



CITY OF PALM SPRINGS: MULCH AND COMPOST UTILIZATION ANALYSIS



Prepared by:



December 1, 2021

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NOTE: Cover image captured from city website, as well as image on page 1.



I. INTRODUCTION

In September 2016, Governor Edmund Brown Jr. set methane emissions reduction targets for California (SB 1383 Lara, Chapter 395, Statutes of 2016) in a statewide effort to reduce emissions of short-lived climate pollutants (SLCP). The targets must:

- Reduce organic waste disposal 50% by 2020 and 75% by 2025.
- Rescue for people to eat at least 20% of currently disposed surplus food by 2025.

Landfills are the third largest source of methane in California, and organic waste material makes up half of the refuse in California landfills.

Each jurisdiction is assigned a recovered organic waste procurement target by the state, which is the tonnage of organic waste to be diverted from landfills and recycled into new products. The 2022 procurement target for the City of Palm Springs is 3,820 tons based on a population of 47,754 full time residents.

Organic waste can be recycled into new products including compost, mulch, biofuel, and electricity.

The City of Palm Springs Office of Sustainability contracted Community Works Design Group (CWDG) to provide analysis and recommendations on the use of compost to achieve the procurement goals for Palm Springs. The climate, weather, and plant material present within Palm Springs precludes the use of organic mulch, while biofuel and electricity solutions require expensive and intensive infrastructure to produce. Compost has been identified as a recycled product which can be applied throughout the City-owned property to meet the procurement goal, and the Palm Springs Disposal Services indicates they have the infrastructure to convert the recycled green waste into nutrient-rich compost.

The City of Palm Springs identified 12 city owned properties to be assessed for the potential of compost incorporation. Community Works visited these sites, collected soil samples, sent the soil samples off for analysis, estimated the square footage of turf areas of the site, and calculated how much compost could be applied to each site.

SB 1383 Requirements

“Commencing January 1, 2022, a jurisdiction shall annually procure a quantity of recovered organic waste products that meets or exceeds its current annual recovered organic waste product procurement target as determined by this article.”

-California Code of Regulations, Title 14, Section 18993.1.a



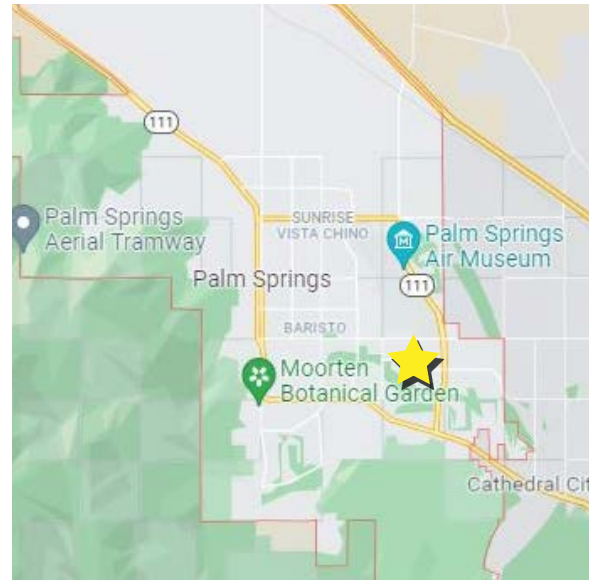
II. CITY-OWNED PROPERTIES

The Following pages show each of the 12 City-owned properties identified by the by the Office of Sustainability for analysis. The properties are ordered by acreage of turf grass, from largest to smallest.

a) **DEMUTH COMMUNITY CENTER, PARK, & DOG PARK**

3601 E Mesquite Ave

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf adjacent to community center, and adjacent to soccer fields.
- Total Turf Acreage: 35 acres
- Compost Application at .5": 2357 Cubic Yards



 TURF AREA

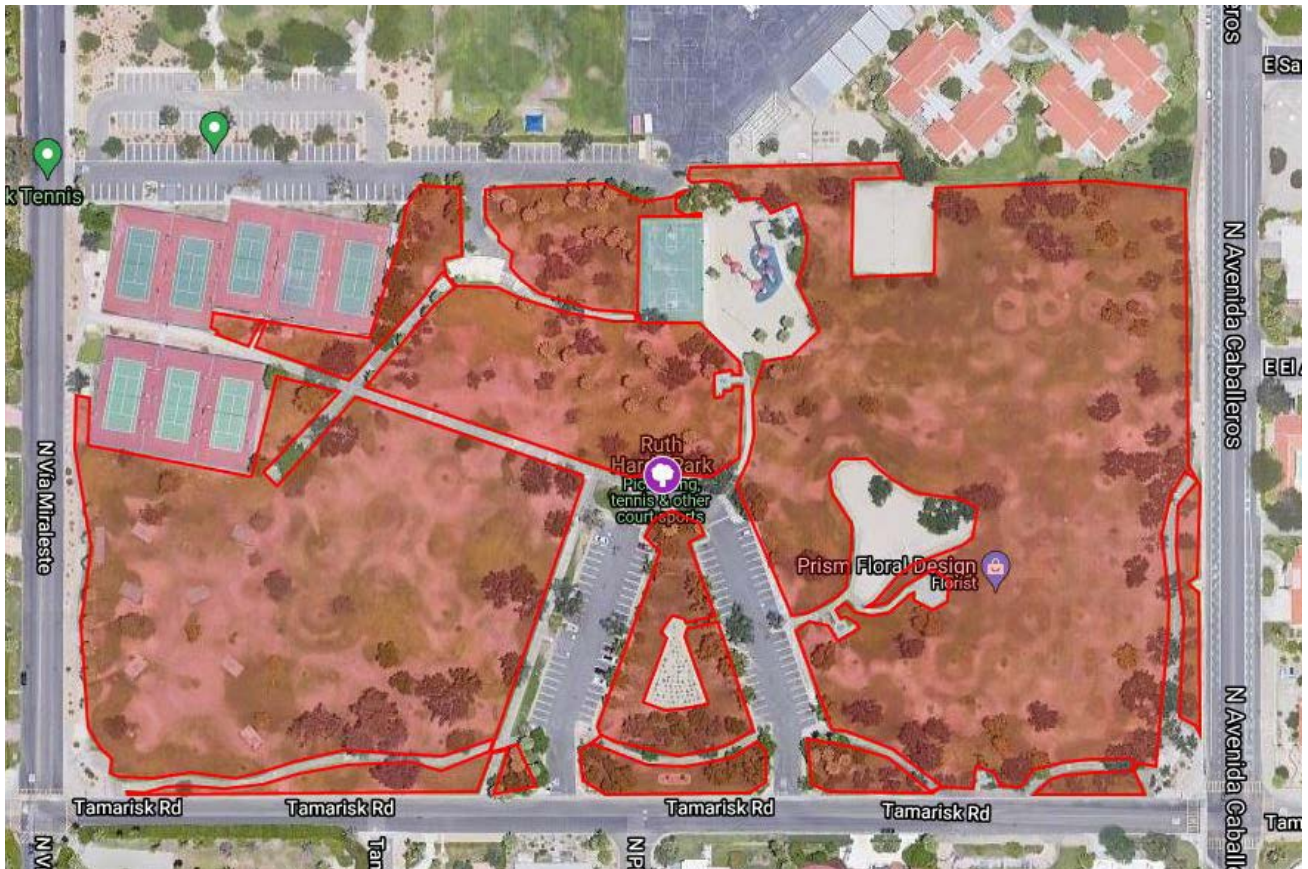
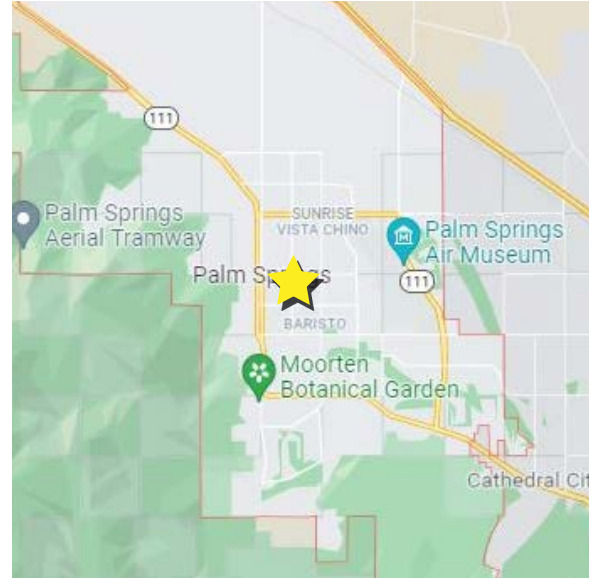
NOT TO SCALE



