

California Water Efficient Landscape Ordinance:
Golf Course Water Budget SLA Determination
for New Golf Course Construction &
Rehabilitated (Remodeled or Renovated) Golf
Courses.

December 19, 2017

California Water Efficient Landscape Ordinance:
Golf Course Water Budget SLA Determination for New Golf Course Construction & Rehabilitated
(Remodeled or Renovated) Golf Courses.

Table of Contents

SECTION 1.0 – NEWLY CONSTRUCTED REGULATION LENGTH GOLF COURSES “SPECIAL LANDSCAPE AREA” (SLA)	3
SECTION 2.0 – REHABILITATED (REMODELED OR RENOVATED) REGULATION LENGTH GOLF COURSES “SPECIAL LANDSCAPE AREA” (SLA)	5
SECTION 3.0 – EXECUTIVE, “PAR 3” LENGTH GOLF COURSES AND STAND-ALONE PRACTICE FACILITIES SLA	8
SECTION 4.0 – OTHER SUBJECTS	9
4.1 MAWA Calculations Worksheets Acreage Area Units for Golf Courses and Other Large Landscapes	9
4.2 Golf Courses and Mulch Requirements of Section 492.6 Landscape Design Plan (a)(3)Soil Preparation, Mulch and Amendments (D) -.....	9
SECTION 5.0 GOLF COURSE TURF ACREAGE REFERENCES.....	11
5.1 Arizona DWR Water Management Plan.....	11
5.2 Southern Nevada Golf Course Water Budgets.....	12
5.2.1 Boulder City Nevada Turf Limitations	12
5.2.2 Las Vegas Valley Water District (City of Las Vegas)	12
5.2.3 Clark County	13

SECTION 1.0 – NEWLY CONSTRUCTED REGULATION LENGTH GOLF COURSES “SPECIAL LANDSCAPE AREA” (SLA)

– Regulation length golf courses require safety corridors outside the periphery of areas designated for active play. These safety corridors are intended to protect non-golfers and golfers from errant golf shots that may otherwise reach neighboring streets, properties and/or adjacent parallel golf holes. The area designated for active play can therefore occupy a smaller footprint of irrigated turf and allow a newly constructed golf course’s SLA to be limited in size. A maximum golf course SLA shall be determined based upon the following criteria:

- The SLA of newly constructed regulation length golf courses is defined as the area(s) designated for active play. The SLA includes all irrigated turf and/or water features located tee through green including the tees, fairways, roughs, surrounds, and playing greens. Practice facilities are also included as part of the overall SLA.
- The SLA of the practice facilities of a newly constructed regulation length golf course are defined as the area(s) of irrigated turfgrass designated for active play (practice) and include all turfgrass and/or water features comprising practice area greens, tees, ranges, and short game/chipping areas.
- A newly constructed regulation length golf course’s SLA including practice facilities shall not exceed an average of five (5) acres of irrigated turfgrass per golf hole plus 10 additional acres of irrigated turfgrass practice facilities per 18 holes.¹
- The SLA of a newly constructed regulation length golf course is inclusive of all water features (ponds, lakes, streams, waterfalls, open irrigation reservoirs, etc.) **with the exception of** enclosed or covered tanks and/or reservoirs that prevent evaporative losses, constructed wetlands that are not irrigated and used solely for on-site wastewater treatment, storm water best management practices and/or storm water retention and recharge.
- The SLA for practice facilities of newly constructed multi-course facilities (>18 holes) may be consolidated into a single and larger practice facility or multiple individual smaller facilities. However, the total SLA for practice facilities shall not exceed an average of 10 acres of irrigated turfgrass per 18 golf holes constructed.
- Practice facility SLA area shall not be reallocated to the golf course SLA area.
- All additional irrigated landscape area (in excess of the SLA acreage) for a newly constructed regulation length golf course shall receive the same ETAF as non-residential landscapes.
- The SLA of newly constructed regulation length golf courses designed with more (or less) than 18 golf holes will be adjusted based upon the number of golf holes at an average of

¹ Average 5 acres of irrigated turfgrass per golf hole and 10 acres of irrigated turfgrass for practice facilities is a standard successfully used with new golf course construction in both in Southern Nevada (beginning approx. 2000) and Arizona (beginning approx. 1984). Supporting references are provided in Section 5.0

California Water Efficient Landscape Ordinance:
Golf Course Water Budget SLA Determination for New Golf Course Construction & Rehabilitated
(Remodeled or Renovated) Golf Courses.

five (5) acres of irrigated turfgrass per golf hole and 10 acres of irrigated turfgrass practice facilities per 18 holes.

