



# MILES CITY, MT SPLASH PAD



**Preliminary  
Engineering  
Review**



**INTERSTATE  
ENGINEERING**

6066 MT Highway  
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**PRELIMINARY ENGINEERING REVIEW**  
**SPLASH PAD**  
**MILES CITY, MONTANA**  
July 2025  
WR25-04-106

## ***General***

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This Preliminary Engineering Review has been prepared on behalf of Milestown Community Improvement, Inc. (MCI2) and the City of Miles City to present the findings of a recent site evaluation and engineering assessment of the splash pad. The evaluation was initiated in response to ongoing concerns regarding consistent water usage which has led to increased operational costs.

An on-site evaluation was conducted on June 11, 2025, by Kaden Bedwell, P.E., and Zach Mills, P.E, of Interstate Engineering and Brady Stone, Jase Kinsey, and Seth Lockie from the City of Miles City Parks & Recreation Department. Input from city staff provided valuable context regarding the facility's operational history, and community usage. Community members were eager to have the facilities open while closed for evaluation, showing the significance of the amenities to local residents.

The objective of this report is to document the results of the site investigation, identify the primary sources and contributing factors of the water usage and splash pad problems, and then provide engineering solutions to address the identified issues. The nondestructive assessment focused on both structural and mechanical components of the system, including the splash deck, piping, play features, treatment equipment and associated infrastructure.

Based on the findings, this report will provide recommendations and construction cost estimates aimed at maintaining the facility at full operational condition, improving long-term performance, and supporting municipality's effort to preserve access to safe and sustainable public recreational opportunities for the community.

## ***Background***

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The splash pad in the City of Miles City, MT, located in Wibaux Park at 200 S. Strevell Avenue, was constructed in 2022. The splash pad is approximately 8,400 square foot in size and accommodates a variety of slides, spray features and dump features. Over the few years, the facility has had the fiberglass storage tank patched, the dump buckets replaced, UV unit troubleshooting calls and a concrete deck expansion to contain water on the slab.

In 2024, Kaden met with Brady and Jase onsite to discuss ongoing issues with the UV system not operating correctly, the tumble buckets not dumping and the automatic fill system not functioning properly. Information and documentation was sent on to the rep for Waterplay who set up a meeting between himself, a UV technician and Jase. Prior to said meeting occurring, the UV unit began functioning properly again. Video was requested of the tumble buckets not spinning and it was discussed to try rotating the water spray bar to push the bucket downwards. There was also no visible signs of underground water leakage and it was recommended that the city attempt to pressure test the recirculation piping and plug off the tanks for inspection that fall.

## Site Findings

An on-site evaluation of the Miles City splash pad was conducted on June 11, 2025. The assessment included a visual inspection of the play features, splash deck, mechanical systems, holding tanks, pipes, and surrounding infrastructure. Dye testing was also performed in the two structures once water levels were at safe occupancy levels. Discussions were held with the facility operators. The following key findings were identified:

### Splash Pad and Play Structure

- The pad is a cast-in-place concrete splash deck. When originally constructed, concrete control joints spaced at approximately 10-foot intervals with little surface cracking between joints. The concrete deck originally had an area that held water, however this was addressed via surface grinding a channel into the concrete to drain the puddle.
- The overspray slab surrounding the splash deck is 6 feet wide and slopes to one of the four main drains. A concrete extension to the slab was installed in front of the northwest slide in 2024 to contain the water from bringing dirt and debris back onto the splash pad.
- A large play feature is roughly centered on the splash pad. The structure features an elevated play tower with two slides, dump features and numerous aerial and ground sprays. While onsite it was observed that the same dump bucket from the 2024 meeting was stuck upside down. The operators found a hex key, loosened a set screw, rotated the spray bar, tightened the set screw and the dump bucket began working properly the rest of the time we were onsite. It was also noticed that the slide structures have excessive oxidation staining and the slide flanges are cracked and leaking at numerous joints.



Figure 1: Concrete drainage grinding.



Figure 2: Joint leak below slide.

