

**LAS VEGAS VALLEY WATER DISTRICT  
BOARD OF DIRECTORS MEETING  
MARCH 4, 2025  
MINUTES**

CALL TO ORDER 9:00 a.m., Commission Chambers, Clark County Government Center,  
500 South Grand Central Parkway, Las Vegas, Nevada

DIRECTORS PRESENT: Marilyn Kirkpatrick, President  
Jim Gibson, Vice President  
April Becker  
Justin Jones  
William McCurdy II  
Michael Naft  
Tick Segerblom

STAFF PRESENT: John Entsminger, Doa Ross, Greg Walch, Kevin Bethel

*Unless otherwise indicated, all members present voted in the affirmative.*

**COMMENTS BY THE GENERAL PUBLIC**

*For full public comment, visit [www.lvwwd.com/apps/agenda/lvwwd/index.cfm](http://www.lvwwd.com/apps/agenda/lvwwd/index.cfm)*

Laura McSwain, 2727 Ashby Ave., representing the Water Fairness Coalition, commented on items #1 and #2. She stated that the minutes of the January 21, 2025, meeting lack detail and asked if there was specific insight to the agenda that was given to a specific group of speakers from the public. She also spoke on item #2 and stated that using the revenue from the Excessive Use Charge to fund the Southern Nevada Water Authority's Water Smart Landscape (WSL) rebate program is inappropriate for multiple reasons. Ms. McSwain's full comment was submitted and is included in these minutes.

Pete Foley, 4512 Fernbrook Rd., commented on item #2 and questioned why at a time when the community is facing record temperatures and heat-related deaths, the District is asking the community to remove grass. He stated that he understands the need to conserve water but stated that there has been no effective environmental assessment of how the mass removal of grass is affecting the environment. He said that once a heat island exists, it impacts the monsoon season negatively. He stated that as leaders of Southern Nevada, the commission should only ask their constituents to do something that they themselves are willing to do.

Diane Henry, 7525 Coley Ave., spoke on item #2 and expressed concern with using the revenue from the Excessive Use Charge to fund the WSL rebate program. She added that a large amount of grass is being removed from the community's parks and school athletic fields, of which many are being replaced with hazardous and toxic, plastic turf. Ms. Henry said that artificial turf needs to be hosed down and disinfected, which negates the water savings that are claimed. She quoted research about the benefits of natural grass, which include producing oxygen and cleaning the air, dust suppression, filtering pollution, reducing the heat island effect and others. She added that the District should promote cool season and water efficient types of grass, rather than its removal.

Ed Uehling, Las Vegas, spoke on item #4 and expressed concern with the Southern Nevada Water Authority (Authority) borrowing nearly \$500,000,000 dollars against the ratepayers. He stated that there is no indication as to what project is being financed with this money. He stated that despite having high water rates and high salaried employees, the Authority continues to borrow large sums of money, adding that it is a mismanagement of funds. He concluded by stating that artificial turf is hazardous and dangerous.

**ITEM NO.**

**1. Approval of Agenda & Minutes**

FINAL ACTION: A motion was made by Vice President Gibson to approve the agenda and the minutes from the joint meeting of January 21, 2025. The motion was approved.

**BUSINESS AGENDA**

- 2. Authorize an additional rebate of \$2 per square foot for single family residential District customers for each square foot of grass converted through the Southern Nevada Water Authority’s Water Smart Landscapes Rebate Program.**

Mr. Entsminger reported that the State of Nevada had given the Authority a grant at the beginning of last year that allowed the \$3 per square foot WSL rebate to increase to \$5 per square foot, regardless of jurisdiction. Since all those funds have been committed, the program has seen a decrease in applications with the rebate’s return to \$3 per square foot. He stated that this \$2 topper would allow District customers to continue to receive \$5 per square foot of grass removed. Vice President Gibson asked where the sources of the dollars will come from. Mr. Entsminger responded that the sources of these funds would come from revenue from the Excessive Use Charge, which has been committed to be used exclusively for conservation-related initiatives.

FINAL ACTION: A motion was made by Vice President Gibson to approve staff’s recommendations. The motion was approved.

- 3. Adopt, approve and authorize a resolution that allows the General Manager, or his designee, to place insurance coverage and pay annual insurance premiums in an amount not to exceed \$5,000,000 for the efficient administration of the District’s risk management and insurance program.**

Director Naft stated that he understands the importance of this item and asked that the District notify the board when the authority is exercised. Vice President Gibson requested clarification on how the Board would be notified if the action was exercised. Mr. Entsminger stated that if the General Manager exercised his authority and pay the insurance premium, he would do so to prevent a lapse in coverage and provide a report afterwards.

