

Swimming Pool Venue

Environmental Health Outbreak Investigation Survey:

An Environmental Health Systems Approach to Recreational Water Illness Prevention

- Information Collection Tool for Understanding How the Aquatic Facility Works -

Facility: _____ **Date(s):** _____

Address: _____ **City, State, Zip:** _____

Contact/Position: _____ **Telephone:** _____ **Email:** _____

Note to Environmental Health Specialist:

This data collection tool may be used where a thorough understanding of the integrated environmental health system of equipment, processes, people/policies, and economics is needed of an aquatic facility to better assess contributing factors during an outbreak investigation. It may also be used to assist the facility management to better control the factors that may impact the prevention practices. It should be completed in as much detail as possible. Not all the information specified may be available to environmental health specialists or applicable for every aquatic facility.

Completion of the form may take several hours – please keep in mind that this initial investment of time is quite important. In following years, only changes to the facility need to be addressed after the initial data collection is done. Please do not leave sections blank. If a question doesn't apply, write N/A. If a question can't be answered please explain why. Where applicable, please specify the unit of measurement being used (e.g., meters vs. feet).

Throughout this form the term "pool" will be generically used for individual water features such as spa, splash area, and water slide, as well as for a swimming pool. Use the chart below to link the collected data back to a specific aquatic feature. In the data collection, if there is more than one pool, specify whether answers apply to all pools, or just one. This form does not include space for more than four pools. Use multiple forms if more pools are included (e.g., at a water park). If available, please attach a plan review diagram to this assessment. If the facility has a map, please include. If no map or plan review diagram is available, make a sketch in the space provided on the last page, and/or attach labeled photographs.

It is recommended that if you are completing the form electronically, you use a different font and/or italics for your answers. This will make the form much easier to read if additional information is added in the future to an existing form.

Name / General Description

Pool 1

Pool 2

Pool 3

Pool 4

If more space is needed in any part of the form, please make a note and use the back of the page.

1. PHYSICAL DESCRIPTION OF POOL

	Pool 1	Pool 2	Pool 3	Pool 4
Indoor or Outdoor				
General Shape (rectangle, round..)				
Surface area (sq. ft. / m)				
Length x Width (or Radius) (specify yds, ft or m)				
No. gallons				
Depth range				
User Groups* (i.e. daycare, swim teams, water aerobics, adult swim etc.)				
Maximum bather load				
Decking type				
Pool surface type (specify)				
Slides				
Diving boards				
Sprinklers or other features				
Other Information				

*In the space below, provide the age range, and the season/ month for each group using the pool.

Notes:

What is the maximum bather load standard in your state for various facilities and sizes?

Are their policies to ensure that bather load is not exceeded?

Does the pool(s) meet current design standards?

2. WATER FLOW & TREATMENT

a. WATER SOURCE

What is the source of water used in the pool (i.e., natural, well, municipal, reclaimed, etc.)? What are the water treatment processes used in source water production? Does the water source (i.e., municipal water supply) use chloramine for disinfection?

b. STORAGE

Is the water stored on site under any condition (i.e. for future use)?

c. WATER FLOW / DELIVERY

How does the water flow from the pool(s), through the various (i.e. filtration, recirculation, heating, disinfecting) systems back into the pool?

Explain the steps in the water flow process. (i.e. the water leaves the pool through the main drains – x% enters through the heating system and then goes to the filtration system; y% goes directly through the filtration system – the water then goes through the disinfection system—the water then enters the pool through the inlets)

Are the pipes labeled with the direction of the water flow?

Are the valves labeled with the direction of on/ off?

Are there any pipes with dead ends? If so, how are they capped off?

Are there any pipes where the water flow is not known?

How is the pool refilled?

Does the water refilling the pool go through filtration? Disinfection? Heating? Recirculation? Other?

Recirculation

Fill in the number or description of the following and indicate their locations on the diagram(s).

Supply and return	Pool 1	Pool 2	Pool 3	Pool 4
Fill Line Height (for adding make-up water)				
Drains				
Skimmers				
Hair strainers				
Return inlets				
Gutters (specify type)				
Other				

Notes:

Filtration

Filter media	Pool 1	Pool 2	Pool 3	Pool 4
Media type*				
Make and model				
Specifications				
Surface area				
Maximum capacity				
Gallons/ pound or gallons/ square inch				
Influent Gauge reading				
Effluent Gauge reading				
Slurry feeder				

* DE, sand, gravity sand, pressure sand, anthracite, cartridge filter (specify media), other (specify).

Notes:

Please make sure to answer the following questions for all aquatic facilities:

Is the pump size adequate to ensure the required turnover rate?

Is the pump size adequate for the filter?

Is the pump working near maximum capacity?

In the event of an emergency, can the pump be made to work at a higher capacity than normal?

Is the pump in good condition?

If the pool has a cartridge filter, answer the following

Cartridges: give number, type, pore size (please specify unit of measure, i.e., microns).

What is the maintenance routine?

How old is it?

What are the manufacturer’s recommendations for cleaning the cartridge filter?

Are the manufacturer’s recommendations followed? If not, how is it cleaned?

