water area from the north. There is also concern that even though the marsh area is increasing, the value to wildlife is diminishing. There are fears that the increased runoff from construction and agriculture is affecting the wildlife.

Many respondents (29) indicated something should be done to improve Linnie Lac. And more than half (22) understand that improving the lake will increase their property values. Survey respondents were against using chemicals to control weeds and algae on Linnie Lac. The concern about the affect of the chemicals on wildlife and people lead their concerns. Another option respondents were clearly against was whether or not the dam should be removed. Respondents believe a river system would be a step backward and felt the dam should be left in.

Respondents indicated that cost factors may be a reason to not undertake a project on Linnie Lac. Those responding to the survey are mostly opposed to improving public access on the lake and are concerned about the affect boats and motors would have on the lake.

Almost half (19) of the respondents did not answer a question asking what type of organization would best suit their area. The respondents that did answer were evenly split, indicating no consensus. The response to this

question indicates that the successful completion of a rehabilitation project will be difficult.

Many respondents indicated they believe the City of New Berlin should play a large role in the rehabilitation of Linnie Lac. They believe strongly that tighter controls on development and runoff could have prevented many of the problems.

Half of the respondents indicated they would support a whole lake dredging of Linnie Lac. Those who were opposed were primarily concerned about the costs of such a project. Partial dredging was only supported by 10 respondents. Respondents felt that if it's done, it should be done right. Cost was again listed as a concern. When given the opportunity to express any other comments, many indicated the area was too important to ignore and that the state should pay for the improvements since much damage was done during the Highway 45 construction.

SEDIMENT SURVEY

On January 25, 1992 a sediment survey was conducted through the ice. A grid was established over the ice bound lake. Sample points were 50 feet apart. A total of 74 points were sampled. A Sitex color sounder was used through the ice to determine the water depth and the depth of soft sediments. Holes were drilled with an eight inch ice auger. A graduated push rod was pushed into the sediments to the point of refusal to verify the depth of soft sediments found by the Sitek.

The bottom of Linnie Lac consisted of soft black sediments containing little evidence of shells, marl or decaying organic matter (detritus). The underlying material was hard blue clay. The depth of clay was not determined. The average water depth was 2.5 feet and the average depth to the blue clay was 5.4 feet.

Linnie Lac contains approximately 18,000 cubic yards of sediment in the open water area of the lake. Sediments were not sampled in the cattail marsh north of the open water. The deepest sediment was found at the marsh-open water interface where 9 feet of soft sediments were found. Removing the soft sediment in the open water area would approximately double the amount of water in Linnie Lac.

An important consideration in a dredging project is the sediment composition. Problems with arsenic have prevented some projects from going beyond the initial discussion stage, so it was important to determine if Linnie Lac has any such problems. If a project is intending to spread spoils on farm fields, it is important to know the nutrient levels in the material being removed. After discussions with DNR water regulation and zoning staff, a composite sediment sample was collected March 2, 1993 from a point 40 feet north of the east end of the dam. The sample was taken to Sommer-Frey Laboratories (DNR certification #241249360) in Milwaukee for processing.

The results are presented below:

Total Organic Carbon, mg/kg	8,100
Total Solids, % wt.	29.54
Arsenic as As, mg/kg	8.69
Copper as Cu, mg/kg	9.07
Potassium as K, mg/kg	704
Ammonium Nitrogen, mg/kg	54.6
Nitrate Nitrogen, mg/kg	4.20
Nitrite Nitrogen, mg/kg	1.45
Total Kjeldahl Nitrogen, mg/kg	131.0
Total Phosphorus as P, mg/kg	25.4

The level of arsenic found in Linnie Lac is very low compared to other lakes in southeastern Wisconsin. In Little Muskego Lake directly south of Linnie Lac, arsenic concentrations in bottom sediments have ranged up to 96 mg/kg with a mean level of 35.7 mg/kg (WDNR, 1980). Little Muskego Lake was treated with approximately 47,000 pounds of sodium arsenite. Since there were no sodium arsenite treatments on Linnie Lac, the very low level of arsenic found would not warrant special considerations during a dredging activity.

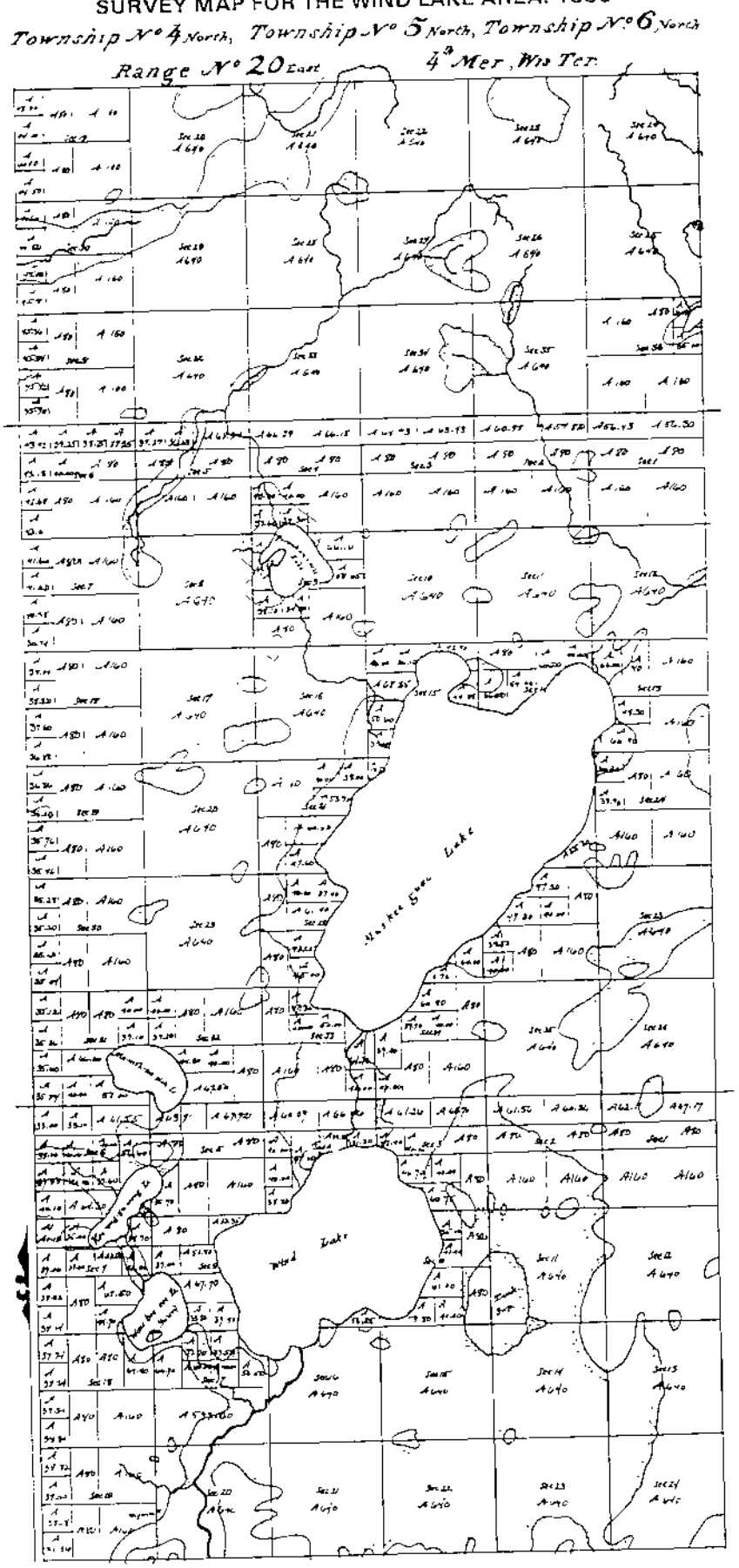
According to the US Environmental Protection Agency (EPA) guidelines for Great Lakes Harbor sediments, phosphorus concentrations of less than 420 mg/kg (milligram per kilogram) are indicative of nonpolluted sediments. Between 420 and 650 mg/kg are indicative of moderately polluted and more than 650 mg/kg are heavily polluted sediments. The phosphorus concentrations in the Linnie Lac sediments are very low (25.4 mg/kg) by comparison to these guidelines. This is also a lower phosphorus concentration than the sediment sampled in Wind Lake and Big Muskego. The Wind Lake phosphorus concentrations ranged from 145 to 710 mg/kg and in Big Muskego Lake from 706 to 1094 mg/kg (SEWRPC, 1991).

There are many in the community that believe years of sediment have accumulated in Linnie Lac. There is only about 20,000 cubic yards of water volume in Linnie Lac. During the course of this planning project, flows through Linnie Lac frequently had the appearance of muddy, chocolate brown, caused by the high levels of fine sediment in the water.

When a water drop strikes bare ground, it dislodges the soil particles and allows them to be transported downstream. The finer the soil particle, the easier it dislodges and moves. Sands and gravels need much higher flows or greater velocity to dislodge them; and they quickly settle back out as soon as the water velocity slows down. Clay particles however, because they are very fine, can sometimes take days or weeks to settle out of the water column. Because the storage in Linnie Lac is small and because the velocity is often great, the clay soils do not have time to settle out and are carried downstream.

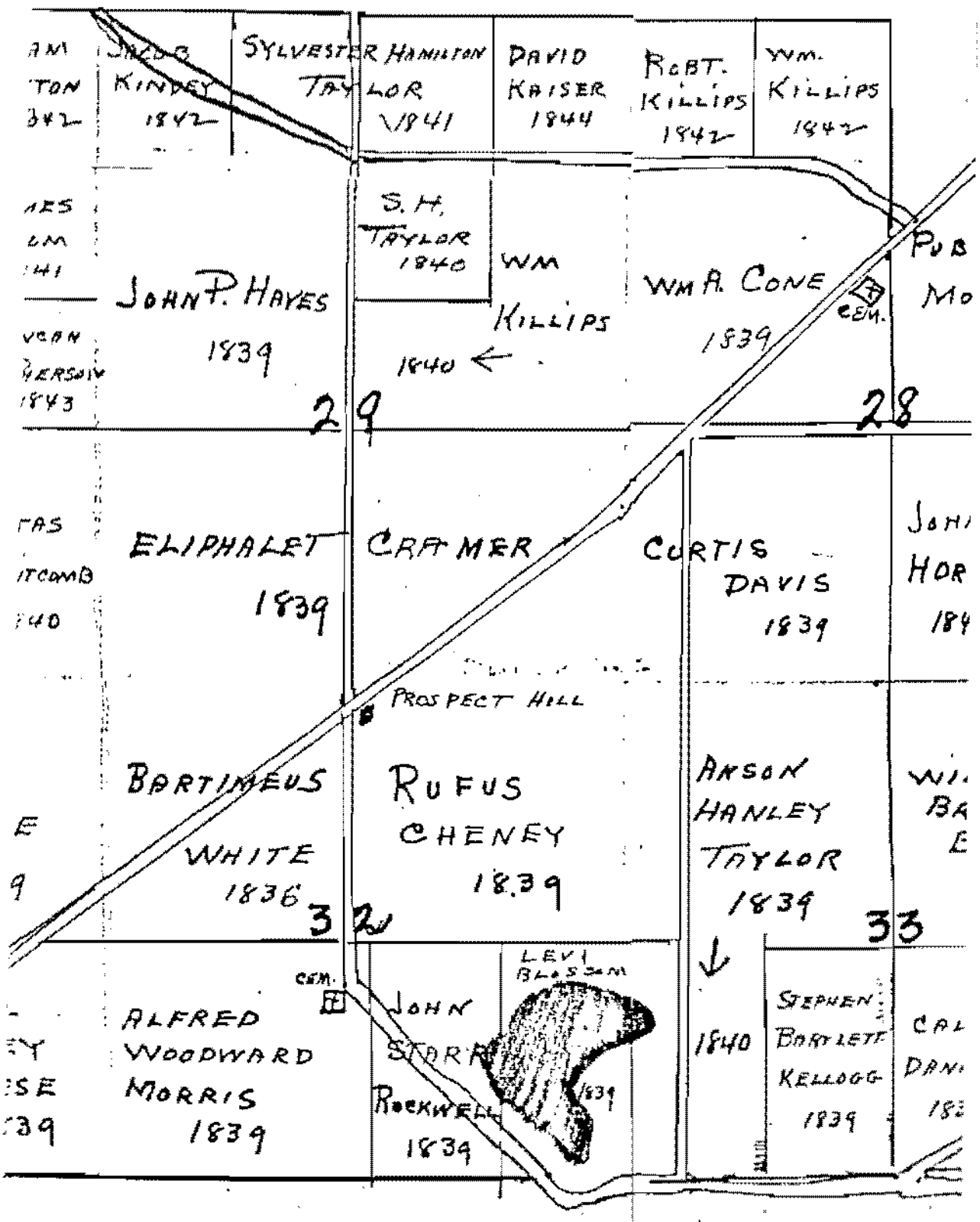
It can be assumed that the cattail marsh on the north end of the Linnie Lac is moving southward. Although a survey map from 1836 however, shows that Linnie Lac did not yet exist, a map provided by a long time resident shows a much larger water area than is present today. Water flows through the cattail marsh tend to dissipate as the water reaches the open area of the lake. Heavier sediment particles settle out. As the material collects around the cattails, the water depth diminishes. Lower water depths then allow the cattails to grow, further encroaching on the open water area.