FINAL ACTION: A motion was made by Director Naft to adopt, approve and authorize the resolution. The motion was approved.

- 4. Adopt a resolution providing for the issuance of general obligation bonds, additionally secured by Southern Nevada Water Authority pledged revenues, in the maximum principal amount of \$472,100,000, and providing certain details in connection therewith.**

FINAL ACTION: A motion was made by Vice President Gibson to adopt the resolution. The motion was approved.

**COMMENTS BY THE GENERAL PUBLIC**

Ed Uehling stated that he does not remember the Apex project being included in the 2021 Integrated Resource and Planning Advisory Committee (IRPAC) recommended projects. He asked if this one project will cost nearly \$500,000,000. He stated that the Authority needs to focus on bringing additional water resources to the valley and not solely transferring water from within the valley.

Sharon Seeley, 6475 Darby Ave., expressed concern about the excess water charges, vegetation that is dying due to lack of water, the removal of natural grass, and the installation of artificial turf. She stated that artificial turf emits heat, but it is also a danger to the health of the community. She feels that the District staff and board are not taking serious action in doing what is right for the citizens of Las Vegas.

Terry O’Roarke, 2000 Palm Canyon, stated that those who are converting to water smart landscaping are getting a portion of their ratepayer and taxpayer money back, as some of the WSL rebate program had come from a State of Nevada grant. She stated that the WSL promotions tend to focus on the installation of artificial turf.

Laura Bautista, Henderson, NV, spoke about her husband’s termination from the District. She stated that he had been an exemplary employee for 15 years but was terminated without a verbal or written warning. She added that the District and its board have lost sight of integrity and accountability. Her full written comment is included in these minutes.

Diane Henry spoke about the spring mandatory watering restrictions advertising and stated that it is very misleading and confusing as to how many days per week a resident can water. Her full written comment is included in these minutes.

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Pete Foley stated that there is a lack of transparency and accountability with the District. He reminded the board of the District's commitment to give an accounting of the Excessive Use Charge revenue, which he stated has not yet happened. He stated that at the end of last year, President Kirkpatrick gave a commitment to have a detailed discussion around the challenge of managing growth and water resources. He stated that also has not yet happened. He concluded by mentioning the issues with the heat island effect and asked why the board has not discussed this topic.

Laura McSwain provided information to the board that included a series of documents that support the Water Fairness Coalition's new mission which is "Grass Under Trees is Functional." She disagrees with the concept that incentivizing \$100 to plant a tree is the most effective tool to helping heat mitigation, and stated that the protection of our mature, existing landscaping is the most effective tool. She stated that the included documents outline the importance of the tree and natural grass relationship. She also included letters between District staff and a District customer that discussed the Non-functional Turf Removal Advisory Committee (NTRAC), which was tasked with defining non-functional turf in the valley. Ms. McSwain believes NTRAC should be re-established and the issues revisited. The documents referenced are included in these minutes.

**Adjournment**

There being no further business to come before the board, the meeting adjourned at 9:42 a.m.

**Copies of all original agenda items and minutes, including all attachments, are on file in the General Manager's office at the Las Vegas Valley Water District, 1001 South Valley View Boulevard, Las Vegas, Nevada.**

## Public comment received for the 3/4/25 LVVWD Board of Directors meeting



### March 4, 2025 LVVWD Meeting – First Public Comment

#### Agenda Item #1-

The minutes of the January 21, 2025 meeting are lacking in detail and fail to illustrate the charade that occurred during that meeting's initial public comment. Representatives from Vegas Chamber, Nevada Resorts Association, Latin Chamber of Commerce, Nevada Conservation League and others came out to speak on agenda item 13. When Diane Henry brought up concerns about initial public comment being available for ONLY Agenda Items and general public comments at the end of the meeting, President Kirkpatrick indicated that the speakers were there to comment on item 13, so it was allowed. There was only one problem, there was no supporting documentation provided to the public in advance of the meeting. How would they have known? What special insight to the agenda that was denied the general public in advance of the meeting was given to this specific group of speakers?

