Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor
Richard H. Opper, Director

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July 15, 2010

FINDING OF NO SIGNIFICANT IMPACT

TO ALL INTERESTED GOVERNMENTAL AGENCIES AND PUBLIC GROUPS

As required by state and federal rules for determining whether an Environmental Impact Statement is necessary, an environmental review has been performed on the proposed action below:

Project	Phase 2A Wastewater System Improvements
Location	Bigfork, Montana
Project Number	WPCSRF Project # C303196 DOC-TSEP Project # MT-TSEP-CG-10-469
Total Cost	$10,200,000

From the 2008 Wastewater System Preliminary Engineering Report (PER), it is recommended that improvements be made to the wastewater treatment system to meet anticipated growth within the District, more stringent discharge limits, and to replace aging equipment that threatens system reliability. To address these critical issues, a new membrane bioreactor (MBR) plant will be constructed.

The MBR facility will be constructed adjacent to the existing wastewater trickling filter plant. The MBR facility will consist of a series of bioreactors designed for carbon, nitrogen, and phosphorous removal, a membrane filtration system (0.4 micrometer pore size), and an ultraviolet (UV) closed-vessel reactor disinfection system. Treated wastewater will continue to be discharged to Flathead Lake through the existing outfall line. All components of the new facility, including office and laboratory space, will be enclosed within a building for aesthetics and operational ease. All of the necessary biological tankage and equipment (pumps, blowers, piping, etc.) will be installed for the 20-year design conditions, along with approximately half of the required membranes. The District will only have to install additional membranes in the basins for expansion when it becomes necessary. Upon completion of the new MBR facility, most components of the trickling filter plant will be decommissioned except for the flow equalization basins and the solids (sludge) handling and treatment equipment which the District will continue to use. The proposed improvements will accommodate anticipated growth within the community, will improve system reliability, and will produce a high quality effluent that will be capable of meeting the more restrictive total phosphorous and total nitrogen limits in the District's new discharge permit.

Federal and State grant/loan programs will fund the project. Environmentally sensitive characteristics such as wetlands, floodplains, historical sites, and threatened or endangered species are not expected to be adversely impacted as a result of the proposed project. No significant long-term environmental impacts were identified. An environmental assessment (EA), which describes the project and analyzes the

impacts in more detail, is available for public scrutiny on the DEQ web site (**http://www.deq.mt.gov/ea.mcpx**) and at the following locations:

Mike Abrahamson, P.E.
Department of Environmental Quality
1520 East Sixth Avenue
P.O. Box 200901
Helena, MT 59620-09011
mabrahamson@mt.gov

Julie Spencer, District Manager
Bigfork Water and Sewer District
P.O. Box 1108
Bigfork, MT 59911

Comments on the EA may be submitted to the Department of Environmental Quality at the above address. After evaluating substantive comments received, the department will revise the environmental assessment or determine if an environmental impact statement is necessary. If no substantive comments are received during the comment period, or if substantive comments are received and evaluated and the environmental impacts are still determined to be non-significant, the agency will make a final decision. No administrative action will be taken on the project for at least 30 calendar days after release of the Finding of No Significant Impact.

Sincerely,

Todd Teegarden

Todd Teegarden, Bureau Chief
Technical and Financial Assistance Bureau

BIGFORK WASTEWATER TREATMENT SYSTEM IMPROVEMENTS
PHASE 2A

ENVIRONMENTAL ASSESSMENT

I. COVER SHEET

A. PROJECT IDENTIFICATION

Applicant: Bigfork County Water & Sewer District

Address: PO Box 1108
Bigfork, MT 59911

Project Number: SRF Project # C303196
DOC-TSEP Project # MT-TSEP-CG-10-469

B. CONTACT PERSON

Name: Julie Spencer, District Manager

Address: PO Box 1108
Bigfork, MT 59911

Telephone: (406) 837-4566

C. ABSTRACT

The Bigfork County Water & Sewer District (District), through its 2008 Preliminary Engineering Report (PER) update, has identified the need to make significant changes to the wastewater treatment system. The District's current wastewater treatment facility (WWTF) which utilizes synthetic media trickling filters for secondary treatment, chemical precipitation with sand filtration for phosphorus removal, and ultraviolet disinfection, was constructed in 1987. The facility discharges treated wastewater to Flathead Lake. The 23-year old facility is in adequate physical condition, but much of the mechanical equipment is original and nearing the end of its useful life. While the facility has been able to consistently meet its discharge limits (no violations in the past 5 years), anticipated growth (~5% per year) within the District and more stringent discharge limits for nutrients (25% reduction) associated with the 2001 Flathead Lake TMDL, are serious concerns.

To address growth, aging equipment, and anticipated permit requirements, the wastewater treatment facility will need to be upgraded to an advanced treatment system. The Bigfork Phase 2A Improvements project involves construction of a new Membrane Bioreactor (MBR) facility adjacent to the existing trickling filter plant. The MBR facility will consist of a series of bioreactors designed for carbon, nitrogen, and phosphorous removal, a membrane filtration system (0.4 micrometer pore size), and an ultraviolet (UV) closed-vessel reactor disinfection

system. Treated wastewater will continue to be discharged to Flathead Lake through the existing outfall line. All components of the new facility including the bioreactors, membrane filtration equipment, UV disinfection system, and chemical storage and feed system will be enclosed within a new building for aesthetics. Office and laboratory space will also be included in the building. All of the necessary biological tankage and equipment (pumps, blowers, piping, etc.) will be installed for the 20-year design conditions, along with approximately half of the required membranes. The District will only have to install additional membranes in the tanks for expansion when it becomes necessary. Upon completion of the new MBR facility, most of the components of the trickling filter plant will be decommissioned. The existing sludge digester and storage tanks, along with the sludge pumps and aeration blowers will still be utilized for solids handling by the District. The existing equalization basins will continue to be used to provide flow equalization to the MBR facility and for use as an emergency bypass of the headworks if required, in order to protect the membranes from unscreened sewage. The project also includes installing a non-potable water system to reuse plant effluent internally, and a new generator for emergency backup power. The proposed improvements will accommodate anticipated growth within the community, will improve system reliability, and will produce a high quality effluent that will be capable of meeting the more restrictive total phosphorous and total nitrogen limits in the District's new discharge permit. All proposed improvements would be designed to meet state design standards in accordance with Montana Department of Environmental Quality (DEQ) Circular DEQ-2.

