http://www.rurdev.usda.gov/IA_Home.html

USDA United States Department of Agriculture
Rural Development

Iowa

USDA Rural Development State Director Bill Menner (third from right) participated in ribbon cutting and open house activities to celebrate the recently completed expansion of Mahaska Health Partnership in Oskaloosa. The project was financed through a $23 million loan from USDA Rural Development.

Success Stories

(02/04/2014) New Akron Care Center facility tremendous asset to northwest Iowa

(01/21/2014) New medical clinic in Woodbine helps improve healthcare options in southwest Iowa

(01/10/2014) Fiber-to-the-home broadband project helps producer use smart-farm technology to improve operation's safety and efficiency

In the News

More

(August 6, 2014) U.S. Trade Representative Michael Froman to Headline White House "Made in Rural America Regional Forum" In Mount Vernon Friday August 8th

(July 29, 2014) USDA Rural Development Temporarily Accepting Applications to Refinance Home Loans in Rural Iowa

(June 25, 2014) Scranton Manufacturing Company Celebrates Groundbreaking for Large Facility Expansion

(June 23, 2014) USDA Rural Development Facilitating Rural-Issues Roundtable Discussion in Keokuk on Wednesday, June 25th

(June 12, 2014) USDA Rural Development Awards $607,476 to Create Jobs and Economic Opportunities in Rural Iowa Communities

Spotlights

More

The Agricultural Act of 2014 makes areas with population up to 35,000 and rural in character eligible for USDA Rural Housing Programs with certain provisions. Changes to the eligible areas map based on the Farm Bill will be released on 5/6/2014.

See Also
- Iowa Home Page
- State Director
- Business and Cooperative
- Community Facilities
- Energy
- Housing
- Water and Environmental
- Lenders and Realtors
- American Recovery and Reinvestment Act

I Want to Find
- Local Office Information
- Apartments for Rent
- Homes for Sale
- Revolving Loan Funds

Iowa

Water and Environmental Programs

Water and Environmental Programs (WEP) provide rural communities with technical assistance and financing necessary to develop drinking water and wastewater disposal systems. Safe drinking water and sanitary waste disposal systems are vital not only to public health, but also to the economic vitality of rural areas.

During the past five years, USDA Rural Development in Iowa has invested more than $183 million to help communities with water and wastewater disposal systems.

- Water and Waste Guaranteed Loans, Direct Loan and Grant Program
- Other Water and Waste Grant Programs
- Engineer Information and Contract Documents
- Completing Environmental Assessments - Helpful Information
- Environmental Assessment Worksheet
- Contact Us

See Also
- Iowa Home Page
- State Director
- Business and Cooperative
- Community Facilities
- Energy
- Housing
- Water and Environmental
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Last Modified:07/24/2014

Iowa

Water and Environmental Programs Engineer Information and Contract Documents

- Preliminary Engineering Report Guidelines
  - RUS Bulletin 1780-2 (4-4-13)
  - Iowa Supplement to RUS Bulletin 1780-2 (July 2014)
  - Water/Sewer Project Information - IA Guide 13j (10-10)
  - RUS Instruction 1780 (Refer to Subpart C) (10-10)

  Life Cycle Cost Analysis 2014 "real" federal discount rate = 1.6%. See OMB Circular A-94 appendix C for more information.
- Sample Life Cycle Cost Calculation (March 2014)
- Sample Annual O&M and Short-Lived Reserve Costs (June 2013)
- Sanitary Sewer Project Guidelines (4-7-11)
- Owner Construction and Owner Performed Services Requirements (12-2-11)
- Engineering Agreement Information (Word Doc) (7-21-14)
- Engineering Agreement Information (PDF) (7-21-14)
- Open and Free Competition (5-17-12)

Contract Documents

- Contract Document Information (Word Doc) (7-21-14)
- Contract Document Information (PDF) (7-21-14)
- Preconstruction Conference - Guide 12a (2-22-07)
- Engineer Inspection Report - Guide 12h (4-7-97)
- Prefinal - Final Inspection - Guide 12e (4-7-97)
- Owner Report - Guide 12i (4-7-97)
- Construction Document Forms
  - Project Sign - Iowa Guide 22 (6-1-13)
  - Project Sign CDBG - Iowa Guide 22cdbg (6-1-13)
  - Compliance Statement - RD 400-6 (Rev. 4-00)
  - Certification for Contracts, Grants and Loans - 1940 Q, Exh A-1 (4-7-97)
  - Certification Regarding Debarment - AD 1048 (1-92)

Last Modified:07/29/2014

See Also
- Iowa Home Page
- State Director
- Business and Cooperative
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UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Utilities Service

BULLETIN 1780-2

SUBJECT: **Preliminary Engineering Reports for the Water and Waste Disposal Program**

TO: Rural Development State Directors, RUS Program Directors, and State Engineers

EFFECTIVE DATE: Date of approval.

OFFICE OF PRIMARY INTEREST: Engineering and Environmental Staff, Water and Environmental Programs

INSTRUCTIONS: This bulletin replaces existing RUS Bulletins 1780-2 (September 10, 2003), 1780-3 (October 2, 2003), 1780-4 (October 2, 2003), and 1780-5 (October 2, 2003).

AVAILABILITY: This bulletin and all the exhibits, as well as any Rural Development instruction or Rural Utilities Service instructions, regulations, or forms referenced in this bulletin are available at any Rural Development State Office. The State Office staff is familiar with the use of the documents in their States and can answer specific questions on Agency requirements.

This bulletin is available on the Rural Utilities Service website at http://www.rurdev.usda.gov/RDU_Bulletins_Water_and_Environmental.html.

PURPOSE: This bulletin assists applicants and their consultants with instructions on how to prepare a Preliminary Engineering Report as part of an application for funding as required by 7 CFR 1780.33(c) and 7 CFR 1780.55.

MODIFICATIONS: Rural Development State Offices may modify this guidance when appropriate to comply with State statutes and regulations in accordance with the procedures outlined at Rural Development Instruction 2006-B (2006.55).

