



[Date]

[NAME]

[DEPT]

[ADDRESS]

Re: [FACILITY]

Dear [CLIENT];

This Report will discuss the research, analysis, calculations, opinions, and conclusions of USA Management LLC. concerning the existing aquatic facilities at [FACILITY] Swimming Pool Facility located at [FACILITY ADDRESS].

We have the experience and expertise to review and analyze the pertinent information concerning this project and its issues as well as provide a competent conclusion and recommendations from the information.

COMMON ABBREVIATIONS

For brevity, the following abbreviations may be used in this report:

- ADA – The United States regulations commonly referred to as the Americans with Disabilities Act of 1990, specifically Title III (Accommodations – Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities)
- VGBA – The United States regulation commonly referred to as the Virginia Graeme Baker Swimming Pool and Spa Safety Act
- ARS – Arizona Revised Statutes 665, Title 18 Environmental Quality, Chapter 5 Department of Environmental Quality,, Environmental Reviews and Certification, Article 2 Public and Semipublic Swimming Pools and Spas, December 31, 2008.
- ISPSC – International Swimming Pool and Spa Code, a code reference rather than a regulation
- NEC – National Electric Code, a code reference rather than a regulation.
- SF – Square Feet (measure of area)
- FT – Feet (unit of measure)
- IN – Inch (unit of measure)
- CF – Cubic Feet (measure of volume)
- GAL – Gallons (measure of volume)
- FPS – Feet per Second (measure of velocity)
- GPM – Gallons per Minute (measure of flow volume over time)
- TDH – Total Dynamic Head (measure of pressure in a confined system)
- HP – Horsepower (measure of electrical energy transfer or power, typical for pumps and motors)

INTENT OF REPORT

The proposal for services noted above included an onsite survey of the aquatic facilities and appurtenances to observe the condition of the pool structures, finishes, deck, lighting, fittings, MEP equipment, signage, and ancillary equipment. The intent of this report is to analyze the information obtained during the on-site survey to identify any regulatory compliance issues and construction, operation, or maintenance issues and/or defects. Each identified issue will be described with a reference to the applicable regulation.

PRELIMINARY INFORMATION

The project is a municipal park with an aquatics facility generally north of 5th Street and east of 10th Avenue. The aquatic facilities are within a common fenced area which includes a small “wading” pool and a separate swimming pool (Lap and Diving Pool), concrete deck, a bath house, fixed benches and portable picnic tables, and several shade structures attached to the bath house. Generally, the pools are completely exposed to the elements. The mechanical and electrical equipment for the aquatic facilities is located in the large equipment and storage area located on the south side of the bath house. Based on Google Earth imagery, the pools were built prior to 1978. No Construction or Record Documents have been provided.

Note: The small pool is not properly a “Wading Pool” in accordance with ARS R18-5-244, as it exceeds the maximum depth of 24-IN. However, for purposes of brevity the small pool will be referred to as “The Wading Pool” in this report.

ONSITE SURVEY OBSERVATIONS

We performed an onsite survey of the existing swimming pools on November 18, 2022. During this site visit, we collected photographs of the existing conditions as well as measurements and notes.

Our preliminary observations during this site visit included the following:

- The Wading Pool is rectangular in shape with a water surface area approximately 40-FT in length and 14-FT wide. The minimum water depth is 1.0-FT and the maximum is 3.0FT. There is (1) structural step across the shallow end. The approximate water surface area is 560 SF with an approximate volume of 1,100 CF (8,250 GAL). The total Wading Pool system volume (pool basin, piping, and mechanical equipment) is approximately 8,700 GAL. The pool includes (2) skimmers (one at the shallow end and one at the deep end) eight (8) bottom returns. According to Staff the pool includes (2) 8-IN diameter main drains in the deep end of the pool, though these were not visible due to the poor water quality covering this area. The pool does not have any side wall returns, light fixtures, step rails, or ladders. The pool is located within the common pool fence perimeter and placed approximately 20-FT from the Lap Pool. The depth of the Lap Pool at the closest point to the Wading Pool is approximately 4-FT.
- The Lap Pool is rectangular in shape with a water surface area approximately 164-FT in length and 50-FT wide. The minimum water depth is 3.0-FT and the maximum is 12.0FT. There are two (2) sets of three (3) structural steps in 6-FT wide by 3-FT deep swim outs located at each side of the shallow end of the pool. The approximate water surface area is 8,236 SF with an approximate volume of 49,272 CF (369,540 GAL). The total Lap Pool system volume (pool basin, piping, and mechanical equipment) is

