



Counsilman Hunsaker
AQUATICS FOR LIFE



SPRAYGROUND FEASIBILITY STUDY

**BILLINGS, MT
APRIL 2024**

DRAFT

TABLE OF CONTENTS

01 Summary

Summary.....	02
--------------	----

02 Needs Assessment

Market Demographics.....	04
--------------------------	----

Conditions Analysis.....	05
--------------------------	----

03 Consultant Recommendations

Wading Pools.....	11
-------------------	----

Spraygrounds.....	12
-------------------	----

04 Options

Concept 1: Recirc Sprayground.....	13
------------------------------------	----

Concept 2: Pump and Dump Sprayground.....	14
---	----

Concept Examples.....	15
-----------------------	----

05 Operation Concept

Expense Analysis Overview.....	17
--------------------------------	----

Expense Analysis - Spray & Dump.....	19
--------------------------------------	----

Expense Analysis - Recirculating.....	20
---------------------------------------	----

Expense Analysis - Wading Pool.....	21
-------------------------------------	----

06 Appendix A: Limiting Conditions

General Limiting Conditions.....	23
----------------------------------	----

07 Appendix B: Footnotes

Footnotes.....	24
----------------	----

SUMMARY

This study assessed the condition and functionality of existing aquatic play features (pools, spraygrounds, wading pools) in Billings' public parks. It also evaluated resident needs and usage patterns to develop a data-driven plan for renovation, replacement, or addition of these features.

Current Conditions

The study found that existing aquatic play features vary in condition. Castle Rock Park Sprayground is in good shape, requiring no immediate changes. However, other facilities require upgrades or replacement. Notably, several spraygrounds and wading pools suffer from poor condition or obsolescence (Terry Park, Pioneer Park, Hawthorne Park, North Park).



Resident Needs and Usage Patterns:

The study considered resident needs and demographics to determine optimal placement and types of aquatic features. Knowing that 70% of residents around the country prioritize nearby parks, the plan prioritizes facilities within walking distance (0.5 miles for spraygrounds). Data from the facilities helped identify areas where spraygrounds might be suitable (e.g., Pioneer Park). Additionally, understanding the number of children in specific areas informed the need for improvements or replacements to better serve younger demographics.

Consultant Recommendations:

- Theming of renovated spraygrounds will attract residents, foster a sense of community pride, and celebrate the unique character of surrounding neighborhoods.
- Pump and Dump spraygrounds are recommended for all future and renovated spraygrounds due to the low operating costs, maintenance staff required, and no need for attendants.
- Considering master planning at Centennial, Poly Vista, and Cottonwood. A lack of sprayground service was noted near the Heights. Additional spraygrounds are recommended to better serve those residents. Arrowhead Park, Uinta Park, and Clevenger Park are considerations.

SUMMARY

Prioritization and Recommendations:

Based on condition and resident needs, the plan prioritizes renovations and replacements:

- **High Priority:** Facilities requiring full replacement or significant upgrades (Terry Park Sprayground, Pioneer Park Wading Pool, Hawthorne Park Wading Pool) will be addressed first for safety and functionality.
- **Medium Priority:** Upgrades are recommended for North Park Sprayground to enhance its appeal. Potential replacement may be considered in the future based on budget and population growth.
- **Low Priority:** Castle Rock Park Sprayground remains in good condition and requires no immediate changes.

Specific consultant recommendations include:

- Replacing Terry Park Sprayground with a potentially fire department-themed facility for a more engaging experience.
- Replacing outdated wading pools at Hawthorne to a spray ground.
- Update the North Park with modern spraygrounds to improve safety and play value.



MARKET DEMOGRAPHICS

Billings Demographic Overview (2022)

7 in 10 U.S. residents have at least one local park, playground, open space or recreation center within walking distance of their homes.*

Sprayground:

Pools:

These cater primarily to young children and families. Studies suggest that most users live within a 10-minute walk (around 0.5 miles) of the facility. Some families might drive up to 15-20 minutes (around 1-2 miles) if there's a lack of options closer to home.