HISTORIC UNITED STATES PUBLIC LAND SURVEY MAP FOR THE WIND LAKE AREA: 1836

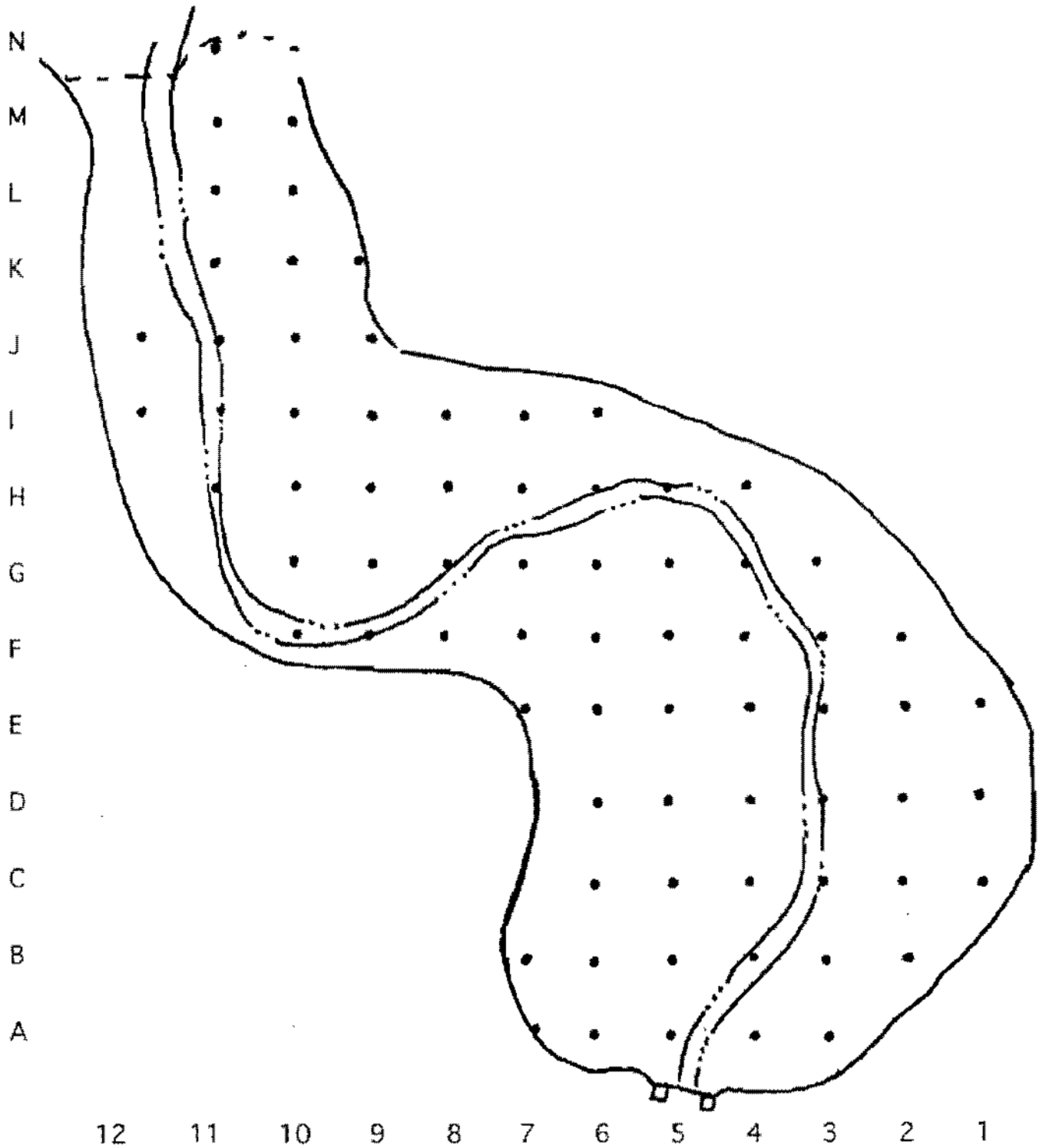


Source: U. S. Public Land Survey and SEWRPC.

LINNIE LAC - DATE UNKNOWN



Linnie Lac
Sediment Sample Points



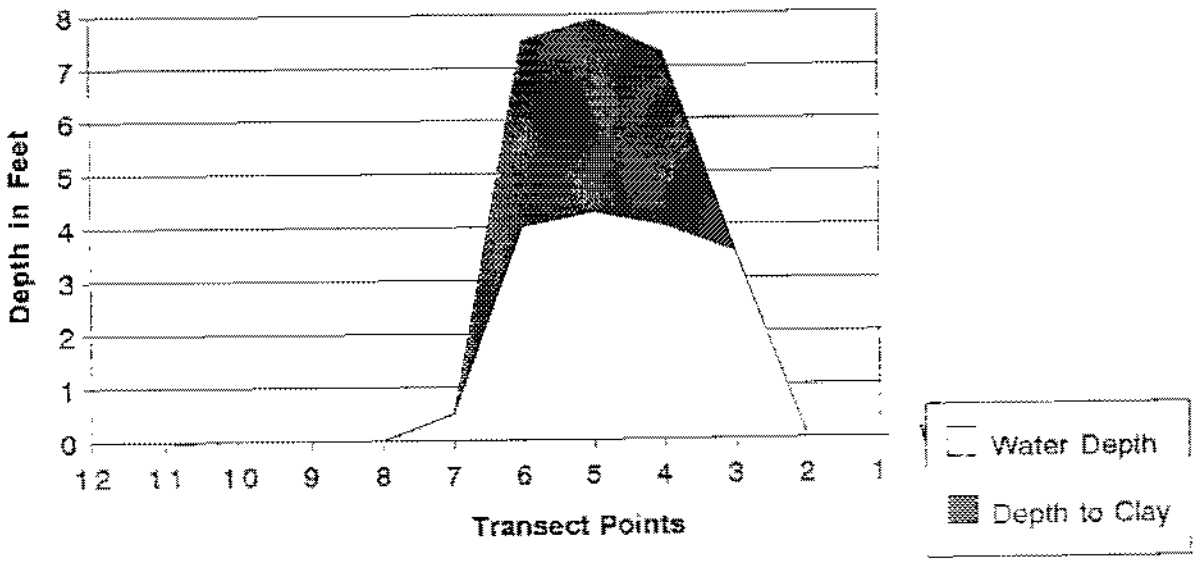
DEPTH OF WATER AT SAMPLE POINTS

	12	11	10	9	8	7	6	5	4	3	2	1
N		3										
M		4.5	3									
L		5	4									
K		5.5	9	2.5								
J	3	4	0.5	3								
I	2	6	5.5	2.5	1.5	0	0					
H		6.5	5.5	2	2	1.5	2	1.5	2			
G			5.5	2	2	4	5	2	3.5	1.5		
F			0.5	2	5	1.5	1	2	2.5	4	2.5	
E						0	0.5	1	1.5	3	3.5	2
D							0.5	1	1	5	2.5	3
C							0.5	1.5	3	3	2	4
B						0	0	1.5	3.5	2	3	
A						0	3.5	3.5	3.25	0		

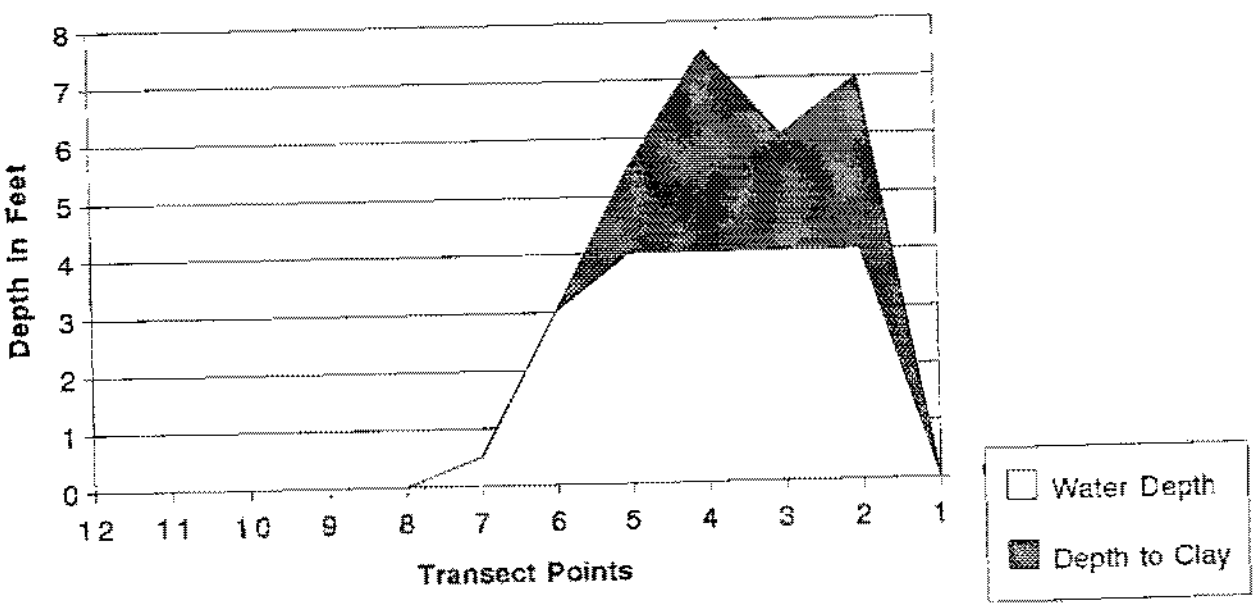
DEPTH TO CLAY AT SAMPLE POINTS

	12	11	10	9	8	7	6	5	4	3	2	1
N		4										
M		5.5	4.5									
L		6	5									
K		7	11.5	4.5								
J	4	5.5	2.5	6								
I	3	7	7.5	4.5	3.5	2	2					
H		8.5	7.5	4.5	4	5	6	6.5	5.5			
G			8	4.5	4	7	9	5.5	7.5	6		
F			2.5	5	7	5	5	5	6.5	8.5	6.5	
E						0.5	2.5	4	4	7.5	6	6
D							4	3	3.5	9.5	7	7.5
C							4	4.5	6	7	6	7
B						0.5	3	5.5	7.5	6	7	
A						0.5	7.5	7.9	7.25	3.5		