b) RUTH HARDY PARK

700 Tamarisk Rd

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf areas adjacent to parking lot.
- Total Turf Acreage: 13.7
- Compost Application at .5": 918 Cubic Yards



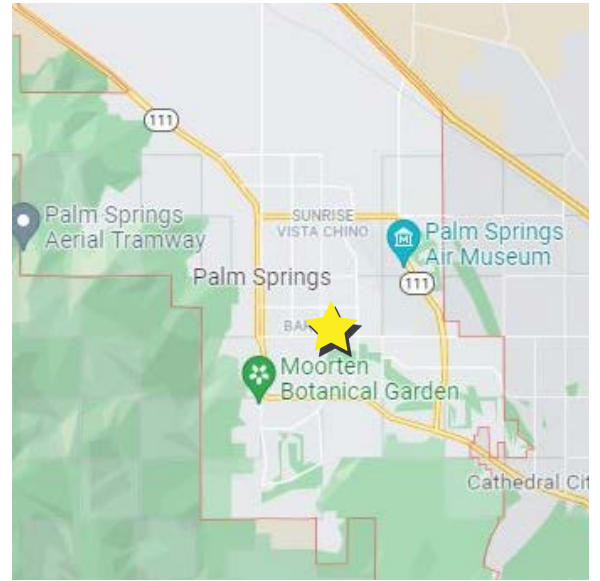
NOT TO SCALE



c) SUNRISE PARK

401 S Pavillion Way

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf areas surrounding playground.
- Total Turf Acreage: 7.8
- Compost Application at .5": 525 Cubic Yards



TURF AREA

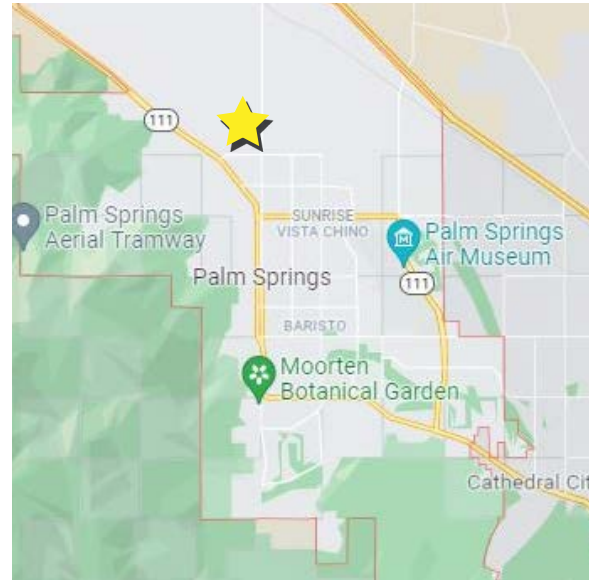
NOT TO SCALE



d) **JAMES O. JESSIE DESERT HIGHLAND
UNITY CENTER**

480 W Tramview Rd

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf adjacent to basketball court and open field south of parking lot.
- Total Turf Acreage: 7.3
- Compost Application at .5": 494 Cubic Yards



