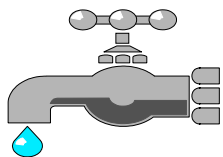


Factsheet: Preliminary Engineering Report (PER)



The Public Water Supply Section of the North Carolina Division of Environmental Health (PWSS) prepared this factsheet to explain what is expected to be submitted as part of a

Preliminary Engineering Report (PER). A copy of this report, including applicable elements of [15A NCAC 18C .0307\(b\)](#)*, must be provided with the application. Note the following general requirements:

1. Engineer Information
2. Applicant Information
3. Project Description
4. Design Basis
5. Consideration of Alternatives
6. Construction Estimate

What are the Six Elements of the PER?

The six elements of the PER are described below:

1. **Engineer Information:** The cover sheet of the PER must provide following information concerning the engineer:
 - a) The name of the proposed project.
 - b) The engineer's contact information, including:
 - i) The name and mailing address of the engineer,
 - ii) The email address of the design engineer, and
 - iii) The phone number of the design engineer.
 - c) The seal and signature of the design engineer in accordance with [21 NCAC 56.1103](#). The design engineer must be a Professional Engineer (PE) licensed to practice in North Carolina.
2. **Applicant Information:** The PER must provide the following information concerning the applicant:
 - a) "Name and [mailing] address of the applicant [and their Authorized Representative],"³
 - b) Email address of Authorized Representative, and
 - c) Phone number of Authorized Representative.
3. **Project Description:** The project description should describe both the project and its context within the affected water system and service area. To this end, this section should accomplish the following:
 - a) Describe the proposed project. This description should indicate if the proposed project represents a phase of a multi-phase project.
 - b) Describe the location of the proposed project.
 - c) Describe "any existing water system related to this project."¹
 - d) Identify "the municipality, community, area, or facility to be served by the proposed water system."² The service area should be located on a map and the description must include the following:

- i) Population and number of connections to be served by proposed project,
 - ii) "A description of the nature of the establishments and of the area to be served by the proposed water system,"⁴ and
 - iii) "A description of the future service areas of the public water system [and the potential for the area served by the proposed project to experience an increase or decrease in demand] for [the next] 5, 10, 15 and 20 years."⁵
- e) Provide the water demand for the proposed project and any additional phases that may be associated with the project.
 - f) Discuss the following when describing both the proposed project and the existing water system, as applicable:
 - i) Note the presence (or lack thereof) and type of fire protection in both the existing and the proposed water system.
 - ii) Describe the degree of cross-connection control hazard and notation of the level of backflow prevention required for the proposed project. (Use 15A NCAC 18C Appendix B, Figure 2 for hazard classification.)
 - iii) List all treatment processes (if applicable).
4. **Design Basis:** The PER should:
 - a) Document the public health need that the project will address, and
 - b) Show why the proposed alternative best addresses that need.The PER should also document why the proposed alternative is sufficient to address this need. That is, the PER must show that the proposed alternative will work. The PER should discuss the critical design parameters and show the calculations that use them to size and select components of the plan design. At a minimum, existing systems must provide parameters including "a statement of maximum daily treated water supply and maximum daily demand"¹³ in order to establish the design basis.
5. **Consideration of Alternatives:** The PER must address alternative projects as follows:
 - a) "Alternative plans for meeting the water supply requirements of the area"⁶ must be submitted for consideration. These plans should always include the "do-nothing" or "no-build" alternative as well as the preferred alternative. They must also include "any technical alternatives."^{7a} Some examples of typical technical alternatives follow:

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Ex. #1 – Need for additional drinking water supply.

- “For new systems, obtaining water service from an existing system.”⁶
- New groundwater supply source.
- New surface water supply source.

Ex. #2 – Need for additional finished water storage.

- Elevated storage tank.
- Ground storage tank with booster pump.
- Alternative location of ground storage tank at site of greater elevation.

Each alternative must be assessed for the following:

- i) The “total costs”^{7c} over the plan's lifetime,
- ii) Operational requirements,
- iii) Operator qualifications (if applicable),
- iv) Reliability, and
- v) Water quality considerations.

The PER should document that the preferred alternative best addresses the above considerations.

- b) “For existing systems, [submit] a prioritized list of infrastructure improvements.”¹⁴ For each

project on the list that ranks higher than the proposed project, give an explanation of what is being done to address it. (This action may include the pursuit of project financing.) If nothing is being done to address the item, then explain why this is. The PER should document that either this project addresses the system's greatest need(s) or that the greater needs are already being addressed to the extent possible.

6. Construction Estimate: The construction estimate must include “costs of [all] integral units.”^{7b}

References & Notes

* Especially items ¹⁻⁷ and ¹³⁻¹⁴.

¹15A NCAC 18C .0307(b)(1)

²15A NCAC 18C .0307(b)(2)

³15A NCAC 18C .0307(b)(3)

⁴15A NCAC 18C .0307(b)(4)

⁵15A NCAC 18C .0307(b)(5)

⁶15A NCAC 18C .0307(b)(6)

^{7a}15A NCAC 18C .0307(b)(7)(A)

^{7b}15A NCAC 18C .0307(b)(7)(B)

^{7c}15A NCAC 18C .0307(b)(7)(C)

¹³15A NCAC 18C .0307(b)(13)

¹⁴15A NCAC 18C .0307(b)(14)

Preliminary Engineering Reports (PERs) for planning loans - For water supply project planning loans, provide sufficient documentation to demonstrate why the proposed project is needed to eliminate a public health hazard and why priority rating points should be awarded under the applicable priority criteria. To the extent feasible, provide documentation similar to that required in the PER to demonstrate the scope of the desired construction project, and other information such as population and water rates for the applicant's service area for determining points.