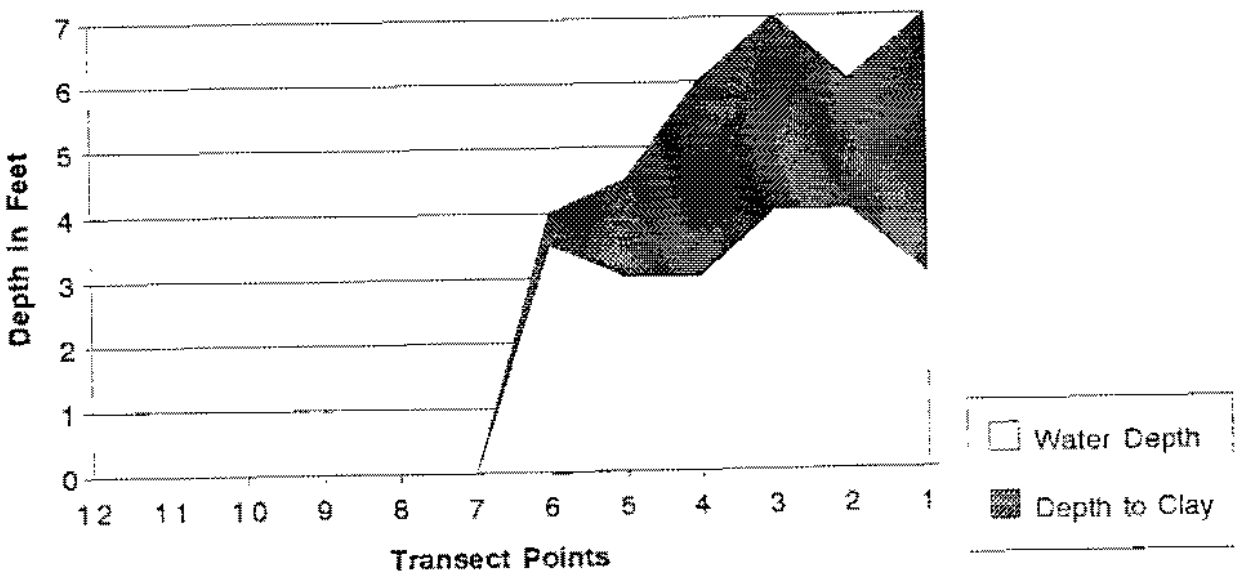
Cross Section - Transect A



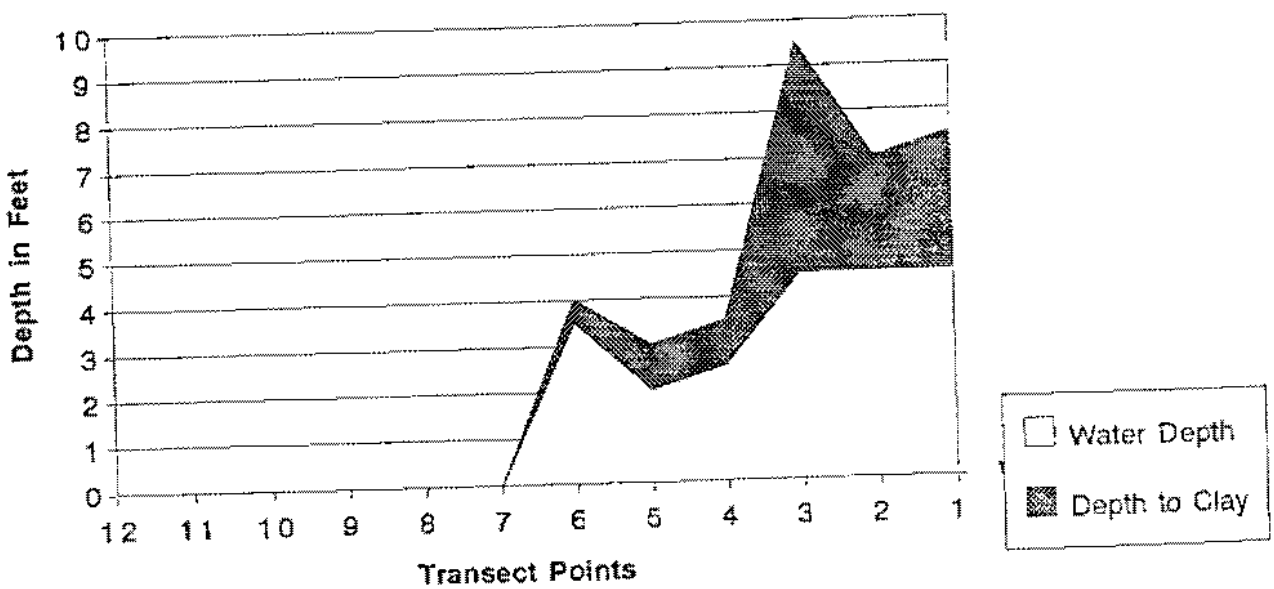
Cross Section Transect B



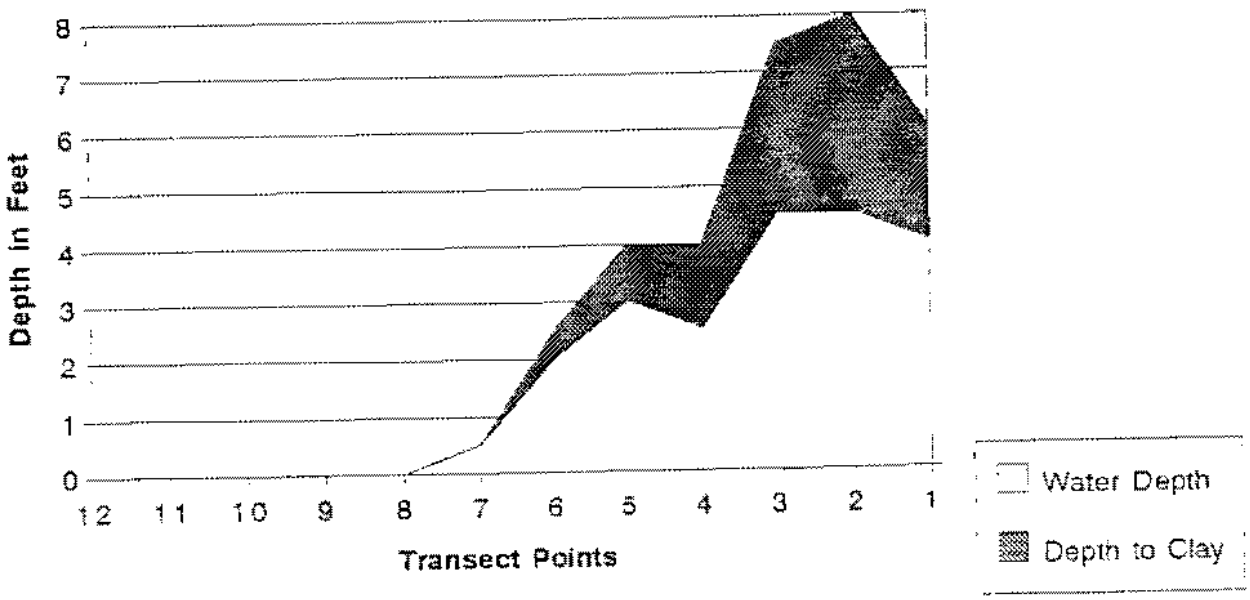
Cross Section Transect C



Cross Section Transect D



Cross Section Transect E



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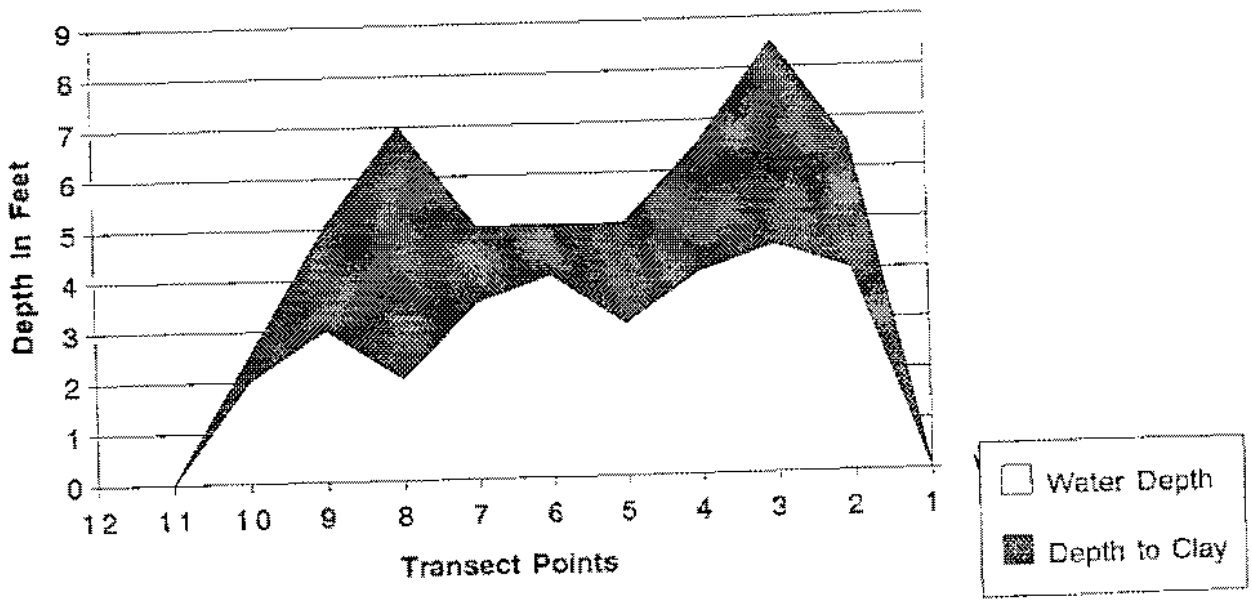
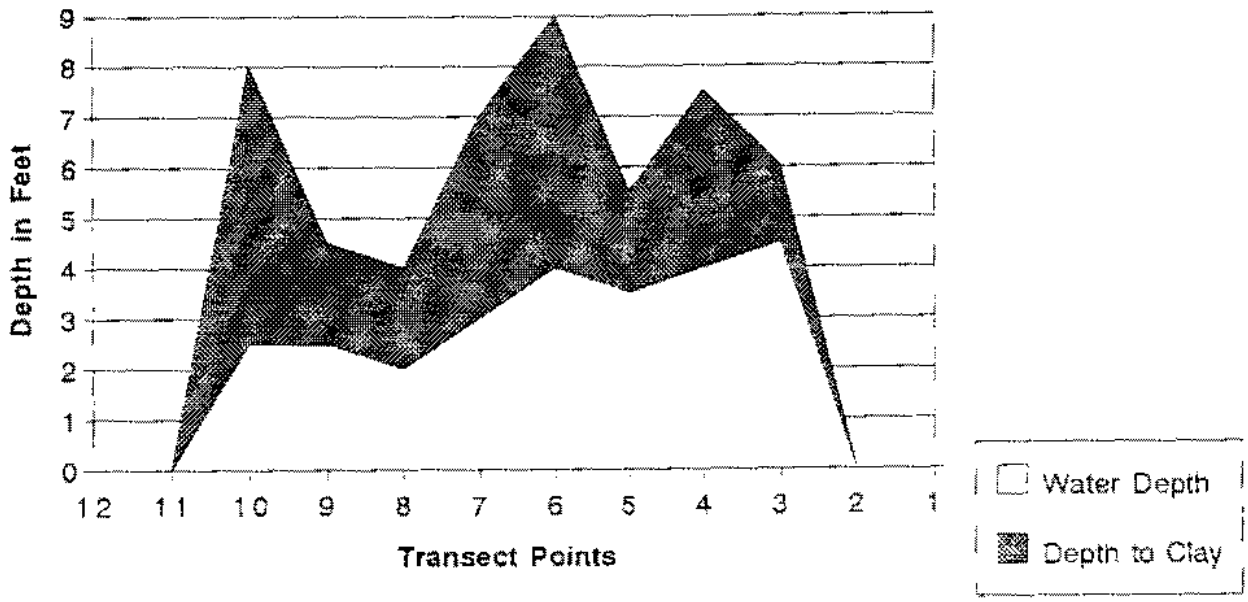


Cross Section Transect G



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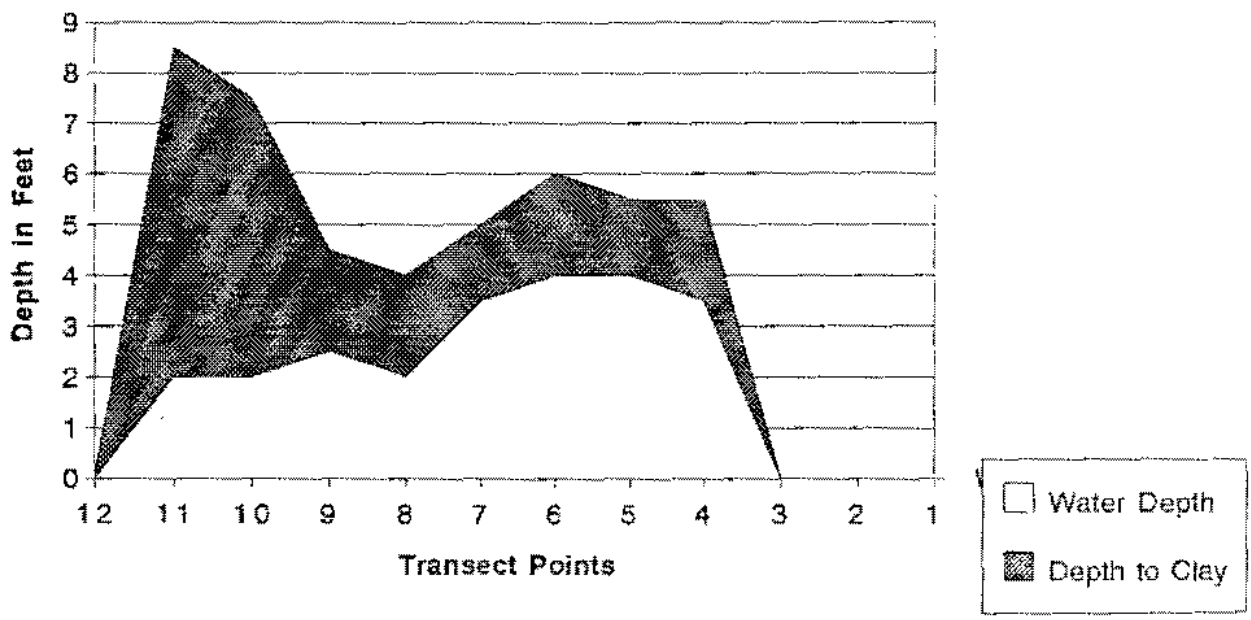

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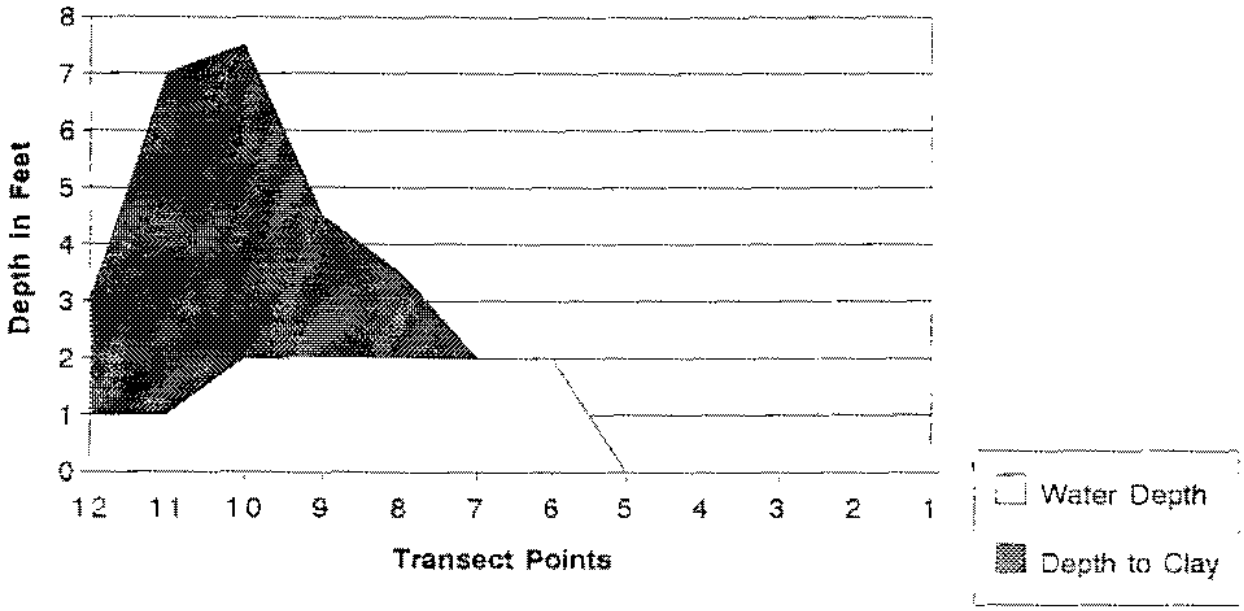

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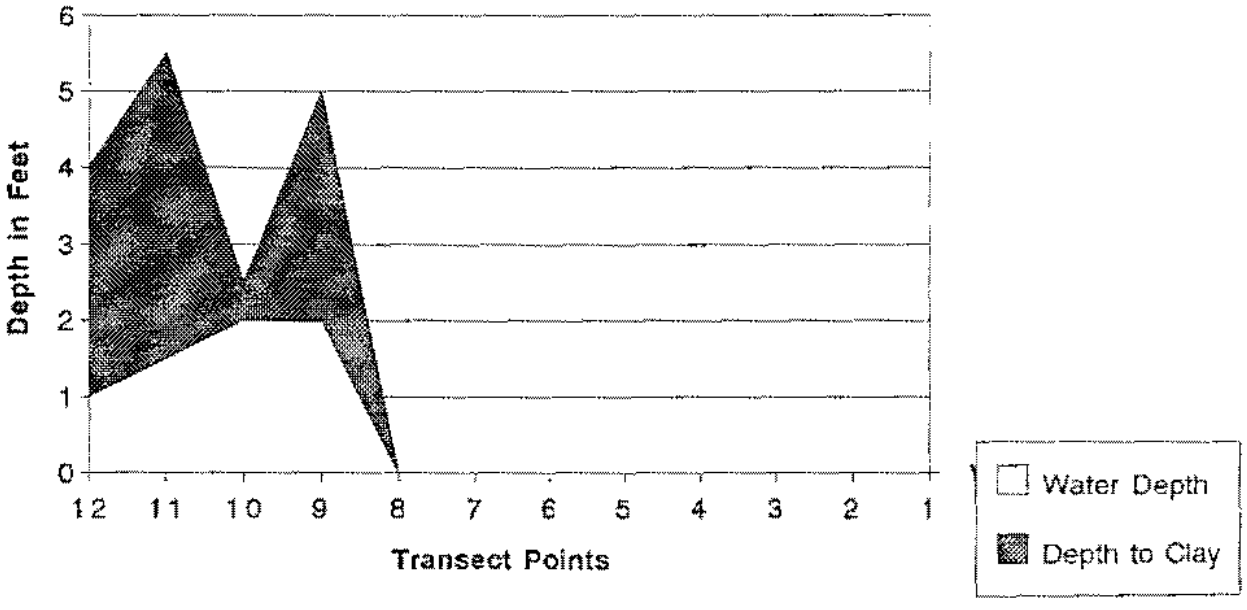