Federal and State grant/loan programs will fund the project. The improvements are estimated to cost approximately $10,200,000. It is anticipated that the project will be funded through a low interest loan (3.75%) obtained from the State Revolving Fund (SRF) loan program, and grants from the Treasure State Endowment Program (TSEP), the Department of Natural Resources & Conservation (DNRC), and the Water Resources Development Act (WRDA).

Environmentally sensitive characteristics such as wetlands, floodplains, threatened or endangered species, and historical sites are not expected to be adversely impacted as a result of the proposed project. Additional environmental impacts related to land use, water quality, air quality, public health, energy, noise, growth, and sludge disposal were also assessed. No significant long-term environmental impacts were identified.

Under Montana law, (75-6-112, MCA), no person may construct, extend, or use a public sewage system until the DEQ has reviewed and approved the plans and specifications for the project. Under the Montana Water Pollution Control State Revolving Fund Act, the DEQ may loan money to municipalities for construction of public sewage systems.

The DEQ, Technical and Financial Assistance Bureau, has prepared this Environmental Assessment to satisfy the requirements of the Montana Environmental Policy Act (MEPA) and the National Environmental Policy Act (NEPA).

D. COMMENT PERIOD

Thirty (30) calendar days

II. PURPOSE OF AND NEED FOR ACTION

The Bigfork wastewater treatment facility (WWTF) is a well-run and well-maintained facility that consistently meets its MPDES discharge permit limits. However, the existing WWTF was constructed in 1987, and much of the mechanical equipment is original and nearing the end of its useful life. In addition, the District has experienced significant growth (~5% annually), which is anticipated to continue throughout the 20-year design period leading to capacity issues with many of the wastewater treatment unit processes. The facility is authorized to discharge to Flathead Lake under Montana Pollution Discharge Elimination System (MPDES) Permit No. MT0020397. Flathead Lake has an A-1 classification for water quality, which is the highest classification in the State, but the lake is also listed on the State's 303(d) list for aquatic life impairment associated with elevated nutrient levels. In an effort to maintain and restore this high quality water body, a total maximum daily load (TMDL) was developed in 2001. A 15 percent reduction in nitrogen and phosphorus loads, plus an additional 10 percent load reduction for a margin of safety, has been proposed as the TMDL (phase 1 allocation) for core urbanized areas such as Bigfork. This is a significant reduction for nutrients that the existing treatment facility will not be capable of meeting.

To address the aging equipment concerns, provide future capacity for the design wastewater flows and loads through the planning period, and meet more stringent discharge limitations, the wastewater treatment facility will need to be upgraded, expanded, and additional treatment processes added.

III. ALTERNATIVES INCLUDING THE PROPOSED ACTION

In 2008, the Bigfork W&S District replaced the influent lift station pumps, replaced the facility's control system, and constructed a new headworks building equipped with a fine screen and grit removal, in preparation for the needed treatment improvements. Due to space limitations at the existing treatment site, only specific "small footprint" treatment technologies were investigated for advanced treatment. Whenever possible, existing tanks will be utilized. In addition, all alternatives discussed below have the ability to be constructed in phases, and adjacent to the existing system, enabling the existing facility to remain in use throughout construction. In addition, the current District office and laboratory space is inefficient and inadequate for future operations. All treatment alternatives would include space for a laboratory; an office area; and restroom facilities.

A. Four alternatives for providing advanced wastewater treatment were evaluated in the PER. In all cases, the design criteria for a new treatment facility include: biochemical oxygen demand (BOD) < 5 mg/L, total suspended solids (TSS) < 5 mg/L, total nitrogen < 10 mg/L, and total phosphorus < 0.5 mg/L. The treatment alternatives evaluated included:

T-1 No Action

T-2 Membrane Bioreactor (MBR)
T-3 Sequencing Batch Reactor (SBR) and Cloth Media Disc Effluent Filtration
T-4 Sequencing Batch Reactor (SBR) and Continuous Backwash Effluent Filtration

T-1 NO ACTION - The no-action alternative would result in the continued use of the District's trickling filter system for secondary treatment, with chemical precipitation and pressure sand filters for phosphorus removal. While the existing facility is currently performing well and is capable of meeting its discharge limits, due to the age of the facility, many of the mechanical components of the treatment facility are near or at the end of their useful life. These include blowers, pumps and motors which will cause significant problems for the WWTF when they become inoperable. As the community continues to grow, many of the existing unit processes will be at or exceed their treatment capacity. Also, the existing facility was not designed to optimize nitrogen removal, which will result in permit violations when more stringent nitrogen limits are imposed in the discharge permit. Based on these concerns, the no-action alternative was not considered to be a viable option.

T-2 MEMBRANE BIOREACTOR (MBR) – This alternative would consist of construction of a suspended growth activated sludge biological reactor integrated with a membrane filtration system. A membrane filtration system replaces the solids separation function of both secondary clarifiers and effluent filters in conventional activated sludge systems resulting in a smaller footprint. Another benefit for treatment sites with expansion constraints is that MBR technology enables the bioreactors to be operated at a considerably higher biomass concentration than conventional activated sludge plants, which allows for the construction of smaller tanks that still provide a high level of treatment. The membranes are immersed in an aeration tank in direct contact with the treated wastewater and a vacuum is applied to the header connected to the membranes which draws treated water through the membranes filtering out particles larger than 0.4 micrometers. Coarse bubble diffusers are used to scour the membrane surfaces to keep them clean. This alternative would include the construction of three biological treatment trains and three membrane tanks. The biological trains would contain aeration and anoxic zones for BOD and nitrogen removal. Alum would be added to the influent splitter structure for chemical phosphorus removal. The membranes would filter out any particulate matter (TSS). The filtered water would then be directed to an ultraviolet (UV) disinfection system and discharged to Flathead Lake. The MBR process would combine the unit operations of aeration, secondary clarification and filtration into a single process, would produce a high quality effluent, would simplify operation, and greatly reduce space requirements in comparison to a conventional activated sludge treatment facility.

