



# Water Pollution Control Project Needs Assessment (PNA) Form

Water Quality Control Division

## Contents

1	Application Information .....	1
2	Executive Summary .....	3
3	System Structure and Operation .....	4
3.1	Legal Ownership of System .....	4
3.2	Organizational Chart .....	4
3.3	Current Operator in Responsible (ORC) Charge .....	4
3.4	Operator Certification .....	4
3.5	20-year cash flow projection .....	4
4	Project Purpose and Need .....	5
4.1	Compliance .....	5
4.2	Existing facility limitations .....	5
4.3	Operations and Maintenance .....	5
5	Existing Facilities Analysis .....	5
5.1	Existing Treatment- Section required for treatment and outfall projects .....	5
5.1.1	Area Discharge Permits .....	6
5.1.2	Service Area .....	6
5.1.3	Facilities Layout and Description .....	6
5.1.4	Existing Process Flow Diagram .....	6
5.1.5	Wastewater Flows .....	7
5.1.6	Appropriateness of Treatment Technologies .....	7
5.1.7	Capacity of Treatment Technologies .....	7
5.1.8	Operational Controls .....	8
5.2	Collection System .....	8
5.2.1	Service Area .....	8
5.2.2	Overall Collection System Description .....	8
6	Facility Planning Analysis .....	9
6.1	Planning Area Description .....	9

6.1.1 Project Area Map ..... 9

6.1.2 208 Plan Coordination ..... 9

6.1.3 Local and Regional Issues ..... 9

6.2 Population and Flow Projections ..... 10

7 Assessment of Alternatives ..... 11

7.1 Alternatives ..... 11

8 Selected Alternative ..... 13

8.1 Justification of Selected Alternative ..... 13

8.2 Technical Description and Design Parameters..... 14

8.3 Proposed Process Flow Diagram ..... 14

8.4 Appropriateness of Treatment Technologies ..... 14

8.5 Environmental Impacts ..... 14

8.6 Land Requirements ..... 15

8.7 Construction Challenges ..... 15

8.8 Operational Aspects ..... 15

8.9 Costs ..... 16

8.10 Green Project Reserve ..... 16

8.11 Environmental Checklist ..... 17

8.12 Project Implementation ..... 17

8.12.1 Proposed Schedule ..... 17

8.12.2 Public Meeting ..... 17

9 Attachments ..... 18



**COLORADO**  
Department of Public  
Health & Environment

# Water Pollution Control Project Needs Assessment (PNA) Form

Water Quality Control Division

## 1 Application Information

Entity Name:

Name of Project:

Type of Project (check all that apply)

- New domestic wastewater treatment plant
- Construction project resulting in increase or decrease in design capacity of existing wastewater treatment plant
- Modification of wastewater treatment plant that will not result in a change to treatment capacity
- New or relocated wastewater treatment plant outfall
- New or expansion of lift station
- New interceptor (24-inch diameter or larger pipeline)
- Collection system (gravity sewer mains less than 24-inches in diameter)
- In-Kind Replacement (Replacement of any process or hydraulic treatment conveyance component with an identical or similar component. Usually in cases where equipment has reached end of life and replacement is necessary to maintain compliance)
- Stormwater<sup>1</sup>
- Non-Point Source Discharge<sup>1</sup>

Owner Information:

Name:

Address:

Email:

Phone:

Consultant Engineer Information:

Name:

Address:

Email:

Phone:

Signatures:

This PNA was prepared by \_\_\_\_\_ on \_\_\_\_\_  
(Print Name) (Date)

Signature \_\_\_\_\_ License # \_\_\_\_\_

Engineer Seal:

Include the Engineer's Seal as Attachment 1.

1) For stormwater and non-point source discharge projects, complete only the applicable sections of this form

## Self-Certification

Does the system intend to self-certify all or a portion of the project?  (more information)

Yes    No

If yes, please identify the portions of the project that the system will self-certify.

Collection system piping

Provide explanation:

## Streamlined Review

Does the system intend to use the streamlined review process for all or a portion of the project? 