The draw radius for pools depends on their features and target audience. Lap pools and competitive facilities might attract users from further afield, potentially 20-30 minutes (around 3-5 miles) or more.

TOTAL POPULATION: 115,000

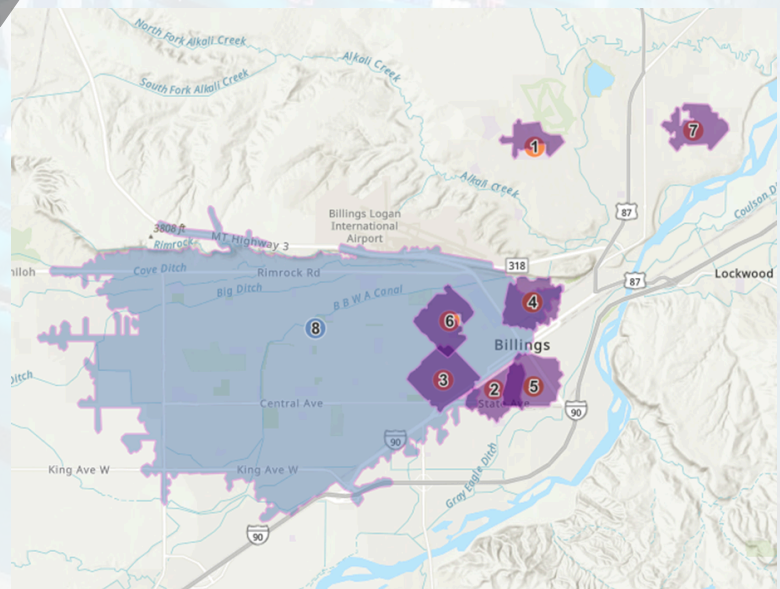


Billings Overview

- Currently there are ~115,000 residents in Billings
- 74% of residents have a park within a 10-minute walk meeting national benchmarks

United States Comparison

- 7 in 10 U.S. residents have at least one local park, playground, open space or recreation center within walking distance of their homes.*
- Spraygrounds and wading pools:
- These cater primarily to young children and families. Studies suggest that most users live within a 10-minute walk (around 0.5 miles) of the facility. Some families might drive up to 15-20 minutes (around 1-2 miles) if there's a lack of options closer to home.



*National Recreation and Park Association (NRPA) - 2023 Engagement with Parks Report

CONDITIONS ANALYSIS

WADING POOLS

Pioneer Park Wading Pool

- This area will serve the second most school aged children. (2,278)
- Wading pools are an obsolete park amenity
- Newer amenities would be a full-sized pool or sprayground
- Creates unsafe condition for staff and public
- Consider enhancing facility to better match other park amenities

Population within a 10-minute walk

Park Name	Children - <10yrs	Total Population
Terry Park Sprayground	543	3,810
Highland Sprayground	483	3,371
Pioneer Park Wading Pool	350	3,325
Castle Rock Park Sprayground	497	3,191
South Park Splash Pad	365	2,837
North Park Splash Pad	364	2,713
Hawthorne Park Wading Pool	302	2,102
Grand Total	2,904	21,349



CONDITIONS ANALYSIS

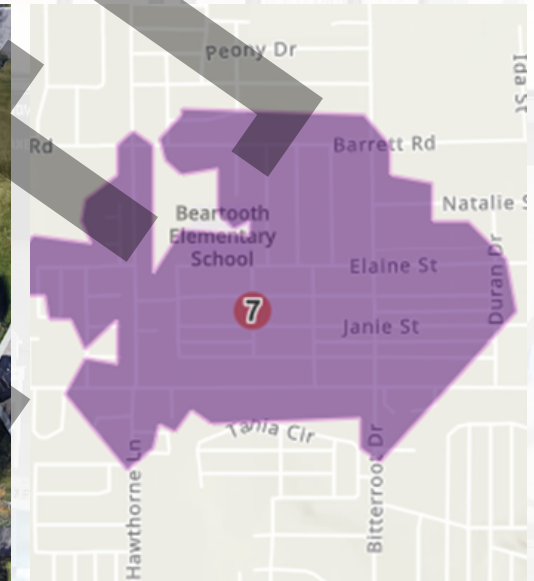
WADING POOLS

Hawthorne Park Wading Pool

- The current wading pool is obsolete and should be replaced with a sprayground.
- This park will not see the utilization of other parks.
- Obsolete wading pool
- Minimal play value
- Should enhance water feature to better support other park amenities

