Clean Water State Revolving Fund (SRF) Project Plan Preparation Guidance

Michigan Department Environmental Quality

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Introduction

This document provides detailed guidance to potential loan applicants and their consultants regarding federal and state requirements governing project plan preparation for the State Revolving Loan Fund (SRF). This guidance is intended to be comprehensive and addresses a wide variety of potential projects; not every issue within this guidance is relevant to every project. However, when items are pertinent to the project, they must be addressed at a level of detail appropriate to the complexity of the issue and the scope of the proposed project. The applicant's final project plan must address all of the elements identified in state law (MCL§324.5303) and its attendant rules (Mich. Admin. Code R323.952). A copy of these rules can be found at State Budget Office Web site (http://www.michigan.gov/orr/0,1607,7-142-5698---,00.html).

The SRF is an **environmental protection program**, focused on correcting water quality problems rather than increasing wastewater system capacity to accommodate anticipated development. The evaluation of certain issues is required by federal regulations, and analyses must be conducted to ensure that proposed projects protect and enhance the environment. *Applicant Actions Related to Project Planning* (guidance available on the Clean Water Revolving Fund Web site) provides a comprehensive list of agencies that may need to be contacted to provide input or environmental clearances.

Applicants should begin project plan development as early as possible, ideally ten months prior to the annual SRF July 1 submittal deadline. Revolving Loan Section (RLS) staff are available to discuss program requirements and project plan contents. Applicants should submit a draft project plan for review at least 90 days before the plan is finalized. This will allow staff to identify any problematic issues or potential obstacles to prioritizing the project. The community will then have the opportunity to incorporate the necessary changes before the project plan public hearing.

Potential applicants should note that all contracts for architectural and/or engineering services (including planning, design, and/or construction engineering) for work being funded by the SRF must publicly announce all requirements for these services and negotiate contracts using a Qualifications-Based Selection (QBS) process. Guidance documents for the QBS process, along with the QBS *Procurement of Architectural and Engineering Services Certification Form*, can be found in the *Design Phase Guidance* document or on the Clean Water Revolving Loan Fund Web site.

Incorporation of green project components in eligible SRF projects is encouraged. Refer to the CWSRF and DWSRF Green Project Reserve Guidance (http://www.michigan.gov/deq/0,4561,7-135-3307_3515_3517-233829--,00.html) for project examples and eligibility requirements.

Applicants that wish to use a Construction Management At-Risk (CMAR), Progressive Design-build (PDB), or Fixed-Price Design-Build (FPDB) should refer to the *Project Delivery Methods Guidance*, which is available on the SRF Web site, and schedule a meeting with a RLS project manager early in the planning stage to discuss project delivery requirements and eligibility. Additionally, the project plan must discuss the benefits and disadvantages of selecting one of these delivery methods over the traditional Design-Bid-Build delivery method and why the chosen method is the best fit for the project.

A complete final project plan will be the basis for project prioritization for SRF loan assistance. Two copies of the final project plan must be submitted to the address on the front cover of this guidance by July 1 of any given year for prioritization on a Project Priority List (PPL) for the following fiscal year (October 1 to September 30). A completed *Project Plan Submittal Form, PPL Scoring Data Form*, and *Project Useful Life and Cost Analysis Certification Form* must accompany the final project plan submittal. These forms are available on our Web site.

Project Plan Contents

Your project plan should begin with basic background information. The initial section should be detailed enough to serve as the foundation for assessing needs, evaluating alternatives, and identifying environmental issues.

Delineation of the Study Area

The study area provides the basis for planning the proposed project(s) and includes the area that contributes to the wastewater and water quality problems to be addressed by one or more feasible projects. The study area should cover the geographic area served by any existing wastewater system(s) and include potential treatment sites or facilities outside of the current service area.

Once the study area is delineated, the area to be served by the proposed project must be identified, including the current service area(s) and any new service areas anticipated during the next 20 years. Maps of the study and service areas must be included in the project plan.

Environmental Setting

The environmental setting in the project study area must be discussed, including a brief evaluation of the following items as applicable:

Cultural Resources

Known historical and archaeological sites must be described, based on documentation provided through the National or State Historical Register, the State Historical Preservation Office (SHPO), Tribal Historic Preservation Offices (THPO), local historical societies, and local or regional planning agencies.

The Natural Environment

A. Air Quality

   The current and anticipated future air quality in the study area should be discussed, especially as it relates to the project and any residential or commercial growth that may be facilitated by the project.

B. Wetlands

   All wetlands in the study area must be identified and described. A wetlands map must be included in the project plan.

C. Coastal Zones

All Great Lakes shorelands, coastal zones, and coastal management areas within the study area must be identified and described. A map of any coastal zones and coastal management areas must be included.

D. Floodplains

Floodplains within the study area must be identified and described. A Federal Emergency Management Agency (FEMA) floodplain map, with the proposed construction areas marked, must be included in the project plan.

E. Natural or Wild and Scenic Rivers

All rivers designated for protection within the study area must be identified and described.

F. Major Surface Waters

The characteristics and uses of the surface water and groundwater should be identified. Points where water is drawn for public or private water supply or for agricultural or industrial use must be noted. A map of the major lakes, rivers, streams, and drains in the study area must be included in the project plan.

G. Recreational Facilities

A map showing parks and other outdoor recreational facilities in the area should be included in the project plan. Plans for the expansion of existing sites and new developments must be described.

H. Topography

The topography of the study area delineating drainage basins and their characteristics (e.g., area, slope, elevation) should be noted. A topographic map of the study area should be included.

I. Geology

A description of the geological structures or formations that affect the choice of alternatives should be included.

J. Soils

Soil types in the study area and their characteristics that could affect or be affected by the project alternatives (e.g., permeability, erosion potential, compaction) should be identified. Suitability of the soil for septic tank use, effluent treatment/sludge disposal, and road or building construction should also be addressed. Areas where adverse soil or subsoil conditions may be encountered during construction should be identified.

K. Agricultural Resources

All prime or unique farmlands in the study area must be identified and described. A map of these farmlands must be included in the project plan.

L. Fauna and Flora

Fauna and flora characteristic of the study area should be identified. Environmentally-sensitive habitats and any species currently listed as threatened, endangered, or state special concern must be identified.

Land Use in the Study Area

The existing land uses in the study area must be described, including an identification of residential, commercial, industrial, agricultural, and public use areas. Maps from the master plan showing existing and future zoning and land uses should be included. A discussion of the master plan, zoning, and other land use regulations or policies, especially those that address sensitive features, should be included.

The predicted land use in the study area over the 20-year planning period must be discussed. Development trends should be addressed, with an emphasis placed on any trends that may be detrimental to the air and water quality, impact agricultural uses, or develop sensitive areas.

Population

Population data is critical to assessing the need, priority, and sizing of proposed facilities. The data presented in the project plan must include the following items:

A. The existing population in the study area, including any seasonal population.

B. The current population served by the existing facilities.

C. The current and future population to be served by the proposed project.

D. Population projections for the study area for the next 5, 10, and 20 years.

Projections used in the project plan should correlate with those prepared by the appropriate regional planning agency or the state of Michigan.

Economic Characteristics

Present and future economic characteristics must be described, including:

A. The economic structure and major employers.

B. The median annual household income in the study area.

C. The major economic characteristics which might affect population growth (or decline) in the study area, including how these trends are expected to affect the need for wastewater facilities.

Existing Facilities

The discussion of the existing municipal sewage transport/treatment/disposal facilities should include the following items:

A. The method of wastewater treatment and the physical condition of facilities (i.e., years in service, capacity, and efficiency of the major components).

B. The method of sludge handling/disposal and the status of the Residuals Management Program.

C. The type of collection facilities, including the physical condition and location of existing collector sewers, interceptors, outfalls, and pump stations.

D. The location of all treatment plants, sludge management and industrial pretreatment facilities, pumping stations, and collection systems.

E. The design capacity, existing flows, and characteristics of wastes.

F. Septage receiving facilities, septage acceptance capabilities, and septage treatment loadings.

G. The location and description of major industrial discharges.

H. The average and peak dry-weather and wet-weather flows received by the treatment and collection facilities.

I. Infiltration and inflow (I/I) problems in the collection system.

J. The existence of any combined sewers and their impact on wastewater treatment and collection facilities.

K. The location of all system bypasses, including sanitary sewer overflows (SSO), with their frequency, duration, and cause.