 TURF AREA

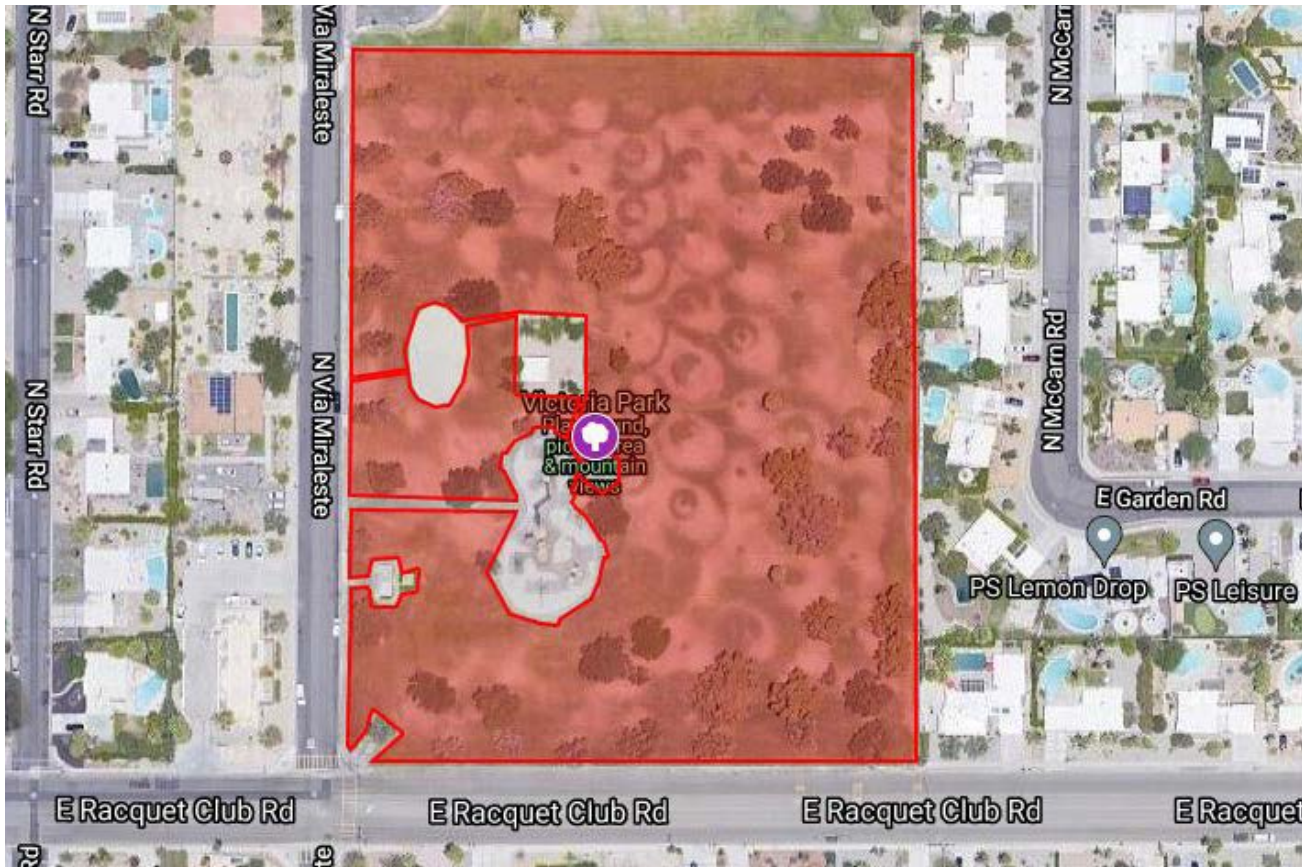
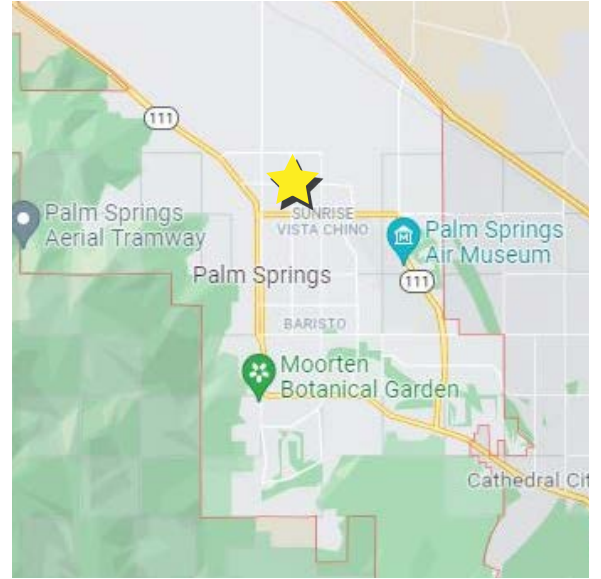
NOT TO SCALE



e) VICTORIA PARK

2744 N Via Miraleste

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf south of playground.
- Total Turf Acreage: 6.8 acres
- Compost Application at .5": 455 Cubic Yards



TURF AREA

NOT TO SCALE





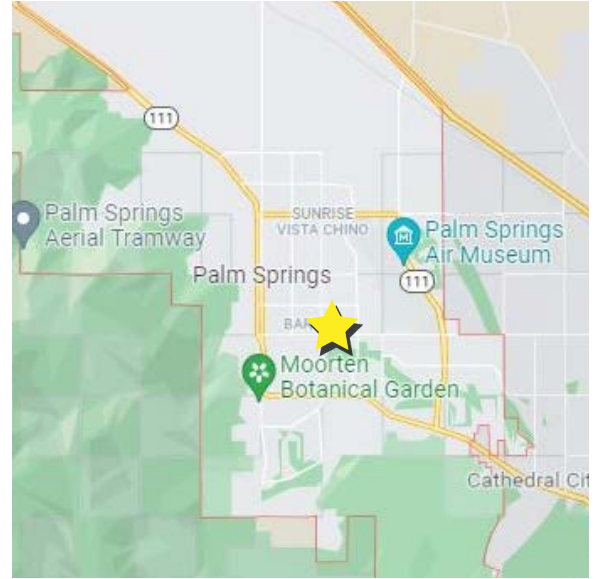
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g) **PALM SPRINGS SWIM CENTER**

405 S Pavilion Way

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf adjacent to swim facility.
- Total Turf Acreage: 1.8
- Compost Application at .5": 119 Cubic Yards