- See Section 3 for a discussion regarding the SLA of newly constructed stand-alone practice facilities, executive length golf courses and par 3 golf courses.

Example Calculations for Newly Constructed Golf Courses

Maximum SLA Calculated by Number of Golf Holes:

- Example 18-Hole Golf Course SLA = 100 acres [(18 golf holes X 5 acres of irrigated turfgrass) + (10 acres of irrigated turfgrass practice facilities per 18 holes)]
- Example 27-Hole Golf Course SLA = 150 acres [(27 golf holes X 5 acres of irrigated turfgrass) + (10 Acres of irrigated turfgrass Practice facilities per 18 holes X 1.5)]

Example Non-Residential Landscape Acreage Calculation

- Non-Residential Landscape Acres (NRLA) = Total Golf Course Acres (TGCA) – Golf Course SLA Acres (SLAA)
- Example total 18-hole golf course, practice facilities & safety corridor footprint of 125 acres
- 125 TGCA – 100 SLAA = 25 NRLA

Newly Constructed Golf Courses MAWA Calculation

- MAWA = (SLA Acres X ETAF 1.0) + (Non-Residential Landscape Acres X ETAF 0.45)

SECTION 2.0 – REHABILITATED (REMODELED OR RENOVATED) REGULATION LENGTH GOLF COURSES “SPECIAL LANDSCAPE AREA” (SLA)

- Current MWELo guidelines allow 100% of an existing golf course’s irrigated turfgrass to be designated as the SLA with no limits on the total area. Therefore, established, older golf courses often comprise more irrigated turf acreage within the current MWELo SLA definition than needed to accommodate areas of active play. Reducing non-essential irrigated turf areas however requires thoughtful reconfiguration of both the course design and the irrigation system in order to maintain a safe yet still playable golf course. During golf course rehabilitation (remodeling or renovation) projects the opportunity is presented to require a strategic reduction of peripheral turf as a condition of required permits, plan checks and/or design reviews.

Some golf courses may opt to shut down the entire facility to perform a complete rehabilitation (remodeling or renovation) in one effort. More often, golf course rehabilitation (remodeling or renovation) projects are performed incrementally in phases over multiple years in order to not significantly impact play and cash flows. Therefore, the amount of peripheral area converted from turf to non-residential landscapes during a phased rehabilitation (remodeling or renovation) should be proportional to the size of the “*disturbed area*” occurring in each phase. Upon completion of all phases of a rehabilitation (remodeling or renovation) project, the goal is an incremental reduction of the portion of the resultant golf property that qualifies for the SLA designation with respect to determining a water budget therefore.

Requiring inclusion of existing water features in the SLA reduced footprint may not be practical in some cases where large water features were originally incorporated into a design. Therefore, in the case of rehabilitated (remodeled or renovated) existing golf courses the SLA will only consider turf area and not water features when calculating the acreage that qualifies for the SLA designation.

Additionally, several golf course rehabilitation (remodeling or renovations) projects can be considered as water conserving in their own right (e.g., turf conversion from high to lower water using varieties [cool season versus warm season species], irrigation system renovations to produce higher irrigation efficiencies, lake liner replacements, lake removal, stand-alone turf reduction projects). These projects should be exempt from any incremental turf reduction requirement so as not to discourage or dis-incentivize such water conserving projects due to onerous costs. However, should excavation or grading activity outside of, or in addition to, the components of the project identified as water conserving be planned or envisaged, the incremental turf reduction based on that “*disturbed area*” shall be required.

Determining the minimum required area of turf reduction during a regulation length golf course’s rehabilitation (remodeling or renovation) will be based upon a percentage of the “*disturbed area*” per following criteria:

California Water Efficient Landscape Ordinance:
Golf Course Water Budget SLA Determination for New Golf Course Construction & Rehabilitated
(Remodeled or Renovated) Golf Courses.