L. The location of all combined sewer overflows (CSO), with their frequency, duration, and cause.

M. An evaluation of pump station capacities.

N. The adequacy of pump stations (e.g., backup power, alarms, controls, wet well/dry well separation) in maintaining sewer system integrity.

O. The existence of any operation or maintenance problems.

P. An evaluation of the system's climate resiliency. The system's ability to withstand and respond to changes resulting from climatic factors, such as increased flooding risks, increased intensity or frequency of storm events, should be evaluated. The availability of back-up power to continue facility operations should be discussed. Information and resources can be found at the EPA Web site for climate ready water utilities (ww.epa.gov/climatereadyutilities).

Q.

Fiscal Sustainability Plan

Projects that involve the repair, replacement, or expansion of a treatment works must develop and implement a Fiscal Sustainability Plan (FSP) that contains the following items:

A. An inventory of critical assets that are part of the treatment works.

B. Evaluation of the condition and performance of inventoried assets or asset groupings.

C. Certification that the applicant has evaluated and will be implementing water and energy conservation efforts as part of the plan.

D. A plan for maintaining, repairing, funding, and as necessary, replacing the treatment works.

The FSP is not required for the entire wastewater system; it is only required for the assets that are a part of the SRF-financed project. Items A and B should be included in the project plan, while Items C and D are submitted with the Part III Application. Further information can be found in the *FSP Guidance* and *FAQ* document.

FSP development is an eligible activity, provided it has been identified in the project plan and is a part of an eligible construction project. Energy and water conservation audits can also be a part of FSP development. A description of the FSP activities should be presented in the project plan along with the estimated costs. Refer to the *SRF Eligibility Guidance* for further information.

Need for the Project

The documentation of need should be sufficiently detailed to form the basis for project ranking on the PPL. The need for the proposed project must include a discussion of the following topics:

Compliance Status

A. The status of compliance with the existing National Pollutant Discharge Elimination System (NPDES) or groundwater discharge permit should be described, including a comparison of the existing treatment facility performance to the permit discharge limits. If the NPDES permit contains an enforceable construction schedule, those requirements should be discussed in relation to the proposed project.

B. A copy of the latest discharge permit must be included as an appendix to the project plan.

Orders

All court orders, federal or state enforcement orders, and administrative consent orders involving the municipality should be described. A copy of each order must be included in an appendix to the project plan.

Water Quality Problems

A. Point and nonpoint sources (NPS) of pollution from on-site systems, stormwater runoff, municipalities, industries, and agriculture should be identified. The quality and quantity of these discharges should be described to evaluate the magnitude of water quality impacts of the separate and/or cumulative discharges. The sources expected to be addressed by the proposed project must be identified.

   Where a municipality is considering providing service to areas currently without sewers, documentation of an existing pollution problem is the most critical factor for determining funding eligibility. It must be demonstrated that the disposal of wastewater from the existing population is causing a public health problem, groundwater contamination, or a violation of the point source discharge requirements of the federal Clean Water Act.

   Since a direct link between improperly functioning septic systems and water quality sampling results is often not clear, the documentation process involves the compilation of information to establish the site conditions and its impact on septic systems. The local health department should be able to provide septic system installation and drinking water well records, which will establish the condition of the systems, the replacement frequency, and the depth to the water table. The applicable public health code, county soil survey, soil maps, sanitary surveys, site inspections, and soil borings can supply information on the impact of the site conditions on septic system function. A mailed questionnaire can be used to obtain additional information such as the age of the building and sewage disposal system, lot size, location of the sewage disposal system and distances from the house/drinking water well/property lines, system maintenance, occupancy of the building, water-using appliances, depth of drinking water well, and identification and characterization of any problems.

   Collectively, this documentation can establish the need for the project and may include any of the following:

   - Lack of required vertical separation from groundwater (seasonally or permanently high water table) or bedrock (shallow soil over bedrock)
   - Non-conformance with setback requirements from drinking water wells or piping, buildings, property lines, or water bodies
   - Evidence of silts, mucks, or unsuitable soils that can cause permeability problems
   - Ponding or breakout of sewage or effluent on the ground
   - Backup of sewage in home/business plumbing
   - Existence of steep slopes
   - Inadequate lot sizes
   - Use of holding tanks are considered evidence of failures

- Records of repairs/replacements of on-site systems
- Age of system (design life 20-30 years) – if no health department records exist for a particular address, the assumption can be made that the system is not in compliance based on this design life
- Data from recent sampling of drinking water wells for nitrates (>10 mg/L) and/or fecal coliform bacteria
- Data on frequency of pump-outs
- Evidence of slow drainage
- Evidence of odors
- Restricted water usage

Other resources that can be used to document problems with existing on-site systems include studies of phosphorus loadings, E. coli and fecal coliform bacteria concentrations in nearby surface waters, and the use of human genetic markers. However, findings from these efforts alone should not be considered conclusive evidence that on-site systems are causing the water quality problems. Instead, the findings can be used as a broad indicator of a potential problem and can provide collective evidence in conjunction with the above referenced data.

Where phosphorus leaching from adsorption fields is of concern, this leachate should be evaluated in the context of other nonpoint or point sources of pollution. A well-documented nutrient budget for the surface water in question may be useful in demonstrating the relative significance of phosphorus leachate. The nutrient budget should consider nonpoint source pollutants such as runoff from fertilized or chemically-treated lawns, the pollutant loadings of tributary streams, and groundwater flow both into and out of lakes. In many cases, it is extremely difficult to document that phosphorus leachate from on-site systems is causing a significant water quality problem.

In regards to E. coli and fecal coliform bacteria, large exceedances of the Michigan water quality standards for total body contact recreation are indicators of the probable presence of disease-causing microorganisms or pathogens. E. coli bacteria counts over 300 organisms per 100 milliliters (based on the geometric mean of 3 or more samples taken during the same sampling event at representative locations within a defined sampling area) and fecal coliform bacteria counts over 400 organisms per 100 milliliters in discharges to surface waters (based on the geometric mean of all of 3 or more samples taken during any period of discharge not to exceed 7 days) are above levels protective of total body contact recreation. However, in many cases, it is extremely difficult to document that these hotspots of contamination are of human origin and stem from failing on-site systems.

B. Even if the municipality is not contemplating providing service to unsewered areas, septage disposal problems in the study area should be identified. Factors that can contribute to disposal problems may include an increasing number of on-site systems, the decreasing availability of suitable land for disposal, or the lack of a treatment plant willing to or capable of accepting septage. Treatment plant upgrades to accept and treat septage should be considered where appropriate.

Projected Needs for the Next 20 Years

The project plan should examine and prioritize **all** wastewater needs in the study area for the next 20 years, whether or not funding is being sought for every capital improvement. Improvements or modifications to improve a system's ability to adapt and respond to changes resulting from climatic factors (i.e., increased risk of flooding, increased intensity of storm events, warmer winters or water) should also be examined. For needs that will be addressed using SRF loan assistance, a cost-effectiveness analysis based on a 20-year planning period must be performed, and each component to be funded must be part of the facility that will cost-effectively address water quality and/or public health problems.

A. Residential wastewater needs must be based on 20-year population projections that correlate with those prepared by the state of Michigan or an appropriate regional planning agency. In all cases, 70 gallons per capita per day must be used in computing the future per capita residential wastewater flow **unless** another figure can be justified. Another figure might be calculated by subtracting the estimated I/I and industrial flows from an average daily base flow derived from reliable water supply records showing residential consumption or wastewater flow records over extended dry periods. This figure is then divided by the existing sewered residential population to obtain the per capita contribution.

B. Industrial, commercial, and institutional flows should be supported by documentation, either in terms of letters of intent or flow records, particularly where flows from individual water users are a significant contribution to the total wastewater flow. Projection of these flows should be based on realistic economic expectations.

