

# Commercial Site Assessment™ Tier II

Prepared for:

**Woodhill  
HOA**

18125 Kindred Ct.  
Lakeville, MN 55044

2021 Season



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## Controller Systems

#1	
#2	

### Commercial Site Assessment™

Date of Tier I CSA: August 4<sup>th</sup>, 2021  
Certified Technician: Russ Jundt, CLIA, CIT

Date of Tier II CSA: August 4<sup>th</sup>, 2021  
Certified Technician: Russ Jundt, CLIA, CIT

Irrigated Acres: 3.56  
Irrigated  $ft^2$ : 154,975.83

## Woodhill HOA Audit Observations

Woodhill HOA has 2 water sources and 2 controllers with 34 zones total.

- **System #1:** Weathermatic Smartline, 12 zones, wired rain sensor functional
  - *Schedule A: Start–10pm, Days–Odd*
    - *All zones but 5 (wire slot open, no zone) and 14 (wire slot open, no zone).*
  - *Schedule B: Start–9am, Days–Everyday*
    - *Zone 2*
- **System #2:** Weathermatic Smartline, 22 zones, wired rain sensor functional
  - *Schedule A: Start–7pm, Days–Even*
    - *All zones - 35 mins each*
  - *Schedule B: Start–12pm, Days–Odd*
    - *Zone 2 only*

## Woodhill HOA Audit Issues and Solutions

**Issue #1:** Both systems have smart (weather-based) controllers that can manage the irrigation systems effectively. However, when we checked the controllers' settings, the run times of some individual zones didn't make sense. Zone 2 on both controllers runs every day (not allowed unless new sod or seed are being watered) of which there were none. Other run times were very long, even for a dry season/time of year like 2021. Smart controllers are only a piece of the puzzle for water savings, and they cannot control system design and have minimal impact to the base program/run times.

**Solution #1:** Adjust runtimes based on application rates, microclimates, slope, and soil types.

**Issue #2:** Of the 485 rotors, 143 of them are either, leaking, broken, or not turning, etc.

**Solution #2:** Replace 143 broken or defective rotors.

**Issue #3:** There are some zones with mixed sprinkler types (rotors and sprays) on the same zone. Sprays apply approximately two to three times as much water in their areas as rotors, causing over watering/wasted water.

**Solution #3:** Convert spray nozzles to rotary nozzles. Rotary nozzles have a similar application rate to rotor heads and work well with each other.

**Issue #4:** There are also areas that lack proper coverage, have heads in unmaintained areas, or have redundant heads. This may be due to landscape aging/changing, poor design, etc.

**Solution #4:** Move heads for better coverage, add heads where there is a gap in coverage, or cap/eliminate heads that are not needed.

**The following are individual system changes that could use further explanation from “Critical Repairs and Adjustments” tables.**

**Irrigation System 1:**

**Issue #5:** Zone 7 has a line leak where the water pours out of a crack between the curb and the road. The exact cause of the leak is unclear until it is dug up. This leak is undermining the concrete and likely the asphalt and should be addressed as soon as possible (if it hasn’t been already).

**Solution #5:** Investigate cause of leak and repair.

## Water Rates:

Meter Reading Interval: ☐ Monthly ☒ Quarterly ☐ Other \_\_\_\_\_

Units Measured As: ☒ 1000 gallons ☐ CCF

Converted Units: ☒ 1 unit = 1000 gallons

WATER RATES	Irrigation Metered System
Price per unit (per 1,000 gals)	\$5.64
Threshold per quarter	Irrigation Metered System
Sewer Rate per unit (if unmetered):	None

## Historical Water Usage:

### Water Source #1

Year	Annual Water Usage (gallons)	Annual Water Cost*
2020	475,000	\$2,679
2019	340,000	\$1,918
2018	339,000	\$1,912
2017	314,000	\$1,771
2016	464,000	\$2,617
5 Year Average	386,400	\$2,179

### Water Source #2

Year	Annual Water Usage (gallons)	Annual Water Cost*
2020	1,468,000	\$8,280
2019	1,136,000	\$6,407
2018	589,000	\$3,322
2017	963,000	\$5,431
2016	1,028,000	\$5,798
5 Year Average	1,036,800	\$5,848

\*Based on current Water Rates for best year to year comparison.