Population within a 10-minute walk

Park Name	Children - <10yrs	Total Population
Terry Park Sprayground	543	3,810
Highland Sprayground	483	3,371
Pioneer Park Wading Pool	350	3,325
Castle Rock Park Sprayground	497	3,191
South Park Splash Pad	365	2,837
North Park Splash Pad	364	2,713
Hawthorne Park Wading Pool	302	2,102
Grand Total	2,904	21,349



CONDITIONS ANALYSIS

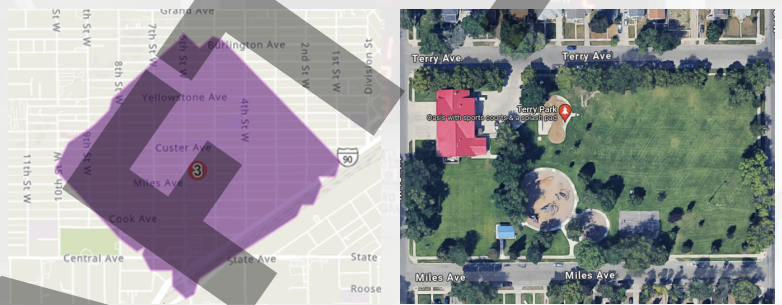
SPRAYGROUNDS

Terry Park Sprayground

- The current sprayground lacks functional features and existing features should be replaced.
- There is an opportunity to impact a large number of residents
- Theming to the fire department will celebrate the surrounding area.

Population within a 10-minute walk

Park Name	Children - <10yrs	Total Population
Terry Park Sprayground	543	3,810
Highland Sprayground	483	3,371
Pioneer Park Wading Pool	350	3,325
Castle Rock Park Sprayground	497	3,191
South Park Splash Pad	365	2,837
North Park Splash Pad	364	2,713
Hawthorne Park Wading Pool	302	2,102
Grand Total	2,904	21,349



CONDITIONS ANALYSIS

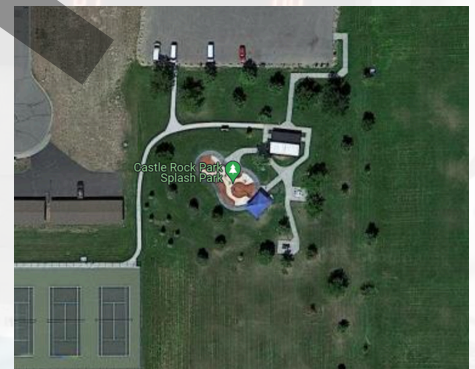
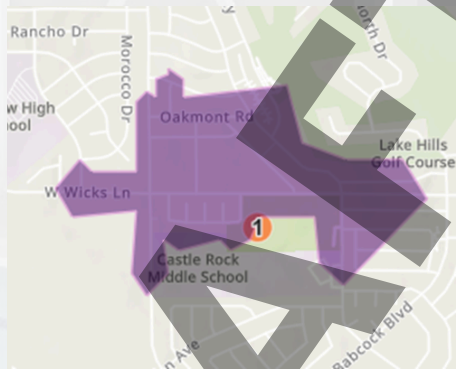
SPRAYGROUNDS

Castle Rock Park

- The current spray ground appears to be serving the right population and equipment is in good condition no changes are necessary.