- A golf course rehabilitation (remodel or renovation) project requiring mandatory turf reduction is defined as any project requiring a permit, plan check or design review that will disturb more than one (1) acre of area during the project.²
- *Disturbed Area* (DA) is defined as the total area of soil disturbance (minus trenches) resulting from rototilling, grading and/or excavation.
- The minimum required turf reduction area for an 18-Hole regulation golf course's rehabilitation (remodeling or renovation) project shall be equal to 20% of the total disturbed area of each phase when greater than one (>1) acre is disturbed per permitted project. (Example: If an 18-Hole regulation golf course's rehabilitation, remodeling or renovation project will result in five (5) acres of disturbed area, then one (1) acre of area upon completion shall be planted & irrigated to meet the ETAF of a commercial landscape area.)
- Voluntary incorporation of additional turf reduction area is encouraged.
- Upon completion, the area where turf reduction has been performed at a minimum shall meet the ETAF & MAWA requirements of non-residential landscapes.

Water Features:

- Existing water features (ponds, lakes, streams, waterfalls, open irrigation reservoirs, etc.) are excluded from a rehabilitated (remodeled or renovated) regulation length golf course SLA calculation.
- Newly constructed, added or enlarged water features (ponds, lakes, streams, waterfalls, open irrigation reservoirs, etc.) are included in a rehabilitated (remodeled or renovated) regulation length golf course SLA calculation.
- The same as with newly constructed regulation length golf courses; constructed wetlands that are not irrigated and used solely for on-site wastewater treatment, storm water best management practices and/or storm water retention and recharge are exempt from inclusion in the SLA calculation as are storage tanks / reservoirs if completely enclosed / covered for the express purpose of preventing evaporation losses.
- No additional turf reduction shall be required once the SLA (area of active play) of a regulation length golf course while under rehabilitation (remodeling or renovation) meets

² Proportionally the MWEL 500 sq. ft. disturbed area standard that triggers rehabilitation of an average three thousand (3000) sq. ft. residential landscape equates to greater than sixteen and one-half (>16½) acres of disturbed area in relationship to a one-hundred plus (100+) acre golf course. Since a) the State of California requires storm water pollution prevention plans (SWPPP) when more than one (1) acre is disturbed, b) most municipal agencies require grading permits when soil volumes (minus trenches) of fifty (50) cubic yards or greater are disturbed, and c) the MWEL landscape rehabilitation process is triggered by a required permit, plan check or design review, the one acre threshold to trigger incremental golf course rehabilitation appears reasonable. Note also that fifty (50) cubic yards is equal to approx. 3/8" of soil disturbance over one acre.

California Water Efficient Landscape Ordinance:
Golf Course Water Budget SLA Determination for New Golf Course Construction & Rehabilitated
(Remodeled or Renovated) Golf Courses.

the average five (5) acres of irrigated turfgrass per golf hole, plus 10 additional acres of irrigated turfgrass practice area per 18 Holes guideline.

- Where a change in configuration or total number of golf holes will occur during the rehabilitation (remodeling or renovation) process the SLA will be adjusted based upon the total number of holes upon completion and the total *disturbed area* during construction. Where new holes are added their SLA must be based on the average of five (5) acres per golf hole of irrigated turfgrass plus 10 acres of irrigated turfgrass practice facilities per 18 holes.
- Determining the SLA for rehabilitated (remodeled or renovated) stand-alone practice facilities, executive length and par 3 golf courses is discussed in Section 3.

