RIVERFRONT DEVELOPMENT STUDY

AND

MASTER PLAN

FOR THE

CITY OF MARYSVILLE

APRIL 1986

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CONSULTING ENGINEERS

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Marysville, MI 48040

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March 26, 1986

City of Marysville
1111 Delaware
Marysville, MI 48040

RE: Waterfront Development Study & Master Plan

Dear Gentlemen:

It gives me great pleasure to submit the Waterfront Development Study and Master Plan. This plan reflects input made by the Planning Commission the Michigan Waterways.

If you have any questions regarding this plan please do not hesitate to contact me at our Marysville office which is listed above.

Sincerely yours,
K. DON WILLIAMSON & ASSOCIATES, INC.

Charles E. Williams, P.E.
Vice-President

CEW:kmm

FILE NO. 1705, 2.1.1

INTRODUCTION

The purpose of this study is to recommend uses for the City waterfront and provide the background information, technical feasibility, and cost analysis to support these uses. From these recommendations the City can adopt a Master Plan for the City owned waterfront. This Master Plan is important to coordinate the uses and development of the waterfront. The City must make provisions for uses that depend on the river frontage. The plan can also be the basis for budgeting and setting priorities for improving and fully utilizing this waterfront. This is a timely issue because of the present problems associated with the property and funding available..

The area to be studied is from the Junction Bouy south to Cemetery Road. The shoreline across River Road from the condominiums is not included because it is privately owned. There is considerable erosion problems in a number of areas, conflict of uses, and needs in the community that are not being meet by the present waterfront development. Some of these require immediate attention and others require long range budgeting and planning.

In the past there has been a number of discussions, meetings and plans presented concerning various uses of the waterfront. Many of these were involving proposals for a marina. Developing a marina represents the largest and most difficult activity to accomplish. A marina has the most stringent requirements for land and water access and acreage. This must be the focal point of any master plan. A site must be identified for the marina and the remainder of the

plan developed around it. Later in the report, discussion will be provided as to why a marina should be considered for the community.

Another important aspect to be included is an improved launching ramp. The existing launching ramps represent a dangerous condition due to the exposure to wave action. The site also has limited adequate parking. Other aspects that will be identified are improving commercial utilization of the water front, fishing and public access. Cost estimates will be provided for these proposed improvements in the appendix of the report.

EXISTING WATERFRONT USES

An inventory of the City owned waterfront encompassed 7400 feet of river frontage which includes a variety of uses.

Junction Bouy to Water Plant

This section is presently park area. It has steel sheet piling wall, launching ramps, sidewalks along the wall small parking area, and a large open grassed area. Across River Road is a heavily used picnic area and parking for the picnicers and cars with boat trailers.

The existing steel sheet piling wall is too low in this area as it regularly experiences flooding. Approximately 40% of grass area is very wet due to the high water level and low ground level of this area. This area is occassionally used for river watching, but is not used for fishing.

Launching ramps have no protection from boat wake and waves in the river. On a busy weekend launching and retrieving boats is very hazardous. A number of boats have been damaged and people injured at this launching site.

Water Treatment Plant

This area is adequately protected by steel sheet piling which is in good condition. Much of the frontage is occupied by the treatment facilities with two water intake lines extending out approximately 500 feet into the river.

Wastewater Treatment Plant

Between the water treatment plant and the new wastewater treatment plant is the old wastewater treatment plant. The building and some

of the tanks have been abandoned. The old sludge digesters (2) are being used for sludge storage and one below ground tank serves as the chlorine contact chamber. The sludge drying beds are occassionally being used but their primary function is to serve as backup to the liquid sludge disposal process. Most of these structures can and should be demolished. The sludge drying beds will have to be relocated. The area of drying beds can be reduced but they are intergral to the process. The chlorine contact chamber is presently in use and will require relocation.

Old Chrysler Marine Facility

The existing building with steel sheet piling wall around it and docks are in good condition. This area has an overhead boat hoist and boat storage in the building. The City owns all of the Chrysler property east of River Road.

"Beach" Area

The area south of the Chrysler Facility is presently used for beach. This is a low flat area. It has a small gravel parking area. There is a grassed area for picnicing and sunbathing. A number of storm sewers cross this area. No shore line protection has been built for this area. The beach provides natural protection.

South of "Beach" Area to Wilkie Brothers Factory

This area is a higher banked area and is experiencing erosion. The erosion has reduced the slope to near the roadway. Through the years this area has been stabilized with rubble dumped along the river bank. The area between the river and the roadway is very narrow eliminating

much use of the area. The City does own a narrow strip of land on the west side of the River Road (see Drawing No. 1705-02).

South of Wilkie Brothers Factory to Cuttle Road

This river front is owned by the condominium associations.

Cuttle Road to U.S. Border Patrol

This area has existing steel sheet piling wall that has deteriorated to the point of failure. In it present condition, the wall is a hazard. This area is a prime fishing site and generates a large number of cars parking along the road. The southern portion of this section of the riverfront is high banks and limits access to the river. This high bank area has been protected by rubble slope protection.

South of the U.S. Border Partol to Cemetery Road

This area is a continuation of the high banks until a small area at the southern end opposite Cemetery Road. Most of the area is to narrow to allow access to the river except at the southern end. This shore line has been protected by use of rubble.

FUTURE USES

There are a number of future uses that need to be included in the Master Plan. This section will discuss the reasons for including these uses and the requirements for each use. The uses to be discussed are the marina, upgraded launching facilities, fishing and public access with adequate parking, and commercial activities.

MARINA

A marina represents a whole new industry to the City of Marysville. When you look throughout the state of Michigan and the U.S. there are very few communities that are blessed with the natural resource that Marysville has - that being the St. Clair River. Marysville is one of the only cities, espically its size, in the state of Michigan that has the potential to develop a marina and that has not. Marinas represent a very valuable economic activity, a whole new industry for the City.

A study done by the Michigan Sea Grant College Extension Service has a computer program that predicts the spending impact of a marina. This program is based upon a number of studies that the Extension Service and Michigan Waterways has conducted. Based upon their numbers the total annual craft related expenses for a boat are categorized as follows:

	Power 20'-25'	Power Greater Than 25 Feet	Sail boat Greater Than 20 Feet
Annual Craft Expenses	$1,773	$3,598	$2,800
Trip Expenses Per Day	$ 84	$ 119	$ 48

When these figures are multiplied by the typical days per year of

use, the average annual expenditure on the boat and trip expenses are slightly over $8,000.00 per boat. Obviously not all of this spending would be in the City of Marysville, but a significant percentage of that could be. A marina of about 100 slips, with a typical size mix represents annual expenditures of approximately $800,000. The analysis as provided by the Michigan Sea Grant College is included in Appendix 1.

The question arises where do all of these boats come from. In St. Clair County there are over 2,200 boats over 20 feet in length registered to residents of the County. Many of those boats are owned by Marysville residents. But because there is no marina facility here or adequate launching ramps, people are using them elsewhere. These boats are kept in Port Huron, Sarnia, and even St. Clair.

Another aspect of providing a marina is the improvement in the quality of life. This adds to Marysville uniqueness and takes advantage of the beautiful river. Instead of making a negative statement about the quality of life and the lack of marina facility in the community, providing a marina, especially a first class marina as proposed, makes a definite positive statement for the City of Marysville.

LAUNCHING RAMPS

New launching ramps are needed as documented in the existing uses. The present launching ramps are inadequate and represent a dangerous condition. They definately need to be replaced or upgraded. There is a tremendous demand for use of these inadequate launching ramps as can be witnessed during the summer months. Launching ramps can also have a significant economic impact upon the community. In St. Clair

County there are over 4,000 boats alone that are in the trailable size range that could be launched at this facility. The trailable boat is the fastest growing segment of the boating population.