4/4/13

JACQUELINE M. PONTI-LAZARUK
Assistant Administrator
Water and Environmental Programs

Date

TABLE OF CONTENTS

ABBREVIATIONS

CDBG – Community Development Block Grant
CFR – Code of Federal Regulations
EDU – Equivalent Dwelling Unit
EPA – Environmental Protection Agency
GAO – Government Accountability Office
GPCD – Gallons per Capita per Day
HUD – Department of Housing and Urban Development
O & M – Operations and Maintenance
PER – Preliminary Engineering Report
RD – Rural Development
RUS – Rural Utilities Service
SRF – State Revolving Fund
USDA – United States Department of Agriculture
WEP – Water and Environmental Programs
WWD – Water and Waste Disposal

1 GENERAL

A PER is a planning document required by many state and federal agencies as part of the process of obtaining financial assistance for development of drinking water, wastewater, solid waste, and stormwater projects. An applicant for funding from the WWD program must submit a PER as required by 7 CFR 1780.33(c) and 1780.55. The PER describes the proposed project from an engineering perspective, analyzes alternatives to the proposal, defines project costs, and provides information critical to the underwriting process.

In 2012 the USDA, Rural Development (RD), Rural Utilities Service, Water and Environmental Programs formed a working group to develop an interagency template for PERs for use by both federal agencies and state administering agencies. The USDA-led working group included 36 individuals representing 4 federal agencies, 16 state agencies, the Border Environment Cooperation Commission, and the North Carolina Rural Center. Also, the effort was supported by the Small Community Water Infrastructure Exchange. On January 16, 2013, the principals of the federal participants executed an interagency memorandum supporting use of the interagency template, attached as Exhibit One.

2. PURPOSE

This bulletin provides information and guidance for applicants and professional consultants in developing a PER for submittal with an application for funding. RD State Offices should provide a copy of the Bulletin to applicants and consulting engineers upon request or refer them to the website listed on the Bulletin's cover sheet for an electronic copy.

3 HOW TO USE THE INTERAGENCY TEMPLATE

There has been increasing interest throughout the government at both state and federal levels to improve coordination between funding agencies in the processes involved in applications for infrastructure funding. A recent GAO report, "Rural Water Infrastructure: Additional Coordination Can Help Avoid Potentially Duplicative Application Requirements" (GAO-13-111), released October 16, 2012, called the effort of the working group led by USDA to develop the attached Interagency PER Template "encouraging" and stated that it would "help communities".

Content of a PER: The attached Interagency PER Template describes the content of a PER and should be used without modification, except for items noted below. Often an applicant will initially consider only a single funding source and later determine that an application to additional funding agencies is necessary. To avoid having to revise the PER to meet the additional agencies' needs, the consulting engineer should provide

responses to all sections of the PER outline, unless specific sections do not apply to a proposed project.

Short-Lived Assets: The short-lived asset table in Appendix A is a list of examples of short-lived assets. Depending on local practices and applicants, some of these items may not be considered short-lived assets if they are considered part of O&M or long-term capital financing. Consulting engineers and applicants should coordinate with each other and with the Agency to determine which items should be considered short-lived assets for specific projects.

Engaging State Partners: State Offices should engage funding partners to encourage state-wide adoption of the attached template as a standard for all state leveraging partners. Existing state-level agreements resulting from previous coordinated efforts for adopting a standard PER outline must be modified or replaced with this template. Efforts underway to adopt new state-level PER outlines must use this template. State-level agreements implementing this template between various leveraging partners should keep additional requirements to a minimum, but should not remove any required sections from the template.

Income Projections for Underwriting Purposes:

The State Office uses some of the information from the PER, especially Sections 6 (e) and (f), for underwriting purposes. Note that for income projection purposes, every effort should be made to identify actual data regarding water usage or wastewater generation. For metered systems, actual data should be used.

When financing construction of a new system or improvements to an existing system without any existing usage data, water use and wastewater generation approximations for income projection purposes should, if at all possible, be based on information from surrounding similar communities and systems. The source of data used should be documented in the PER.

The value of 100 GPCD shown in Section 6 is a general value and may not be appropriate for many rural systems financed with WWD funds, so in the absence of reliable data, a value of 5000 gallons per EDU per month (approximately 67 GPCD or 167 GPD per EDU) should be used.

Exhibit One: Interagency Preliminary Engineering Report Template

January 16, 2013

INTERAGENCY MEMORANDUM

Attached is a document explaining recommended best practice for the development of Preliminary Engineering Reports in support of funding applications for development of drinking water, wastewater, stormwater, and solid waste systems.

The best practice document was developed cooperatively by:

- US Department of Agriculture, Rural Development, Rural Utilities Service, Water and Environmental Programs;
- US Environmental Protection Agency (EPA), Office of Water, Office of Ground Water and Drinking Water and Office of Wastewater Management;
- US Department of Housing and Urban Development (HUD), Office of Community Planning and Development;
- US Department of Health and Human Services, Indian Health Service (IHS);
- Small Communities Water Infrastructure Exchange;

Extensive input from participating state administering agencies was also very important to the development of this document.

Federal agencies that cooperatively developed this document strongly encourage its use by funding agencies as part of the application process or project development. State administered programs are encouraged to adopt this document but are not required to do so, as it is up to a state administering agency's discretion to adopt it, based on the needs of the state administering agency.

A Preliminary Engineering Report (Report) is a planning document required by many state and federal funding agencies as part of the process of obtaining financial assistance for development of drinking water, wastewater, solid waste, and stormwater facilities. The attached Report outline details the requirements that funding agencies have adopted when a Report is required.

In general the Report should include a description of existing facilities and a description of the issues being addressed by the proposed project. It should identify alternatives, present a life cycle cost analysis of technically feasible alternatives and propose a specific course of action. The Report should also include a detailed current cost estimate of the recommended alternative. The attached outline describes these and other sections to be included in the Report.

Projects utilizing direct federal funding also require an environmental review in accordance with the National Environmental Policy Act (NEPA). The Report should indicate that environmental issues were considered as part of the engineering planning and include environmental information pertinent to engineering planning.

For state administered funding programs, a determination of whether the outline applies to a given program or project is made by the state administering agency. When a program or agency adopts this outline, it may adopt a portion or the entire outline as applicable to the program or project in question at the discretion of the agency. Some state and federal funding agencies will not require the Report for every project or may waive portions of the Report that do not apply to their application process, however a Report thoroughly addressing all of the contents of this outline will meet the requirements of most agencies that have adopted this outline.

The detailed outline provides information on what to include in a Report. The level of detail required may also vary according to the complexity of the specific project. Reports should conform substantially to this detailed outline and otherwise be prepared and presented in a professional manner. Many funding agencies require that the document be developed by a Professional Engineer registered in the state or other jurisdiction where the project is to be constructed unless exempt from this requirement. Please check with applicable funding agencies to determine if the agencies require supplementary information beyond the scope of this outline.