We are still waiting for the agenda promised by President Kirkpatrick during the December 2024 meeting that would include the Hard decisions she was faced <sup>with</sup> during private meetings related to the adoption of the One-size-fits-all excessive use penalties.

#### Agenda Item #2-

The WFC objects to the revenue sources identified for the funding of the Water Smart rebate program, particularly the \$2.00 subsidy coming from the District's Excessive Use Charge penalties. It is inappropriate for multiple reasons. **First-** the use of the excessive use charge penalties in this manner exceeds their original intent as described when the rules change was adopted. During the September 6, 2022 meeting that included the review of the Business Impact Statement, it was stated that the money would be placed into the financial reserve fund. **FROM THE BUSINESS IMPACT STATEMENT PRESENTED SEPTEMBER 6, 2022.**

**If the proposed rule provides a new fee or increases an existing fee, the total annual amount the local government expects to collect and the manner in which the money will be used:**

While these changes are being proposed with the sole purpose of sending a strong pricing signal to incentivize conservation of the community's water resources, the proposed changes are estimated to generate approximately \$25 million in their first year of implementation. **Revenue collected as a result of the proposed Service Rule changes, if adopted, will be placed in the District's financial reserve fund for future needs.**

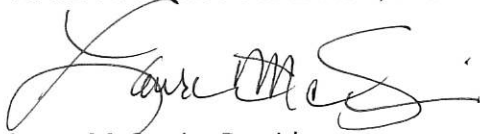
**Allowed expenditures of such funds are as follows:**

Operating and Maintenance Expenses  
Debt Service  
Capital Needs  
Emergency Responses.

**Second-** any public money, tax payer or rate payer should not be subsidizing artificial turf without the materials being vetted specifically so that they do not add to the community's heat island (materials range in temperature during summer months 165 to 185 degrees Fahrenheit) and must be tested for toxicity and PFAS and not allowed if either are present.

With Recycling Southern Nevada has 135 years water supply. The Excessive Use Charge penalties should be suspended and returned to residents, with the full accounting that has been promised by both Commissioners Jim Gibson and Marilyn Kirkpatrick going back to May of 2024.

WATER FAIRNESS COALITION, INC

A handwritten signature in black ink, appearing to read 'Laura McSwain', written in a cursive style.

Laura McSwain, President



LVVWD 3/4/2025  
Public Comment

**Public comment received for the 3/4/25 LVVWD Board of Directors meeting**

Members of the Board,

I am here to speak about the career of a 15-year employee—a man whose dedication and excellence were unwavering. His performance reviews, documented by three separate supervisors, reflect his outstanding contributions. These reviews contain not a single negative remark. Here are just a few examples:

- He “exemplifies the District’s values and conducts himself in a truly professional manner.”
- He “can be relied upon to maintain the highest ethical behavior.”
- As “an effective and high-performing supervisor,” his “crew’s performance remains excellent.”
- His “focus on long-term improvements and reliability” is “a great value to the District.”
- Under his leadership, “the booster crew has identified and implemented numerous system and equipment improvements, resulting in cost savings, extended asset life, efficiency, and safety enhancements.”

Despite this impeccable record, he was abruptly perped walked out—without a single prior disciplinary action. Not one verbal or written warning in 15 years.

Yet, the District’s outside attorney dismissively referred to this situation as “garden variety.” Meanwhile, they requested a 30-day extension for settlement discussions—only to hand it off to yet another attorney, all at the expense of ratepayers.

According to YOUR legal counsel, the following actions are considered “garden variety” at the Las Vegas Valley Water District:

- Zero progressive discipline—terminating an employee without prior warnings or corrective action
- Hiring multiple outside law firms—one to investigate HR’s conduct, another to defend the District
- A director illegally recording an employee’s phone call and submitting it to HR
- Placing multiple employees on 15 weeks of paid administrative leave while manufacturing reasons for termination
- Twisting testimony, omitting key evidence, and misrepresenting facts to build a false case against a dedicated employee

- General Manager John Entsminger knowingly and falsely informing outside sources that the employee was fired for theft—an act of malfeasance and reckless disregard for the truth

If all of this is what your counsel considers “garden variety,” then this Board has completely lost sight of integrity and accountability.

I hope you recognize this as an opportunity to do the right thing. But if you choose to ignore it, then you have no business sitting in those seats.

