

Site Assessment Protocol for Non-Traditional Recreational Water Projects
Pre-Qualification Process for Permit Modification

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Contents

Introduction	4
PHASE 1: Site Selection and Feasibility	8
1A Site Selection and Project Scope Submission [Entity]	8
1B Feasibility Determination [NYC Health Department]	10
PHASE 2: Source Water Characterization	11
2A Waterbody Feasibility Assessment [Entity]	11
2B Waterbody Assessment and Preliminary Wet Weather Analysis [NYC DEP and NYC Health Department]	11
2C Preliminary Waterbody Feasibility Assessment Regulatory Determination [NYC Health Department]	12
PHASE 3: Containment and Water Flow Proof of Concept	12
3A Containment and Apparatus Engineering Design and Turnover [Entity]	12
3B Containment and Apparatus Engineering Design and Turnover Determination [NYC Health Department]	13
PHASE 4: Source Water Treatment and Operations and Maintenance	13
4A Treatment Train Design Submission [Entity]	13
4B Preliminary Treatment Train Design Regulatory Determination [NYC Health Department and NYC DEP]	14
4C Water Treatment Demonstration [Entity]	14
4D Water Treatment Regulatory Determination [NYC Health Department]	14
PHASE 5: Recirculated Water Treatment and Monitoring	15
5A Disinfection and Residual Monitoring Methods [Entity]	15
5B Disinfection and Residual Monitoring Regulatory Determination [NYC Health Department]	15
PHASE 6: Prototype Assessment	15
6A Prototype Build and Mobilization for Data Collection [Entity]	15
6B Prototype Build and Mobilization Regulatory Determination [NYC Health Department]	16
PHASE 7: In-Water Demonstration	16
7A Water Assessment and Data Collection [Entity]	16
7B Interim Data Quality and Integrity Review [NYC Health Department]	17
7C Data Review & Regulatory Determination [NYC Health Department]	17
Permit Application Submission	18
Beach Permit Application Requirements	18
Application Requirements	18
Permit Review	19
Beach Surveillance and Monitoring	19
Pool Permit Application Requirements	19
Application Requirements	19
Permit Review	20
Pool Operations and Monitoring	20
Appendix A: Technical Prerequisites for Not Contained Projects	21
PHASE 3A	21

PHASE 6A.....	22
PHASE 7A.....	22
Appendix B: Technical Prerequisites for Contained Projects	23
PHASE 3A.....	23
PHASE 4A.....	25
PHASE 4C.....	26
PHASE 5A.....	26
PHASE 6A.....	27
PHASE 7A.....	28

INTRODUCTION

The New York City Department of Health and Mental Hygiene (NYC Health Department) oversees recreational swimming facilities, including permitting and inspecting beaches and pools for compliance with the protections required under the New York City Health Code. This Site Assessment Protocol (Protocol) sets out the NYC Health Department’s evaluation process for a beach, pool, or hybrid recreational water project that does not immediately satisfy certain Health Code health and safety requirements. The Protocol for this “non-traditional recreational water project” aligns with the [framework](#) provided by the New York State Department of Health for these novel facilities, and sets out the detailed information the NYC Health Department will need to determine whether to issue a permit authorizing the facility and how to oversee it once it opens to the public.

An entity seeking to design and build a novel facility will need to satisfy and comply with health, safety, environmental protection, siting, construction, and other regulatory mandates beyond the NYC Health Department, including federal, state, and city requirements. The entity also must identify the various permits and sequence for approvals. Agencies may include—depending on the facility—the U.S. Army Corp of Engineers; New York State Departments of Environmental Conservation, Health, and Parks; and NYC Departments of Environmental Protection, Buildings, Design and Construction, City Planning, Parks and Recreation, Small Business Services, and the Economic Development Corporation. This is not meant to be a complete list but aims to highlight that the entity, in conjunction with this Protocol, will need to work with other relevant governmental agencies that may have a role in approving the novel project.

The Protocol uses a phased approach to its assessment process, with more site-specific and complex analysis as the phases progress. There are checkpoints throughout the process to assess a broad range of public health considerations under various weather, environmental, and water conditions. The phases may include the following seven components: (1) Site Selection and Feasibility; (2) Source Water Characterization; (3) Containment and Water Flow Proof of Concept; (4) Source Water Treatment and Operations and Maintenance; (5) Recirculated Water Treatment and Monitoring; (6) Prototype Assessment; and ultimately an (7) In-Water Demonstration..

Regulatory Framework for Protecting the Health and Safety of Swimmers

Recreational swimming facilities have long been defined as either a “beach” or a “pool.” A “beach” is typically a waterfront area where swimming is allowed in an open waterbody where land, often characterized by sand or small pebbles conducive to recreation and lounging, meets water. The water meets baseline federal, state, and local water quality mandates and water quality is maintained by the constant movement of the water. Regular testing monitors water quality and when standards are not met, the beach is put under an advisory or closed to swimmers until water quality is restored. The “beach” includes the swimming area, land area, buildings, equipment, toilets, showers, and dressing facilities. A constructed swim facility—a “pool”—is a watertight enclosure or structure filled with a source of potable water and an engineered system for recirculation and water treatment. The pool operator regularly monitors and maintains water quality. Pool facilities include the pool and deck area, buildings, equipment, toilets, showers, and dressing facilities.

Beaches and pools open to the public in NYC are required to comply with the NYC Health Code, which sets out health and safety protections for swimmers at beaches in Health Code [Article 167](#) and at pools in [Article 165](#). The beach or pool operator must obtain an operating permit from the NYC Health Department after meeting Health Code permit requirements. The Health Department inspects to monitor ongoing compliance to promote swimmer health and safety. Satisfying these standards is critical to protecting the health and safety of New Yorkers. Among other concerns, swimming in water that is contaminated creates a significant risk of illness and death including from dysentery, cholera, hepatitis A, intestinal parasites, *Giardia*, *Cryptosporidium*, norovirus, *E. coli*, and more. Children, pregnant people, and immunocompromised people are especially susceptible. The U.S. Environmental Protection Agency (EPA) conservatively estimates that 3,400 to 5,500 people become sick each year from swimming in sewage-contaminated water.

Non-traditional recreational water projects that do not meet the Health Code protections for a beach or pool—and consequently are ineligible for a permit—require a modification (also called a “waiver”) of Health Code provisions. The Health Code allows the NYC Health Department to modify Health Code requirements if there are “practical difficulties, or unusual or unreasonable hardships,” and the permit applicant demonstrates that it has an alternative way to protect health and safety such that the purpose of the Health Code requirement is satisfied.

Assessment to Enable a Modification of Health Code Health and Safety Requirements

This Protocol establishes the process for any applicant for a beach or pool permit that does not meet certain Health Code requirements to show an alternative way to protect health and safety, and the Health Department can, accordingly, modify the requirements. The requirements that protect swimmer health and safety are based on decades of health and illness data from recreational waters that are already designated as acceptable for swimming. As such, these requirements may need to be amended or clarified based on details of the novel project and its location. This Protocol establishes methods for measuring and addressing the emerging risks to health and life that are introduced by the novel approach, and set forth the health and safety requirements to be met. By implementing this step-by-step, careful assessment, the NYC Health Department can allow for innovation and protect the health and safety of New York City swimmers.

The Protocol requires complete, accurate, and timely submissions to the NYC Health Department for each phase of the process. The NYC Health Department is not responsible for costs associated with the requirements on the entity to meet submission requirements. The process is dependent on the regulations that require waiver and are defined by the NYC Health Department after the first phase. Protocol requirements may be adjusted depending on the project details, including the proposed location, and as the phases progress.

Following a successful conclusion of the assessment, the entity can proceed seamlessly to complete the NYC Health Department’s traditional permitting process for opening and operating the facility, with the Health Department granting a modification of Health Code requirements that would likely include specific conditions for operating with an alternative approach to protecting health and safety.

Table 1: Overview of Site Assessment Protocol for Non-Traditional Recreational Water Projects

Structure Type ¹	Apparatus ¹	Non-Traditional Recreational Water Source ²	Phase 1: Site Selection and Feasibility	Project-Specific Phases (Determined by NYC Health Department)						Conditional Approval NYC Health Department	Permit Application Submission	Permit Issuance NYC Health Department
				Phase 2: Source Water Characterization	Phase 3: Containment and Water Flow Proof of Concept	Phase 4: Source Water Treatment and Operations and Maintenance	Phase 5: Recirculated Water Treatment and Monitoring	Phase 6: Prototype Assessment	Phase 7: In-Water Demonstration			
Contained	N/A	SCR-CSO, PCR-CSO, SCR, or PCR	✓	✓	✓	✓	✓	✓	✓	✓	Bathing Establishment Permit Application (Article 165)	✓
Not Contained	No Apparatus	SCR-CSO, PCR-CSO, or SCR	✓	✓	✓				✓	✓	Bathing Beach Permit Application (Article 167)	✓
	Apparatus		✓	✓	✓			✓	✓	✓		✓
	No Apparatus	PCR	Not Required: Proceed to Standard Bathing Beach Permit Application									✓
	Apparatus		✓	✓	✓			✓	✓	✓		✓

¹Structure Type and Apparatus Definitions

As outlined in the Introduction and Table 1, the Site Assessment Protocol is a phased approach dependent on whether the Permit to operate is for a bathing establishment (a “pool” or waterbody with physical alteration), a bathing beach (waterbody in natural state without physical alteration), or combination of both. The definitions below will guide the entity to assess applicability for their proposed location and project. NYC Health Department will establish the pathway to be used based on the entity’s Phase 1 submission. Submission requirements for each subsequent phase are defined with technical prerequisites in Appendix A or B, dependent on the pathway selected.

