Town of Richmond
Wastewater Treatment Facility 20 Year Evaluation
Scope of Services

INTRODUCTION

The Richmond Wastewater Treatment Facility (WWTF) operates under NPDES Permit No. 3-1173 effective December 21, 2020. The Richmond Wastewater Treatment Facility is a 0.222 MGD activated sludge treatment facility that incorporates the use of an anoxic selector. In general, the treatment processes at the facility involve the use of screening, grit removal, anoxic selectors, aeration basins, secondary clarification, filtration, and disinfection. The solids train includes septage receiving, aerated sludge holding and dewatering.

This 20 Year Evaluation/Preliminary Engineering Study will assess the existing facility to identify needs, develop alternatives to address the needs, and select a recommended alternative.

SCOPE OF SERVICES

Professional engineering consultant services are to be performed by the ENGINEER as follows.

I. 20 Year Evaluation/Preliminary Engineering Study (Step I)

A. Review Existing Information

Existing information will be gathered and reviewed for use in the 20 Year Evaluation/preliminary engineering study of the Richmond WWTF. Existing information to be gathered and reviewed may include the following:

- Monthly operations reports (3 years of historical data)
- NPDES Discharge Permit No. 3-1173
- Operation and maintenance manuals
- As-Built drawings
- Current Basis for Final Design
- Current operating budget
- Planned future development and sewer connections

The goal of this task will be to facilitate identification and discussion of potential solutions to be evaluated using an alternatives analysis process. Existing studies, existing conditions plans, available drawings, and field measurements will be gathered and reviewed.

B. Establish Design Criteria

The current NPDES discharge permit for the Richmond WWTF is for 220,000 gallons per day. The Town will not seek to investigate increasing permitted flows as part of this study. Three years of monthly operation reports will be reviewed to determine current influent loading and flows for the treatment process and disposal.

The Town will provide information on future development and additional sewer connections planned for the collection system. This information will be used to develop 20 year design flow and loadings.

The influent and effluent design criteria identified will be used to develop alternatives.

C. Existing WWTF Condition Assessment

An evaluation of each of the individual unit processes included in the scope will be performed to determine the adequacies and deficiencies of each process component relative to the design standards "Recommended Standards for Wastewater Facilities" (2004 Edition) and "TR-16, Guides for the Design of Wastewater Treatment Works" (2016 Edition).

An inventory will be prepared for the existing equipment to document the type, model, age, condition (poor, fair, good) and operability.

Existing process components to be assessed include:

- Influent Pumping
- Screening
- Grit removal system
- Anoxic Selectors
- Biological Process including aeration tanks, diffusers, and blowers
- Secondary Clarification and RAS/WAS Pumping
- Cloth Media Filtration
- Ultraviolet Disinfection
- Effluent Flow Metering
- Aerated Sludge Storage including tanks and blowers
- Septage receiving
- Sludge dewatering
- Electrical including standby power
- Site including fencing, sidewalks, driveways, and lighting
- Buildings

D. Alternatives Development and Analysis

Using the established design criteria, a comprehensive development of alternatives and evaluation will be performed for each project element. Information will be forwarded to equipment suppliers and other vendors requesting proposals to include equipment and/or installation costs. The following information will be developed to perform a technical and economic comparison of these alternatives:

- Narrative description
- Preliminary design criteria
- Advantages and disadvantages
- Environmental impacts
- Land requirements
- Construction problems
- Preliminary opinions of cost to include life-cycle costs, project O&M costs, present worth, and cost effectiveness.

The economic comparison will include a present worth analysis of the alternatives. This evaluation of alternatives may include a "no action" alternative.

E. Proposed Project

From the selected alternatives identified, a proposed project will be defined, and a narrative description of the improvements will be developed. Preliminary design criteria and layouts for the recommended upgrades from previous sections will be referenced.

An updated site plan and process schematic indicating the new treatment components and reuse of any existing structures will be prepared.

An initial hydraulic profile will be developed for the liquid stream.

Project phasing will be defined in the form of a Sequence of Work so that the existing facilities can remain operational. Constructability issues and problems will be identified.

Based on the preliminary design, estimated construction costs for each of the treatment component upgrades will be compiled and projected for a future construction start date.

The total project cost will be developed and will include construction, construction contingency, engineering, and other related project costs.

Available funding sources will be identified for the project. Options include the State of Vermont Clean Water State Revolving Fund (CWSRF) loan program. The Town will qualify for the 50% loan subsidy for the engineering. The balance of the project funding would be provided as a loan at an interest rate of 2% and 20-year term.

Contacts will be made with local and State agencies to identify the list of permits/approvals required.

F. Report

A report summarizing the results of the 20 Year Evaluation will be prepared to incorporate the following information. This report will follow the State Water Investment Division WID format for preliminary engineering studies and include:

- Project Planning
- Existing Facilities
- Project Need
- Alternatives Evaluated
- Selection of Alternatives
- Proposed Project
- Conclusions and Recommendations

Electronic copies of the 90% report will be submitted to the Town for review. Once the review comments are received and addressed, two (2) copies and an electronic 'PDF' version of the final report will be provided for distribution.

G. Review Meetings

Hoyle Tanner will prepare for and conduct 30%, 60%, and 90% review meetings with representatives of the Town and Vermont DEC Water Investment Division during the preparation of the preliminary engineering study. The purpose of these meetings is to maintain involvement of all parties in the preparation of the study by reviewing the information as it is developed.

III. Additional Services

In addition to the foregoing being performed, the following services shall be provided only when mutually agreed upon in writing by and between the OWNER and the ENGINEER's compensation and time duration of the Agreement. Additional Services will commence when incorporated into this scope of services by written Amendment signed by both parties. Examples of Additional Services available are:

A. 20 Year Evaluation of the Collection and Conveyance System (will be added as an amendment)
B. Development of additional treatment process alternatives
C. Environmental Report
D. Soil Borings or Geotechnical Study
E. Hydrogeological Study
F. Basis for Final Design
G. Archeological Resource Assessment
H. Survey
I. Final design (Step II) services
J. Bond vote or other funding assistance
K. Grant application assistance
L. Other additional services not identified herein, but which may become necessary at a later date.

IV. Owner Responsibilities

Your responsibilities under this agreement shall include:

1. Provide all available information as to the project requirements.
2. Provide access to the site(s).
3. Designate a contact person who can act with the Owner's authority regarding this project.
4. Complete careful, timely Deliverables reviews and provide comments during Deliverable meetings.
5. Attend critical meetings with the State and funding agencies if needed.