Turf Reduction Exempt Projects & Categories:

- Water conserving rehabilitation (remodeling or renovation) projects requiring a permit, plan check or design review are exempt from mandatory turf reduction based on total disturbed area. Voluntary incorporation of turf reduction for water conservation is encouraged. Projects qualifying for an exemption include:
 - Conversions of existing golf courses to 100% recycled water as part of a rehabilitation (remodeling or renovation) project.
 - Stand-alone turf reduction projects that upon completion meet non-residential landscape ETAF & MAWA standards.
 - Irrigation system renovations that will conserve water by improving application efficiency and/or distribution uniformity.
 - Water feature removal or a renovation (manmade line lakes, reservoirs, streams and/or ponds) that includes liner replacement. Water feature(s) renovation will qualify only if the total surface area of the water feature(s) remains the same or is reduced in size upon completion.
 - Turf renovation, repair or sodding performed as part of normal maintenance. (Includes drill seeding, slice seeding, winter over seeding, and/or sod replacement providing that rototilling, excavation, and/or grading are not performed as part of the project.)
- Repair or rehabilitation (remodeling or renovation) projects resulting from a flood, fire, earthquake etc. requiring a permit, plan check or design review are considered required repairs and exempt from mandatory turf reduction based on *disturbed area*; however voluntary incorporation of turf reduction is encouraged.
- Disturbed areas directly related to projects initiated by outside/municipal agencies via property condemnation and/or legal right-of-way access (highway expansion, utility installations, etc.,) are exempt from mandatory turf reduction based on disturbed area; however voluntary incorporation of turf reduction is encouraged.

SECTION 3.0 – EXECUTIVE, “PAR 3” LENGTH GOLF COURSES AND STAND-ALONE PRACTICE FACILITIES SLA

“Executive” and “par 3” length golf courses with an entire area/parcel that does not exceed the guideline of an average five (5) acres of irrigated turfgrass per golf hole and 10 acres of irrigated turfgrass for practice facilities per 18 holes will remain as 100% SLA. These facilities are typically utilized by beginning players / individuals learning the game justifying some flexibility with regards to the total amount of turf comprising the property. Nine-hole “regulation length” facilities however will fall under the average acreage five (5) acres of irrigated turfgrass per golf hole guideline plus 10 acres of irrigated turfgrass for practice facilities. (Note: A stand-alone practice facility area is not necessarily proportional to the number of golf holes as would be the case for a profit entity.)

Stand-alone practice facilities (driving ranges including short game / chipping areas etc.) generally do not exceed 10 acres of irrigated turfgrass. The trend with new stand-alone practice facilities has been to migrate towards artificial turf surfaces in the driving range landing area. This reduces the need for large mowing equipment, and reduces repair, maintenance and irrigation costs. Stand-alone practice facilities often maintain natural turf greens, tee surfaces and short game areas that typically total much less than 10 acres of irrigated turfgrass. Therefore, standalone practice facilities of 10 acres of irrigated turfgrass or less should be exempt and/or deemed 100% SLA.

SECTION 4.0 – OTHER SUBJECTS

4.1 MAWA Calculations Worksheets Acreage Area Units for Golf Courses and Other Large Landscapes - The Golf Industry suggests the MAWA calculations worksheet be updated for large landscapes (golf courses, parks, cemeteries, sports fields etc.) and include landscape / SLA area in units of acres in addition to the current square feet. (XL Spreadsheet 2010 Version available online at: <https://www.google.com/search?q=DWR+MAWA+Calculator&ie=utf-8&oe=utf-8&client=firefox-b-1>)

4.2 Golf Courses and Mulch Requirements of Section 492.6 Landscape Design Plan (a)(3) Soil Preparation, Mulch and Amendments (D) -

The peripheral safety corridors are areas where reducing golf course turf is most practical for either new golf course construction or rehabilitated (remodeled or renovated) golf courses. These are “somewhat” out-of-play areas for purposes of both the “recreational area” and “SLA” definitions; however these areas often enter into play for the vast majority of golfers whose skill levels are at best mediocre. A fluffy 3” depth of loose organic mulch will absorb and swallow most errant golf balls upon impact, making them extremely difficult to find. This slows play and affects course revenues as golfers search for their lost golf balls. Additionally, when a golf ball does end up on top of the mulch the fluffiness of the loose organic will create a difficult lie that will contribute to additional errant shots. This may place surrounding residences, properties and persons in greater danger than they would otherwise be were the mulch requirement to be exempted for golf courses.

In addition, as golfers traverse the area searching for their lost balls by raking and disturbing the mulch with their clubs and feet they are going to disrupt the mulch depth and that will require significant labor to refurbish and repair these areas on an ongoing basis. These peripheral safety corridors are also very often sloped toward the fairway where the fairway turf that serves as a vegetated flood control channel during storm events. Mulch floats & moves with runoff water during heavy rainstorms, ultimately migrating to and clogging storm drainage inlets.