Contained: Any enclosure or structure that holds recreational water for wading, bathing or swimming. Enclosures or structures are typically impervious and restrict the flow of water in and out. Water is typically recirculated, treated and floating debris (floatables) skimmed off the surface to keep the water clean. A non-traditional containment design may allow water to flow in and out of porous walls or the floor of the enclosure or structure based on hydrostatic pressure or mechanical pumping. Contained enclosures or structures will be reviewed on a case-by-case basis, as detailed in this pre-qualification process. The shape of the structure must be designed to prevent bather entrapment and collapse from hydrostatic pressure and must not endanger bather safety or impair water circulation. Water flow and treatment will be evaluated independently.

Not Contained: Recreational area in an open waterbody with natural flow where the water that flows in the swim area at a particular point in a particular period has no diversion or impediment by the constructed environment.

Apparatus: Any temporary or permanent obstruction or material that encloses the swim area (such as but not limited to geotextile, membrane, fabric, mesh, or net) in the open waterbody causing the flow of water to be diverted by the constructed environment.

²Non-Traditional Recreational Water Sources:

Primary contact recreation and secondary contact recreation are defined by the New York State Department of Environmental Conservation (NYS DEC, see [6 NYCRR Parts 700, 703, 890 and 891](#)).

Combined sewer overflow (CSO) is a mix of excess stormwater combined with untreated or partially treated domestic sewage and industrial wastewater from a combined sewer outfall directly into the city's waterways to prevent sewage from backing up in the system and upstream flooding.

SCR-CSO: Waterbody is classified for secondary contact recreation and within 750 feet of a combined sewer overflow

PCR-CSO: Waterbody is classified for primary contact recreation and within 750 feet of a combined sewer overflow

SCR: Waterbody is classified for primary contact recreation and not within 750 feet of a combined sewer overflow

PCR: Waterbody is classified for primary contact recreation and not within 750 feet of a combined sewer overflow

PHASE 1: SITE SELECTION AND FEASIBILITY

1A Site Selection and Project Scope Submission [Entity]

Description

Phase 1A is the formal starting point to initiate the pre-qualification process seeking approval of non-traditional recreational water projects. The objectives are to:

- Establish an overview and project scope for the recreational water project after consideration of baseline criteria for site selection.
- Identify proposed site location for initial feasibility analysis.
- Coordinate with agencies that have ownership, regulatory jurisdiction, or permit authority to identify the interagency approvals for design, build, operation, and maintenance of the project and to identify sequence of any permits and approvals.
- Assess the interface and dynamic nature of urban space and waterfront development at the proposed location.

Submission Requirements

- The *Phase 1A Site Selection and Project Scope Submission* is a consolidated deliverable to the NYC Health Department that will include written descriptions, maps, and conceptual drawings that are site-specific for the proposed recreational water project. The submission must provide details on each element of the site selection criteria outlined in Table 2 for site and project development, interagency coordination and permitting analysis, environmental, project concept, and utility and transportation infrastructure.
- The *Permitting and Critical Path Analysis Status Report* is a deliverable to the NYC Health Department that will include a defined timeline (e.g., Gantt chart format) of the interagency coordination and permitting analysis process that identifies and shows the sequence of permits and approvals such as for health, safety, environmental protection, siting, construction, or other requirements for the proposed project including NYC Health Department's Site Assessment Protocol and Permit Application. If the project is exempt from an agency permit, a written analysis of that determination and relevant supporting correspondence with the respective agency will be included in the submission. The timeline shall include:
 - Permit approval milestones
 - Site preparation activities
 - Prototype construction timeline and procurement
 - Prototype mobilization to selected site
 - Water treatment equipment mobilization to selected site
 - Sampling and analysis start date, end date, and schedule
 - Pilot completion milestone
- Every site is different, and variables may change from location to location. Submissions are site-specific and may not be transferable to projects performed elsewhere.

Table 2: Baseline Criteria for Site Selection

Criteria	Meaning and Considerations
Permitting Analysis and Interagency Coordination	
Regulatory Requirements	Regulatory and permit requirements for health, safety, environmental protection, siting, construction, or other requirements for the proposed location and project from federal, state and city agencies. Agencies may include for example, the U.S. Army Corp of Engineers; New York State Departments of Environmental Conservation, Health, and Parks; and NYC Departments of Environmental Protection, Buildings, Design and Construction, City Planning, Parks and Recreation, Small Business Services, and the Economic Development Corporation. It shall also include federal, state or city policies for development and use of the waterfront, as applicable, for example, Coast Guard navigation rules or the NYC Waterfront Revitalization Program (WRP).
Environmental Review	Identify involved parties related to coordinated environmental review processes for the project such as State Environmental Quality Review (SEQR), City Environmental Quality Review (CEQR), Environmental Impact Statement (EIS), or Environmental Impact Assessment (EIA), as applicable, or indicate project is exempt from such review. If the project needs environmental review, the applicant must confirm that the project satisfies those requirements and the timeline to achieve the regulatory approvals.
Permit Modifications	Identification of specific modifications (also called “waivers”) to NYC Health Department permit requirements that are being proposed for project completion
Site and Project Development	
Ownership	Public or private land ownership; if public, agencies with jurisdiction
Property Access	Property easements and general site access for patrons
Current Site Use	Existing land, shoreline, and water features at the proposed location and surrounding area
Zoning and Building	Zoning and building classifications
Urban Development	Forecast and project development projects at the proposed location and surrounding areas such as such as coastal resiliency projects, waterfront development, and transportation projects
Environmental	
Prior Environmental Impacts	Prior industrial use, potential hazardous materials, or any other past environmental/remediation and due diligence assessments at the proposed location and surrounding areas (e.g., brownfields, landfills)
Prior Water Quality Assessments	Prior water quality studies or assessments at the proposed location
Other Sources of Contamination	Potential sources of contamination such as stormwater outfalls, other point and non-point sources of potential contamination, and surface and roadway runoff including petroleum
NYS DEC Use Classification	NYS DEC waterbody classification for recreational waters
Combined Sewer Overflow (CSOs)	Distance of swim area from any wastewater discharges including wastewater treatment plants, combined sewer outfalls, or other pollution sources
Marine Traffic	Distance of swim area from marinas and docking areas, federally maintained navigation channels, large commercial ships, ferry lines, vessels with marine sanitation devices, canoeing, other boating activity, and fishing
Hydrology	Current velocity and basic water conditions including tidal variation, waves, or other marine turbulence
Geology	Riverbed and bathymetry allows for project construction and long term stability, mooring/anchoring
Noise	Noise level assessment specially that may impact lifeguarding duties
Project Concept	

Site Plan	Site layout, project boundaries, existing infrastructure, and planned capital improvements including ancillary facilities and any supporting facilities for water treatment, storage and recirculation on land and in the water.
Utilization	Anticipated number of patrons visiting both in the water and on the land area
Containment	Contained swim area or not contained (See Table 1 Definitions)
Apparatus	In-water construction or material in a not contained recreational area (See Table 1 Definitions)
Source Water	Source of recreational water
Water Treatment	Water treatment and continuous disinfection, if applicable

Utilities Infrastructure	
Access to Electric or Gas	Existing access or plans for new access to electric and other power sources or utilities
Access to Sewer	Existing access or plans for new access to City sewer distribution system; describe anticipated waste streams
Access to Water	Existing access or plans for new access to City water distribution system

Transportation Infrastructure	
Public Access	Patron access points including roadways, subways, railroad lines and parking
Transportation Impact	Impact on pedestrian and vehicular traffic (i.e. increased utilization of existing bathrooms, concessions, parking, rideshare drop and pickup zones, subway and bus access, etc.)
Emergency Egress	Access roads for emergency response

1B Feasibility Determination [NYC Health Department]

Description

Phase 1B is a review of the *Phase 1A Site Selection and Project Scope Submission* and the *Permitting and Critical Path Analysis Status Report* by the NYC Health Department in consultation with relevant federal, state or city. The objectives are to:

- Assess threshold feasibility of the site location and project scope to approve progressing with the pre-qualification process.
- Confirm for the entity the subsequent project-specific phases that must be completed for the pre-qualification process.
- Request additional information from the entity, as needed, to enable a determination.

