

Auditor Name: _____ Date: _____

Certifying Organization: _____

Audit Location: _____

- ① The irrigation audit must be conducted as part of a QWEL workshop or independently supervised by a QWEL certified professional. Calculations must be completed independently. Completed forms must be submitted to the QWEL Professional Certifying Organization through which you are obtaining the QWEL certification.
- ② Complete site information, evaluation, and basic system tune-up prior to irrigation system testing.
 - Only conduct an irrigation audit if the irrigation system is determined to be in good working order.
- ③ Irrigation System Testing Procedures
 - Draw a diagram of the test area including dimensions, head locations, and catch can locations.
 - Only conduct an irrigation audit on overhead irrigation systems if the wind speed is 5 mph or less.
 - Run zone to be tested and mark spray bodies with flags.
 - Place catch cans in zone to be tested.
 - Ensure all cans are of the same size and shape.
 - Use a minimum of 24 catch cans and a number of cans that can be divided by four.
 - Leave a space of about 2 feet between a spray body and a catch can.
 - Layout catch cans in a uniform grid.
 - Space cans approximately 5 – 8 feet on center for fixed and rotary spray sprinklers.
 - Space cans approximately 10 – 20 feet on center for rotors.
 - Pull flags before running test as they will obstruct the path of the spray.
 - Run the irrigation zone for a sufficient amount of time to collect a minimum volume of water of 20 ml. Typically 5 – 10 min for fixed spray sprinklers and 10 – 30 mins for rotors and rotating sprinklers.
 - If the test area covers more than one station the run time for each station must be adjusted to achieve a matched precipitation rate across the test area.
 - Measure and record the amount of water in each catch can.
 - Use scale on catch can if available to measure volume of water in ml or depth of water in inches or centimeters.
 - If no scale is available pour water into a graduated cylinder with a ml scale.
 - For catch cans with straight sides and a flat bottom, simply measure the depth of water in inches or centimeters using a ruler.
 - Ensure that catch cans are numbered on the diagram so that the location of the measurements is known as this may help to identify issues with the irrigation system.
- ④ Calculate the low quarter distribution uniformity (DU_{LQ}):
- ⑤ Calculate the net precipitation rate (PR_{NET}):
- ⑥ Use the DU_{LQ} and PR_{NET} to determine a basic irrigation schedule for the test area.



Date: _____

Auditor

First Name: _____ Phone Number: _____
 Last Name: _____ Email: _____

Test Area

Site Name: _____ Test Area Name: _____
 Site Type: _____ Test Area Size: _____ sq ft
 Soil Type: _____ Plant Material: _____
 Microclimate: _____ Root Depth: _____ inches
 Slope: _____ Plant Factor (PF): _____
 Time to Runoff: _____ min ETo for 1 Week: _____ inches

Irrigation System

Water Source: _____ Meter Type: _____
 Static Pressure: _____ psi Meter Size: _____ inches
 Dynamic Pressure: _____ psi Meter Units: _____
 Irrigation Type: _____ Backflow: _____

Options

<u>Site Type</u>	<u>Microclimate</u>	<u>Water Source</u>	<u>Meter Type</u>	<u>Backflow Device</u>
Residential	Shade	Municipal Well	Dedicated irrigation	Reduced pressure assembly
Commercial	Part shade	Recycled water	Mixed use	Double check valve
	Full sun	Graywater		Anti-siphon valve
<u>Soil Type</u>	Extreme heat	Rain water	<u>Meter Size</u>	(atmospheric breaker)
Sandy			5/8", 1", 1.5", 2",	Pressure vacuum breaker
Loam	<u>Slope</u>	<u>Irrigation Type</u>	3", 4", 5", 6"	None
Silt	Flat	Spray sprinklers		
Clay loam	Slight	Rotating sprinklers	<u>Meter Units</u>	
Clay	Moderate	Rotors	Gallons	
	Steep		CCF	



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Include: test area dimensions, head locations, catch can locations, catch can numbers, north arrow.