Population within a 10-minute walk

Park Name	Children - <10yrs	Total Population
Terry Park Sprayground	543	3,810
Highland Sprayground	483	3,371
Pioneer Park Wading Pool	350	3,325
Castle Rock Park Sprayground	497	3,191
South Park Splash Pad	365	2,837
North Park Splash Pad	364	2,713
Hawthorne Park Wading Pool	302	2,102
Grand Total	2,904	21,349



CONDITIONS ANALYSIS

SPRAYGROUNDS

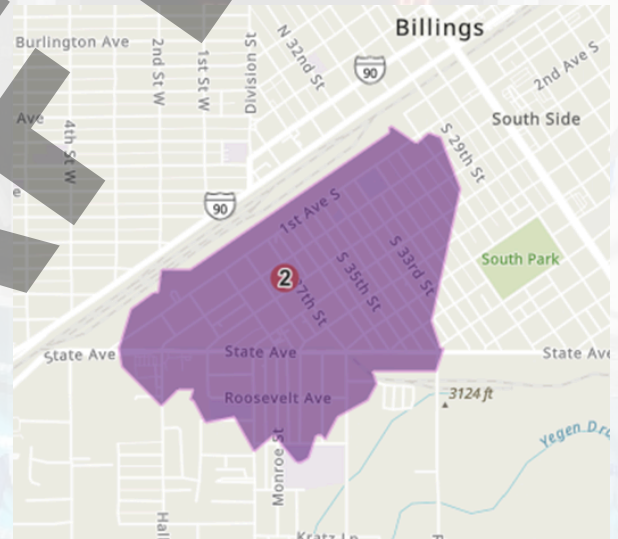
Highland Sprayground

- Equipment appears to be in good condition.
- Features could be updated with minimal cost impact.



Population within a 10-minute walk

Park Name	Children - <10yrs	Total Population
Terry Park Sprayground	543	3,810
Highland Sprayground	483	3,371
Pioneer Park Wading Pool	350	3,325
Castle Rock Park Sprayground	497	3,191
South Park Splash Pad	365	2,837
North Park Splash Pad	364	2,713
Hawthorne Park Wading Pool	302	2,102
Grand Total	2,904	21,349



CONSULTANT RECOMMENDATIONS

Wading Pools are Phasing Out

INCREASED RISK OF DISEASE TRANSMISSION

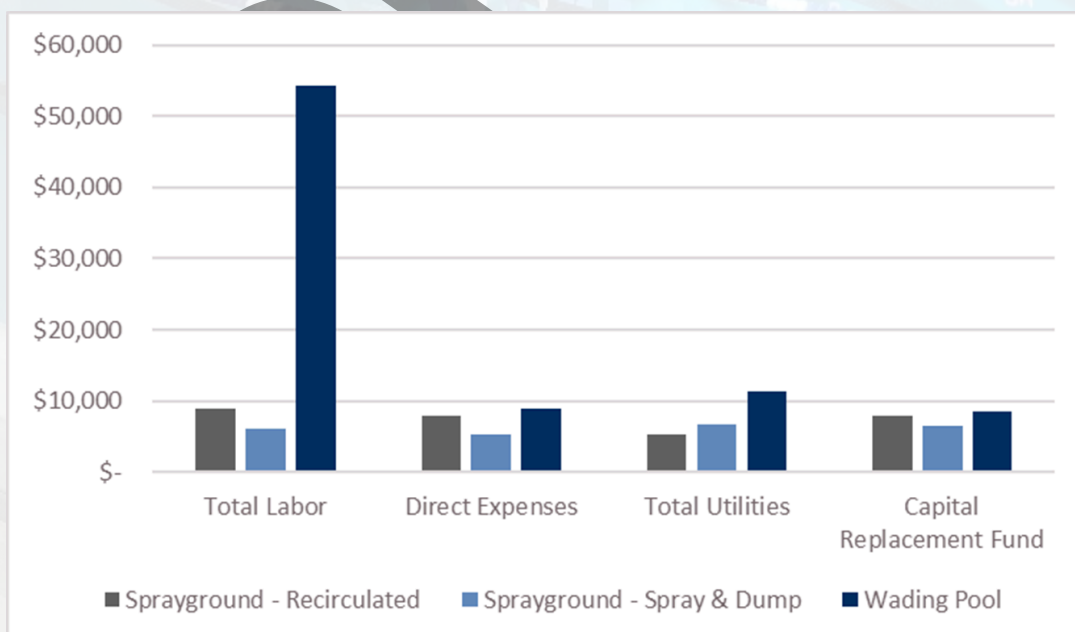
- Kiddie/Wading Pools are the most common pool type to experience an immediate closure from Health Department Officials due to low disinfectant levels (13.5%)*
- Secondary Sanitation Systems are recommended for pools designed for children less than 5 years old due to the risk associated with disease outbreaks.