Outcome

- Deny or accept the proposed site location and project scope to continue the pre-qualification process. If accepted, the NYC Health Department will identify the project-specific phases as next steps and the entity will be granted a notice to proceed.
- The project-specific phases are identified based on the specific waiver(s) proposed by the entity in Phase 1A. Any other waiver(s) required after the notice to proceed will require a re-submission of Phase 1A.
- A notice to proceed with the pre-qualification process does not represent an implicit approval by the NYC Health Department. Formal approval of waiver(s) is granted upon review of the NYC Permit application.

PHASE 2: SOURCE WATER CHARACTERIZATION

2A Waterbody Feasibility Assessment [Entity]

Description

Phase 2A is a review of existing water quality data and hydrodynamic modeling of the proposed waterbody to broadly screen the pattern and frequency for when the waterbody will meet recreational water quality criteria¹. The objectives are to:

- Screen the proposed waterbody for feasibility and predictability in meeting recreational water quality criteria under both dry and wet weather conditions using available historic and recent water quality data.
- Provide an initial characterization of water quality data.
- Research historic and current site use to identify and characterize the possible presence of physical, chemical, or biological contaminants or substances that may potentially present a public health risk. Summarize any existing characterization studies or water quality data available at the proposed location.
- Identify data gaps in known and emerging contaminants of concern, including assessment by an independent third-party subject matter expert with environmental site assessment experience in recreational waterbodies.

Submission Requirements

- The *Phase 2A Waterbody Feasibility Submission* is a deliverable to the NYC Health Department and NYC Department of Environmental Protection that will provide a summary of existing water quality data for the proposed location including using available data from at least the most recent 15-year period:
 - A map
 - Raw data in spreadsheet format (parameter, concentration, analytical method).
 - Trend analysis between fecal indicator bacteria concentrations and rainfall intensity and duration. Organize the raw data by categories including physical, chemical, biological contaminants or substances that may potentially present a public health risk.
- The selected third-party subject matter expert must provide their credentials and qualifications, for review and approval by the NYC Health Department, and provide independent certification of the *Phase 2A Waterbody Feasibility Submission*.

2B Waterbody Assessment and Preliminary Wet Weather Analysis [NYC DEP and NYC Health Department]

Description

Phase 2B is preliminary waterbody modeling by NYC agency subject matter experts based on available water quality data and data submitted in *Phase 2A Waterbody Feasibility Submission*. The objectives are to:

- Model baseline water quality conditions of the selected waterbody.
- Perform predictive water quality modeling under various rainstorm intensity scenarios (hurricanes and tropical storms) to characterize the length and duration of waterbody impacts after CSOs and to estimate the recovery time to return to baseline conditions.

Outcome

- Screen the proposed waterbody under both dry and wet weather conditions for feasibility and predictability in meeting recreational water quality criteria or as an influent water supply to be treated for use in a contained project.
- Define baseline water quality and preliminary trigger levels for wet weather advisory (rainfall intensity and duration) during bathing season (May to September) to assess swim-ability for the proposed waterbody, if required based on the proposed project.
- Request additional information from the entity, as needed.

¹ Applicable bacteriological water standards include but are not limited to: 30-day geometric mean cannot exceed 30 enterococci/100 mL and single sample cannot exceed 60 enterococci/100 mL and as required by NYS Department of Health Framework for Submittal to Demonstrate Acceptable Water Quality and Design of a Novel Bathing Facility, January 2024.

2C Preliminary Waterbody Feasibility Assessment Regulatory Determination [NYC Health Department]

Description

Phase 2C is a regulatory review by the NYC Health Department of the *Phase 2A Waterbody Feasibility Submission* and the results of *Phase 2B Waterbody Feasibility Assessment and Preliminary Wet Weather Analysis*. The objectives are:

- Evaluate completeness, limitations, and uncertainties in the third-party assessment of data gaps for known and emerging contaminants for physical, chemical, biological contaminants or substances as it pertains to human health risk assessment.
- Begin assessment of technical requirements for site-specific water quality monitoring and sampling that may be required to fill data gaps in the human health risk assessment.
- Evaluate if source waterbody characterization is adequate and that water quality conditions are defined and predictable for the recreational water use of the proposed project.

Outcome

- Deny or accept the proposed source waterbody for further assessment and data collection. If accepted, the NYC Health Department will grant a notice to proceed with the next project-specific phase.
- Request additional information from the entity, as needed, to enable a preliminary waterbody feasibility assessment regulatory determination.

PHASE 3: CONTAINMENT AND WATER FLOW PROOF OF CONCEPT

3A Containment and Apparatus Engineering Design and Turnover [Entity]

Description

Phase 3A provides the entity the opportunity to present non-traditional and innovative projects for engineering review and consideration. The objectives are:

- Show the proof-of-concept design for the recreational water and swim area.
- Provide needed approvals and permits for structural, plumbing, and electrical safety, transport and installation onsite such as NYS DEC, US Army Corps of Engineers, NYC DOB, and/or NYC SBS.

Additionally, if containment enclosure or structure or an apparatus is proposed, additional objectives are:

- Describe how the design will provide recreational water containment or act as a not contained apparatus.
- Describe the anticipated lifetime of the apparatus, containment, or structure and indicate a schedule for how and when the device will be placed in the water and removed if needed.
- Provide engineering specifications for a conceptual design of any enclosure, structure, membrane, or textile, such as treatment medium, filter, fabric, or mesh.
- Model how the water flow is impacted.
- Conduct a performance analysis of the materials over time after exposure to contamination from solid particles, water, or reactive chemicals on or within the media resulting in the loss of hydraulic conductivity and nearly clogged state.
- Identify life cycle and operation and maintenance (O&M) requirements.

For contained projects, phases 3, 4, and 5 may be conducted concurrently in accordance with NYC Health Code Article 165.

Submission Requirements

- **Not Contained Projects**
 - The Phase 3A design and submissions for not contained projects must meet the technical prerequisites in Appendix A.
 - The *Phase 3A Beach and Apparatus Engineering Design and Turnover Submission* is a deliverable to the NYC Health Department by a professional engineer or architect licensed and registered to practice in the

State of New York that includes engineering plans and specifications for siting a bathing beach and any apparatus, if present.

- The *Permitting and Critical Path Analysis Status Update (Phase 3)* is a progress update report on environmental review and regulatory permit approvals.
- **Contained Projects**
 - The Phase 3A design and submissions for contained projects must meet the technical prerequisites in Appendix B.
 - The *Phase 3A Containment Engineering Design and Turnover Submission* is a deliverable to the NYC Health Department by a professional engineer or architect licensed and registered to practice in the State of New York that includes engineering plans and specifications for the siting a bathing establishment, its facilities and the containment enclosure or structure.
 - The *Permitting and Critical Path Analysis Status Update (Phases 3, 4 and 5)* is a progress update report on environmental review and regulatory permit approvals.

3B Containment and Apparatus Engineering Design and Turnover Determination [NYC Health Department]

Description

Phase 3B is a regulatory review of the *Phase 3A Engineering Design and Turnover Submission*. The objectives are:

- Evaluate technical requirements for the engineering design and water turnover in meeting the requirements of the applicable NYCHC.
- Evaluate if water turnover is adequate to maintain water quality.

Outcome

- Deny, accept, or request resubmission of the apparatus or containment design proposed, as applicable. If accepted, the entity will proceed with next steps including prototype development and in-water demonstration.
- Request additional information from the entity, as needed, to enable a regulatory determination of the containment or apparatus engineering design.

PHASE 4: SOURCE WATER TREATMENT AND OPERATIONS AND MAINTENANCE

4A Treatment Train Design Submission [Entity]

Description

Phase 4A provides the entity the opportunity to present water treatment approach for influent source water, including novel technologies and combinations of technologies for NYC Health Department review. The treated effluent will be used as the recreational water for bathing. The objectives are:

- Provide engineering plans and specifications for the water treatment facility design and construction.
- Provide engineering plans and specifications for a proposed treatment train based on site specific influent source water quality
- Submit validation reports for required technologies or new combinations of technologies.
- Identify operation and maintenance requirements including waste management and disposal.

Submission Requirements

- The Phase 4A submissions must meet the technical prerequisites in Appendix B including relevant submission requirements in Phase 3A Submissions for Contained Projects.
- The *Phase 4A Treatment Train Design Submission* is a deliverable to the NYC Health Department by a professional engineer licensed and registered to practice in the State of New York with water treatment expertise that includes an engineering and validation report.

