

Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities Financed by:



State of Oregon
**Department of
Environmental
Quality**



Rural Community
Assistance Corporation
www.rcac.org



**United States
Department of
Agriculture**

Disclaimer

This document provides information on preparing wastewater planning documents and environmental reports for the purpose of funding public wastewater utility projects. This information is intended as guidance for utility managers, engineering consultants, and environmental consultants and should be interpreted and used in a manner fully consistent with federal and state environmental laws and implementing rules. This document is not a final agency action and does not create any rights, duties, obligations, or defenses, implied or otherwise, in any third parties. This document should not be construed as rule, although some of it describes existing state and federal laws. The recommendations contained in this document should not be construed as a requirement of rule or statute. The organizations that developed this document anticipate revising this document from time to time as conditions warrant.

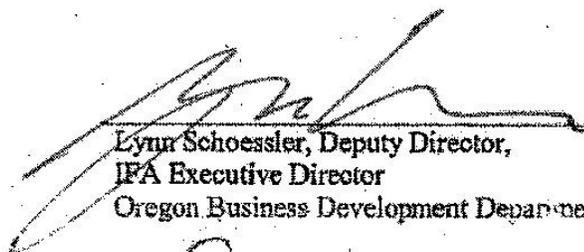
Authority

The following agencies cooperatively developed and adopt this document as official guidance for the preparation of wastewater planning documents and environmental assessments for public utilities:



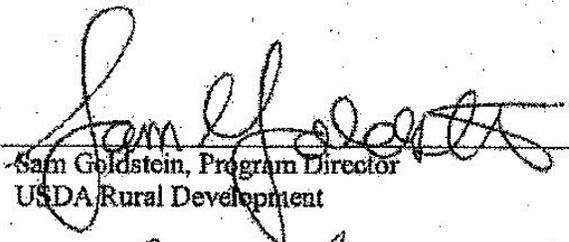
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1. Introduction

Wastewater utilities in Oregon operate under permits issued by the Oregon Department of Environmental Quality. The permit requirements with respect to discharges are based in the federal Clean Water Act. Wastewater utilities plan routine and periodic plant and collection system maintenance, improvements and expansion with planning documents.

Many of Oregon's public wastewater systems are aging, undersized, and/or unable to meet increased regulatory requirements. These systems often need financial help to pay for the needed upgrades. Publicly owned wastewater utilities in Oregon have four primary sources of public funds available to them.

The four primary public funding organizations for wastewater projects in Oregon are:

- **Oregon Department of Environmental Quality**
DEQ administers the Clean Water State Revolving Fund (CWSRF), which provides low- interest loans to public utilities for preparing planning and environmental review documents, design and construction of wastewater facilities and other water quality improvement projects.
- **Oregon Business Development Department Infrastructure Finance Authority**
OBDD-IFA administers the federal Housing and Urban Development Community Development Block Grant (HUD-CDBG) program for “non-entitlement areas” within Oregon, as well as the Oregon Lottery-funded Water/Wastewater Financing and Special Public Works Fund programs (grant/loan). These programs can finance preparation of planning and environmental review documents, in addition to design and construction of public wastewater systems.
- **United States Department of Agriculture Rural Development**
RD administers several loan and grant programs focused on constructing and upgrading needed public and private non-profit utility systems, including wastewater systems in small rural communities (population less than 10,000).
- **Rural Community Assistance Corporation**
RCAC is a private nonprofit organization that provides training and technical assistance with funding through the national Rural Community Assistance Partnership. RCAC is designated a Community Development Financial Institution by the U.S. Department of Treasury and can provide low-interest loans for projects. RCAC financing can cover feasibility and pre-development expenses to meet USDA-Rural Development's requirements.

Each of these funding organizations requires the submittal of an appropriate planning document as a condition of funding. Additionally, programs that use federal funds require an environmental review to comply with the National Environmental Policy Act (NEPA).

When municipalities and other public entities prepare wastewater planning documents, they may not always know what the source of their funding will be. These funding organizations developed this guide to provide a convenient, comprehensive listing of planning requirements for entities applying for funds to help improve wastewater systems.

This guide should be used by utility managers, public works directors and consultants for developing wastewater planning documents that will meet the requirements of the four primary public funding organizations in Oregon listed below. Section 2 provides wastewater utility managers with an overview of the

planning process and references resources for their efforts. Section 3 provides engineering consultants with detailed information about the content of wastewater planning documents. Section 4 provides environmental consultants with detailed information about the content of environmental reports.

2. Wastewater Planning Overview and Process

Utilities Planning Framework

In 2007, six major water and wastewater associations and the U.S. Environmental Protection Agency signed an agreement pledging to support effective utility management (EUM) based on “Ten Attributes of Effectively Managed Water Sector Utilities” and five “Keys to Management Success.” The “Ten Attributes of Effectively Managed Water Sector Utilities” comprise a comprehensive framework for operations, infrastructure, customer satisfaction, community welfare, natural resource stewardship and financial performance. These attributes are:

- **Product Quality:** Produces treated wastewater and process residuals in full compliance with regulatory and reliability requirements and consistent with customer, public health and ecologic needs.
- **Customer Satisfaction:** Provides reliable, responsive and affordable services in line with explicit, customer-accepted service levels. Receives timely customer feedback to maintain responsiveness to customer needs and emergencies.
- **Employee and Leadership Development:** Recruits and retains a workforce that is competent, motivated, adaptive and safe-working.
- **Operational Optimization:** Ensures ongoing, timely, cost-effective, reliable and sustainable performance improvements in all facets of its operations, with a focus on minimizing resource use, loss and impacts.
- **Financial Viability:** Understands the full life-cycle costs and maintains a balance between long-term debt, asset values, operations and maintenance expenditures, and operation revenues.
- **Infrastructure Stability:** Understands the condition of and cost associated with critical infrastructure assets. Maintains and enhances the conditions of all assets over the long term.
- **Operational Resiliency:** Proactively identifies, assesses, establishes tolerance levels for, and effectively manages the full range of risks (legal, regulatory, financial, environmental, safety, security, natural disaster-related and other catastrophic-disaster related).
- **Community Sustainability:** Explicitly considers a variety of pollution prevention, watershed and source water protection approaches. Manages operations to:
 - protect, restore and enhance the natural environment
 - efficiently use water and energy resources
 - promote economic vitality
 - foster overall community improvement.
- **Water Resource Adequacy:** Ensures water availability consistent with current and future customer needs. (Mostly applicable to water utilities.)
- **Stakeholder Understanding and Support:** Fosters understanding and support from oversight bodies, community and watershed interests, and regulatory bodies for services levels, rates structures, operation budgets, capital improvement programs and risk management decisions.

In 2008, the associations and EPA developed an Effective Utility Management Primer (EUM, 2008) can help water and wastewater utility managers make practical, systematic changes to achieve excellence in utility performance. The primer distills the expertise and experience of utility leaders into a framework that helps utility managers identify and address their most pressing needs through a customized, incremental approach. EPA, utility advisors, collaborating organization representatives, and these funding organizations encourage all utility managers, regardless of their utility's size, budget and unique circumstances, to read, consider and implement the strategies and approaches outlined in the primer.

“Utility managers and stakeholders can use this Primer in a variety of ways. At one end of the spectrum, the Primer can educate utility staff and stakeholders regarding the range of responsibilities faced by water and wastewater managers. At the other end of the spectrum, it can provide a framework for utility’s long-term strategic planning efforts.” EUM Primer

The first step in Effective Utility Management is to perform a self-assessment. The EUM Primer includes a self-assessment tool that can help utility managers evaluate current performance and identify improvements. These funding organizations encourage all utilities to complete a self assessment.

Utilities Planning Resources

Sound planning is critical to the effective management of a utility and its infrastructure. In recognition of this, in 2012, the Office of Water at EPA published *“Planning for Sustainability: A Handbook for Water and Wastewater Utilities”* (Sustainability Handbook, 2012). The handbook provides information about ways in which utilities can build sustainability considerations and other techniques into their planning processes to help them make the right infrastructure choices for their communities and ensure that this infrastructure is effectively managed over its full life cycle.

While the 10 Effective Utility Management attributes focus on outcomes water-sector utilities should strive to achieve, there also is a need to demonstrate how other well-accepted tools can help utilities, improve efficiency, reduce waste in their operations, and promote utility sustainability. One set of tools involves the use of “Lean” techniques. Lean is a powerful set of specific practices that can help utilities achieve the outcomes embodied in the EUM attributes. In October 2012, EPA released the *“Resource Guide to Effective Utility Management and Lean”* based on input and examples from several utilities involved in both EUM and Lean. (Resource Guide to Effective Utility Management and Lean, 2012). The effective utility management attributes express what utilities should seek to achieve and Lean tools outline how to work towards those attributes, or outcomes.

Asset Management

An important element of infrastructure stability is asset management. Asset management is maintaining a desired level of service for what you want your assets to provide at the lowest life-cycle cost. Lowest life-cycle cost refers to the best appropriate cost for rehabilitating, repairing or replacing an asset. A high-performing asset management program incorporates detailed asset inventories, operation and maintenance tasks, and long-range financial planning to build system capacity. It puts systems on the road to financial sustainability. EPA has developed asset management handbook (Asset Management Handbook,

“Asset management is maintaining a desired level of service for what you want your assets to provide at the lowest life-cycle cost.”

2003) and asset management tools such as EPA's Check Up Program for Small Systems for small communities (CUPSS, 2011). These funding organizations encourage all utilities to implement asset management.

Integrated Planning

Utilities face a daunting task of needing to address multiple Clean Water Act requirements, due to growth, aging infrastructure and increasingly complex water quality issues (toxics, sanitary sewage overflows, stormwater, etc.). EPA, states and utilities often focus on each requirement individually without full consideration of all obligations. This approach may unintentionally constrain a municipality from addressing its most serious water quality issues first.

Utilities interested in integrated planning are encouraged to contact DEQ.

In 2012, EPA outlined an *Integrated Planning* approach which allows utilities to evaluate water quality problems more holistically (Integrated Planning Memo, 2012). This integrated planning process involves sequencing Clean Water Act requirements in a manner that addresses the most pressing health and environmental protection issues first.

It is essential that long-term approaches to meeting Clean Water Act requirements are sustainable and within a utility's financial capability. Through integrated planning, DEQ may give utilities with higher financial burdens longer time periods to complete work needed to address some Clean Water Act requirements.

Purpose of Wastewater Planning Document

Wastewater planning results in multiple benefits, such as:

- Documenting and addressing current and future potential environmental and regulatory issues associated with the wastewater system
- Providing an educational tool for the public, community decision makers, and/or state and federal funding and regulatory agencies
- Contributing to the research, data collection and analysis that DEQ may use to develop or reissue the associated wastewater discharge permit.

Funding organizations require a wastewater planning document as a condition of providing funding to:

- Assure that all viable alternatives are evaluated
- Demonstrate how the recommended project is a cost-effective and environmentally sound alternative including a "present worth" alternative analysis
- Determine the least-cost viable alternative that is modest in design, size and cost for federal Rural Development funding
- Show how the cost of facility improvements, maintenance and operations will be paid, examining current user rates for adequacy, and forecasting when and where rate increases are necessary
- Serve as a guide for the design engineer by presenting engineering design criteria, process type and extent, alternate site locations, and cost estimates.

DEQ's CWSRF program requires "an engineering planning document," generally in the form of a comprehensive facilities plan, but may accept a pre-design report in certain circumstances. RD also requires submittal of a wastewater planning document called Preliminary Engineering Report during the application process. OBDD-IFA's Community Development Block Grant, Water/Wastewater and Special Public Works Fund programs all require a planning document before a final design and construction project will be funded.

RCAC financing follows requirements of RD's program. While each program uses different terminology, the requirements are similar.

Preparation for Wastewater Planning

Some preparation before hiring a consultant can save a utility time and money. Several tools can help assess utilities' needs. For example, the EUM Primer includes a self-assessment tool. This tool helps identify options for improvement, establishes a baseline from which to measure progress, and will be useful in encouraging conversation and consensus building among the utility's stakeholders, such as city councils, sanitary system boards and community and watershed interests. Asset management tools, such as EPA's CUPSS, will help with evaluating the operation and maintenance costs associated with specific systems and equipment. DEQ, RD, OBDD-IFA, and RCAC all offer technical assistance with the use of self-assessment tools.