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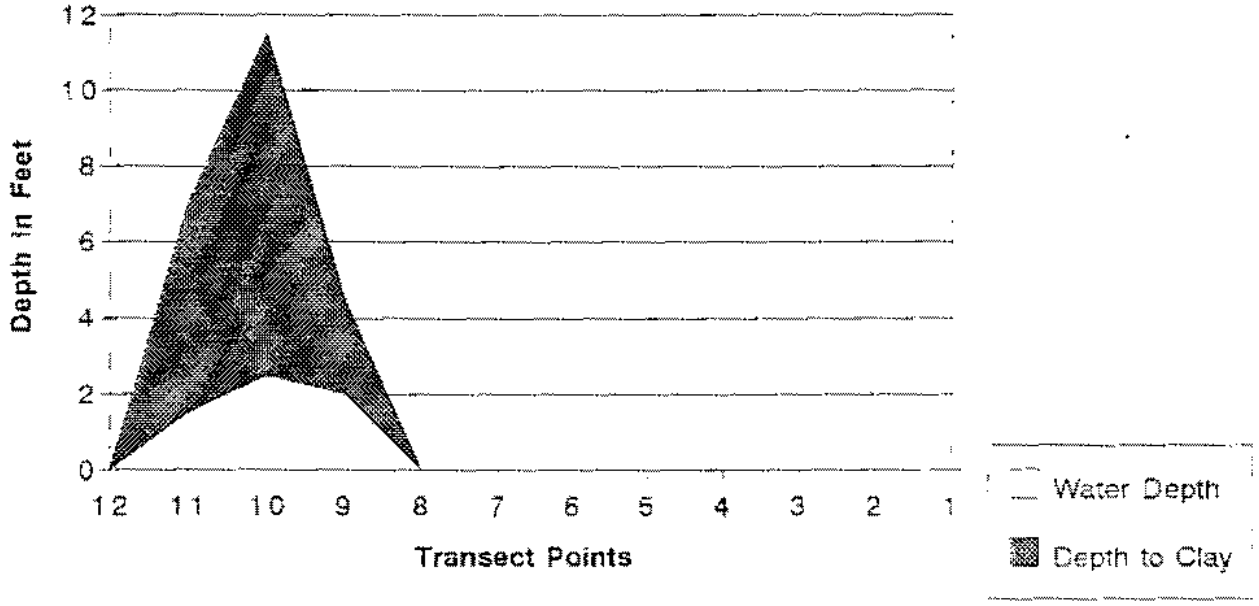

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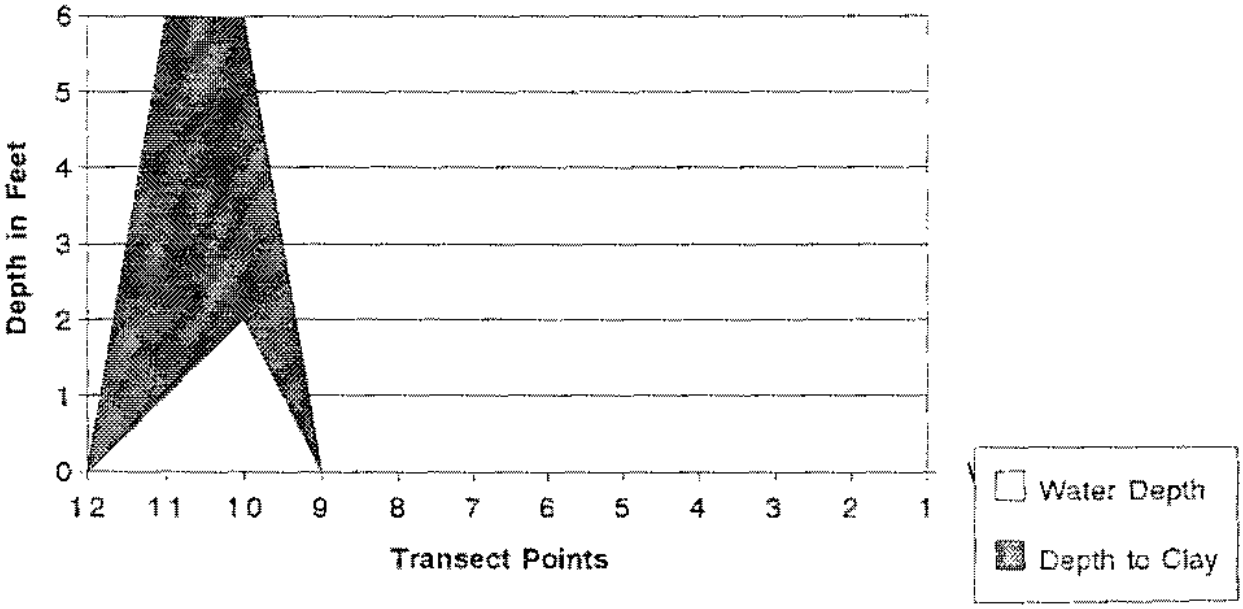

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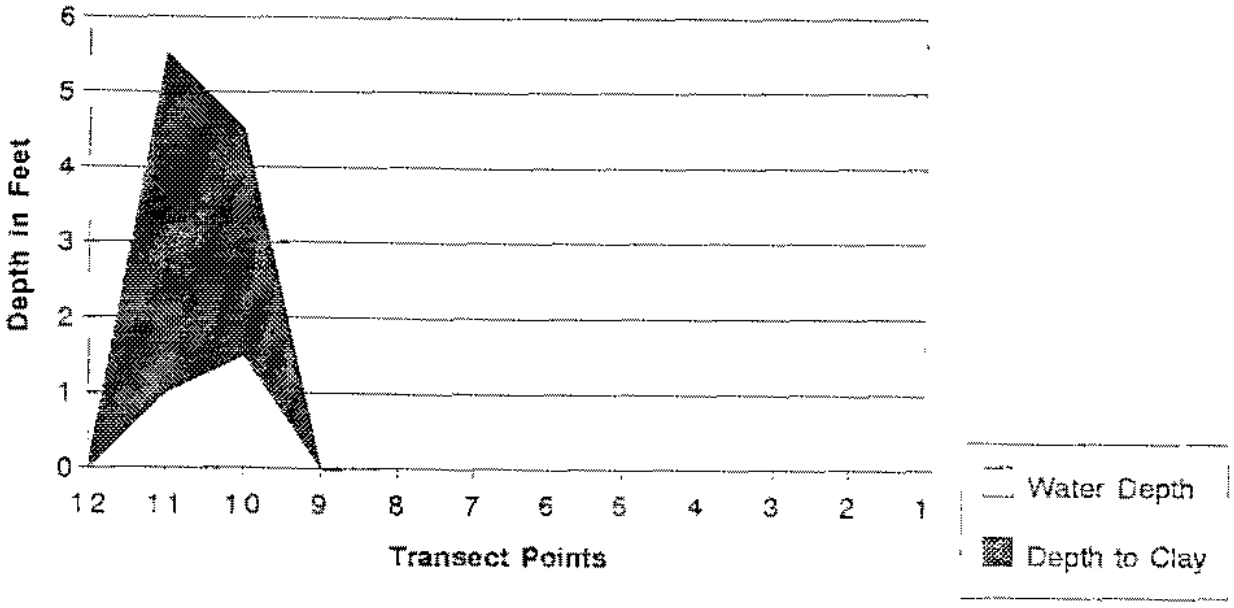

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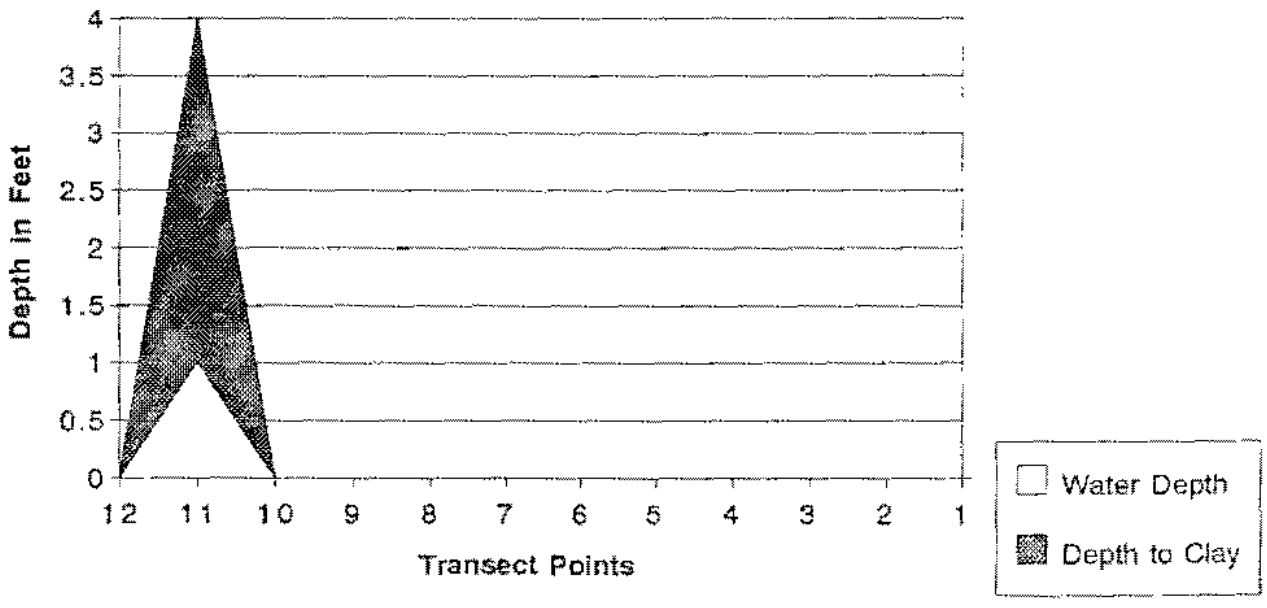


DREDGING ALTERNATIVES

Two alternatives were presented to Linnie Lac residents in the community survey: 1) to dredge the entire lake and 2) to do partial dredging. "Entire" was not defined in the survey but rather was left for the respondents to interpret. To some that meant the entire, current, open water area. To others that meant all of the so-called original water area, extending far into the cattail marsh. There was good support in the survey for doing the "entire lake", much more so than doing a partial dredging activity.

Dredging the open lake area involves removing approximately 18,000 cubic yards of soft sediments. This would leave a clay bottom with an average depth of approximately 5 1/2 feet. There would likely be a reduction in plant growth with the removal of the soft sediments.

Dredging may have short term adverse affects including increased turbidity and destruction of the bottom habitats. There may also be impacts at the sediment disposal sites such as those associated with heavy truck traffic. This may not be as much of a concern if a disposal agreement is reached with a local gravel pit.

Dredging requires a permit from the DNR under Section 30.20 of the Wisconsin Statutes. A permit from the Army Corps of Engineers, and from the City of New Berlin would also be required. Disposal would involve a permit from WDNR for a Water Pollution Discharge Elimination System (WPDES) permit for runoff.

<u>Dredging Methods</u>

There are two methods of dredging: hydraulic and mechanical. Hydraulic dredging uses a rotary cutting head to loosen sediments that are then vacuumed with a high-capacity pump. The slurry, which is 80 to 90% water, is pumped directly to a disposal area where solids are allowed to settle. Clean water is then discharged back to the lake. If a disposal site is available within a mile of the lake, this can be more economical than mechanical dredging. Costs will run approximately $5.00 a cubic yard for hydraulic dredging. (1994 Cost estimates were obtained from three independent

contractors and averaged.) This method is not appropriate for removing material with large debris or from areas heavy with cattails. This process could be used on the open water area of Linnie Lac but would be ineffective for reopening channels along the developed shoreline through the cattail marsh. Advantages of hydraulic dredging includes less disruption of the shoreline, less turbidity in the water column and less disruption of lake use. Disadvantages include the need for a larger disposal site to contain the slurry, and the need for a disposal site closer to the dredging area.

Mechanical dredging uses dragline or clamshell equipment to remove the sediment, usually from shore. Sediment would be stockpiled on shore or placed directly into trucks for transportation. This method allows for a smaller disposal site because the material removed has much a lower water content. This method runs approximately $7.00 a cubic yard. Advantages of mechanical dredging include the ability to truck further distances, and the ability to have a smaller disposal site. The disadvantages include high turbidity levels, longer work time needed, increased truck traffic in the area, and shoreline disturbances.

Mechanical dredging may also be conducted by placing a backhoe on barges, removing the sediment into containers placed on other barges. Barges are then transported to the off-load site on shore. There the material is moved from the barges to trucks for hauling. This method is needed when shoreline limitations prevent placing heavy equipment on the shore. However, because of the increased material handling, this is the most costly method. This may run as much as $11.00 a cubic yard.

Yet another method of mechanical dredging involves lowering the water level in the lake. Heavy equipment then works directly on the lake bottom, removing the sediments and placing the material into trucks for transport. This method is the least costly method, with current prices running about $2.00-3.00 per cubic yard. However, there can be problems associated with this method. If groundwater prevents the complete lowering of the lake level, the equipment may be too heavy to be used on the lake bed.

Dredging Aiternatives

There are five possible dredging alternatives for Linnie Lac. The first is to do nothing and leave the lake as it is. The second is to dredge the entire Linnie Lac area including the cattail marsh. This alternative was mentioned by some survey respondents. Because of current laws governing wetlands, both state and federal, this is not a likely option. The permit would be very difficult if not impossible to acquire and current law would then require the creation of wetlands elsewhere to compensate for the wetlands being destroyed. This would greatly increase the cost of the project.

Option three would be to dredge the open water area only, removing only the soft sediments. This could be done by hydraulic or mechanical dredging. The cost of this option if done hydraulically, would be approximately $90,000. Legal, financial and disposal considerations would bring the total cost to approximately $115,000.

Option four would be to dredge the open water area and to create two channels in the cattail area, one along the north western shoreline and the other along the northeastern shoreline, to allow residents in those areas to access the main, open water area. The northeastern channel would be approximately 1100 feet long by 15 feet wide and 6 feet deep. This would entail removing 3700 cubic yards of material. The northwestern channel would be approximately 700 feet long, 15 feet wide and 6 feet deep. Approximately 2400 cubic yards would be removed. The additional 6100 cubic yards of material to be removed from the channels would bring the construction cost estimate for this project to approximately $300,000. This estimate assumes that mechanical dredging from barges will be used for the project.