T-3 SEQUENCING BATCH REACTOR (SBR) AND CLOTH MEDIA DISC EFFLUENT FILTRATION – This alternative consists of construction of a Sequencing Batch Reactor (SBR) for biological treatment and cloth media disc filters for effluent filtration to further remove TSS and phosphorus. SBR systems are a fill and draw activated sludge wastewater treatment system that utilizes a single basin for treatment and clarification. This results in a smaller "footprint" than needed for a conventional activated sludge facility. To provide continuous treatment, SBR systems typically contain two basins that are operated 180 degrees out of phase, with alternating cycles. SBRs generally contain the following phases of operation, which occur sequentially on a cyclical basis: fill, react, settle, decant and idle. The cloth media filters are located in a separated basin and consist of several disc shaped frames, approximately 7 feet in diameter that are covered with cloth media and mounted on a hollow shaft, which conveys the filtered effluent flows. The entire disc assembly is submerged in the treated wastewater. The filters are cleaned through the use of backwash pumps and disc rotation. Cloth media filter systems require a small footprint for a given treatment capacity, enabling them to be easily installed within the boundaries of the existing treatment site. This alternative would include the construction of two new SBR basins for the biological treatment and two cloth filter system basins. As the wastewater fills the basin it would be exposed to anaerobic, aerobic, and anoxic conditions that would result in BOD, nitrogen and some phosphorous removal. After treatment the basin is allowed to settle and the supernatant is decanted to a flocculation and sedimentation basin for additional phosphorus removal, through the use of alum, prior to the cloth media disc filtration unit. The filtered water would then be directed to an ultraviolet (UV) disinfection system and discharged to Flathead Lake.

T-4 SEQUENCING BATCH REACTOR (SBR) AND CONTINUOUS BACKWASH EFFLUENT FILTRATION – This alternative would be similar to alternative T-3 with the use of continuous backwash filters in lieu of cloth media disc filters. The SBR process would be the same. The benefit of backwash filter is their significant peak solids capture capabilities and their ability to be operated as an additional denitrification process with appropriate design and chemical addition. Continuous backwash filters use a deep (generally 40 inches or more) granular media bed in which media is continuously pumped from the bottom of the filter to the top through use of an air lift pump. The pumping action scrubs the media and keeps it clean. At the top of the filter, the media is separated from the backwash water and deposited back onto the filter bed. Due to the required depth of the filter, placement inside an existing tank is not possible so a new concrete basin would be required to house the filter bed. The filtered water would then directed to an ultraviolet (UV) disinfection system and discharged to Flathead Lake.

B. The Bigfork WWTP currently utilizes ultraviolet (UV) disinfection, which is a physical disinfection process involving electromagnetic radiation. Due to the high

quality effluent produced by the treatment technologies discussed above, UV would continue to be an effective means for providing disinfection. The District has been pleased with its current UV system and like that it does not have the safety concerns associated with chlorine gas or the handling problems of hypochlorite solutions. Therefore, alternative disinfection technologies were not evaluated in the PER. However, two UV alternatives for providing wastewater disinfection were considered in the PER and included:

D-1 No Action
D-2 New Ultraviolet Disinfection Facility

D-1 NO ACTION - The no-action alternative would result in the continued use of the District's existing UV disinfection system. District staff has indicated that general maintenance of the system has increased in the last few years due to the age of the equipment. Failure of the disinfection system would result in permit violations and would pose a threat to public health. In addition, it is anticipated that the current disinfection system will exceed its capacity within five years. Based on these concerns, the no-action alternative was not considered to be a viable option.

D-2 NEW ULTRAVIOLET DISINFECTION FACILTY – This alternative would consist of replacing the existing disinfection system with a new ultraviolet light disinfection system capable of treating the design flow. A closed vessel UV reactor is proposed in lieu of the more traditional open channel UV system, due to the hydraulics of the plant and the space available for the UV equipment. Closed vessel UV systems can operate under pressure and require a significantly reduced footprint in comparison to open channel UV systems. This alternative would consist of the installation of two closed vessel UV reactors equipped with low pressure UV lamps. A third UV reactor would be added as the system reaches full build-out.

C. COST COMPARISON - PRESENT WORTH ANALYSIS

The present worth analysis is a means of comparing alternatives in present day dollars and can be used to determine the most cost-effective alternative(s). An alternative with low initial capital cost may not be the most cost efficient project if high monthly operation and maintenance costs occur over the life of the alternative. Salvage values were determined to be inconsequential and therefore not presented. An interest rate of 6.0% over the 20-year planning period (design year 2028) was used in the analysis. Table 1 provides a summary of the present worth analysis of the feasible alternatives considered.

TABLE 1 - ECONOMIC EVALUATION OF TREATMENT SYSTEM ALTERNATIVES

Alternative Number (From Above)	Alternative	Total Capital Cost	Annual O&M	Total Present Worth
T-2	Membrane Bioreactors (MBRs)	$6,790,500	$205,000	$9,141,850
T-3	Sequencing Batch Reactors (SBR) and Cloth Media Disc Effluent Filtration	$4,369,000	$133,000	$5,897,000
T-4	Sequencing Batch Reactors (SBR) and Continuous Backwash Effluent Filtration	$4,252,000	$131,000	$5,752,000
D-2	New Ultraviolet Disinfection Facility	$409,500	NA **	$409,500

** No annual O&M costs for these capital improvements were presented within the report.

C. BASIS OF SELECTION OF PREFERRED ALTERNATIVE

Selection of the preferred alternative was based upon several criteria, both monetary and non-monetary. The ranking criteria considered are shown in Table 2. Each alternative was assigned a ranking score of 1 to 5 for each category with 5 being the most favorable and 1 being the least favorable. The ranking factors were then multiplied by the relative weight of importance assigned to each evaluation criteria. The weighted rank scores were then summed, resulting in a weighted rank total score, the greatest score indicating the highest ranking. As shown in the ranking criteria matrix, alternative T-2 (MBR) ranked the highest, primarily due to treatment reliability and facility flexibility. Even though it has the highest capital cost, based on the overall score, alternative T-2 was selected to provide advanced wastewater treatment for the Bigfork W&S District. Due to the distinct nature of MBR manufacturer designs, a competitive pre-selection process was undertaken. As a result of this process Enviroquip flat plate membranes were selected. In addition, a new pressurized UV system (Alternative D-2) will be installed to disinfect the effluent from the MBR plant. When phase 2 load allocations for the Flathead Lake TMDL are implemented, the associated nutrient effluent limits may require supplementary upgrades to the treatment system for additional nutrient removal.