A wastewater planning document requires good information on the system's condition and capacity, population growth projections, wastewater flows, treatment plant loading, and the utility's financial viability. Accordingly, a utility can better prepare for facilities planning by:

- Reviewing existing operations and maintenance costs and compiling several years of budgets, including existing debt service;
- Conducting an asset inventory and condition assessment, which includes system deficiencies and capacity estimates;
- Conducting collection system inflow and infiltration (I/I) studies, identifying I/I reduction projects, and determining a reasonable estimate of achievable I/I removal. If the collection system is in poor condition, design flows calculated with existing data will result in excessively large treatment plant expansions. Completing several collection system projects and measuring the results over several wet seasons may be needed;
- Assuring that population projections in the comprehensive plan are up to date;
- Assuring that the wastewater monitoring information is accurate. For example:
 - Do the flow meters have an adequate range?
 - Are the flow meters calibrated annually?
 - Is the lab following a written quality analysis and quality control (QA/QC) plan?

A utility may also check in with DEQ about the preparation process to discuss:

- Reasons the utility wants to do a facilities plan
- Preparatory work that has been done
- What work the utility could do itself
- Whether the utility is prepared to move the project forward after the facilities plan is completed

Consultant Selection

Preparing wastewater planning documents will likely require the services of consultants. When seeking professional services, utilities face two basic tasks: selecting the consultant best qualified to meet the utility's need, and ensuring that the consultant understands and provides for the utility's specific needs in the most cost-effective manner. All public utilities must comply with state law and their own local procurement policies. Oregon procurement provisions are in Oregon Administrative Rule (OAR) 137-048. Engineering services must be procured through qualification

Utilities should meet with DEQ before hiring a consultant to discuss preparation for wastewater planning.

based selection (QBS), rather than via a fee-based selection process. Review these procedures thoroughly in preparation for facilities planning.

In addition to state requirements, utilities applying for funding from RD must select an engineer using the process described in Chapter 7 of the Code of Federal Regulations (7 CFR 1780.39(b)). This process is based on the qualifications based selection process. The QBS process involves a public announcement (typically including a Request for Qualifications or RFQ) of all requirements for engineering services and negotiation of contracts on the basis of demonstrated competence and qualifications for the type of professional services required. QBS selection is also strongly encouraged, but not required for CWSRF, Water/Wastewater and Special Public Works Fund programs.

Utilities may also wish to review written guidance. EPA's "Contracting for Professional Services" presents a systematic set of proven contract procedures and guidance on how to minimize or avoid common issues and problems that can arise (EPA Contracting for Professional Services, 1982). The League of Oregon Cities' "City Handbook" (chapter 9) contains useful information about the public procurement process (LOC City Handbook, 2010). The National Rural Water Association and the Rural Community Assistance Partnership (www.rcap.org) also can help in selecting an engineer. Utilities may also wish to purchase handbooks and other resources for assistance with preparing request for proposals and requests for qualifications.

When is an Environmental Review Required?

Some level of environmental review is required by the four funding organizations, with the only exception being grants or loans from OBDD-IFA's Water/Wastewater Financing and Special Public Works Funds, or a combination thereof. These two programs do not require environmental review. Each funding organization determines environmental review requirements. Submittal requirements and review processes may vary among each of the four agencies.

Funding organization staff should be contacted early in the project planning process to identify the level of environmental review appropriate to the proposed project. If you anticipate a project to be Community Development Block Grant-funded and/or involves special circumstances, contact OBDD-IFA to determine the level of environmental review required under the CDBG program.

Wastewater Planning Process

After hiring a consultant, the utility should host a "kick-off" meeting with the consultant and DEQ. For OBDD-IFA funded projects, the regional coordinator should also be invited. The purpose of the kick-off meeting is to help the utility and consultant obtain a clear understanding of current, known future and potential future regulatory requirements. If the utility's permit is not up-to-date, the consultant will need to determine projected permit limitations and requirements.

The meeting should include a discussion of proposed regulations that may affect project design and scoping of alternatives. Accordingly, the consultant should work closely with DEQ engineers to determine what level of service DEQ can offer and what level of detail the consultant will need to do, especially concerning potential future regulatory requirements.

Utilities should submit draft planning documents to DEQ and participating funding organizations for review and comment. An environmental report need not be submitted for DEQ review along with the draft planning

Utilities should contact DEQ, Rural Development and/or Oregon Business Development Department IFA staff early in the planning process to determine what level of planning documentation is required.

document. DEQ may convene a final review meeting to discuss its comments and issue a comment letter after the meeting. For OBDD-IFA funded projects, the regional coordinator may also attend. The consultant will then make the necessary changes and resubmit the document. Assuming that all requested changes are made, DEQ will approve the planning document. DEQ may also conditionally approve the document.

RD will review draft planning documents only if accompanied by a complete application. RD is, however, able to assist in answering any questions about planning document requirements during the draft phase of document development. Additionally, utilities should submit the wastewater planning document and environmental report at the same time. RD's state engineer will fully review the planning document and environmental report before approving the project for RD project funding consideration.

The flow chart on the next page shows the wastewater planning process beginning with utility operations and data collection and ending with an approved wastewater planning document.

Phased and Incremental Projects

In certain circumstances, improving a wastewater system in incremental phases can be the most cost-effective alternative. Project phasing may also be a result of implementing integrated plans. While a utility's wastewater planning document will address needs of the larger community area over a 20-year period, phasing creates smaller projects consistent with current funding limitations and the utilities' ability to pay. The phases should be consistent with approved wastewater planning documents. Proposed projects not within the original project scope or amended phased planning document will require developing a plan amendment and associated environmental documentation.

To determine the scope of a phased project, bring together and evaluate all individual activities that are related either on a geographical or functional basis, then prioritize which projects need to be addressed for the system and/or are logical parts of the planned project. In other words, the "project" means an activity or group of integrally related activities, designed to accomplish, in whole or in part, a specific objective for improving the wastewater system.

Phased projects should shape the environmental report to address all phases of the project at once when possible, and always when phases of a project are interdependent for wastewater system operations. This may help avoid possible redesign of subsequent phases that were not considered early on during selection of the current project's preferred alternative. Cost savings may also be realized by assessing environmental impacts for all planned phases rather than contracting for multiple ERs one phase at a time. It is important to note that multi-phase ERs may require amendments if they become outdated once future phases apply for project construction funding. Environmental reports are generally acceptable for five years, provided the scope hasn't changed. However, environmental reports older than 18 to 24 months can require an amendment memo to confirm environmental impacts have not changed for the project area (e.g. no new endangered species have been listed since the original report).

Value Analysis/Value Engineering

Value engineering, value analysis, and value methodology, are specialized cost control techniques performed by an independent group of experienced professionals. The technique involves an intensive, systematic and creative effort to reduce costs while enhancing reliability and performance. Value analysis is typically used to select between two or more closely rated alternatives. Value analysis is performed during or immediately following preparation of a wastewater planning document. Value engineering is used to review a selected

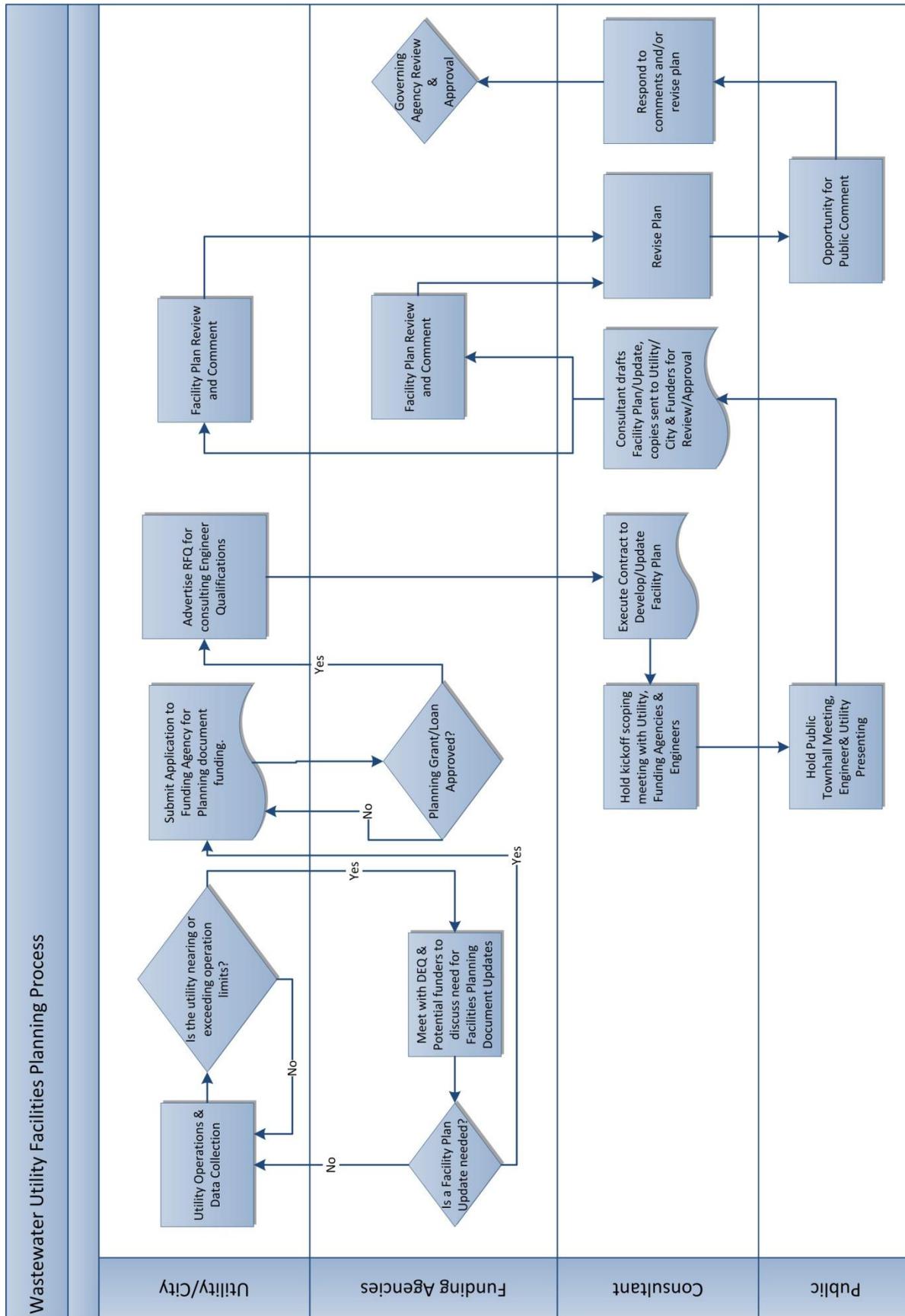
alternative for cost savings and project improvements. Value engineering is typically performed during preparation of the final engineering design documents, typically at the “pre-design” (ten percent design) phase.

CWSRF and RD funded projects with estimated costs in excess of 10 million dollars require a value engineering study during or after engineering design. For these purposes, the project cost is the entire project, not just the amount funded by each funding organization separately. These funding organizations also recommend value engineering for projects with values of less than \$10 million. DEQ uses EPA’s guidelines to review value engineering reports for completeness. (USEPA Value Engineering, 1984) When time allows, DEQ engineers may also participate as a member of value engineering team.

Summary for Utilities Managers

In summary, these funding organizations recommend the following practices to help the wastewater planning process go smoothly:

- ✓ Conduct an EUM self-assessment and implement a program of continuing self-improvement.
- ✓ Before contracting for a wastewater planning document:
 - Consult with DEQ. DEQ can assess the need and content of the document and help you define the scope.
 - Prepare an inventory and self-assessment of the current condition of the system.
 - Collect data on wastewater flows and permitted effluent loads at least a year ahead.
 - Confirm that the monitoring program is calibrated and accurate. (i.e. Flow meters are calibrated and capturing all flows, Laboratory data is accurate (QA/QC is done correctly and regularly).
 - Confirm population projections.
 - Review qualification based selection procedures.
- ✓ During wastewater plan preparation:
 - Hold a kick off meeting.
 - Confirm the results of the completed Wastewater planning document with DEQ, funding agencies and municipality.
 - Obtain DEQ approval of the final document.
- ✓ After approval of the wastewater planning document:
 - Wait until all parties agree that construction will begin within 2 years before beginning the Environmental Review. Environment review can, in some cases, take a full year to complete.