Since my concerns have been repeatedly dismissed and I have yet to receive real answers:

- I am filing complaints with multiple state and federal agencies and pursuing criminal charges for illegal wiretapping.
- I will be filing complaints with the Nevada Attorney General's Office for fraudulent misrepresentation and exploring legal action for defamation.
- Those responsible must be held accountable.

I truly hope that in the future, when questions of ethics, law, and integrity arise, this Board will remember its duty and act—before another dedicated employee and his family are subjected to ten months of unnecessary suffering.

I trust that external authorities will step in where this Board has failed.

## Public comment received for the 3/4/25 LVVWD Board of Directors Meeting

March 4, 2025

LVVWD Board Members:

From March through April, Mandatory watering restrictions require watering no more than 3 days a week. But your latest ad about this, which is pretty much everywhere.... on your website, TV, smartphones, Facebook, Instagram, and Nextdoor, are very misleading.

You're announcing that the Spring Watering Schedule, which is up to 3 days a week, is now in effect. But your ad (Attached) says, "WATER PLANTS & TREES UP TO 2 Days A WEEK". Then in small print it says, "STILL GOT GRASS? WATER GRASS up to 3 DAYS A WEEK".

If you're trying to create confusion so people believe they can only water 2 days a week, then your ad will likely be successful. Many people will think that if they water more than twice a week, you'll send them a dreaded violation warning or the water police. But your regulations actually allow up to 3 days a week, if needed. Most potted plants and gardens cannot survive on twice weekly once the temperatures begin to climb. And hand watering is very difficult and tedious.

Your ad seems very misleading, especially with the large words below it on your website that say "Mandatory Watering Schedule".

Respectfully,

Diane Henry

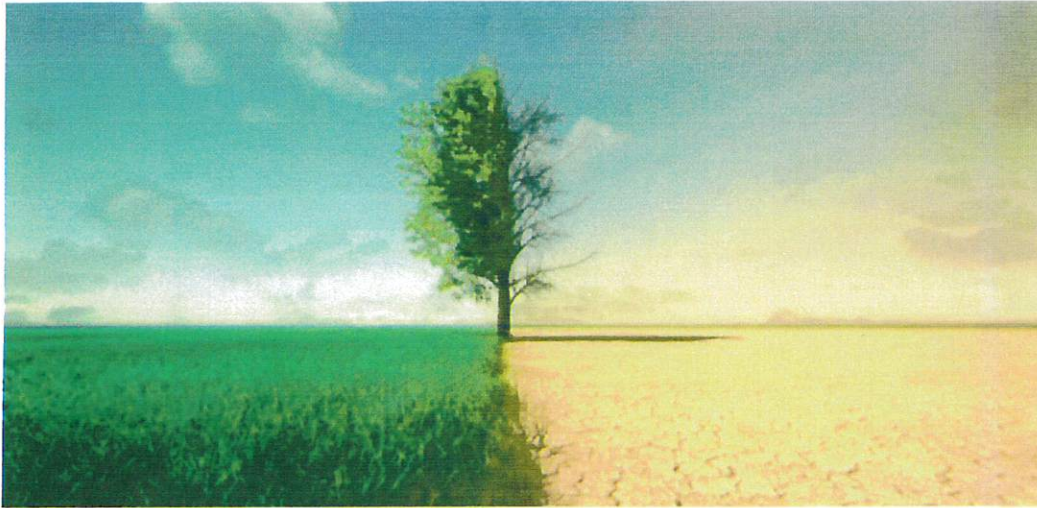
rechenry@aol.com





## Mandatory watering schedule

Assigned watering days are mandatory for all customers. Running your landscape irrigation system outside your assigned days is [water waste](#) and may result in a [water waste fine](#).



Grass Under Trees Is Functional  
Save Our Urban Forest

*I feel the SNWA has way overstepped its mandate and is now risking doing severe and highly consequential damage to Southern Nevada, economically, environmentally and in quality of life. They are now severely threatening our urban forest just as we need it most to help mitigate the effects of regional warming and the heat island effect of our urban community!*

**Norm Schilling, Horticulturist and Gardening Expert**

Join us at

**[WaterFairnessCoalition.com](http://WaterFairnessCoalition.com)**





Turf Grass – Finding Balance and recognizing that healthy trees and soil invite rain.

