Engineering Report Outline

Landfill Leachate Treatment

NEW YORK STATE | Department of Environmental Conservation

This document outlines the elements of comprehensive engineering evaluations to support informed decisions for municipal landfill leachate projects in New York State. Such documents are referred to in this document as an Engineering Report. Engineering reports that satisfy this outline are an eligibility requirement for the Landfill Leachate category in the Water Quality Improvement Project (WQIP) Program. Only municipally-owned permitted active municipal solid waste landfills or municipally-owned active construction and demolition and debris landfills with leachate collection systems are eligible for this program.

Required Elements

1. Cover

The cover of the engineering report should contain at a minimum:

a. A descriptive project title,
b. Name of the Owner/Municipality,
c. Applicable Part 360 landfill permit number,
d. Name of the engineering firm preparing the report,
e. Date of the report, including any revision dates,
f. Professional Engineer stamp and signature from a qualified P.E. licensed to practice in New York State

2. Executive Summary

Brief description of the purpose of the report, need for the project, evaluations conducted, recommended alternative, schedule, cost, and next steps.

3. Definition of the Problem

Succinctly define the environmental issue to be addressed by the project. The recommended alternative will resolve the defined issue. Consider the applicability of the items listed below and include relevant items in the problem definition.

a. Public health or environmental impact
b. Aging or inadequate infrastructure
c. Groundwater/surface water contamination. Sampling and analytical methods must be consistent with those accepted by DEC or DOH and results must be from a laboratory accredited by Environmental Laboratory Approval Program (ELAP) to perform the method. See DEC's Water Quality Assurance website for information on how this data may be helpful to DEC.
d. Reasonable growth and its impact on design flow rates (average, peak day, peak hour, peak instantaneous)
e. County-wide or regional planning efforts
f. Water, energy and/or waste considerations (include audits, if available)
g. Suitability for continued use
h. Physical risk due to climate change (sea level rise, storm surge, potential for flooding impacts, or other extreme weather events)
i. Compliance with current standards (federal, state, and local laws)

4. Project Background and History

4.1 Site Information

Describe the area(s) under consideration and include the following:

a. Location
b. Geologic conditions (soil type, depth to bedrock and groundwater, slope if significant)
c. Environmental resources (potentially impacted waterbodies, aquifers[1], endangered species, wetlands, archeologically sensitive areas, agricultural districts, etc.) including any preliminary coordination with involved agencies
d. Floodplain considerations[2] including identification of Base Flood Elevation for the site
e. Project impacts to Potential Environmental Justice Area(s) (PEJA) and/or Disadvantaged Communities (DAC). The DECinfo Locator is a resource to identify these areas.

4.2 Ownership and Service Area

Describe the ownership of the facilities and area(s) being served or to be served.

a. Municipality(ies) that own and maintain the existing or proposed infrastructure (county, city, town, village, etc.)
b. Areas served or to be served (county, city, town, village, hamlet, census designated place (CDP), etc.)
    i. Areas served that are reasonably contiguous with or wholly within a CDP should include a map overlaying the project area and CDP boundary.
    ii. County and Town sewer districts must include maps.
c. Outside users requiring inter-municipal/private/industrial agreements
d. Industrial discharges or hauled waste (e.g., source, volume, composition)

4.3 Existing Facilities and Present Condition

a. Provide overview of major system components and include the following:
    i. General description and history of major system components with process flow diagram
    ii. Current or future projects on the same site
    iii. Documented compliance issues
    iv. Analyses of production rates for processing and/or manufacturing operations (applicable to industry)
    v. Existing energy consumption (include energy audit results if available)
    vi. Photographs
    vii. History of damage due to storm or flood impacts (include elevation of floodwaters)
b. Describe each unit process being evaluated and its present condition. Include the following:
    i. Existing capacity, age, conveyance, treatment, storage, and/or disposal capabilities
    ii. Past projects, significant operations and maintenance history, and preventative maintenance history
    iii. Failure history and component limitations
    iv. Ability to meet current design standards for treatment

[1] For projects located within a federal sole source aquifer area, specify the aquifer and detail the potential effects of the project and construction of the project on the aquifer.
[2] Floodplain considerations would also include consideration of CRRA guidance referenced throughout this document. The full guidance document can be found here.

v. Planned, current, or future improvements outside of the project scope
vi. Existing security and/or cybersecurity measures
vii. Inventory of existing assets, if available