3. Contents of a Wastewater Planning Document

The appendices contain both general (Appendix C.1) and detailed (Appendix C.2) outlines for wastewater planning documents. These outlines were cooperatively developed by a workgroup of federal and state agencies who encourage their use as part of the funding application process and project development. While the detailed outline provides information on what to include in a wastewater planning document, the level of detail required will vary according to the complexity of the proposed project.

The following discussion provides additional guidance for wastewater planning documents in Oregon and follows the format of the detailed outline in Appendix C.2:

Project Planning Area

Wastewater planning documents must comply with statewide land use goals and be consistent with locally adopted comprehensive land use plans. Goal 11 is the primary statewide land use planning goal. Under Goal 11, local governments must establish an urban growth boundary and must only provide sewer services within the UGB, unless providing sewer services is the only practicable alternative to mitigate a public health hazard and will not adversely affect farm or forest land. Accordingly, the planning document must include a description of the UGB. Additionally, planning documents must show compliance with Goal 11 and the local comprehensive plan. These funding organizations rely on an affirmative land use compatibility statement (LUCS) from the local government as a determination of compatibility with the acknowledged comprehensive plan. Accordingly, wastewater planning documents must be accompanied by an affirmative LUCS.

In addition, this section of the wastewater planning document should address socio-economic conditions and trends that could affect the project. Information about local industries, employment, median household income level, vulnerable populations and poverty levels should be included. The current median household income may be derived from the most recent American Community Survey five-year estimate corresponding to the project planning area or a more appropriate census statistical unit (e.g. census tract) that contains and is representative of the system's residential users.

Population Trends

Wastewater planning documents must also discuss the population forecasts in the locally adopted comprehensive plans. All Oregon counties must coordinate with cities to develop population forecasts for county and city use in land-use planning work. ORS 195.036, pertaining to area population forecast coordination, states:

“The coordinating body under ORS 195.025(1) shall establish and maintain a population forecast for the entire area within its boundary for use in maintaining and updating comprehensive plans, and shall coordinate the forecast with the local governments within its boundary.”

In Executive Order 97-22, Oregon's Governor directed DEQ and other state agencies to use the population and employment forecast developed or approved by the Oregon Department of Administrative Service's Office of Economic Analysis in coordination with Oregon's 36 counties to plan and implement programs and activities. Accordingly, if the comprehensive plan contains a population forecast that has been duly coordinated and

acknowledged, then the wastewater planning document must use it, unless the comprehensive plan does not fit with the wastewater planning document goals. For instance, a population forecast may be needed for a larger area and/or longer planning period than provided in the comprehensive plan. Intergovernmental agreements regarding sewage services may also affect population forecasts. In these cases, the population forecasts in the comprehensive plan may be augmented with forecasts from DAS Office of Economic Analysis that are more recent. This is further explained in Oregon Planning Bulletin #98-1 (Appendix D).

The wastewater planning document must fully discuss population forecasts from the comprehensive plan as applied to the proposed service area and how those forecasts are to be used in designing the proposed wastewater facilities. The wastewater planning document may propose a population forecast other than the forecast in the acknowledged comprehensive plan if approved by the Oregon Department of Land Conservation and Development.

Existing Facilities

For treatment plant projects, the description and evaluation must include all wastewater collection, treatment, and disposal (recycled water and biosolids) facilities in the study area, including common sewerage systems not owned or operated by the city or service district (i.e. satellite collection systems) if connected. A separate plan may be submitted for satellite collection systems if such a plan exists. Planning documents addressing a subset of the larger wastewater system need only address the proposed project components, if the project can be considered “stand alone” and can be built without other larger wastewater system changes.

Utilities that have conducted an asset inventory and condition assessment through the Effective Utility Management process will have this information available for the wastewater planning documents. A complete asset inventory includes capacity information and condition assessment of the conveyance system, the treatment plant, sludge treatment/disposal, biosolids land application and recycled water use systems (as applicable). The ability of these systems to meet regulatory requirements should be discussed in this section.

Details about quantity of inflow and infiltration should follow the general guidance of EPA document “*I/I Analysis and Project Certification*.” This document provides a procedure to determine non-excessive I/I. (See 40 CFR 133.103 for current definition of non-excessive I/I). If I/I exceeds the non-excessive I/I criteria, a cost-effective analysis is needed to determine the amount of I/I that is cost effective to remove. This analysis should be included as a recommended special study in the conclusions sections if not included in the wastewater planning document. See “*Wastewater Engineering: Collection and Pumping of Wastewater*,” Chapter 6, Metcalf & Eddy, for information about cost-effective I/I analysis.

Financial Status of any Existing Facilities

In addition to the financial information requested in this section of the detailed outline, the planning document should also include the previous three years of audits and most recent approved budget. The current monthly residential user rate and rate structure must be identified. Include a calculation of the average wastewater bill rate as a percentage of mean household income.

This section of the wastewater planning document must include a detailed discussion of the methodology used to develop an Equivalent Dwelling Unit estimate. An EDU, also known as residential equivalent unit, is the average wastewater flow received by the treatment facility for one single-family residential housing unit. This can be referred to as the level of wastewater service provided to

EDU - An equivalent dwelling unit, also known as residential equivalent unit, is the average wastewater flow received by the treatment facility for one single-family residential housing unit.

a typical rural residential dwelling. To calculate EDUs, break down the total number of residential, commercial, industrial and public connections in the system by category and include estimates both before and after the proposed project. Present the data in the following table format:

EDU Summary Table

Type of User	Number of Users		Total Usage (Gal. / year)	Usage Per User (Gal. / year)	EDUs ¹	EDUs ²
	Before	After				
Residential, Permanent						
Residential, Seasonal						
Commercial, Small						
Commercial, Large						
Industrial, Small						
Industrial, Large						
Public/Other, Small						
Public/Other, Large						
Totals						

NOTES:

“User” means a single connection to the sewage system.

“Number of Users Before” means the total number of users before constructing the project

“Number of Users After” means the total number of users immediately after constructing the project.

This does not include projected growth.

Multi-family users with one meter may be considered commercial or other.

Permanent residential is defined as “reside in residence more than six months out of the year.”

Small commercial, industrial or public facilities are those that typically receive water service through a one-inch or smaller meter.

Provide a separate list of all commercial, industrial and public facilities.

1- Based on actual usage (USDA -Rural Development and DEQ)

2- Based on 7,500 gallons per month as an average residential flow (OBDD-IFA)

Need for Project

This section of the wastewater planning document must fully discuss relevant regulations, primarily the Clean Water Act and associated state and federal rules. DEQ staff will provide technical assistance with determining and applying the relevant regulations. The planning document must include not only regulations pertaining to direct surface water discharges, but also those pertaining to stormwater discharges, erosion control, effluent reuse, groundwater, sludge management and wetland or waterway impacts. Relevant Clean Water Act components include:

- beneficial uses (www.deq.state.or.us/wq/rules/div041tblsfigs.htm#t1)
- status of the receiving stream (www.deq.state.or.us/wq/assessment/assessment.htm),
- waste load allocations derived from a Total Maximum Daily Load, (www.deq.state.or.us/wq/tmdls/tmdls.htm), if one is completed or proposed.

A complete planning document must also include regulatory requirements from other relevant agencies such as the Oregon Department of Land Conservation and Development.

The second topic in this section is “Aging Infrastructure.” This section must include details of all unit performance issues, deficiencies and useful life. The existing system’s reliability must be evaluated according to EPA and DEQ guidelines. See Appendix E. Also required is an evaluation of the current system’s ability to meet current and potential future effluent limits and other regulatory requirements. This section must also include an evaluation of the collection system’s condition, calculation of inflow and infiltration (I/I) using EPA methods (USEPA Infiltration/Inflow, May 1985) and (USEPA Handbook, October 1991). This section must also include a determination of whether the I/I is “non-excessive”. The definitions for non-excessive I/I is contained in the code of federal regulations (40 CFR 35.2120).

The “Reasonable Growth” section must include flow and load projections based on a 20-year planning period from completion of construction. For example, if the projected project completion date is 2020, then the “design year” is 2040. While alternate flow projection methods may be proposed, the plan must include a probability analysis of peak flows based on DEQ flow-projection guidelines. See “DEQ Guidelines for Making Wet-Weather and Peak Flow Projections for Sewage Treatment in Western Oregon” (DEQ Flow Projection Guidelines, April 1996). Adequate justification must be provided if alternate flow projections are used as the basis of design.

Alternatives Considered

As discussed in the detailed outline, failure to document alternatives considered is often a planning document weakness. A full consideration of all viable alternatives and a transparent selection process is key to the planning process. At a minimum, the following alternatives must be considered:

- 1) building new centralized facilities
- 2) optimizing the current facilities (no construction)
- 3) developing centrally managed decentralized systems
- 4) developing an optimum combination of centralized and decentralized systems

Alternative approaches to ownership and management, system design (including resource efficient or green alternatives), and sharing of services, including various forms of partnerships, should be considered.

The planning document must include enough detail in addressing each alternative to make a clear justification for selecting the recommended alternative. If an alternative is rejected as non-viable without an economic analysis, the basis of the rejection must be clearly stated.

Operator certification requirements for each alternative must be considered and the cost associated with retaining qualified staff must be included in the estimation of life cycle operating costs.

While DEQ encourages consideration of cost during alternative selection, utilities applying only for CWSRF funding are not required to comply with RD design policies regarding cost-effective analysis (7 CFR 1780.57).

The discussion must also include a determination of whether each alternative is permitted by the local comprehensive plan and development regulations (zoning) and what, if any, conditions or limitations are required. If the recommended alternative is a significant project which is not included in the list of public facility projects in the applicable city and/or county comprehensive plan, an amendment to the comprehensive plan may be necessary. This requirement applies to urban growth boundaries or unincorporated communities with a population greater than 2,500. Consultation with the state’s Department of Land Conservation and Development may be necessary.

Selection of an Alternative

The planning document must describe the alternative selection procedures. As stated in the detailed outline (Appendix C.2, section 5), the analysis should include a “triple bottom line analysis.” When a traditional qualitative matrix scoring analysis is used, the near-term (20-year) life cycle costs should be excluded. However, longer-term life costs, such as those associated with end-of-life plant rehabilitation, expansion and flexibility to meet potential future requirements, should be evaluated in the triple bottom line analysis. Also, the analysis may be used to eliminate non-feasible alternatives.

Proposed Project (Recommended Alternative)

The operating budget should include wastewater treatment and collections operations and maintenance only. The proposed project section of the wastewater planning document must contain a fully developed description of the proposed project based on the preliminary description under the evaluation of alternatives. This section must also include a detailed present worth value calculation for the preferred alternative.

Annual Operating Budget

The wastewater planning document should include analysis of financing options, a viable financing plan and an itemized annual budget for construction, operations and maintenance, and replacement costs associated with the preferred alternative. A summary of the community’s budget history, adopted budget and future budget expectations must also be included. The projected annual budget must include (see details in sections below):

- a. Identification of users and calculation of equivalent dwelling units
- b. Evaluation of system revenues
- c. A proposed projected rate structure based on equivalent dwelling units and as a percentage of median household income
- d. A comparison of rate structures

OBDD-IFA’s Community Development Block Grant program will accept financial reviews prepared for and approved by RD in lieu of the requested financial information in the CDBG application

Income

This section must identify the total system revenues, including any fee equivalents derived from other local funding sources that are or will be used to pay specifically for the system/facility to be upgraded or improved with this proposed project. This could include levies on taxable property within the service area being used to pay for the system but does not include system development charges.