The estimated administration, design and construction cost for the recommended alternative (Alternative T-2 and D-2) is $10,200,000. The District will fund the project using a $750,000 Treasure State Endowment Program (TSEP) grant; a $100,000 Department of Natural Resources & Conservation (DNRC) grant; a $240,000 direct appropriation grant from the Water Resources Development Act (WRDA); and a $9,110,000 loan from the Water Pollution Control State Revolving Fund (WPCSRF) program. Of the loan amount, $384,000 will be forgiven, with the remaining $8,726,000 having an interest rate of 3.75% for 20 years.

TABLE 2 RANKING CRITERIA FOR TREATMENT ALTERNATIVES							
Criteria	**Weighting Factor**	**Alt T-2: MBR**		**Alt T-3: SBR w/ Cloth Media Disc Effluent Filtration**		**Alt T-4: SBR w/ Continuous Backwash Effluent Filtration**	
		Score	**Weighted Score**	**Score**	**Weighted Score**	**Score**	**Weighted Score**
Cost Effectiveness	6	3	18	5	30	5	30
Treatment Reliability	4	5	20	3	12	3	12
Facility Flexibility	4	5	20	3	12	2	8
Operational Ease	3	5	15	4	12	4	12
Energy /Resource Use	1	4	4	5	5	5	5
Weighted Total			**77**		**71**		**67**

If the project needs to be funded with a revenue bond, the monthly sewer rate will increase $35.08 per month. This will result in a sewer rate (including current debt service and O&M costs) of approximately $87.99 per month per user. The financial impact of this project on the system users through a revenue bond is shown in Table 3. Based on the EPA guidance for project affordability, the proposed project will result in a monthly cost per household that is 3.0% of the monthly median household income, and therefore may impose an economic hardship on household income for some residents.

Table 3 PROJECT AFFORDABILITY (REVENUE BOND)	
Total monthly debt service and O&M cost[1]	$87.99
Monthly median household income (mMHI)[2]	$3,010.00
User rate as a percentage of mMHI	3.0 %

[1] Bigfork W&S District Uniform Application Form
[2] Based on 2000 census data

If the project is funded with a general obligation (GO) bond, the cost to each property owner within the Bigfork Water & Sewer District will be $71 per year per $100,000 of the taxable market value of the property. The taxable market value is approximately 1/2 to 1/3 of a property's market value. For example, a property with a market value of $275,000 would have a taxable market value of $137,500. The GO assessment for this property would be $8.14 per month. To this cost, $52.91 must be included to cover the District's current debt service and O&M costs, resulting in an equivalent monthly sewer rate of $61.05. The financial

impact of this project on the system users through a GO bond is shown in Table 4. Based on the EPA affordability guidance, the proposed project will result in a monthly cost per household that is 2.0% of the monthly median household income, and therefore may impose a moderate economic hardship on household income for some residents.

Table 4 PROJECT AFFORDABILITY (GO BOND)	
Total equivalent monthly debt service and O&M cost[1]	$61.05
Monthly median household income (mMHI)[2]	$3,010.00
User rate as a percentage of mMHI	2.0 %

[1] Variable depending on market value of property. Assumed $275,000.
[2] Based on 2000 census data

Although the proposed project will result in high sewer rates with either funding scenario, due to State permitting and Flathead Lake TMDL requirements, the District has chosen to implement the project to avoid penalties and fines associated with permit violations.

IV. AFFECTED ENVIRONMENT

A. PLANNING AREA/MAPS

Bigfork is an unincorporated community located on the northeastern shore of Flathead Lake at the mouth of the Swan River along Highway 35 in Flathead County (See Figure 1). Water and sewer services for the Bigfork community are provided through a County Water and Sewer District.

The planning area encompasses the community of Bigfork and the recreational communities of Eagle Bend and Harbor Village, as well as adjacent areas that may be developed in the near future. The District boundary and planning area are shown in Figure 2. This proposed project involves construction of a new membrane bioreactor (MBR) plant with UV disinfection to provide advanced wastewater treatment (Figure 3). The project will take approximately eighteen months to construct following system design and approval. Construction is scheduled to begin in fall 2010.

B. FLOW PROJECTIONS

The current average day flow to the wastewater treatment facility is approximately 230,000 gallons per day. Flow monitoring has shown the annual average wastewater flow to be 84 gallons per capita per day (gpcd), the summer average flow to be 101 gpcd, and the maximum monthly value to be 113 gpcd.

Based on historical flow data, there is clearly an infiltration and inflow (I&I) component to the summer-time wastewater flow for the wastewater treatment facility that coincides with rising lake levels. Several projects have been implemented in an attempt to address this issue, including rehabilitation (slip-

lining) of the two sewer mains located around Bigfork Bay. While the sewer main rehabilitation did reduce infiltration, the problem still exists likely due to the migration of groundwater to service lines and other pipes in the area that have not been repaired or replaced. Regardless, I&I is not considered “excessive” for the overall collection system as per capita flows, even under maximum month flow conditions, do not exceed the EPA “trigger” flow value of 120 gpcd. EPA guidelines state that in general it is not economically feasible to undertake a collection system project to eliminate I&I if domestic wastewater plus infiltration does not exceed 120 gpcd. No capacity deficiencies have been identified within the collection system and none are anticipated in the foreseeable future.

Population determination within the Bigfork area is complicated by the fact that a large portion of homes are occupied by seasonal or part-time residents. In addition the Bigfork Census Designated Place (CDP) does not coincide with the District W&S boundary. Based on historical customer/population growth combined with current District commitments to additional lots within the District boundaries, a yearly growth rate of 5% for year round residents and a 2% growth rate for summer tourists were assumed through design year 2030. The projected design population and design flows are shown in Table 4.

Table 4
PROJECTED POPULATION AND WASTEWATER FLOWS

Year	Population (summer)	Average Daily Flow	Max Month Flow
		(gal/day)	(gal/day)
2008	2,768[1]	227,000	379,000
2030	8,125	690,000	930,000

[1] Bigfork Water & Sewer population estimate.

C. NATURAL FEATURES

The area surrounding the District consists of mountainous, forested land and valleys typical of western Montana. The Swan River flows from the south through the Swan Valley and enters Flathead Lake at Bigfork. The Flathead River flows from the north and enters Flathead Lake two miles west of Bigfork. The planning area consists of hilly and steep slopes within the community and flat valley land to the west. The elevation in Bigfork varies from approximately 2900 feet near the lake to approximately 3000 feet at the Eagle Bend golf course. Along the lakeshore, the soils are typically a gravelly loam comprised of glacial outwash, while in Bigfork the soil is loamy fine sand.