### Mechanical System

- Four main drains gather the feature water off the splash pad and drain it into a settling strainer manhole. From the strainer manhole, it's piped into a 4,000 gallon fiberglass storage tank where the recirculation system draws water. During operations, it was noticed that the city staff was straining cotton and debris out of the storage tank instead of the strainer manhole. The strainer manhole has a vertical PVC tee in it with a standpipe that has perforated holes to strain said debris

out prior to making it to the storage tank. During operation, the flow rate of the water draining from the splash pad would exceed the allowable flow through the standpipe penetrations so the water level would completely fill the strainer manhole before dumping into the top of the standpipe, thus creating a water imbalance between the two tanks. When the pumps for the splash pad system turn on, a large water draw is put on the storage tank and the slow draining strainer manhole didn't allow the water to recirculate fast enough to keep the storage tank levels from dropping low. During a normal operation, this would turn the autofill on as the tank is demanding water but then when the splash pad turns off and the tanks finally balance out, the storage tank would be overfull and waste out the overflow line. Interstate recommended that either the staff drill additional larger penetrations in the standpipe or remove the standpipe entirely. Before leaving the facility, the pipe was removed and the water levels balanced between the two tanks.

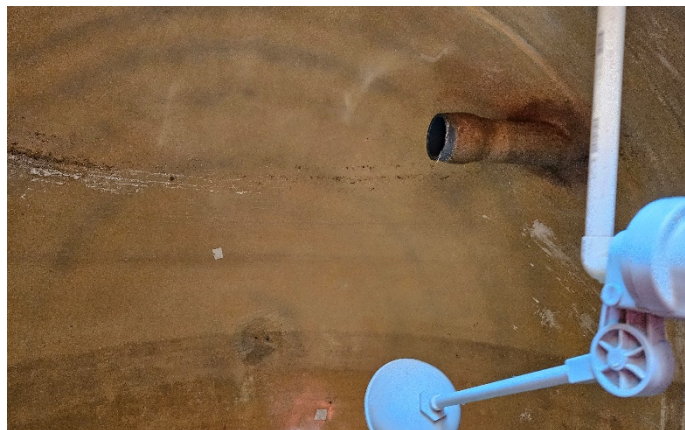


**Figure 3: Strainer manhole full of water with standpipe.**



**Figure 4: Strainer manhole after standpipe removed.**

- The autofill system is a 1" line that runs from the mechanical building into the storage tank and is controlled with a ball float valve at the end. The city stated that even when the ball is completely submerged, the water wont shut off unless the staff manually pull it up. There is an overflow pipe that will drain the water into a gravel sump basin in the park if the tank level increases to much. With the fill water running 24/7 there's a



**Figure 5: Scum line on tank walls at overflow pipe penetration.**

possibility of the tank wasting water to the park, as evidence by debris scum lines in the tank.

## Water Loss

- The staff state that the water level will drop an entire stair rung (approximately 12 inches) overnight if the autofill line is turned off.
- Dye testing was conducted in the strainer manhole and storage tank. The manhole showed no signs of leakage around the pipe penetrations. The floor/wall seal was not directly evident due to sediment on the ground, but the tank water was very stagnant when the splash pad was not functioning. The fiberglass tank did not reveal any significant sources of leaks once the water level was drawn down to a safe level and the recirculation pump turned off. The inlet pipe from the manhole was recently fiberglass patched in place. A small section on the top of the new fiberglass appeared to allow dye behind the patch. This was above the water level in the tank at the time of testing so it's unclear if water is capable of leaving the tank at this location, however it should be investigated further.