Option 5 would be to lower the lake level and bring in heavy equipment to scrape the sediments from the lake bed. While this method has been successfully used in some areas, there are a number of active springs on Linnie Lac. The potential contractor or equipment owner should determine the suitablity of the lake bottom to ensure sufficient support for the equipment prior to bidding. The cost estimate for this method is approximately $75,000.

Option 4 and 5 recreate the two channels for riparian access to Linnie Lac. Without flowing water through the channels, stagnant water may create a very unpleasant, and possibly unusable channels in relatively short time. Based on the drainage patterns in the area, the northwestern channel should end up with natural flows passing through the channel. However, there does not appear to be any significant flow on the northeastern area. To help keep this channel clear and functional, for both humans and fish and wildlife, the northeastern channel should be opened up to the existing drainage way just to the north.

Another possibility for dredging Linnie Lac would be to make the lake deeper overall. This would involve removing significant amounts of clay at much higher costs because of the difference in equipment needed and the difficulty in handling and disposal. This has not been presented as a final option.

Disposal Sites

Location of a disposal site often places a significant constraint on a potential dredging project. Criteria used in the selection of suitable disposal sites include: existing and proposed land use; the existence of a flood hazard; the existence of a primary environmental corridor; soil and slope limitations; areal extent; distance from the dredging site; and distance from a watercourse.

For a potential dredging project on Linnie Lac, disposal sites are extremely limited. Linnie Lac is surrounded by residential development on the east and south, the freeway and a nursery on the north and a gravel pit on the west. Discussions with the gravel pit operator indicated that they may be able to assist by taking up to 100,000 cubic yards of material. The proposed project size of 21,100 cubic yards is well within that limit. The close proximity of the gravel pit to the lake would keep transportation costs low. Permits for the disposal would be secured by the project sponsors and a legal agreement would need to be secured detailing the technicalities of the disposal.

Project Management

Undertaking a dredging project is a very time consuming job. The attention to the details of the permit process, the construction project, and contracts require good organization. If the residents decide to conduct a dredging project, there are a number of options. One is to create an organization such as a lake district or an association to handle the project. The advantage is that the costs are kept low and the control local. The disadvantages of not forming an organization include a lack of participation, extended project times based on volunteer limitations, and possible financial limitations.

Another option is to secure the cooperation of the City of New Berlin to manage the project. This would provide full time staff, although time limitations because of other current job responsibilities would exist. A disadvantage would be a potential lack of local control. There are many in the Linnie Lac community that believe the city has not done what has been necessary to protect the lake from the effects of erosion. A cooperative effort therefore might go a long way to improving the relationship.

A third option would be to hire a project manager. Some engineering firms offer project management services. There are also private consulting firms and some dredging contractors who are able to combine responsibilities. Although the advantage to this option is increased productivity and efficiency, the cost may prevent this from being an option.

Grants

Although there are a number of grants available to local lake groups , there are few that are given for dredging projects. Older lake programs provided extensive funds for dredging projects that had very short life spans. And the very low numbers of groups receiving benefits from the programs for very large costs, led to the end of those grants.

The Recreational Boating Facilities (RBF) grant program does provide funds for navigational dredging projects. There are constraints on the funds however. The grant will not provide cost share funds for whole lake type dredging, only for channels up to 50 feet in width. Additionally, the lake must have public access. While there are public lands on Linnie Lac, none of

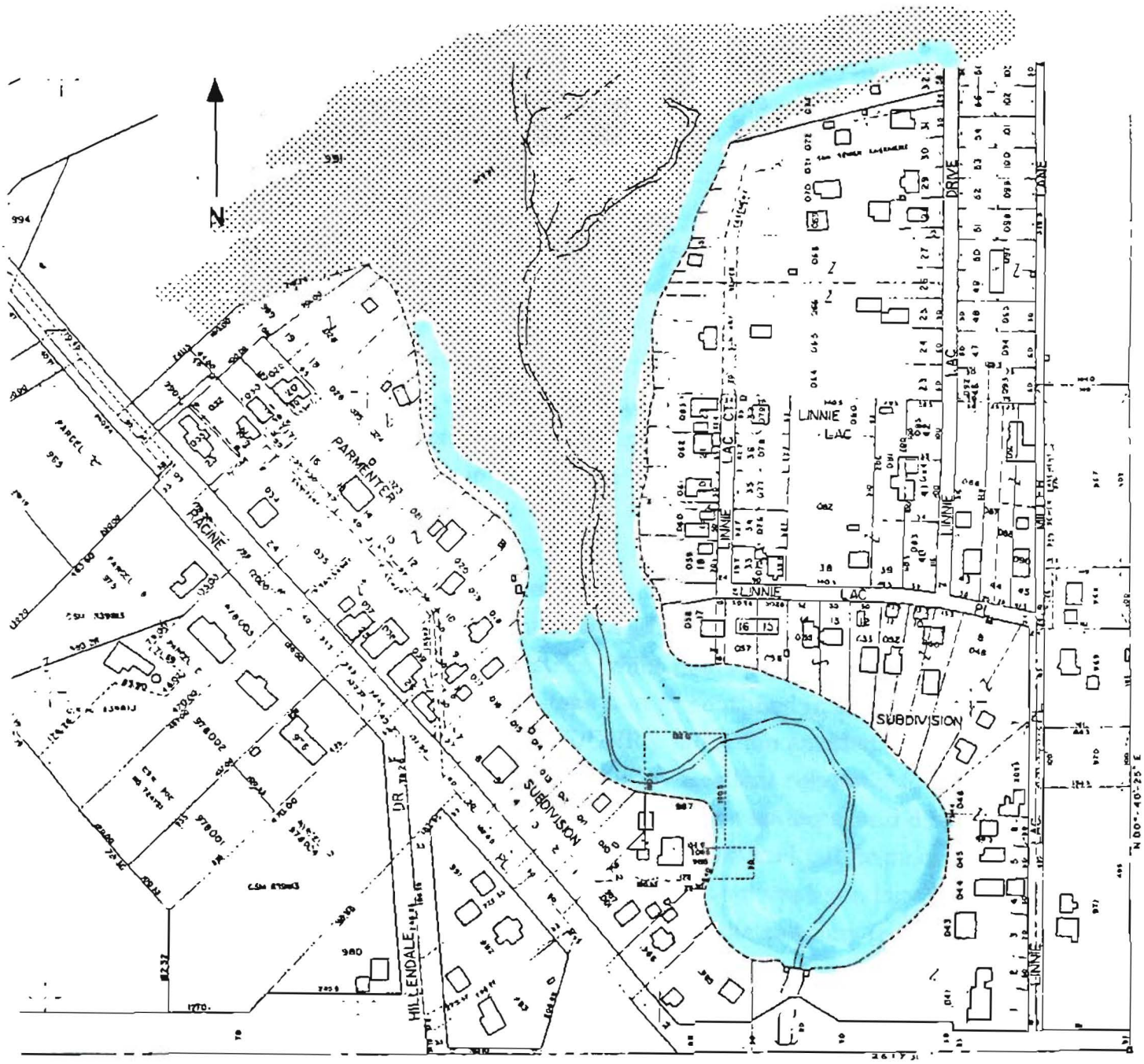
them are improved. There are no parking or ramp facilities. This would need to be corrected prior to applying for the dredging funds. The improvements to the public launch could be cost shared through this same grant program. Up to 50% of the cost of the improvements could be received under the grant program. The two applications could be submitted at the same time.

If the decision by the community is to proceed with the dredging project, negotiations should begin immediately with the Wisconsin Waterways Commission (WWC). The WWC administers the RBF grant for the DNR. The main discussion should focus on securing funds to pay for "a channel" from the cattail marsh to the dam. This would provide funds for approximately 1200 feet long, 50 feet wide by 6 feet deep, or about 6,700 cubic yards. This could provide up to $47,000 in additional funds. The State Senator and Representative for this area would be a good resource for grant assistance.

There are a couple of less likely sources of funds. One is the Federal Clean Lakes program. This is very difficult to acquire because only one or two projects in the state receive funding. One such lake is Wind Lake, at the lower end of the watershed. Linnie Lac may want to work with DNR to tie in with the Wind Lake project as a way to provide overall improvement in the watershed. The DNR water resource manager in Milwaukee can provide assistance with the Clean Lakes funds.

The second less likely source of funds would be secure a line item funding appropriation in the State budget. Although this type of funding is not very likely to pass through the entire budget process, state representatives and senators can assist with that option.

PROPOSED OPEN WATER AREA FOR LINNIE LAC



Cattail Marsh

Proposed Open Water Area, Including Channels

ORGANIZATION

The community survey attempted to determine the organizational structure that would be supported by the community and would allow for smooth implementation of project plans. There was no consensus. Almost half did not even respond to the question. Those that did respond were evenly split between a lake district, a lake association or no organization at all.

Any type of activity involving lake management requires some type of formal organization. Which one works the best depends a great deal on the problems, the people and the commitment of the people. The University of Wisconsin Extension in Stevens Point (UWEX) provides assistance to groups who want to organize. The UWEX has published guidelines that include the steps needed to form the organization, guidelines for developing bylaws and assistance in training organizational leaders.

Lake District

A lake district is a special purpose government unit that is created to deal with a specific cause, a lake. It is similar to a school district which only handles school issues, or a sanitary district which deals with sewage. A lake district is formed by following specific steps that are outlined in the Wisconsin Statutes Chapter 33. A UWEX/DNR publication entitled A Guide to Wisconsin's Lake Management Law, 1990 is an excellent reference for creating a lake district. Petitions must be circulated to residents, and district boundaries need to be established, usually by holding several public meetings to work out the perimeter of the district. All lands within the boundary are included in the district. Once the district is created, a district may then elect a board of commissioners, develop a budget and propose projects and expenditures. An annual meeting of all residents and property owners within the boundaries have a vote at the annual meeting. The annual meeting must approve all major projects and expenditures. The annual meeting also determines the method used to raise taxes and how much should be raised.

Lake Association

A lake association is usually a much more informal organization. It can be very structured or very loose. Often lake associations develop bylaws and

become incorporated. They can then apply for non-profit status through the IRS.

An association is a voluntary organization. Anyone who wishes to contribute time, effort or funds may do so, but there is no formal recourse if someone who will benefit from a project refuses to contribute.

Other Methods

Occasionally a group may decide to request formal cooperation from a city or town. If a large percentage of the landowners support an activity, such as a private road improvement or in this case dredging, the city could then assume responsibility. The city would then conduct the project and assess all the landowners on the basis of their benefit from the project. The advantage of this is that the project could begin much sooner than if another organization had to be created first. A successful project could lay the foundation for further organizational efforts by the community. A disadvantage is that once the activity is complete, there is no organization to conduct other potential projects. The success of educational efforts in the immediate Linnie Lac area and in the larger community of New Berlin will often depend on the work of small organizations like associations or lake districts.

Another option is to solicit cooperation from the Little Muskego Association or Lake District. There has been concern expressed that the Little Muskego area would blame Linnie Lac for pollution problems. However, Linnie Lac is clearly a victim of pollution and it is highly unlikely that it is a source. Most of what enters Linnie Lac passes right on through it.

Other Options

Although chemical treatment is not a popular choice with local residents, some have indicated that their area would be much more pleasant if something could be done with the weed condition. Currently weeds choke off much of the lake surface. Algae accumulates on the weeds, and the lake then becomes stagnant and odiferous. Improvment of the aquatic plant community will not provide any relief for the sedimentation problems.

Small scale treatment of milfoil in the lake using a chemical specifically for milfoil, combined with planting native aquatic plants may be beneficial. Shoreline areas could be planted with sedges and rushes to provide cover for wildlife. Deeper water areas could be planted with pondweeds to provide food and shelter for fish and wildlife. Native plants such as pondweeds do not tend to choke out a lake like milfoil does. Plants can be dropped from a boat and left to fend for themselves. Local companies that specialize in wetlands can work with a group to develop a plan for planting. This could include work in the cattail marsh to improve the quality of plants and habitat.

Any use of chemical treatment in a lake or wetland needs a permit from the DNR. Contact the Milwaukee office of the DNR at 263-8500 to acquire application forms. Although plants can currently be placed in a lake without a permit, there have been attempts to legislate control of that activity. It is always a good idea to work closely with the DNR water resource personnel or water regulation and zoning personnel to get their input on a project.

Once an organization is formed there a number of educational projects that should be undertaken. Educational efforts should target different segments of the community, from lakeshore residents to city elected officials. Materials and support are available from DNR and the UWEX. Some of the publications that are available are provided with this report. Also, the organization should be a watchdog for local land use decisions. The group should also work with the DNR to ensure that the gravel extraction complies with the requirements to protect water quality.

Priority Watershed Project

The Priority Watershed Project (PWP) has the potential to have a significant impact on the Linnie Lac area. A copy of the watershed plan is included with this document. Activities conducted over the next eight years will be focused on reducing the amount of nutrients and sediments that enter the streams and lakes in the watershed. Cities and towns will be asked to put in place measures such as erosion control ordinances, storm water ordinances and plans, street cleaning measures, and other activities designed to improve water quality. The Linnie Lac community should work very closely with the

City of New Berlin to be sure the necessary activities are undertaken and to ensure the greatest level of success for the project.

SUMMARY

This report documents the findings of a study requested by the City of New Berlin. The report documents the results of the community survey, a sediment survey and makes recommendations for a dredging project to improve the conditions on Linnie Lac.

What the future holds for Linnie Lac depends upon the desires and the level of committment the residents and landowners have. Regardless of where or how the problems originated, the solutions must come from the local citizens. The DNR can provide assistance and funds, but are not in a position to fix the problem without local support and effort. The DNR will work with groups that show themselves to be serious about their goals. If there are strong wills and steadfast determination, changes can be made to improve the lake. It will take serious effort to bring about these changes, but the result will be an improved water resource. The level of activity in the watershed known as Wind-Muskego watershed, is very high and is highly conducive to further activities that are water based.