4B Preliminary Treatment Train Design Regulatory Determination [NYC Health Department and NYC DEP]

Description

Phase 4B is a regulatory review of the *Phase 4A Treatment Train Design Submission*. The objectives are:

- Evaluate technical requirements of the water treatment design to achieve removal of physical, chemical, and biological contaminants (e.g., appropriate log-reduction value of viruses, protozoa, and bacteria) from the source waterbody.
- Evaluate if water treatment will predicably and consistently achieve effluent water quality performance standards for the treated water so that it acceptable for use as a recreational water supply for a contained bathing structure.
- Review validation reports for treatment efficacy for known and emerging contaminants of concern identified in prior phases.

Outcome

- Deny, accept, or request resubmission of the water treatment design proposed, as applicable. If accepted, the entity will proceed with next steps including an in-water demonstration of the water treatment.
- Request additional information from the entity, as needed, to enable a regulatory determination of the water treatment engineering design.

4C Water Treatment Demonstration [Entity]

Description

Phase 4C provides the entity the opportunity to validate water treatment on a demonstration-scale. The objectives are:

- Provide written test plan detailing the demonstration procedures.
- After approval of the test plan, conduct verification testing and data collection in accordance with the written test plan.
- Provide written final report for submission to the NYC Health Department.

Submission Requirements

- The Phase 4C submissions must meet the technical prerequisites in Appendix B.
- The *Phase 4C Water Treatment Test Plan* is a deliverable to the NYC Health Department by a professional engineer licensed and registered to practice in the State of New York with water treatment expertise that includes a written plan delineating specific objectives for demonstration, including performance objectives, experimental design, field procedures, sampling procedures, analytical procedures, quality assurance procedures, data management, analysis, and reporting.
- The *Phase 4C Water Treatment Interim Results* is a set of deliverables to the NYC Health Department by a professional engineer licensed and registered to practice in the State of New York with water treatment expertise that includes a cumulative dataset of influent and effluent water quality monitoring and sampling results conducted during the in-water demonstration of the water treatment.
- The *Phase 4C Water Treatment Test Final Report* is a deliverable to the NYC Health Department by a professional engineer licensed and registered to practice in the State of New York with water treatment expertise that includes a summary of influent and effluent water quality data over the test period. The entity shall conduct trend analysis showing treatment efficacy and demonstrate that the influent conditions are representative of the variable conditions expected for the proposed location.

4D Water Treatment Regulatory Determination [NYC Health Department]

Description

Phase 4D is a regulatory review of the *Phase 4C Water Treatment Test Plan*, *Phase 4C Water Treatment Interim Results* and the *Phase 4C Water Treatment Test Final Report*. The objectives are:

- Evaluate water treatment test plan for demonstrating a representative demonstration-scale water treatment testing for showing performance and efficacy in treating contaminants of concern.

- Evaluate water treatment test results over the course of the demonstration-scale test.
- Evaluate water treatment test final report for treatment efficacy for known and emerging contaminants of concern identified in prior phases.

Outcome

- Review and approve the *Phase 4C Water Treatment Test Plan* for implementation of the water treatment demonstration.
- Interim review the *Phase 4C Water Treatment Interim Results* and provide real-time feedback to the entity so that adjustments can be made or request additional information from the entity as needed.
- Deny or approve the *Phase 4C Water Treatment Test Final Report* for the entity to proceed with subsequent phases. Request further testing or treatment design alterations may be required from the entity, as needed, to enable a regulatory determination of the water treatment. NYC Health may require resubmission of the *Phase 4A Treatment Train Design Submission* based on the outcomes of Phase 4C and 4D.

PHASE 5: RECIRCULATED WATER TREATMENT AND MONITORING

5A Disinfection and Residual Monitoring Methods [Entity]

Description

Phase 5A provides the entity the opportunity to present the water treatment method selected to meet the requirement to maintain residual disinfectant in the contained bathing area to address contaminants that enter the bathing area after source water treatment including from bathers in the water and other environmental sources (i.e. untreated source water splash, waterfowl, etc.)

- Provide engineering specifications for the recirculated water treatment system proposed to maintain a residual disinfectant.
- Identify operation, maintenance, and monitoring protocols to ensure the required physical and bacterial water quality conditions are maintained.

Submission Requirements

- The Phase 5A submissions must meet the technical prerequisites in Appendix B including relevant submission requirements in Phase 3A Submissions for Contained Projects.

5B Disinfection and Residual Monitoring Regulatory Determination [NYC Health Department]

Description

Phase 5B is a regulatory review of the *Phase 5A Disinfection and Residual Monitoring Methods Submission*. The objectives are:

- Evaluate technical requirements for the engineering specifications of the recirculated water treatment to maintain disinfection and residual monitoring in accordance with the requirements of the applicable NYCHC.
- Evaluate if operation, maintenance, and monitoring protocols are sufficient to maintain the required water quality.

Outcome

- Deny, accept, or request resubmission of the disinfection and residual monitoring methods proposed, as applicable. If accepted, the entity will proceed with the next phases.
- Request additional information from the entity, as needed, to enable a regulatory determination of the disinfection and residual monitoring methods.

PHASE 6: PROTOTYPE ASSESSMENT

6A Prototype Build and Mobilization for Data Collection [Entity]

Description

Phase 6A provides the entity the opportunity to demonstrate prototype details for the NYC Health Department review.

- Develop an in-water prototype design for any structure proposed which will be used during Phase 7.
- Provide needed approvals and permits for structural, plumbing, and electrical safety, transport and installation onsite such as NYS DEC, US Army Corps of Engineers, NYC DOB, and/or NYC SBS.

Submission Requirements

- The Phase 6A submissions must meet the technical prerequisites in Appendix B including relevant submission requirements in Phase 3A Submissions for Not Contained or Contained Projects, as applicable.
- The *Permitting and Critical Path Analysis Status Update (Phase 6)* is a progress update report on environmental review and regulatory permit approvals.

6B Prototype Build and Mobilization Regulatory Determination [NYC Health Department]

Description

Phase 6B is a regulatory review of the *Phase 6A Prototype Build & Mobilization for Data Collection Submission*. The objectives are:

- Evaluate technical requirements for the prototype design to meet the required scalable structure.
- Coordinate and collaborate with applicable interagency parties involved in the permitting and approval processes for transportation and installation onsite prior to the sampling season.

Outcome

- Deny, accept, or request resubmission of the prototype design proposed, as applicable. If accepted, the entity will proceed with the next phase.
- Request additional information from the entity, as needed, to enable a regulatory determination.

PHASE 7: IN-WATER DEMONSTRATION

7A Water Assessment and Data Collection [Entity]

Description

Phase 7A is the planning and data collection to demonstrate the performance of the non-traditional recreational water project. The objectives are to:

- Develop and implement a Quality Assurance Project Plan (QAPP) that provides the framework for empirical data collection, analysis, and evaluation.
- Mobilize the structure or apparatus prototype, as applicable, designed and constructed in prior phases to demonstrate performance including water turnover.
- Implement water treatment and recirculation for pools, as applicable, designed and tested in prior phases to demonstrate water quality criteria conditions are met and residual disinfectant maintained.
- Data collection will capture empirical water quality and site-specific conditions under steady-state and dynamic conditions to demonstrate the predictability and long-term sustainability of the waterbody to support recreational activities.
- Maintain contemporaneous communication with the NYC Health Department, including required project deliverables, to ensure objectives of the QAPP are achieved. The entity shall be expected to perform additional data collection, resampling, and methodology adjustments in a timely manner based on NYC Health Department's review of data .
- Establish a site-specific dataset of water quality and site conditions to demonstrate that the proposed location will sufficiently meet the intent of public health protections required in NYC Health Code and has scientifically defensible characteristics that support recreational activities in the waterbody.

Submission Requirements

- Phase 7A submissions must meet the technical prerequisites in Appendix B including relevant submission requirements in Phase 3A Submissions for Not Contained or Contained Projects, as applicable.

- Weekly: The *Phase 7A Weekly Water Quality and Site Conditions Submissions* are deliverables to the NYC Health Department. At a minimum, the submissions must include:
 - Sampling and data collection methodology.
 - Documentation including field notes, chains of custody for any water samples collected, and final analytical laboratory reports (including both routine bacteriological sampling and initial site characterization sampling), in a manner prescribed by the NYC Health Department.
 - Summary of water quality analytical results, in a manner prescribed by the NYC Health Department.
 - Flow and containment analysis.
 - Results of annual and routine sanitary surveys as defined in the QAPP.
 - Results of the floatable debris and visual surveys as defined in the QAPP.
 - Any deviations in water treatment monitoring parameters or performance indicators.
 - Any other submissions as requested by the NYC Health Department based on prior results.
 - Submit a signed affidavit agreement that certifies the work was performed as required by the QAPP. Any deviations shall be explicitly noted on the affidavit.
- If Applicable: The *Phase 7A Supplemental Sampling Final Report* is a deliverable to the NYC Health Department by a professional engineer licensed and registered to practice in the State of New York with water treatment expertise that demonstrates accuracy and comparability of supplemental water quality testing methods that are not EPA-approved and/or ASTM standard analytical methods, if those are being used as part of the project. The format for the final report will be based on the technical prerequisites defined by the NYC Health Department.
- Final: The *Phase 7A In-Water Demonstration Final Report* is a deliverable to the NYC Health Department by a professional engineer licensed and registered to practice in the State of New York with water treatment expertise that summarizes findings including analysis of an apparatus or the containment enclosure or structure, water quality or flow data collected, water treatment performance indicators, and structural and water treatment system operations and maintenance. The entity shall provide a conclusion of the results of the in-water demonstration including any limitations, deficiencies, and proposed project changes or improvements.