It is also worthwhile to consider how these golf course peripheral safety corridors established to native / desert plant materials in Southern Nevada are mulched. Golf courses (as well as residences) are allowed to use organic or inorganic materials of their choice such as: decomposed granite, rock, gravel and/or organic mulch. Mulch is a requirement of the Southern Nevada Water Authority but no minimum depth is mandated.³ Therefore, in lieu of 3” of organic mulch at installation we propose the following as options:

³ Personal communications: Patrick Watson, Conservation Services Administrator for the Southern Nevada Water Authority, 12/13/2017.

California Water Efficient Landscape Ordinance:
Golf Course Water Budget SLA Determination for New Golf Course Construction & Rehabilitated
(Remodeled or Renovated) Golf Courses.

- In peripheral golf course safety corridors reduce the 3" minimum requirement to a minimum 1½" of mulch cover. Clubhouse, hotel, parking lot and other support landscapes outside of the safety corridors of the golf course shall still be mulched to a 3" depth.
- As an option where point source irrigation (above or below ground bubblers & basins and/or drip emitters) is designed, installed and positioned under each plant's canopy to irrigate individual plants basins/root zones require mulch be placed only within the drip line or basin.
- In sprinkler irrigated landscaped (non-turf) peripheral safety corridors require a minimum 1½" of mulch throughout all exposed soil areas. Mulch is required until the low water requiring landscape has established & matured to provide >50% soil cover and/or can survive without supplemental irrigation and permanent abandonment of the overhead sprinkler system.
- Mulch is not required where annual seeding of wildflowers and/or seasonal native drought tolerant grasses that survive on annual precipitation. This applies to either peripheral golf course safety corridors or other support landscapes. The annual vegetation would be cut close to the ground (weed whipped) for fire suppression purposes at the end of its season so to still would stabilize soil and control erosion until the next seasons seeded planting is established.

SECTION 5.0 GOLF COURSE TURF ACREAGE REFERENCES

5.1 Arizona DWR Water Management Plan – The Arizona Department of Water (ADWR) resources put into effect water management plans that limited golf course turf acreage in 1984. ADWR has five “Active Management Areas” (AMA) that regulate various sectors (agricultural, municipal, industrial etc.) of water use. Large landscapes (golf courses, parks, schools, etc.,) are considered industrial irrigators (Chapter 6 of the Management Plan) whose water use is actively managed through water budgets and acreage restrictions. Generally Arizona golf courses minimize their areas of low water using landscapes that require irrigation to maximize their MAWA for golf course turf. The budgets are based on various factors including:

- A) When the landscape / golf course was constructed (post 1984 or pre 1985),
- B) Acreage limits based on that era of construction,
- C) Types of landscaping low water use landscapes, three (3) turf categories, and water surface area
- D) Annual water application rates adjusted to each AMA’s climate (ET rate) in units of “acre feet per acre” per calendar year are assigned.
- E) A total maximum allowable water allocation (MAWA) is calculated using the above information and site specific acreage is determined.
- F) Leaching fractions can be applied for when water with >1000 mg/l total salts is used.
- G) Recycled water (effluent) use is encouraged by each acre-foot of effluent used being counted as only 0.6 acre-feet against the MAWA.

Acreage limits for newer construction (post 1984) defined under “Planted acres” in Chapter 6, Section 6.3.7 Industrial Conservation Requirements and Monitoring and Reporting Requirements for Turf-Related Facilities

6-301. Definitions (Definition Number 17 is found on page 6-36):

“Planted acres” means the total turf acres and low water use landscaped areas of a golf course up to a maximum of 5 Acres per hole. In determining a facilities planted acres, turf acres shall be counted first.

Link to Chapter 6 of the Phoenix AMA’s 3rd Management Plan that is still currently in effect:
<http://www.azwater.gov/AzDWR/WaterManagement/AMAs/documents/ch6-phx.pdf>

California Water Efficient Landscape Ordinance:
Golf Course Water Budget SLA Determination for New Golf Course Construction & Rehabilitated
(Remodeled or Renovated) Golf Courses.