Throughout the District, depth to groundwater varies, generally following the river or lake elevations. In low areas, groundwater is within two to three feet of the surface usually from May to October.

Flathead Lake is classified as an A-1 waterbody. Waters classified A-1 are suitable for drinking, culinary, and food processing purposes after conventional treatment for removal of naturally present impurities. It is also considered

suitable for bathing, swimming and recreation; growth and propagation of salmonoid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply.

Bigfork's average high temperature is 81° F in July, and the average low temperature is 22° F in January. The average annual precipitation rate is 22 inches per year, the majority of which falls during May and June. Snow is common from November to March and averages 54 inches per year.

V. ENVIRONMENTAL IMPACTS OF PROPOSED PROJECT

A. DIRECT AND INDIRECT ENVIRONMENTAL IMPACTS

1. Land Use – There will be no impact to land use due to the proposed project. All treatment improvements will occur on land within the boundaries for the existing wastewater treatment facility.

2. Floodplains and Wetlands – No improvements will occur within the 100-year floodplain. The proposed project will not impact any wetlands. The Department of Natural Resources (floodplains) and Army Corps of Engineers (wetlands) have been notified of this project and asked to reply with any concerns. See *Section X Agencies Consulted* of this report for a summary of their comments.

3. Cultural Resources – No impacts to cultural resources are anticipated. All construction activity will occur on previously disturbed ground within the boundaries of the existing treatment facility. The State Historic Preservation Office (SHPO) and the Tribal Historic Preservation Office of the Confederated Salish and Kootenai Tribes of the Flathead Nation have reviewed the proposed project. See *Section X Agencies Consulted* of this report for a summary of their comments.

4. Fish and Wildlife – Animal life will not be significantly affected by the proposed project. All improvements will occur within the boundaries of the existing treatment plant and therefore the project will not affect any critical wildlife habitats, nor will any known endangered species be affected. The proposed project has water quality benefits, including nitrogen, phosphorus and pathogen reduction, that will protect and reduce the risk of harm to fisheries and other animals.

   The Montana Department of Fish, Wildlife, and Parks and U.S. Fish and Wildlife Services have been notified of this project and asked to reply with any concerns. See *Section X Agencies Consulted* of this report for a summary of their comments.

5. Water Quality – The proposed wastewater treatment facility will produce a higher quality effluent than the current facility, and therefore will have a positive effect on Flathead Lake.

The existing wastewater treatment facility is designed to serve a population of 5,412 with a design flow of 500,000 gpd. Those numbers were used to establish the facility's baseline allocated nondegradation load limits in the discharge permit. Any increase above this baseline allotment is subject to the provisions of Montana's Nondegradation Policy 75-5-303, MCA, and requires the facility to provide a higher level of treatment for compliance. Recent discharge data has shown that the existing facility is currently discharging approximately 3% of the allotted BOD load; 6% of the allotted TSS load; 21% of the allotted total nitrogen load; and 12% of the allotted total phosphorus load. In addition the fecal coliform discharged are consistently below 1 organism/100 mL.

Flathead Lake is listed on the State's 2008 303(d) list of impaired water bodies. The beneficial use impacted is aquatic life. The probable causes of this impact have been identified as nutrients (phosphorus and nitrogen), mercury, PCBs, and sedimentation. Municipal point source discharges are listed as a probable source for some of these pollutants. The TMDL for Flathead Lake was completed in 2001. While final nutrient effluent concentrations for the Bigfork WWTF have not been issued, a 15 percent reduction in nitrogen and phosphorus loads, plus an additional 10 percent load reduction for a margin of safety, has been proposed as the TMDL (phase 1 allocation) for core urbanized areas such as Bigfork.

The primary purpose of the proposed upgrades to the wastewater treatment facility is to further improve or maintain the current quality of the effluent. The District's current discharge permit has load limits for total nitrogen (TN) and total phosphorous (TP) at 42.1 lbs/day and 4.2 lbs/day respectively. At the average annual design flow of 0.69 MGD this equates to a TN concentration of 7.3 mg/L and a TP concentration of 0.73 mg/L. System performance modeling indicates that the new facility will be capable of meeting these limits producing an effluent with a TN of 6.73 mg/L and a TP of 0.17 mg/L. Currently the Bigfork WWTP (at 0.23 MGD) discharges, on average, 33 lbs/day total nitrogen (or 18 mg/L) and 0.35 lbs/day total phosphorous (or 0.18 mg/L). Once the new facility is operational, the concentration of TN in the discharge will be reduced by 63% and will meet the 25% reduction required by the Flathead Lake phase 1 TMDL. Bigfork has been proactive in reducing TP to the Lake, and have been achieving much less than 1 mg/L for many years through the use of alum and filtration. The new MBR facility will continue to produce an effluent that meets or exceeds the current low levels of phosphorous observed at the current WWTP. While the new facility may not see a 25% reduction in TP from current discharge levels, it will be capable of meeting its permitted load limit. At design flows the average daily load is estimated to be 38.7 lbs/day for TN and 0.98 lbs/day for TP, both of which are less than allowable load limits in the current permit. These projected reductions are significant and the proposed improvements are a major step towards meeting more stringent nutrient standards that may result from the implementation of phase 2 load allocations associated with the Flathead Lake TMDL in the future.

6. Air Quality - Short-term negative impacts on air quality are expected to occur during construction from heavy equipment in the form of dust and exhaust fumes. Proper construction practices will minimize this problem. Project specifications will require dust control. Due to the residential development adjacent to the treatment plant, coordination with neighboring properties during construction will be important.

7. Public Health - Public health will not be negatively affected by the proposed project. Treatment facility improvements will reduce nutrient loading to the Swan River and Flathead Lake. Improved sewage treatment will reduce the potential to pollute surface waters.

8. Energy – An increase in energy consumption will occur after the new treatment plant is constructed due to additional equipment. Energy consumption will be minimized as much as possible through the use of energy efficient equipment (pumps, blowers, lighting, etc…). The consumption of energy resources directly associated with construction of the recommended improvements is unavoidable but will be a short-term commitment.

9. Noise - Short-term impacts from excessive noise levels may occur during the construction activities. Due to the residential development adjacent to the treatment plant, coordination with neighboring properties during construction will be important. The construction period will be limited to normal daytime hours to avoid early morning or late evening construction disturbances. All equipment will be housed within a building, and therefore no significant long-term impacts from noise will occur.