Another factor that is important is that Marysville represents the only launching facility on St. Clair River, north of St. Clair. There is a 12 - 15 mile stretch of river with Marysville as the only launching facility. It is the only launching facility to service some of the greatest pickerel fishing in the world. So the natural demand in combination with the growing number of trailable boats, makes it easy to see that an upgraded and enlarged facility is necessary.

FISHING SITES

With the great fishing in the St. Clair River especially along the Marysville frontage, fisherman are going to get to the river and do their fishing. But by providing improved access sites, the City will better serve these fishermen, have better control of them and make it easier to police their activities. The Michigan Department of Natural Resources has recognized the value of providing quality fishing near home and is placing a greater emphasis on funding these type of activities. The advantage of improvements is evident in the areas that the City of Port Huron has provided in Pine Grove Park and around the Municipal Office Center. Along with providing improved access to the fishing sites, adequate parking, waste recepticales and benches are needed.

PUBLIC ACCESS

The general public should be provided access to the river. The public will obviously be able to utilize the fishing access

sites. But additional provisions should be provided for passive activities, such as boat, bird, and nature watching. The value and the demand for these activities can be witnessed at the "beach" area on any winter day when a continual string of people visit the site to watch and feed the birds. In the summer the same area is extremely busy with boat watchers, sunbathers and people walking the beach. To support these areas adequate parking must be provided.

By providing adequate off-street parking for the public access and the fish sites, parking can be removed for the streets. This will eliminate traffic conflicts and parking on private properties and improve the area esthetics.

Another need that has to be included in the plan is for not only parking access but access for walking, jogging, and bicycling. Improved paths, such as a bike path, should be provided to connect the various city areas along the river and the City Park. Eventually these bike paths could be tied into an overall bike system throughout the community so that the bike paths in the residental areas would feed into these bike paths along the water front. On a nice summer night the number of bikers in the community can be witnessed coming to and from the riverfront. By separating them from the vehicular traffic, a vast improvement of safety and esthics for the biking public would be provided.

COMMERCIAL

Another very important activity strived for in the Community is commercial activities. Because of the level of use of the riverfront areas, commercial activities can be supported and are necessary.

The City of Marysville has two primary areas of need:

1. A Marine Service and Convenience Store.
2. A Restaurant-Banquet Type Facility.

No where in the vicinity is there a convient facility to provide service, fuel or food to the boats on the River. With the amount of boating and foot traffic that the launching ramps generate, especially with an improved launching ramp, it could easily support a marine service and convience store. A marina facility will greatly add to this demand.

A restaurant-banquet facility could fill a void in the City. A combination of this type could compliment the City golf course, marina and launching ramps. If on or near the riverfront and golf course, it would have the aesthetics of the river and activity of the golf course to attract patrons and events. The City has a liquor license that could be applied for by the facility operator.

MASTER PLAN

The Master Plan includes provisions for the uses discussed in the previous sections of the report. Each section will individually address the uses and provide the technical feasibility and summary of the cost estimates.

MARINA

The marina design is based on providing 30 to 60 foot long slips with as many slips as possible incorporated into the design. All the slips provided will be marketable. This is evident at all the marinas up and down the river and on the lake. Therefore, the intent is to provide as large a facility as possible. The marina would include provisions for transient and seasonal boaters. The facility would have a building for restrooms and shower facilities, along with an administration office and storage. It would provide conditions within the harbor for no greater than 1 foot waves. Included would be pump out facilities for removing wastewater from the boats. Gas and diesel fuel facilities would be provided either within the marina or in the adjacent commercial facility. Each slip would have utilities such as electricity, water, and possible telephone. The site would be adequately lighted and have access sidewalks. It would also include parking to support the marina.

Three potential sites were identified and evaluated for the marina: Site 1 is the area between the Junction Bouy and the Water Treatment Plant and east of River Road extending out into the river. Site 2 is the area south of Huron Street and east of River Road. Site 2 primarily

occupies the area referred to as the beach. Site 3 is the area between the Junction Bouy and the Water Treatment Plant extending west including the picnic area in the park. See Exhibit 1 for the location of each site.

A layout was developed for each site along with a corresponding estimate of the construction cost. Each site was analyzed to compare the benefits, impacts and the economics. The availability of land for future expansion was also considered. These preliminary findings were presented to the Marysville Planning Commission and the Marysville Marine and Waterfront Development Committee. From these analyses and the meetings it was determined that Site 1 represented the most feasible cost effective site with the least negative impacts. It is also the most politically acceptable site.

Analysis of Site 1 and the proposed development is discussed on the following pages. A summary of each analysis and a preliminary layout of Site 2 and Site 3 is included in Appendix 2 and Appendix 3. Appendix 4 includes the cost estimates for the various sites and other proposals included in this Study.

A cost comparison of the three sites is listed below. The best method of comparing the cost of the three sites, with varying number of wells, is to compare the cost on a per well basis:

	Number of Slips	Total Project Cost	Cost Per Well
Site 1	106	$ 1,909,020.00	$ 18,010.00
Site 2	85	$ 2,071,608.00	$ 24,375.00
Site 3	143	$ 2,870,550.00	$ 20,075.00