7B Interim Data Quality and Integrity Review [NYC Health Department]

Description

Phase 7B is an interim regulatory review of the *Phase 7A Weekly Water Quality and Site Conditions Submissions*. The objectives are:

- Evaluate the weekly submissions to evaluate if objectives of the QAPP are being executed.
- Perform quantitative data analysis and water quality trend analysis over time.
- Adjust the QAPP as necessary to achieve the study objectives.
- Provide requirements to the entity for additional data collection, resampling, or methodology adjustments that are needed based on the weekly report(s) to fill data gaps.

Outcome

- Maintain continuous contact with the entity.
- Provide real-time feedback to the entity so that adjustments can be made or request additional information from the entity as needed.

7C Data Review & Regulatory Determination [NYC Health Department]

Description

Phase 7C is a regulatory review of the *Phase 7A Supplemental Sampling Final Report and Phase 7A In-Water Demonstration Final Report*. The objectives are:

- Evaluate the complete dataset to characterize the water quality in the proposed waterbody under dry and wet weather conditions with a focus on fundamental variables that impact water quality including identifying sources and impact of wastewater discharges, local source contamination, floatables, and other chemical/physical contaminants. Data analysis will be performed to assess the potential level of human health risks associated with the waterbody.

- Ensure weather conditions are representative and include periods of prolonged dry weather and variable wet weather conditions in both rainfall intensity and duration. If assessment is conducted during an unusually dry season or during a season without a range of rainfall intensity and duration, additional data collection may be required during a subsequent beach season(s) to complete additional sampling.
- The regulatory determination will be in collaboration with NYC DEP and other governmental agencies. It will be determined if the current NYC waterbody water quality model requires modification and calibration based on the results of the water quality and site conditions assessment, which may require additional modeling beyond the scope of this Site Assessment Protocol. The daily sampling data will be used to develop an empirical relationship between weather conditions and water quality concentrations in the proposed waterbody. The modified and amended and calibrated water quality model will define a predictive wet weather advisory threshold. This new threshold value will validate or supersede the wet weather advisory threshold from Phase 2B.
- Consult with external subject matter expert(s) (SMEs) with credential and expertise in hydraulic modeling, water resources engineering, quantitative microbial risk assessments, and health-illness risk evaluation of water quality conditions in natural waterbodies. The SMEs will confirm the final analysis was conducted in accordance with the QAPP and best practices and evaluate if data collection was adequate and sufficient to validate or develop a new threshold value. The SMEs shall also provide insight on the trends, predictability, and sustainability of water quality at the proposed location to assess if it can support recreational activities that involve ingestion or immersion in the water, such as swimming, for a general population. The SMEs shall recommend if additional hydrodynamic modeling is necessary to evaluate the proposed location's ability to achieve and maintain health and safety requirements for recreational use.

Outcome

- Determine whether water quality and site conditions show acceptable level of risk for general population swimming by meeting EPA's health-based risk criteria.
- Define specific terms or conditions and any additional mitigation measures that would have to be taken to protect health if a waiver is granted. The NYC Health Department may conclude that that more information is needed to enable such determination.
- Request more information from the entity to enable a regulatory determination.
- If acceptable, issue a conditional approval to the request for pre-qualification. This will allow the entity to proceed with a Bathing Beach or Bathing Establishment Permit application for the proposed location that includes a waiver of the NYCHC requirement(s), as applicable. A conditional approval is limited to the specified requirement(s) and does not represent an implicit approval by the NYC Health Department of any other waivers. Modifications made after conditional approval is granted, including changes of special features or other NYCHC waiver(s), will require a re-submission of the pre-qualification process elements.
- If applicable, consider the supplemental sampling methods proposed as a data collection method.

PERMIT APPLICATION SUBMISSION

The procedures outlined below explain the process for a traditional initial permit application. Permit renewal for a non-traditional recreational water project may additional applicant submission and NYC Health Department review.

Beach Permit Application Requirements

Application Requirements

To apply for a bathing beach permit, the entity must submit to the NYC Health Department a full application as required by NYCHC 167.07 that meets all requirements of NYCHC 167.37. The application package must include:

- Engineering plans, specifications, and engineering reports prepared by an engineer or architect licensed and registered to practice in the State of New York.
- Site assessment, including watershed map, land area plot map, water level, sources of contamination, sewage discharge locations, weather and topographical influences, water currents, historic water quality analysis, biological influences, and location and level of fishing, boating, and canoeing.

- Bathymetry, including bathing area boundaries, water surface area, bottom slope, bottom material
- Maximum permissible loading
- Emergency services location information
- Water quality results
- Scope of work letter, engineering plans including dimensions, bathhouses, access roads, parking, building, water supplies, sanitary and storm sewers, and electrical and telephone services, and engineering specifications, signed and stamped by a licensed engineer or architect in the State of New York
- A completed safety plan for NYC Health Department approval
- A certificate of occupancy including certificate of inspection for plumbing and electrical work where required
- Copies of aquatic supervisory certificates
- Copies of all applicable regulatory permits and approvals identified in the prior phases, including structural, electrical, plumbing, wastewater, source water, or sewage discharge permit from an approved agency.

The entity must include a formal modification request under the provision of NYCHC 167.05(d)², which includes:

- A description of the hardship presented to the entity by the requirement.
- The conditional approval letter from the NYC Health Department if the modification request includes a waiver of baseline siting requirement(s), which includes if a proposed beach has a SCR-CSO, PCR-CSO, or SCR baseline site modification category.
- Any proposed additional measures to protect the health of bathers, as set out in the conditional approval.

The entity must also submit the application through the NYC Department of Consumer and Worker Protection (DCWP) Licensing Center and provide the required permit application fee and business documents such as workers compensation and disability insurance.

Permit Review

The NYC Health Department will conduct a review of application submission against the NYCHC Article 167 requirements to ensure all requirements are met and review waiver request to ensure public health protection.

The NYC Health Department will provide a preliminary statement of application acceptance conditional on final construction inspection.

Following successful construction inspection, the NYC Health Department will provide the entity a letter of approval and approve the NYC DCWP Bathing Beach Permit. Based on modification requests or other location-specific conditions, the NYC Health Department may include specific terms and conditions for bathing beach operations when issuing the NYC DCWP Bathing Beach Permit approval.

Beach Surveillance and Monitoring

Once a permit is issued and the bathing establishment is in operation, routine sampling will be conducted by the NYC Health Department as part of our NYC Beach Surveillance and Monitoring Program.

Pool Permit Application Requirements

Application Requirements

To apply for a pool permit, the entity must submit an application to the NYC Health Department for review as required by NYCHC 165.05 including application fees, detailed engineering plans, specifications and an engineering design report.

- Scope of work letter including a description of the facility location and background, a detailed summary of the proposed facility and the work to be done, land and seasonal water table, and physical aspects of the surrounding environment and structures.

² NYCHC 167.05(d) No person shall operate, construct or maintain...a bathing beach...located outside the boundary delineated for primary contact recreation as defined by applicable regulations of the New York State Department of Environmental Conservation

- Engineering Plans bearing the seal and signature of an engineer or architect licensed to practice in the State of New York. Detailed scaled and dimensional drawings must include all of the following:
 - Plot plan and general site plan
 - Detailed plans
- Specifications for the pool and facility construction, recirculation, filtration, and disinfection systems, and all other appurtenances shown on the detailed plans
- Engineering design report and calculations including hydraulic calculations, disinfection and pump size calculations, recirculation equipment, filtration facilities, disinfection equipment, turnover and filtration rate, filter flow rates, and pump curves.
- PHE forms 88 and 100
- Supplemental or additional information as requested by the NYC Health Department
- A completed safety plan for NYC Health Department approval
- Wastewater or sewer discharge permit from an approved agency
- Copies of Aquatic Supervisory Certificates
- Copies of Pool Operator Certificate
- Copies of all applicable regulatory permits and approvals identified in the prior phases, including structural, electrical, plumbing, wastewater, source water, or sewage discharge permit from an approved agency.