Include in this section a proposed rate structure and estimated revenues to be derived from rates upon project completion. This rate structure should correspond to the recommended alternative and Appendix C (6)(f). The funding agencies utilize the projected O&M, debt service and reserves, as applicable, to arrive at a total annual cost figure. The EDU count is then divided into the total annual cost to arrive at an EDU cost. The EDU cost is then used by the agencies to evaluate program eligibility, affordability, grant eligibility and cost reasonableness.

The rate structure should emphasize conservation with the use of an ascending (flow- and load-based) rate structure and must include:

- A comparison of various rate structure alternatives on a per-EDU basis using the estimated budget and industry standards. This comparison should also include an evaluation of the user rate as a percentage of the median household income.

- A proposed monthly user rate (per EDU) assuming the proposed project is funded entirely with loans. A separate calculation of the monthly user rate per EDU may be included for those projects expecting grant funding.
- A proposed rate implementation schedule, including what steps the community needs to undertake to adopt and implement a new rate structure by construction completion.

Annual Operations and Maintenance Costs

In addition to the guidelines in section 6.f.ii of the detailed outline (Appendix C.2), annual operations and maintenance costs should be calculated on a per-EDU basis.

Debt Repayments

This section must include a description of any existing debt service paid for existing wastewater facilities, whether through property taxes or user rates and when it will be paid off. As mentioned in section of 6.f.iii of the detailed outline (Appendix C.2.), all estimates of funding should be based on loans, not grants. However, a separate discussion of debt repayments may be included for those projects expecting grant funding.

Short-Lived Asset Reserve

Break down the short-lived asset list into three groups – those with an expected life of one to five years, six to 10 years and 11 to 15 years. Furnish the estimated cost at time of construction for each asset or group of assets. Since the list is used to calculate the annual reserve deposit and assists in determining grant/loan percent, it must include the entire wastewater system, not just the proposed improvements. Do not duplicate items in the three lists, as they may be multiplied.

In addition to the above, the annual operating budget must include any anticipated additional capital outlay over the next 10 years. Additional capital outlay must not include items already accounted for in the short lived assets or captured as maintenance items. Provide details on each capital outlay item.

Conclusions and Recommendations

As discussed in Appendix C.2, the conclusions and recommendations section will include any additional findings and recommendations. This section should mention all additional reports, such as environmental impact analysis of the alternatives, that are needed to obtain funding. In cases where two or more alternatives are too close to make a final decision at the wastewater planning document level, the planning documents should detail what additional studies are needed to make a final decision. This could include an I/I cost effectiveness analysis and/or a value analysis study. Also, if the estimated construction cost is \$10,000,000 or more, this section should mention the need for a value engineering study at the predesign phase.

Wastewater Planning Document Appendices

Include the following documents in the appendices:

- Summary of all effluent quality monitoring data
- Rainfall statistic page (from “Climatology of the United States No. 20, Monthly Station Climate Summaries, 1971-2000” for the rain gage used in the Facilities Plan.)
- Flood plain map
- Soils map
- Land Use Map (include service area and UGB boundaries)

- Recycled Water Use Plan
- Biosolids Management Plan
- NPDES and/or WPCF Permit
- Outfall Mixing Zone Study
- Other environmental studies related to the permit
- Detailed cost estimate spreadsheets
- Sewer Use Rate Study

4. Scope of Environmental Review and Content of Environmental Report

Scope

The level or extent of environmental review will vary, generally in accordance with the project's complexity or scope. Construction of a new wastewater treatment plant at a new location will require a more comprehensive environmental review than the replacement of old pipes in an existing trench or addition of a flow meter at the treatment plant.

Content

Utilities applying to USDA-Rural Development should follow the most recent version of the Bulletin 1794A-602 entitled "*Guide for Preparing the Environmental Report for Water and Environmental Program Proposals*," also known as the "Green Guide." (RD Green Guide, March 2008) RCAC interim financing can be guaranteed by USDA-Rural Development permanent financing and would need to meet RD environmental review requirements for the project.

The "Green Guide" will generally meet DEQ's requirements with the following differences:

- 1) When the "Green Guide" directs the applicant to contact RUS Rural Development staff, applicants for CWSRF loans should instead contact the DEQ project officer <http://www.deq.state.or.us/wq/loans/contacts.htm>;
- 2) The applicant for CWSRF funding will consult directly with authorities delegated with overseeing compliance with other federal environmental laws and executive orders. For a step-by-step process on documenting the cross-cutting federal authorities, CWSRF applicants should follow the *Applicant Guide to the State Environmental Review Process* found on DEQ's website at: <http://www.deq.state.or.us/wq/loans/envreview.htm>; and
- 3) DEQ will issue a public notice of environmental determinations for CWSRF loan projects.

OBDD-IFA directs applicants for Community Development Block Grant program funding to follow Chapter 3 of the *CDBG Grant Management Handbook* and the HUD website page for Environmental Review Requirements in Oregon at <http://www.hud.gov/local/shared/working/r10/environment/oregon.cfm?state=or>

When multiple agencies provide funding for a single project, applicants must meet environmental review requirements for each agency. Early communication to, and coordination among, all funding agencies is advised to prevent or minimize any potential delays.

Roles and Responsibilities by Funding Program

Funding Source	USDA-RD & RCAC *	DEQ CWSRF	OBDD-IFA CDBG	OBDD-IFA WWFP & SPWF
Environmental determination is required for:	Construction loans	Construction loans	All planning, design and construction grants	No environmental review is required for grants or loans entirely from OBDD-IFA Water/Wastewater, or Special Public Works Funds, or a combination thereof.
Consultation with other federal cross cutting authorities:	RD	Applicant	Responsible entity (applicant)	
Documentation of environmental impacts:	RD	Applicant	Responsible entity	
Environmental Determination is made by:	RD	DEQ Project Officer	Responsible entity certifying officer	
Accepting/adopting another agency environmental report:	RD accepts environmental reports approved by other agencies, sometimes requiring supplemental information.	DEQ accepts other agencies environmental report with a cross-cutter memo	Responsible entity may adopt environmental assessment prepared for another agency provided certain requirements are satisfied	
Public notice is published by:	RD	DEQ	Responsible Entity	
Environmental review guides	Green Guide	Green Guide and Applicant Guide to the SERP	CDBG Grant Management Handbook and HUD website	
For more information contact:	RD state environmental coordinator	DEQ project officer	OBDD-IFA regional coordinator	OBDD-IFA regional coordinator

*RCAC interim financing with USDA Rural Development follow RD requirements.

Federal Cross- Cutting Authorities

There are a number of federal laws, executive orders and government-wide policies that apply by their own terms to projects and activities receiving federal financial assistance, regardless of whether the statute authorizing the assistance makes them applicable. These "cross-cutting federal authorities" (cross-cutters) include environmental laws such as the National Historic Preservation Act and the Wild and Scenic Rivers Act, and social and economic policy authorities such as Executive Orders on Equal Employment Opportunity and government-wide debarment and suspension rules. Appendix F contains an example of a cross-cutting review.

Appendix A – References

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USEPA Handbook, October 1991. Handbook Sewer System Infrastructure Analysis and Rehabilitation (EPA/625/6-91/030). [Online] Available on National Service Center for Environmental Publications (NSCEP): www.epa.gov/nscep/.

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USEPA Integrated Planning, June 2012. Integrated Municipal Stormwater and Wastewater Planning Approach Framework. [Online] http://www.epa.gov/npdes/pubs/integrated_planning_framework.pdf.

USEPA Value Engineering, 1984. Value Engineering For Wastewater Treatment Works (EPA 430/9-84-009). [Online] Available on National Service Center for Environmental Publications (NSCEP): www.epa.gov/nscep/.

Appendix B – Acronyms and Definitions

Acronyms

APE – Area of Potential Effect
CDBG – Community Development Block Grant
CFR – Code of Federal Regulations
CWSRF – Clean Water State Revolving Fund
DLCD – Oregon Department of Land Conservation and Development
EDU – Equivalent Dwelling Unit
EPA – Environmental Protection Agency
ER or ERR – Environmental Report (also known as Environmental Review Record, as used by the CDBG Program).
FONSI – Finding of No Significant Impact
FP – Facility Plan
I/I – Infiltration and Inflow
NEPA – National Environmental Policy Act
NPDES – National Pollutant Discharge Elimination System
OAR – Oregon Administrative Rule
OBDD-IFA – Oregon Business Development Department – Infrastructure Finance Authority
DEQ – Oregon Department of Environmental Quality
O&M – Operation and Maintenance
OMB – Office of Management and Budget
ORS – Oregon Revised Statute
OWRD – Oregon Water Resources Department
PDR – Pre-design Report
PER – Preliminary Engineering Report
PPG – Predevelopment Planning Grant
RCAC – Rural Community Assistance Corporation
RD - United States Department of Agriculture – Rural Development
RUS – Rural Utilities Services
SERP – State Environmental Review Process
SPWF – Special Public Works Fund
TMDL – Total Maximum Daily Load
USDA – RD – United States Department of Agriculture – Rural Development
VE – Value Engineering
WPCF – Water Pollution Control Facility
WW – Water/Wastewater Financing Program

Definitions

Capital Improvement Plan (CIP): A short-range plan, usually covering four to 10 years, which identifies and prioritizes capital improvement projects and equipment purchases for a community.

Comprehensive Plan: The local plan which guides a community's land use, conservation of natural resources, economic development and public facilities.

Design: The preparation of plans and specification for construction projects.

Environmental Assessment (EA): A concise public document that briefly provides sufficient evidence and analysis for determining whether an Environmental Impact Statement is necessary and facilitates preparation of an EIS when one is required. EA is used interchangeably with ER and ERR by agencies and reflect the same document.

Environmental Impact Statement (EIS): If during the environmental review process the funding agency determines that a proposed project may "significantly affect the quality of the human environment," an EIS will be required (42 U.S.C. 4332 (2)(c)). An Environmental Impact Statement is the most detailed level of environmental review, requires significant public participation, and will often be managed at a federal national office level. EIS reviews can take years to complete but are rarely required for wastewater projects.

Environmental Report (ER): Also known as an Environmental Review Record by the Community Development Block Grant program. The documentation of the environmental review process including assessments or EISs, published notices, notifications and correspondence related to a specific project or group of projects. EA is used interchangeably with ER and ERR by agencies and reflect the same document.

Equivalent Dwelling Unit (EDU): Also known as Residential Equivalent Unit (REU), it is the average wastewater flow received by the treatment facility for one single-family residential housing unit. This also refers to the level of wastewater service provided to a typical rural residential dwelling.

Facilities Plan (FP): A comprehensive document that examines the entire existing wastewater collection, treatment and disposal system and identifies all operational and performance problems. It projects future wastewater loads, and describes and evaluates viable alternatives for reliably meeting discharge permit requirements.

Feasibility Study: An engineering study that involves the consideration and detailed discussion of project alternatives and implementation without the preparation of detailed engineering design.

Federal Cross Cutting Authorities: A number of federal laws, executive orders and government-wide policies apply by their own terms to projects and activities receiving federal financial assistance, regardless of whether the statute authorizing the assistance makes them applicable. These "cross-cutting federal authorities" (cross-cutters) include environmental laws such as the National Historic Preservation Act and the Wild and Scenic Rivers Act, and social and economic policy authorities such as executive orders on equal employment opportunity and government-wide debarment and suspension rules.

Infiltration/Inflow (I/I) Reduction Plan: A wastewater collection system capital improvement plan focused on reducing inflow/infiltration. Elements of this plan typically include television inspection, smoke testing, flow monitoring, a priority list of improvements, and a schedule for those improvements. Infiltration is groundwater entering a sewer system through such means as defective pipes, pipe joints, connections or manhole walls. Inflow includes direct flow of water other than wastewater or groundwater into a sewer system. Planning should include monitoring, data collection and measurement, evaluation, analysis, security evaluations, report preparation, environmental review, public education and review process,

and any other activity leading to a written plan for the provision of sewage facilities intended to remediate an existing or anticipated water pollution problem, but excluding the preparation of detailed bid documents for construction.

Pre-design or Preliminary Design Report (PDR): A document that describes in detail and definite terms the recommended project using preliminary design drawings and other supporting information including, but not limited to: basis of design, design criteria, site plan, process and instrumentation diagrams, hydraulic profile, major equipment list and preliminary construction cost estimates.