TURF AREA

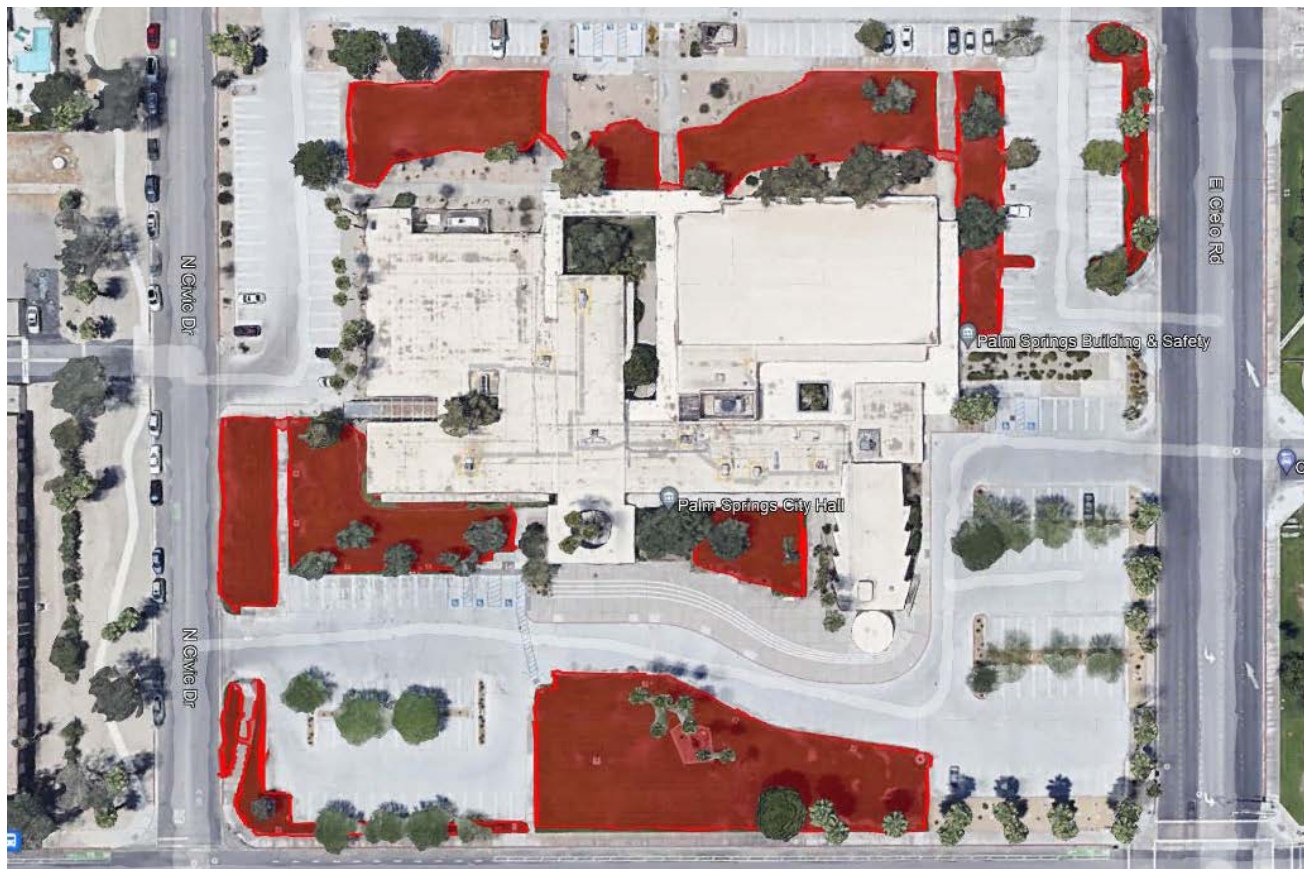
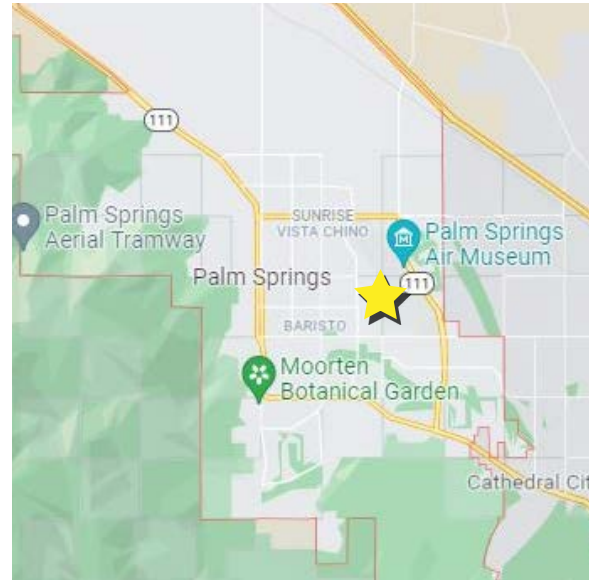
NOT TO SCALE



h) CITY HALL

3200 E Tahquitz Canyon Way

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf adjacent to parking lot.
- Total Turf Acreage: 1.2
- Compost Application at .5": 79 Cubic Yards