How often is it replaced?

Filtration system

Sampling	Pool 1	Pool 2	Pool 3	Pool 4
Are there access ports to sample media?				
Can backwashed water be accessed for sampling?				
Is the pool filter accessible by operator during operating hours?				

Notes:

Turnover

Turnover	Pool 1	Pool 2	Pool 3	Pool 4
Pump Make and model				
Specifications				
Pump rate				
Flow rate (gpm)				
Turnover rate (Required)				
Turnover rate (Actual)				
Time since last maintenance date				
Volume of pool (gal)				

$$\text{Turnover Rate} = \frac{\text{Pool Volume (in gallons)}}{\text{Pump Flow Rate (in gpm)} * 60}$$

How many turnovers occur each day?
 (Indicate for each pool if there is more than one)

Does the turnover rate of each pool meet the requirements?

Notes:

Backwash*

For what reasons do you backwash your pool (s) (pressure differential, water cloudy, etc.)?

Backwash	Pool 1	Pool 2	Pool 3	Pool 4
How often?				
How long?				
Pressure differential needed before backwash?***				
Where is it discharged?				
Is the backwash visible?				
Other				

*Use back of page if necessary

***This information can be found in the pool’s policy statement or manufacturer’s manual

Notes:

Are there exceptions to the backwash schedule for the pool(s)? If yes, what are the exceptions?

Shared filtration

Is shared filtration between pools allowed in your state/district?

If there are multiple pools, are they on the same filter?

If there is a kiddie pool, is it filtered separately? If not, which pool(s) does it cocirculate with? (kiddie pools are low volume, shallow wading pools catering to diaper and toddler-ages children and may be at higher risk for fecal contamination)

Cross-connection

Is there an air gap where the fresh water enters the surge tank?

Is there an air gap at the pool waste line/backwash line?

Is there an air gap at the pool Fill line (used for adding make-up water)?

Heater

Note: heaters may inactivate certain pathogens therefore examining the temperature of the water in the boiler can help understand the health of the pool

Is (are) the pool(s) heated?

Is there a thermometer to check and/or set the temperature of the water in the boiler?

What is the high temperature in the boiler? (This information may be obtained from the operating manual.)

What is the set point for pool temperature?

System manufacturer and model? (This may be useful to obtain information such as high temperatures from the manufacturer if not otherwise available.)

Temperature of water in return (based on the manufacturer's recommendations)?

Is the water sent to the heater before filtration or after?

What percentage of water is heated? (Approximately)

Notes:

Disinfection

Fill in the brand name and amount used. If UV is used, indicate the level of energy delivered in millijoules.

	Pool 1	Pool 2	Pool 3	Pool 4
Chlorine (specify liquid, tablet, powder, gas*)				
Bromine				
Peroxyamino-sulfate				
Ozone				
UV				
Other				

*If liquid chlorine, what % NaOCl (sodium hypochlorite) active ingredient?

*** In the following sections there are some questions regarding the distance between the controller and the probe. A smaller distance between these two is essential to ensure that actual pool conditions are being measured.**

Notes:

Disinfectant Addition

	Pool 1	Pool 2	Pool 3	Pool 4
Added manually or by a controller?				
Name of system or controller				
Model				
Manufacturer				
Distance from the controller's meter to the probe				
Where is the injector located?				
Distance from chemical injection site to probe				

If a controller is used, are colorimetric tests being performed, too?

Does the automatic pool chlorinator measure chlorine or oxidation reduction potential (ORP)? If yes, what are the maintenance and calibration procedures and frequency of these? Is there an automatic record of these readings maintained?

Notes:

Disinfection policy

What is the response if chlorine levels drop too low?

Cyanurates

Is the use of cyanurates permitted in your state?

Are cyanurates used in these pool(s), specify?

Do they factor in cyanurates with the measurement of free chlorine residual? If yes, how do they do it?

What level of cyanurates is maintained?

What are the state and local standards for pool chlorination? Do the standards account for cyanurates?

If there is a state or local requirement to increase free chlorine ppm if cyanurates are present, does the pool conform?

Do they measure cyanurate levels? How often?

What method do you use to measure cyanurate levels?

pH Adjustment Equipment

	Pool 1	Pool 2	Pool 3	Pool 4
Type of chemicals used for pH adjustment				
Added manually or by a controller?				
Name of system or controller				
Model				
Manufacturer				
Distance from chemical injection site to probe				
Where is the injector located?				
Distance from chemical injection site to probe				

Notes:

Shocking the Pool(s) (hyperchlorination, superchlorination, chlorine-shocking, etc.)

Under what conditions is the pool shocked?

What method is used to shock the pool (specify products)?

How is the proper amount of chemicals to use determined?

If chlorine shock is used, what concentration (mg/L) is achieved?

Do they measure the concentration? If yes, how?

How do they return the disinfectant levels to normal?

Waste

How is disposal of the following things handled?

Chlorinated Water

Where is chlorinated wastewater put?

Does this meet the waste disposal standards?