Future Environment without the Proposed Project

This section should discuss the anticipated impacts to water quality and public health if the proposed project is not implemented. The future wastewater treatment needs, based on the population and economic projections, and the anticipated useful life of the various wastewater components should be taken into consideration.

Analysis of Alternatives

The alternative evaluation must consider the objectives of the project, any technical constraints, and the discharge permit requirements. The widest variety of potential alternatives for the entire system and the various area and/or functional subsystems must be identified. Based on the project objectives and requirements, the potential alternatives must be evaluated and screened. The rationale for rejecting an alternative must be provided in the project plan; an in-depth analysis is only performed for the principal alternatives. The in-depth analysis will include a monetary evaluation, implementability assessment, potential environmental impacts, and technical differences between the alternatives.

Identification of Potential Alternatives

The following types of alternatives must be evaluated, in addition to conventional transportation and treatment technologies or processes.

No Action

The no-action alternative is evaluated to assess the impact of continuing with the existing treatment and collection system. This alternative may be feasible when transportation, treatment, and disposal facilities are in compliance with discharge permits or where no facilities currently exist.

Optimum Performance of Existing Facilities

The existing facilities should be evaluated to determine if they can function more efficiently with operational changes, the addition of new equipment, or the addition and training of operating personnel. The investigation will determine what additions, expansions, or replacements can be made to improve system operation.

The following items should be considered:

A. The optimum performance level possible with the existing process design.

B. The age and reliability of the existing treatment equipment and its remaining useful life.

C. Any additional operating controls and laboratory facilities needed to monitor and improve operations.

D. Process modifications (e.g., conversion of conventional activated sludge to contact stabilization, the addition of mechanical aeration to waste stabilization ponds).

E. The impact on performance of implementing an industrial pretreatment program if one does not already exist.

F. The impact on performance of flow reduction programs to remove or eliminate excess I/I.

G. The performance of the existing on-site disposal systems and modifications to improve performance through public education and management.

Water and Energy Efficiency

Provide an explanation of the selected alternative's potential for water and energy efficiency and associated cost savings. Water efficiency efforts to consider include water reuse, water efficient devices, water meters, water audits and conservation plans. Energy efficiency efforts to consider include energy audit and assessment results, energy use of proposed alternatives, emissions of various alternatives and greenhouse gas reductions, and use of renewable energy.

Applicants are required, to the maximum extent practicable, to select an alternative that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation. This must take into account the cost to construct the project, the cost to operate and maintain the project over the life of the project, and the cost to replace the project.

The following resources are available to assist with the analysis:

Water Efficiency Tools

- EPA's WaterSense Program Web site: (http://www.epa.gov/watersense/)
- EPA's Water Conservation Plan Guidelines Web site: (http://epa.gov/watersense/pubs/guide.html)
- AWWA Water and Audit Software Web site: (http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx)
- AWE Water Conservation Tracking Tool Web site: (http://www.allianceforwaterefficiency.org/tracking-tool.aspx)

Energy Use Assessment and Audit Tools

- EPA's Energy Use Assessment Tool Web site: (http://water.epa.gov/infrastructure/sustain/ energy_use)

Regional Alternatives

While regional alternatives can provide economies of scale, the complete cost of each alternative and its comparability with other alternatives must be evaluated carefully. For instance, a regional alternative may serve areas with no water pollution problems along with areas that have existing needs, while other alternatives serve only those areas with existing pollution problems (e.g., a regional interceptor extension compared to a treatment plant upgrade in a small town).

For regional alternatives, the capacity and adequacy of the proposed treatment facility must be examined. Where either of these is deficient, the costs of upgrade or expansion to treat the increased flows and the basis for these costs must be added to the analysis. These costs are in addition to any interceptor/pump station costs. Where a new regional treatment facility is proposed, the basis for allocating costs to the participating municipalities and the need to negotiate and execute intermunicipal service agreements must be discussed.

In analyzing regional alternatives, alternative interceptor routings must be evaluated, with consideration given to cost and the magnitude of facilitated growth caused by access to wastewater transportation and treatment. The resulting socioeconomic and environmental impacts of the growth resulting from alternative routings must be examined. A critical issue is the basis for population projections in the areas that will be served by regional interceptors, particularly where undeveloped areas will be traversed by these interceptors. It is essential that projections be based on recognized methodologies and the assumptions that the projections are based be discussed in the project plan. Where the construction of a regional interceptor will facilitate or accelerate development of a currently less developed area, the impacts of this development must be addressed. Also, the population to be ultimately accommodated by the system must be presented in the project plan and must correspond to acceptable assumptions and projection methodologies.

Analysis of Principal Alternatives

The evaluation of principal alternatives must compare the costs and the potential impacts resulting from each alternative. Consideration should be given to the financial impact of the project upon the municipality to ensure that the project is affordable.

Equivalent alternatives must be compared. Each alternative must serve the same customers and provide the same 20-year capacity. Each alternative must address all of the needs detailed in the Need for the Project section above. Any deviations from this "apples-to-apples" comparison must be noted. The analysis should cover the following items, as appropriate.

The Monetary Evaluation

The monetary evaluation must include a present worth analysis. This analysis does not identify the source of funds, but compares all costs for each alternative over the 20-year planning period. Refer to the *Fundamentals of the Monetary Evaluation* for further information.

The following cost factors are associated with the monetary evaluation:

A. Sunk Costs

Sunk costs are the investments or financial commitments made before or during project planning. As sunk costs, they are not to be included in the cost-effectiveness analysis since they have already been committed regardless of the alternative selected. Sunk costs typically include the cost of existing facilities and associated land, outstanding bond indebtedness, and the cost of preparing the project plan.

B. Present Worth

Present worth is the sum that if invested now at a given interest (discount) rate, would provide exactly the funds required to pay all present and future costs. Total present worth, used to compare alternatives, is the sum of the initial capital cost plus the present worth of operation, maintenance, and replacement (OM&R) costs minus the present worth of the salvage value at the end of the 20-year planning period. Where the components used as the basis for calculating OM&R costs (e.g., the number of operators, energy costs, training needs) differ between alternatives, a breakdown of those differences must be provided.

The real discount rate used to calculate the present worth cost is established each year by the Federal Office of Management and Budget. The real discount rate is posted on the Clean Water Revolving Fund Web page.

C. Salvage Value

The planning period for the monetary evaluation is 20 years. At the end of this period, portions of the proposed structures or equipment may have a salvage value. When calculating present worth, the salvage value of structures or equipment is determined by using straight line depreciation. The present worth of the salvage value is computed using the real discount rate. The useful life to be used in the monetary evaluation should fall within the following ranges:

1) Land ─ permanent.
2) Wastewater conveyance (e.g., collection sewers, force mains, interceptors, tunnels) ─ 50 years.
3) Wastewater treatment plant or other structures (e.g., basins, buildings, concrete structures, lift stations, outfalls, septic tanks, tile fields) ─ 30 to 50 years.

4) Process equipment ─ 15 to 20 years.

5) Auxiliary equipment ─ 10 to 15 years.

If a useful life of less than 20 years is assigned to any project component, the cost-effectiveness analysis must show the present worth of the replacement cost at the end of the useful life, as well as the present worth of the salvage value of the replacement at the end of the 20-year planning period.

D. Escalation

Only energy costs and land value may be escalated in the monetary evaluation. The cost of labor, equipment, and materials is not escalated since it is assumed that any increase will apply equally to all alternatives. Different alternatives, on the other hand, may use different fuel supplies, or one alternative may use land application, and another may not.

The escalation of energy costs is to be based on data periodically published by the EPA or on historical data for the area, if justified. Land prices should be escalated at a uniform rate of 3 percent per year, except for rights-of-way and easements.

E. Interest During Construction

If interest during construction is significant and may influence the choice of alternatives, it may be included in the monetary evaluation using one of two methods. If expenditures are uniform and the construction period is less than four years, interest is one half of the product of the construction period (in years), the total capital expenditures (in dollars), and the real discount rate. Otherwise, interest should be calculated on a yearly basis.

F. Mitigation Costs

The costs of mitigation, whether undertaken by the applicant or another party, must be included in the monetary evaluation. Depending on the short-term or long-term nature of mitigation, appropriate cost factors should be applied to generate a present worth value. Where either impacts or the types of mitigation (such as non-structural measures) are not easily reduced to a monetary basis, they must still be considered in the alternatives analysis along with other non-monetary issues such as implementability.