approximately 388,000 GAL. The pool includes a perimeter gutter system with (50) grated drop outs. According to Staff, the gutter drains to waste and there is no surge tank. The pool also includes (21) floor returns, (6) light fixtures, (3) three-rung over wall ladders, (2) step rails, and (1) 1-meter diving stand with 16-FT fiberglass springboard. According to Staff the pool includes (4) 12-IN square main drains in the deep end of the pool, though these were not visible due to the poor water quality covering this area. The pool does not have any side wall returns.

- The pool deck consists of fairly smooth concrete with sheet drainage to the perimeter lawn areas. The deck concrete has numerous cracks and separations. Most of the joint caulk is degraded or missing. There does not appear to be any significant vertical movement of the deck or separation from the pool coping.
- The pool area is surrounded by a 10-FT tall chain link fence with (2) gated openings. The main entrance is through a welded steel gate set into an opening of the bath house.
- There are a number of 24-foot tall poles set around the pool deck with 1, 2, or 3 light fixtures aimed into the pool area.

In general, the swimming pools appear to be a typical concrete (Gunitite) structure with Marcite (marble dust and cement) plaster, plastic inlet and return fittings (main drains and floor returns), and line voltage (120 volt) underwater light fixtures. The Wading Pool appears to be structurally sound with no cracks or significant displacement (settlement or heaving); however, the Lap Pool has numerous cracks in the floor and walls along with some significant separation at the expansion joint located across the 5-FT depth line. The equipment does not appear to be serviceable with none of the systems operating during my site visit. Several equipment items are damaged beyond repair.

SPECIFIC FINDINGS

According to a plaque on the wall of the bath house, the pool was dedicated in May 1977. Regulations for Public Pools in [SAID STATE] were minimal in 1977; hence, the design criteria can only be assumed based on the existing equipment.

The sanitary facilities include the following:

- Women's Rest Room
 - (2) Toilets, (1) Handicapped accessible
 - (1) Sink
- Men's Rest Room
 - (2) Urinals
 - (1) Toilet, Handicapped accessible
 - (1) Sink

The Wading Pool Mechanical equipment consists of the following:

- Filter Pump – Discontinued version, Hayward Self-Priming Tristar Pump, 1.5 HP, approximate capacity is 55 GPM at 60-FT TDH.
- Filter – Hayward 18-IN High Rate Sand Filter with side mount dial valve, approximate capacity is 35 GPM.

- Chlorinator – Pentair Model 300 Rainbow off line tablet chlorinator, maximum water volume is 12,000 GAL.
- Blue White Model F-300 Flow Meter, maximum flow rate of 120 GPM.
- 2-IN Schedule 40 piping – (1) main drain suction line, (1) skimmer suction line, (1) filter return line, (1) backwash line.

Based on the Wading Pool description and equipment info noted above, the system characteristics are as follows:

- Wading Pool turn over rate (based on maximum flow rate through filter 8,700 GAL / 35 GPM = 249 minutes) is approximately 4.14 hours.
- Wading Pool turn over rate (based on maximum flow rate from pump 8,700 GAL / 55 GPM = 159 minutes) is approximately 2.64 hours.
- Water Velocity through suction and discharge piping (based on maximum flow rate through filter) is approximately 3.35 FPS.
- Water Velocity through suction and discharge piping (based on maximum flow rate from pump) is approximately 5.26 FPS.