In addition to the traditional requirements, a non-traditional permit may include terms and conditions that require a Treatment System Manager to supervise the water treatment system operations and maintenance. A Treatment System Manager would be required to:

- Be qualified to carry out the operation, maintenance, and monitoring requirements established following the completion of the pre-qualification process.
- Sign an affidavit on a form approved by the Department attesting that they possess sufficient knowledge, skills, abilities, and training to operate the water treatment system.

Permit Review

The NYC Health Department will conduct a review of application submission against the NYCHC Article 165 requirements to ensure all requirements are met and review waiver request to ensure public health protection.

The NYC Health Department will provide a preliminary statement of application acceptance conditional on final construction inspection.

Following successful construction inspection, the NYC Health Department will provide the entity a letter of approval and approve the NYC DCWP Bathing Establishment Permit. Based on modification requests or other location-specific conditions, the NYC Health Department may include specific terms and conditions for bathing beach operations when issuing the NYC DCWP Bathing Establishment Permit approval.

Pool Operations and Monitoring

Once a permit is issued and the bathing establishment is in operation routine inspection will be conducted by the NYC Health Department. All bathing establishments shall be maintained and operated in a safe, clean, and sanitary condition at all times in accordance with the requirements of Article 165 and any applicable waiver conditions.

APPENDIX A: TECHNICAL PREREQUISITES FOR NOT CONTAINED PROJECTS

PHASE 3A

- **Projects with modifications to waterbody classification and/or proximity to CSO:** Engineering plans, drawings and specifications must be provided by a professional engineer or architect licensed and registered to practice in the State of New York including:
 - Engineering plans with dimensions, elevations, appropriate cross-sections, and details including:
 - precise location, layout and dimensions of the beach with references to known landmarks such as piers, bridges, marine hubs and structures such as public buildings
 - layout and dimensions of an apparatus, if present
 - bathymetry and geology in the beach sand and bathing areas along with other proposed features related to the project such as ladder, stairs, deck, walkway, walls or fences for beach access, entrances and exits to the bathing area, lighting fixtures, bathhouses, toilets and showers
 - location of combined sewer overflows (CSOs) or other sources of contaminants within 10,000 ft and distance from the swim area
 - direction of prevailing wind and information on direction and intensity of currents at the beach location and supporting structure of the apparatus, if present
 - Dredging and disposal plan if dredging of materials on the waterfront is anticipated for construction.
 - Utility plan depicting the existing and newly proposed infrastructure for power, sewer and water.
 - Surface drainage management for the proposed apparatus.
 - Specifications: One set of complete specifications depicting bathhouse, bather preparation facilities, and all other appurtenances shown on the detailed plans shall be submitted.
- **Projects with an Apparatus:** The apparatus design submission must be provided by a professional engineer or architect licensed and registered to practice in the State of New York and must meet the following requirements:
 - Material finishes: Define the construction material (such as but not limited to geotextile, membrane, fabric, or mesh) that is present in the open waterbody including the shape and size of any platforms, side walls or material, bottom, deck, and piers or supports needed for placement. If the bottom material is not sand, pea gravel, or similar, a waiver of NYCHC 167.37(b)(5) is required.
 - Entrapment
 - The apparatus must be designed to prevent entrapment of bathers as required by NYCHC 167.37(d)(1).
 - The apparatus must also meet structural safety requirements of NYCHC 165.41 to ensure there are no projections or obstructions which could endanger patron safety, specifically as required by NYCHC 165.41(f).
 - Deck/land area
 - The apparatus must have adequate land area per bather, determined based on the proposed design or as required by NYCHC 167.37(b)(3) or 165.41(k).
 - The structure must be protected from coastal flooding, wind, and wave conditions.
 - Turnover: Assess how the apparatus will function in the open water and the mechanism for water turnover within the apparatus. Include modeling to demonstrate that the apparatus does not divert or inhibit flow and meets the definition of not contained (Table 1). Minimum and maximum water flow velocity and fresh water flow-through must be provided as required by NYCHC 167.37(b).
 - Bathhouse: Bathhouses, including toilets, showers, and drinking water fountains, must be provided in accordance with NYCHC 165.39.
 - Life cycle analysis
 - Describe how the apparatus is expected to function when bathers are in the water including biofouling, extended exposure to marine water (if applicable), and considerations for exposure to bather and any other sources of contamination over time.

- Provide routine and long-term operation and maintenance requirements for the apparatus including a life cycle analysis and replacement schedule based on the anticipated project lifetime.
 - Verify shoreline construction and anchoring is compliant with applicable NYC, NYS and Federal requirements such as NYC SBS Chapter 56 of the NYC Charter and Title 22 of the NYC Administrative Code, NYC WRP, [NYS DEC 6 NYCRR V A Part 505 Coastal Erosion Management](#), [US Army Corps of Engineers Rivers and Harbors Appropriation Act Section 10](#), New York Environmental Conservation Law, Article 15 Water Resources, Title 5 Protection of Water and [US EPA Clean Water Act Section 404](#).

PHASE 6A

• Projects with an Apparatus

- Define the prototype dimensions and specifications and how they compare to the proposed full-scale project. The prototype structure shall be sized such that the containment and water treatment methods are fully observed, and the findings and conclusions are representative and will scale to a full-size structure. If any additional bench- or demonstration-scale testing are conducted that will demonstrate the capability and integrity of the structure, the results of such studies may also be submitted to support the request.
- The prototype must be set into the waterbody at the proposed site at least 30 days prior to the start of the beach season. At a minimum, the in-water structure shall remain in place for the entire duration of a beach sampling season (May – September).

PHASE 7A

• Projects with modifications to waterbody classification, proximity to CSO, and/or an Apparatus

- Quality Assurance Project Plan (QAPP)
 - The QAPP must provide sampling methodology, sample collection procedures, data analysis, laboratory requirements, logistics and scheduling details. Samples must be analyzed by a laboratory with a New York State ELAP certification for the specified analysis.
 - The QAPP must be submitted to the NYC Health Department prior to commencement of the in-water demonstration.
 - Scope must include independent and/or side-by-side samples to be conducted by the NYC Health Department and the entity for validation purposes.
- Water Quality Sampling: The scope of sampling (such as site location selection, sample collection time, sampling frequency, parameters, and analytical lab methods) will be based on the proposed location, usage, length geomorphology, potential pollution sources such as combined sewer overflow discharge transport and dilution, historical water quality data, regional hydrodynamics of the waterbody, and other environmental conditions. Water quality sampling will be required both inside and outside the apparatus, if applicable, to assess dry and wet weather conditions. At a minimum, the scope shall include:
 - Analytes: Water samples will be collected for enterococci and/or *E. coli* as required by NYCHC 167.13, and total and fecal coliforms as specified by NYCRR 703.4. Analytical methods will be in accordance with established and/or accepted industry standards. Additional analytes may be required by the NYC Health Department based on completion of prior phases.
 - Frequency: Conduct daily sampling at the same time each day during the bathing season (May to September) to establish representative data for the proposed site across various water quality and waterbody conditions and during dry and wet weather conditions. The number of samples must include at least three sample locations representing the full bathing area length and geomorphology.
 - Location Specific Parameters: Collect additional sampling to establish initial site conditions including physical, chemical, biological, and water quality parameters as required by the NYC Health Department.

- Sanitary Surveys: Any sanitary and floatable debris surveys must include an assessment of both inside and outside the prototype containment enclosure or structure, if applicable. The surveys shall be conducted with the intent to show how the structure is impacted by debris in the respective waterbody.
 - Annual Sanitary Survey: Conduct a survey at the start of the bathing beach season (May), using the [EPA Annual Sanitary Survey for Recreational Waters](#) form to record beach conditions characteristics of the site that may impact water quality and bather safety.
 - Routine Sanitary Survey: Conduct routine sanitary surveys at the time of each sampling for the entire beach season (May through September) using the [EPA Routine Sanitary Survey for Recreational Waters](#) form to record beach conditions including the presence of floatable debris, sewage, fuel, oil, or other contaminants.
 - Supplemental Floatable Debris and Visual Survey (required for locations that have a baseline site category of SCR-CSO or PCR-CSO):
 - Floatable Debris Survey: Conduct monthly floatable debris surveys for the entire beach season (May through September) using the [EPA Assessing and Monitoring Floatable Debris](#) methodologies.
 - Visual Survey: During wet weather and for a time period thereafter, defined based on results of prior phases, the entity must provide timestamped videos showing the bathing area, the CSO, and the waterbody between.
- Flow and Containment Analysis: A microbiological growth and decay evaluation will be required weekly over the assessment period on any construction materials (including but not limited to grates, fabric, deck materials, and beach materials).
 - Additional data measurements may be required to document water current and velocity flow-through to demonstrate water turnover of at least 100 gallons per bather per day as required by 167.37(b)(7) and 167.37(b)(2).
 - Additional requirements to assess the prototype design for bather safety (e.g., entrapment, accessibility, construction material finishes) in accordance with applicable regulations and guidance, including NYCHC requirements.
- **Supplemental Sampling Methods (Not EPA-Approved)**
 - If the entity is proposing supplemental water quality testing using methods that are not EPA-approved methods and/or ASTM standard analytical methods, such as the use of continuous monitoring equipment, a detailed description of the proposed supplemental test procedure, together with references to published studies of the applicability of the supplemental test procedure for the parameter in question must be provided to the NYC Health Department for consideration.
 - The method must be implemented at the proposed area during the entirety of any phase identified by the NYC Health Department. Comparability data for the performance of the proposed supplemental test procedure must be provided for consideration to establish equivalent or superior performance to the mandated EPA approved method. These methods may be permitted in conjunction with an approved method but will not be considered as a sole measure for regulatory monitoring requirements.
 - Additional technical prerequisites to be provided based on method proposed and water quality parameter to be measured.