1. 5000 SQ FT OF GRASS PRODUCES O<sub>2</sub> FOR 34 PEOPLE PER DAY. (DR. KELLY KOPP)
2. **Climate change is making it harder for trees to ‘breathe’**  
[new research](#), which was recently published in *Proceedings of the National Academy of Sciences*, the effectiveness of trees to act as filters for carbon dioxide is falling, especially in warmer and drier climates. As such, it is estimated that trees in environments where the temperatures are rising will slowly start to be less effective. This is a good argument for not removing turf and not replacing mature trees with new seedlings that will take years to mature, and may not at all. For every 1000 15-gallon trees, one may reach maturity.
3. **Tree Health and Longevity**
  - a. Grass under tree canopies protects soil moisture, reduces heat stress, and prevents root damage caused by rock or artificial turf, ensuring healthier and longer-living trees
4. **Mitigation of Urban Heat Island Effect** grass and trees together reduce surface temperatures, cool surrounding areas, and combat the urban heat island effect, which is critical for Las Vegas' rising temperatures
5. **Water Efficiency** Grass under shade requires less water due to reduced evaporation, making it a sustainable option compared to unshaded lawns
6. **Community and Aesthetic Benefits**
  - a. Shaded grass areas provide cooler recreational spaces, improve air quality, and enhance neighborhood aesthetics, contributing to overall community well-being
7. **How does functional turf affect urban heat island mitigation?**
  - a. **Evaporative Cooling** Grass cools the surrounding air via evapotranspiration, reducing surface and air temperatures. For example, irrigated natural turf can be up to 4.9°C cooler than average surface temperatures
  - b. **Reduced Heat Retention** Unlike synthetic materials like artificial turf, asphalt, or rocks grass reflects less heat.
  - c. **Air Quality Improvement** Turfgrass absorbs pollutants, produces oxygen, and reduces dust and noise pollution, contributing to healthier urban environments.
8. **SOCIETAL BENEFITS OF GRASS**
  - a. Improves human mental and physical health.
  - b. Increases social community and harmony, and deters crime.
  - c. Decreases noxious pests, invasive species, and human disease exposure.

#### TURF REMOVAL NEGATIVE IMPACTS

Rebate programs may be suitable for desert climates, policymakers should carefully consider the ecosystem services lost and the potential new ecosystem disservices resulting from such changes. Policymakers often underestimate the ecosystem services provided by turfgrass systems and fail to consider the potential negative environmental consequences of non-turfgrass landscapes after implementing rebate programs. Instead of complete turfgrass removal, there may be other viable strategies such as utilizing more drought-tolerant turfgrass species, changing management practices, and more (Braun, Straw, et al., 2023).

# Legislative Intent of AB356

## Quotes from meeting minutes:

- SNWA Andy Belanger states that SNWA was “seeking a legislative vehicle to address nonfunctional turf in SO NV”. He also said that “parks, schools, playing fields and residential backyards are supported in our code and will continue to protect these”.
- Not every home is located in areas zoned exclusively for single-family residences. Many SNWA users live in condominiums where the only green space may be the common area. The bill will deprive them of this space.
- **ASSEMBLYMAN WATTS: Assembly Bill 356 is not intended to target common areas in communities. Common areas in these communities are considered functional turf. Green spaces in multifamily developments are not being addressed in the bill. Medians and other areas serving no purpose are addressed by the provisions in the bill. May 11, 2021**
- Assemblywoman Cohen expresses concern and wants to make sure multifamily dwellings are considered that to those residents grass is functional even if they don't play on it... Assemblyman Watts elaborates for Assemblywoman Cohen... functional other than ornamental...specifically addresses turf that is NOT residential. April 9, 2021



Dear Mr. Engelbretson,

Thank you for providing feedback about Southern Nevada's nonfunctional grass initiative. Your inquiry was forwarded to me for a response, and we have reviewed your request, as well as the Nevada Division of Forestry information you cited.

For some background, the Nonfunctional Turf Removal Advisory Committee—appointed by the Southern Nevada Water Authority (SNWA) Board of Directors and comprised of representatives from various public and private organizations from throughout the community—provided careful and thoughtful deliberation in developing nonfunctional turf definitions to help ensure that our community maintains grass areas for public use while eliminating decorative grass that provides no recreational value.

While we understand your position, the fact is that grass uses much more water than drip-irrigated trees and plants. Because trees and grass have different watering needs, the SNWA agrees with landscaping experts that trees and grass should be irrigated separately; the published research on the Nevada Division of Forestry website acknowledges this.