Plant Material Need: **433,860 gallons**

Cost: **\$6,693/year**

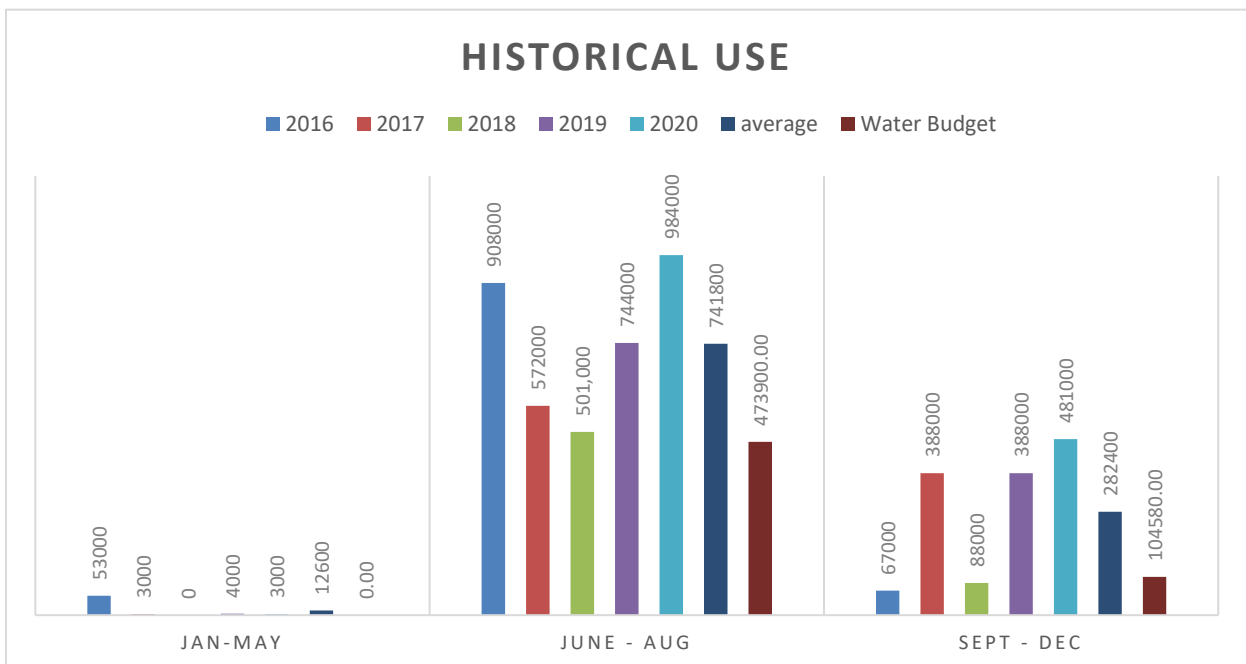
$$Eff \% = \frac{\text{water need}}{\text{water use}}$$

$$Eff \% = \frac{433,860}{1,036,800} = \mathbf{41.85\%}$$

EPA Standard = 75% Efficiency

*Eff* = 75% : 578,480 gallons used at an annual cost of **\$3,827**

Month	April-May Reading	June-July Reading	Oct-Nov Reading	Total(gal)
2020 Usage	3,000	984,000	481,000	<b>1,468,000</b>
2019 Usage	4,000	744,000	388,000	<b>1,136,000</b>
2018 Usage	0	501,000	88,000	<b>589,000</b>
2017 Usage	3,000	572,000	388,000	<b>963,000</b>
2016 Usage	53,000	908,000	67,000	<b>1,028,000</b>
Avg Usage	<b>12,600</b>	<b>741,800</b>	<b>282,400</b>	<b>1,036,800</b>
Water Budget	<b>0</b>	<b>473,900</b>	<b>104,580</b>	<b>578,480</b>



## System Components:

Water Source			Deficiency?	
#1	Location	18119.5 Kindred Ct, Lakeville MN 55044		
	Source	City Feed		
	Anti-syphon			
		Brand	Wilkins/Zurn (975XL) RPZ	
		Size	2"	
		Inspection Date	Tested 6/26/21	
		Visual Inspection	Good	
	Deduct Meter			
		Brand	Neptune	
		Size	1.5"	
		Serial Number	60818604	
		Reading	3,306,113.2 Gallons	
		Visual Inspection	Good	
	Booster Pump			
		Brand	N/A	
		Size		
		Volt/AMP		
		Visual Inspection		
	Notes:	<b>Water Source for Controller #1</b>		