INCREASED OPERATING COSTS

- Disinfectant is required in all pools and should be checked by staff throughout the day using valuable park resources, staff, and requiring specialized training.
- Attendants are required to open the facility straining an already short-staffed system.

LACK OF FEATURES

- Wading pools typically lack features that will draw younger families (spray features, dump buckets, slides, etc.)
- Wading pools do not accessibility to all, regardless of their abilities. They lack inclusive design which encourages the physical, functional and social development of children.



*Morbidity and Mortality Weekly Report (MMWR) - Violations Identified from Routine Swimming Pool Inspections, 2008

CONSULTANT

RECOMMENDATIONS

Sprayground Modernization

	Recirculated	Pump and Dump
Advantages	Water conservation: Uses less water as it continuously recirculates and filters the water.	Lower initial cost: Less complex plumbing is needed.
	Lower operating costs: Saves money on water use and reduces the amount of chemicals needed for treatment.	Simpler maintenance: Easier to maintain and clean.
	Environmentally friendly: Minimizes water waste.	Lower risk of illness: Continuously replaces water, reducing the chance of bacteria growth.
Disadvantages	Higher initial cost: Requires more complex plumbing and filtration systems.	Higher operating costs: Uses more water, which can be expensive depending on location.
	Maintenance: Regular cleaning and filter maintenance are crucial.	Less environmentally friendly: Uses more water and requires more chemicals for treatment.
	Potential for waterborne illness: Improper maintenance can lead to bacteria growth in the recirculated water.	



OPTIONS SUMMARY

Option 1 – Recirc Sprayground PROJECT COST

OPINION OF PROJECT COST: Sprayground - Recirculated			
Description	Unit	Amount	Opinion of Cost
Ops Building		1,000	\$378,000
Mechanical	Sq. Ft.	300	
Storage	Sq. Ft.	500	
Restrooms	Sq. Ft.	200	
Sprayground		855	\$500,088
Sprayground	Sq. Ft.	855	
Features	Allowance	1	
Pool Mechanical	Add. Cost	1	
Support		2,565	\$109,742
Outdoor Deck	Sq. Ft.	1,710	
Fence	Ln. Ft.	203	
Overhead Lighting	Sq. Ft.	2,565	
Shade Structures	Quantity	1	
Total Building Construction Costs	Sq. Ft.	4,420	987,829
Site Construction Costs (landscaping, utilities, walks)			\$110,500
Furniture, Fixtures, Equipment			\$27,000
Subtotal			\$1,125,329
Inflation (1 year)	10.0%		\$112,533
Contingency	10.0%		\$123,786
Indirect Costs	12.0%		\$163,398
Total Estimated Project Costs:			\$1,525,046
Rounded			\$1,600,000