G. User Costs

Another aspect of the monetary evaluation is the computation of the total cost of the project to users. Total cost includes capital and financing costs, OM&R costs, and other costs (e.g., sunk costs, hook-up/tap-in fees, and front footage assessments). The project plan must show estimated costs (annual, quarterly, or monthly) to residential and industrial users for each alternative. This information must be made available to the public as part of the public participation process.

H. CMAR, PDB, or FPDB Delivery Method

If a CMAR, PDB, or FPDB delivery method is to be utilized, the monetary evaluation (which includes an estimate of costs for the CMAR/design-build firm) must consider the

costs of the selected method versus the traditional Design-Bid-Build delivery method. The benefits and disadvantages of these methods must be discussed in detail as part of the alternative evaluation, with an explanation of why the chosen delivery method is the best fit for the project.

Partitioning the Project

Under certain circumstances, a partitioning of the project is allowed. A partitioned project plan may be prepared when construction of a discrete component of the project must occur prior to the completion of the entire project in order to remedy a severe public health, water quality, or other environmental problem. The partitioned plan must demonstrate that the project component to be constructed early will not: (a) foreclose any reasonable alternatives for the overall project; (b) cause significant adverse direct or indirect environmental impacts; and (c) be highly controversial. While the partitioned project plan will not contain the detail required for the overall project, it must provide conceptual information regarding the potential alternatives (of which the early component is a part) that will ultimately be required to correct all deficiencies. This detail should demonstrate how the early project component will eventually be integrated into the cost-effective long-term solution. Another planning document will need to be prepared later to address the remaining future work in order to satisfy the requirements of MCL§324.5303.

The Environmental Evaluation

The major environmental impacts expected to result from each alternative must be compared in the project plan. Where impacts are similar, the discussion can compare impacts in terms of scope and intensity. Where vastly different types of impacts are expected, the whole range of impacts must be addressed, including any significant environmental benefits precluded by rejection of an alternative. In general, the comparison of impacts resulting from each alternative should address each relevant environmental, social, or other factor identified in the project background section. It may be possible to summarize the comparison of impacts in a matrix or other tabular format. However, complex and major impacts should be fully described to clarify the differences in scope and intensity of impacts expected to result from the various alternatives. Anticipated mitigation requirements and costs must be included in this discussion.

Implementability and Public Participation

Throughout the evaluation of alternatives, the public must be provided with opportunities to comment. With public input, it may become apparent that certain alternatives or sites are not acceptable to the public or to neighboring communities affected by the project. These issues must be resolved in the choice of alternatives.

Some implementability issues to be resolved and discussed in the project plan include the financial burden on the applicant municipality, the need for intermunicipal agreements, the formation of an operating authority, the availability or competing uses of the proposed site, and the ability of the municipality to manage the construction and OM&R of the facility.

Technical and Other Considerations

A. Infiltration and Inflow (I/I) Removal

Infiltration and inflow is clear water entering the system during wet weather or high groundwater conditions. If discharged into a treatment works, this flow may cause sewer surcharging, sanitary sewer overflows, and other operational or capacity problems.

I/I removal may be cost-effective compared to the operational costs for transport and treatment of the clear water. However, projects proposing I/I removal solely to reduce operational costs are not eligible. In order to be eligible for SRF funding, a proposed project must demonstrate that the I/I is resulting in a capacity problem that can be addressed either through new construction to alleviate the capacity problem or through removal of I/I.

An evaluation of I/I should be completed for each existing collector system in the study area. Both private and public sources of I/I must be included in this evaluation. If **any** of the following conditions exist, then an I/I analysis **must** be performed during project planning:

1) Wastewater flow during high groundwater conditions is greater than 120 gallons per capita per day (gpcd). For a calculation of this threshold number, look at the metering data for the spring months of March/April/May and the fall months of September/October/November (non-precipitation days);

2) Wastewater flow during the design storm event or when any smaller storm event is greater than 275 gpcd. For a calculation of inflow from the WWTP records, use flow metering data for the period April 1 through October 31. Select at least six of the largest storm events for analysis. Extrapolate the data to the recommended remedial design standard (25-year/24-hour storm event during growth conditions and normal soil moisture) using the longer duration storms; or

3) Storm events cause backup problems, overflows, or poor treatment performance due to hydraulic overloading.

In large communities and regional systems, the analysis should be performed on a district or subdistrict basis (based on areas tributary to a particular pump station or other readily monitored area) to avoid masking problems in older areas by averaging these flows with flows from newer areas, particularly where the older areas are exhibiting capacity problems. I/I analysis and flow monitoring results from various subdistricts cannot be extrapolated to other subdistricts of the system due to the large variability in the conditions and facilities between subdistricts. Flows in regional systems should not be averaged together if there are capacity problems anywhere in the system.

The gpcd is calculated for existing population and flows only; future growth is not included. Once the cost effectiveness of I/I removal is established, then reasonable population increases for the system can be evaluated.

In preparing an I/I analysis, the applicant should analyze the treatment plant flow records, compare the sewage flows against water consumption records, conduct flow monitoring at selected manholes or pumping stations, identify surcharges and overflows in the system, and conduct a field investigation to determine the quantity, location, and source of the I/I. Pump station run times are not an adequate basis for I/I determinations or for defining the scope of work, although excessive run times can identify areas where further analysis is needed. Subsystems that are tributary to facilities that are exhibiting

surcharges, overflows, or other operational problems due to peak clear water flows (during wet weather or high groundwater conditions) must be investigated.

The estimated costs to eliminate portions of the I/I are compared to the costs to transport and treat the I/I. Transport and treatment costs include the costs to enlarge the sewers, pump stations, or treatment works in order to eliminate surcharges, overflows, or other capacity problems, coupled with the costs to treat the extraneous flows. If the costs to construct necessary facilities to relieve capacity problems and the costs to treat the extraneous water exceed the costs to remove the water by rehabilitating the system, then the I/I is considered excessive. Where a portion of the I/I is determined to be excessive, the recommended alternative **must** include a sewer system rehabilitation component to eliminate the excessive I/I, which will require the completion of a Sewer System Evaluation Survey (SSES). The SSES needs to have been recently conducted to be acceptable.

A SSES starts with the information gathered in the I/I analysis and then identifies the specific sources of extraneous water input, whether a peaking source (such as a cross connection or flooding manhole) or a steady source (such as infiltration into a deteriorated sewer or service lead). Each source, both public and private, is quantified as to the volume of flow it contributes to the system. In all cases, the disconnection of footing drains must be considered during the preparation of the SSES.

In order to confirm the estimated I/I source leakage rates, quantification of leakage rates attributable to each type of defect found in the system must be verified in the field through water simulation testing. Water simulation testing shall be taken at design storm conditions.

Once the sources of extraneous flow are identified, specific costs to address these sources are estimated. Typically, this information is presented in a tabular format showing the flow contributed and the cost for its removal. These costs are compared to the costs to transport and treat the extraneous water. This comparison will identify those sources that are less costly to remove versus those sources where it is less costly to transport and treat the extraneous water.

The costs to transport and treat the extraneous water must include all physical improvements to the collection system needed to convey the excess flows to the treatment plant and the plant improvements necessary to treat the flows. All of the costs to handle this water (e.g., new sewers; equalization to prevent bypasses; upgrades to pumping stations; increases in the size of components at the treatment plant) must be identified and presented in a cost-per-gallon basis.

Where sewage treatment is provided by another municipality, contract capacity issues must be considered. This may result in project alternatives that include relief and storage if additional capacity cannot be purchased.

Performance of studies to complete an I/I analysis or an SSES are eligible for loan assistance in conjunction with a funded construction project.