The Lap Pool Mechanical equipment consists of the following:

- (2) Aquatech, End Suction Centrifugal Pump, Model 780A75274, 7.5 HP, approximate capacity is 500 GPM at 60-FT TDH (each), total maximum flow rate is approximately 1,000 GPM. 6-IN suction, 4-IN discharge flanges.
- (12) Hayward 36-IN High Rate Sand Filter with side mount dial valve, approximate capacity is 142 GPM (each), total maximum flow rate is approximately 1,704 GPM. 2-IN side wall connections. Note: (3) sets of (4) filters are placed on (3) 4-IN sub-manifolds.
- Chlorinator – Pentair Model 3340 Rainbow off line tablet chlorinator, maximum water volume is 658,500 GAL.
- Blue White Model F-300 Flow Meter, maximum flow rate of 2,200 GPM.
- Kruger & Eckels Model 307 Chemical Controller, inoperative.
- Accu-Tab Series 3150 Tablet Chlorinator, inoperative.
- 8-IN piping from main drain.
- 6-IN piping to pump suctions.
- 4-IN piping from pump discharge.
- 8-IN filter manifold piping.
- 4-IN filter sub-manifold piping.
- 8-IN piping to pool returns.
- 6-IN piping to backwash.
- 1.5-IN piping from filter return to Accu-Tab.
- 3-IN piping from Accu-Tab to pump suction.

Based on the Lap Pool description and equipment info noted above, the system characteristics are as follows:

- Lap Pool turn over rate (based on maximum flow rate through filters (388,000 GAL / 1,704 GPM = 228 minutes) is approximately 3.8 hours.
- Lap Pool turn over rate (based on maximum flow rate from pumps (388,000 GAL / 1,000 GPM = 388 minutes) is approximately 6.47 hours.
- Water Velocity through 8-IN main drain suction line is approximately 6.38 FPS.
- Water Velocity through 6-IN pump suction line is approximately 5.56 FPS.

- Water Velocity through 4-IN pump discharge line is approximately 12.6 FPS.
- Water Velocity through 8-IN filter manifold line is approximately 6.38 FPS.
- Water Velocity through 4-IN filter sub-manifold line is approximately 5.4 FPS.
- Water Velocity through 6-IN filter backwash line is approximately 11.1 FPS.
- Water Velocity through each 2-IN filter connection is approximately 7.94 FPS.

REGULATORY AND CODE COMPLIANCE ISSUES

The following analysis will be based on the current State regulations (published and in force as of 1/1/2023) as any significant renovation or remodeling work will require compliance with such. Comparison between previous and current regulations will be provided where available or known.

Specific Comments and Issues with Regulatory References:

- ADA 242.2 – swimming pools with maximum water depths of 24-inches must have an ADA compliant ramp from the deck level to the pool floor. Swimming pools with water depths exceeding 24-IN and with less than 300-FT of perimeter must have (1) approved means of handicapped access (lift or ramp). Swimming pools with more than 300-FT of perimeter must have (2) means of access (lift or ramp plus wither lift, ramp, transfer wall, or transfer stairs).
 - Wading Pool has approximately 108-FT of perimeter and must have (1) means of handicapped access.
 - Lap Pool has approximately 452-FT of perimeter and must have (2) means of handicapped access.
- ARS R18-5-207 – Construction Materials
 - (C) – The Lap Pool shell has numerous cracks and structural failures which imply the pool is no longer waterproof.
 - (D) – The Lap Pool has numerous cracks in both the floor and walls. The Lap Pool expansion joint has failed and is no longer water tight.
- ARS R18-5-208
 - (B) – Based on the water surface area of the pools, the maximum users in the Wading Pool is 56 people and the maximum users in the Lap Pool is 666 people.
 - (C) – Based on the available toilets, the maximum users which can be inside the aquatics facility is 250 people.
 - (E) – The maximum bather load for each pool must be posted in a conspicuous area within the pool enclosure.
- ARS R18-5-213 – Entries and Exits
 - (A) – The Wading Pool does not have the minimum number of exits.
 - (B) – Steps and ladders placement in the Lap Pool does not comply with maximum separation of 75-FT.
 - (C) – The Wading Pool does not have an exit at the deep end of the pool.
 - (E) – The location of the ladders in the Lap Pool intrudes into the racing lanes.
- ARS R18-5-214 – Steps
 - (A) – The Wading Pool steps do not have a hand rail.
 - (B) – The steps in the Lap Pool and the Wading Pool are not clearly marked with a contrasting color tile band.