MARYSVILLE WATERFRONT DEVELOPMENT STUDY & MASTER PLAN

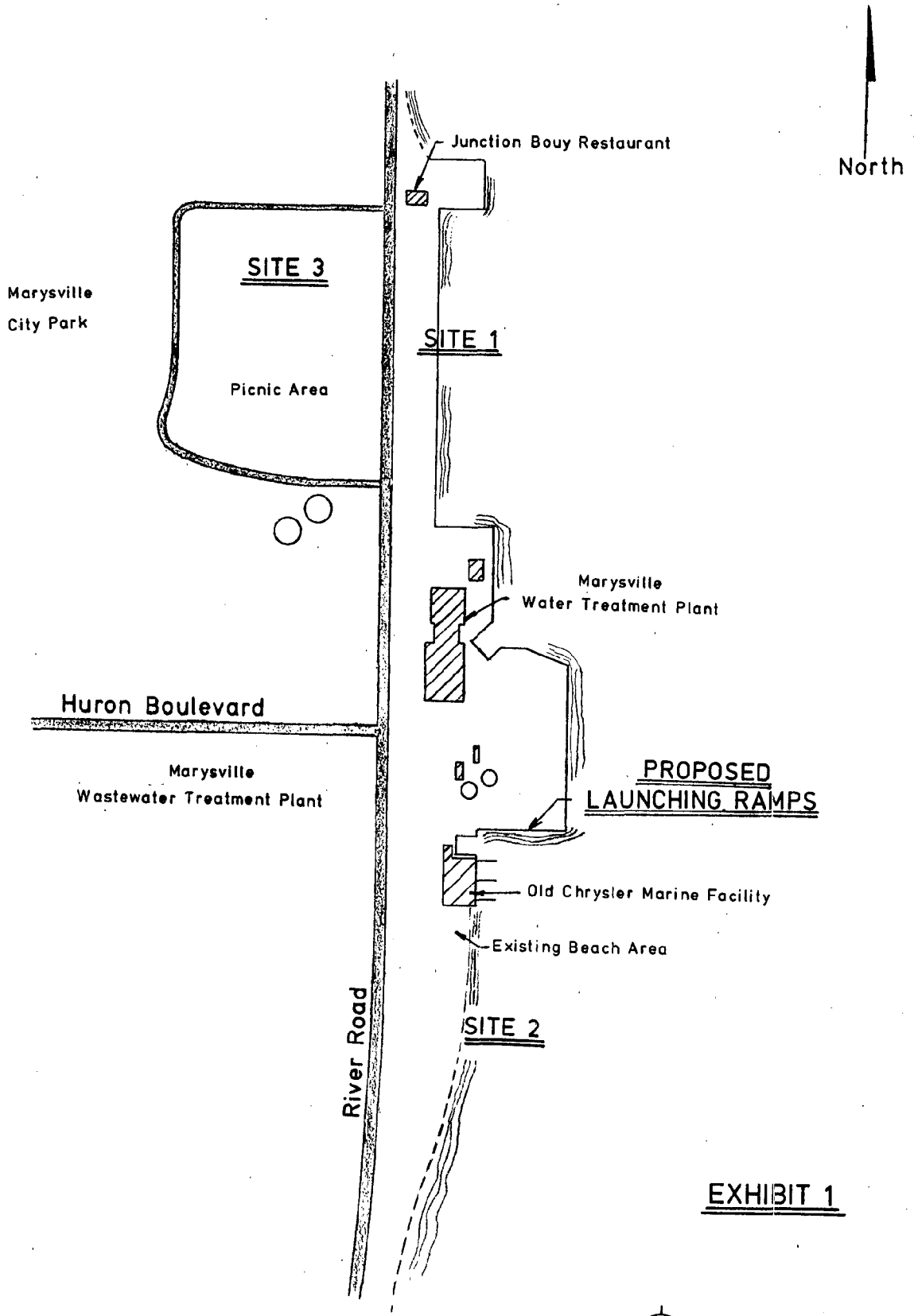


EXHIBIT 1

K. DON WILLIAMSON & ASSOC., INC.
CONSULTING ENGINEERS
HARBOR BEACH, MI
MARYSVILLE, MI

SITE 1

Site 1 is delineated on Drawing No. 1705-01 included in the back of the Study. The property is City owned and utilized for launching ramps and passive park area. It has protection both up stream (Junction Bouy) and down stream (Water Treatment Plant). The proposed site utilizes the existing sheeting along the water treatment plant. The marina would be consistant with the existing recreational land use as the marina would be an extension of the park. With the City owning considerable land west of River Road, this area also has the potential for future expansion. It also offers the land for parking, for both marina use and for the fishing pier and walkway. More land is available adjacent to the north side of the park. The City should consider purchasing the land for future park or marina use.

The most critical aspect of the marina proposal in Marysville is protection from boat wake. This requires a substantial breakwater along the river front due to the wave action and ice flows in winter. The proposal at Site 1 includes 520 lineal feet of solid breakwater and 200 feet of floating breakwater. The solid breakwater would be composed of 2 walls of interlocking steel sheet piling driven into the river bottom. These walls would be 12 feet apart and would be filled with stone or excavated materials and have a concrete cap. The elevation of this cap would be 582.5. The river side steel wall would extend one foot above the concrete deck and be capped to provide additional protection from overtopping for pedestrians on the breakwater.

The floating breakwater is proposed to extend south of the solid wall. It is substituted for the solid wall due to the depth of the water and the protection afforded it by the solid breakwater. This floating breakwater would consist of rubber tires filled with floatation and wired together. It would be anchored to the solid wall and white oak timber piles driven together to form dolphins. This rubber tired breakwater may require removal in the winter. Removal could consist of a boat towing it inside the harbor. It would not have to be removed from the water only out of the ice flows. The anchorage system would have to be designed to allow for removal in the winter. The floating breakwater would be designed so that it would have adequate width to reduce the waves to a acceptable level. This floating breakwater substantially reduces the cost of the breakwater in the deeper water. Local labor or other sources of inexpensive labor could minimize the assembly cost for the floating breakwater.

The marina will extend as far west as possible to maximize the size. The proposal includes extending the marina to within 14 feet of the existing River Road. This will require excavation behind the existing sheet piling wall, removal of it, and installation of a new sheet piling wall around the perimeter of the basin. To facilitate loading and temporary parking along the marina, River Road will have to be widened approximately 20 feet. This will require upgrading and a new surface for River Road along with the addition of curbing along the east side of the road. A small retaining wall would isolate the marina walkway from the parking and loading lane.

The interior walls of the marina, to maximize the area for the

wells, will be interlocking steel sheeting instead of riprap slope protection. This sheeting will be lighter weight than the breakwater sheeting. It will be capped with a concrete sidewalk 6 feet wide. The finger piers off the sheeting would be fixed piers. These piers would be 3 feet wide with steel structural members with wood decking. They would be supported by timber piling driven into the bottom.

The remainder of the marina docks would be composed of floating head peirs 8 feet wide and floating finger piers 3 feet wide. They would be connected to the solid wall by adjustable ramps. As proposed Site 1 would consist of 106 wells. The following is the mix of the sizes of the wells:

30 Foot Wells	90
45 Foot Wells	13
60 Foot Wells	3
TOTAL	106

Future expansion of the marina could be west through the 80 foot wide passage at the north end of the marina.

The restrooms and shower buildings which would also include administrative office and storage, would be approximately 1500 square feet and include:

	Number For Men	Number For Women
Water Closets	3	3
Urinals	2	0
Lavatories	4	4
Showers	3	3

The service dock would include a pump out facility and fuel

dispensing equipment. Utilities (electricity and water) to each slip would be provided. Docks along the outer walls should include access to telephone connections. Lighting would be provided along the piers and throughout the site. Public telephone would be provided at the restroom and shower facility.

As mentioned in the discussion on the solid breakwater, pedestrian access will be provided on the breakwater. This will make for an excellent fishing pier and river access to the public. Provisions included for the fisherman and the public are the 12 foot wide concrete deck with railing on both sides and benches interspaced along the inside of the breakwater. This pier will extend into prime fishing area. The floating breakwater should make an excellent fish habitat. The enlarged deck area at the end of the breakwater will provide a nice facility for watching the boats and observing the river. Access to the breakwater will be provided by a separate entrance to minimize pedestrian traffic in the marina.

Parking will be provided in two areas. Parking for the marina, which will be for approximately 120 cars, will be at the southern end of the marina accross River Road. Parking for the fisherman and public access would be at the north end of the park and represent approximately 40 cars.

The detailed cost estimates and analysis is included in Appendix 4. The total estimated project cost for Site 1 is $1,909,020. The estimated cost per well for Site 1 is approximately $18,010.

LAUNCHING RAMPS

The launching ramp location is east of the water treatment plant. The location, detailed layout, and parking area are shown on Drawing No. 1705-01. This is a logical location for the launching ramps, because of the existing sheeting providing some protection for the launching ramps and the room for parking. Constructing the launching ramps at this location will require relocation of sludge drying beds to the existing wastewater plant site west of River Road, along with the demolition of some components of the abandoned wastewater treatment plant. Both of these activities are conducive to the overall objectives of the City as the drying beds should be on the site of the existing plant and the facilities to be demolished are hazards. The demolition of the tankage could be completed at a later time, depending upon the level of funding available.

The launching ramps consist of 4 launching ramps with two skid piers. To support the 4 launching ramps, 67 parking spots for cars with trailers would be provided and 30 spots for single cars. The construction details include concrete plank for the launching ramp surface and riprap slope protection along the ramp. The existing sheeting would be cut to provide an opening for the launching ramps. Protection would be provided for this area by floating breakwaters. This is an excellent application of floating breakwater, as the sites for the breakwater is extremely protected from ice and current and they will adequately diminish the wave action in the area.