APPENDIX B: TECHNICAL PREREQUISITES FOR CONTAINED PROJECTS

PHASE 3A

- **Bathing Establishment**: Engineering plans, drawings and specifications must be provided by a professional engineer or architect licensed and registered to practice in the State of New York and include:
 - Engineering plans showing all proposed facilities: The locations of the bathing area, diving boards, ladders, stairs, deck, walkway, walls or fences enclosing the pool, entrances and exits to the bathing area, inlets, main drains, pool and deck drains, vacuum fittings, drinking fountains, piping, hose bibbs, surface skimmer system, recirculation system and appurtenances, filtration system, disinfection equipment, sewage connections, water main, lighting fixtures and other proposed features related to

the operation and safety of the proposed project including bathhouses, toilets and showers. Include dimensions, elevations, appropriate cross-sections, and details.

- Dredging and disposal plan if dredging of materials on the waterfront is anticipated for construction.
- Utility plan depicting the existing and newly proposed infrastructure for power, sewer and water.
- Surface drainage management for the proposed bathing area.
- A flow diagram or schematic of the water treatment and recirculation system.
- Piping plan containing the size, type, and location of all piping, including elevations.
- Engineering design report and calculations: A summary of the design basis, including information relative to the capacity or patron loading (maximum and average), pool area and volume, hydraulic computation (including head loss in all piping and water treatment), chlorinator and pump sizing calculations, recirculation equipment, filtration facilities, disinfection equipment, turnover and filtration rate, filter flow rates, pump curves, capacity of bathhouse and bather preparation facilities and toilet facilities, and all other appurtenances, shall be submitted.
- Specifications: One set of complete specifications for the construction of the proposed bathing area, bathhouse, bather preparation facilities, recirculation system, filtration facilities, disinfection equipment and all other appurtenances shown on the detailed plans shall be submitted.
- **Containment**: The containment design submission of the enclosure or structure must be provided by a professional engineer or architect licensed and registered to practice in the State of New York and must meet the requirements of Article 165, including but not limited to:
 - Structural stability: The designing architect or engineer shall certify the pool structural stability. The structure must be designed and constructed to withstand all anticipated loading for both full and empty conditions, and hydrostatic and environmental pressures involved in each case and in accordance with NYCHC 165.41(b).
 - Material finishes: Pool materials must be inert, stable, nontoxic, and enduring for the water quality conditions in accordance with NYCHC 165.41(c). Sand, earth, or wood is not permitted. Pool bottom and sides must be a white or light color and easily cleanable. Corners formed by the pool walls and bottom must be rounded.
 - Size and shape: The shape of any pool must not impair the circulation of pool water, in accordance with NYCHC 165.41(f). There shall be no underwater or overhead projections or obstructions which would endanger patron safety or interfere with pool operation.
 - Minimum water depth: The minimum depth of water in the pool shall be three feet except for wading pools, in accordance with NYCHC 165.41(g).
 - Bottom slope: The bottom of the pool shall slope downward toward the main drains, in accordance with NYCHC 165.41(h).
 - Pool walls: The walls of a pool shall be either vertical for a distance of at least six feet (6') or as specified in NYCHC 165.41(i).
 - Ladders, recessed steps, stairs, and handrails: Except in a wading pool, steps or ladders shall be provided to serve the shallow and deep portion of the pool, and if the pool is over thirty feet wide, such steps or ladders shall be installed on each end and on opposite sides, in accordance with NYCHC 165.41(t).
 - Ladders: Pool ladders shall be corrosion-resistant and shall be equipped with nonslip treads, in accordance with NYCHC 165.41(t)(1).
 - Recessed steps: Recessed steps shall be readily cleanable and shall be arranged to drain into the pool to prevent the accumulation of dirt, in accordance with NYCHC 165.41(t)(2).
 - Stairs: Where stairs are provided, they shall be located diagonally in a corner of the pool or be recessed, in accordance with NYCHC 165.41(t)(3). They shall be equipped with a handrail.
 - Handrails: Where ladders, recessed steps and stairs are provided within the pool, there shall be a handrail at the top of each side thereof extending over the coping or edge of the deck, in accordance with NYCHC 165.41(t)(4).
 - Deck in accordance with NYCHC 165.41(k):
 - A continuous deck at least five feet (5') wide shall extend completely around the pool.
 - The deck shall be of a uniform, easily cleaned, impervious material with a slip-resistant surface.

- The deck of outdoor pools shall be sloped away from the pool or to the deck drains to prevent other waters from entering the pool such as from surface runoff from the deck, rainwater, or natural waters from the surrounding waterbody. Deck drains, when used, shall be adequately spaced and arranged. There shall be no direct connection between the pool deck drains and the pool gutter or recirculation system.
 - Turnover
 - The system shall be designed for a recirculation flow rate that will result in an adequate turnover period as determined by the NYC Health Department based on the source water quality.
 - Recirculation pumps shall have adequate capacity (flow rate and pressure) to meet the design requirements of the pool including filter backwashing and turnover rate, in accordance with NYCHC 165.45(d). It shall be self-priming if installed above the hydraulic gradient. A gauge which indicates both pressure and vacuum shall be installed on the pump suction header and a pressure gauge shall be installed on the pump discharge line. Gauges shall be installed as near to the pump inlet as possible.
 - A means of continuously measuring rate of flow shall be provided in the recirculation system in accordance with NYCHC 165.45(l).
 - A water treatment system consisting of pumps, piping, filters, water conditioning and disinfection equipment, and other accessory equipment, shall be provided which will clarify, chemically balance and disinfect the pool water. See Phase 4 for additional requirements.
 - Bathroom and bather preparation facilities: Toilets and showers must be provided in adequate number and proximity, in accordance with NYCHC 165.49. Drinking water fountains must be provided in accordance with NYCHC 165.43(a)(3).

PHASE 4A

- Engineering design of the source water treatment must be provided by a professional engineer or architect licensed and registered to practice in the State of New York and submissions must include:
 - An engineering report with:
 - Range of influent water quality expected under various conditions including during steady state and wet weather conditions as defined by the NYC Health Department, following the completion of prior phases.
 - Defined water treatment train including requirements for pretreatment (e.g., solids removal).
 - Manufacturers product specifications for each component.
 - Water treatment design guidelines and technical specifications that depict performance metrics for the water treatment including target effluent water quality standards anticipated to be achieved for removal of physical, chemical and biological contaminants.
 - Summary table of the sources of water and makeup water that will be used for recreational waters including municipal water, untreated or treated river water, or any other water source. Indicate the source composition and volume of water to fill the containment enclosure or structure and the amount of makeup water anticipated including its source.
 - Validation that treatment process can reliably and consistently achieve the technical requirements along with provided surrogate parameters and continuous monitoring parameters.
 - Proposed operations and maintenance, including backwashing operations if applicable.
 - Define safety factors or other fail-safe mechanisms in the design.
 - Third-party validation reports if at least one of the following conditions is met:
 - UV treatment is proposed (in accordance with the US EPA Ultraviolet Disinfection System Guidance Manual (UVDGM)).
 - Novel treatment technologies are proposed.
 - Intended operations or influent water quality parameters (including turbidity and conductivity) are outside of standard conditions indicated by the manufacturer and industry protocols.
- The source water treatment engineering design submission must meet the following technical requirements:

- Provide the water treatment facility design and construction including location and size of the housing. All pumps, filters, chemical feeders and other mechanical equipment and chemicals must be secured and protected by an appropriate enclosure or room, separate and apart from the pool in accordance with NYCHC 165.45(b). The size of the equipment room shall provide working space to perform routine operations and to allow normal maintenance operation and removal without disturbing other piping or equipment. Adequate storage area shall be provided for chemicals and supplementary equipment.
- Provide the water treatment design for the proposed treatment processes that, in combination, achieve the log-reduction value of viruses, protozoa, and bacteria based on the source water characteristics as specified by the NYC Health Department
- Continuous monitoring must be provided to ensure the integrity of the various treatment processes is maintained.