Water Source			Deficiency?	
#2	Location	18051 Kindred Ct, Lakeville MN 55044		
	Source	City Feed		
	Anti-syphon			
		Brand	Wilkins/Zurn (975XL) RPZ	
		Size	2"	
		Inspection Date	Tested 6/26/21	
		Visual Inspection	Good	
	Deduct Meter			
		Brand	Neptune	
		Size	1.5"	
		Serial Number	1542536134	
		Reading	163,795,504 Gallons	
		Visual Inspection	Good	
	Booster Pump			
		Brand	N/A	
		Size		
		Volt/AMP		
		Visual Inspection		
	Notes:	<b>Water Source for Controller #2</b>		

### Recommend Critical Repairs and Adjustments: Controller #1

	<b>Zones</b>														
<b>Head Type</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>Total</b>
Total # Rotors	12	10	13	11	E	29	16	8	8	10	12	15	16	N	160
Total # Sprays					M				1			1		O	2
Rotating Nozzles					P									N	
Drip					T									E	
Mixed Head Types					Y				X			X			
<b>Repairs</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>Total</b>
Damaged Rotors	2	3		3	S	7	5	4	2	6	2	9	9	E	52
Damaged 4" Sprays					L									X	
Damaged 6" Sprays					O									C	
Damaged High Pop Rotor					T									L	
Damaged High Pop Spray														U	
Line Leaks							1							D	1
Wrong Nozzle r=rotor s=spray									1 S			1 S		E	2 S
Damaged Spray Head Nozzles															
Raise/Straighten Heads															
<b>Design Improvements</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>Total</b>
Move Head for better coverage	5	2									2	1	1		11
Add Head for better coverage											1	1			2
Cap Head		1	3												4

### Recommend Critical Repairs and Adjustments: Controller #2

	Zones																						
Head Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
Total # Rotors	24	21	12	13	10	12	15	12	13	14	12	13	15	10	13	12	22	19	16	16	17	14	325
Total # Sprays																							
Rotating Nozzles																							
Drip																							
Mixed Head Types																							
Repairs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
Damaged Rotors	5	2		4	1	2	4	2	3	3	4	3	6	2	2	4	9	12	9	5	5	4	91
Damaged 4" Sprays																							
Damaged 6" Sprays																							
Damaged High Pop Rotor																							
Damaged High Pop Spray																							
Line Leaks																							
Wrong Nozzle r=rotor s=spray																							
Damaged Spray Head Nozzles																							
Raise/Straighten Heads																							
Design Improvements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
Move Head for better coverage	1			1	1			1				1				1	1			1			8
Add Head for better coverage	1	2	4	3	1	1		1				1			1		1		2	2		2	22
Cap Head					1									1									2

## Critical Repairs and Adjustments

Repairs	Price (each)	Count		Total
R1.) Installed 5" rotor (Issue #2)	\$ 65.00	143		\$ 9,295.00
R2.) Poly line leaks (Issue #5)	\$ 90.00	1		\$ 90.00
				\$ 9,385.00

## Design Improvements

Design Improvements	Price (each)	Count		Total
D1.) Replace spray nozzle with rotary nozzle (matching precipitation rate) (Issue #3)	\$ 20.00	2		\$ 40.00
D2.) Move a head (Issue #4)	\$ 150.00	19		\$ 2,850.00
D3.) Add a Head (Issue #4)	\$ 150.00	24		\$ 3,600.00
D4.) Cap unnecessary heads (Issue #4)	\$ 30.00	6		\$ 180.00
				\$ 6,670.00

## Recommended Efficiency Upgrades

### System Efficiency and Design Upgrades

System Efficiency and Design Upgrades	Price (each)	Count		Total
U1.) Program controllers with new runtimes as part of startup in spring (Issue #1)	\$ 0.00	2		\$ 0.00
				\$ 0.00

In summary, completing the recommended critical repairs and upgrades will result in substantially more efficient water usage and healthier plant material.

**Next Steps:**

- ☐ Fix repair issues
- ☐ Program controller runtimes to match effective watering parameters
- ☐ Change spray nozzles to rotary nozzles for matching application rates to rest of zone
- ☐ Move heads to a better position
- ☐ Add heads/change heads in areas that are lacking proper coverage
- ☐ Cap unneeded heads
- ☐ Annually maintain (including adjustments) & monitor property