The driveways and the area adjacent to the launching ramps, which includes the prepare to launch and tie down lanes, should have asphalt paved surface. The remaining of the parking area could be gravel until funds become available to complete asphalting. Fencing in the area would

be removed and thus allowing for free circulation and improved fishing in the area. Esthetics in the area would be greatly improved. An area can be set aside for picnicing. Trash containers should also be provided.

A side benefit to the launching ramp proposal is the added protection for the existing old Chrysler facility. The floating breakwaters will make this area a very viable commercial location. It will be a very convenient facility to the launching ramps and an easy area to dock for fuel or other activities. Upgrading this facility could be included in the launching ramp proposal.

Restrooms should be provided for the launching ramps. This could be accomplished in this upgraded old Chrysler facility. As part of the requirements for commercial leasing of this property, restrooms could be furnished and maintained. This would also provide a monitoring and regular hours for the restroom facilities.

FISHING AREAS

St. Clair River along Marysville represents some of the best pickerel fishing in the world. To improve access for fisherman and to allow for better policing and control of those areas, a number of areas are identified for fishing access.

A major addition to the fishing access sites would be the marina breakwater access. This represents the area with the best potential.

The second good fishing site to be improved is the launching ramp area. This is very popular area with the fisherman. By improving the parking lot, removing the remanents of the old waste-water plant and the old fencing, this area could be the focal point of the waterfront development.

The third fishing access site that should receive emphasis is the area along River Road south of Cuttle. This represents a very popular fishing site, but lacks any of the necessary improvements especially adequate parking. The existing sheet piling wall is also failing.

To upgrade this site to provide erosion protection and necessary improvements for fishing and public access, the following are needed:

1. New steel sheet piling wall with railing
2. Adequate parking
3. Sidewalk
4. Bike path through area
5. Benches and trash recepticles
6. Fishing pier

These could be phased to allow improvements as funding becomes available. Parking and the sheet piling wall are first priorities.

Parking can be accomplished by improving the area south of Cuttle Road on the west side of River Road and north of the U.S. Border Patrol. This is the fairly flat area owned by the City. Pedestrians access can be provided to the fishing area by construction of a ramp on the east side of River Road down to the river level. This will require the addition of approximately 100 feet of sheeting to provide erosion protection in the area and allow more space for the access ramps. This ramp can then become part of the bike path and walkway along the river front.

The replacement of the sheeting will allow construction of a railing along the river and an adequate sidewalk. Trash recepticles and benches should be incorporated into the improvements.

A long range plan for this area would be a fishing pier extending out into the river with an observation deck along the shore line. This would extend out into the river allowing access to the fishing. It would be a wood structure with timber piling driven into the bottom. This would be a focal point for fishing. It has the potential to become a marketing item for the community.

The parking provisions on the west side of the road would include 74 cars. A sidewalk on the west side of the road to the north end of the parking would cross River Road and have steps down to the river front and the improved area.

PUBLIC ACCESS

Public access must be provided along with the fishing access for more passive activities, such as bird watching, hiking, sunbathing, and childrens play area. The prime area for this is the area considered the "beach" area. This has a natural beach with a existing bird population which in the winter includes ducks, geese, and swans. The area requires little capital improvements as there is an existing parking lot serving this area. This parking area could be paved in the future. This beach area will provide an excellent staging area for the walkway-bike path which should continue to the north and south. Included in this area should be provisions for a childrens activity center. These basic improvements will enhance and encourage the present uses of this area.

Further to the south of this area, access should be provided. The bank is higher in this area with beach access more limited. But the bike path walkway should continue south through this area to allow access and to contract the area riverfront areas.

The focal point of this area could be an observation tower. This could be located north of Wilkie Brothers where the bank is a higher elevation. This observation tower would be for viewing the river and boats. It could be constructed of telephone poles and treated lumber. It would be an area that people could walk or bike to from either the beach area to the north or the fishing area to the south. It would provide a gathering point and resting area for this stretch of the river.

The last area to be addressed for public access would be to the extreme south end of this study section. This area is opposite Cemetery Drive, south of the U.S. Border Patrol. This area would make for a nice quiet family picnic area. It would be a good area for small gatherings or a quiet lunch. Parking would be provided across River Road south of the U.S. Border Patrol. This would be the end point of the bike path - walkway along the riverfront.

The bike path should continue through all the areas. The sections with narrow frontage and private property, the path should be installed along the roadway. A section of riverfront north of Cuttle Road to Wilkie Brother's Conveyor is private frontage. This could be accomplished by paving a strip with rumble strip along the edge of the street to delineate the bike path.

COMMERCIAL AREAS

Two areas represent great potential for commercial development. The first area, which is the old Chrysler Marine Facility, has great potential with the relocation of the launching ramps. The City has in the past attempted to lease this facility with no success. With the added traffic generated by the relocated launching ramps and the

added protection of the floating breakwater this becomes a high activity area. An area with great commercial potential. This facility could include any of the following activities:

1. Boat sales and rental
2. Boat parts sales
3. Marine service
4. Fishing tackle and bait
5. Convenience store
6. Marine fuel sales

The City should determine whether it wants to sell fuel out of the marina or include it with this center. There is no reason to duplicate the equipment. The City should retain ownership of this property and lease the facility to an operator. One suggestion is for the City to include fuel sales in this facility, but to retain a percentage of the fuel sales.

The second site with great commercial potential is between the golf course and River Road. This is shown on Drawing No. 1705-03. This is a prime location for a combination restaurant-lounge with banquet facilities. It has the advantage of the traffic from the golf course and the aesthetics of the river. The terrain of the site with some minor grading will allow for a two story facility. The upper level could house the restaurant-lounge with the cooking facilities. This would be on the same level as the golf course. This would be conducive to pedestrian and golf cart traffic coming from the golf course. The entrance to the facility would be off River Road or the restaurant-lounge would be off Golf Course Drive. Additional car parking would be provided adjacent to the golf course parking, this would provide adequate overflow parking for both facilities. It could have a deck to the east

overlooking the river on the upper level. The lower level could be the banquet facility. The river side of the building, the lower level, could be on ground level with the potential for a walkout patio. A ramp from the entrance drive to the banquet facility entrance would be provided to make provisions for both entrances to be handicapped accessable.

This facility will also generate additional business for the golf course as it will provide for one day golf outings, meals and entertainment. This location should support 300 to 400 seat capacity restaurant-banquet facility. Because this location is surrounded by City owned property, the City should continue to own this property if possible. A long term land arrangement should be sought with a restaurant developer and operator.

EROSION CONTROL

Erosion control is a concern to everyone on the St. Clair River because of the high water levels and the river current. It would be desirable if the City could afford to install steel sheet piling along the entire river, however, the economics overrule this as a viable option. Each area has to be individually analyzed to determine the extent of the investment and erosion control protection justified by the property values. A number of methods to control erosion are available. Each vary in cost, complexity and effectiveness. Following are four commonly used methods:

1. Interlocking steel sheet piling walls
2. Built-up slope with riprap and filter cloth protection
3. Loose placed riprap and rubble
4. Vegetation cover

The following is a brief overview of these four systems of erosion control.

Interlocking steel sheet piling wall is the cadillac type of protection if properly designed and placed. It will provide years of excellent protection. However, this treatment is the most expensive.

Built-up riprap slope protection consists of placing engineered filter fabric cloth (strong plastic fabric manufactured specifically for this use) with 6" gravel layer placed on top. Outer layers of armor stone are placed on top of the gravel. The armor stone is sized for the specific type and size of wave for each location. This provides stable slope protection and reduces the wave energy. This is especially important for a marina application. This slope treatment requires more room as it has to be installed on a shallow slope. Another problem with this slope protection is that it is very difficult to install where there is a current or large wave action. The currents of St. Clair River makes this difficult to install.