- (F) – The steps in the Lap Pool have riser heights which exceed the maximum allowable dimension of 12-IN.
- ARS R18-5-215 – Ladders
 - (A) – Due to width of Lap Pool exceeding 20-FT, ladders are required on each side of deep end.
- ARS R18-5-217 – Decks and Deck Equipment
 - (H) – Hose bibs are not located to allow access to all areas of the deck.

(J) Insufficient joints are in the pool deck to prevent cracking and movement. The width of some joints exceeds the allowable 3/16-IN. Construction and expansion joints in the deck are not watertight.

- ARS R18-5-218 – Lighting
 - (B) – There is insufficient underwater and exterior lighting to properly illuminate the pools for use in low light conditions. There are no lights in the Wading Pool. The Lap Pool does not have sufficient exterior lighting to properly illuminate the deck on the east and west sides of the pool.
- ARS R18-5-219 – Water Depths
 - (A) – The minimum water depth in the Wading Pool exceeds 24-IN. Hence, this pool is not compliant with the regulations for a Wading Pool and must be treated as a standard swimming pool. The minimum depth for racing lanes to terminate is 5-FT – the minimum water depth in the Lap Pool where the racing lanes terminate is 3-FT.
- ARS R18-5-220 – Depth Markers
 - (A) – There are no depth markers on the vertical walls of the Lap Pool, except for (1) located at each set of steps.
 - (B) – Depth markers on the deck of the Lap Pool exceed the maximum spacing of every 1-FT of water depth change until the 5-FT water depth. Depth markers on the deck of the Lap Pool exceed the maximum spacing of every 2-FT of water depth change in areas deeper than 5-FT of water depth. Depth markers on the deck of the Lap Pool exceed the maximum horizontal spacing of every 25-FT.
 - (F) – The shallow end of the Lap Pool (area of pool less than 5-FT deep) is not set aside with a rope and float line.
- ARS R18-5-221 – Diving Areas and Equipment
 - (A) – The diving board at the Lap Pool exceeds the maximum allowable length.
 - (I) – The diving board manufacturer's information is not readily visible.
 - there are not sufficient skimmers in the pools to allow 100% of the flow through the skimmer system.
- ARS R18-5-222 – Prohibition Against Diving
 - (B) – “NO DIVING” markers are not provided at either pool for water depths less than 5FT.
- ARS R18-5-223 – Circulation System
 - (D) – Circulation equipment is not accessible for inspection, repair, or replacement.
- ARS R18-5-224 – Piping and Fittings
 - (A) – The water velocity in several suction lines exceeds the allowable 6 FPS. The water velocity in several discharge lines exceeds the allowable 10 FPS.
 - (E) – Piping which is subject to freezing does not have the required slope or drain valves.
 - (G) – Piping is not properly identified as to purpose and flow direction.
- ARS R18-5-225 – Pumps and Motors
 - (A) – Wading Pool pump capacity exceeds Wading Pool filter capacity.
 - (D) – No emergency shut off switches are provided in the pool area for the pumps.
- ARS R18-5-226 – Drains and Suction Outlets
 - (B) – Due to the lack of water clarity to visually inspect the main drains, it is not apparent that the main drains have tamper resistant hardware and open areas compliant with regulations.

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(C) Due to the lack of water clarity to visually inspect the main drains, it is not apparent that the main drains have the maximum spacing to comply with regulations.

