

OKLAHOMA FUNDING AGENCY COORDINATING TEAM

**CHECKLIST FOR
ENGINEERING REPORTS
FOR
WASTEWATER PROJECTS**

ENDORSED BY:

**OKLAHOMA WATER RESOURCES BOARD
OKLAHOMA CITY AREA INDIAN HEALTH SERVICE
USDA - RURAL DEVELOPMENT - OKLAHOMA
OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
OKLAHOMA DEPARTMENT OF COMMERCE**

Revised: February 18, 2016

Completed
Not Applicable

Engineering Report Checklist: Wastewater Projects

I. INTRODUCTION.

II. PROJECT PLANNING AREA.

A. Location, maps, photographs, and sketches.

- Provide a map showing legal and natural boundaries of entire service area.
- Include a map showing new service areas or annexed areas.

B. Growth areas and population trends.

- Describe the population projections within the project planning area and/or concentrated growth areas for the defined design period (must be based on recognized sources). See Appendix A in Guidelines.
- Include a summary of the current and projected water use data.

C. Current and projected wastewater flows.

- Provide current flows (hydraulic) and organic loads for all users (domestic and industrial).
- Include projected flows (hydraulic) and organic loads for all users (domestic and industrial).
- Present wastewater flow rates during average and peak flow periods. See Appendix B in Guidelines.

D. Environmental concerns in service area.

- Describe major environmental concerns in the service area.

E. Community engagement.

- Describe community engagement in the project planning process.

III. EXISTING FACILITIES AND NEED FOR PROJECT.

A. Location and layout.

- Provide site plan.
- Provide schematic layout of treatment facilities.

B. Condition of existing facilities.

- Sewer lines: discuss adequacy and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).
- Lift stations: discuss adequacy and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).
- Treatment facilities: discuss hydraulic and organic capacity and suitability for continued use, and compliance with DEQ requirements (Consent orders, etc.).

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C. Health and safety.

- Discuss concerns expressed by regulatory agencies, and relevant correspondence included.
- Include reference of applicable agency regulation(s).
- Handicap accessibility (for federally funded projects): provide a description of the accessibility of the office or other public spaces. Any deficiencies should be addressed in the proposed project.
- Security: provide determination of necessary security improvements as defined by the system's vulnerability assessment. Note: the information contained in the engineering report should only describe the construction necessary to enhance the water system's security. It should not provide any specific information regarding inadequacies.

D. System O&M.

- Provide description of concerns (indicate those with greatest impact).
- Describe inflow, infiltration, and leakage.
- Discuss adequacy of management.
- Discuss inefficient design(s) or outdated facilities.
- Discuss problem elimination.

E. Design hydraulic and organic capacity.

- Describe growth capacity necessary to meet needs during planning period.
- Determine facilities needed to meet future growth.
- Design for phased construction.
- Provide number of new customers committed to project.

F. Water system availability.

- Describe existing water or proposed supply to wastewater treatment systems.
- Describe effect of proposed project on existing water system.

G. Growth capacity.

- Describe growth capacity necessary to meet needs during planning period.
- Determine facilities needed to meet future growth.
- Design for phased construction.
- Provide number of new customers committed to project.

H. System mapping.

- Include location and mapping of existing and proposed facilities.

IV. ALTERNATIVES CONSIDERED.

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A. Describe facilities associated with each alternative:

- Treatment.
- Wet weather flow equalization.
- Lift stations.
- Collection lines.
- Discharge facilities and locations.
- Sludge handling facilities.

B. Design criteria.

- State the design parameters used for evaluation purposes.
- Provide data in a tabular form. See Appendix D in Guidelines.

C. Environmental impacts.

- Provide a short description of environmental impacts that may preclude any alternatives.

D. Land Requirements.

- Identify site(s), and specify if currently owned or to be purchased or to be leased.
- Identify easement(s) to be acquired.

E. Construction problems:

- Subsurface rock and unsuitable materials.
- High water table.
- Flood prone area(s) and related maps.
- Limited access.

F. Cost estimates.

- Include construction costs.
- Include non-construction and other related costs.
- Include annual operation and maintenance costs.
- Include cost effective present worth analysis. See Appendix C in Guidelines.