In the published research, titled [Selecting and Maintaining Trees for Urban Desert Landscapes](#), authors Dale A. Devitt and Robert L. Morris state that “lawns and trees should be grown separately.” Furthermore, the authors indicate that mixed-landscapes of trees and grass are irrigated to favor the shallow-rooted grass, which consequently causes trees to grow more slowly due to competition for water, air and fertilizer.

Over the past 25 years, the SNWA's Water Smart Landscapes Rebate Program has incentivized the replacement of more than 240 million square feet of grass through more than 90,000 conversion projects, including projects within Desert Shores. While not every tree has survived these projects (due to inadequate irrigation designs or other variables affecting tree health), the overwhelming majority of properly irrigated and maintained trees survive and thrive after a landscape conversion.

Lastly, you mentioned that providing adequate water for trees within HOAs uses a significant amount of water compared to grass. While this has not been our experience, we are happy to review any water use data with you.

As an example, however, we reviewed just one of the common-area landscapes within Desert Shores, along Regatta Drive between Buffalo Drive and Mariner Drive. Before the grass was replaced, the landscape consumed 7.2 million gallons of water (2021); after the conversion, it consumed 4.3 million gallons (2024), resulting in a 40 percent reduction in water consumption for that common area alone.

With climate change continuing to create uncertainty, we can expect Southern Nevada to continue getting warmer and drier. As a result, some of the most popular tree species in our valley will be unable to adapt to extreme-heat conditions, regardless of how well they are irrigated. With this in mind, the SNWA partnered with a local non-profit and recently completed the installation of 1,000 new desert-adapted trees in our valley; the City of Las Vegas and Clark County are also supporting ongoing initiatives to plant thousands of trees community-wide.

The SNWA's website (snwa.com) includes a [range of resources and educational materials](#) focused on proper tree care, tips to protect trees during a landscape upgrade, and recommendations for efficient tree irrigation.

If you would like more information or to discuss landscape water usage with SNWA's Conservation experts, please contact me at 702-822-8543.

Regards,  
Bronson  
SNWA/LVVWD Outreach Manager

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Bronson L. Mack  
SNWA | LVVWD Public Outreach  
1001 S. Valley View Blvd, LV, NV 89153  
702-822-8543



**Dear Mr. Mack,**

I appreciate your response on behalf of the County Commissioners, also known as the Water Authority Board. I applaud SNWA's ongoing collaborative efforts to plant thousands of new desert-adapted trees in our valley. It's clear that we both agree on the imperative of protecting our urban forest. While we have different views and methods for achieving this goal, I would like to highlight a few important points where our opinions differ.

**AB356 / 220 and Nonfunctional Turf Removal Advisory Committee (NTRAC):** When AB356 was first enacted, I compared the bill's language with the Nonfunctional Turf Removal Advisory Committee's (NTRAC) guidelines. I immediately contacted my District 6 State Senator to inquire how administrative rules and guidelines could exceed the authority of state statute. Unfortunately, I never received a response, but I firmly believe this is the case. With over 15 years of state government experience, I have knowledge of drafting and promulgating administrative procedures to help carry out the provisions of state statutes. It's crucial to review, correct, and improve procedures as time passes. I believe it is time for SNWA to reconvene the NTRAC group to address this issue. It seems clear to me that NTRAC exceeded its mandated authority by including orders to remove single-family residential (SFR) front lawns in homeowner associations. AB356 was promoted as a bill mandating the removal of grass that was not cared about, such as grass in grand front entrances to HOAs, along roadways, in highway and parking lot medians, and in front of commercial establishments—not from any individual homeowners' front lawns.

**Trees and Grass Should Be Irrigated Separately:** My argument is not about new development expansion and future tree landscaping but rather about the need to preserve our existing trees planted 35 years ago **with grass around them**. These trees have now matured into big, glorious specimens. Based on my firsthand witness to a homeowner association tree-turf irrigation study, I stand by my assertion that trees in some communities with dense tree cover can and do require more water than grass. Nearly 500 trees in this community were inventoried and classified by arborist John Smith and included in the water study. Using an average of 33-foot canopies, the total coverage area was determined to be about twice the size of that community's surface area. Drip irrigation requirements were applied to the trees based on species and average canopy size. When drip water requirements for trees were calculated, they were nearly identical to the average annual water usage data extracted from three years' worth of LVVWD water bills, which included water for all trees, grass, shrubs, and plants. Dr. Heidi Kratsch's logic and conclusions regarding tree irrigation needs align nearly identical with the HOA's study results. I have attached her data exhibit 5 for your reference.