Source: Counsilman-Hunsaker



OPTIONS SUMMARY

Option 2 – Pump and Dump Sprayground

PROJECT COST

OPINION OF PROJECT COST: Sprayground - Spray & Dump			
Description	Unit	Amount	Opinion of Cost
Ops Building		900	\$346,500
Mechanical	Sq. Ft.	200	
Storage	Sq. Ft.	500	
Restrooms	Sq. Ft.	200	
Sprayground		855	\$350,088
Sprayground Features	Sq. Ft. Allowance	855 1	
Support		2,565	\$109,742
Outdoor Deck	Sq. Ft.	1,710	
Fence	Ln. Ft.	203	
Overhead Lighting	Sq. Ft.	2,565	
Shade Structures	Quantity	1	
Total Building Construction Costs	Sq. Ft.	4,320	806,329
Site Construction Costs (landscaping, utilities, walks)			\$108,000
Furniture, Fixtures, Equipment			\$26,000
Subtotal			\$940,329
Inflation (1 year)	10.0%		\$94,033
Contingency	10.0%		\$103,436
Indirect Costs	12.0%		\$136,536
Total Estimated Project Costs:			\$1,274,334
Rounded			\$1,300,000

Source: Counsilman-Hunsaker

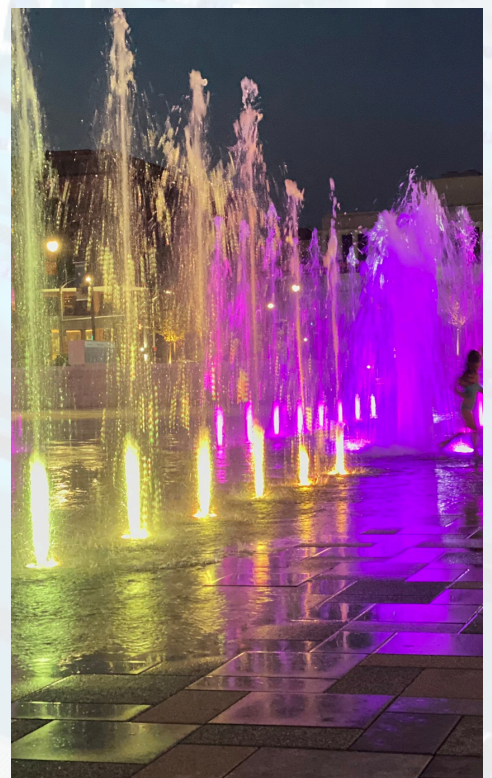
OPTIONS SUMMARY

Sprayground Examples



OPTIONS SUMMARY

Sprayground Examples



OPERATION CONCEPT

Expense Analysis

The following information details operating expenses for the aquatic center, focusing on major cost categories and estimation methodologies. Projections are made through a combination of historical data, industry benchmarks, and relevant factors like local conditions and user projections.

Key Expense Areas:

- **Facility Staff:** Annual payroll considers benefits, taxes, and scheduling based on user demand and established procedures. Pay rates align with existing job classifications and wage scales. Costs associated with staff dedicated to program delivery are factored into the expense table.
- **Commodities:** This category encompasses day-to-day operational supplies, including office, program, custodial, repair, and chemical needs. Chemical costs consider the use of liquid chlorine and muriatic acid, adjusted based on projected bather load and water balance. Medium bather load is used for cost estimation purposes.
- **Utilities:** Utility costs are determined by reviewing current rates from comparable facilities in the region. Total costs include energy, demand charges, and delivery fees. It is crucial to exercise caution when comparing these costs with facilities outside the immediate area due to potential regional variations.
- **Electricity:** Calculations are based on both demand and energy costs obtained from utility rate information provided by the project committee. The table outlines the estimated electricity costs for various operational scenarios.
- **Water & Sewer:** Water and sewer services are required for domestic use, compensating for evaporation and backwashing purposes. Backwash and domestic water are released into the sanitary system, excluding landscape irrigation.
- **Repair & Maintenance:** This budget allocation covers facility repairs and general maintenance for the building and pool mechanical systems.
- **Capital Replacement Fund:** Certain equipment manufacturers recommend annual maintenance programs to ensure optimal performance, often requiring contractors. Additionally, unforeseen repairs throughout the year may also necessitate external services. This fund reserves money for such maintenance and replacement needs.

The definitions provided clarify the figures on the subsequent pages. Traditional pools and wading pools necessitate all of these expenses, while spraygrounds only require some of them.