Any preliminary design information must be written in accordance with the regulatory requirements of the state or territory where the project will be built.

Information provided in the Report may be used to process requests for funding. Completeness and accuracy are therefore essential for timely processing of an application. Please contact the appropriate state or federal funding agencies with any questions about development of the Report and applications for funding as early in the process as practicable.

Questions about this document should be referred to the applicable state administering agency, regional office of the applicable federal agency, or to the following federal contacts:

Agency	Contact	Email Address	Phone
USDA/RUS	Benjamin Shuman, PE	ben.shuman@wdc.usda.gov	202-720-1784
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HUD	Stephen Rhodeside	stephen.m.rhodeside@hud.gov	202-708-1322
IHS	Dana Baer, PE	dana.baer@ihs.gov	301-443-1345

Sincerely,

1/16/13

Jacqueline M. Ponti-Lazaruk, Assistant Administrator
USDA, Rural Development, Rural Utilities Service, Water and Environmental Programs

01/16/13

Sheila Frace, Acting Deputy Director
US EPA, Office of Water, Office of Wastewater Management

1/16/13

Andrew Sawyers, Deputy Director
US EPA, Director, Office of Water, Office of Ground Water and Drinking Water

1/16/13

Ronald Ferguson, PE, RADM, Director
Division of Sanitation Facilities Construction, Indian Health Service

1-16-13

Stanley Gimont, Director
Office of Block Grant Assistance, US Department of Housing and Urban Development

Attachment

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EPA, Office of Water, Office of Wastewater Management	Matt King
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EPA, Region 9	Abimbola Odusoga
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HUD, Office of Community Planning and Development	Eva Fontheim
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Indiana Finance Authority	Shelley Love
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Kentucky Department of Local Government	Jennifer Peters
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Minnesota Pollution Control Agency	Corey Mathisen, PE
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Montana Department of Commerce	Kate Miller, PE
North Carolina Department of Commerce	Olivia Collier
North Carolina Rural Center	Keith Krzywicki, PE
North Carolina Department of Commerce	Vickie Miller, CPM
Rhode Island Department of Health	Gary Chobanian, PE
Rhode Island Department of Health	Geoffrey Marchant

ABBREVIATIONS

NEPA – National Environmental Policy Act
NPV – Net Present Value
O&M – Operations and Maintenance
OMB – Office of Management and Budget
Report – Preliminary Engineering Report
SPPW – Single Payment Present Worth
USPW – Uniform Series Present Worth

GENERAL OUTLINE OF A PRELIMINARY ENGINEERING REPORT

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

DETAILED OUTLINE OF A PRELIMINARY ENGINEERING REPORT

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.

i) 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.

ii) 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.

iii) 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	
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 A 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 A 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.

i) Drinking Water:

Water Supply. Include requirements for quality and quantity. Describe recommended source, including site and allocation allowed.

Treatment. Describe process in detail (including whether adding, replacing, or rehabilitating a process) and identify location of plant and site of any process discharges. Identify capacity of treatment plant (i.e. Maximum Daily Demand).

Storage. Identify size, type and location.

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

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

ii) 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).

iii) Solid Waste:

Collection. Describe process in detail and identify quantities of material (in both volume and weight), length of transport, location and type of transfer facilities, and any special handling requirements.

Storage. If any, describe capacity, type, and site location.

Processing. If any, describe capacity, type, and site location.

Disposal. Describe process in detail and identify permit requirements, quantities of material, recycling processes, location of plant, and site of any process discharges.

iv) 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).

i) 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.

ii) 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.

iii) 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.

i) 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.

ii) 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.

iii) 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.

iv) 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 A 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.

Appendix A: Example List of Short-Lived Asset Infrastructure

Estimated Repair, Rehab, Replacement Expenses by Item within up to 20 Years from Installation)	
Drinking Water Utilities	**Wastewater Utilities**
Source Related	**Treatment Related**
Pumps	Pump
Pump Controls	Pump Controls
Pump Motors	Pump Motors
Telemetry	Chemical feed pumps
Intake/ Well screens	Membrane Filters Fibers
Water Level Sensors	Field & Process Instrumentation Equipment
Pressure Transducers	UV lamps
Treatment Related	Centrifuges
Chemical feed pumps	Aeration blowers
Altitude Valves	Aeration diffusers and nozzles
Valve Actuators	Trickling filters, RBCs, etc.
Field & Process Instrumentation Equipment	Belt presses & driers
Granular filter media	Sludge Collecting and Dewatering Equipment
Air compressors & control units	Level Sensors
Pumps	Pressure Transducers
Pump Motors	Pump Controls
Pump Controls	Back-up power generator
Water Level Sensors	Chemical Leak Detection Equipment
Pressure Transducers	Flow meters
Sludge Collection & Dewatering	SCADA Systems
UV Lamps	**Collection System Related**
Membranes	Pump
Back-up power generators	Pump Controls
Chemical Leak Detection Equipment	Pump Motors
Flow meters	Trash racks/bar screens
SCADA Systems	Sewer line rodding equipment
Distribution System Related	Air compressors
Residential and Small Commercial Meters	Vaults, lids, and access hatches
Meter boxes	Security devices and fencing
Hydrants & Blow offs	Alarms & Telemetry
Pressure reducing valves	Chemical Leak Detection Equipment
Cross connection control devices	
Altitude valves	
Alarms & Telemetry	
Vaults, lids, and access hatches	
Security devices and fencing	
Storage reservoir painting/patching	

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WATER/SEWER PROJECT INFORMATION

Applicant Name: _____

Project Description:_____

_____

1. Is the proposed project needed to correct a violation of an Iowa DNR health or sanitary standards? (If yes, attach copy of violation letter) _____yes _____no

2. Current Water Usage Information for Last Consecutive 12 Months (Complete even if proposed project is sewer. If water supply is from private wells, write N/A.)