Yes    No

If yes, please identify the portions of the project that the system will utilize streamlined review process.

Wastewater treatment new construction or modifications that do not include an alternative technology

Provide explanation:

## 2 Executive Summary

Provide a narrative that summarizes the system needs, selected alternative, and the environmental and/or public health benefits of the proposed project.

### 3 System Structure and Operation

#### 3.1 Legal Ownership of System

Name:

Address:

Phone:

Fax:

#### 3.2 Organizational Chart

Include an Organizational Chart as Attachment 2.

#### 3.3 Current Operator in Responsible (ORC) Charge

Name(s):

Certification Number:

Certification Expiration Date:

Operator Certification Level (check one)

Staff Operator  Contract Operator

Treatment:  Class D  Class C  Class B  Class A

Collection:  Class 4  Class 3  Class 2  Class 1

Combined Treatment/Distribution:  Class S

#### 3.4 Operator Certification

Do the system operators have adequate operator certification levels for the proposed project as defined by *Regulation 100 Water and Wastewater Facility Operators Certification Requirements*?  Yes  No

Explain the impact of the proposed project on the required operator in responsible charge (ORC) certification level and other predicted staffing changes.

Include a copy of the written delegation of duties, including constraints and conditions requiring consultation with the ORC, as Attachment 3.

#### 3.5 20-year cash flow projection

Include a copy of the 20-year cash flow projection as Attachment 4. 

## 4 Project Purpose and Need

Discuss the issue or concern that the proposed project will address. Specific issues are outlined below. All issues must be discussed in each sub section below even if they are not the project driver.

### 4.1 Compliance

Summarize the system's current and future discharge permit compliance status that necessitates the proposed project.

### 4.2 Existing facility limitations

Summarize existing wastewater system facility(ies) limitations that necessitate the proposed project.

### 4.3 Operations and Maintenance

Summarize operational and maintenance (O&M) issues with the existing wastewater facilities that necessitate the project.

## 5 Existing Facilities Analysis

### 5.1 Existing Treatment- Section required for treatment and outfall projects

Not applicable (*for collection system piping, lift stations, interceptors, only*)

System Discharge Permit Number:

Existing Permitted Treatment Capacity:

Flow: MGD

Loading: Pounds per Day BOD<sub>5</sub>

5.1.1 *Area Discharge Permits*

Identify all other discharge permits for facilities discharging to the same stream segment as the existing treatment facilities.

5.1.2 *Service Area*

Describe the existing service area including residential, commercial and industrial users, as well as flows and loads from the service area.

5.1.3 *Facilities Layout and Description*

Describe existing facilities including design capabilities and conditions of existing treatment processes including treatment processes used and major design parameters (e.g. process capacities, unit loading rates, side stream flows, and solids handling).

5.1.4 *Existing Process Flow Diagram*

Provide a process flow diagram of the existing treatment system as Attachment 5.

5.1.5 *Wastewater Flows*

Please describe the existing wastewater flows and influent characteristics (including toxic pollutants), discharge permit limits, and overload conditions. Discuss and analyze the average, peak, dry, and wet weather flows. Describe flow contributions from residential, commercial, and industrial users, as well as infiltration and inflow.

5.1.6 *Appropriateness of Treatment Technologies*

Discuss if the existing treatment process(es) are appropriate to meet the current discharge permit considering existing influent quality and discharge permit limits.

5.1.7 *Capacity of Treatment Technologies*

Is the capacity of the existing wastewater treatment system appropriate to accommodate wastewater flows through the next 20 years?

Yes  No

Please explain:

5.1.8 *Operational Controls*

Describe if the existing treatment processes have appropriate operational controls.

5.2 Collection System

Required for collection system, lift stations, and interceptor projects only

Not applicable (for treatment and outfall projects, only)

5.2.1 *Service Area*

Describe the existing service area including residential, commercial and industrial users, as well as flows and loads from the service area.