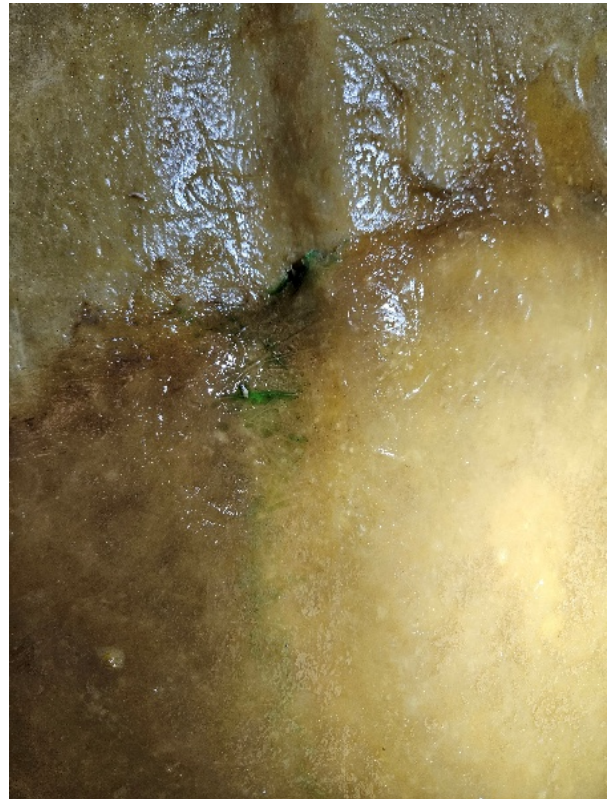


Figure 6: Dye migrating behind fiberglass surface.

- The underground piping was not able to be tested during the inspection.

## Winterization Procedures

- The tanks are drained in the fall and left empty the duration of the winter. The main drains are covered to prevent fall rain and snow melt from entering the system. All the feature lines are drained via gravity and pressurized air.

## Alternative Analysis and Recommendations

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With few areas of potential leaks discovered during the dye test, additional testing should be performed to further evaluate the facility components and piping. It was recommended to the city staff that they isolate the underground piping from each structure via inflatable pipe plugs, fill the structures full of water and record the water levels in the structures for a couple days. If the water levels do not fluctuate, then the tanks can be deducted from the equation and one by one each pipe penetration should be opened and individually tested for water loss. If a tank(s) level drops, then the leak can be isolated in the structure and fixed.

Further testing needs to be completed, however the following conclusion can be made based on knowledge of the facility and staff reports. The recirculation pump runs 24/7 to keep the water chemically balanced in the storage tank by pulling water from the tank,

running it through the filtration system, and piping it back into the storage tank. The staff state that water loss is clear in the morning if the autofill line has been shut off over night, during which time the facility is closed to the public and the features haven't been operating. This would indicate that an issue lies within the piping or structures between the main drain piping and the recirculation piping. Although the feature piping can't be completely ruled out as a potential source for water loss, it is not the reason the water level drops overnight.

The costs associated with the repairs for the leakage may be a wide range in scope and therefore have not been provided until further testing has been completed. The following are items that Interstate feels should be maintained and/or replaced.

### Storage Tank Auto Fill Valve

- **Estimated Cost: \$200**
- The existing float valve doesn't shut off and should be replaced. The valve can be unscrewed from the fill line and a new float and valve purchased at a local hardware or agricultural store and installed.

### Repair Slides and Water Features

- **Estimated Cost: \$10,000 - \$30,000**

- The waterslides should be put on a minimum annual maintenance schedule. The waterslides are oxidized, the slide joints are cracked and leaking water, and it was stated that kids have informed the staff of rough joints when sliding down the surface. If an operations and maintenance manual isn't on record for the



Figure 7: Cracked flange on waterslide.

project, please follow the link below to access said manual for Waterplay's fiberglass slide maintenance and repair.

- o [https://www.waterplay.com/files/6816/1644/5504/Fiberglass\\_Slide\\_Maintenance\\_and\\_Repair\\_Manual\\_210318.doc.pdf](https://www.waterplay.com/files/6816/1644/5504/Fiberglass_Slide_Maintenance_and_Repair_Manual_210318.doc.pdf)
- o The slide surfaces should be waxed per manufacturer recommendations at least yearly.
- o If the riders are stating an unpleasant surface or water is seen coming out of the bottom of the flange, the existing joint filler should be removed and replaced.

- The cracks in the fiberglass flanges are severe and should be repaired to limit further damage or the sections should be on a schedule to be replaced. As stated in the Waterplay repair manual, “fiberglass fractures are found... typically on the bolting flanges. The flanges are critical to the structural integrity of the part. Any fractures to the slide component could seriously degrade the structural integrity of the slide section and must be fixed immediately.”

### Next Steps

To support MCI2 and the city in making an informed decision, we recommend the following steps:

1. Perform additional facility testing by isolating each individual underground components and hydrostatically test the individual structures and piping for leaks.
2. Identify the leak and perform repairs.
3. Prepare funding for operational, maintenance and replacement costs.