PHASE 4C

- The source water of the proposed site location must be utilized for the treatment train influent. Demonstration at the specified site may not be transferred to other project locations.
- Influent water characterization
 - Evaluate concentrations of bacterial and chemical contaminants.
 - Determine process monitoring requirements.
 - Determine any pre or post treatment requirements (i.e. solids removal, de-chlorination).
- Schedule: The water treatment demonstration must be performed over an adequate time period to represent the variations in source waters that are anticipated.
- Startup: Record and document all start-up conditions, observations, and results, including reaching stable operation of the treatment technology and modifications needed to the O&M manuals.
- Verification Testing
 - Evaluate treatment performance, relative to removal of target contaminants under specified conditions
 - Evaluate treatment technology O&M criteria based on performance indicators such as visual observations, reliability, residuals generation (if applicable), chemical use (if applicable), power consumption.
 - Record and document test conditions and observations and results.
 - Verification testing must be conducted for a timeframe to be determined by the NYC Health Department. At a minimum, three consecutive months will be required after startup, with no more than nine days of downtime.
 - Analytical sampling must be conducted under steady state and wet weather conditions, and written quality assurance procedures must be provided.
 - Samples must be analyzed by a laboratory with a New York State Environmental Laboratory Approval Program (ELAP) certification for the specified analysis.

PHASE 5A

- Provide engineering design of the recirculated water treatment system by a professional engineer licensed and registered to practice in the State of New York with water treatment expertise.
- The engineering submission must meet the requirements of Article 165, including but not limited to:
 - Water treatment devices: all devices shall be tested and certified by the National Sanitation Foundation (NSF) or another testing laboratory using standards promulgated by NSF. If not NSF approved, the experimental equipment shall undergo further evaluation as follows:
 - Use-testing of the recirculated water treatment method(s) proposed, including a submission of a final engineering report on use-testing results, for a comparable design application in recreational water that is in operation for at least 60 days in NYS or at least 10 applications in another state; or
 - Pilot-testing for a period of at least 90 days, including submission of a final operational report with pilot-testing results; or

- A combination of use- and pilot-testing or a trial use period approved by the NYC Health Department. Any use- or pilot-testing reports shall be signed and stamped by the design engineer or architect.
- Continuous disinfection: Disinfection is a core public health protection requirement in recreational waters needed for health and safety that cannot be modified. Continuous disinfection of the pool water must be provided to maintain an effective disinfectant with an easily measurable residual (i.e., chlorine or bromine). The pools shall be equipped with a chlorinator, hypochlorinator, or other disinfectant feeder or feeders. An automatic controller shall be provided for continuous monitoring and active adjustment to maintain the target level of residual disinfectant. The feeder shall be automatic, easily disassembled for cleaning and maintenance, and capable of providing the required chemical residuals which meet the requirements of NYCHC 165.23(a) and 165.45(l). Other water treatment technologies such as ultraviolet (UV) may be used as a secondary method supplementary to a chemical disinfectant.
- pH control: Mechanical feed equipment for the purpose of adding a chemical for pH adjustment shall be provided for all pools in accordance with NYCHC 165.45(m). An automatic controller shall be provided for continuous monitoring and active adjustment to maintain target level of pH.
- Recirculation: The water treatment methods for disinfection and pH control shall provide adequate recirculation and distribution of the chemicals throughout the pool and must be verified by pool water testing prior to bather exposure in accordance with NYCHC 165.29(b) and 165.31(c).
- Filtration: The water treatment must include at least one filter and the filtration system shall be designed to maintain the required pool water quality in accordance with NYCHC 165.45(i). Water must be sufficiently clear to see a Secchi disk at the bottom in any location of the pool from the deck in accordance with NYCHC 165.25(b)(1).
- Ultraviolet (UV) Light Disinfection: UV units must be in accordance with NYCHC 165.45(l)(9), if provided. The light intensity shall be maintained at the manufacturer's specified level for the flow rate.
- Surface skimming: A surface skimmer system, perimeter overflow system or recessed automatic surface skimmers, must be provided and must be designed and installed to continuously remove all floating material, surface dirt and wastewater in accordance with NYCHC 165.45(h).
- Physical water quality: Provided treatment and operational procedures must ensure bottom and sidewalls are kept free of sediment and visible soil and floatable debris in accordance with NYCHC 165.25(c).
- Bacteriological water quality: Treatment must maintain water quality such that samples collected for coliform must not exceed 4 colonies per 100 mL analyzed each month in accordance with NYCHC 165.25(d). When the membrane filter technique is used coliform bacteria shall not be present in more than 10 percent of portions analyzed in any month; and total bacteria shall not exceed 200 colonies per milliliter. Samples must be analyzed by a laboratory with a New York State ELAP certification for the specified analysis.

PHASE 6A

- Define the prototype dimensions and specifications and how they compare to the proposed full-scale project. Include drawings of conceptual full-scale design in relation to pilot including ancillary facilities and buildings (locker rooms, bathrooms, concessions, queue and entrance, equipment storage, lifeguard stations) and emergency egress.
- Provide calculations for the design basis of the pilot and rationale for representative of the full-scale project, including information relative to the capacity or patron loading expected and pool surface area and volume.
- The prototype structure shall be sized such that the containment and water treatment methods are fully observed, and the findings and conclusions are representative and will scale to a full-size structure. If any additional bench- or demonstration-scale testing are conducted that will demonstrate the capability and integrity of the structure, the results of such studies may also be submitted to support the request.
- The prototype must be set into the waterbody at the proposed site at least 30 days prior to the start of the beach season. At a minimum, the in-water structure shall remain in place for the entire duration of a beach sampling season (May – September).

- Provide a process flow schematic or diagram in elevation view of the water treatment and recirculation system depicting how water flows in and out of the prototype, and the piping/mechanical equipment for recirculation.

PHASE 7A

- **Quality Assurance Project Plan (QAPP)**
 - The QAPP must provide sampling methodology, sample collection procedures, data analysis, laboratory requirements, logistics and scheduling details.
 - The QAPP must be submitted to the NYC Health Department prior to the in-water demonstration.
 - Scope may include independent and/or side-by-side samples to be conducted by the NYC Health Department and the entity for validation purposes, if requested by NYC Health Department.
- **Water Quality Sampling:** Testing must monitor water quality in the bathing area, analyze treatment train and ability to maintain continuous residual, as well as operations and maintenance requirements. The scope of sampling (such as site location selection, sample collection time, sampling frequency, parameters, and analytical lab methods) will be based on the proposed location, size and shape of the pool, potential pollution sources such as CSO discharges, transport, and dilution that impact source water, historical water quality data, regional hydrodynamics of the waterbody, and other environmental conditions. Water quality sampling may be required both inside and outside the structure to assess dry and wet weather impacts to source water quality. At a minimum, the scope shall include:
 - **Analytes:** Water samples must be collected for coliform bacteria as required by NYCHC 165.25(d) and any other parameter as required by the NYC Health Department. Additional analytes may be required by the NYC Health Department based on completion of prior phases.
 - **Frequency:** Conduct daily sampling at the same time each day during the bathing season (May to September) to establish representative data for the pool under various source water quality conditions. The number of samples must include at least three sample locations representing the entire pool area.
 - **Location Specific Parameters:** Collect additional sampling to establish initial site conditions including physical, chemical, biological, and water quality parameters as required by the NYC Health Department.
- **Sanitary Surveys:** Not applicable for Phase 7A as methods for pretreatment for solids removal were addressed in Phase 4A. CSO conditions surrounding the containment may not impact the deck or bathing area.
- **Flow and Containment Analysis:** A microbiological growth and decay evaluation will be required weekly over the assessment period on any construction materials (including but not limited to grates, fabric, deck materials, and beach materials). Additional technical prerequisites related to source water treatment and continuous disinfection to be provided based on site- and project-specific characteristics.
- **Supplemental Sampling Methods (Not EPA-Approved)**
 - If the entity is proposing supplemental water quality testing using methods that are not EPA-approved methods and/or ASTM standard analytical methods, such as the use of continuous monitoring equipment, a detailed description of the proposed supplemental test procedure, together with references to published studies of the applicability of the supplemental test procedure for the parameter in question must be provided to the NYC Health Department for consideration.
 - The method must be implemented at the proposed area during the entirety of any phase identified by the NYC Health Department. Comparability data for the performance of the proposed supplemental test procedure must be provided for consideration to establish equivalent or superior performance to the mandated EPA approved method. These methods may be permitted in conjunction with an approved method but will not be considered as a sole measure for regulatory monitoring requirements.
 - Additional technical prerequisites to be provided based on method proposed and water quality parameter to be measured.