5.2.2 *Overall Collection System Description*

Discuss the existing collection system including: gravity collection pipelines, facility age, material type, condition of materials, and amount of AC pipe. Describe the location and capacities of all relevant lift stations and interceptor sewers and their relation to the proposed project.

Provide a map of the existing collection system as Attachment 6.

Provide information on current infiltration and inflow.

## 6 Facility Planning Analysis

### 6.1 Planning Area Description

#### 6.1.1 *Project Area Map*

Provide a map or maps showing the current and projected service area for the 20-year planning period; identify environmental features such as streams, lakes, wetlands, and floodplains for the entire planning area. On the map, identify the locations of municipal and industrial treatment plants, sludge management areas and facilities, pretreatment plants, lift station sites and any significantly developed areas served by onsite or unconventional systems.

Include the map as Attachment 7. 

#### 6.1.2 *208 Plan Coordination*

Is the project within or near the boundaries of a 208 Agency or regional council of governments (COG)?  Yes  No

If yes, describe how the project is in conformance with the 208 Plan in relation to service area boundaries, population projections, and whether or not the project is identified in the 208 Plan.

#### 6.1.3 *Local and Regional Issues*

Were local and regional planning efforts considered?

Yes  No Please describe.

Was consolidation with another water system / treatment facility considered?

Yes  No If yes, describe the consolidation considerations. If no, please indicate why consolidation was not considered.

## 6.2 Population and Flow Projections

For a 20 year planning period, forecast the population growth, projected increase in Single Family Equivalents (SFEs), and projected wastewater flows.

Current SFEs - As Calculated in the Prequalification Form:

Population and Demand Projections - The department generally accepts two methodologies for projecting water flows over the 20 year planning period. Other methodologies are acceptable with a clear explanation and all assumptions and parameters listed:

Method 1: Population based projections. Recommended for primarily residential systems and/or for systems without potable water meter data.

Method 2: Equivalent Residential Unit (EQR) Analysis. Recommended for systems with a high multifamily, commercial, and industrial users.

Method 1 and 2 templates can be found here:

Attach the population projection as Attachment 8.

Discuss supporting data and reasons for projected future growth during the 20 year planning period.

Note: Projects designed solely to serve future development or population growth are not eligible for State Revolving Fund financing.

Identify waste load projections for major effluent parameters such as BOD, TSS, ammonia, phosphorus, metals, etc.

## 7 Assessment of Alternatives

This section should contain a description of the reasonable alternatives that were considered in planning a solution to meet the identified needs. If the proposed project includes new technology then the please discuss whether or not the technology is covered in the CDPHE Design Criteria.

### 7.1 Alternatives

For each alternative, please provide:

- A description of the alternative addressing the issues identified in Section 4: Project Purpose and Need.
- Capital cost estimates and annual operation and maintenance costs.
- Advantages and Disadvantages of each alternative.

#### Alternative 1 Title:

Alternative 1 Description (2000 character limit):

Alternative 1 Capital and Operation and Maintenance Costs (2000 character limit):

Alternative 1 Advantages and Disadvantages (2000 character limit):

**Alternative 2 Title:**

Alternative 2 Description (2000 character limit):

Alternative 2 Capital and Operation and Maintenance Costs (2000 character limit):

Alternative 2 Advantages and Disadvantages (2000 character limit):

**Alternative 3 Title:**

Alternative 3 Description (2000 character limit):

Alternative 3 Capital and Operation and Maintenance Costs (2000 character limit):

Alternative 3 Advantages and Disadvantages (2000 character limit):

Provide discussions of additional alternatives as Attachment 9.

## 8 Selected Alternative

### 8.1 Justification of Selected Alternative

Please demonstrate why the selected alternative best meets system needs based on both monetary and non-monetary considerations.

**8.2 Technical Description and Design Parameters**

For the selected alternative, please describe all proposed project components and assumed design parameters.

**8.3 Proposed Process Flow Diagram**

Include a proposed treatment facility process flow diagram or map of the collection system, lift station, or interceptor, as applicable as Attachment 10.