Loose placed riprap and rubble slope protection is basically the truck dumped rubble that is pushed over the sides of the banks. For years this has been a preferred method to improve slope stability in a number of locations. From an economic standpoint this has its advantages but aesthetically leaves something to be desired. In many cases this method is of last resort.

Vegetation slope stability is the least expensive and most enviromentally sensitive method. It requires flat slopes and adequate soils to maintain the growth. This method is not satisfactory in cases with severe wave action or high currents. It is not effective in areas that are experiencing erosion problems.

Each method has its advantages and preferred uses. There are many additional variations of the basic treatments. Following are recommendations for each area in the study.

Junction Bouy and the Water Treatment Plant

This area is presently protected with steel sheet piling wall. With the high water levels, this area experiences periodic flooding. This causes inconvience but no monitary damage. The marina proposal will improve this area and provide the high level of protection required. This should be accomplished with the steel sheet piling.

Launching Ramps and the Old Chrysler Facility

The existing sheet piling wall and the proposed floating breakwater will adequately protect this area from erosion.

"Beach" Area (Old Chrysler Facility to 1,000 feet south)

This area has flat slopes and vegetation cover. There is little damage that can be caused by wave action or erosion. The "beach" area provides some natural protection. This area should be maintained as an area with beach and vegetation type of protection. This is a good area to be left as "natural".

Area South of the "Beach" to Wilkie Brothers

This area is higher banked with little beach. It is experiencing serious erosion problems. The only improvements requiring protection is River Road pavement. The present method of placing loose rubble and riprap should protect the shoreline. But this method will require continual monitoring. After storms or during seasonally high water

levels the addition of more rubble will be required. This area is of lower economic value, thus does not justify the large capital expendures to provide a higher level of protection. In addition there is insufficient slope to the deeper water to provide riprap slope protection.

Cuttle Road Area

To provide protection and added room for the fishing area and proposed bike path, steel sheet piling should be utilized. This area has the potential for intense use that justifies the added expense for the steel sheet piling wall.

Area Opposite the U.S. Border Partol

This area should be protected by rubble until such time that a steel sheet piling wall can be funded.

South of the U.S. Border Patrol to Cemetery Road (Cuttle Creek Picnic Area)

This area should be protected with built-up riprap slope protection. Because it is being proposed for a small picnic area and the river is not too deep at this location, placed riprap slope protection will provide the required level of protection at a reasonable cost.

IMPLEMENTAION & FINANCING

The implementation of the findings in this Study begins with adoption of the Master Plan. This will provide the framework for the City Staff to begin soliciting funding and interest in developing the various items in the Study.

The local recreation plan which Marysville has adopted must be amended to reflect the activities and improvements in this plan. It is then submitted to the State for their approval. This then can become the basis for many of the recreational grants.

COMMERCIAL

With the adoption of the Master Plan the staff can begin soliciting interest or proposals on developing the restaurant-banquet facility at the riverfront and golf course. This could begin by contacting potential restaurantuers with successful existing restaurants in other communities. Ads for proposals in restaurant trade publications could also generate interest in the site.

The City should consider some basic criteria for the proposals, i.e. leasing particulars, restaurant size or type of menu and responsibility of the developer (access drive, parking lot, sewer and water). The City should consider making some of the site improvements such as upgrading the parking lot as a City's economic incentive.

The commerical activity at the old Chrysler marina facility should be shelved until a schedule can be identified for the launching ramp improvements. The launching ramp improvements will have such a significant impact on the facility that all proposals should reflect the higher traffic and better local aesthetics of an improved launching ramps.

MARINA & LAUNCHING RAMPS

The marina and launching ramps represent the most capital intensive proposal. The marina - launching ramps will provide:

1. Much needed safer launching ramps
2. More parking for cars with boats
3. Boat mooring facilities
4. Marina and fishing parking
5. Demolision of the old wastewater plant
6. Public access to riverfront and better fishing
7. Better marketability of the old Chrysler facility
8. Source of employment in community

The prime source of funds for those improvements is the Michigan Waterways. Presently their grants are a 50% match of local funds. The 50% local match money can be created a number of ways:

1. Through other grants
2. City capital budget expenditures
3. City forces doing the work
4. Bonding with debt retirement from marina revenues
5. Bonding with debt retirement from City general funds
6. Bonding with debt retirement from special millage.
7. Bonding with any combination of the above

Waterways is receiving funding from appropriations of marine fuel tax money for capital expenditures. Because the state legislature and governor's office has expressed support for funding marina construction due to the significant economic impact of boating and marina's, Waterways will be a stable source of funding for a number of years. Waterways has established a point system to prioritize marina construction. They are also administering a number of other funds from the Federal government. Marysville should

request funding through Waterways and determine a timetable for funding. Once this is established the City can pursue other sources of money. This is especially important for soliciting other grants to offset the 50% local match. Other grant sources will be listed later in the Study.

The economic impact and jobs creation of marinas are well established. This can be the basis for a Small Cities Economic Grant to fund a portion of the project. A grant of this nature can be used to offset the local 50% match.

A well run marina will operate at a profit. St. Clair's Marina, which is a comparable size marina which would generate a similar type of boating traffic and volume of business, is a good comparison for projecting Marysville's potential revenues and expenses. The following are typical figures from St. Clair Harbor Commission for 1985 operations:

Income:	
Charges for Services & Mooring	$ 103,068
Sale of Merchandise	157,317
Other	817
TOTAL OPERATING REVENUE	$ 261,202
Expenses:	
Wages & Benefits	$ 45,116
Contractual Services	2,000
Merchandise & Supplies	143,938*
Heat, Light & Power	8,276
Other	14,525
TOTAL OPERATING EXPENSES	$ 213,855
TOTAL OPERATING PROFIT	$ 47,347

*Does not include estimated $18,506 fuel loss through a tank leak.

Through the years the St. Clair Marina has generated a sizeable fund balance of $341,262. Profits from the facility can be used for retiring debt, providing for maintenance and future expansion, additions, and improvements.

WATERFRONT & FISHING ACCESS

The additional land available north of the City park should be considered for purchasing. Grant money could be utilized to pay for this addition to the park.

Funding for the steel sheet piling wall along River Road south of Cuttle Road has been requested through the Emergency Erosion Control Fund administered by the U.S. Army Corps of Engineers. This application should be followed up with a contact with the United States Legislators. (David Bonier, Carl Levin, and Bob Traxler, who does not represent Marysville but is a good contact).

The remainder of the fishing access site and parking lots construction money should be requested through the Department of Natural Resources. The Fisheries Division has money available for projects that provide high quality fishing opportunities especially in an urban setting. The other sources of funds listed on the following pages are applicable. To improve the chances of receiving a grant and begin to meet the parking needs, the City could initiate construction of the parking lots using City forces to develop a gravel parking lot.

The bike path-walkway is a prime candidate for funding through Coastal Management Programs (CMP). CMP programs fund studies (a portion of this Study was funded by CMP) and low cost construction projects. The Michigan Department of Transportation should also be contacted. They have in the past funded bike paths.

The Cuttle Creek Picnic Area could use any of the following listed sources of grant money for construction. This may be a project within the limits of the City's Department of Public Works forces to do this construction.

The City should encourage local civic groups (Lions Club, Rotary, Power Squadron, etc.) or encourage involvement from the National Guard to actively participate in these projects. Their backing is important both financially and emotionally. These groups could aid in assembling or purchasing floating breakwaters, benches, children's activity center, observation deck, fishing areas or litter receptacles.