G. Advantages/disadvantages.

- Describe ability to meet owner's needs within its financial and operational resources.
- Evaluate compliance with DEQ requirements.
- Describe compatibility with existing comprehensive area-wide development plans.
- Satisfy public and environmental concerns.
- Decision matrix considering monetary and non-monetary factors.

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V. PROPOSED PROJECT DESIGN (Recommended Alternative).

A. Wastewater.

1. Treatment.

- Provide plan view of site layout.
- Provide schematic and identify plant location and site of any discharges.
- Describe the process in detail.
- Provide status of compliance with the 208 plan (applicable for discharging facilities).
- Provide description of how sludge is/will be managed and a copy of DEQ approval letter for sludge management plan.
- Provide a table showing the design capacity for each treatment unit. See Appendix D in Guidelines.
- Describe the foundation conditions and floodplain elevations at sites of proposed structures.
- Provide approximate elevation of groundwater in relation to subsurface structures.
- Provide geotechnical results for all treatment facilities including lagoons.
- Include hydraulic profile.
- Provide alternate power source.

2. Pumping stations.

- Identify size, type and site location and any special power requirements.
- Identify method for emergency operations.
- Describe the foundation conditions and floodplain elevations at sites of proposed structures.
- Provide approximate elevation of groundwater in relation to subsurface structures.
- Provide alternate power source.
- Address potential clogging issues.

3. Collection system layout and hydraulic calculations.

- List sewer line lengths.
- State collection line sizes.
- Describe slopes, manholes, and key components.
- Describe character of soil through which mains will be installed including NRCS soil maps and descriptions.

4. Hydraulic, design, and organic calculations.

- Provide sufficiently detailed calculations to comply with DEQ design requirements.

5. Waste disposal.

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- Discuss various sites considered and advantages of recommended site.
- Discuss proximity to residences, industry and other establishments.

6. Green project reserve components (for SRF Projects Only).

- Identify and discuss any components of the proposed project that may qualify as “green” based on the guideline in Appendix E.
- Complete and attach the GPR check sheet as an appendix to the Engineering Report.

7. Stormwater components.

- Identify any stormwater projects with potential to help achieve the water quality objectives of the Clean Water Act.

8. Recommended alternative cost estimate:

- Development costs.
- Construction costs.
- Land and rights.
- Legal fees.
- Engineering fees.
- Resident project representation or construction inspection fees.
- Environmental costs.
- Operation and maintenance manual as appropriate.
- Interest.
- Contingency.
- Refinancing.
- Other costs associated with the proposed project.

B. Water reuse.

1. Volume and quality of reclaimed water flow.

- Describe anticipated flow from WW treatment works to the water reuse treatment facility.
- Describe how proposed project impacts the design flow in the Oklahoma Water Quality Management Plan (208 Plan) and other applicable OPDES permit limits.

2. Treatment, category, and usage.

- Describe treatment processes.
- Describe disinfection system.
- Describe biosolids management.
- Describe category and usage of reclaimed water.

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Describe location of plant.

Describe discharge points.

3. Storage, retreatment, and chlorination.

Describe storage facility.

Describe retreatment.

Describe chlorination.

4. Pumping stations.

Identify size, type, and locations.

Identify any special power requirements.

Identify provisions for emergency operations.

5. Reclaimed water distribution system layout.

Identify general locations of line improvements (lengths, sizes, and key components).

Include the direction of flow of all existing and proposed reclaimed water distribution lines.

6. Hydraulic and design calculations.

Provide supporting calculations to demonstrate DEQ compliance.

7. Other requirements.

Include waste disposal.

Include green project reserve components.

Include recommended alternative cost estimate.

VI. FINANCIAL STATUS. *Required and reviewed only by USDA-RD funded projects.

Provide current and proposed or projected rate schedules.

Discuss annual O & M cost.

Provide tabulation of users by monthly usage categories.

Provide revenue received for the last three fiscal years or financial audits if available.

Discuss status of existing debt and required reserve accounts.

Provide an evaluation of short-lived assets. See Appendix F in Guidelines.

VII. CONCLUSIONS AND RECOMMENDATIONS.

Describe additional findings and recommendations.

Discuss special studies.

Include special coordination.

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- Provide implementation plan and schedule.

END OF CHECKLIST