Wastes: old filter media, backwash

Biological Waste:

Vomit

Fecal contamination

Blood fluids

Dead animals

Notes:

3. ASSOCIATED PHYSICAL FACILITIES

Hygiene

Proper hand washing, especially after changing diapers or using the toilet is essential to reducing the risk of recreational water illnesses. This section addresses the ease of hand washing, showering, and other good hygiene practices in the facilities.

Facility	Location	How many?	Distance from pool*
Changing room			
Toilet			
Shower			
Diaper-changing area			
Hand washing/sinks			

*If more than one pool, specify distance from the nearest

Notes:

What is the distance from the hand washing sinks to the diaper-changing area?

Is there adequate soap, paper towels, hot water, etc.?

How often are supplies refilled?

Are directions for hand washing posted?

Are the faucets spring-loaded? (Often spring loaded faucets do not give users enough time to adequately wash their hands)

Is there a pre-swimming shower policy? If so, provide a copy or a summary.

Is there a policy for washing hands? If so, provide a copy or a summary.

Are animals allowed on the premises? If so, what types?

Is there a swim diaper policy? If so, provide a copy or a summary.

Food & Water Vending (If Applicable)

Operation of Food & Water Vending

Are there policies regarding food vending at this type of facility in your state/district? If so, what are they?

Is food service available? If so, list food source and type. Provide a list or menu of food served. What are the hours of operation?

Are vending machines available? If so, list food source and type. Provide a list of food items.

Is picnicking allowed at the pool facility? If so, where is picnicking allowed?

Water fountain(s): how many? Where are they located?

Are food and drink allowed around or in the pool?

Notes:

4. FACILITY MANAGEMENT

(If possible, obtain copies of all documents listed below.)

Operational

Is the pool public (i.e., municipal or other organization) or private (i.e., club or residential)? (Note: if these do not fit your state's categories, write them in)

What are the months, hours and days of operation?

What is the vacuuming schedule?

Biological Incident policy:

Fecal accident response

Does the pool have a fecal accident response policy?

If yes, what is the policy? (please obtain a written copy if possible)

Vomit response

Does the pool have a vomit response policy?

If yes, what is the vomit policy? (Please obtain a written copy if possible)

Blood-borne pathogen response

Does the pool have a blood-borne pathogen response policy?

If yes, what is the blood-borne pathogen policy? (Please obtain a written copy if possible)

Is there a fecal/vomit accident response log? If so, provide a copy.

Record keeping

Is the pool operator keeping water chemistry records?

What water chemistry activities are recorded in the log book?

How often and when are the water chemistry activities recorded in the log book?

Who recorded the water chemistry measurements?

Is the acceptable range for water chemistry listed in the log book?

Is the pool operator keeping maintenance records?

What maintenance activities are recorded in the log book (backwash, etc.)?

Are records kept of the following (if so, provide a copy):

Construction or modifications

Recent maintenance

Pump & equipment repairs

Disinfection system repairs

Who reviews these records?

What warrants a pool closing?

Notes:

5. PEOPLE : Recreational Water Illnesses (RWIs) and Employees and Pool users

Membership

Is membership required?

If yes, what is the number of members?

Ages

What age groups are using pools?

Policies

What are the pool use policies (restrictions, limited use by certain groups, etc.)

What type of education of swimmers is there regarding RWIs (all swimmers, season-pass holders)?

What type of education required for pool staff regarding RWIs?

Is there a daycare use policy in place?

Signage regarding policies on the following issues:

Restrictions on swimmers?

Vomit?

Fecal contamination?

Blood fluids?

Bather loads?

Notes:

6. RECENT DEVELOPMENTS

Any recent pool problems that could lead to potential health effects (i.e. changes in filters, pumps, chemicals, etc.)? Describe.

Has the pool switched any routines lately? Describe.

Have there been any modifications to the pool lately? Describe.

Has there been any disruption in the water service since opening the facility? Describe.

Have fertilizers or pesticides been used near the pool recently? Describe.

Notes:

7. FIELD ASSESSMENT

Disinfection

Field assessment measurements (actual measurements on day of assessment)

	Pool 1	Pool 2	Pool 3	Pool 4
pH level				
Total chlorine				
Free/residual Cl ₂ (normal)				
Combined chlorine				
ORP reading (if applicable)				
Total alkalinity				
Cyanurates				
Water clarity/ Turbidity (e.g. visual or metric)				

Notes:

Water Chemistry Measurement Observations

	Pool 1	Pool 2	Pool 3	Pool 4
Test kit manufacturer?				
Expiration date of the chemicals in the test kit?				
How often are free chlorine residual levels measured?				
How often are the pH levels measured?				
What time(s) of day is the free chlorine measured? The pH measured?				
Method used for measurement? (i.e., DPD)				
Where is the reading taken? (i.e., poolside, filter bay)				

Notes:

What other water quality readings were taken and measurements?

If other water indicators measured, what method of measurement is used?

What is the state/district policy regarding how often water chemistry readings should be taken?

How often are readings taken? Where are readings taken?

Notes:

Final note to Environmental Health Specialist: if you think of any other situations or issues not covered by this form, please include them in this space.

Please attach plans or draw the pool(s), with measurements/dimensions indicated and/or provide labeled photographs, if possible.