A. Total residential usage (gallons) _____

B. Total non-residential usage (gallons) _____

C. Total bulk usage (gallons) _____

Total usage from all users (gallons) _____

3. Existing System (Complete both columns)	Water	Sewer
A. Number of Residential Users	_____	_____
B. Number of Non-Residential Users (Attach list of non-residential users and the water usage for the last consecutive 12 months for each non-residential user)	_____	_____
C. Number of Bulk (Contract) Users (Attach list of bulk users and the water usage for the last consecutive 12 months for each bulk user)	_____	_____
Total	_____	_____

D. Are all water users currently individually metered? _____yes _____no

E. Are all developed properties within the existing service area served by the existing facility? _____yes _____no

F. Attach a copy of your current rate structure and ordinances for the existing facility.

4. New System (complete applicable column)	Water	Sewer
A. Number of proposed Residential Users	_____	_____
B. Number of proposed Non-Residential Users (Attach list of proposed non-residential users)	_____	_____
C. Bulk (Contract) Users (Attach list of proposed non-residential users)	_____	_____
Total	_____	_____

D. Will all developed properties within the proposed service area be served by the propsed facility? _____yes _____no

Applicant and Project Name: _____

5. Incorporated City(ies) to be served:

Incorporated City	**Current Users**		**New Users**		**Total Users**	
	Water	Sewer	Water	Sewer	Water	Sewer
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
				Total	_____	_____

6. If proposed project will serve users outside an incorporated area, provide the following:

Location		**Current Users**		**New Users**		**Total Users**	
County	Township	Water	Sewer	Water	Sewer	Water	Sewer
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
					Total	_____	_____

7. Amount of land now owned: _____ acres Estimated value: $_____
Amount of land to be acquired: _____ acres Estimated value: $_____

8. Certifications

We certify that, as an applicant for Federal assistance, we are in compliance with all Federal, State, and local requirements, including the following:

a. Compliance with special laws and regulations.
b. Compliance with State Pollution Control or Environmental Protection Agency standards.
c. Consistency with other development plans of the area and State Strategic Plan.
d. Compliance with the Civil Rights Act of 1964.
e. Compliance with Title IX of the Education Amendments of 1972.
f. Compliance with Section 504 of the Rehabilitation Act of 1973.
g. Compliance with the Age Discrimination Act of 1975.
h. Compliance with A-133 Audit requirements.

We certify that, if applicable, as a provider of electric services, we will not require users of a water or sewer system financed by Rural Development to accept electric service as a condition of receiving assistance.

We certify that, to the best of our knowledge and belief, we are unable to finance the proposed project from our own resources or through commercial credit at reasonable rates and terms.

We certify that, to the best of our knowledge and belief, no outstanding judgment has been obtained and recorded by the United States of America in a Federal Court (other than in the United States Tax Court) against our organization.

We certify that, to the best of our knowledge and belief, the above information submitted on this form is correct.

_____
Signature of Applicant Representative

Title:_____

Date:_____

Applicant and Project Name: _____

Project Contacts (attach additional sheets if necessary):

	Name	Organization Name/Address	E-mail	Office Phone	Cell Phone	Fax
Mayor/President/ Chair						
Clerk/Secretary						
Engineer						
Legal Representative						
Bond Counsel						
Auditor						
Financial Advisor						
Environmental Preparer						
CDBG Administrator						
Lender						
Other						

9. Please identify any contacts above or other key employees related to, or closely associated with, any employee of Rural Development:

_____

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Iowa

Water and Environmental Programs Engineer Information and Contract Documents

- Preliminary Engineering Report Guidelines
  - RUS Bulletin 1780-2 (4-4-13)
  - Iowa Supplement to RUS Bulletin 1780-2 (July 2014)
  - Water/Sewer Project Information - IA Guide 13j (10-10)
  - RUS Instruction 1780 (Refer to Subpart C) (10-10)

  Life Cycle Cost Analysis 2014 "real" federal discount rate = 1.6%. See OMB Circular A-94 appendix C for more information.
- Sample Life Cycle Cost Calculation (March 2014)
- Sample Annual O&M and Short-Lived Reserve Costs (June 2013)
- Sanitary Sewer Project Guidelines (4-7-11)
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  - Project Sign - Iowa Guide 22 (6-1-13)
  - Project Sign CDBG - Iowa Guide 22cdbg (6-1-13)
  - Compliance Statement - RD 400-6 (Rev. 4-00)
  - Certification for Contracts, Grants and Loans - 1940 Q, Exh A-1 (4-7-97)
  - Certification Regarding Debarment - AD 1048 (1-92)

Last Modified:07/29/2014

See Also

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- Business and Cooperative
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UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Utilities Service RUS
Iowa Rural Development
Supplement to RUS Bulletin 1780-26, dated 4/11/14

SUBJECT: Guidance for the use of Engineers Joint Contract Documents Committee (EJCDC) documents Water and Waste Disposal Projects with RUS Financial Assistance.

TO: Applicants and Project Engineers

EFFECTIVE DATE: July 21, 2014

AVAILABILITY: This Supplement and related documents are available on the Iowa Rural Development website at http://www.rurdev.usda.gov/IA_we_ContractDocs.html

PURPOSE: The attached Bulletin assists Applicants and Project Engineers in the development of engineering agreements and construction contracts that are legally sufficient, ensure appropriate services are provided at a reasonable fee, and expedite the achievement of the Applicant's goals.

ENGINEERING AGREEMENT ADDITIONAL INFORMATION REQUIRED: Iowa Rural Development requests that the fees be separated to identify all costs. The following information is required with the Engineering Agreement documents to identify all costs:

a. Basic Services:
   1. If reimbursable expenses are in Basic Services, the total reimbursable cost for Basic Services must be shown separately on Appendix 1 to Exhibit C.

b. Resident Project Representative services:
   1. If a Resident Project Representative is proposed, indicate on the Standard Hourly Rate Schedule, Appendix 2 to Exhibit C the exact billing class for RPR services for this specific project.
   2. If reimbursable expenses are included in the RPR total compensation shown in C2.04.A.1, the total reimbursable costs for RPR services must be shown separately on Appendix 1 to Exhibit C.

c. Additional Services:
   1. If Additional Services are planned for the project, the costs need to be itemized in the Agreement. By itemizing the services and cost they are preapproved as required in A2.02A. Following is a sample format for showing Additional Services:

a. Operation and Maintenance manual (LS-HR)	$ _____
b. Property surveys (LS-HR)	$ _____
c. Soil testing (LS)	$ _____
d. Easement work (LS-HR)	$ _____
e. Construction survey (LS-HR)	$ _____
f. Other (LS-HR) _____	$ _____
g. Other (LS-HR) _____	$ _____
Total Compensation for Additional Services	$_____

The individual itemized amounts shall not be exceeded without prior Owner and RD concurrence. Reimbursable expenses are included in each itemized cost (note if lump sum (LS) or hourly rate (HR)).

UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Utilities Service
RUS BULLETIN 1780-26

SUBJECT: **Guidance for the Use of Engineers Joint Contract Documents Committee (EJCDC) Documents on Water and Waste Disposal Projects with RUS Financial Assistance**

TO: Rural Development State Directors, RUS Program Directors, and State Engineers

EFFECTIVE DATE: Date of approval. See "Use of Prior Versions of EJCDC Documents" on page three.

OFFICE OF PRIMARY INTEREST: Engineering and Environmental Staff, Water and Environmental Programs

INSTRUCTIONS: This Bulletin replaces RUS Bulletin 1780-26, dated August 20, 2009, and revised October 2009.

AVAILABILITY: This Bulletin, as well as any Rural Development instruction or Rural Utilities Service instructions, regulations, or forms referenced in this Bulletin are available at any Rural Development State Office. The State Office staff is familiar with the use of the documents in their States and can answer specific questions on Rural Development requirements.

This Bulletin is available on the Rural Utilities Service website at http://www.rurdev.usda.gov/RDU_Bulletins_Water_and_Environmental.html

PURPOSE: This Bulletin assists Rural Development staff in providing information and guidance to applicants and professional consultants in the development of engineering agreements and construction contracts that are legally sufficient, ensure appropriate services are provided at a reasonable fee, and expedite the achievement of the applicant's goals.

MODIFICATIONS: Rural Development State Offices may modify this guidance when appropriate to comply with state statutes and regulations in accordance with the procedures outlined at Rural Development Instruction 2006-B (2006.55).

4/11/14

JACQUELINE M. PONTI-LAZARUK
Water and Environmental Programs

Date

1 GENERAL

a Approved Documents. Subject to the modifications indicated in this Bulletin, the Engineers Joint Contract Documents Committee (EJCDC) developed the following documents which were previously approved by the Rural Utilities Service (RUS) for procurement of professional and construction services by loan and grant recipients:

(1) Agreement between Owner and Engineer for Professional Services (EJCDC No. E-500, 2014 Edition)

(2) Agreement between Owner and Contractor for Construction Contract (Stipulated Price) (EJCDC No. C-520, 2013 Edition)

(3) Standard General Conditions of the Construction Contract (EJCDC No. C-700, 2013 Edition)

b Associated Documents. In addition to items 2 and 3, there are also associated construction contract documents, some of which are available through EJCDC and its member organizations and some of which are to be developed by the engineer based on instructions in this Bulletin.

c Alternative Documents. Recipients not wishing to use EJCDC documents may submit alternative documents for review and consideration. Such documents must be modified to meet all federal and state requirements and must be approved for each project by the Agency and the USDA Office of General Counsel (OGC). When modified as described in this Bulletin, the EJCDC documents listed above have been determined to meet such requirements and generally do not require OGC approval.

2 AVAILABILITY

The EJCDC documents are available online from any of the sponsoring organizations: the National Society of Professional Engineers (www.nspe.org); American Council of Engineering Companies (www.acec.org); and American Society of Civil Engineers (www.asce.org); or directly from EJCDC (www.ejcdc.org). EJCDC documents are proprietary and include a license agreement. RUS offices will not distribute EJCDC documents for any purpose other than training or to illustrate the appropriate use of the integrated set of documents on RUS financially assisted projects.

3 USE OF PRIOR VERSIONS OF EJCDC DOCUMENTS

a Acceptable Use. Although this Bulletin is effective on the date signed, older versions of EJCDC documents may be used in the following circumstances as follows:

(1) Project-specific EJCDC documents approved prior to the effective date of this Bulletin are still considered approved. This Bulletin does not retroactively change the status of an individual document already approved.

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Sample Annual O&M and Short-Lived Asset Reserve Costs

Example of information requested in the Preliminary Engineering Report, section 6.f.ii and iv.

The cost to operate the entire system needs to be provided. For example if the project is to replace the wastewater collection system and no work is planned for the treatment system the cost to operate and maintain the collection and treatment system needs to be provided.

The description must clearly describe the items or task, show the year the event occurs, and the cost in today's dollars.

The following wastewater sample is for gravity sewer collection, one lift station, and a controlled discharge lagoon.

The follow events occur every year (annual O&M costs)		
Pump station electricity/tele		$1,150
Pump station inspection/clean		$100
Collection system general labor		$500
Billing/accounting		$600
Office supplies		$100
Insurance/permits		$500
Minor pump station repairs		$100
Lagoon operator		$5,000
Water testing/sampling		$500
Mowing		$600
	Total	$9,150
The following event occurs in year 10		
Replace pumps		$8,000
Repair/replace controls		$500
Repair manholes		$300
	Total	$8,800
The following event occurs in year 15		
Check & Clean manholes		$3,000
Check & Clean sewer lines		$1,000
	Total	$4,000
The following event occurs in year 20		
Replace pumps		$8,000
Repair/replace controls		$500
Repair manholes		$300
	Total	$8,800

Sample Life Cycle Cost Calculation #1

Project name: Sample city

Alternative: Gravity sewer one lift station

This is a sample of the information RD will be looking for.
This spreadsheet is fillable and calculates the present worth.
Enter the dollar amounts in the yellow highlighted areas.
Provide a detailed listing of items, year, and cost in todays dollars.
The items, costs, and time frame shown is an example only. The Applicant and Project Engieer will need to determine each specific project needs.

