NH Dept. of Environmental Services
“Public Bathing Facility” Program
A Pool Not Fit To Swim In: A Visual Guide
Abbreviated Program Overview

- Approval (construction, renovation, etc.)
  - Permit process - design review - about 20 per year

- Inspection Program
  - Roughly 1,400 Public Facilities
  - Routine, Re-tests, Complaints, Illness, Pre-opening
  - Testing and bacterial analysis
  - Self-Inspecting Cities

- Enforcement
  - NOD, LOD, AO, AF

- Education

- Technical assistance

- Research
What is a Public Bathing Facility?

Env-Wq 1102.44 “Public bathing facility” means a public bathing place that comprises a water-containing structure and associated buildings and equipment, intended or used for bathing, swimming, or diving purposes. The term includes, but is not limited to, swimming pools, spas, special recreation pools, and therapy pools at hotels, motels, health facilities, water parks, condominium complexes, apartment complexes, youth recreation camps, public parks, and recreational campgrounds or camping parks as defined in RSA 216-I:1, VII.

The term does not include any bathing facility which serves 3 or fewer living units and which is used only by the residents of the living units and their guests.
Inspection Overview

- Water Quality
  - Clarity, disinfection, pH, temp, algae, bacteria etc.
- Circulation
  - Returns, drains and skimmers
- Equipment
  - Pumps, filters, gpm, psi, Hg, piping, disinfection
- Chemicals
  - Types, use and safe storage
- Testing and Record keeping
  - Rarely correctly or enough
- Safety
  - Barriers, depth markers, signage, rescue equipment
- Entrapment Avoidance
  - Plumbing, floor/ wall suction, covers, devices
- Toilets/Showers
# Water Quality Requirements

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Swimming, Wading, &amp; Receiving Pools</th>
<th>Spas / Hot Tubs</th>
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<tbody>
<tr>
<td>Free Residual Chlorine (mg/L)</td>
<td>1 - 5</td>
<td>2 - 10</td>
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<tr>
<td>Combined Chlorine (mg/L)</td>
<td>0.5</td>
<td>0.5</td>
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<tr>
<td>Bromine (mg/L)</td>
<td>2 - 10</td>
<td>2 - 10</td>
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<tr>
<td>pH (units)</td>
<td>7.0 - 7.8</td>
<td>7.0 - 7.8</td>
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<tr>
<td>Temperature (°F)</td>
<td>89 Maximum</td>
<td>104 Maximum</td>
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<tr>
<td>Clarity</td>
<td>Main Drain(s)/Bottom Clearly Visible</td>
<td>Main Drain(s)/Bottom Clearly Visible</td>
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<tr>
<td>Cyanuric Acid (mg/L)</td>
<td>50</td>
<td>50</td>
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<tr>
<td>Total Coliform (CTS/100 mL)</td>
<td>&lt; 1</td>
<td>&lt; 1</td>
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<tr>
<td>Escherichia coli</td>
<td>ABSENT</td>
<td>ABSENT</td>
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<tr>
<td>Non-Coliform (CTS/100 mL)</td>
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<td>&lt; 200</td>
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<tr>
<td>Heterotrophic Plate Count (cfu/mL)</td>
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<tr>
<td>Pseudomonas aeruginosa</td>
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<tr>
<td>Stat</td>
<td>Count</td>
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<td>Number of Inspections</td>
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<td>Number of Samples Collected</td>
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<td>Notice of Deficiencies</td>
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<td>Facilities with Bacteria</td>
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<td>Water Quality Violations</td>
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<td>Safety Violations</td>
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<td>On-Site Closure</td>
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<td>New Permits</td>
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</table>
How Do I Know What to Look For

A Quick Walk-Around

- Sight
- Sound
- Smell
- Touch
- Taste
How Do I Know What to Look For IDEAS???
Imminent Threat to Public Health

CAUSES:

• Filtration
• Circulation
• Disinfection
• Water Balance
• Algae
• Air Entrainment
Fall River Mass 2011
Algae Etc