Preliminary Engineering Report (PER): USDA-Rural Development asks applicants to provide a preliminary engineering report so it can review proposed projects for technical, environmental, financial and social feasibility. The report needs to show that a proposed project is modest in design, size and cost, and constructed and operated in an environmentally responsible manner. The depth of analysis in a report is proportional to the size and complexity of the proposed project. Accordingly, a new wastewater treatment facility, or major upgrade to an existing wastewater treatment facility, will require a level of effort similar to a comprehensive wastewater facilities plan.

Public Facility Plan: A support document to a comprehensive plan which describes the water, wastewater and transportation facilities that support land uses designated in the appropriate acknowledged comprehensive plan with the urban growth boundary containing a population greater than 2,500.

Value Engineering (VE) or Value Analysis (VA) Report: A report developed through a specialized cost-control technique applicable to the design of sewage treatment facilities that identifies cost savings that can be made without sacrificing reliability or efficiency. Value analysis is a higher-level review that is typically performed at during or immediately following facilities planning.

Appendix C – Planning Document Outlines

The following outlines of a preliminary engineering report are from an interagency memorandum dated January 16, 2013:

C.1: GENERAL OUTLINE

- 1) PROJECT PLANNING
 - a) Location
 - b) Environmental Resources Present
 - c) Population Trends
 - d) Community Engagement
- 2) EXISTING FACILITIES
 - a) Location Map
 - b) History
 - c) Condition of Existing Facilities
 - d) Financial Status of any Existing Facilities
 - e) Water/Energy/Waste Audits
- 3) NEED FOR PROJECT
 - a) Health, Sanitation, and Security
 - b) Aging Infrastructure
 - c) Reasonable Growth
- 4) ALTERNATIVES CONSIDERED
 - a) Description
 - b) Design Criteria
 - c) Map
 - d) Environmental Impacts
 - e) Land Requirements
 - f) Potential Construction Problems
 - g) Sustainability Considerations
 - i) Water and Energy Efficiency
 - ii) Green Infrastructure
 - iii) Other
 - h) Cost Estimates
- 5) SELECTION OF AN ALTERNATIVE
 - a) Life Cycle Cost Analysis
 - b) Non-Monetary Factors
- 6) PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)
 - a) Preliminary Project Design
 - b) Project Schedule
 - c) Permit Requirements
 - d) Sustainability Considerations
 - i) Water and Energy Efficiency
 - ii) Green Infrastructure
 - iii) Other
 - e) Total Project Cost Estimate (Engineer's Opinion of Probable Cost)
 - f) Annual Operating Budget
 - i) Income
 - ii) Annual O&M Costs
 - iii) Debt Repayments
 - iv) Reserves
- 7) CONCLUSIONS AND RECOMMENDATIONS

C.2: DETAILED OUTLINE

1) PROJECT PLANNING

Describe the area under consideration. Service may be provided by a combination of central, cluster, and/or centrally managed individual facilities. The description should include information on the following:

- a) Location. Provide scale maps and photographs of the project planning area and any existing service areas. Include legal and natural boundaries and a topographical map of the service area.
- b) Environmental Resources Present. Provide maps, photographs, and/or a narrative description of environmental resources present in the project planning area that affect design of the project. Environmental review information that has already been developed to meet requirements of NEPA or a state equivalent review process can be used here.
- c) Population Trends. Provide U.S. Census or other population data (including references) for the service area for at least the past two decades if available. Population projections for the project planning area and concentrated growth areas should be provided for the project design period. Base projections on historical records with justification from recognized sources.
- d) Community Engagement. Describe the utility's approach used (or proposed for use) to engage the community in the project planning process. The project planning process should help the community develop an understanding of the need for the project, the utility operational service levels required, funding and revenue strategies to meet these requirements, along with other considerations.

2) EXISTING FACILITIES

Describe each part (e.g. processing unit) of the existing facility and include the following information:

- a) Location Map. Provide a map and a schematic process layout of all existing facilities. Identify facilities that are no longer in use or abandoned. Include photographs of existing facilities.
- b) History. Indicate when major system components were constructed, renovated, expanded, or removed from service. Discuss any component failures and the cause for the failure. Provide a history of any applicable violations of regulatory requirements.
- c) Condition of Existing Facilities. Describe present condition; suitability for continued use; adequacy of current facilities; and their conveyance, treatment, storage, and disposal capabilities. Describe the existing capacity of each component. Describe and reference compliance with applicable federal, state, and local laws. Include a brief analysis of overall current energy consumption. Reference an asset management plan if applicable.
- d) Financial Status of any Existing Facilities. (Note: Some agencies require the owner to submit the most recent audit or financial statement as part of the application package.) Provide information regarding current rate schedules, annual O&M cost (with a breakout of current energy costs), other capital improvement programs, and tabulation of users by monthly usage categories for the most recent typical fiscal year. Give status of existing debts and required reserve accounts.
- e) Water/Energy/Waste Audits. If applicable to the project, discuss any water, energy, and/or waste audits which have been conducted and the main outcomes.

3) NEED FOR PROJECT

Describe the needs in the following order of priority:

- a) Health, Sanitation, and Security. Describe concerns and include relevant regulations and correspondence from/to federal and state regulatory agencies. Include copies of such correspondence as an attachment to the Report.
- b) Aging Infrastructure. Describe the concerns and indicate those with the greatest impact. Describe water loss, inflow and infiltration, treatment or storage needs, management adequacy, inefficient designs, and other problems. Describe any safety concerns.
- c) Reasonable Growth. Describe the reasonable growth capacity that is necessary to meet needs during the planning period. Facilities proposed to be constructed to meet future growth needs should generally be supported by additional revenues. Consideration should be given to designing for phased capacity increases. Provide number of new customers committed to this project.

4) ALTERNATIVES CONSIDERED

This section should contain a description of the alternatives that were considered in planning a solution to meet the identified needs. Documentation of alternatives considered is often a Report weakness. Alternative approaches to ownership and management, system design (including resource efficient or green alternatives), and sharing of services, including various forms of partnerships, should be considered. In addition, the following alternatives should be considered, if practicable: building new centralized facilities, optimizing the current facilities (no construction), developing centrally managed decentralized systems, including small cluster or individual systems, and developing an optimum combination of centralized and decentralized systems. Alternatives should be consistent with those considered in the NEPA, or state equivalent, environmental review. Technically infeasible alternatives that were considered should be mentioned briefly along with an explanation of why they are infeasible, but do not require full analysis. For each technically feasible alternative, the description should include the following information:

- a) Description. Describe the facilities associated with every technically feasible alternative. Describe source, conveyance, treatment, storage and distribution facilities for each alternative. A feasible system may include a combination of centralized and decentralized (on-site or cluster) facilities.
- b) Design Criteria. State the design parameters used for evaluation purposes. These parameters should comply with federal, state, and agency design policies and regulatory requirements.
- c) Map. Provide a schematic layout map to scale and a process diagram if applicable. If applicable, include future expansion of the facility.
- d) Environmental Impacts. Provide information about how the specific alternative may impact the environment. Describe only those unique direct and indirect impacts on floodplains, wetlands, other important land resources, endangered species, historical and archaeological properties, etc., as they relate to each specific alternative evaluated. Include generation and management of residuals and wastes.
- e) Land Requirements. Identify sites and easements required. Further specify whether these properties are currently owned, to be acquired, leased, or have access agreements.
- f) Potential Construction Problems. Discuss concerns such as subsurface rock, high water table, limited access, existing resource or site impairment, or other conditions which may affect cost of construction or operation of facility.

- g) Sustainability Considerations. Sustainable utility management practices include environmental, social, and economic benefits that aid in creating a resilient utility.
 - 1. Water and Energy Efficiency. Discuss water reuse, water efficiency, water conservation, energy efficient design (i.e. reduction in electrical demand), and/or renewable generation of energy, and/or minimization of carbon footprint, if applicable to the alternative. Alternatively, discuss the water and energy usage for this option as compared to other alternatives.
 - 2. Green Infrastructure. Discuss aspects of project that preserve or mimic natural processes to manage stormwater, if applicable to the alternative. Address management of runoff volume and peak flows through infiltration, evapotranspiration, and/or harvest and use, if applicable.
 - 3. Other. Discuss any other aspects of sustainability (such as resiliency or operational simplicity) that are incorporated into the alternative, if applicable.
- h) Cost Estimates. Provide cost estimates for each alternative, including a breakdown of the following costs associated with the project: construction, non- construction, and annual O&M costs. A construction contingency should be included as a non-construction cost. Cost estimates should be included with the descriptions of each technically feasible alternative. O&M costs should include a rough breakdown by O&M category (see example below) and not just a value for each alternative. Information from other sources, such as the recipient's accountant or other known technical service providers, can be incorporated to assist in the development of this section. The cost derived will be used in the life cycle cost analysis described in Section 5 a.

Example O&M Cost Estimate

<i>Item</i>	<i>Cost Estimate</i>
Personnel (i.e. Salary, Benefits, Payroll Tax, Insurance, Training)	
Administrative Costs (e.g. office supplies, printing, etc.)	
Water Purchase or Waste Treatment Costs	
Insurance	
Energy Cost (Fuel and/or Electrical)	
Process Chemical	
Monitoring & Testing	
Short Lived Asset Maintenance/Replacement*	
Professional Services	
Residuals Disposal	
Miscellaneous	
Total	

* See Appendix C3 for example list

5) SELECTION OF AN ALTERNATIVE

Selection of an alternative is the process by which data from the previous section, "Alternatives Considered" is analyzed in a systematic manner to identify a recommended alternative. The analysis should include consideration of both life cycle costs and non- monetary factors (i.e. triple bottom line analysis: financial, social, and environmental). If water reuse or conservation, energy efficient design, and/or renewable generation of energy components are included in the proposal provide an explanation of their cost effectiveness in this section.

a) Life Cycle Cost Analysis. A life cycle present worth cost analysis (an engineering economics technique to evaluate present and future costs for comparison of alternatives) should be completed to compare the technically feasible alternatives. Do not leave out alternatives because of anticipated costs; let the life cycle cost analysis show whether an alternative may have an acceptable cost. This analysis should meet the following requirements and should be repeated for each technically feasible alternative. Several analyses may be required if the project has different aspects, such as one analysis for different types of collection systems and another for different types of treatment.

1. The analysis should convert all costs to present day dollars;
2. The planning period to be used is recommended to be 20 years, but may be any period determined reasonable by the engineer and concurred on by the state or federal agency;
3. The discount rate to be used should be the "real" discount rate taken from Appendix C of OMB circular A-94 and found at (www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html);
4. The total capital cost (construction plus non-construction costs) should be included;
5. Annual O&M costs should be converted to present day dollars using a uniform series present worth (USPW) calculation;
6. The salvage value of the constructed project should be estimated using the anticipated life expectancy of the constructed items using straight line depreciation calculated at the end of the planning period and converted to present day dollars;
7. The present worth of the salvage value should be subtracted from the present worth costs;
8. The net present value (NPV) is then calculated for each technically feasible alternative as the sum of the capital cost (C) plus the present worth of the uniform series of annual O&M (USPW (O&M)) costs minus the single payment present worth of the salvage value (SPPW(S)):

$$NPV = C + USPW (O\&M) - SPPW (S)$$

9. A table showing the capital cost, annual O&M cost, salvage value, present worth of each of these values, and the NPV should be developed for state or federal agency review. All factors (major and minor components), discount rates, and planning periods used should be shown within the table;
10. Short lived asset costs (See Appendix C.3 for examples) should also be included in the life cycle cost analysis if determined appropriate by the consulting engineer or agency. Life cycles of short lived assets should be tailored to the facilities being constructed and be based on generally accepted design life. Different features in the system may have varied life cycles.

b) Non-Monetary Factors. Non-monetary factors, including social and environmental aspects (e.g. sustainability considerations, operator training requirements, permit issues, community objections, reduction of greenhouse gas emissions, wetland relocation) should also be considered in determining which alternative is recommended and may be factored into the calculations.

6) PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)

The engineer should include a recommendation for which alternative(s) should be implemented. This section should contain a fully developed description of the proposed project based on the preliminary description under the evaluation of alternatives. Include a schematic for any treatment processes, a layout of the system, and a location map of the proposed facilities. At least the following information should be included as applicable to the specific project:

a) Preliminary Project Design

1. **Wastewater/Reuse:**

Collection System/Reclaimed Water System Layout. Identify general location of new pipe, replacement or rehabilitation: lengths, sizes, and key components.

Pumping Stations. Identify size, type, site location, and any special power requirements. For rehabilitation projects, include description of components upgraded.

Storage. Identify size, type, location and frequency of operation.

Treatment. Describe process in detail (including whether adding, replacing, or rehabilitating a process) and identify location of any treatment units and site of any discharges (end use for reclaimed water). Identify capacity of treatment plant (i.e. Average Daily Flow).

ii) **Stormwater:**

Collection System Layout. Identify general location of new pipe, replacement or rehabilitation: lengths, sizes, and key components.

Pumping Stations. Identify size, type, location, and any special power requirements.

Treatment. Describe treatment process in detail. Identify location of treatment facilities and process discharges. Capacity of treatment process should also be addressed.

Storage. Identify size, type, location and frequency of operation.

Disposal. Describe type of disposal facilities and location.

Green Infrastructure. Provide the following information for green infrastructure alternatives:

- **Control Measures Selected.** Identify types of control measures selected (e.g., vegetated areas, planter boxes, permeable pavement, rainwater cisterns).
- **Layout:** Identify placement of green infrastructure control measures, flow paths, and drainage area for each control measure.
- **Sizing:** Identify surface area and water storage volume for each green infrastructure control measure. Where applicable, soil infiltration rate, evapotranspiration rate, and use rate (for rainwater harvesting) should also be addressed.
- **Overflow:** Describe overflow structures and locations for conveyance of larger precipitation events.

b) Project Schedule. Identify proposed dates for submittal and anticipated approval of all required documents, land and easement acquisition, permit applications, advertisement for bids, loan closing, contract award, initiation of construction, substantial completion, final completion, and initiation of operation.

c) Permit Requirements. Identify any construction, discharge and capacity permits that will/may be required as a result of the project.

d) Sustainability Considerations (if applicable).

1. Water and Energy Efficiency. Describe aspects of the proposed project addressing water reuse, water efficiency, and water conservation, energy efficient design, and/or renewable generation of energy, if incorporated into the selected alternative.

2. Green Infrastructure. Describe aspects of project that preserve or mimic natural processes to manage stormwater, if applicable to the selected alternative. Address management of runoff volume and peak flows through infiltration, evapotranspiration, and/or harvest and use, if applicable.
 3. Other. Describe other aspects of sustainability (such as resiliency or operational simplicity) that are incorporated into the selected alternative, if incorporated into the selected alternative.
- e) Total Project Cost Estimate (Engineer's Opinion of Probable Cost). Provide an itemized estimate of the project cost based on the stated period of construction. Include construction, land and right-of-ways, legal, engineering, construction program management, funds administration, interest, equipment, construction contingency, refinancing, and other costs associated with the proposed project. The construction subtotal should be separated out from the non-construction costs. The non-construction subtotal should be included and added to the construction subtotal to establish the total project cost. An appropriate construction contingency should be added as part of the non-construction subtotal. For projects containing both water and waste disposal systems, provide a separate cost estimate for each system as well as a grand total. If applicable, the cost estimate should be itemized to reflect cost sharing including apportionment between funding sources. The engineer may rely on the owner for estimates of cost for items other than construction, equipment, and engineering.
- f) Annual Operating Budget. Provide itemized annual operating budget information. The owner has primary responsibility for the annual operating budget, however, there are other parties that may provide technical assistance. This information will be used to evaluate the financial capacity of the system. The engineer will incorporate information from the owner's accountant and other known technical service providers.
1. Income. Provide information about all sources of income for the system including a proposed rate schedule. Project income realistically for existing and proposed new users separately, based on existing user billings, water treatment contracts, and other sources of income. In the absence of historic data or other reliable information, for budget purposes, base water use on 100 gallons per capita per day. Water use per residential connection may then be calculated based on the most recent U.S. Census, American Community Survey, or other data for the state or county of the average household size. When large agricultural or commercial users are projected, the Report should identify those users and include facts to substantiate such projections and evaluate the impact of such users on the economic viability of the project.
 2. Annual O&M Costs. Provide an itemized list by expense category and project costs realistically. Provide projected costs for operating the system as improved. In the absence of other reliable data, base on actual costs of other existing facilities of similar size and complexity. Include facts in the Report to substantiate O&M cost estimates. Include personnel costs, administrative costs, water purchase or treatment costs, accounting and auditing fees, legal fees, interest, utilities, energy costs, insurance, annual repairs and maintenance, monitoring and testing, supplies, chemicals, residuals disposal, office supplies, printing, professional services, and miscellaneous as applicable. Any income from renewable energy generation which is sold back to the electric utility should also be included, if applicable. If applicable, note the operator grade needed.
 3. Debt Repayments. Describe existing and proposed financing with the estimated amount of annual debt repayments from all sources. All estimates of funding should be based on loans, not grants.
 4. Reserves. Describe the existing and proposed loan obligation reserve requirements for the following:

Debt Service Reserve - For specific debt service reserve requirements consult with individual funding sources. If General Obligation bonds are proposed to be used as loan security, this section may be omitted, but this should be clearly stated if it is the case.

Short-Lived Asset Reserve- A table of short lived assets should be included for the system (See Appendix C.3 for examples). The table should include the asset, the expected year of replacement, and the anticipated cost of each. Prepare a recommended annual reserve deposit to fund replacement of short-lived assets, such as pumps, paint, and small equipment. Short-lived assets include those items not covered under O&M, however, this does not include facilities such as a water tank or treatment facility replacement that are usually funded with long-term capital financing.

7) CONCLUSIONS AND RECOMMENDATIONS

Provide any additional findings and recommendations that should be considered in development of the project. This may include recommendations for special studies, highlighting of the need for special coordination, a recommended plan of action to expedite project development, and any other necessary considerations.

C.3: Example List of Short-Lived Asset Infrastructure

Estimated Repair, Rehab, Replacement Expenses by Item (within up to 20 years from installation):

- Wastewater Utilities
- Treatment Related
- Pump
- Pump Controls Pump Motors Chemical feed pumps
- Membrane Filters Fibers
- Field & Process Instrumentation Equipment
- UV lamps Centrifuges Aeration blowers
- Aeration diffusers and nozzles
- Trickling filters, RBCs, etc. Belt presses & driers
- Sludge Collecting and Dewatering Equipment
- Level Sensors Pressure Transducers Pump Controls
- Back-up power generator
- Chemical Leak Detection Equipment
- Flow meters
- SCADA Systems

Collection System Related:

- Pump
- Pump Controls
- Pump Motors
- Trash racks/bar screens
- Sewer line rodding equipment
- Air compressors
- Vaults, lids, and access hatches Security devices and fencing Alarms & Telemetry
- Chemical Leak Detection Equipment

Appendix D – Oregon Planning Bulletin

OREGON PLANNING BULLETIN

February 20, 1998 ☆☆☆ Bulletin # 98-1

Key Topics:

- Population forecasts
- House Bill 2709
- Coordination
- Coordinating body
- Office of Economic Analysis

Key Laws:

- Goal 2, *Land Use Planning*
- ORS 195.036
- ORS 197.296
- Governor's Executive Order #97-22

Citations:

- *Long-Term Population and Employment Forecasts for Oregon*, State Office of Economic Analysis, January 1997
- *DLCD v. Douglas County*, LUBA 96-233, January 6, 1997, **Reversed and remanded**

On the Horizon:

LUBA ruled against Douglas County's population forecasts in the case cited above. The county revised its forecasts, but they're still 20 percent higher than OEA's, so DLCD has appealed the county forecasts to LUBA again.

State works with local governments to develop coordinated population forecasts

Population forecasts have long been a vital part of every comprehensive plan. But recent events have made them even more important. Today, there's a greater need for a plan's population forecasts to be accurate, up-to-date, and fully coordinated with those of nearby cities and counties. This bulletin explains why.

In the Beginning . . .

Two decades ago, cities and counties throughout Oregon began writing plans in accordance with 1973's Senate Bill 100 and the new statewide planning goals. Each plan was based on a forecast of how the community's population would change over some period of time—usually 20 years. That forecast affected many elements of the plan. For example, it determined how much vacant land would be put in the city's urban growth boundary and how much capacity would be built into public facilities like water treatment plants and sewer systems.

Some larger cities and counties developed their forecasts "in house." But smaller communities often relied on projections made by state or federal agencies or regional utilities, such as the BPA. Fears that the new planning laws might hinder economic growth caused some local officials to choose the highest projections they could find. That would justify a larger UGB, more land for development, and larger public facilities.

Counties Coordinate the Forecasts

Senate Bill 100 gave counties the responsibility to coordinate local plans

and population forecasts. ORS 197.190 (renumbered to ORS 195.025 in 1993) declared each county to be "responsible for coordinating all planning activities affecting land uses within the county . . . to assure an integrated comprehensive plan for the entire area of the county."

In the early days of the planning program, coordination of local population forecasts seemed as if it would be fairly simple. In any given county, each city would adopt a forecast. The sum of those urban forecasts plus the county's forecast for the rural population would add up to one coordinated forecast for the entire county. But such precise coordination wasn't always achieved, for several reasons. Local plans often used ranges of projections rather than a single number. County officials sometimes were unable to persuade a city to alter its forecast. And some cities adopted their forecasts long after their county's plan had been acknowledged.

During the slow-growing 1980's, some imprecision or inconsistency among local population forecasts didn't matter much. But in the fast-growing 1990's, it began to matter a great deal. It was one of several factors that led to the passage of some important land-use legislation, House Bill 2709, in 1995.

House Bill 2709

With 1995's House Bill 2709, Oregon's lawmakers added considerable detail to the general policy set forth in Goals 2, 10, and 14. That policy says that within their urban growth boundaries, cities must

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maintain an adequate supply of buildable land to meet the demand for needed housing. HB 2709 spelled out how cities are to measure their progress in meeting that demand. It said that large or rapidly growing cities must periodically compare their actual growth against growth projected in the plan. If actual growth is exceeding projected growth and beginning to reduce the amount of buildable land below a twenty-year supply, then a city must take action. It must expand its boundary, provide for more intensive use of land within the boundary, or both. These requirements are codified in ORS 197.296.

HB 2709 also added a key sentence to the list of county coordination responsibilities: "The coordinating body under ORS 195.025(1) shall establish and maintain a population forecast for the entire area within its boundary for use in maintaining and updating comprehensive plans, and shall coordinate the forecast with the local governments within its boundary" (ORS 195.036). The "coordinating body" is, in most cases, the county government.

The net effect of HB 2709 has been to greatly increase the emphasis on population forecasts and their coordination. That effect is reinforced by the state's Transportation Planning Rule (OAR 660, Division 12). It requires local transportation system plans to be based on "population and employment forecasts and distributions which are consistent with the acknowledged comprehensive plan" (OAR 660-12-030(3)). That rule requires the forecasts to be for 20 years or more.

DLCD has prepared a workbook to help local planners meet the requirements of HB 2709. It was published in June 1997. Copies of the 138-page book are available at no charge from DLCDC.

A New Source of Forecasts

HB 2709's emphasis on population forecasts caused the state to expand its forecasting efforts and to concentrate them in one place: the Office of Economic Analysis (OEA). The OEA is headed by Paul Warner, Oregon's state economist.

In Executive Order 97-22, signed December 16, 1997, Governor Kitzhaber directed key state agencies such as DLCDC and ODOT to "use the population and employment forecasts developed

or approved by the Department of Administrative Service's Office of Economic Analysis in coordination with Oregon's 36 counties to plan and implement programs and activities." That means the OEA projections will be the touchstone for the coordination of local population projections that is required by ORS 195.036.

DLCD will use the OEA forecasts in a manner similar to the "safe harbor" provisions in the Goal 5 administrative rules. When a local government amends its acknowledged population forecasts (in periodic review or through a plan amendment), it can rely on the OEA forecasts (the "safe harbor"), or it can develop its own. If it develops its own, it must justify any significant departures from the OEA figures.