The following pages have a listing of agencies and grants available for many of the listed projects. To receive any of these grants from the State the City has to agree to nondiscrimination in hiring and use of the improvements and to provide access for handicapped. The following list is the six goals the Michigan Department of Natural Resources has established in the State's 1985-1990 statewide recreation plan Building Michigan's Recreation Future.

Resource Protection Goal: To protect Michigan's natural recreation resources and provide for their public use and enjoyment.

Water Access Goal: To provide public access to Michigan's water bodies particularily the Great Lakes, and to facilitate their recreation use.

Urban Recreation Goal: To improve outdoor recreation opportunity in Michigan's urban areas.

Economic Development Goal: To stimulate Michigan's economy through recreation, tourism and community revitalization.

Community Recreation Goal: To meet regional, county, and community needs for outdoor recreation opportunities.

Wise Investment Goal: To invest Natural Resources Trust Funds to projects that will yield the best long-term recreation return to the people of Michigan.

All of the proposals in this Study fit in these guidelines.

GRANT & GRANT AGENCIES	GRANT DESCRIPTIONS
Michigan Natural Resources Trust Fund (NRTF) Michigan Department of Natural Resources Recreation Services Division P.O. Box 30028 Lansing, MI 48909	Money for land acquisition and development for recreational purposes. Maximum allowable grant is $750,000. Local match is 25%.
Michigan Land and Water Conservation Fund Michigan Department of Natural Resources Recreation Services Division P.O. Box 30028 Lansing, MI 48909	Money for land acquisition and development for recreational purposes. Maximum allowable grant is $250,000. Local contribution to project is 50%.
Michigan Waterways Michigan Department of Natural Resources P.O. Box 30028 Lansing, MI 48909	Money for recreational boating facilities. There is no set maximum grant. Local match is 50%.
Michigan Department of Natural Resources Fisheries Division P.O. Box 30028 Lansing, MI 48909	Because funding is limited at this time, there is no set criteria for this money.
Coastal Management Program Division of Land Resources Programs P.O. Box 30028 Lansing, MI 48909	Money for studies and limited construction projects. Maximum grant is $50,000. Local match is 50%.
Small Cities Block Grant Program Michigan Department of Commerce Office of Community Development P.O. Box 30004 Lansing, MI 48909	Money for economic development especially to create jobs. Maximum grant is $750,000 annually.

NOTE: One grant may possibly be used as matching funds for another.

EROSION CONTROL

Erosion control will have to be addressed continually with the high water level. The areas north and south of Cuttle Road that are receiving rubble treatment will require constant monitoring and intermittant addition of rubble to protect the River Road roadway.

This year with all the emphasis on flooding and high water levels, is a good year to be soliciting funds for erosion control projects.

APPENDIX 1

PROGRAM DS-100 (marina.pc)
Version 1.00

DIRECT SPENDING IMPACTS OF A MARINA

MARINE ADVISORY SERVICE

MICHIGAN SEA GRANT COLLEGE PROGRAM
COOPERATIVE EXTENSION SERVICE

* The direct spending impacts of a marina will be determined by the number of boats of each type to be served. These numbers are:

  * Power Boats 20-25 feet: 10
  * Power Boats over 25 feet: 70
  * Sailboats over 20 feet: 20

* Marina Location: Marysville, MI

* Spending data are based on 1982 figures. If you wish to account for the effects of inflation, enter the current year and average annual rate of inflation since 1982. Enter 0 if you wish to use unadjusted values.

********** Current Year: 1985 **********
********** Annual Inflation Rate: 4 % **********

	Power 20-25 Feet	Power >25 Feet	Sail >20 Feet	TOTAL
BOATING ACTIVITY				
% Boats by Type	10	70	20	100
Number of Boats	10	70	20	100
Average Boat Days	43	48	46	47
Total Boat Days	430	3,360	920	4,710
SPENDING				
Annual Craft Expenses				
Equipment	6,299	80,630	23,240	110,169
Repair	3,487	49,607	7,762	60,855
Insurance	1,924	28,032	4,297	34,252
Storage	6,018	93,622	20,720	120,360
TOTAL CRAFT-RELATED	17,728	251,891	56,018	325,637
Trip Expenses				
Food	15,962	124,725	32,081	172,768
Lodging	2,418	0	2,070	4,488
Auto Fuel	4,837	86,929	3,105	94,871
Boat Fuel	10,641	154,961	3,105	168,707
Equipment	1,451	18,898	1,035	21,384
Other	967	15,118	3,105	19,190
TOTAL TRIP-RELATED	36,277	400,632	44,500	481,408
TRIP + CRAFT SPENDING	54,005	652,522	100,518	807,045

STATEWIDE SPENDING DATA (enter local data individually, if preferred)

Annual Craft Expenses ($/boat/year)				
Equipment	630	1,152	1,162	981
Repair	349	709	388	482
Insurance	192	400	215	269
Storage	602	1,337	1,036	992
TOTAL CRAFT-RELATED	1,773	3,598	2,801	2,724
Trip Expenses ($/boat day)				
Food	37	37	35	36
Lodging	6	0	2	3
Auto Fuel	11	26	3	13
Boat Fuel	25	46	3	25
Equipment	3	6	1	3
Other	2	4	3	3
TOTAL TRIP-RELATED	84	119	48	84

APPENDIX 2

SITE 2

Site 2 is property owned by the City. It is the area of the existing "beach". Unfortunately the City does not own property across the road at this site. Therefore, the area of expansion is limited. The only area available for future expansion would be further to the south. But because of the depth of the river and the height of the roadway, this area is severly limited. Parking is limited due to limited land area available. This site is convenient to the area proposed for the commercial marina service.

The Site 2 Proposal is similar to the Site 1 Proposal in many ways. See Exhibit 2 for the layout. The breakwater will be of similar construction and width thus to allow the fishing and pedestrian access. The floating breakwater at the end is proposed to protect the entrance. It is shorter than Site 1 due to the exposure that it would be subject to. This floating breakwater requirements are the same as that required for the launching ramps. (If launching ramps are constructed first, deduct $34,000 for the floating breakwater from the estimated cost for Site 2).

The restrooms and showers would have to be constructed in the area of the old Chrysler facility. This would reduce the commercial potential of this facility. This proposal fully utilizes the site leaving little open space, grass area or picnic area.