B. Structural Integrity

If the analysis does not confirm that the I/I removal is cost-effective, but structural sewer problems are suspected, the project plan must document the age and condition of those sewers. The project plan should incorporate the findings from recent sewer inspections (e.g., televising, physical inspection) and sewer maintenance records to identify problems. The National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) shall be used to grade and define the severity of pipe defects. The pipe defects must have a structural rating of either Significant (Grade 4) or Most Significant (Grade 5) to be considered for SRF funding. The condition of the manholes must be assessed using the NASSCO Manhole Assessment Certification Program (MACP). Only those manholes that receive a structural rating of either a Significant (Grade 4) or Most Significant (Grade 5) Manhole Rating using a level two inspection will be considered for SRF funding. Only the televising reports and the PACP/MACP rating information for Structural Grade 4 and 5 defects should be included in the project plan. Refer to the Major Rehabilitation of Sewers Section in the *SRF Eligibility Guidance* for further information.

In addition to the sewer and manhole ratings, a discussion of how each defect contributes to the pipe or manhole's imminent danger of failure and the potential consequences of that failure should be included in the project plan. Any factors, such as pipe age, sewer depth, soil type, or difficulty of access that would impact the chance or consequence of failure should be discussed. Refer to the *SRF Eligibility Guidance* (Major Rehabilitation of Sewers) for additional eligibility information.

Please note that where sewers must be cleaned prior to televising or actual sewer rehabilitation, the sewer clean-out residue must be handled as a Liquid Industrial Waste. Refer to the *Applicant Actions Related to Project Planning* for additional guidance.

C. Sludge and Residuals

When facilities that will generate sludge or residuals are proposed, the effect of the different alternatives on the quantity and quality of sludge and residuals must be evaluated. Constituents such as heavy metals or polychlorinated biphenyls (PCB) can impact the safety and cost of sludge or residuals handling and disposal, and should be factored into the alternative analysis.

Where the quantity or quality of sludge or residuals will be affected by the various transportation or treatment alternatives, alternative methods of residuals handling and disposal must be evaluated. Where failing on-site septic systems are to be replaced or upgraded, the options available for handling and disposing of pumped septage must be evaluated. Disposal options that productively recycle or utilize sludge and residuals should be utilized wherever possible. The status of the facility's Residual Management Plan must be discussed and relevant information included in the project plan. If incineration is being considered, ash handling procedures and air quality impacts must be addressed.

D. Industrial Pretreatment

Pretreatment requirements must be considered, particularly where heavy metals, PCBs, or other hazardous wastewater constituents may affect the operation of the proposed alternatives. The potential effects on residuals disposal, treatment process upsets, and direct discharge through sanitary or combined sewer overflows must be addressed.

E. Growth Capacity

The capacity of the proposed facilities to meet wastewater needs during the 20-year planning period must be considered. A balance must be struck between building facilities for the entire planning period and building facilities that will require expansion in less than 20 years. It is important to address capacity needs in a time frame that will allow for planning, designing, and constructing improvements in advance of exhausting capacity and violating permit limitations.

The project plan must document that sufficient wastewater treatment capacity exists or will exist as part of the project over a 20-year planning period. While the specific details of development cannot be predicted accurately, an attempt should be made to identify future wastewater service areas and in-fill population growth.

The type and magnitude of anticipated development must be described in order to justify treatment capacity. To substantiate capacity needs, local planning and zoning documents should be cited. Information on the density of expected development (dwelling units per acre and people per household) should also be provided.

F. Areas Currently Without Sewers

The eligibility of SRF projects in areas currently without sewers is dependent upon the documentation of water quality problems and the existing population to be served by the project. The evaluation of alternatives must consider the following issues:

1) Where a collection system with centralized treatment is being evaluated, the area must be an "existing community" with substantial habitation in existence at the time the project plan is prepared. As general guidance, this means that the existing population occupies about 2/3 of the buildable lots along the potential sewer route or contributes about 2/3 of the design flow to the proposed sewer at the time the project plan is prepared.

2) Where problems can be demonstrated and development exists at a density of less than three dwelling units per acre, or the soils are otherwise suitable, alternatives other than conventional gravity sewers must be evaluated (e.g., the replacement/upgrading of on-site systems, the installation of mounded drain fields or a cluster system, the use of force mains to convey sewage to a centralized treatment facility). The evaluation of these alternatives must consider costs and the potential environmental impacts.

3) Where an interceptor or force main will traverse an undeveloped area, the potential for facilitated development must be considered. Refer to the Evaluation of Environmental Impacts section of this guidance for additional information.

G. Reliability

Each alternative should be evaluated based on reliability ─ its ability to meet and consistently maintain permit limitations throughout the useful life of the project.

H. Alternative Sites and Routings

The evaluation of alternatives must consider a variety of sites and routings whenever possible. The alternative routings should be shown on maps and described in terms of comparative physical characteristics (e.g., existing farmland, sensitive environmental features, surrounding land uses). The ownership and availability of the sites must also be discussed.

I. Combined Sewer Overflows (CSO)

Alternatives to eliminate CSO must be consistent with effluent limits in the discharge permit and the municipality's approved long-range CSO Plan. Sewer separation may be feasible in addition to retention and treatment alternatives. Sewer separation alternatives must address the negative impacts of incomplete separation (i.e., some inflow remains in the system) that can subject the system to peak flows that are difficult to accommodate. Additional treatment or equalization capacity and/or facilities to handle the separated stormwater may be needed. Retention alternatives that dewater through the separate sanitary system to a treatment facility may also be needed to address the extraneous flow impacts. A discussion concerning the elimination of CSO outfalls should be included.

J. Contamination at the Project Site

The cleanup of contamination at a project site must be factored into the assessment of project alternatives, both in the environmental evaluation of the alternatives and cost-effectiveness. Typically, four types of contamination may be encountered during project construction: soils contaminated by petroleum or other chemicals; discarded materials such as chemical drums or insulation; groundwater or surface waters contaminated by chemical leachate or runoff; and materials to be removed or disturbed in the existing facility that contain asbestos, lead, mercury, PCBs, or similar contaminants.

Each project site should be evaluated for potential contamination utilizing the following actions:

1) An identification of past activities that might have caused site contamination, such as leaking underground storage tanks.

2) A visual survey of project sites to identify any abandoned containers and their contents.

3) Where contamination is suspected, soil and groundwater sampling of project sites to evaluate potential contamination problems.

4) An examination of the state's list of contaminated sites, found at the DEQ Web site for contaiminated sites (https://secure1.state.mi.us/FacilitiesInventory Queries/).

5) When the reconstruction or rehabilitation of existing facilities is proposed, a record search or visual survey to identify the presence of contaminated building materials in the areas of proposed construction.

The activities necessary for construction to proceed in areas of contamination (i.e., obtaining permits and approvals, excavation, testing, removal, handling, transportation, and disposal of contaminated materials) must be identified and factored into the environmental evaluation. The costs associated with these activities must be included, as mitigation costs, in the monetary evaluation of alternatives.

K. Green Project Reserve (GPR)

Determine if there are any components that could be eligible for GPR. If you have projects with components that address green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities, it could be eligible for GPR. Review the guidance documents on the GPR Web site (www.michigan.gov/deq/0,4561,7-135-3307_3515_3517-233829--,00.html) to see if project components qualify. For those that do qualify, be sure to include information about the components and how they meet the EPA Green Project Reserve Eligibility Guidance in the project plan. This could be in the form of a separate memo, an attachment, or within the body of the project plan.

Selected Alternative

The description of the selected alternative must be comprehensive, providing sufficient detail on the project and its beneficial and adverse impacts. An explanation of how the proposed project fits into comprehensive plans to address wastewater needs for the next 20 years should be included. Provide graphical depictions of the selected alternative and include street names for projects involving collection system construction.

The following items should be addressed, as appropriate:

Relevant Design Parameters

A summary of the basis of design should be presented, including:

A. The major process features.

B. The unit processes and sizes as related to service area needs.

C. A schematic flow diagram of the treatment processes.

D. The design criteria (e.g., detention times, overflow rates, process loadings, initial and design flows).

E. Residuals management (e.g., grit, sludge, ash).

F. Collection system details. Provide pipe lengths and sizes, street names, and proposed routes. The details are not expected to be known at a design level of specificity, but

citizens should be able to read the description of the selected alternative and know if major construction is being considered for their street.