**Overwhelming Majority of Properly Irrigated and Maintained Trees Survive and Thrive After a Landscape Conversion:** The argument for keeping existing grass under the trees is based on its beauty, health and enjoyment benefits, temperature reduction effects, and avoidance of burdensome special assessments for fixed-income senior citizens. The small amount of extra water required to protect our living environment is well worth

it. Based on the aforementioned water study, watering the tree forest almost gives us the grass for free. Buried drippers will inevitably experience underground water leaks as poly deteriorates with extreme heat. The amount of water wasted underground could easily equal the amount necessary for retaining the original turf under the trees. Since my original email appeal on February 18, 2025, I have become aware of a study by the Desert Research Institute (DRI) for the City of Henderson that confirms that removing turf is damaging to the environment and contributes to increased temperatures and the heat island effect. It highlights that "grass under trees" uses 50% less water and reduces temperatures by over 30 degrees Fahrenheit (page 19). For your information, here is the link to the report: <https://waterfairnesscoalition.us9.list-manage.com/track/click?u=dc6e0e6caed41c850bb8a2727&id=c83065e585&e=e332ace1da>

In summary, we the people need all single-family residential (SFR) front yards, whether in a homeowner association or not, exempted from mandatory turf removal. Trees and grass give us oxygen to live—how can that be deemed a "nonfunctional" purpose? Additionally, we need grass under tree canopies designated as "functional" and exempted from removal for all homeowner associations. Some may choose to perform strategic conservation projects but want to ensure the health and life of their beautiful mature trees by maintaining turf underneath. Cutting down and removing sick and dying trees caused by the stress and trauma of turf removal and replacing them with high water-demand new ones is expensive and will take decades to replace our much-needed shade and cooling benefits.

Best Regards,  
Roy Engelbretson  
Desert Shores and Sun City Summerlin

**ATCH:** Dr. Kratsch - Tree Watering Requirements

## 5-A DR. HEIDI KRATSCH – TREE IRRIGATION

### Heidi Kratsch, Ph.D.

Professor, State Specialist  
UNIVERSITY NEVADA RENO

I have over 20 years of experience working on issues related to woody plant stress. I am particularly interested in the impact of water stress on trees, and have spent most of my career instructing students, green industry professionals, master gardeners and the public on landscape water conservation strategies. I also have an interest in marketing social change, and I have used a variety of strategies to help citizens move towards positive behavior related to urban landscape sustainability.



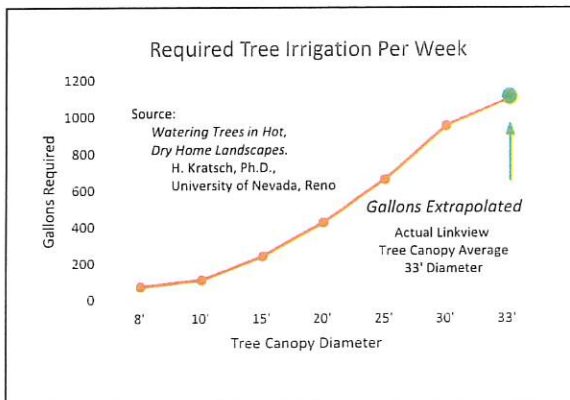
Dr. Kratsch

Kratsch Chart Ends at 30'; 33' Diameter Extrapolated

Diameter of root zone in feet (Trees in Southern Nevada)	8'	10'	15'	20'	25'	30'	33'
Gallons of water for low water use tree	52	81	183	325	508	731	
<b>Avg of high and low trees</b> -->	<b>68</b>	<b>106</b>	<b>238</b>	<b>423</b>	<b>660</b>	<b>951</b>	<b>1093</b>
Gallons of water for high water use tree	83	130	292	520	812	1,170	

<https://extension.unr.edu/publication.aspx?PubID=5109>

Linkview's 455 Trees: Average Canopy Diameter of 33'



#### LINKVIEW TREE IRRIGATION REQ'D - KRATSCH FORMULA

Avg Tree Diameter / Ft	33
Gals / Tree / Weekly	1,093
Number of Trees	455
Total Gallons Weekly	497,315
52 Week Total	25,860,380
Assume Canopy Overlap*	40%
<b>Estimated Annual Gallons Required</b>	<b>15,516,228</b>

\* (Tree Overlap, Hardscape & Structure)