Spraygrounds are becoming increasingly popular due to their cost-effectiveness and ease of maintenance. Unlike traditional pools, they offer a more interactive and engaging water play experience for users of all ages. Additionally, spraygrounds are often designed with various themes and features to enhance the overall enjoyment of visitors.

OPERATION CONCEPT

Expense Analysis

Wading pools, while seemingly simpler than spraygrounds, can incur higher operational costs. Unlike spraygrounds which run on automated timers, wading pools necessitate dedicated staff to ensure safety. This can include lifeguards or attendants, resulting in higher staffing costs compared to the typically self-contained operation of a sprayground. Additionally, wading pools require constant treatment with pool chemicals to maintain proper sanitation. This ongoing cost, coupled with the energy expenditure for running filtration and recirculation systems, adds to the overall operational expense of a wading pool.

Wading pools and recirculating spraygrounds often necessitate regular maintenance and inspections to comply with health and safety regulations, which can further drive up costs. These inspections are crucial to ensure the water quality remains safe for young children, who are more susceptible to waterborne illnesses. The need for temperature control in wading pools, especially in varying climates, can also lead to increased energy consumption. Many of these requirements and costs are not needed with a spray & dump sprayground.

In the grand scheme of community recreation, both wading pools and spraygrounds play vital roles. While spraygrounds offer a low-maintenance, energy-efficient option for water play, wading pools provide a more traditional and supervised aquatic experience. Communities must weigh the benefits and costs of each to determine the best fit for their specific needs and resources.



OPERATION CONCEPT

Expense Analysis – Spray & Dump Sprayground

Direct Facility Expense Budget	
SG-Spray & Dump	
Facility Staff	
Attendant Personnel	\$0
Part-Time Maintenance	\$6,000
Training	\$0
Total Labor	\$6,000
Direct Facility Expenses	
Repair and Maintenance	\$3,300
Operating Supplies	\$1,980
Chemicals	\$0
Direct Expenses	\$5,280
Utilities	
Electricity	\$4,106
Pool Heating	\$0
Water & Sewer	\$2,680
Total Utilities	\$6,785
Total Operating Expenses	\$18,065
Capital Replacement Fund	\$6,500
Total Expense	\$24,565
Estimate Current as of:	
Source: Counsilman-Hunsaker	



OPERATION CONCEPT

Expense Analysis - Recirculated Sprayground

Direct Facility Expense Budget	
SG-Recirculated	
Facility Staff	
Attendant Personnel	\$0
Part-Time Maintenance	\$9,000
Training	\$0
Total Labor	\$9,000
Direct Facility Expenses	
Repair and Maintenance	\$4,000
Operating Supplies	\$2,400
Chemicals	\$1,536
Direct Expenses	\$7,936
Utilities	
Electricity	\$3,633
Pool Heating	\$0
Water & Sewer	\$1,590
Total Utilities	\$5,223
Total Operating Expenses	\$22,158
Capital Replacement Fund	\$8,000
Total Expense	\$30,158
Estimate Current as of:	7/22/2024
Source: Councilman-Hunsaker	



OPERATION CONCEPT

Expense Analysis - Wading Pool

Direct Facility Expense Budget	
Wading Pool	
Facility Staff	
Attendant Personnel	\$43,200
Part-Time Maintenance	\$9,000
Training	\$2,000
Total Labor	\$54,200
Direct Facility Expenses	
Repair and Maintenance	\$4,300
Operating Supplies	\$2,580
Chemicals	\$1,964
Direct Expenses	\$8,844
Utilities	
Electricity	\$3,654
Pool Heating	\$5,988
Water & Sewer	\$1,662
Total Utilities	\$11,304
Total Operating Expenses	\$74,348
Capital Replacement Fund	\$8,500
Total Expense	\$82,848
Estimate Current as of:	
Source: Counsilman-Hunsaker	

CONSULTANT RECOMMENDATIONS

Formal recommendations from consultant:

1. Theming of renovated spraygrounds will attract residents, foster a sense of community pride, and celebrate the unique character of surrounding neighborhoods.
2. Pump and Dump spraygrounds are recommended for all future and renovated spraygrounds due to the low operating costs, maintenance staff required, and no need for attendants.
3. Considering master planning at Centennial, Poly Vista, and Cottonwood. A lack of sprayground service was noted near the Heights. Additional spraygrounds are recommended to better serve those residents. Arrowhead Park, Uinta Park, and Clevenger Park are considerations.