TURF AREA

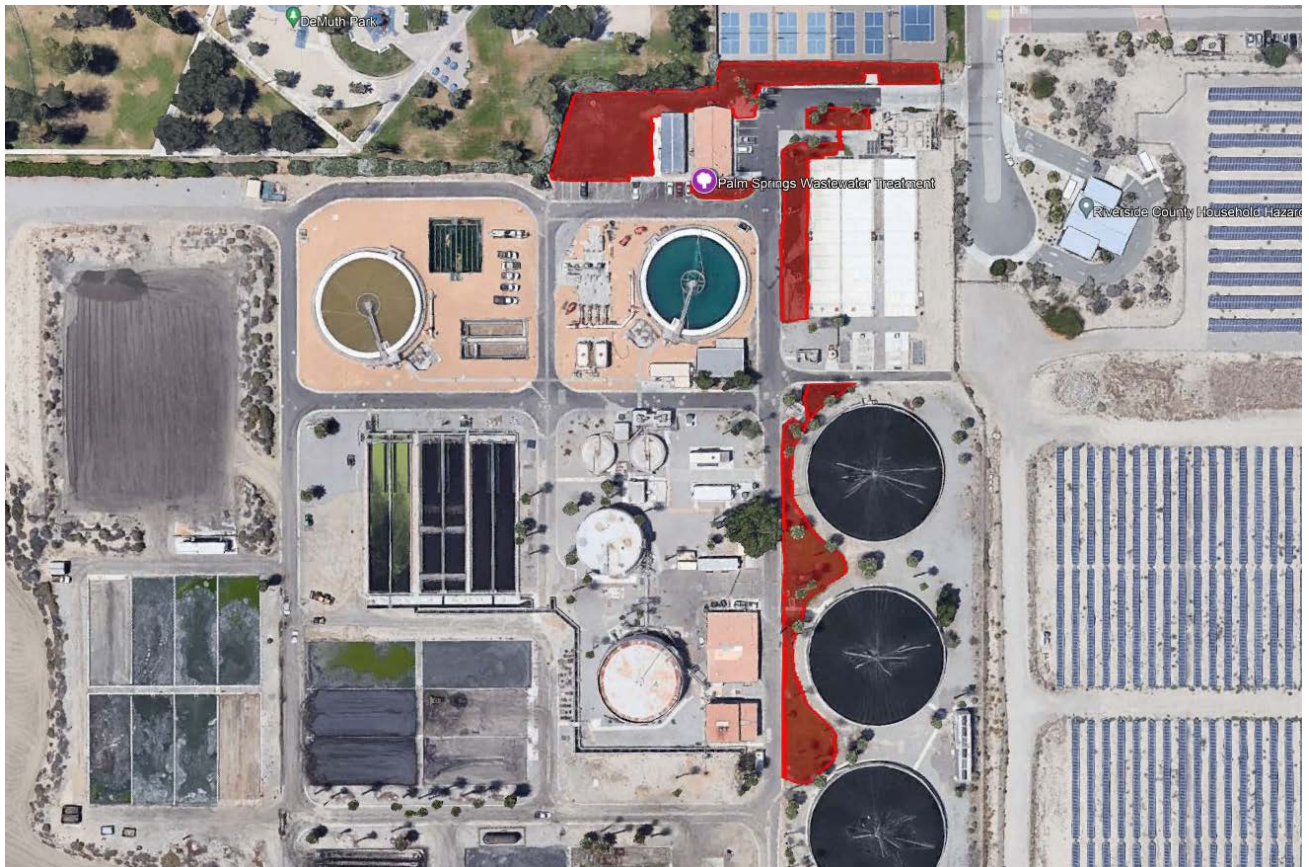
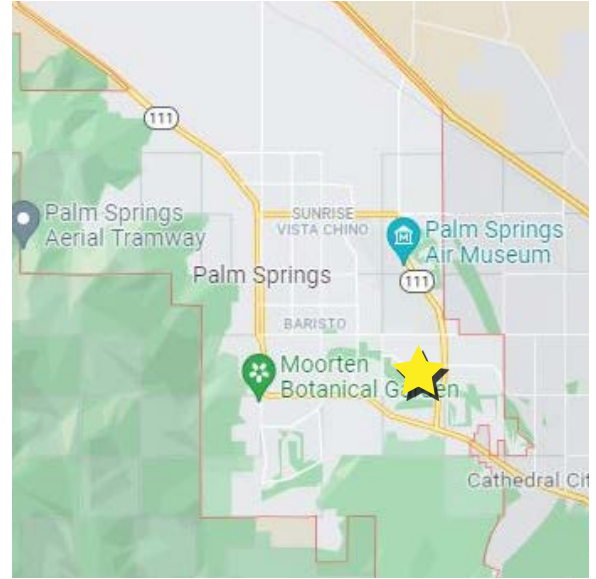
NOT TO SCALE



i) **PALM SPRINGS WASTEWATER TREATMENT**

4375 E Mesquite Ave

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf adjacent to parking lot and building.
- Total Turf Acreage: .8
- Compost Application at .5": 54 Cubic Yards



TURF AREA

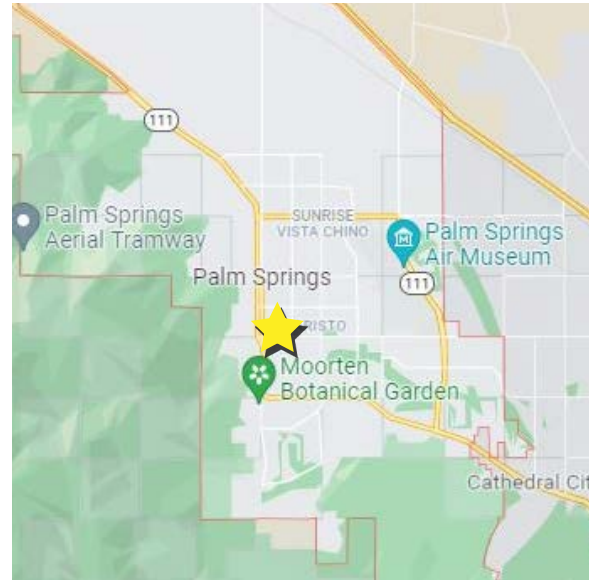
NOT TO SCALE



j) **BARISTO PARK**

296 S Calle Encilia

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf adjacent to Saturnino Rd.
- Total Turf Acreage: .6
- Compost Application at .5": 39 Cubic Yards



TURF AREA

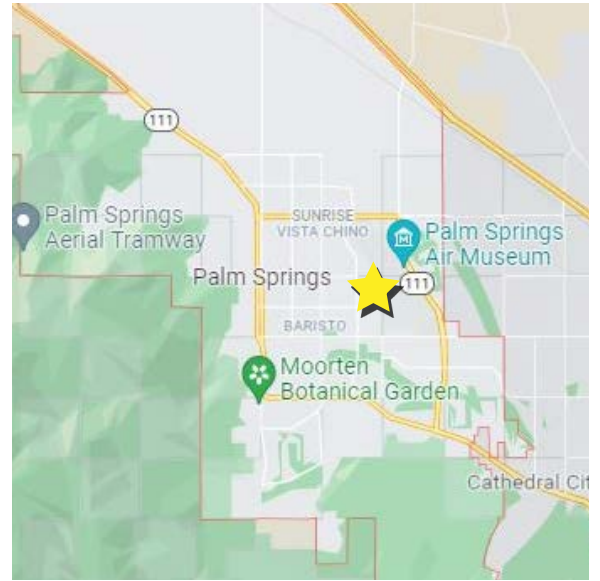
NOT TO SCALE



k) **PALM SPRINGS DOG PARK**

222 N Civic Dr

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf areas inside dog park.
- Total Turf Acreage: .5
- Compost Application at .5": 36 Cubic Yards