Year of repair replacement	Item / event #2	2014 Federal discount rate conversion factor #1	Cost of event in todays dollars	Present value
1	annual O&M costs	17.001	$ 3,050	$ 51,852
1		0.984		$ -
2		0.969		$ -
3		0.953		$ -
4		0.938		$ -
5		0.924		$ -
6		0.909		$ -
7		0.895		$ -
8		0.881		$ -
9		0.867		$ -
10	pumps	0.853	$ 8,800	$ 7,508
11		0.840		$ -
12		0.827		$ -
13		0.814		$ -
14		0.801		$ -
15	manholes	0.788	$ 4,000	$ 3,152
16		0.776		$ -
17		0.763		$ -
18		0.751		$ -
19		0.740		$ -
20	pumps	0.728	$ 8,800	$ 6,406
20	salvage value #3	-0.728	$ 600,000	$ (436,794)
	(This may be a negative value)		**TOTAL Present Value**	**$ (367,875)**

Annual O&M costs

Pump station electricity/tele	$1,150
Pump station inspection/clean	$100
Collection system general labor	$500
Billing/accounting	$600
Office supplies	$100
Insurance/permits	$500
Minor pump station repairs	$100
Total	$3,050

Replace pumps $8,000

repair/replace controls	$500
repair manholes	$300
Total	$8,800

Check & Clean manholes $3,000

clean check sewer lines	$1,000
	$4,000

Replace pumps $8,000

repair/replace controls	$500
repair manholes	$300
Total	$8,800

June, 2013

Total Project cost = $ 1,000,000

Present worth is = Project cost + Total Present Value	$ 632,125

The O&M costs are the annual recuring cost for 20 years, the rate conversion factor is for uniform present value (UPV)

$$UPV = Cost \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

n=20
i=interest rate

The conversion factor for present value of a cost that occurs in a specific year (SPV)

$$SPV = Cost \times \frac{1}{(1+i)^n}$$

n=year
i=interest rate

#1. The Federal discount interest rate from OMB Cicular A94 for 2014 1.6%

#2. Explain each item in great detail on a separate sheet, do not lump items together
Supporting documenation may be requested on the life and cost of each item.

#3. Salvage value in the present worth calculaions.
Use straight line deperciation.
The salvage value is subtracted from the other present values to obtain the total present value.

Assumed life of the collection system is XX years
Construction cost is the cost to construct the system not including the engineering, legal, contingency, interest, and other non construction costs.

construction cost	useful life	years remaining	Value
$ 1,000,000	50	30	$ 600,000

Sample Life Cycle Cost Calculation #2

Project name: Sample city

Alternative: 3-cell lagoon

Year of repair replacement	Item / event #2	2014 Federal discount rate conversion factor #1	Cost of event in todays dollars	Present value
1	annual O&M costs	17.001	$ 6,100	$ 103,704
1		0.984		$ -
2		0.969		$ -
3		0.953		$ -
4		0.938		$ -
5		0.924		$ -
6		0.909		$ -
7		0.895		$ -
8		0.881		$ -
9		0.867		$ -
10		0.853		$ -
11		0.840		$ -
12		0.827		$ -
13		0.814		$ -
14		0.801		$ -
15		0.788		$ -
16		0.776		$ -
17		0.763		$ -
18		0.751		$ -
19		0.740		$ -
20		0.728		$ -
20	salvage value #3	-0.728	$ 400,000	$ (291,196)

Annual O&M cost

Operator	$5,000
Water testing/sampling	$500
Mowing	$600
Total	$6,100

	(This may be a negative value)	**TOTAL Present Value**	**$ (187,493)**

June, 2013

Total Project cost = $ 500,000

Present worth is = Project cost + Total Present Value	**$ 312,507**

The O&M costs are the annual recuring cost for 20 years, the rate conversion factor is for uniform present value (UPV)

$$UPV = Cost \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

n=20
i=interest rate

The conversion factor for present value of a cost that occurs in a specific year (SPV)

$$SPV = Cost \times \frac{1}{(1+i)^n}$$

n=year
i=interest rate

#1. The Federal discount interest rate from OMB Cicular A94 for 2014 1.6%

#2. Explain each item in great detail on a separate sheet, do not lump items together Supporting documenation may be requested on the life and cost of each item.

#3. Salvage value in the present worth calculaions.
Use straight line deperciation.
The salvage value is subtracted from the other present values to obtain the total present value.

Assumed life of the collection system is XX years
Construction cost is the cost to construct the system not including the engineering, legal, contingency, interest, and other non construction costs.

construction cost	useful life	years remaining	Value
$ 500,000	100	80	$ 400,000

USDA

United States Department of Agriculture
Rural Development

Rural Business-Cooperative Service • Rural Housing Service • Rural Utilities Service
Washington, DC 20250

MAY 17 2012

TO: State Directors
Rural Development

ATTN: Community Programs Directors
State Engineers

FROM: JACQUELINE M. PONTI-LAZARUK
Assistant Administrator
Water and Environmental Programs
USDA, Rural Utilities Service

SUBJECT: Open and Free Competition on Water and Waste Projects

This memorandum provides guidance to Rural Development State Office staff regarding requirements for maximum open and free competition contained in 7 CFR 1780.70(b) and (d); Departmental Regulations 3015.182, 3016.36(c) and 3019.43, and OMB Circulars A 102 and A 110. It does not apply to guaranteed loans. This document supersedes the unnumbered letter of the same title dated March 18, 2002, and should be filed with RUS Instruction 1780.

Agency responsibilities described in this memorandum are consistent with the duties of the State Engineer. Therefore, unless stated otherwise, wherever this memorandum states that the Agency will make a determination or perform an action, this means that the State Engineer will do so. State Directors are responsible for ensuring these requirements are met through oversight of State Engineer activities and responsibilities. State Directors are strongly encouraged to provide written delegations of authority for State Engineers to perform these duties.

Procurement Procedures

In accordance with the above regulations owner procurement procedures shall not restrict or eliminate competition. All procurement transactions, whether by sealed bids or negotiation and without regards to dollar value, shall be conducted in a manner that provides maximum open and free competition. Some of the situations considered to be restrictive of competition include, but are not limited to:

1. placing unreasonable requirements on firms in order for them to qualify to do business, such as requiring bidders to provide excessive documentation about an equipment item proposed as an equal product;
2. requiring unnecessary experience and excessive bonding, such as requiring manufacturers to have an unnecessary number of years doing business before their equipment may be evaluated by the consulting engineer to determine if it is an equal product;

3. noncompetitive pricing practices between firms or between affiliated companies, such as accepting a bid from a bidder that the owner knows used unethical practices in development of their bid;
4. organizational conflicts of interest, such as accepting a bid from a bidder when there is a financial relationship between the consulting engineer and the bidder;
5. specifying only a brand name product instead of allowing an equal product to be offered and describing the performance of other relevant requirements of the procurement, and
6. any arbitrary action in the procurement process.

All procurement transactions will be conducted in a manner that prohibits statutorily or administratively imposed in-State or local geographic preferences in the evaluation of bids or proposals, except in those cases where applicable Federal statutes expressly mandate or encourage geographic preference. Nothing in this requirement preempts State licensing laws.