10. Sludge Disposal – Biosolids applied to land must meet all applicable requirements of 40 CFR Part 503 of the Code of Federal Regulations. The Part 503 regulations contain specific numerical limits and other requirements for heavy metals, pathogens, and vector attraction. The District has an EPA 503 permit that allows them to dispose of all sludge (biosolids) generated by the Bigfork WWTP at a land application site located west of the District. After sufficient treatment in an aerobic digester, sludge is transported to a sludge storage tank located at the application site where it is subsequently applied by subsurface injection to approximately 20 to 30 acres/year of farmland owned by the District. The area is farmed the following year and a new area is set aside for injection on a rotational basis. The District owns a total of 317 acres of farmland.

11. Environmental Justice – Environmental Justice Executive Order 12898: The proposed project will not result in disproportionately high or adverse human health or environmental effects on minority or low income populations. The economic impact will ultimately affect all of the users of the system proportionately to the taxable value of the system if a general obligation bond were used to secure a loan for the cost of the project. Otherwise users would all pay nearly the same or based upon the size of

the water service to the respective property. No disproportionate effects among any portion of the community would be expected.

12. Growth – The 20-year design population is based on a growth rate of approximately 5 percent per year. Improvements to the WWTP will be a positive feature for the community.

    Improvements of the wastewater treatment system may result in minor secondary impacts that are associated with the growth of the community. This project would allow the District to manage its growth in a proactive manner and promote urbanization within its service area. The anticipated increase in population and development in the service area would result in increased flows to the WWTF. Secondary impacts may include impacts to: housing, commercial development, agriculture lands, solid waste, transportation, and utilities.

13. Cumulative Effects - Expansion of the plant may result in secondary and cumulative impacts associated with the growth of the community. Growth impacts include: increased air emissions from additional traffic, increased water consumption, increased discharge of treated effluent into Flathead Lake, and possible loss of agricultural and rural land uses. These impacts will need to be managed and minimized as much as possible through District policies and proper community planning.

B. UNAVOIDABLE ADVERSE IMPACTS

Short-term construction related impacts (i.e., noise, dust, traffic disruption, etc.) will occur, but should be minimized through proper construction management. Energy consumption during construction cannot be avoided.

VI. PUBLIC PARTICIPATION

Public participation for this project included a meeting held on April 16, 2008. At the public meeting, the need for the project, recommended alternative, and phasing/scheduling were discussed. Cost estimates for the project and proposed sewer rates were presented as well. No comments on the project were received from the public.

VII. AGENCY ACTION, APPLICABLE REGULATIONS AND PERMITTING AUTHORITIES

No additional permits will be required from the State Revolving Fund (SRF) section of the DEQ for this project after the review of the submitted plans and specifications. However, coverage under the storm water general discharge permit and groundwater dewatering discharge permit, if necessary, are required from the DEQ Water Protection Bureau prior to the beginning of construction.

VIII. RECOMMENDATION FOR FURTHER ENVIRONMENTAL ANALYSIS

[ ] EIS [ ] More Detailed EA [X] No Further Analysis

Rationale for Recommendation: Through this EA, the DEQ has verified that none of the adverse impacts of the proposed Bigfork advanced wastewater treatment project are significant. Therefore, an environmental impact statement is not required. The environmental review was conducted in accordance with the Administrative Rules of Montana (ARM) 17.4.607, 17.4.608, 17.4.609, and 17.4.610. The EA is the appropriate level of analysis because none of the adverse effects of the impacts are significant.

IX. REFERENCE DOCUMENTS

The following documents have been utilized in the environmental review of this project and are considered to be part of the project file:

1. Bigfork Water and Sewer District Wastewater Facilities Preliminary Engineering Report (PER), updated 2008, prepared by Morrison Maierle, Inc.
2. Uniform Application Form for Montana Public Facility Projects for the Bigfork Water and Sewer District (Mayport Harbor), April 2010 prepared by the Bigfork County Water and Sewer District.
3. Bigfork MBR Equipment Pre-Selection Documentation, August 2009 prepared by Morrison-Maierle, Inc.
4. Nutrient Management Plan and Total Maximum Daily Load for Flathead Lake, Montana. December 2001, Montana Department of Environmental Quality.
5. Basis of Design Report Phase 2A Improvements Wastewater Treatment Facility, March 2010, prepared by Morrison Maierle, Inc.
6. Department of Environmental Quality Permitting and Compliance Division Montana Pollutant Discharge Elimination System Fact Sheet (Permit No. MT0020397), May 2010.

X. AGENCIES CONSULTED

The following agencies have been contacted in regard to the proposed construction of this project:

1. The U.S. Fish and Wildlife Service reviewed the proposed project and indicated that the project may possibly affect the federally threatened Bull Trout and its critical habitat. The Service recommended that an “effluent reuse” alternative be implemented to minimize and/or eliminate potential effects to bull trout while minimizing impacts to the Flathead Lake ecosystem.

   DEQ response: The District considered an “effluent reuse” option during design, but was unable to find a suitable land application site. The District will continue to investigate the development and implementation of a “reuse” option, should it becomes a viable means for disposal in the future.

2. The Montana Department of Natural Resources and Conservation (DNRC)

improvements in the Bigfork Wastewater PER since no construction is planned within the designated floodplain.

3. The Montana Historical Society's State Historic Preservation Office (SHPO) reviewed the proposed project. According to their records, there have been a few previously recorded sites and a few cultural resource inventories done within the designated search locales. SHPO stated that since the project will be occurring in areas with previous ground disturbance they feel that there is a low likelihood that cultural properties would be impacted and, as such, felt a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or cultural materials be inadvertently discovered during the project, SHPO must be contacted and the site investigated.

4. The Confederated Salish and Kootenai Tribes Historic Preservation Office reviewed the proposed project. They indicated that since the Bigfork area is part of the Confederated Salish and Kootenai Tribes (CKST) aboriginal territory there is high likelihood that cultural resources could be discovered during the project, especially near the river location. Burials have been discovered in this part of the CKST ancestral homeland. If human remains are found, the local law enforcement and a coroner need to be contacted to determine that it is not a crime scene. In addition, the State Historic Preservation Office and the Confederated Salish and Kootenai Tribes Preservation Office must be contacted. All work in this section of the project will cease to give the CSKT time to remove the skeletal remains and rebury them on the Flathead Indian Reservation.