- ARS R18-5-227 – Filters
 - (A) – filters are not installed to allow ready access to covers for inspection and maintenance.
 - (B) – Filters do not have an automatic air release system.
 - (C) – Filter backwash line does not have a sight glass.
 - (E) – The Wading Pool pump capacity exceeds the maximum allowable flow rate of 25 GPM/SF.
- ARS R18-5-228 – Return Inlets
 - (A) – For the Wading Pool, side wall return inlets are required to direct water flow towards the skimmers.
 - (B) – Pools are required to have a minimum of (1) return inlet per 300 SF of water surface area. The Lap Pool has (1) return inlet per 392 SF of water surface area.
- ARS R18-5-229 – Gauges
 - (B) – Neither circulation system has the required gauges.
- ARS R18-5-230 – Flow Meter
 - (A) – Neither circulation system has a properly installed flow meter.
- ARS R18-5-232 – Overflow Collection System
 - (C) – The overflow collection system at the Lap Pool is not capable of carrying 50% of the minimum system flow rate.
 - (D) – The overflow collection system is not continuous around the pool perimeter. There is no surge chamber installed.
- ARS R18-5-233 – Vacuum System
 - (A) – Neither pool has an installed or portable vacuum system.
- ARS R18-5-236 – Disposal of Filter Backwash
 - (A) – It is not apparent if the backwash from the Lap Pool is directed into a sanitary sewer system. The filter backwash from the Wading Pool is directed onto the ground and not properly into a sanitary sewer system.
- ARS R18-5-237 – Life Guard Chairs
 - (A) – Based on the water surface area of the pools, the Wading Pool is required to have a minimum of (1) Life Guard Chair and the Lap Pool is required to have a minimum of (3) Life Guard chairs.
- ARS R18-5-238 – Life Saving and Safety Equipment
 - (B) – Each pool is required to have a separate US Coast Guard approved ring buoy with 50-FT of rope and (1) 16-FT long non-conductive reach pole with attached shepherd hook.
- ARS R18-5-239 – Rope and Float Line
 - (A) – A rope and float line is required across the Lap Pool on the shallow side of the 5FT depth line.
- ARS R18-5-240 – Barriers
 - (B)(4) – The gate into the bath house does not have the required self-closing and selflatching gate mechanism.
- ARS R18-5-241 – Bath Houses and Dressing Rooms
 - (A) – The dressing rooms are not equipped with baskets or other storage facilities.
 - (F) – There are insufficient hose bibs to allow the dressing rooms to be washed down.
- (H) Based on the available toilets and urinals, the maximum number of people which can be in the aquatics facility is 250 people. No sanitary napkin dispensers are installed in the female dressing area.
 - (I) – A minimum of (2) showers are required in each dressing facility. Only (1) nonworking shower is in each facility.
- ARS R18-5-244 – Wading Pool

Note – the small pool is not compliant with the requirements for a “Wading Pool” designation. The following information is provided to ensure the small pool can be made compliant if desired.

- (B)(1) – The Wading Pool is not separated from the main pool area by a 4-FT tall fence with self-closing, self-latching gate.
- (C) – The Wading Pool maximum water depth exceeds 2-FT.
- (K) – A separate drinking fountain sized for children must be located in the wading pool fenced area.

The ISPSC, although not a component of the Arizona State regulations for public pools, has several areas with more restrictive recommendations than referenced above. These include:

- Minimum turn over rate – 6 hours instead of 8 hours
- Fewer allowed users – 15 SF/USER instead of 10 SF/USER
- Maximum water depth of wading pools is not to exceed 18-IN.
- Submerged suction outlets (main drains) are prohibited in wading pools.
- A body board with neck restraint, Red Cross approved 24 unit first aid kit, and an AED unit are required for the Life Guards.
- A 911 accessible phone is required in the pool area.
- Safety signage is required in the pool area.

Each of these recommendations creates a safer and cleaner aquatics facility. In general, unless otherwise prohibited by a State regulation we recommend all pools comply with the current ISPSC recommendations.

CONCLUSIONS AND RECOMMENDATIONS

The following are my conclusions and recommendations concerning the various issues noted in this Report:

- The Lap Pool structure will require significant renovation work to seal the existing cracks and ensure there are no future structural failures. It is likely that any repair will be temporary and continued movement of the subgrade will cause new failures to appear over time. A permanent solution will require a completely new pool basin to be installed.
- The mechanical systems for both pools should be completely replaced to use current technology to create the highest water quality possible. This is the single most significant issue which affects the health of the pool users.
- Repair/replace the existing deck to ensure a watertight, slip resistant surface which has no trip hazards.
- Install compliant deck markers and safety signage.
- Renovate the dressing and sanitation facilities to meet the anticipated users and achieve minimum code compliance

- Review planning and programming to determine if the pools can be reconfigured to achieve a broader range of activities for users of all abilities, ages, and access needs.