Specifications

Owners procurement procedures will ensure that all solicitations:

1. Incorporate a clear and accurate description of the technical requirements for the competitive procurement of construction services, equipment, and materials. Such descriptions shall not contain features which unduly restrict competition. When it is impractical or uneconomical to make a clear and accurate description of the technical requirements of a procurement, a "brand name or equal" description may be used as a means to define the performance or other salient requirements. The specific features of the named brand that must be met by bidders or offerors shall be clearly stated.
2. Identify all requirements which bidders or offerors must fulfill including the factors that will be used in evaluating bids or proposals, and the basis upon which the contract will be awarded.

In specifying materials, the owner and its consulting engineer will consider all materials normally suitable for the project commensurate with sound engineering practices and project requirements. The Agency shall consider any owner recommendations concerning the technical design and choice of materials to be used for a facility. If the Agency determines that other acceptable designs or materials should be considered in the procurement process, the Agency shall provide the owner with a comprehensive written justification for such a determination.

7 CFR 1780.70(d) only requires a single brand name and the words "or equal" be included in every specification listing a brand name product. As stated above, it also requires that the specific features of the named brand that must be met by bidders or offerors shall be clearly stated.

In addition, specifications, bidding, and contract documents must not prevent bidders or contractors from proposing an equal product at any time up to 5 days prior to bid opening or at any time after award of a contract. Consulting engineers must evaluate proposed equals submitted by bidders and contractors, but are not required to consider equals proposed directly by any subcontractors, suppliers, or other third parties. Prior to bid opening the results of this evaluation would be provided to plan holders as a bid addendum. After contract award the results would be provided to the contractor as part of the shop drawing submittal process.

Equals and substitutes

Bidders and contractors may propose either equals or substitutes. To qualify as an equal product the consulting engineer must determine that a product:

1. is equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
2. will reliably perform and function at least equally well as the brand named product and achieve the results imposed by the design concept of the completed project as a functioning whole; and
3. has a proven record of performance and responsive service.

In addition, the bidder or contractor must certify in writing at the time of shop drawing submittals that, if approved, there will be no increase to the owner in cost or contract times and that the proposed equal will conform substantially to the requirements of the item named in the contract documents.

As designer of record, the consulting engineer has sole discretion to determine whether the proposed item meets the requirements to be an equal. Approval of an equal will be indicated by: (1) the consulting engineer issuing a bid addendum approving the item before bid opening and/or (2) if after contract award, approval of a shop drawing submitted by the contractor.

Substitutes are items of materials or equipment proposed by a contractor and determined by the consulting engineer not to qualify as an equal. Typically they require some level of redesign on the part of the consulting engineer to incorporate into a project. Owners are not required under open and free competition requirements to consider substitutes, but they are required to consider proposed equals.

Bid Schedule

The front end bidding documents must be developed by the consulting engineer in a manner that does not restrict or eliminate competition. To accomplish this, there must not be any statements restricting competition. However, note that Buy American restrictions under Section 1605 of the American Recovery and Reinvestment Act apply if the criteria are applicable and the project includes any funding under this Act.

In addition, the bid schedule must not name any specific brand name products or material types unless a competitive pre-selection was accomplished or less than normal competition has been approved in writing by the Agency. Unless one of these criteria is met, the bid schedule must name the item and include a blank for a unit price or lump sum without reference to any material type or brand name.

Bid schedules set up around a given brand name product with additive or deductive alternatives for other brands are unacceptable. Also, note it is unacceptable to require bidders to list brands in the bidding documents that they intend to use if awarded the contract. A contractor may submit any proposed equals after award in accordance with the requirements of the General Conditions of the contract.

Less Than Normal Competition

Although the regulations require compliance with a standard of maximum open and free competition, there are cases where less than normal competition is acceptable for specific projects. The following examples list those situations. Where an owner's written request or justification is required, the consulting engineer may provide the request or justification as the owner's representative.

Bid schedules and specifications may list only one material type or brand name of equipment if the Agency concurs in writing:

(1) with an owner's written request that project requirements are unique;

(2) that selection of a given material or brand name product is necessary for interchangeability of parts or equipment in an existing system;

(3) that a process is only available from a single source and the need for the process was demonstrated in the Preliminary Engineering Report through either technical justification or a life cycle cost analysis;

(4) that only one type of material will meet technical requirements;

(5) that an equipment item required to meet technical requirements of the project is available from only one source; or

(6) that regulatory authorities require the use of a proprietary item in a permit.

In such cases the owner shall submit written justification to support their assertion that a given material or brand name is required. The Agency then evaluates the submitted documentation and provides a written concurrence or non-concurrence.

For example, a small town may wish to continue use of the same brand of water meters they already use when considering expansion of a water system. The Agency would evaluate the request to standardize on a given brand for a given project and should reject it unless there is a special need for standardization. Standardization may be appropriate if needed for interchangeability of parts or equipment, especially for a smaller system where resources are limited, but not for the convenience for the owner alone.

In addition, for loan-only projects the RUS Administrator may use the exception authority at 7 CFR 1780.25 to approve a written request for a waiver of the requirement for maximum open and free competition if requested by the owner and concurred in by the State Director. Such a waiver may be limited to a given material or brand name of equipment or may be issued for an entire project. Exception authority may never be used to waive the requirement for maximum open and free competition if there is any Agency grant funding in a project. If grant funds are added to a project after award, the requirement for maximum open and free competition must be added to the entire project, but would only apply to procurement transactions taking place after the grant was added.

Attached are exhibits addressing several topics related to the issue of maximum open and free competition.

If there are any questions, please contact Ben Shuman, PE at 202-720-1784 or ben.shuman@wdc.usda.gov or Jon Melhus, PE at 202-720-7817 or jon.melhus@wdc.usda.gov.
Attachments

Exhibit One: Selection of Materials

The owner and its consulting engineer will consider all materials normally suitable for the project commensurate with sound engineering practices and project requirements (7 CFR 1780.70(b)). This does not mean that the consulting engineer as the designer of record has no control over the selection of materials for a project.

The Agency must consider the preference of the owner and consulting engineer in selecting materials (such as pipe materials). If there is a legitimate technical reason for limiting design to a specific material or materials, written justification must be provided by the owner or consulting engineer and submitted to the Agency for concurrence. Written agency concurrence must be obtained prior to the submittal and concurrence in plans, specifications, and bidding documents and the issuance of the advertisement for bids (see Less Than Normal Competition above). If the Agency determines that the owner or consulting engineer's selection of materials is arbitrary or otherwise does not have legitimate technical merit, then the Agency will provide a letter to the owner and consulting engineer requiring alternate materials to be considered in the procurement process.