5. The U.S. Department of the Army Corps of Engineers (USCOE) was contacted on 5/10/06 regarding impacts to wetlands due to the proposed project. No comments were received from the USCOE.

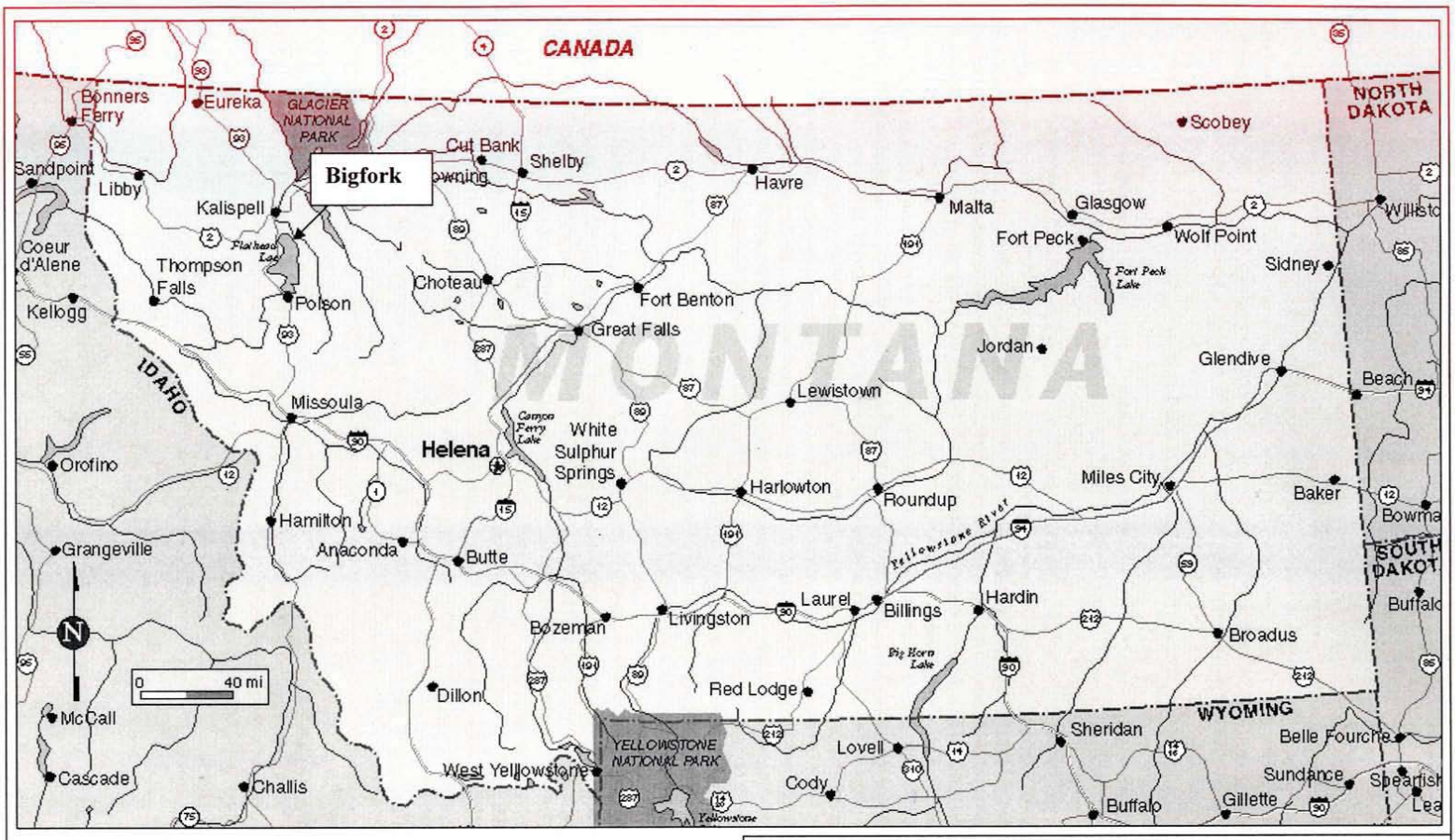
6. The Montana Department of Fish, Wildlife and Parks indicated that they did not have any comments regarding the proposed improvements in the Bigfork Wastewater PER.

EA Prepared by:

Mike Abrahamson, P.E. — Date: 7/15/10

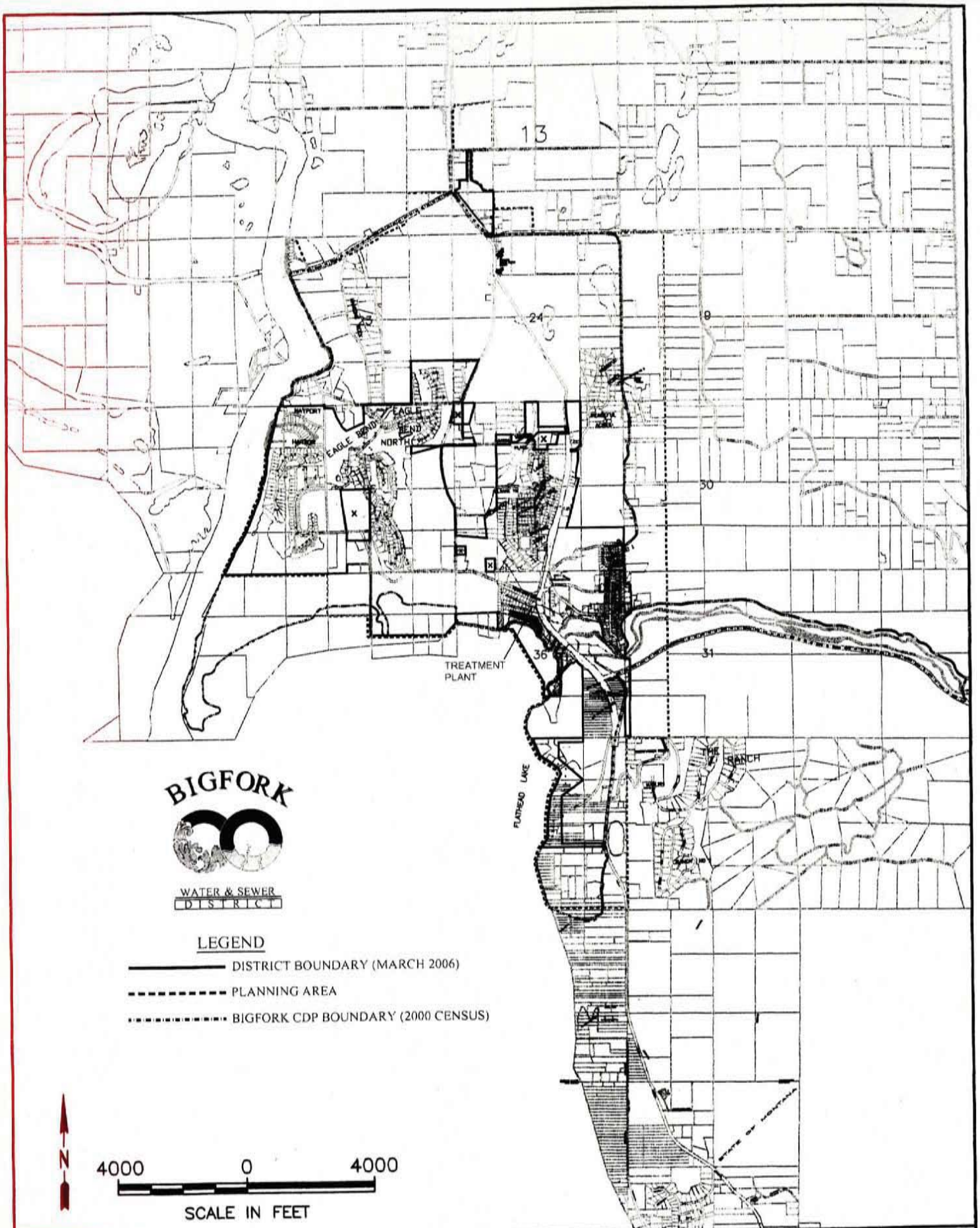
EA Reviewed by:

Jerry Paddock, P.E. — Date: 7/15/10



Montana Department of
ENVIRONMENTAL QUALITY

Figure 1. Site Location Map – Bigfork, MT



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APPR. BY: JMA
DATE: 4/2006

BIGFORK WATER AND SEWER DISTRICT
PRELIMINARY ENGINEERING REPORT

PROJECT NO. 3835.001

DISTRICT BOUNDARY

Figure 2

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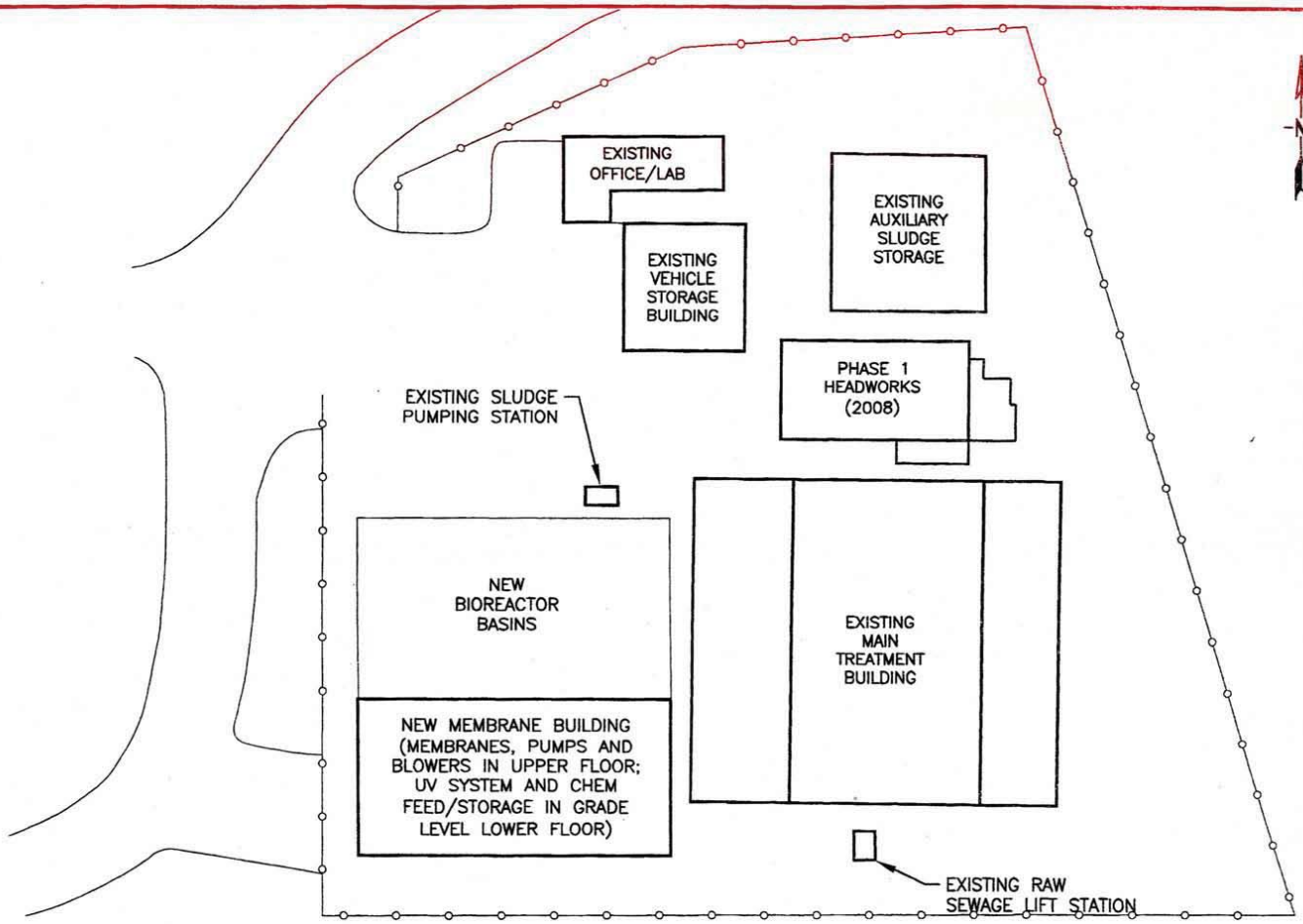

SITE PLAN
SCALE: 1"=40'-0"

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BIGFORK COUNTY WATER & SEWER DISTRICT
BIGFORK, MONTANA

PROJECT NO. 3835.001

SITE PLAN
PHASE 2A, 2B AND 2C WWTF IMPROVEMENTS

Figure 3

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