 TURF AREA

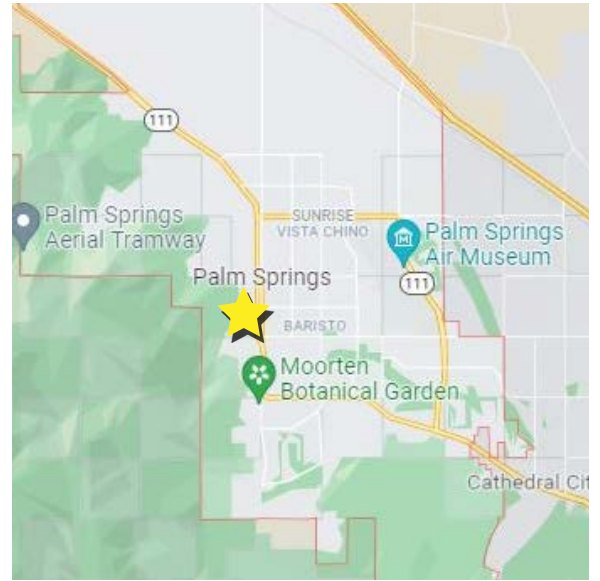
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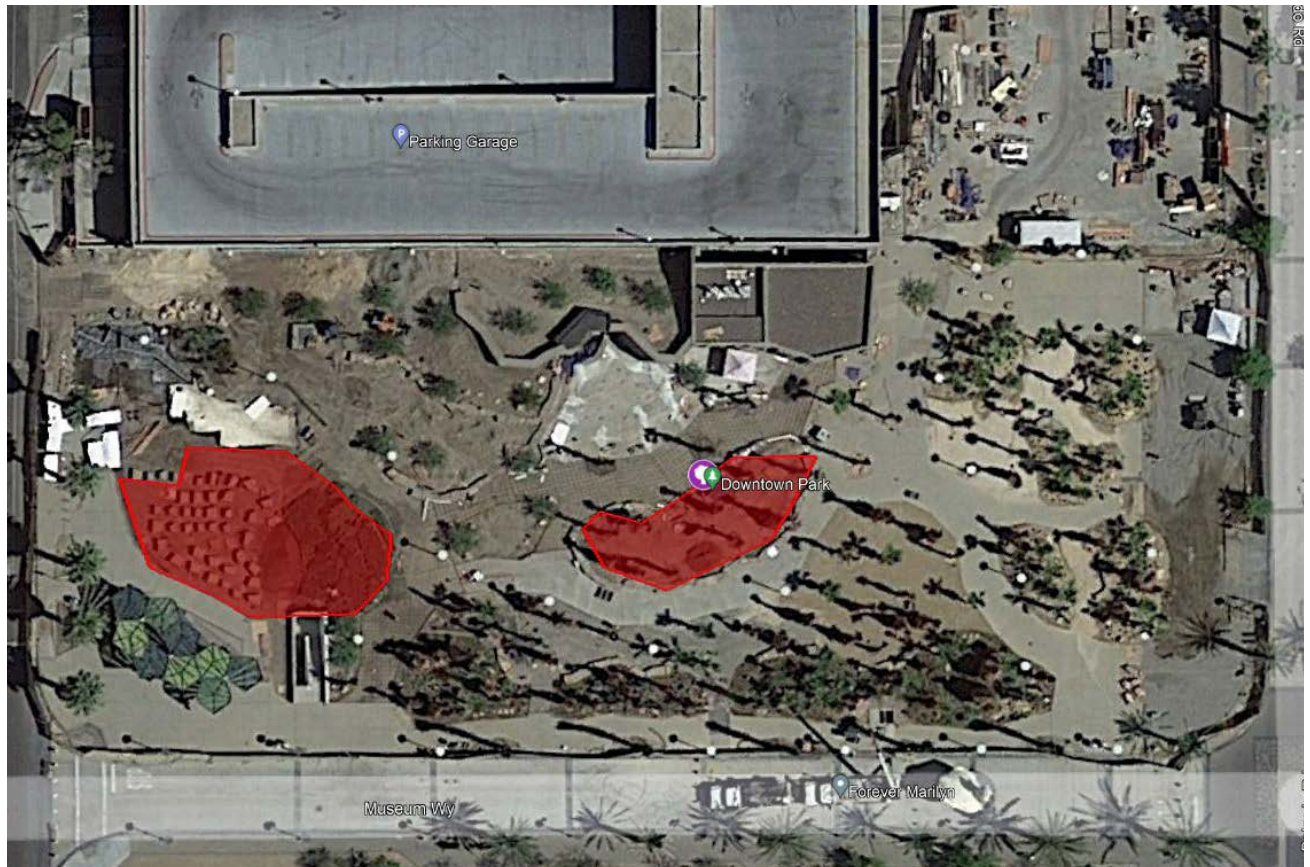
1) DOWNTOWN PARK

100 Museum Dr

- Date Visited: 11/05/2021
- Soil Sample Areas: Turf areas inside park.
- Total Turf Acreage: .1
- Compost Application at .5": 8 Cubic Yards



NOTE: AVAILABLE SATELLITE IMAGERY DOES NOT REFLECT NEW CONSTRUCTION



 TURF AREA

NOT TO SCALE



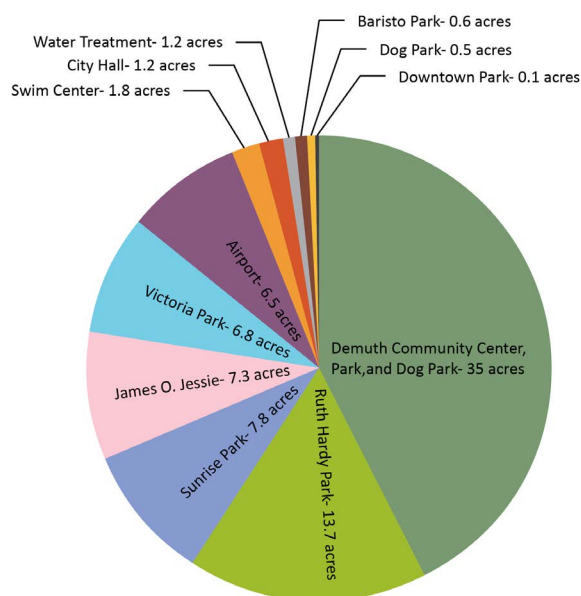
III. FINDINGS

Of the twelve City-owned properties which were assessed there is an estimated total of 82.2 acres of turf. Property turf area varied from a high of 35 acres of turf at the Demuth Community Center, Park, and Dog Park to a low of 0.1 acre at the new Downtown Park.