5.2 Southern Nevada Golf Course Water Budgets – Southern Nevada developed a simple water budget approach that began in approximately 2000. The Southern Nevada Water Authority water purveyors restricted turfgrass area of new golf courses to 100 acres per 18 holes including a maximum budget of 6.3 acre-feet per irrigated acre. (https://www.snwa.com/consv/restrictions_other.html) Originally the turfgrass acreage limitation of ninety (90) turfgrass acres per eighteen (18) hole golf course and an additional ten (10) turfgrass acres for a practice facility was universal amongst all the SNWA member water purveyors.

In 2004 due to ongoing severe drought on the Colorado River system the acreage limitation for new golf courses was temporarily reduced to forty-five (45) turfgrass acres per eighteen (18) hole golf course and an additional five (5) turfgrass acres for a practice facility. This effectively created a moratorium on new golf course construction. Some individual water purveyors in the region have since returned to the old standard, each now maintains their own turf limitations. Clark County has chosen to keep the “moratorium” acreage in place but has mechanisms for a landowner/developer to purchase the rights to “additional golf course water budget acres” via conservation credits. Three slightly different examples of current Southern Nevada standards follow.

5.2.1 Boulder City Nevada Turf Limitations - Chapter 8 Water Utility Regulations 9-8-18: TURF LIMITATIONS ITEM C:

Golf Course Use: Limited to approximately five (5) acres per hole, with a maximum twenty (20) additional acres for driving range. The total turf area, including golf course and driving range, shall not exceed one hundred twenty (120) acres for an eighteen (18) hole golf course development.

Web Link to Chapter 8 of Boulder City Water Utility Regulations 9-8-18: TURF LIMITATIONS:
http://www.sterlingcodifiers.com/codebook/index.php?book_id=417&chapter_id=16399#s138133

5.2.2 Las Vegas Valley Water District (City of Las Vegas) - Limits on planting turf: Before you plant grass, make sure you're following county or city turf limitation codes. Turf limits restrict or prohibit the amount of grass that can be planted at new properties.

Golf courses: Limited to 5 acres average per hole, with a maximum 10 additional acres for driving ranges. Golf Courses are subject to a water budget.

<https://www.lvvwd.com/conservation/measures/index.html> (Note: must use pull down arrows on right side of page to access “Limits on planting turf” language. Additionally, abbreviated language for Clark County is also found on the LVVWD conservation measures webpage. However the full code language has been provided on the following page that discusses conservation credits and landowners personal water rights.

California Water Efficient Landscape Ordinance:
Golf Course Water Budget SLA Determination for New Golf Course Construction & Rehabilitated
(Remodeled or Renovated) Golf Courses.

5.2.3 Clark County - Clark County Code; Title 30.64.030.J.9.

J. Turf. These restrictions cannot be waived or varied. Turf limitations apply as follows:

9. Golf courses shall be limited to a maximum of 45 acres for 18 holes and 5 acres for a driving range;

A. The turf limitation of golf courses may be exceeded if the applicant demonstrates to the satisfaction of the water purveyor that irrigated turf, in excess of the amount specified, will have no significant impact on water resources or water peak demand delivery capacity, because water used for the additional turf will be provided by one or more of the following methods:

i. Water provided from applicant's own wells or appurtenant or transferred water rights which can be legally used to irrigate the property on which the golf course is developed. Printed Chapter 30.64: Site Landscape and Screening Standards March 23, 2015 30.64 - 8

ii. Water provided from the water purveyor. However, the applicant must contribute to an exterior water efficiency retrofit program approved by the water purveyor to offset the impacts on water resources and system delivery capacity, in an amount equivalent to 2 times the amount of water used by the turf grass.

iii. Groundwater provided from the shallow groundwater aquifer. Applicant may develop and provide the ground water at his sole cost or may compensate the appropriate water district to develop ground water pursuant to an agreement with the district. The agreement must have been executed by both parties at the time of the application.

https://library.municode.com/nv/clark_county/codes/code_of_ordinances?nodeId=TIT30UNDECO_30.64SILASCST_30.64.030LA

[END]