Sprinkler = ○

Catch can = ✕



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Check relevant boxes			
Priority	High	Low	Fixed
Mixed hydrozone			
Needs mulch			
High pressure			
Low pressure			
Valve malfunction			
Broken pipes			
Unmatched precipitation rates			
Mixed emission devices			
No head-to-head coverage			
Uneven head spacing			
Excessive overspray			
Broken or missing nozzles			
Tilted heads			
Heads below grade			
Blocked spray			
Leaking seals			
Clogged nozzles			
Low head drainage			
Heads not rotating			
Observations			

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Catch Can Number	Catch Can Volume / Depth	Low Quarter
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
Sum		
Average		

Instructions

- Enter catch can volume (ml) in the second column of the table.
- Enter the depth in inches for cans with straight sides and a flat bottom.
- Identify catch cans in the low quarter and enter the volume (or depth) of these cans in the third column of the table.
- Enter the sum of each column at the bottom of the table.
- Divide the sum of each column by the number of cans in the column to calculate the average for all cans and for the low quarter.
- DU_{LQ} : Divide the average catch volume of the low quarter by the average for all cans. Round to two decimal points.
- PR_{NET} : Use the correct formula depending on whether using volume in ml or depth in inches or centimeters. Round to two decimal points.

Catch Can Type	Throat Area (sq in)
Cal Poly / ITRC / DWR	16.25
Texas A & M System	16.61
Utah State University	12.94



Catch Can Type: _____

Throat Area: _____ sq in

Test Run Time: _____ min

DU_{LQ} Calculation

$$DU_{LQ} = \frac{\text{Average catch volume of low quarter}}{\text{Average catch volume of all cans}} = \frac{\quad}{\quad} = \quad$$

PR_{NET} Calculation using volume in ml

$$PR_{NET} = \frac{\text{Average volume of all cans} \times 3.66}{\text{Test run time} \times \text{Catch can throat area}} = \frac{\quad \times 3.66}{\quad \times \quad} = \quad \text{in / hr}$$

PR_{NET} Calculation using depth in inches or centimeters

$$PR_{NET} = \frac{\text{Average depth of all cans} \times 60}{\text{Test run time}} = \frac{\quad \times 60}{\quad} = \quad$$



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Plant Water Requirement (PWR) - use ETo for 1 week

PWR = ETo x PF

= _____ x _____ = _____ in / wk

Run Time Multiplier (RTM) - used to adjust time for irrigation system inefficiencies

RTM = $1 \div [0.4 + (0.6 \times DU_{LQ})]$

= $1 \div [0.4 + (0.6 \times \underline{\hspace{1cm}})]$ = _____

Irrigation Water Requirement (IWR)

IWR = PWR x RTM

= _____ x _____ = _____ in / wk

Minimum and Maximum Weekly Irrigation Run Time (IRT_{MIN} and IRT_{MAX})

IRT_{MIN} = $(PWR \div PR_{NET}) \times 60$

= $(\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) \times 60$ = _____ min / wk

IRT_{MAX} = $(IWR \div PR_{NET}) \times 60$

= $(\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}) \times 60$ = _____ min / wk

Daily Run Time	Number of Days Per Week to Irrigate (Mature Plants)			
	Weekly ETo	Cool 0 - 0.5 "	Warm 0.6 - 1.0"	Hot above 1"
• Weekly IRT is a management decision between weekly IRT _{MIN} and IRT _{MAX}	Turf	1 - 2 days	2 - 3 days	3 - 7 days
• Number of days to irrigate is a management decision.	Annuals	2 - 3 days	3 - 5 days	4 - 7 days
Use the table for guidance.	Shrubs	Every 2 weeks	Every week	2 - 4 days
	Trees	None	Every 2 months	Every month

Daily IRT = (Weekly IRT ÷ Number of Days to Irrigate)

= $(\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$ = _____ min

Cycles Per Day - round up to the next whole number

Cycles Per Day = (Daily IRT ÷ Time to Runoff)

= $(\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$ = _____

Run Time Per Cycle - round up to the next whole minute.

Run Time Per Cycle = (Daily IRT ÷ Cycles Per Day)

= $(\underline{\hspace{1cm}} \div \underline{\hspace{1cm}})$ = _____