LINNIE LAC COMMUNITY SURVEY

YOUR LAKE PROPERTY

1. Why did you choose property on this lake? (List the letter of your top three reasons in order of importance.) 1st____ 2nd____ 3rd____

   A. Distance to job
   B. Cost of property
   C. Because of neighbors
   D. Recreational value
   E. Other _____

2. The property you own is:

   A. Year round residence
   B. Seasonal residence
   C. Vacant land
   D. Rental income

3. How long have you lived (or owned property) here? _____ years

4. Approximately how many feet of lake frontage do you own? _____ feet

5. How many of the following watercraft are kept at your property?

   _____ Canoes _____ Sailboats _____ Rowboats
   _____ Jetskiis _____ Rafts
   _____ Motorboats, please indicate the HP: _____

6. Which of the watercraft you listed above are used on Linnie Lac?

   _____ Canoes _____ Sailboats _____ Rowboats
   _____ Jetskiis _____ Rafts
   _____ Motorboats, please indicate the HP: _____

7. Do you use Linnie Lac in summer? _____ Yes _____ No

   For what activities:_____

8. Do you use Linnie Lac in winter? _____ Yes _____ No

For what activities:_____

9. Which best describes your properties location: *check one*

_____ open water frontage
_____ cattail frontage
_____ cattails, but accessible by water
_____ off-lake with access
_____ off-lake without access

10. If your property is located off of the lake, does your deed provide for access to the lake?

_____ Yes _____ No _____ Don't Know

Do you know where the access is?

_____ Yes _____ No _____ Don't Know

Do you use the access?

_____ Yes _____ No

YOUR BACKGROUND

11. What is your present occupation? _____

12. How many years of formal education have you completed? _____years

13. How many adults are there in your household? _____

14. How many children (under 18) are there in your household? _____

15. Do you subscribe to any local newspapers? *check those that apply*

_____Muskego Sun _____New Berlin Citizen
_____Enterprise _____Milwaukee Journal
_____Other *please specify*_____

16. Have you heard of the Priority Watershed Project?

_____ Yes _____ No _____ Don't Know

If you have, do you think the program will improve the quality of runoff entering Linnie Lac?

_____ Yes _____ No _____ Don't Know

IN YOUR OPINION

In this section please describe any changes you may have seen in each of the categories below:

17. What change, if any, have you seen in the amount of sediment on the lake bottom?

18. What change, if any, have you seen in the amount of open water on the lake?

19. Please describe any changes may have you seen in wildlife?

20. What change, if any, has there been in how you use Linnie Lac?

21. In your opinion, should something be done to improve Linnie Lac?

22. Do you believe that improving Linnie Lac will affect your property values?

A number of ideas have been discussed regarding the future of Linnie Lac. Please give your reactions to them.

23. Chemical treatment: A number of lakes conduct chemical treatments to control the excessive in-lake plants and algae. A DNR permit is required to treat the plants. Do you think Linnie Lac residents should consider chemical treatment?

_____ Yes _____ No _____ Don't Know

Why/why not?

24. Dam removal: Many years ago, Linnie Lac was created when the dam was put in. One option is to remove the dam, and return Linnie Lac to a river. A river would provide different uses than the lake currently does. In your opinion, is this option worth pursuing?

_____ Yes _____ No _____ Don't Know

Why/why not?

25. Under certain conditions it may not make sense to undertake major changes on Linnie Lac. In your opinion, what might the "certain conditions" be?

_____

_____

_____

26. Public Access: How do you rate the public access to Linnie Lac?

_____

_____

_____

Do you think public access should be changed?

_____ Yes _____ No _____ Don't Know

And if so, how?

_____

_____

27. If it was required to secure financial help for a project, should public access to Linnie Lac be improved ?

_____

_____

_____

28. Lake Management: What type of organization do you believe is needed to rehabilitate Linnie Lac:

_____ Lake District
_____ Lake Association
_____ None
_____ Other *please specify* _____

29. What role do you think the city should play in rehabilitating Linnie Lac?

_____

_____

_____

30. Would you support dredging all of Linnie Lac?

_____ Yes _____ No _____ Don't Know

Why/why not?_____

_____

_____

31. Would you support dredging part of Linnie Lac?

_____ Yes _____ No _____ Don't Know

Why/why not?_____

_____

_____

If you think dredging should be done please indicate on the enclosed map where your property is, and where your believe the dredging should be done.

32. If you believe Linnie Lac should be dredged, how deep should it become?

_____

30. Do you have anything else you would like to comment on regarding Linnie Lac? *Attach additional page if necessary.*

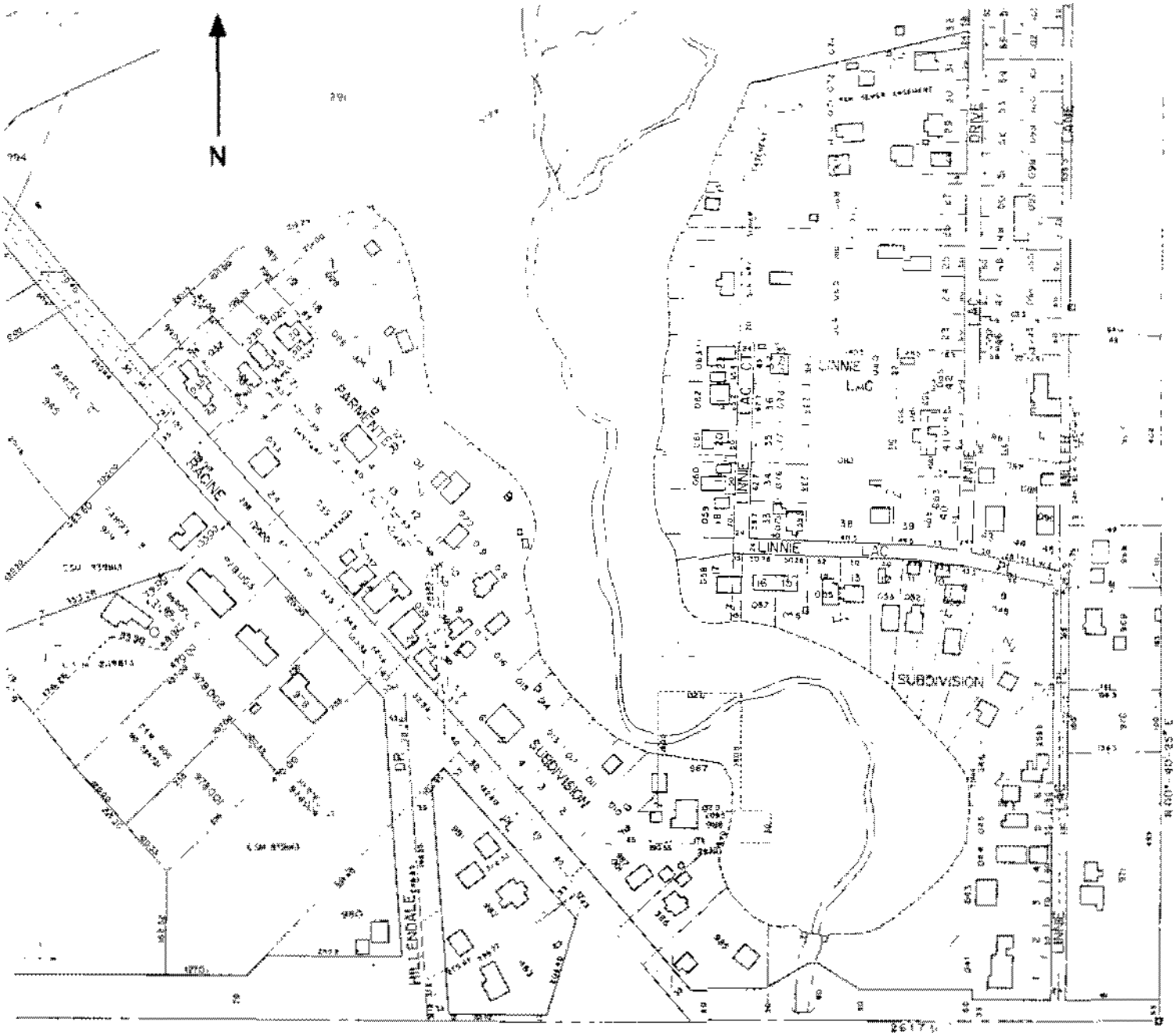
_____

_____

_____

_____

If you think dredging should be done please indicate on this map where your property is, and which areas of the lake you believe should be dredged..



LINNIE LAC COMMUNITY SURVEY

YOUR LAKE PROPERTY

1. Why did you choose property on this lake?

	1st	2nd	3rd
Distance to job	4	6	2
Cost of property	18	8	3
Because of neighbors	2	4	6
Recreational value	1	3	4
Other	12	6	4
Other includes:			
Inheritance	3		
Like the water, once was nice	1		
House layout and yard	1		
Evicted	1		
Values we were seeking	1		
Solitude, peace, quiet, nature	1		
Stay in area	1		
Don't live near lake	1		
Location, off free-way		1	
Like New Berlin area		1	
Family here for years		1	
Thought we could use lake, but can't		1	
Grew up in area		1	
Built on family's land		1	
Location, near end of road			1
Country atmosphere			1
Possibly a clean lake in the future		1	
General location			1

2. The property you own is:

Year round residence	32
Seasonal residence	0
Vacant land	5
Rental income	1
No Response	2
Total	40

3. How long have you lived (or owned property) here?

0 - 5 Years	6
6 - 10 Years	3
11 -15 Years	5
16 - 20 Years	8
21 - 25 Years	2
26 - 30 Years	3
31 - 40 Years	7
41 - 50 Years	4
55 Years	1
No Response	1
Total	40

4. Approximately how many feet of lake frontage do you own?

< 100	Feet	10
100 - 150	Feet	9
151 - 200	Feet	3
400	Feet	1
None		11
No Response		6
Total		40

5. How many of the following watercraft are kept at your property?

Canoes	4
Sailboats	0
Rowboats	5
Jetskiis	0
Rafts	0
Motorboats	7
h.p.: 55, 6, 330	

6. Which of the watercraft you listed above are used on Linnie Lac?

Canoes	3
Sailboats	0
Rowboats	2
Jetskiis	0
Rafts	0
Motorboats	0
Paddleboats	1

7. Do you use Linnie Lac in summer?

Yes	11
No	24
No Response	5
Total	40

For what activities:

Fishing	5
Enjoy wildlife	1
Boating	1
Swimming	1
For blocking view of freeway	1
Just for view	1
Watching people fish	1
No water, all cattails	1
Paddle around lake until weeds grow in	1
Recreation	1
To live, water area is not useable	1
Used to fish years back	1
We can't use it, water is only 6 inches deep in places	1

Enjoy the scenery one month in spring and one month in fall when there isn't weeds covering the water. Unable to use for any real recreational purposes.

I don't use the land but would like to improve the lake so the land would have more value

Sometimes fish for weed bass & stunted algae monsters or abnormal things in lake

8. Do you use Linnie Lac in winter?

Yes	16
No	20
No Response	5
Total	40

For what activities:

Ice skating	12
Fishing	2
Cross country skiing	1
ATV/snowmobiling	3
Sledding	1
Scenery	1
To live, water area not usable	1

9. Which best describes your properties location:

open water frontage	13
cattail frontage	10
cattails, but accessible by water	3
off-lake with access	2
off-lake without access	8
No Response	4
Total	40

10. If your property is located off of the lake, does your deed provide for access to the lake?

Yes	2
No	3
Don't Know	7
No Response	28
Total	40

Do you know where the access is?

Yes	3
No	4
Don't Know	5
No Response	28
Total	40

Do you use the access?

Yes	0
No	11
No Response	29
Total	40

YOUR BACKGROUND

11. What is your present occupation?

Retired	12
Admin. support	4
Precision Production	3
Production	3

Professional	2
Technical	2
Trans., Mater Handler	2
Mechanics, Repairers	1
Construction	1
Sales Occ	1
Homemaker	1

12. How many years of formal education have you completed?

< 12 Years	4
12 Years	17
12 - 14 Years	6
> 14 Years	4
No Response	9
Total	40

13. How many adults are there in your household?

One Adults	10
Two Adults	18
Three Adults	7
Four Adults	1
No Response	4
Total	40

14. How many children (under 18) are there in your household?

No Children	23
One Child	5
Two Children	3
Three Children	3
No Response	6
Total	40

15. Do you subscribe to any local newspapers?

Muskego Sun	1
New Berlin Citizen	13
Enterprise	8
Milwaukee Journal	22
Other:	
Waukesha Freeman	8
Sentinel	1

16. Have you heard of the Priority Watershed Project?

Yes	13
No	17
Don't Know	9
No Response	1
Total	40

If you have, do you think the program will improve the quality of runoff entering Linnie Lac?

Yes	6
No	4
Don't Know	17
No Response	13
Total	40

IN YOUR OPINION

17. What change, if any, have you seen in the amount of sediment on the lake bottom?

More sediment	20
None	4
Don't know	2

In 1954 it was about 20 feet deep, now it is only 4 feet deep.
Before we moved in 1951, it was beautiful.
There is getting more as the lake fills and the cattails move toward the dam.
There is more sediment than water. We had 4 feet of water in front of us, now we have nothing.
Lost water front
There is a lot more every year.
About 4 feet of sediment has built up in the last 14 years.
More of it, less depth.
An increase in sediment 2
There is more sediment each year. Lake gets more shallow, can see a brown stream going through after a rain.
More and more each year. When I moved in I had water, now I have marsh and cattails.
Filling up rapidly for past several years.
Originally this lake was clear and transparent, a wonder to fish and a pleasure to swim in as a child.
In the 12 years I have lived here, I think the lake has lost a lot of water depth.
When I moved here the lake was 31 feet in the center.
Cattails continue growing further south.
There has been lots of sediment in the lake.
Can't tell you, can't see the bottom with the cloudy water and weeds.
I do not walk in the lake, therefore I do not know.
The sediment is bad.
Lots, Lake is now very shallow with muck bottom over most of it.
About 5 - 10 feet.

18. What change, if any, have you seen in the amount of open water on the lake?

None	4
Less	2

Since the lake was poisoned some years ago, I believe the open water was reduced about 40%.
The lake was once 27 acres, now it is only 5 acres.
It grows over the summer.
It was wide open after freway 43 started. There is lots of dirty brown water flowing after a heavy rain.
Its shrinking/getting smaller. 4
There is less every year, and every year it changes faster.
Open water is disappearing.

Decrease of about 1/4 the surface area due to cattails.
Not lived here long enough.
It seems to have gotten smaller.
It has decreased, especially in early and mid summer.
Choked with weeds.
Lake has diminished from 25 acres to 5 acres of open water.
More cattails in some areas.
Less and less each year.
Every spring and summer it seems there are more weeds than the following year.
The lake is obviously shrinking, places where the kids canoed they can't get in. We can longer ice skate from our property to the main lake anymore.
The back end of the lake is completely impassable. Before you could canoe or row all the way back.
There has been a lot of change.
I would say that it has decreased by 20 to 30 feet with cattails growing further out of the marsh.
It varies from year to year.
About 2/4 less water.
Half or less.
Open water is getting less and less.
None, except for our shoreline, I have started to remove cattails.