G. Pump station types and sizes, including provisions for standby power and odor control.

Project Maps

Legible maps, with distance scales and other appropriate graphics, must be provided to show the following items:

A. Locations of treatment and disposal facilities for wastewater and residuals. If residuals must be transported, proposed haul routes and schedules (hours and frequency) should be discussed.

B. Routes, lengths, and sizes of sewers and force mains.

C. Locations of pump stations.

D. Locations of CSO and stormwater control/treatment facilities.

Controlling Factors

The factors that shape the selected alternative and design should be discussed.

A. Service area population, including any special users (i.e., industrial or commercial customers).

B. Characteristics of influent wastewater and treatment residuals.

C. Discharge permit requirements.

D. Stipulations in court orders, federal or state enforcement orders, or administrative consent orders.

E. Proposed effluent limits.

F. Local health department findings and directives.

G. Mitigation of environmental impacts of the proposed project construction and operation.

H. The factors that dictate the sizing of the collection and transportation system (e.g., state standards, anticipated service area flows, minimum slopes).

H. Other pertinent factors (e.g., budget restraints or debt loads).

Special Assessment District Projects

A special assessment is a charge that a municipal government may levy on parcels of property to recover the costs of a public improvement such as a new wastewater collection system. A special assessment district (SAD) is the limited geographical area where properties receive a direct, special, and unique benefit from the public improvement (e.g., a rise in property market values).

All properties that will receive a benefit from the proposed wastewater system must be included within the boundaries of the SAD (i.e., the SAD cannot be gerrymandered in order to exclude certain properties, such as project opponents). All properties within the SAD with a currently-occupied dwelling, either seasonal or year-round, must be required by ordinance to connect to the proposed wastewater collection system upon the completion of construction unless the county health department has provided a certification that the property has a properly functioning on-site sewage disposal system. The ordinance must be structured to ensure that (a) the municipality has the legal authority to demand connection at a later date and (b) on-site system failures are identified proactively through frequent monitoring, inspections, and evaluations.

The SAD needs to be delineated during the project planning period and presented in the draft project plan for public review and comment. A map showing the SAD boundaries, the individual parcels within and around the SAD, and any vacant parcels must be included. Properties that will not be required to connect to the new collection system, as certified by the county health department, must also be identified on the map. Copies of the health department certifications must be included in a project plan appendix.

The final project plan must include information on the number of (a) parcels in the SAD, (b) parcels where a service connection will be made, (c) parcels occupied seasonally rather than year-round, (d) parcels that are vacant, and (e) parcels that will not be required to connect to the new system. The final plan also needs to include the estimated annual amount to be levied on owners of parcels where a service connection will be made and the estimated annual amount to be levied on owners of vacant and excluded parcels.

Sensitive Features

If environmentally-sensitive features ─ wetlands, floodplains, prime or unique agricultural lands, archaeological sites, or threatened or endangered species habitat ─ may be affected by the project, such features should be clearly shown on a map included in the project plan.

Schedule for Design and Construction

Major project-related activities and scheduled dates must be listed and briefly explained. The time required for design, financing, bidding, permit procurement, seasonal restrictions on construction, and the mitigation of environmental impacts of construction and operation should all be identified. If the project is part of a regional system, the time required for review and approval from the regional system should be identified and factored into the schedule. Time needed to amend intermunicipal agreements should be identified and factored into the project schedule. Projects that involve the creation or modification of a SAD must identify the dates for the confirmation hearing on the special assessment tax roll and the close of the special assessment appeal period. If the SAD includes a significant number of seasonal residents, it is

strongly suggested that the confirmation hearing be held during the season of highest occupancy.

Cost Summary

A summary of all costs associated with planning, design, and construction of the selected alternative must be presented, including costs associated with administration, financial and legal services, land acquisition, mitigation, and other project-related activities. Costs of green project reserve components should be specifically identified.

Authority to Implement the Selected Alternative

The legal, financial, and managerial aspects of the applicant's organization should be briefly discussed to document that the applicant has the legal authority, capability, and willingness to plan, finance, build, operate, and maintain the wastewater facilities. Information must be provided to identify the entity that will own, operate, and finance the facilities to be built as part of the proposed project. Where responsibility for implementation rests with more than one municipality, each entity's jurisdiction and responsibility must be delineated. The institutional arrangements for financing the project, including capital cost contributions from other entities, must be described.

In the case of a project serving more than one municipality, the intermunicipal service agreement forms the basis of the institutional and financial obligations of each participating municipality. The project plan must identify service agreements that will be needed in order to finance and construct the project. If revisions to existing agreements are needed to implement the project (i.e., reallocating contract capacities or revising formulas by which costs are allocated by quantity, waste strength, or rate of flow), the project plan must also identify the necessary amendments.

For projects that involve the disconnection of footing drains to remove clear water from sanitary or combined sewer house leads, an ordinance or similar legal instrument will be an indication that the municipality has the legal authority to complete the proposed project. The project plan must identify this legal document.

Where the applicant's authority to finance and construct the proposed project requires contractual arrangements with other local units of government, resolutions must be obtained from all of the participating entities adopting the project plan and agreeing to implement the selected alternative. These resolutions will suffice as an initial demonstration of project implementation capability. However, executed intermunicipal agreements will be needed to solidify the arrangements to finance the project.

All service agreements and necessary ordinances must be submitted for DEQ review as part of the rate methodology submittal during the SRF loan application process.

User Costs

The total estimated project costs should be translated into an estimated total annual, quarterly, or monthly residential user charge over the useful life of the project. The amount of flow generated by the typical residential customer, based on actual metering or water usage, must be presented to allow the public to calculate their actual costs.

The discussion of user costs must identify the number of users or user equivalents. When user equivalents are used, an explanation of how a user equivalent is defined must be included. The number of users must be related to the total annual debt to be retired so that it is clear how the cost of the project is distributed across the users. Where other sources of capital within the capital improvements budget of the community will be used to defray costs, this should be described so the public is aware of all the funding sources. The use of hook-up fees, special assessments, or other financing tools that will be used to defray the debt must be discussed.

Estimated costs must be generated without factoring in new users projected to connect after project completion, even though such users could serve to lower long-term costs. The goal is to present project cost impacts on the current customers, including a comparison of existing charges to the proposed charges after project completion, so users can view costs from a before and after perspective.

The project costs and associated user charges must include and differentiate the following items:

A. Capital expenditures (e.g., debt retirement, hook-up/tap-in fees, special assessments).

B. Operation and maintenance.

C. Replacement of service-limited facilities and components.

D. Other costs likely to be incurred by customers.

Since customers will have varying means to pay hook-up or tap-in fees and recurring user charges, it may be useful to briefly discuss various methods of payment and any financial aid programs that may be available to assist customers.

Disadvantaged Community

Part 53, Clean Water Assistance, of the Natural Resources Environmental Protection Act, 1994 PA 451, as amended, provides benefits to municipalities who meet the state's criteria for disadvantaged community status. Those benefits include additional priority points and extended loan terms. A *Disadvantaged Community Status Determination Worksheet* must be completed and returned with the final project plan submittal.

Thirty (30) year loans are available for communities who meet the state's criteria for disadvantaged community status (as determined above) and have provided sufficient documentation within the project plan that the asset(s) being funded will have a useful life that meets or exceeds 30 years.

Useful Life

Projects must submit documentation to reasonably support the projected useful life of the assets financed by the SRF loan. Useful life estimates should be supported by manufacturer's recommendations and other relevant information in the project plan. Loan terms (typically 20 or 30 years) must not exceed the useful life of the project.

For projects involving a variety of components or equipment with varying useful life estimates, a weighted average should be used to determine the overall project useful life. The weighted useful life should be the total of all calculated life values (each asset's dollar value times its estimated useful life) divided by the total estimate of all the project dollars spent on those assets (weighted useful life = total of life values / total estimate dollars spent on assets).

Evaluation of Environmental Impacts

The potential beneficial and adverse environmental effects of the project must be evaluated in the project plan. The natural environment described in Section I may be affected by implementing the selected alternative. The analysis of project impacts should be organized to consider the impacts of the proposed project on the existing environment. Responses from reviewing agencies can be compiled in an appendix. Responses received after the project plan submittal should be forwarded to your RLS project manager.