Turf areas were assessed and identified as an opportunity where compost could be incorporated into existing maintenance practices to meet SB 1383 procurement goals and revitalize soils. A .5" depth application of compost as a topdressing was calculated for turf areas to be used during the over seeding process. This top dressing applied over all assessed areas of turf equals to 5,522 cubic yards of compost.

The conversion for 1 ton of organic waste in a procurement target to cubic yards of compost is 1.45 cubic yards of compost = 1 ton of organic waste. (See table 1)

A .5" application of compost across the assessed turf areas would equal 3,808.2 tons of organic waste. This would met 99.6% of the procurement target goal of 3,820 tons.



TOTAL ACRES OF TURF = 82.2

99.6% OF PROCUREMENT TARGET ACHIEVED THROUGH .5" APPLICATION OF COMPOST ON ALL ASSESSED TURF AREAS.

Conversion Factors		
1 Ton of Organic Waste in a Procurement Target Shall Constitute:		
Recovered Organic Waste Product	Quantity	Unit
Renewable Gas in the form of Transportation Fuel	21	DGE
Electricity from Renewable Gas	242	kWh
Heat from Renewable Gas	22	therms
Electricity from Biomass Conversion	650	kWh
Compost	0.58	tons
Compost	1.45	cubic yards
Mulch	1	ton

TABLE 1: Conversion factors provided in CalRecycle procurement planning tool.
Available at <https://www.calrecycle.ca.gov/organics/slcp/procurement>



IV. RECOMMENDATIONS

Current maintenance practices of the City-owned park sites include overseeding turf areas with annual winter grasses. At the time of overseeding a top dressing of .25" up to .5" of compost can be applied to cover, stabilize, and prevent dessication of seeds while providing organic matter and nutrients to the soil.

Soil reports indicate certain City-owned properties could benefit from aeration as soils may be compacted. Aeration provides an opportunity to incorporate compost into the soil and can supplement current overseeding practices. Aeration on warm season grasses is best performed in late spring/ early summer when warm season grasses are actively growing.

"When applying compost as a topdressing, it is important to apply a thin layer (about ¼ inch) and work it into the soil... The best way to incorporate compost into the soil is through aeration. A good method of incorporation is to apply the compost first, followed by several passes with an aerator equipped with hollow-tines and a heavy drag mat attached. The drag mat will break-up the cores and mix the compost with the soil, dragging some of the mix back into the holes. This operation is best performed during cool/ moist seasons when grass is actively growing. Aeration and dragging can be stressful to the turf during hot, dry weather." (Landschoot, 1997)

A combination of overseeding, topdressing, and aeration may be used to achieve the SB 1383 procurement goals and to improve the quality of the turf throughout city owned properties.

Annual rotation of aeration and compost application would benefit soils through ensuring they are not compacted and by preventing a thick layer of organic matter building up from consecutive applications of overseeding and topdressing.

"Successive applications of thick layers without soil incorporation will result in a build-up of organic matter at the soil surface that may cause rapid drying of turf roots and form a layer that restricts rooting into the soil." (Landschoot, 1997)

Landschoot, P. (1997, January 1). Using composts to improve turf performance. Penn State Extension. Retrieved November 30, 2021, from <https://extension.psu.edu/using-composts-to-improve-turf-performance>.



V. APPENDIX

- Soil Reports
- City-owned Property Analysis: <https://www.google.com/maps/d/edit?mid=12T0IbeXPT5CNA7Knau4dazI9xPwGEHU&usp=sharing>



WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #2 Demuth Community Center
Our ID No. 21-314-31, received Nov. 9, 2021

Dear Luke,

The soil pH is moderately alkaline at 7.77.

Salinity or electrical conductivity is modest at 0.60 millimho/cm. Moderate salinity is beneficial. It can indicate the presence of nutrients. Excessively high salinity restricts water uptake. Normally, salinity should be less than about 2.5 millimho/cm.

Nitrogen, potassium and magnesium are moderate. Sulfur is low. Boron is modest. Phosphorus, iron, manganese, zinc and copper are high. Sodium is low. SAR (sodium adsorption ratio) is 0.8. Aluminum is moderate. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Aluminum restricts growth by interfering with the metabolism of phosphorus and calcium. It causes stunting and discoloration. Foliage may turn a dull gray green. Aluminum is high in poorly aerated soil and in overly acidic soils. Soluble calcium helps to reduce the toxicity of aluminum.

Soil moisture is low at about 17% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply agricultural gypsum (calcium sulfate) at 10 pounds per 1,000 square feet.

Apply potassium sulfate (0-0-50) at 5 pounds per 1,000 square feet. Apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter. Nitrogen is not currently needed.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed. If boron is low in the leaf tissues, apply boron.

Solubor can be applied at about 1 ounce per 1,000 square feet in order supply 0.2 ounces of boron. Boron must be uniformly applied to the soil in order to avoid localized hot spots. Dissolve it in water and uniformly apply. Irrigate afterwards.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Potassium sulfate (0-0-50) – 6 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards or as needed, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

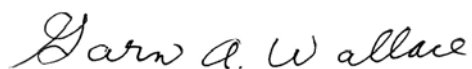
arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter. Nitrogen is not currently needed.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,



Garn A. Wallace, Ph. D.
GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60-120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium Saturation Extract pH value ECe (milli- mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft. relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage	***** high, ***** very high 21-314-31 #2 Demuth Community Center graphic 13.17 **** 68.45 *** 31.30 ***** 2.68 **** 5.33 **** 0.97 **** 0.15 ** 535.97 **** 66.21 *** 29.42 * 16.42 * 0.03 *** 0.17 * 0.84 *** 0.08 * 0.39 * 0.07 * n d * 0.01 * 0.42 * 0.04 * n d * n d * 1.66 * n d * 0.28 * 7.77 **** 0.60 ** millieq/l 67.7 3.4 15.0 1.2 27.5 1.2 12.0 0.3 6.1 24 0.7 30 2.1 1.3 0.0 27.6 1.7 4.6 0.09 * 0.8 * 5 fair/good sandy loam no fair 3.3% 19.7%

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

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El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #4 Ruth Hardy
Our ID No. 21-314-33, received Nov. 9, 2021

Dear Luke,

The soil pH is moderately alkaline at 7.86.