If there is no Agency approved justification for limiting design to a particular material or materials, then the choice of material to use for the project must be left to the construction contractor. In such a case, material specifications must be open. This may mean that more than one specifications section (e.g. one for each type of pipe) will be required for a particular item.

An example would be in the case where High Density Polyethylene (HDPE), Ductile Iron (DI) or Polyvinyl chloride (PVC) pipe are all technically feasible for a proposed water system. Even if the owner preferred DI, if there is no Agency approved justification to limit design to DI, the bidding documents, specifications, and drawings must allow all three pipe materials. If a portion of the system had to be DI due to an approved technical justification, then the bid schedule and plans and specifications would include such requirements.

Exhibit Two: Selection of a Design Approach

Often the owner and consulting engineer will want to select a specific design or technology for a given project that is proprietary or otherwise precludes the use of other technologies that may be able to meet the technical requirements of a project.

The Preliminary Engineering Report (PER) should be used to evaluate design or technology alternatives and exclude them from further consideration based on life cycle cost or technical merit analyses. § 1780.57(n) requires that a facility design provide the most economical service practicable, therefore designs and technologies excluded through life cycle cost analysis in the PER do not need to be considered later in plans, specifications, and bidding documents.

When reviewing the PER, the Agency should ensure that appropriate and technically feasible alternatives have been considered and should not concur if the applicant tries to exclude appropriate technologies. Alternative technologies or designs do not have to be considered further if they are excluded by sufficient technical or life cycle economic analysis.

In the case of proprietary equipment where only one manufacturer exists for a given technology, the selection of that technology may result in the default selection of a brand name. This is acceptable only if the use of that technology was adequately justified in the PER, but the Agency should document prior to concurring in plans and specifications that the requirement for maximum open and free competition has been met even though an item required to meet technical requirements of the project is available from only one source.

When more than one technology is acceptable for a given project, the consulting engineer and owner should leave the bidding documents open to allow as broad a variety of technologies as practicable. For example, in the case of procurement of water storage tanks, a bid schedule should call for a tank of a certain capacity rather than of a specific type (e.g. single pedestal versus multi-legged tank), unless a certain type of tank was shown in the PER not to be economical or technically feasible for a given project in which case it would not have to be considered in the procurement. Infeasible options do not need to be included in procurements, but factors excluding their use must be documented in writing by the owner or their consulting engineer and concurred in by the Agency in writing.

It is acceptable to use a base bid with alternates if the following conditions are met:

1. The base bid and alternates must not be different brand names, but rather different designs or technologies. If a base bid lists one proprietary brand name product for a given technology or design with additive or deductive alternates, this is unacceptable and should not be used.
2. The bidding documents must clearly explain which bid schedule item is potentially being replaced by the bid alternate item(s).
3. Selection of the design or technology must be made on the basis of low price and the bidding documents must clarify that the selection will be made in this manner. Owners are not allowed to use additional funds to make up the difference in cost to enable use of a more expensive design or technology.

Exhibit Three: Procurement of Equipment Prior to Selection of a Contractor

Sometimes the selection of a major equipment item can significantly impact the remainder of the project. It is important to maintain an environment of open and free competition in these circumstances. In cases like this, it may be best to conduct a "pre-selection" process. One of two approaches may be used based on whether a procurement contract is assigned upon award of a construction contract to the General Contractor or not.

For procurement contracts to be assigned to the General Contractor, a two phase process is allowed for pre-selection wherein materials or equipment may be selected prior to the selection of a construction contractor. This process enables the owner and consulting engineer to meet the requirements of maximum open and free competition and still complete the design around a specific type of material or equipment.

The first phase involves the competitive selection of the materials or equipment using competitive negotiation procedures (7 CFR 1780.72(c)). A Request for Proposals (RFP) is developed by the consulting engineer and publicly advertised by the owner. Manufacturers or suppliers reply to the RFP and submittals are ranked in accordance with the terms and conditions of the RFP. The RFP should include cost and other factors as determined by the owner and consulting engineer and concurred in by the Agency.

Negotiations on price and potentially other factors may then be completed with one or more of the manufacturers or suppliers submitting proposals. These negotiations may result in changes in the ranking of proposals. Then an award is made based on the best value to the owner in accordance with the ranking factors in the RFP.

A critical factor in using this approach is that the price of the materials or equipment must be locked in by the award based on a hold period established in the RFP. At this point a contract exists between the owner and the manufacturer or supplier. Contract documents for this purpose may be developed by the consulting engineer or standard forms of agreement between the manufacturer and the owner developed by industry groups may be used, such as the Engineers Joint Contract Documents Committee (EJCDC) procurement "P-series" forms. In either case, forms of agreement will require adaptation for use on Agency funded projects unless National Office approves a standard form of agreement for this purpose. Any form of agreement used must be approved by the Agency for individual projects with the assistance of the OGC Regional Attorney if required.

Next, the consulting engineer completes the design process. Note that the consulting engineer now has the advantage of knowing which materials or brand name equipment will be used in the final design, enabling them to complete the design with fewer unknowns.

The second phase is for selecting a contractor. The bid documents will look like bidding documents normally used, except for the following differences:

1. The bid schedule must list specific line items that were contracted for in phase one, including brand names and locked-in prices based on the first phase procurement. A base bid with additive or deductive alternates is still not allowed.
2. The specifications for the line items that were bid in phase one will not include a requirement for consideration of equals because competition requirements were met in phase one for these items.

3. Article 23 of the Instructions to Bidders (Attachment F of RUS Bulletin 1780-26) will need to be modified by the consulting engineer to clarify that the contract between the owner and manufacturer or supplier will be assigned to the construction contractor upon award to the General Contractor.

Upon award of the construction contract, the procurement contract for equipment purchases transfers from the owner to the contractor without any variation in the price or terms of the contract.

For Procurement Contracts where the owner turns over the equipment to be installed by the General Contractor without assigning the procurement contract to the General Contractor, the equipment would not be included in the bid schedule, but would be listed as owner supplied equipment in the contract. In addition, the Owner must maintain insurance and store the equipment in such a manner as to protect it until it is turned over to the General Contractor.