The analysis of impacts should address the direct, indirect, and cumulative impacts.

Analysis of the Impacts

Direct Impacts

Direct impacts are the social and environmental impacts that are directly attributable to the construction and operation of the project. Projects such as minor sewer rehabilitation (grouting or slip lining) will normally have minimal impacts on environmental features, but will have noise, dust, and traffic disruption impacts. New treatment plants, retention basins, and collector or interceptor sewers normally have greater primary impacts that must be evaluated, particularly where construction will occur in undeveloped areas.

Direct impacts can be divided into those attributable to project construction and those attributable to project operation. While construction normally creates short-term impacts that can be mitigated or reversed through adequate restoration, the destruction of structures or sensitive habitats in the course of construction can result in long-term, irreversible impacts.

A. Construction Impacts

- The project plan must describe all of the areas that will be affected by construction. All of the natural and man-made features existing in these areas must be identified. Construction in rights-of-way should describe the existing features in the zone of construction. Areas of potential tree removal must be identified, and any removal of large trees or extensive areas of vegetation removal must be noted. Drainage features, sidewalks, and other features that will be disturbed should be identified.

- Impacts upon sensitive features such as floodplains, wetlands, stream crossings, shorelands, and prime or unique agricultural lands must be identified. Disturbance of any of these features must be described and typically will require review by and permits from state or federal agencies (see *Applicant Actions Related to Project Planning*). Applicants should have sensitive features such as floodplains and wetlands delineated by qualified consultants and include these delineations in the project plan.

- Construction methods, area of disturbance (including expected width of trench and associated disturbed areas) should be thoroughly described.

- Rare, threatened, endangered, and special concern species must be identified in the project plan. A biological survey may be required to identify if they exist in the areas of construction, or would be affected by proximity to construction.

- Impacts upon archaeological, historical, or cultural resources (e.g., historic neighborhoods or buildings or streetscapes) must be identified. Refer to the Michigan State Housing Development Authority Web site for instructions and documents needed for a SHPO review and to the RLS Web site for *THPO Guidance*.

- Traffic impacts should be identified, especially the areas where construction will impact access or areas that will be affected by increased construction traffic. The potential location of construction haul routes and other traffic disturbances should be addressed.

- Impacts to surface water and groundwater, including impacts from construction dewatering, must be identified.

- Other potential environmental impacts not identified above should be addressed.

B. Operational impacts

- Impacts of facility discharges to groundwater and surface water should be identified, including any interim discharges for segmented projects. Project operation can impact the surrounding area as long as the facility is in operation. Operational impacts include odors, noise, traffic, and accidents such as chemical spills.

C. Social impacts

- Increased user costs are a social impact. Large increase in rates can create a negative impact. A discussion of any existing or proposed methods to lessen this impact should be discussed.

- Construction may increase jobs in the area either directly or indirectly. Major disturbance of traffic patterns such as extensive detours or lack of access to important facilities or businesses are negative impacts that should be discussed. Examples of long-term impacts include the relocation of businesses or residents and employment changes.

Indirect Impacts

Indirect impacts are those caused or facilitated by the proposed project, but which will be removed in time and/or distance. Indirect impacts often take the form of new residential or commercial development made possible by the project. A key point to remember is that interceptors or an expanded treatment facility can cause indirect impacts in addition to the direct impacts due to the construction activity. Facilitation of new areas of development, even if "consistent" with zoning, may be considered significant adverse impacts, as provided in 323.954

Rule 4 (5). In addition, the conversion of agricultural lands and open areas to other uses and destruction of sensitive environments such as wetlands, shorelands, areas of unbroken forest canopy, and other habitat areas may also be considered significant adverse impacts.

The impacts of undirected growth include additional traffic, overcrowded schools, overextended police and fire protection, and a heavy financial burden on existing and future residents not only for the cost of new wastewater facilities, but also for the cost of other capital improvements. Undirected growth not only affects local residents and their quality of life, but can also have serious adverse impacts on the natural environment, historical resources, and sensitive features.

The following indirect impacts must be discussed in the project plan:

A. Changes in the rate, density, or type of residential, commercial, or industrial development, and the associated transportation changes.

B. Changes in land use (i.e., the loss of open space, floodplains, prime agricultural land, shorelands, forested areas, or other natural habitats).

C. Changes in air or water quality due to facilitated development, which includes impacts from increased traffic.

D. Changes to the natural setting or sensitive features resulting from secondary growth.

E. Impacts on cultural, human, social, and economic resources.

F. Impacts on area aesthetics.

G. Resource consumption over the useful life of the treatment works, including the generation of solid waste.

Cumulative Impacts

Cumulative impacts are those impacts to the environment that increase in magnitude over time or that result from individually minor but collectively significant actions taking place over time. Cumulative impacts may take the form of multiple impacts affecting one particular element of the environment. A comprehensive overview of these impacts should be presented, not an analysis of each impact separately. The overview should blend together impacts from actions directly related to the project and/or related impacts with impacts from actions attributable to other agencies or persons. Cumulative impacts should encompass the entire treatment system, other public works projects, and projected community growth. Some examples are:

A. Siltation or other impacts caused by successive discharges to the same watercourse over time.

B. Water quality impacts from direct discharges and nonpoint sources.

C. Indirect impacts from development facilitated by a new interceptor where a new interstate highway or other infrastructure additions will help induce development.

D. The impacts from multiple public works projects occurring in the same vicinity upon business or residential access and traffic patterns. Segments occurring in successive years may also have a cumulative disruptive impact.

E. Fiscal impacts on the municipality and its citizens resulting from multiple public works projects occurring in the same time frame.

Mitigation

Where adverse impacts cannot be avoided, mitigation must be considered and described in the project plan, whether or not it is required by a particular permit or agency clearance. The magnitude and potential for environmental impacts, and any "extraordinary measures" necessary to mitigate them, form the basis for the DEQ to determine whether or not an Environmental Impact Statement will be required.

The project plan must include both structural and non-structural measures that will be taken to avoid, eliminate, or mitigate adverse impacts on the environment. Structural measures include mitigation related to the specific design and construction of the facility. Non-structural measures include mitigation related to governmental, institutional, or private plans, policies, or regulations, or related to the phasing of facility construction over the planning period. The discussion must specifically address the proposed mitigation for each identified impact.

Short-Term Construction-Related Mitigation

Many mitigation techniques used to minimize construction impacts are standard procedures included in construction contracts. Examples are traffic and safety hazard controls, dust control, noise control, soil erosion and sedimentation control, tree protection, disposal of construction spoils, and restoration of roads, vegetation, and utilities. These types of mitigation must be discussed in the project plan. Siting and routing decisions should consider the relative costs of replacing or restoring the more expensive or valuable existing features such as roads and mature vegetation.

General Construction

If construction will occur in or near sensitive features, mitigation measures are usually specified in permits issued under the various acts that protect those features. Typical mitigation-related permit specifications include:

A. Prohibiting the disposal of spoils in wetlands, floodplains, or other sensitive areas.

B. Specifying the use of construction mats or wide-track vehicles in wetlands or limiting construction to dry seasons.

C. Specifying certain construction practices for stream crossings along sewer routes.

D. Construction timing and other requirements to protect endangered/threatened species and their habitat.

Early contact should be made with permitting authorities to determine the existence and extent of the various sensitive features. This information must be incorporated into the project plan. Be aware that these agencies often cannot provide a clearance on the proposed action without detailed plans or drawings. Because the applicant municipality is ultimately responsible for complying with federal and state environmental laws and regulations, its representatives must be timely in providing sufficient information for agency evaluations.

Even if the required permits or clearances do not specify mitigation measures, mitigation must be evaluated if adverse impacts are possible.

Mitigation of Long-Term Impacts

Every effort must be made to avoid potential long-term or irreversible adverse impacts. Alternative routings of collector sewers, interceptors, or outfalls and alternative sites for major facilities that avoid affecting sensitive environmental features must be evaluated in the project plan. Where it is demonstrated that there are no feasible and prudent alternatives that totally avoid impacts, mitigation must be considered to ensure that sensitive features do not suffer permanent or irreversible adverse environmental impacts.