Three important facts about the OEA forecasts should be noted. First, they forecast population growth only for counties, not cities. A city updating its forecast will need to coordinate with its county officials to decide what part of the county's growth should be forecast for the city. The city's share of past growth is likely to be the starting point for such coordination. For example, if a city had contained ten percent of a county's total population for several decades, then ten percent of the growth projected for the entire county might be forecast for that city. But if local officials knew that a big new computer chip plant soon would bring many new jobs to that city, they might forecast 12 or 15 percent of the county's future growth in that city.

Second, OEA forecasts are not "state numbers" developed in Salem and imposed on cities and counties. Rather, they are the result of a cooperative process between the state and its local governments. The OEA worked closely with local officials from all 36 counties and many cities to develop its current forecasts, and it will do so in the future. A review process enables local officials to propose revisions to the OEA forecasts. That process already has resulted in changes to the OEA forecasts for Malheur and Morrow Counties.

Third, state agencies still must comply with ORS 197.180, a law that requires them to conduct their programs "in a manner compatible with" acknowledged local plans. If a local plan contains a forecast that has been duly coordinated and

acknowledged, then a state agency probably must use it. But the law doesn't say agencies must use local forecasts that don't fit the agency's project or action. For example, a state agency would not be bound to use a city's acknowledged twenty-year forecast if the agency needed a fifty-year forecast for an area larger than that covered by the city's forecast. In many cases, the acknowledged local forecast will provide only part of the information an agency needs. The agency then may augment that with OEA forecasts that are more recent, extend over a larger area, and reach further into the future.

Current OEA projections are found in "Long-Term Population and Employment Forecasts for Oregon, January 1997." This forty-page document contains county-by-county projections in five-year increments to the year 2040. OEA will update it in the year 2000. This document and other population data are available on the Internet at OEA's web site: www.oea.das.state.or.us.

The Douglas County Case

The significance of OEA forecasts was highlighted in a recent LUBA case involving Douglas County. In 1996 the county decided to amend the population forecast in its comprehensive plan. Also in 1996 the OEA began developing its long-term population forecast for the entire state, to be done by October of that year. When DLCD and the OEA learned that the county intended to adopt its new forecast in October, they both asked the county to wait and consider the new OEA forecast. But the county didn't wait: its board of commissioners adopted a local forecast without weighing it against the OEA's forecast for Douglas County.

DLCD appealed that decision to the state's Land Use Board of Appeals (LUBA), alleging two violations of Goal 2, *Land Use Planning*: that the county had failed to coordinate its actions with all other affected governmental units, and that it lacked an adequate factual base for its new forecast. LUBA ruled in DLCD's favor on both counts. LUBA said:

"By ignoring the state economist's and DLCD's requests, the County failed to meet the first step of its obligation

under Goal 2—the obligation to engage in and exchange information. Where a state agency expresses concerns about a county's proposed planning activity, and advises that it soon will release data and forecasts relevant to the local government's planning activity, the Goal 2 coordination obligation requires the county to address that concern Although the County is not required to accede to every concern expressed by an agency, it must respond to an agency's legitimate concern."

In considering how Goal 2's requirement for an adequate factual base applied to Douglas County's population forecast, LUBA said this: "The test of whether this requirement is met is the same as that for determining whether a decision is supported by substantial evidence; i.e., 'is the decision supported by evidence a reasonable decision maker would rely upon to support a conclusion.'" LUBA concluded that the county lacked such evidence to support its use of certain "multipliers" used to forecast the county's population growth.

In response to LUBA's ruling, the county reconsidered its forecasts. But it still adopted forecasts about 20 percent higher than those prepared by the OEA. DLCD believes that the forecast is not supported by an adequate factual base and therefore has taken Douglas County's forecast to LUBA again.

Why Accurate Forecasts Are Needed

In the slow-growing eighties, many people thought it wise to "err on the high side" with population forecasts. A generous forecast would justify an ample urban growth boundary, an abundance of vacant land for development, and plenty of infrastructure capacity to serve development. Any costs from erring on the high side were deemed to be minor.

But in the fast-growing nineties, costs from inflated or uncoordinated forecasts have come to be seen as anything but minor. Such costs include:

- wasting money to build unneeded or oversized infrastructure
- misdirected, inefficient, or unwanted growth
- loss of farmland and other natural resources.

The wasting of money occurs when a service provider builds unneeded capacity into a road, sewer system, water system, or other public facility. For example, if ODOT uses an inflated forecast to design a new interchange, the resulting facility will have capacity in excess of what's needed. A million dollars wasted on excess capacity there is a million dollars taken from a badly needed project somewhere else in Oregon.

Misdirected growth occurs when a forecast induces growth or development in a place not suited for it. For example, suppose that a small city surrounded by steep hills is facing serious infrastructure problems. More growth would force it to spend millions of dollars on expensive new roads, sewers, and water lines in hilly areas, and local taxpayers don't want that. But if the city has a population forecast that "errs on the high side," the city may have to expand its infrastructure into those hilly areas to maintain the supply of buildable land required by ORS 197.296.

Unnecessary loss of farmland, wildlife habitat, and other natural resources is another consequence of inflated forecasts. Land put inside a UGB and designated for urban growth that never

comes may well be developed in low-density sprawl. That's likely to take the land out of farm production and displace or destroy some natural resources.

Many people still may regard population forecasts as abstract, perhaps even insignificant. But in Oregon's planning system, forecasts are numbers that count.

For more information . . .

If you have questions about the topic of population forecasts, please contact your field representative from DLCD or one of these DLCD staff members:

Jim Hinman 503 373-0088
Jim Sitzman 503 731-4065, Ext. 23 (Portland)
or 503 378-4919 (Salem)

If you would like more information about the Office of Economic Analysis and the process used to forecast population growth in Oregon's counties, please call:

Kanhaiya Vaidya 503 378-4967



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The *Oregon Planning Bulletin* is a summary of key judicial and policy decisions that affect land use planning in Oregon. It is produced by DLCD and distributed free to city and county officials and state agencies throughout Oregon. Its frequency of publication is determined by events such as court rulings and therefore will vary. The bulletin is a summary. It should not be regarded as a complete statement of state planning policies, laws, or rulings on land-use issues. Comments and questions should be directed to the editor, Mitch Rohse (☎ 503 373-0064; e-mail mitch.rohse@state.or.us).

Appendix E – Reliability Requirements

This appendix explains USEPA and DEQ reliability requirements:

EPA Reliability Requirements

In 1974, EPA published a technical bulletin as a supplement to Federal Guidelines: Design, Operation, and Maintenance of Wastewater Treatment Facilities titled “Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability” (UPEAP Design Criteria, 1974). The bulletin outlines minimum standards of reliability for three classes of wastewater treatment works: Class I, Class II and Class III. Class I is the highest level of reliability and applies to facilities that discharge to waters which could be permanently or unacceptably damaged by discharge of degraded effluent for only a few hours. Class II reliability applies to facilities that discharge to waters that would not be permanently or unacceptably damaged by discharge of degraded effluent, but could be if the discharge continued over several days. Class III applies to facilities that discharge to waters that would not be permanently or unacceptably damaged by discharge of degraded effluent for any length of time.

Section 212 of the EPA bulletin lists component backup requirements. In these requirements, the bulletin uses the terms “peak wastewater flow” and “total design flow” but does not clearly define them. However, other federal guideline information describe “peak flow” as the peak instantaneous flow and “design flow” as the annual average flow.

Western Oregon Planning Requirements

Western Oregon has a distinct dry and wet season. The vast majority of the precipitation occurs during the months of November through May, with very little precipitation occurring during the summer months. As such, peak flows may exceed average dry weather flows by more than an order of magnitude.

Oregon Administrative Rules have established an upper threshold for sanitary sewerage overflows. During the summer months, these overflows are prohibited unless they are the result of a storm event which exceeds the one-in-10 year 24-hour storm. During the winter months, SSOs are prohibited unless it is due to a storm event which exceeds the one-in-five-year 24-hour storm magnitude. Therefore, treatment plants in Oregon must be capable of treating all wastewater up to these flows.

DEQ has developed guidelines to estimate current or projected sewage flow rates using a statistical method based on rainfall (DEQ Flow Projection Guidelines, April 1996). These guidelines utilize the following definitions for various flow rates employed in wastewater design:

- MMDWF₁₀: The Maximum Monthly Average Dry-Weather Flow with a 10 Percent Probability of Occurrence
- MMWWF₅: The Maximum Monthly Average Wet-Weather Flow with a 20 Percent Probability of Occurrence
- PDAF₅: The Peak Daily Average Flow Associated with a One-in-Five-Year Storm
- PIF₅: The Peak Instantaneous Flow Attained during a One-in-Five-Year Peak Daily Average Flow

Reliability Classification in Western Oregon

A treatment plant’s capacity is based both on hydraulic capacity and treatment capacity. Hydraulic capacity is simply the amount of sewage that can move through the system without overflowing. Treatment capacity is the amount of sewage that can be treated to meet effluent limits. In Oregon, wastewater treatment facilities must have both the hydraulic and treatment capacity to handle the peak day average flow associated with a five-year storm (PDAF₅).

Because the ratio between the dry and wet season flow can be very high in western Oregon, applying the EPA reliability requirements directly could require an unnecessarily large (and costly) wastewater treatment facility. Therefore, DEQ recommends applying the reliability criteria in Western Oregon as follows:

Collection Systems

- Design gravity and alternative collection systems to handle the peak hourly flow associated with the one-in-five-year 24-hour storm event (PIF₅). See OAR Chapter 340 Division 052 Appendix A.
- Sewage pumping stations should have a firm capacity (and stations should still be operational should the largest pump go out of service) equivalent to the peak hourly flow associated with the one-in-five-year 24-hour storm event (PIF₅). However, in-system storage (flow equalization) may be considered to reduce the design peak hourly flow on a case-by-case basis. (DEQ Pump Station Standards, May 2001)

Treatment Systems

- In general, all units should be able to handle the peak hourly flows without overflowing or damaging the equipment, with the largest flow capacity unit out of service. The system should also contain enough flexibility to allow any unit to be taken out of service and meet permit requirements by redistributing the wastewater to other active treatment units.
- All pumping stations required to convey wastewater flows should have a firm capacity (largest pump out of service) equivalent to the peak hourly flow.
- The headworks should be sized for peak hourly flow. A minimum of two units are required. Facilities with only one mechanical screen may include a manual bar screen for redundancy. No redundancy is needed for grit removal units.
- Primary clarifiers, when present, should be sized for peak daily flow. No redundancy is needed if the secondary processes are adequate to treat dry weather flows without primary treatment.
- Size aeration basins using modeling to generate desired treatment. Typically, this means 10 mg/L at maximum monthly average dry weather flow with a 10 percent chance of occurrence (summer) and 30 mg/L at maximum monthly average flow with a five percent chance of occurrence (winter). A minimum of two units are required.
- Size the secondary clarifiers for either the peak average daily flow associated with a one-in-five-year storm with all clarifiers operational, or the MMDWF₁₀ with the largest clarifier off line, whichever results in greater treatment capacity. A minimum of two secondary clarifiers are required. Use separate overflow rates for the dry and wet seasons.
- Size the disinfection system for peak-hour flow with full redundancy.
- For chlorination systems, the contact chamber should be sized for at least 15 minutes of contact time at the peak hour flow, 20 minutes at peak day, or 60 minutes at average dry-weather flow, whichever results in the largest basin. A minimum of two contact units is required. A minimum length-to-width ratio of 40:1 is required, with 72:1 preferred. Operation in series is recommended.
- For UV systems, a minimum of two units is required. Sizing is based on a minimum dose of 30 mJ/cm² at either the peak-hour flow with all units on, or the maximum day dry weather flow with largest unit offline, whichever results in the larger design. This dose must be calculated with a certain percentage of fouling and end-of-lamp life statistics as discussed in the Ten State Standards. Full redundancy of the ballasts and controls is required. A single control panel is acceptable, as long as there is full redundancy within the panel. In addition, a UV transmittance of more than 65 percent should be verified before selecting UV. Collimated beam tests are recommended. A UV transmittance and UV intensity meters are required. UVT and UVI control is recommended.