5. Alternatives Analysis

The report must include an analysis of the alternatives listed below. . Any alternatives considered technically infeasible should be identified as such and the rationale briefly discussed.

a. Leachate treatment technology at generating landfill
b. Leachate treatment technology at another landfill
c. Leachate treatment technology at an alternate non-landfill permitted location

6.0 Selected Alternative(s)

6.1 Description

Describe how each alternative will resolve the defined problem. Present the following information for each selected alternative, as appropriate:

a. Proposed preliminary design, design standards, sizing, and supporting calculations.
b. Impact on existing facility (design average, and loads)
c. Need for redundancy
d. Land requirements
e. Environmental impacts and mitigation measures
    i. Potential State Environmental Quality Review (SEQR) concerns such as water quality and supply, noise levels, air quality, population growth, wetlands, floodplains, and other sensitive areas
    ii. Potential Impacts (negative or positive) on a PEJA or DAC
f. Seasonal limits, challenges, and requirements
g. Constructability and schedule (account for seasonal limitations). The schedule should include the following where applicable:
    i. District formation or extension or 202b proceedings,
    ii. Environmental review,
    iii. Bond resolution,
    iv. Office of State Comptroller (OSC) approval,
    v. Grant and financing applications, awards and execution,
    vi. Permit applications (wetland, Army Corp of Engineers, etc.),
    vii. Technical review and approval of engineering report and plans and specifications, and
    viii. Bidding and construction duration.

6.2 Cost Estimate

Present the following information for each selected alternative, as appropriate:

h. Total project cost, rounded to nearest $1,000, with construction costs, non-construction costs, and contingency separately stated
    i. The cost estimate must comprehensively cover all elements and phases of the recommended project.

ii. Include a detailed breakdown of construction and equipment costs and provide quantities where applicable (e.g., linear feet, diameter, square feet).
iii. Non-construction may include land/easement acquisition, legal, engineering, construction management, financial advisor, grant/loan administrator, etc.
iv. DEC suggests Total Project Contingencies of 35% for projects without completed design; 25% if design is complete; and 15% after bids are received, inclusive of inflation.

i. Annual operation and maintenance (O&M) cost considering personnel, administration, water purchase or waste treatment costs, insurance, energy cost (fuel or electric), process chemicals, monitoring and testing, short-lived asset maintenance and replacement professional services, and residuals disposal. Include any income from energy generation or other outside revenue.
j. Indicate the change in annual O&M from current budget.

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6.3 Summary of Selected Alternative(s)

Provide a summary table of the selected alternatives identifying any major differences, pros and cons, non-monetary factors, and costs.

a. Provide a summary life-cycle cost analysis for all technically feasible alternatives. A comprehensive life-cycle cost analysis may be warranted for projects involving new infrastructure technologies. This analysis should convert capital, O&M, short-lived assets, and salvage costs to present worth values. State the time period and the interest rate used in the evaluation.

6.

6.4 **Next steps**

Must include but not limited to

a. Include descriptions of planned community engagement.
b. Discuss expected SEQR Review.
c. Engage the NYSDEC RPA early in the review of the project to be sure a coordinated review is performed, if needed, and review/issuance of any other necessary permits and/or approvals.
d. Discuss anticipated procurement methods and plan of contracts (e.g., design/bid/build, energy performance contract, Project Labor Agreement, Wicks, design/build, etc.)
e. Attach signed Engineering Report Certification, if seeking funds through DEC (Appendix C).

7. Maps & Figures

Provide maps, drawings, and/or figures as necessary to fully detail the site, the project, and its impacts. For each figure, overlay with applicable information such as municipal boundaries and floodplain and/or resiliency guideline elevations. Include necessary map elements including, but not limited to, a north arrow, legend, and scale.

a. Overall service area
    i. Municipal boundaries, including CDP boundaries if applicable
    ii. Service area boundaries
    iii. PEJA and DAC areas
    iv. Treatment plant(s)
b. Existing project site
    i. Site layout/overall schematic drawing

ii. Hydraulic profile
iii. Process flow diagram
iv. Federal Emergency Management Agency (FEMA) Flood Map with project location identified

c. Proposed improvements for each selected alternative
i. Sewer lines (Identify type of improvement: new, repair, replace, line, etc.)
ii. Treatment plant site(s)
iii. Storage tanks
iv. Treatment equipment
v. Hydraulic profile
vi. Process flow diagram

CONTACT INFORMATION

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https://dec.ny.gov/get-involved/grant-applications/wqip-program