**8.4 Appropriateness of Treatment Technologies**

Discuss appropriateness of the proposed treatment process(es) to meet proposed discharge limits considering anticipated influent wastewater quality.

**8.5 Environmental Impacts**

Describe direct and indirect impacts on floodplains, wetlands, wildlife habitat, historical and archaeological properties, etc., including any projected permits and certifications. Indicate the need for a stormwater permit application, an 401/404 permit applications, and CDOT and railroad permit applications.

**8.6 Land Requirements**

Identify all necessary sites and easements, permits and certifications, and specify if the properties are currently owned, to be acquired, or leased by the applicant.

**8.7 Construction Challenges**

Discuss construction challenges such as subsurface rock, high water table, limited access, or other conditions that may affect cost of construction or operation of a facility.

**8.8 Operational Aspects**

Discuss the operator staffing requirements, operator certification level requirements, the expected basic operating configuration and process control complexities, and the operational controls and equipment that allows operational personnel to respond to routine and unanticipated treatment challenges, such as flow rate, fluctuations in influent quality, process monitoring and chemical feed dosing.

**8.9 Costs**

Summarize the capital costs associated with the selected alternative. The 20 year cash flow projection included in Attachment 4 must reflect the capital and operation and maintenance costs associated with the selected alternative.

Cost Categories:

*(enter a percentage of total project costs, attributable to each cost category below)*

Secondary Treatment (Category I)	_____%
Advanced Treatment (Category II)	_____%
Infiltration/Inflow (Category IIIA)	_____%
Sewer System Rehabilitation (Category IIIB)	_____%
New Collector Sewers (Category IVA)	_____%
New Interceptors (Category IVB)	_____%
CSO Correction (Category V)	_____%
Storm Sewers (Category VI)	_____%
Recycle Water Distribution (Category X)	_____%
Nonpoint Source Pollution Control Activities (Category VII)	_____%
TOTAL: (should total 100%)	_____%

Please include an estimate of the projected increase in and total average monthly user charges. Does the user charge system allow for billing, collection, and enforcement?

**8.10 Green Project Reserve**

Check one or more green category that applies to the project:

Green Infrastructure  Water Efficiency  Energy Efficiency  Environmentally Innovative

Describe any green components incorporated into the selected alternative.

The system must reference the most recent copy of the EPA Green Project Reserve guidance and procedures. These references are available on the CDPHE WQCD GLU website under "Green Project Reserve": <https://www.colorado.gov/pacific/cdphe/wq-environmental-reviews>

Include a business case for the project as Attachment 11, if applicable.

### 8.11 Environmental Checklist

Include the Environmental Checklist for the Selected Alternative as Attachment 12.

### 8.12 Project Implementation

#### 8.12.1 *Proposed Schedule*

(Please attach a project schedule as Attachment 13 if one is available)

Request for PELs  \_\_\_\_\_

Site Application Submittal Date  \_\_\_\_\_

Process Design Report/Basis of Design Report Submittal Date  \_\_\_\_\_

Final Plans and Specifications Submittal Date (for Non-Streamlined Review only)  \_\_\_\_\_

Discharge Permit  \_\_\_\_\_

Miscellaneous Permits  \_\_\_\_\_

Public Meeting Date \_\_\_\_\_

Loan Application Submittal Date \_\_\_\_\_

Advertisement for Bids Publication Date \_\_\_\_\_

Construction Contract Award Date \_\_\_\_\_

Construction Start Date \_\_\_\_\_

Construction Completion Date \_\_\_\_\_

#### 8.12.2 *Public Meeting*

Provide documentation of a public meeting held or describe when and where the meeting will be held. The meeting must be noticed for 30 days. Provide the public notice, sign in sheet, and agenda as Attachment 14 or provide to your project manager in the Grants and Loans Unit after the meeting has taken place.

Include the public meeting documentation as Attachment 14.

Or, will be provided to the Grants and Loans Unit project manager after the meeting takes place.