Siting Decisions

The location of treatment facilities or major appurtenances is generally permanent and irreversible and should avoid damage to sensitive features. When there is absolutely no other feasible alternative, replacement of damaged features (e.g., wetlands) may be an option upon approval by the agency with permitting or review authority over the resource.

Operational Impacts

Preventative and mitigative measures to address impacts occurring as a result of facility operation such as odors, aerosols, noise, and operational accidents, must be discussed. These potential impacts can generally be mitigated by use of buffer zones and structural or mechanical features of the facility. Potential releases of hazardous chemicals can be addressed in the facility's operation plan. Potential impacts of effluent discharge are typically addressed in discharge permits; however, if the quality or quantity of a discharge will adversely affect the hydrologic regime or vegetation of a wetland or stream, mitigation must be considered.

Mitigation of Indirect Impacts

The provision of infrastructure in an area frequently facilitates residential and commercial growth, especially where publicly-financed infrastructure gives one location a competitive advantage in building costs over other locations in the same market area. The potential for facilitated development must be evaluated in conjunction with other capital improvements and infrastructure projects, particularly where a lack of adequate wastewater facilities currently prevents development.

Where new development is expected to be either facilitated or accommodated by the project, the project plan must show that the negative impacts can be mitigated so as not to be detrimental to the cultural, historical, and natural features of the area. Mitigation of indirect adverse impacts is often accomplished by utilizing non-structural means (e.g., public policies, phasing the construction of the facility). The first step in addressing this issue is demonstrating

that the capacity provided by the project corresponds with the current master plan and/or zoning. Where the current master plan or ordinances are not adequate to address facilitated development, the project plan must discuss the necessary modifications and a projected schedule for the modifications.

SRF loan assistance cannot be provided to a project that will accommodate or facilitate growth in areas that are protected from development under federal or state law. Treatment capacity, interceptors, and sewers will not be eligible for funding if they serve or provide capacity to such areas. The project plan must demonstrate that planning, zoning, or other land use controls acknowledge the location and status of protected lands and resources so that these lands and resources will be safeguarded from damage or destruction.

Master Plan and Zoning

The master plan and zoning should recognize and protect the cultural, historical, and natural attributes existing in the study area. Planning and zoning should specifically address development pressures on the following:

A. Historical features or neighborhoods so that these areas are not directly destroyed by new building or indirectly impacted by other infrastructure.

B. Prime or unique agricultural land to control direct development of this critical resource and prevent displacement of farmers by increased taxes and other assessments for sewers and road widening made necessary by development.

C. Wetlands, floodplains, stream banks, shorelands, or other sensitive features to direct growth away from these areas and to prevent deterioration of these areas by dumping, nonpoint source pollution, and other degradation (e.g., destroying vegetation, draining, ditching, utilization of pesticides and herbicides).

Ordinances

Ordinances should be developed and enforced to control increased stormwater and NPS pollution from impervious surfaces, fertilized and chemically treated residential lawns, and disturbed areas where new construction is occurring. Structural solutions (e.g., settling or retention basins, a stormwater control network) may be necessary to address the magnitude of stormwater, potential flooding, and NPS pollution problems that are created by growth.

Building codes, performance standards, specific ordinances, or limitations on certain uses can be used to address the increased noise, odors, and air pollution from dust, general combustion sources (open burning, wood stoves), and vehicle emissions caused by increased growth.

Staging of Construction

Construction of interceptor sewers, collection sewer extensions, and major treatment facility expansions should be staged when feasible. This method, especially when increases in capacity and extension of the system are dramatic, can assist in limiting the debt retirement burden for existing residents. It can also allow for other capital improvements, such as roads, to keep pace with the provision of wastewater facilities. The routing and timing of interceptors and

sewer extensions can help direct development and in accordance with the municipality's master plan and zoning.

Public Participation

The opportunities for public participation must be documented in the project plan. This participation is generally informal in the early planning phase and more formal during the finalization of plans. In addition to public meetings, other methods of involving the public include newspaper articles, fliers in utility bills, mass mailings to citizens, and the establishment of citizen's groups for input on controversial projects. The purpose is to address any controversial aspects of the project plan and/or to generate a better understanding of the project.

Public Meetings on Project Alternatives

Public meetings should be held during project development to discuss the various alternatives being considered. These meetings should be advertised in a newspaper of general circulation in the study area and should be held at times and places conducive to maximizing public input (i.e., generally in the evening and at a central location). While a brief summary of the meetings should be included in the project plan, a record of the proceedings is not required.

Although public meetings on the proposed alternatives are preferred, council meetings held in accordance with all of the above requirements is acceptable. In either case, a demonstration that there were adequate opportunities for public consultation, participation, and input in the decision-making process during alternative selection must be included in the project plan. A list of significant issues raised by the public and any changes to the project resulting from public input should also be discussed.

The Formal Public Hearing

The municipality applying for an SRF loan must hold a formal public hearing prior to the adoption and submittal of a final project plan. The date, place, and time of this hearing must be conducive to maximizing public input. For complex or controversial projects, or projects that will serve more than one municipality, hearings at several locations could be held.

Public Hearing Advertisement

A notice of the public hearing must be advertised at least 30 days prior to the hearing in a newspaper of general circulation in the communities affected by the proposed project. Notices on the municipality’s Web site can supplement, but not substitute, for the published public hearing notice. The draft project plan must be available for public review during that 30-day period. A copy of the advertisement and an affidavit confirming its publication must be included in the final project plan. Instructions on where to find copies of the project plan and how to submit written comments about the project must be included in the advertisement. A *Notice of Project Plan Public Hearing (Model)* can be found on the SRF Web page.

Public Hearing Transcript

A verbatim transcript of the public hearing, recorded by a court reporter or transcribed by a stenographer from a recording of the proceedings, must be included in the final project plan.

The transcript must also include the comments received and the issues raised by the public during the hearing.

Public Hearing Contents

The following items must be discussed during the public hearing:

A. A description of the water quality problems to be addressed by the project and the principal alternatives that were considered.

B. A description of the recommended alternative, including its capital costs and a cost breakdown by project components (e.g., treatment plant, sewer system).

C. A discussion of project financing and costs to users, including the proposed method of project financing and estimated monthly debt retirement; the proposed annual, quarterly, or monthly charge to the typical residential customer; and any special fees that will be assessed.

D. A description of the anticipated social and environmental impacts associated with the recommended alternative and the measures that will be taken to mitigate adverse impacts.

In the event no one from the public attends the hearing (a reporter would be considered a member of the public, as would members of the applicant's governing body), the public hearing may be opened and closed without a formal presentation of the project plan. However, a transcript or recording must still be submitted with the final project plan documenting this action.

Comments Received and Answered

The final project plan must include the following items:

A. A typed list with the names and addresses of the people who attended the public hearing.

B. A copy of any written comments that were received during the public comment period for the proposed project.

C. The applicant's responses to the comments received.

D. A description of any changes that were made to the project as a result of the public participation process.

Adoption of the Project Plan

The official period for receiving public comments on the proposed project may either end at the close of the formal public hearing or extend for several days after the hearing. After the close of the public comment period, an alternative must be selected for implementation by the municipalities participating in the project. The final project plan submitted by the July 1 deadline must include resolutions from all of the participating local units of government to formally adopt

the project plan and implement the selected alternative. A *sample Joint Resolution* is available on the RLS Web site. Note that the resolution to adopt the project plan must not occur prior to the public hearing and end of the public comment period.

More Information, Forms, and Guidance

Please visit the DEQ SRF Web site (www.michigan.gov/cleanwaterrevolvingfund) for more information and to obtain the following additional planning-related forms and documents:

Applicant Actions Related to Project Planning

Design Phase Guidance

Project Delivery Methods Guidance

Clean Water Revolving Funds SRF/SWQIF Project Plan Submittal Form (including sample Joint Resolution and Disadvantaged Community Worksheet)

PPL Scoring Data Form

Project Useful Life and Cost Analysis Certification Form

FSP Guidance and FAQ

Fundamentals of the Monetary Evaluation

SRF Eligibility Guidance

Notice of Project Plan Public Hearing (Model)

THPO Guidance

National Natural Landmarks in Michigan

Regional Planning Agency Addresses