Direct Facility Expense Budget			
	SG-Recirculated	SG-Spray & Dump	Wading Pool
Facility Staff			
Attendant Personnel	\$0	\$0	\$43,200
Part-Time Maintenance	\$9,000	\$6,000	\$9,000
Training	\$0	\$0	\$2,000
Total Labor	\$9,000	\$6,000	\$54,200
Direct Facility Expenses			
Repair and Maintenance	\$4,000	\$3,300	\$4,300
Operating Supplies	\$2,400	\$1,980	\$2,580
Chemicals	\$1,536	\$0	\$1,964
Direct Expenses	\$7,936	\$5,280	\$8,844
Utilities			
Electricity	\$3,633	\$4,106	\$3,654
Pool Heating	\$0	\$0	\$5,988
Water & Sewer	\$1,590	\$2,680	\$1,662
Total Utilities	\$5,223	\$6,785	\$11,304
Total Operating Expenses	\$22,158	\$18,065	\$74,348
Capital Replacement Fund	\$8,000	\$6,500	\$8,500
Total Expense	\$30,158	\$24,565	\$82,848
Estimate Current as of:	7/22/2024		
Source: Councilman-Hunsaker			

APPENDIX A:

General Limiting Conditions

This study is based on information that was current as of February 2024. Every reasonable effort has been made in order that the data reflects the most timely and current information possible and is believed to be reliable. This study is based on estimates, assumptions, and other information developed by the consultant from independent research.

No warranty or representation is made by the consultant that any of the projected values or results contained in this study will actually be achieved. No responsibility is assumed for inaccuracies in reporting by the client, its agents, and representatives or any other data source used in preparing or presenting this study. This entire report is qualified and should be considered in light of the above conditions and limitations.

DRAFT



APPENDIX B: FOOTNOTES

1. Centers for Disease Control. Water-Related Injuries: Fact Sheet. Retrieved 3-11-18. <https://www.cdc.gov/homeandrecreationalafety/water-safety/waterinjuries-factsheet.html>
2. U.S. Consumer Product Safety Commission. Guidelines for Entrapment Hazards: Making Pools and Spas Safer. Retrieved 3-11-18. <http://www.rfabc.com/Assets/RFABC+Digital+Assets/pdf/ntrapmnt.pdf>
3. U.S. Consumer Product Safety Commission. Virginia Graeme Baker Pool and Spa Safety Act. Retrieved 10-5-12. <http://www.cpsc.gov/pssa.pdf>
4. National Center for Health Statistics. Lifetime Expectancy. Retrieved 3-11-18. <https://www.cdc.gov/nchs/data/hus/hus16.pdf#015>
5. Arthritis Foundation. Aquatics for Arthritis. Retrieved 3-11-18. <https://www.arthritis.org/living-with-arthritis/exercise/arthritis-friendly/aquatics.php>
6. Aquatic Exercise Association. Retrieved 10-5-12. <http://www.aeawave.com/>
7. United States Masters Swimming. History & Archives. Retrieved 10-5-12. <http://www.usms.org/hist/>
8. United States Green Building Council. Leadership in Energy & Environmental Design. Retrieved 3-12-18. <https://new.usgbc.org/leed>
9. Salvesen, David and Renski, Henry. Center for Urban and Regional Studies. Importance of Quality of Life in the Location Decisions of New Economy Firms. <https://curs.unc.edu/files/2013/04/neweconomyreport.pdf>