19. Please describe any changes may have you seen in wildlife?

None 8
Wildlife has been reduced drastically
There once was turtles, frogs, muskrats, and snakes. Now you don't see or hear any of these anymore.
Wildlife remains, fish growth seems stunted except for carp.
Because of the wetland conditions we now have, there is more wildlife such as deer, geese and ducks.
Fewer ducks and now the blue heron that walked my shoreline walks in the middle of the lake.
Lots of geese and ducks use our pond.
None, I can't see. Too many cattails.
There used to be different fish in the lake, now the only thing I've seen is carp.
Less game fish, more carp. We no longer see mink like we did a few years ago.
Hardly any ducks anymore, fish not edible anymore.
No frogs. Use to be a good fishing lake. Few turtles, few muskrats.
Less fish and other water life.
We used to see ducks with young wandering through our yard.
The fish aren't as big or as plentiful as before.
More geese, muskrat, occasional sanbill cranes, egrets.
Haven't seen egrets for a few years. Fewer herons, a lot fewer frogs.
There are not many ducks and no frogs around.
I have seen the ducks increase but as the weeds take over they move on to more open lakes.
Amount of geese using the lake has increased.
Wildlife is sparse, the only fish is carp.
Few ducks and geese. No fish.
Not much.
Ducks and geese.

20. What change, if any, has there been in how you use Linnie Lac?

None 9
I don't use it 6

We don't live at the lake but we pass the lake every day. After heavy rains the brown water flows over the dam.
When we were youner we used the lake often, never use it now.
None, except it it getting ugly.
I won't let my dog swim in it anymore, no will I eat the fish, or swim in it myself as I used to do.
No change, its been bad water quality since we moved here.
Don't even fish there anymore as water looks too bad.
When I was a child we skated on the lake, now I don't allow my children to.
We used to do more fishing but it is almost impossible with the weeds and I've seen a change in water quality. It is more murky.
Can't swim, too yucky.
No longer fish or swim, not am I entertained to see others enjoying themselves.
Less pleasing to look at.
It looks so bad we seldom go near it. Years back we always skated and hiked around it.
Haven't swam in it for years.
I never use in in the summer. You can't row a boat with all the weeds. You can't fish or swim.
I never tire of the beauty and wildlife on Linnie Lac
This lake is not being used because we can't
I can't use it, no water at my frontage
We used to fish, swim, skate on the lake and be able to eat fish.

21. In your opinion, should something be done to improve Linnie Lac?

Yes	13
No	3
Yes. . . .	16

Close the gravel pit, a river of light brown sediment flows in like a river of mud after it rains. The sediment looks like the gravel pit.
Pull the dam
Should be dredged 2
By all means bring back life of all lakes, regardless of their size
I would like to see more clear water, without weeds and sediment
Stop the chemical lawn treatments
Dig out the middle and let it go to a stream
It would be nice
Put it back the way it was.
I love the lake as it is, however, if it can be improved without undue economic hardsh to the people who live in New Berlin, lets go for it.
If the lake was cleaned up I'd probably use it or be able to take my children down for some outdoor activities.
I feel it would improve the environment, especially wildlife and we would like to use it for recreational purposes.
Without a doubt
Dredging and erosion control up stream, specifically from the tree farm.
Definitly, Its a shame to see a beautiful lake like this once was, destroyed by carelessness of industries in our area.
In the past there have been attempts but have all fallen at the wayside due to lack of funds.
After talking with the alderwoman, I'm not sure how much could be improved at this time.
First my creek should be weeds destroyed whereas the weeds flow with heavy streams and settle in our creek. The lake will come again if heavy rains come with brown water.

22. Do you believe that improving Linnie Lac will affect your property values?

Yes	13
No	4
Don't know	2
Yes. . . .	9

I don't mind that
It would improve the property. It would also put hardship on the elderly becuse of increased property taxes. \
It will bring up the property value
Of course it will
Definitely for the better
I'm sure that it would
But hopefully not to the point of losing it to the city because of high taxes
Lake property is always worth more.
I do feel it will improve our property and its value
Possibly
I think so, for those who live at the lake
Depends on the extent of the improvement
My property value may go up slightly. But if I don't figure on selling my taxes will increase greatly
I suppose so. As it is, certain times of th year the water loods terrible.
I would think so. Maybe not the value of some of the older homes, but the property they sit on.
I doubt it, but it will improve our retirement years.

A number of ideas have been discussed regarding the future of Linnie Lac. Please give your reactions to them.

23. Chemical treatment: A number of lakes conduct chemical treatments to control the excessive in-lake plants and algae. A DNR permit is required to treat the plants. Do you think Linnie Lac residents should consider chemical treatment?

Yes	4
No	20
Don't know	9

Why/why not?

I don't like chemicals in water
Its been poisoned several years ago and nother has been done about. Now all we have is cattails. It used to be open water, no more wildlife.
It won't do any good the lake is too shallow.
Will this help in any way to increase the recreational value of Linnie Lac? What will it do for the fish population?
Chemicals kill people as weel as plants and algae
As long as our creek, out of weeds from runoff the road, the lake will be clean.
Because the condition of this lake is far beyond being improved with just chemicals
I am not paying again. I paid my share on the dam and was lied to, the lake was never raised and all athey did was put cement around the rock dam that was there.
It would increase the looks of the lake
Killing water plants will cause all the silt to go into Little Muskego
I don't like chemicals. Would support natural way to clean up plants and algae. Wbant to keep ducks and geese coming back.
Short term solution
It only kills the tops of the weeds, adding fertilizer for more

Chemical treatment is only temporary, when the water clears, more plants will grow, a costly bandaid.
We have already tried this
Don't like the use of chemicals and they will feed into Little Muskego Lake.
Lake shallow now. This temporary fix would be foolish and surely a waste of money to say the least.
As long as it does not contaminate the ground water.
Need to know more about it
The sediment is the problem, not the weeds
Is it natural?
I feel it would look better, return some wildlife.
It has to be dredged out
There is too much sediment

24. Dam removal: Many years ago, Linnie Lac was created when the dam was put in. One option is to remove the dam, and return Linnie Lac to a river. A river would provide different uses than the lake currently does. In your opinion, is this option worth pursuing?

Yes	5
No	22
Don't know	7

Why/why not?

I want to live on a lake and enjoy it
What use would a river provide?? Linnie Lac residents paid for the dam. Why not leave as is.
It won't work
What effect will this have on prperties further down the line(flooding) will we still have water in the lakes or will we have a trickle? For thsoe who use it, will there still be a fishing spot?
I think it's better to keep the dam, as the people who live at the lake, would enjoy the lake.
That's not the answer to cleaning a lake. Why get tid of a lake that could serve as a perfect recreational spot for people of all ages, especially children
You destroy the wildlife area you now have.
If the lake couldn't be brought back, this is a great idea. At least it would look a lot nicer.
Removing the dam would leave a concrete ditch which would do damage downstream from silt runoff and would also lower the local acquifer and local wells would suffer.
Because we want to live on a lake not a river
Didn't they just repair it?
This little lake is spring fed. There are still several springs around. Through the years it has been uncared for. I think if the dam were taken out we would have nothing more than a ditch.
If you removed the dam we would not have a river but a small creek that possibly would dry up
Would much rather have a lake than a river (if it's cleaned up). Would fish again in a lake.
You say a river and I say a drainage ditch
Definitly against dam removal. I think this would affect our water tables and it also would not lood good.
This would leave a lot of waste land where the lake is now.
The river would be too small for any uses.
Probably would benefit nature.

Because no matter what happens to the dam, that land will be in a flood plain.
I like the privacy and wildlife the lake provides, wetlands are at a premium. To destroy the beauty of Linnie Lac is a horrid thought.

25. Under certain conditions it may not make sense to undertake major changes on Linnie Lac. In your opinion, what might the "certain conditions" be?

Leave as is
Don't know 3
More cost to the landowner than land is worth. But I do not live there
If the lake has filled with sediment over the years and has hardened is it not worthwhile both recreationally and financially to do major changes?
My out of pocket expense
If not taking out the sediment, the weeds wil lbe there always. Yes if cast to clean our
Would need to be presented with any conditions existing
If I have to pay one cent for it
Cost in dollars and cents. Not enough money around Linnie Lac to do anything major. Until major silt areas are found and stopped.
Cost, this is the biggest draw back. Increase in taxes.
Silt should be removed.
Residents of the area are not financially able to undertake such a project.
This area of New Berlin will not improve real estate-wise if pond is not improved. Will remain low income and poor upkeep by many owners.
Excessive expense to current homeowners
Cost and how long it will last
If we don't do something, we will be losing one of the beautiful spots in New Berlin. As it is I see many cars stop and sit a while to enjoy it
Cost
In that case let well enough alone and never, never bother to bring this subject up again.
If the cost of a project would cost too much
Lack of funds
What would be the point in trying to improve. Make larger?
Opening the area to more motorized traffic, be it watercraft, ATV, snowmobile, etc
Removal of the dam and excess economic hardship on property owners in the area
Clean it Up
Too costly
Expense. I have no desire to use Linnie Lac

26. Public Access: How do you rate the public access to Linnie Lac?

Good 3
Is none 4
Don't know 6
Access points need to be marked and shrubs removed.
It is residents responsibility to lake. If public access to lake, they will voice that they have the right to do with the lake
I believe that they were all sold to the people that lived beside them
We don't know where it is
Fair to good
There are a couple of places
Poor, not too many people know where it is
Very hard to locate
It could be utilized and there is access on both sides of Linnie Lac
Its been let go and grown over. If we had a lake again they would have to be kept up
I hope there isn't one
Perfect
Linnie Lac is not conducive to public access

Do you think public access should be changed?

Yes	8
No	14
Don't know	11

And if so, how?

If I recall there was an access on the north end, reopen it. Kids should be able to fish and swim in it.
Parking needs to be at all access to lake
Only if it is dredged could one be created
Pond is too small for public access. If one is created, should be no motors only
It should be marked and improved
Not unless they develop the lake to a size that can handle motors
Cleaned up and signs put up
Cleaned up, perhaps a city owned lot others could use with some parking
What for?
No access
I think they just have to be cleaned out
There shouldn't be any

27. If it was required to secure financial help for a project, should public access to Linnie Lac be improved ?

Yes	6
No	2
Absolutely	2
Don't know	5

If this will help with cost factor, yes.
The residents at the lake enjoy watching, fishing, while we don't live at the lake. I think they should take care of the lake.
The streets around Linnie Lac wouldn't be able to handle it and there is no parking on the streets
Other than parking areas no.
yes first fix linnie lac
Might need some work as clearing away brush that has grown up over the years.
If thats what it takes
By all means let it be done and let us do it as soon as possible before the project slips quietly into obscurity as it has done so many times before.
I don't really understand how public access to the lake and financial help for a project go together.
There is no reason not to have public access but where
No motors
It depends on what would be involved

28. Lake Management: What type of organization do you believe is needed to rehabilitate Linnie Lac:

Lake District	7
Lake Association	6
None	5
City	2
State	1
No Response	19
Total	40

29. What role do you think the city should play in rehabilitating Linnie Lac?

They approved new construction that contributed to lake filling in, they should pay 33% of clean up and charge new construction also
None
Alot
Let's pursue the other things as to feasibility. If ,changing it for improved recreation is available then the city will probably want to be involved, the area becomes viable and a source of bucks
The city should have some financial responsibility since the public would be using it if it were clean.
If they want the lake Rehabilitated from years of filling up let them pay for the whole cost
Find out where all the silt is coming from that enters Linnie Lac
Financial- as I think they are parcially responsible for the sediment through all the building x-way and channeling the runoff into Linne Lac planning and public improvement
Totally finance the project
The freeway project dumped tons of sediment into the lake and so has building in New Berlin.
I think the city should be very financially supportive.
The taxes of people in this area have been going towards improvements in other areas. Also city failed to regulate erosion control to keep pond from filling in. since they are responsible they are responsible for some of the damage, they should help pay for needed improvements.
The city's plan is to pretend Linnie Lac doesn't exist. They'd rather look at new subdivision and say this is New Berlin. They need to improve this corner of New Berlin so we all feel like one community
I feel it should be part of their responsibility, because of the growth of the city it was destroyed and I feelthey should help restore it
City should come up with a way to help financially
I think the city of New Berlin should be more involved with wanting to do something with cleaning up the lake. I think they need to take a leadership part as local action hasn't worked. The city should pay for it because it was city businesses and properties where the runoff came from.
Controlling runoff between the state and city they should take care of it.
75%
I think the city should shoulder the lions share of the expense. Because they have been remiss in their duties to protect this lake
Full role
Large-city approved I-43, construction had a lot to do with speeding up the filling up of the lake with sediment, Heavy rain over a large exposed area that the rain via creek into the lake.
A large part, put some money in this side of town.
All of it

30. Would you support dredging all of Linnie Lac?

Yes	20
No	4
Don't know	4
No Response	12
Total	40

Why/why not?

I am on social security and I dont feel I can afford extra expense.
Because everyone that used to have water should have water again.
I think to support dredging lake by residents financial help so the lake will be big.
The lake should be brought back to its original size.
I am not paying
Too costly
Not with my funds
Dredging will not only improve the local water quality, but will also improve habitat locally and down stream.
No use doing a half job and let it fill in again.
At one time Linnie Lac was a beautiful area and because of the city growth ,and development we have lost, it and I feel it would be beneficial to all to try and restore it
Because thats the only way to get a clean lake again in my opinion
To open up to the original water area
Its the only way to return it to its natural state.
Make to original size
Where I live we have no water why should I pay to clean the lake and only half done.
It would depend on the economic implications.
Just to clean it up, but before dredging to find out where the problem begins.
Can't afford it
No value to me

31. Would you support dredging part of Linnie Lac?

Yes	10
No	15
Don't know	9
No Response	6
Total	40

Why/why not?