Appendix F – Federal Cross Cutting Example

This memo is intended to document that all Federal Cross Cutting requirements were met for the above project as part of the USDA Environmental review process and review for NEPA compliance.

In detail:

- 1. Historic/Cultural Resources (NHPA/AHPA, EO 11593)**—SHPO was contacted by letter October 28th, 2008. On November 21st, 2008 SHPO responded by letter (SHPO Case # 08-2433) advising that no prior cultural resource surveys have been completed near the project area. A search of the SHPO database identified 69 historic properties in Clatsop County, none of which are within the project APE. THPO consultations letters were sent to the Confederated Tribes of the Grand Ronde and Siletz Indians in October 2008. The Grand Ronde indicated they have not identified any archeological or cultural sites within the project area; but that precautions should be taken during construction due to the high likelihood of ancestral habitation in these areas. The Siletz Indians were contacted a separate time in December 2008 but failed to respond. The Shoalwater Bay Tribe of the Shoalwater Bay require consultation for projects in Clatsop county. The Shoalwater were contacted by letter 2/6/09 with four follow-up phone calls made over the next month. No response was received. USDA sent letters to the tribes and SHPO in October 2011 to conclude the Section 106 process. SHPO responded by letter in October 2011, indicating two potential cultural sites had been discovered by private citizens since the time they were originally consulted on the project. SHPO requested that an archaeological survey be performed to ground truth the sites prior to project approval. An archaeological survey was completed by Heritage Research Associates in February 2012 and sent to SHPO and Rural Development for review. The cultural report and field surface survey did not identify any archaeological resources in the project's APE and no further archaeological investigations were recommended. Regardless, an Inadvertent Discovery Plan will be required in the USDA Letter of Conditions to mitigate against any unanticipated discovery of archaeological artifacts or human remains.
- 2. Wetlands (EO 11990)**—Wetland impacts require review and often permitted through both the Oregon Department of State Lands (DSL) and the U.S. Army Corp or Engineers (COE). Curran-McLeod contacted ACOE to discuss construction details and submit permitting applications. ACOE indicated a permit is not required given the plan to HDD underneath any wetland areas. Curran-McLeod has removed their ACOE permit application. Initial correspondence with DSL identified hydric soils and wetlands within the railroad ROW (Option A) area where the HDD is planned. DSL recommended on-site wetland determination to determine the extent of wetlands at the drill entry sites, equipment staging areas, and proposed pump stations. This route was eliminated as an option due to land easement issues, thus there will no longer be a need for a wetland delineation.
- 3. Flood Plains (EO 11988 & 12148)**—The ER indicates the project site is not located within the 100-year flood zone as indicated by FEMA FIRM map panels 410027 0020B and 410027 0019B. The loan specialist has completed FEMA form 81-93.
- 4. Farmland Protection Policy Act**—State land use goals prohibit the extension of sewers into resource areas and outside urban growth boundaries (UGB), except to resolve a documented health hazard (State Goal 11). The Shoreline project meets these requirements. The project is located entirely in existing highway/road ROWs. Properties bordering the project are zoned for many uses including single family (SF), lake and wetland (LW), residential-agricultural 5 acre parcels (RA-5), open space recreational (OPR), exclusive farm use (EFU), military reserve (MR) and agricultural-forest (AF). Because the project remains within the ROWs; however, none of the surrounding land uses will be affected.
- 5. Coastal Zone Management Act**—The City of Warrenton and the SSD are both located within the Oregon Coastal Zone covered by the Coastal Zone Management Plan, managed by the Oregon Division of Land

and Conservation Development (DLCD). Because the project involves a federal action (USDA), DLCDD will require a Federal Consistency Determination before the project can be approved to proceed. Federal consistency review includes local comprehensive plan and ordinance review as well as other state agency programs that are a part of the CZMP. A consistency determination was received from DLCDD on August 24th, 2011.

6. **Wild & Scenic Rivers/Protected Areas**— The project's Area of Potential Effect (APE) does not include any National or State Park areas, Wild and Scenic rivers or wildlife refuges.

7. **ESA/EFH/Critical ESA Species Habitat**— Current protected species lists were provided by USFWS, ODFW and NMFS. NMFS and ODFW did not identify issues in the current project proposal, if BMPs were used during construction. USFWS provided comments concerning the Federally threatened Oregon silverspot butterfly (*Speyeria zerene hippolyta*). The butterfly is known to have occurred on Camp Rilea, in the meadows or pastures directly west of Hwy 101, and near the proposed project area east of Hwy 101 at Cullaby Lake. After further consultation, EPA issued a letter April 21, 2009, stating their determination that the project will have no effect on ESA-listed species or their critical habitat and will not adversely affect essential fish habitat.

8. **Environmental Justice (EO 12898)**—USDA is required to perform an environmental justice analysis of all projects funded through our program. Included in this analysis is a search of the census and social justice information for the community a project is to be located in and completion of RD form 2006-38 Civil Rights Impact Analysis Certification, certifying that the project does not have a disproportionate impact on a community or protected group within a community. A civil rights impact analysis has been completed by the loan specialist; however, the environmental report includes the required population and income data. No civil rights issues have been identified. Future rate increases may cause hardship to lower income households. Exact data is not known at this time.

Clean Air Act-- This project basically entails soil excavation and improvements on the wastewater system (changes at the sites above and changes to the piping system).

The dust rules that will apply during excavation include:

- Division 208: Visible Emissions and Nuisance Requirements
 1. Water will be used to control dust from the work site.
 2. Necessary site ingress/egress mitigations will ensure that dirt is not dragged on to the pavement because that can cause a dust problem. By installing water bars to spray both sides to the truck will wash the dirt off of the tires of the trucks.
 3. For the installation of piping systems the contractor may need crushed rock and asphalt. If so, the owner and operator of the rock crusher and asphalt plant will obtain an air permit to operate.
- Division 248: Asbestos Requirements
 1. During excavation on land and on roadways this project may come across Cement Asbestos Pipe (nonfriable asbestos pipe), used as pipe in years past. The contractor will test the pipe before beginning construction.
 2. If demolition of facilities is required during this project, an asbestos survey is required to insure asbestos containing building materials are identified and removed according to the regulations. DEQ regulations for the removal and disposal of asbestos containing materials will be followed.

Appendix G – Common Concerns and Good Practices

Avoid spending money and getting a wastewater planning document written only to have it sit on shelf, unused:

- Consult with DEQ before commissioning a wastewater planning document. DEQ can assess the need and content of the document and help you define the scope.
- Updating a wastewater planning document on a regular basis is NOT a DEQ requirement. If facts on the ground have changed, i.e. expansion of service area and or population, or the ability to treat wastewater, updating makes sense. For its' own sake, however, it is not required.
- An environmental review does not need to be written until all parties agree that the project will go forward, within about two years from the environmental review completion.

To work against the possibility of writing a bad wastewater planning document:

- Consult with DEQ before commissioning a wastewater planning document. DEQ can assess the need and content of the document and help you define the scope.
- Prior to starting or commissioning a wastewater planning document, collect data on wastewater flows and permitted effluent loads at least a year ahead.
- Prior to collecting data on wastewater flows and permitted effluent loads, confirm that the measuring devices are functioning properly (i.e.: Flow meters are calibrated and capturing all flows, laboratory data is accurate (QA/QC is done correctly and regularly).
- Make "Approval by DEQ" part of the contract for commissioning the writing of a wastewater planning document.
- Confirm the results of the completed wastewater planning document with DEQ, funding agencies and municipality.

To ensure the wastewater planning document is approvable by DEQ:

- Consult with DEQ before commissioning a wastewater planning document. DEQ can assess the need and content of the document and help you define the scope.
- Make "Approval by DEQ" part of the contract for commissioning the writing of a wastewater planning document.
- Confirm the results of the completed wastewater planning document with DEQ, funding agencies and municipality.

To avoid writing a wastewater planning document that does not reflect reality:

- Consult with DEQ before commissioning a wastewater planning document. DEQ can assess the need and content of the document and help you define the scope.
- Prior to collecting data on wastewater flows and permitted effluent loads, confirm that the measuring devices are functioning properly (i.e.: Flow meters are calibrated and capturing all flows, laboratory data is accurate (QA/QC is done correctly and regularly).
- Make "Approval by DEQ" part of the contract for commissioning the writing of a wastewater planning document.

Avoid having spent the time and money on an environmental review, and the project doesn't move forward:

- Consult with DEQ before commissioning a wastewater planning document. DEQ can assess the need and content of the document and help you define the scope.
- Make "Approval by DEQ" part of the contract for commissioning the writing of a Wastewater planning document.

- Confirm the results of the completed wastewater planning document with DEQ, funding agencies and municipality.
- Plan ahead. Know when your project needs to be in place.
- Wait until all parties agree that construction will begin within 2 years before beginning the environmental review. Environment review can, in some cases, take a full year to complete.

Avoid the need to rewrite a wastewater planning document because too much time has passed:

- Consult with DEQ before commissioning a wastewater planning document. DEQ can assess the need and content of the document and help you define the scope.
- Updating a wastewater planning document on a regular basis is NOT a DEQ requirement. If facts on the ground have changed, ie expansion of service area and or population, or the ability to treat wastewater, updating makes sense. For its' own sake, however, it is not required.
- Make "Approval by DEQ" part of the contract for commissioning the writing of a wastewater planning document.
- An environmental review does not need to be written until all parties agree on the project that will go forward, within about two years from the environmental review completion.

Avoiding conducting an environmental review again because too much time has passed (5 years or changed project scope):

- Plan ahead. Know when your project needs to be in place.
- Wait until all parties agree that construction will begin within 2 years before beginning the environmental review. Environment review can, in some cases, take a full year to complete.

Keeping the cost of wastewater planning documenting as low a possible:

- Consult with DEQ before commissioning a wastewater planning document. DEQ can assess the need and content of the document and help you define the scope.
- Updating a wastewater planning document on a regular basis is NOT a DEQ requirement. If facts on the ground have changed, ie expansion of service area and or population, or the ability to treat wastewater, updating makes sense. For its' own sake, however, it is not required.
- Prior to starting or commissioning a wastewater planning document, collect data on wastewater flows and permitted effluent loads at least a year ahead.
- Prior to collecting data on wastewater flows and permitted effluent loads, confirm that the measuring devices are functioning properly (i.e.: Flow meters are calibrated and capturing all flows, laboratory data is accurate (QA/QC is done correctly and regularly).
- Do data collection in above with plant/municipality personnel. Confirm that the data is correct and usable. Get a line item cost for data collection from consultants before signing a contract. Subtract cost of doing the legwork yourself from the bottom line. Bargain with consultants for best price on using the data you collect rather than having to pay them to collect it.
- Confirm the results of the completed wastewater planning document with DEQ, funding agencies and municipality.
- Plan ahead. Know when your project needs to be in place.
- Wait until all parties agree that construction will begin within 2 years before beginning the environmental review. Environment review can, in some cases, take a full year to complete.

Keeping the time associated with creating a wastewater planning document as compact as possible:

- Consult with DEQ before commissioning a wastewater planning document. DEQ can assess the need and content of the document and help you define the scope.
- Updating a wastewater planning document on a regular basis is NOT a DEQ requirement. If facts on the ground have changed, ie expansion of service area and or population, or the ability to treat wastewater, updating makes sense. For its' own sake, however, it is not required.

- Prior to collecting data on wastewater flows and permitted effluent loads, confirm that the measuring devices are functioning properly (i.e.: Flow meters are calibrated and capturing all flows, laboratory data is accurate (QA/QC is done correctly and regularly).
- Prior to starting or commissioning a wastewater planning document, collect data on wastewater flows and permitted effluent loads at least a year ahead.
- Do data collection in above with plant/municipality personnel. Confirm that the data is correct and usable. Get a line item cost for data collection from consultants before signing a contract. Subtract cost of doing the legwork yourself from the bottom line. Bargain with consultants for best price on using the data you collect rather than having to pay them to collect it.
- Confirm the results of the completed wastewater planning document with DEQ, funding agencies and municipality.
- Plan ahead. Know when your project needs to be in place.

Revision	Date	Changes	Editor