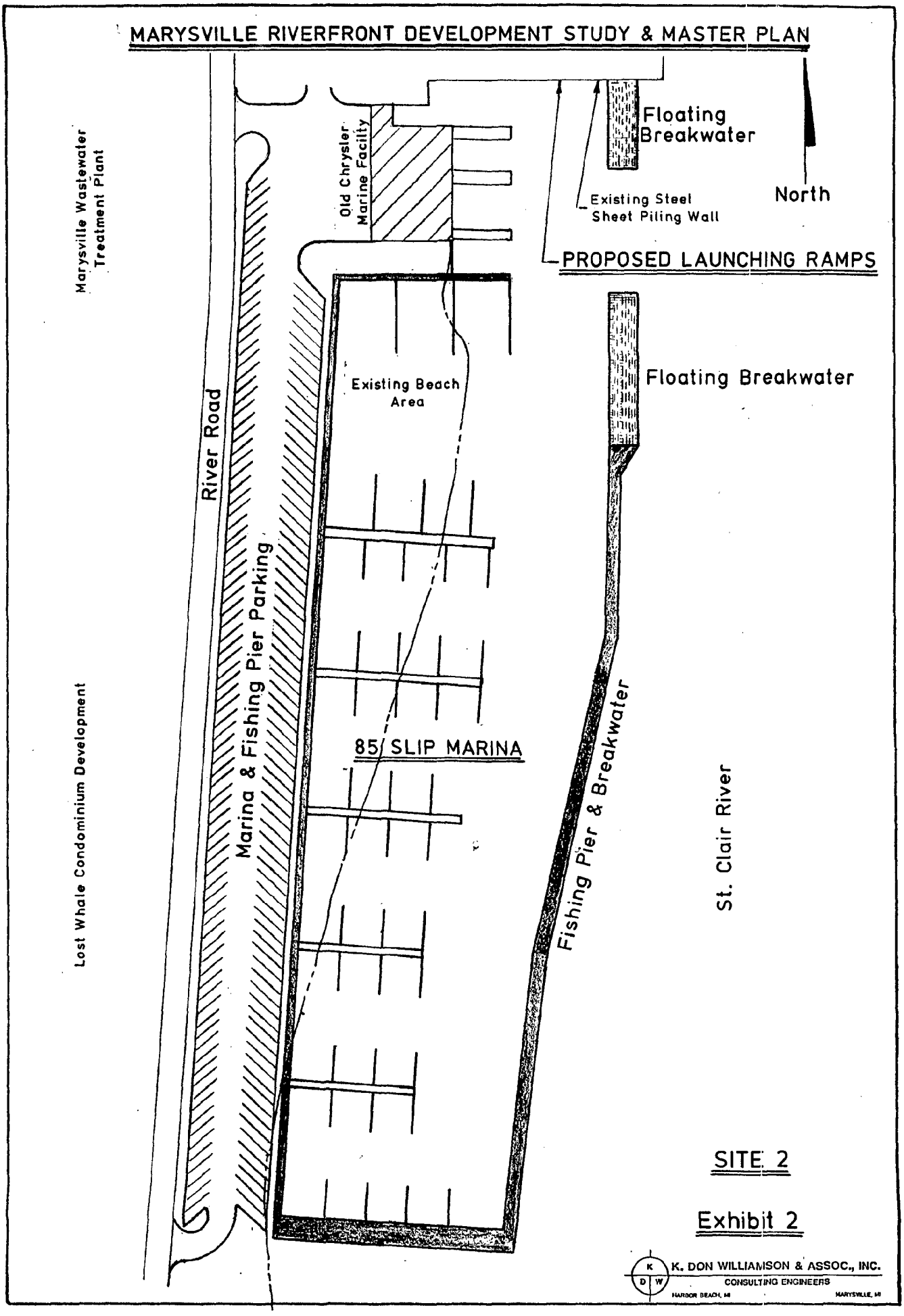
This site requires excavation inland to maximize the area of the marina as Site 1. Parking would be provided between the roadway and marina. The interior walls would be interlocking steel sheeting

of a lighter weight than the breakwater wall. The marina would be composed of fixed finger piers off of the sheeting and floating piers in the remainder of the harbor. The total number of wells for Site 2 is 85. The following is the mix and size of those wells:

30 Foot Wells	73
45 Foot Wells	9
60 Foot Wells	3
TOTAL WELLS	85

The detailed cost analysis for Site 2 is included in Appendix 4. The total estimated project cost is $2,071,608.00. The cost per well for Site 2 is approximately $24,375.00.

Site 2 is unacceptable because of limited land area for improvements, costly construction and conflict with the existing use of the site. The beach area should remain as a natural area with beach.


MARYSVILLE RIVERFRONT DEVELOPMENT STUDY & MASTER PLAN
Floating Breakwater
North
Existing Steel Sheet Piling Wall
PROPOSED LAUNCHING RAMPS
Marysville Wastewater Treatment Plant
Old Chrysler Marine Facility
River Road
Existing Beach Area
Floating Breakwater
Marina & Fishing Pier Parking
85/ SLIP MARINA
Fishing Pier & Breakwater
Lost Whale Condominium Development
St. Clair River
SITE 2
Exhibit 2
K. DON WILLIAMSON & ASSOC., INC.
CONSULTING ENGINEERS
HARBOR BEACH, MI
MARYSVILLE, MI

APPENDIX 3

SITE 3

Site 3 is property owned by the City. The area is contained within Marysville City Park and includes the existing launching ramps and picnic area. This site will require the relocation of River Road, 18" sanitary sewer and water mains. River Road relocation will require additional park land. The sanitary sewer relocation, because of the depth of the sewer, will be very expensive (this sewer is the deepest in the City). The City owns more property to the West and south of this proposed area. This marina could be further expanded in the future to the west but encounters conflicts with relocated River Road, sanitary sewer and water mains.

Site 3 encompasses many of the improvements in the Site 1 proposal. The solid breakwater will allow limited access to the river. The floating breakwater is proposed to protect the entrance. The existing sheet piling wall would be used for protection but another wall would have to be constructed 12 feet from it and tied to the existing wall. Because this wall is to low for adequate protection, a concrete cap with curb will have to be formed and poured to provide a height of 583.5 feet. Railing would be added on the river side of the wall.

The interior walls would be riprap slope protection with filter cloth base. This is less expensive but requires more room. Additional dock length is also required.

The finger piers along the exterior walls would be solid piers. The remaining finger piers (off the head piers) and the head piers would be floating piers.

Restrooms and showers would be provided and be similar in size as Site 1 proposal.

The parking area at the west end of the marina will eliminate additional park and require the enclosing of an open drain with storm sewer. Some excavated material can be used to fill this drainage course.

A large volume of earth excavation is required for this proposal (at the west end of the marina a cut of approximately 20 feet). Disposing of the excess material could pose a problem. Some material will be used to fill for the parking area and some could be used for a toboggan hill in the park but a significant amount of excess material would need to be trucked to another site.

The grade differential at the west and north sides will require an abutment wall along the sidewalk to protect the roadway grade.

The total number of slips for Site 3 proposal is 143. The mix and size of these wells is as follows:

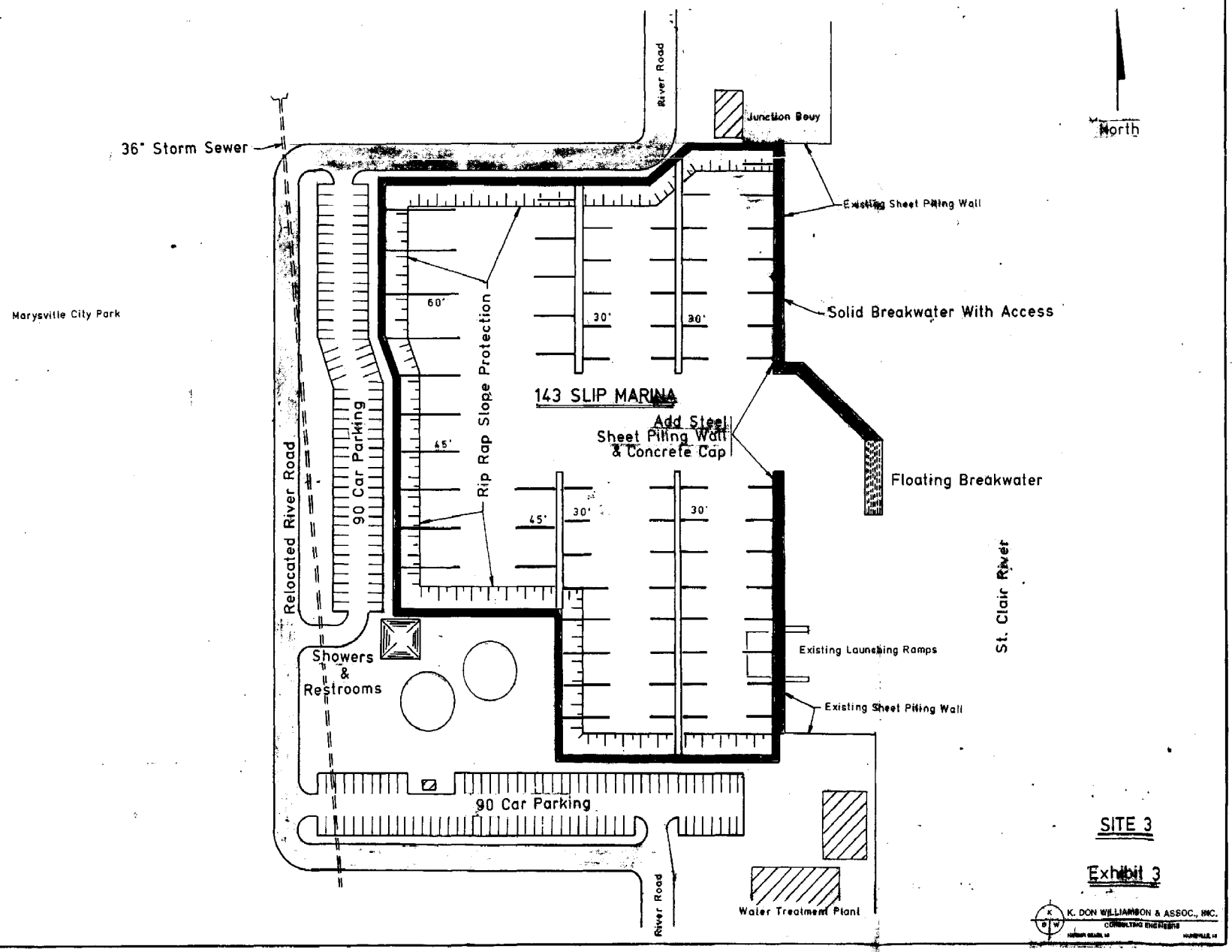
30 Foot Wells	109
45 Foot Wells	27
60 Foot Well	7
TOTAL WELLS	143

The detailed cost analysis for Site 3 is included in Appendix 4. The total estimated project cost is $2,870,550.00. The cost per well for Site 3 is approximately $20,075.00.

Site 3 is unacceptable because of the conflicts with existing park and picnic area, the relocation of River Road through the park and the higher cost.

This park area west of the existing River Road is heavily used for picnicing all summer long. Dedicating this area for marina was opposed by the Planning Commission. This opposition is supported by the City Council and local citizens. The existing use of this property is well supported and backed by the public.

MARYVILLE WATERFRONT DEVELOPMENT STUDY & MASTER PLAN



SITE 3

Exhibit 3

K. DON WILLIAMSON & ASSOC., INC.
CONSULTING ENGINEERS

APPENDIX 4

COST ESTIMATES

APRIL 1986

Marina - Site 1

Solid Breakwater with Concrete Cap & Railings	$468,000
Floating Breakwater with Dolphins	40,000
Interior Steel Sheet Piling Wall	149,400
Excavation	132,300
Sidewalk	29,700
Floating Head Piers	126,720
Solid Finger Piers	36,450
Floating Finger Piers	30,000
Restrooms & Showers	165,000
Dock Utilities	106,000
Site Electrical & Lighting	50,000
Mechanical	40,000
Temporary Parking & Loading Lane	11,760
Relocated Street	27,000
Retaining Wall	22,320
Asphalt Parking	25,200
Site Sanitary Sewer	3,000
Site Water Main & Hydrant	3,000
Pump Out Equipment	15,000
Fuel Handling Equipment & Tanks	60,000
TOTAL CONSTRUCTION COST	$1,590,850
CONTINGENCIES	318,170
TOTAL PROJECT COST	$1,909,020

Marina - Site 2

Solid Breakwater With Concrete Cap & Railings	$774,000
Floating Breakwater with Dolphins	22,000
Interior Steel Sheet Piling Wall	129,000
Excavation	144,000
Sidewalk	16,020
Floating Head Piers	108,000
Solid Finger Piers	21,000
Floating Finger Piers	70,000
Restrooms & Showers	165,000
Dock Utilities	85,000
Site Electrical & Lighting	45,000
Mechanical	40,000
Asphalt Parking	26,320
Site Sanitary Sewer	3,000
Site Water Main & Hydrant	3,000
Pump Out Equipment	15,000
Fuel Handling Equipment & Tanks	60,000
TOTAL CONSTRUCTION COST	$1,726,340
CONTINGENCIES	345,268
TOTAL PROJECT COST	$2,071,608

Marina - Site 3

Solid Breakwater with Concrete Cap & Railings	$ 117,000
Floating Breakwater with Dolphins	16,000
Interior Steel Sheet Piling Wall with Concrete Cap	272,550
Riprap Slope Protection	146,500
Excavation	576,000
Sidewalk	38,520
Floating Head Piers	158,040
Solid Finger Piers	106,200
Floating Finger Piers	109,215
Restrooms & Showers	165,000
Dock Utilities	143,000
Site Electrical & Lighting	80,000
Mechanical	50,000
Enclosed Open Drain	48,000
Relocated Street	57,700
Relocated Sanitary Sewer	91,000
Relocated Water Main	41,000
Retaining Wall	57,600
Asphalt Parking	37,800
Site Sanitary Sewer	3,000
Site Water Main & Hydrant	3,000
Pump Out Equipment	15,000
Fuel Handling Equipment & Tanks	60,000
TOTAL CONSTRUCTION COST	$2,392,125
CONTINGENCIES	478,425.
TOTAL PROJECT COST	$2,870,550

Launching Ramps - Phase 1

Ramps - Concrete Planks	$ 16,500
Skid Piers	7,000
Excavation	8,500
Cut Existing Sheet Pile Wall	4,000
Demolition of Sludge Drying Beds	15,000
Asphalt Drive & Tie Down Area	15,600
Gravel Parking Area	16,900
Sludge Drying Bed Relocation	32,000
Floating Breakwater	34,000
Landscaping & Seeding	4,000
TOTAL CONSTRUCTION COST	$153,500
CONTINGENCIES	30,700
TOTAL PROJECT COST	$184,200

Launching Ramp - Phase 2

Asphalt Parking Area	$ 24,000
Relocate Chlorine Contact Chamber	35,000
Demolition	20,000
TOTAL CONSTRUCTION COST	$ 79,000
CONTINGENCIES	15,800
TOTAL PROJECT COST	$ 94,800

RIVERFRONT DEVELOPMENT

COST ESTIMATES

Cuttle Road Fishing Access & Parking

Steel Sheet Piling Wall with Railing	$210,000
Concrete Sidewalk & Deck	33,600
Pedestrian & Bike Ramp	2,000
Concrete Stairway	4,500
Wood Fishing Pier & Deck	12,000
Parking Area - Gravel	10,400
Overflow Parking	6,000
CONSTRUCTION COST	$278,500
CONTINGENCIES	55,700
TOTAL CONSTRUCTION COST	$334,200

Bike Path Along Waterfront

Asphalt with Rumble Strip	$ 17,000

Observation Tower

Wood Tower & Access Walk	$ 5,000

Cuttle Creek Picnic Area

Riprap	$ 21,800
Parking Area - Gravel	1,800
Landscaping & Picnic Tables	1,500
CONSTRUCTION COST	$ 25,100
CONTINGENCIES	5,020
TOTAL CONSTRUCTION COST	$ 30,120