All or nothing 2
Do it all
If you are going to do the job, do the whole lake not just part of it.
If there is logical purpose for it, not if it's Lets try and see if it helps.
If dredging part of lake, it may be repeated the same as present.
Anything would be better than nothing.
It would be a start.
I am not paying
We need more depth to control weeds.
Not with my funds
If not possible to dredge all, make a river around owners property
If this is what they feel is better than doing the entire lake.
All or nothing But we must provide north end of lake owners at least a channel to main lake.
It does not make sense to me to dredge just a part of it, everyone around the lake should be helped out.
Some is better than none but what about the other property owners.
It would do no good to do part it.
Would be waste of money.
If it is going to be done do it all not just a part of it.
No value to me

32. If you believe Linnie Lac should be dredged, how deep should it become?

15 - 20 feet
Leave as is
Fifteen or twenty feet deep.
Yes, I believe that Linnie Lac should be deep, about 10 feet.
Deep enough for the bottom to be nice
Original depth 15 to 20 feet
8 to 10 feet 12 feet
35 feet the way it was before the freeway.
Deep enough for fish life to develop and survive.
25 feet
I would think back to the original depth.
I feel it should be restored to its original state or close to it existing creek bed bottom
Ten feet from solid bottom to surface is good.
Fifteen feet from bottom to surface to avoid winter kill of fish would be exceptional
At least 8 to 10 feet.
15 feet
Until all sediment is removed
Original depth
Deep enough to stop the weeds from growing back.
5-10 feet
If done deep enough for fishing and small boats
Back to natural depth

33. Do you have anything else you would like to comment on regarding Linnie Lac?

State should also pay 33% they put freeway in and never silt screened it contributing to part of problem
IIf gravel pit does not close
Its been 18 yrs since we have lived in the area of Linnie Lac. but I've always thought it was an asset to the area and would like to see it preserved
I like living, here. I do enjoy the scenes. Changes in regards to Linnie Lac and if it has the potential for increased fishing, then it is probably worthwhile to pursue it.
No out of pocket expense to property owners
I tried to clean out my creek often, but give it up because of the water from runoff the road and from gravel pit afterheavy rain.
I tell you the truth, before the freeway came we never had trouble with weeds in our 42 years.
City and state should be involved financially Everybody around the lake would not have to pay. It would be only the people that live in the old John Block subdivision again that would have to pay the cost of dredging. It is not within the financial means of most people on Linnie Lac.
It would be a real shame if it was just left-it would totally close up and be unsightly and smelly and possibly unsanitary.
This was once a beautiful pond, deep and clear now because of construction and tree farm runoff of many years it is a sad sight.
If the lake is restored it should be monitored.
There used to be more Wildlife that you don't see anymore
I would just as soon leave the lake as it is, rather than remove the dam and have a little river running through it.
Linnie Lac is a historical part of New Berlin to bad we don't take history more serious. Its a beautiful natural place

S-F ANALYTICAL LABORATORIES, INC.
A Subsidiary of Sommer-Frey Laboratories, Inc

Aron & Associates
26111 West Loomis Road
Wind Lake, Wisconsin 53185

March 11, 1993
Project #93-0583

Attn: Kathy Aron

Sediment Analysis

Mud collected 3-2-93

Total Organic Carbon, mg/Kg	8,100
Total Solids, % wt.	29.54
Arsenic as As, mg/Kg	8.69
Copper as Cu, mg/Kg	9.07
Potassium as K, mg/Kg	704
Ammonium Nitrogen, mg/Kg	54.6
Nitrate Nitrogen, mg/Kg	4.20
Nitrite Nitrogen, mg/Kg	1.45
Total Kjeldahl Nitrogen, mg/Kg	131.0
Total Phosphorus as P, mg/Kg	25.4

reference: Test Methods for Evaluating Solid Waste, USEPA, SW-846, 3rd Ed.

Gary G. Geipel
Senior Analyst

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(414) 475-6700 FAX:(414) 475-7216

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SEWRPC STAFF MEMORANDUM

TO: Files

FROM: David B. Kendziorski, Principal Planner

DATE: August 16, 1988

SUBJECT: Meeting to Discuss Aquatic Weed Problems on Linnie Lac, City of New Berlin

Introduction

At the request of State Senator Lynn Adelman, representatives of the City of New Berlin, Wisconsin Department of Natural Resources (DNR), and the Regional Planning Commission met to discuss potential methods to control excessive aquatic plant growths on Linnie Lac. Lake residents have been concerned about the declining water quality, excessive plant growths, and unusable surface water for several years. One lake resident offered to contribute financially to the City or DNR to assist in rehabilitating the lake. The meeting was attended by Mr. Steven K. Hoese, Community Development Director and Mr. John P. Graber, City Engineer, from the City of New Berlin; Mr. Neal T. O'Reilly from the DNR; and Mr. David B. Kendziorski from the Regional Planning Commission.

Background

According to some lake residents, Linnie Lac was larger and deeper many years ago. Some residents indicated that the water surface had been as large as 20 acres in the past. Based on a 1967 hydrographic map, the lake was four to six feet deep 20 years ago. The lake now appears to have a depth of two to three feet at most locations. However, the surface area of Linnie Lac apparently has not changed significantly over at least the past 30 years, except for a few years in the 1960s when the outlet dam collapsed. Based on measurements made by the Commission staff, Linnie Lac had a surface area of 5.1 acres in 1956; 8.5 acres in 1963; 5.4 acres in 1967; 7.0 acres in 1970; 6.9 acres in 1975; 6.4 acres in 1980; and 6.7 acres in 1985. The surface area of the lake varies considerably in response to the water level because of the low elevation of the adjacent wetland just north of the lake.

The lake's surface area is nearly covered with weeds, and some fish reside in the lake. During dry weather, the water is relatively clear at the downstream end near the dam. At the upstream end of the lake, the water is turbid, with a high solids concentration. The few pockets of open water contain floating algae. The lake has been filled in by sediments contributed by upstream sources and by the deposition of aquatic plant remains. Sediments are contributed mainly by two inlet streams: one from the east, which drains urban subbasins which do not have sanitary sewer service; and one from the west which receives wash water from a nearby gravel pit. The lake residents have sanitary sewer service. The lake has a large watershed--about 5,340 acres--as shown on Exhibit A. Exhibit B is a 1985 aerial photograph of the lake.

The dam at the lake outlet is privately owned. However, the City repaired the dam in the early 1980s at the request of the lake homeowners association and the cost of those repairs was then assessed to the lake property owners. The top elevation of the dam--815.0 feet above National Geodetic Vertical Datum (NGVD)--was not changed by the City. An old dam at the lake outlet collapsed in April 1964 and the new dam was rebuilt within a few years. The top elevation of the old dam is unknown, although the surface area of the lake before the dam collapsed was similar to the present area of the lake.

Discussions with residents of Linnie Lac indicate that there is a general desire for improved water quality and a usable surface water resource. Four alternative methods of addressing the water quality and excessive weed problems were formulated, as discussed below.

Alternatives

The first alternative would be to implement watershed management measures--but no in-lake techniques--to improve Linnie Lac. Through regulations, the City could reduce pollutant loadings to the lake from construction sites and malfunctioning septic tank systems. A detailed watershed management plan could be prepared to identify other sources of pollution and appropriate control measures. Such a watershed management plan for Linnie Lac may be expected to cost about $10,000. However, because of its advanced stage of eutrophication and the large tributary drainage area, any improvement in water quality or reduction in weed growth in Linnie Lac would likely be minimal.

Under the second alternative, the lake could be dredged. The lake could be dredged to provide a total surface area of seven acres and a mean depth of 10 feet, which would provide open water areas suitable for boating and fishing. To conduct the dredging, the lake could be drained and the sediments removed with land-based equipment such as a dragline. Assuming that the bottom sediments are not contaminated with toxic substances and that a suitable dredge spoils disposal site could be found within a few miles, the proposed dredging may be expected to cost about $3 to $4 per cubic yard of dredge spoils, or about $250,000 to $300,000 for the entire lake. A permit for dredging would need to be obtained from the DNR. Prior to issuance of a permit, an environmental assessment would be conducted, the bottom sediments would be characterized, the proposed bottom contours would be determined, and the dredge spoils disposal site would be identified.

A third alternative for improving the usability of Linnie Lac would be to increase the elevation of the dam to provide greater water depth. Based upon a preliminary review of the existing dam elevation, the topography of the adjacent land, and the floodplain elevation, it may be feasible to raise the elevation of the dam by two to three feet. This increase in the dam elevation would raise the water depths to the range of four to six feet, which existed about 20 years ago. The deeper water would provide substantially improved open water areas, although heavy macrophyte growth would remain.

To raise the elevation of the dam, either an engineering consulting firm or the City Engineer would have to prepare the engineering specifications for raising the dam which would comply with DNR standards. The engineering study would determine the feasibility, and best method, of raising the dam, as well as the estimated cost. A floodplain hydrologic/hydraulic analysis, including a dam break analysis, would be required as part of this analysis to evaluate potential upstream and downstream impacts of raising the dam. These analyses could be conducted by an engineering consulting firm or by the Regional Planning Commission. It is expected that the hydrologic/hydraulic analysis would cost about $2,400. Raising the elevation of the dam would require a DNR permit. In addition, the DNR and Commission staffs could evaluate any potential ecological impacts raising the dam may have on the adjacent wetland.

A fourth alternative would utilize mechanical harvesters and herbicides to control excessive macrophyte and algae growth. Several firms provide harvesting or herbicide services on a contract basis. The DNR can provide the City with a list of firms which provide these services in southeastern Wisconsin. A DNR permit is required to use herbicides on lakes, but macrophyte harvesting is only minimally regulated. Aquatic plan control may entail a cost of about $300 to $500 per acre for each treatment. One or two treatments per year should be sufficient for most areas.

Conclusions

A range of solutions are feasible to improve the usability of Linnie Lac and to control aquatic plant growth. It may be desirable to arrange a meeting with Linnie Lac residents to discuss the alternatives. Hopefully, the lake residents can reach an agreement on a preferred alternative, or combination of alternatives.

Should a preferred alternative be selected, potential sources of funding and financing arrangements may be investigated. Such sources may include:

1. Private donations, such as the generous offer made by the Linnie Lac resident;

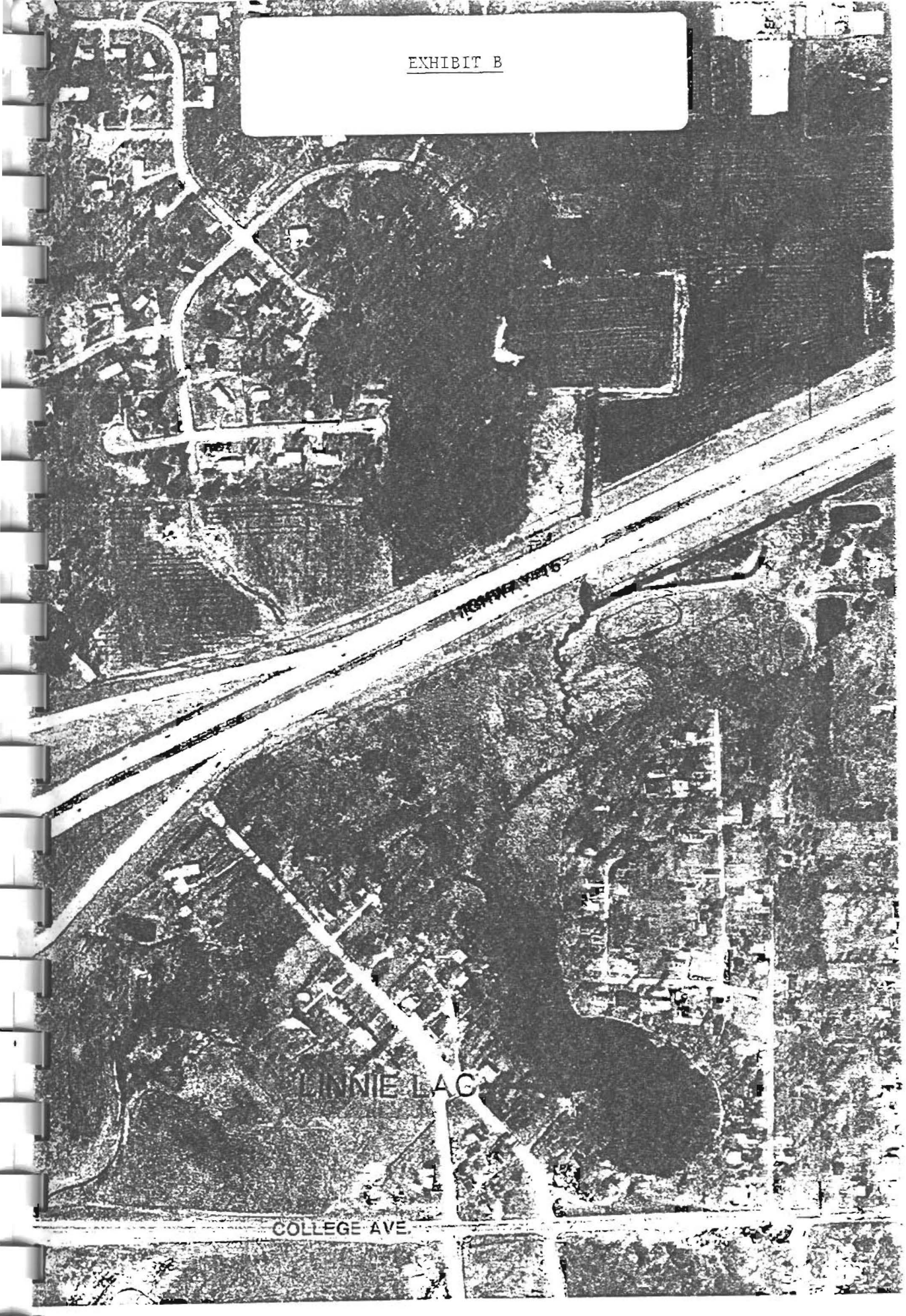
2. The Wisconsin Fund Nonpoint Source Abatement Program administered by the Department of Natural Resources;

3. Municipal financing, with special assessments then levied against the benefiting property owners; and

4. Voluntary payments made by the affected property owners.

Although State and federal funds have previously been provided for the rehabilitation of inland lakes, such funds are not longer available. Wisconsin's Inland Lake Renewal Program was terminated and there is currently no state program to provide funds or services for lake rehabilitation. Furthermore, since Linnie Lac does not have adequate public access, the DNR will provide only limited lake management services. However, both the DNR and the Commission staffs can provide technical assistance to the Linnie Lac residents to help improve the condition of the lake.

EXHIBIT B



1" = 400'

DATE OF PHOTOGRAPHY MARCH 1988