## 9 Attachments

### Include the following with the Project Needs Assessment submittal:

- Attachment 1 - Engineer's Seal
- Attachment 2 - Organizational Chart
- Attachment 3 - Written delegation of operator duties
- Attachment 4 - 20-year cash flow projection
- Attachment 5 - Existing process flow diagram
- Attachment 6 - Existing collection system map
- Attachment 7 - Project area map
- Attachment 8 - Population and flow projections
- Attachment 9 - Additional alternatives descriptions
- Attachment 10 - Proposed process flow diagram
- Attachment 11 - Green Project Business Case
- Attachment 12 - Environmental checklist
- Attachment 13 - Project Schedule
- Attachment 14 - Documentation of public meeting
- Attachment 15 - Cost and Effectiveness Evaluation Certification

**Projecting Water Flows Method 1: Population based projections**

Assumptions/Data			Information Source
Current System Population		People	
Current Service Area Population (If providing wastewater services to neighboring community)		People	
Population Growth Rates		% increase/year	
Average Daily per Capita Flow Rate		Gallons per capita day	
Average Day Maximum Month per Capita Flow Rate		Gallons per capita day	
Maximum Daily per Capita Flow Rate		Gallons per capita day	
Peak Hour Factor			
Average Influent BOD <sub>5</sub> Concentration		mg/L	
Average Day Maximum Month Influent BOD <sub>5</sub> Concentration		mg/L	

Year	System Population	Service Area Population (if different)	Average Daily Flow (MGD)	Maximum Daily Flow (MGD)	Peak Hour Flow (MGD)	Average BOD <sub>5</sub> Loading (pounds per day)
+0						
+5						
+10						
+15						
+20						

### Projecting Water Flow Method 2: Single Family Equivalent (SFE)

A	Number of Residential Potable Water Taps		Units
B	Total Annual Potable Water Use less Irrigation Usage (gallons per year) - Residential		
C	Estimated equivalent residential potable water usage Annual flow per EQR = A/B		Gallons per SFE
D	Wastewater flow from commercial users		Gallons per ft <sup>2</sup>
E	Equivalent EQRs per 1000 ft <sup>2</sup> of commercial space EQRs per 1000 ft <sup>2</sup> = D*1000/C		SFEs per 1000 ft <sup>2</sup>
F	Commercial space in service area		1000 ft <sup>2</sup>
G	Commercial EQRs Commercial EQRs = F*E		SFEs
H	Wastewater flow from industrial users		Gallons per ft <sup>2</sup>
I	Equivalent EQRs per 1000 ft <sup>2</sup> of industrial space EQRs per 1000 ft <sup>2</sup> = H*1000/C		SFEs per 1000 ft <sup>2</sup>
J	Industrial space in service area		1000 ft <sup>2</sup>
K	Industrial EQRs Industrial EQRs = H*J		SFEs
L	Length of sewer pipe in collection system		ft
M	Infiltration/Inflow contribution per 1000 feet of sewer pipe		gallons
N	Equivalent EQRs per 1000 feet of sewer pipe EQRs per 1000 LF = M/C		SFEs per 1000 LF
O	Infiltration/Inflow EQRs Infiltration/Inflow EQRs = L/1000*N		SFEs
L	Total EQR = A + G + K + N		SFEs

Population and Flow Assumptions / Data			Information Source
Current System Population		People	
Current Service Population (if providing water to neighboring community)		People	
Population Growth Rate		% increase / year	
Commercial Growth Rate		% increase / year	
Industrial Growth Rate		% increase / year	
Average daily flow per SFE		Gallons per capita day	
Maximum daily flow per SFE		Gallons per capita day	
Peak hour factor		Gallons per capita day	
Average Influent BOD <sub>5</sub> Concentration		mg/L	

Year	System Population	Service Population (if different)	Residential SFEs	Commercial SFEs	Industrial SFEs	I/I SFEs	Total SFEs	Average Daily Flow (MGD)	Maximum Daily Flow (MGD)	Peak Hour Flow (MGD)	Average BOD <sub>5</sub> Loading (pounds per day)
+0											
+5											
+10											
+15											
+20											