Thank you for the opportunity to prepare and submit this report for your consideration. We appreciate the opportunity to provide our services to create it. If you have any questions or need any additional information, please contact our office.

Sincerely,

USA Management LLC.

Attachments – pictures with commentary



Chain link perimeter fence and exterior pole lighting.

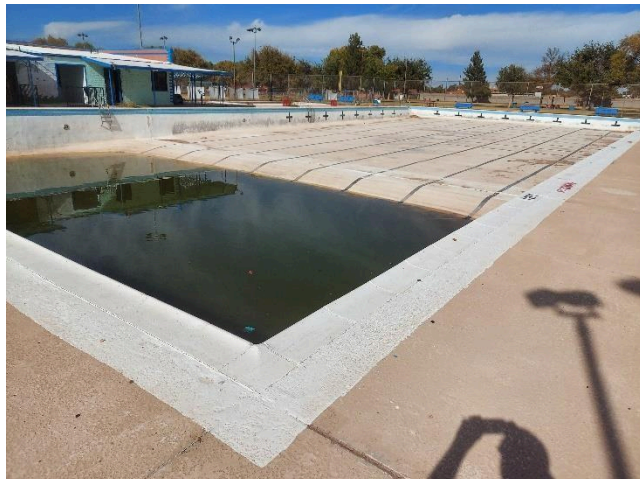


Wading pool.



Lap pool – shallow end.

Lap pool – deep end with diving tower and springboard. Bath house and equipment yard with attached shade structures.



Lap pool



Entry gate at west side of bath house.



Lap pool expansion joint – failed caulk across entire joint.



Significant cracks in deck. Minor corrosion on diving tower.



Separation between coping and deck.
Failed caulk in joints.

Bottom of fence tied and padlocked to rebar in an attempt to prevent unauthorized entry into pool area.





Significant cracks in deck with some separation. Failed caulk in joints.



Electrical junction box – not elevated above pool water surface to comply with NEC.



Lap pool filter plant – several filter tank lids are broken or missing, several filter base supports are broken.

Insufficient access to comply with OSHA.

Vegetation restricts sight and access.



Lap pool filter pumps – one motor is missing, piping creates air blockages, pumps are not suitable for self-priming position.

No vacuum or pressure gauges.



Lap pool filter plant manifold – no pipe supports on upper section, flow meters not located per manufacturers recommendations.

Lap pool filter plant – insufficient pipe supports on upper section, several filter tank lids are broken or missing, several filter base supports are broken.

Insufficient access to comply with OSHA.

Vegetation restricts sight and access.





Wading pool filter plant – backwash does not tie into sanitary sewer, flow meters not located per manufacturers recommendations.



Lap pool chemical controller – significant damage to protective case and missing components.

Storage room – debris and trash restricting access, inoperative equipment, electrical equipment does not have sufficient clearance to comply with NEC.





Lap pool floor return – missing cover plate.

Significant structural crack across pool floor.



Significant structural crack in Lap pool wall translating through tile bands.

Tile and plaster spalling.



Significant cracks in Lap pool floor.



Lap pool expansion joint – significant structural failure, caulk and plaster failures.



Significant structural crack in Lap pool wall translating through tile bands.

Lap pool expansion joint – significant structural failure, caulk and plaster failures.





Lap pool floor – structural failure and separation with flexure cracks.



Chemical storage areas – rust and corrosion of metal surfaces. Dry rot in wood. Roof material has separated and no longer attached to support structure.

Lap pool – plaster spalling. Vertical displacement between deck and coping.





Lap pool – gutter does not extend around entire pool perimeter.

Plaster and tile spalling.



Lap pool – inconsistent step height, hand rail does not extend to bottom step.