- Green Algae
- Black Algae
- Mustard Algae
- White Water Mold

- Touch-Slimy walls
Circulation – The Basics

Suction side – Provides water to the pump:
- Skimmers/Gutters
- Drains/Outlets

Pressure side – Circulation within the pool
- Returns/Inlets

Diluting Dirty Water with Clean Water
Skimmer Function – Lift the Lid
Skimmers

• Water Level is Critical! Under and Over
• Circulation stops
• Surface removal of contaminants
• lighter than water
• Largest
Water Level

• Overflow
  – Largest concentration of contaminants
  – Lighter than water
  – Pollen, leaves and needles, dust, grass, algae, mucous (“Spit –n- Snot”), bodily fluids, lotions, oils, etc.

• Minimum of 50/50%  More is better! 80/20

• Convey water to the pump
Oh No You Didn’t
Importance of Inlets

• Distribution of filtered, disinfected, heated water
• Responsible for circulation within the pool
• Direct water to dead spots – EYEBALLS
• Up or Down?
Water Movement
What’s that Smell?
Leading Pool Myth
I can smell the chlorine from the hotel lobby!
What’s that Smell?

Strong odor associated with pools .....IT’S NOT CHLORINE

Free Chlorine Reacting with Urine/Sweat = CHLORAMINES

Responsible for most complaints

- Irritation of eyes and mucous membranes,
- Rashes
- Respiratory issues – Asthma attacks

Largest contribution from pee in the pool
What’s that Smell?

Chloramines are volatile and off-gas
Mono-chloramine, Di-chloramine, Nitrogen Trichloride

Air-Water Interface

Exacerbated by agitation of the water

Swim Teams, Water Aerobics, Water Features, Hot Tubs

Poor Ventilation and lack of Fresh Air

Other Sources
What’s that Smell?

Very hard to treat chemically for busy pools - Health Clubs

Shocking requires good ventilation and fresh air

UV treatment

Not a big problem in outdoor pools
Env-Wq 1102.12 “Cover/grate” means a covering fitting or assembly that separates the bather from the suction sump or piping, sometimes referred to as a “grate” or a “cover.”
Env-Wq 1104.07
Suction Outlet Cover/Grate

- (a) The operator of a PBF shall inspect each cover/grate daily to insure the cover/grate has not been damaged and is securely attached.

- (b) The owner of a PBF shall not allow bathers to use the PBF if any cover/grate is missing, broken, or secured in such a way that it can be removed without the use of tools.

Results in immediate on site closure
Covers must be securely fastened with supplied hardware and installed according to mfg instructions.
Entrapment Avoidance

- Types of Entrapment
  - Body Entrapment
  - Hair Entrapment
  - Limb Entrapment
  - Evisceration/Disembowelment
  - Mechanical Entrapment
Layers of Protection

• Approved Anti-Entrapment Covers

• Dual or multiple outlets Hydraulically
Balanced or Unblockable Drain

• Safety Vacuum Release System (SVRS)

• Emergency Shut Off Switch for all
spa pumps
Guidance: The Pool and Spa Safety Act does not cover vacuum ports, but CPSC recommends covering all outlets in pools and spas when they are in use.
Testing and Record Keeping

The operator of a PBF shall:

Conduct tests for disinfectant residual and pH prior to opening the PBF to the public and every 4 hours during operation. Temp for spas

Maintain dated daily logs for the PBF for a rolling 12-month period; and

Make the records available to the department and patrons of the PBF upon request.
Ask them for the records
Free Chlorine 1-5 ppm
pH 7.0-7.8
Spa Temp Max 104

Ask Them to test?

Free Chlorine 1-5 ppm
pH 7.0-7.8
Spa Temp Max 104

You do a test
Wanna take a dip?
Chemistry

Graph of disinfection efficacy according to pH

Graph of disinfection efficacy according to pH

% Active Biocide

Hypochlorous acid (HOCl)

Chlorine Dioxide (ClO₂)

Hypobromous Acid (HOBr)

Effectiveness is Maintained in Alkaline Waters
Pool Discharge
Discharge to Meredith Bay
Thanks!