Salinity or electrical conductivity is moderate at 1.62 millimho/cm.

Nitrogen, boron and sulfur are moderate. Phosphorus, potassium, magnesium, iron, manganese, zinc and copper are high. Sodium is modest. SAR (sodium adsorption ratio) is 1.7. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Soil moisture is low at about 14% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Balance soil moisture with soil aeration.

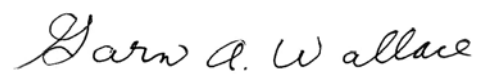
Apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter. Nitrogen is not currently needed.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed.

Recommendations for soil renovation

The soil does not appear to need to be renovated.

Sincerely,

A handwritten signature in cursive script that reads "Garn A. Wallace". The signature is written in black ink and is positioned above the typed name.

Garn A. Wallace, Ph. D.

GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60-120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium	***** high, ***** very high 21-314-33 #4 Ruth Hardy graphic 25.52 ***** 134.40 ***** 20.38 ***** 4.04 ***** 14.09 ***** 1.11 ***** 0.30 ***** 560.88 ***** 121.33 ***** 112.45 ***** 103.88 ***** 0.09 ***** 0.17 ***** n d ***** 0.07 ***** 0.47 ***** 0.15 ***** n d ***** 0.01 ***** 2.47 ***** 0.07 ***** n d ***** n d ***** 1.64 ***** n d ***** 0.59 *****
The following trace elements may be toxic The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants.		Saturation Extract pH value ECe (milli-mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft.	
problems over 150 ppm good 20 - 30 ppm toxic over 800 toxic over 1 for many plants increasing problems start at 3 relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage		7.86 ***** 1.62 ***** millieq/l 186.4 9.3 40.9 3.4 99.0 4.3 24.3 0.6 17.6 164 4.6 51 3.6 2.3 0.1 140.3 8.8 17.1 0.13 ***** 1.7 ***** 19 fair sandy loam no high 4.0% 27.6%	

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

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El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #6 Sunrise Park
Our ID No. 21-314-35, received Nov. 9, 2021

Dear Luke,

The soil pH is modestly highly alkaline at 7.97.

Salinity or electrical conductivity is modest at 0.48 millimho/cm. Moderate salinity is beneficial. It can indicate the presence of nutrients. Excessively high salinity restricts water uptake. Normally, salinity should be less than about 2.5 millimho/cm.

Nitrogen and sulfur are low. Potassium and magnesium are moderate. Boron is modest. Phosphorus, iron, manganese, zinc and copper are high. Sodium is modest. SAR (sodium adsorption ratio) is 1.4. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Soil moisture is modest at about 54% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply gypsum at 10 pounds per 1,000 square feet.

Apply potassium sulfate (0-0-50) at 5 pounds per 1,000 square feet. Apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter.

Balance soil moisture with soil aeration.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Ammonium sulfate (21-0-0) – 5 pounds

Potassium sulfate (0-0-50) – 6 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards or as needed, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

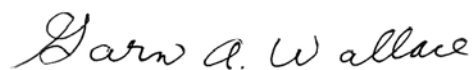
Soil Analyses Plant Analyses Water Analyses

Balance soil moisture with soil aeration.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,

A handwritten signature in cursive script that reads "Garn A. Wallace".

Garn A. Wallace, Ph. D.

GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60-120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium	***** high, ***** very high 21-314-35 #6 Sunrise Park graphic 13.91 **** 93.01 *** 53.27 ***** 1.39 **** 5.37 **** 1.18 **** 0.17 ** 580.57 **** 95.07 *** 54.38 ** 21.87 * 0.06 *** 0.20 * 0.32 ** 0.18 * 0.88 * 0.06 * n d * 0.02 * 1.25 ** 0.04 * n d * n d * n d * 2.15 * n d * 0.35 *
The following trace elements may be toxic The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants.		Saturation Extract pH value ECe (milli-mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft.	
problems over 150 ppm good 20 - 30 ppm toxic over 800 toxic over 1 for many plants increasing problems start at 3 relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage		7.97 **** 0.48 ** millieq/l 44.4 2.2 10.1 0.8 40.9 1.8 11.4 0.3 5.1 57 1.6 8 0.6 0.6 0.0 31.8 2.0 4.2 0.08 * 1.4 * 9 fair/slow sandy loam no fair/low 12.5% 23.2%	

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #3 James O. Jessie
Our ID No. 21-314-32, received Nov. 9, 2021

Dear Luke,

The soil pH is modestly highly alkaline at 7.93.

Salinity or electrical conductivity is moderate at 0.96 millimho/cm.

Nitrogen is modest. Potassium and boron are moderate. Sulfur is modest. Phosphorus, iron, manganese, zinc and copper are high. Sodium is modest. SAR (sodium adsorption ratio) is 1.9. Aluminum is moderate. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Aluminum restricts growth by interfering with the metabolism of phosphorus and calcium. It causes stunting and discoloration. Foliage may turn a dull gray green. Aluminum is high in poorly aerated soil and in overly acidic soils. Soluble calcium helps to reduce the toxicity of aluminum.

Soil moisture is low at about 19% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply potassium sulfate (0-0-50) at 5 pounds per 1,000 square feet. Apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter.

Balance soil moisture with soil aeration.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Potassium sulfate (0-0-50) – 6 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards or as needed, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

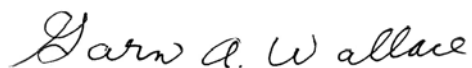
Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

Balance soil moisture with soil aeration.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,

A handwritten signature in cursive script that reads "Garn A. Wallace".

Garn A. Wallace, Ph. D.

GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60-120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium Saturation Extract pH value ECe (milli- mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft.	***** high, ***** very high 21-314-32 #3 James O. Jessie graphic 17.57 ***** 79.70 *** 75.18 ***** 2.22 **** 11.80 ***** 2.48 **** 0.31 *** 516.56 **** 115.84 **** 98.30 ** 68.94 ** 0.07 *** 0.23 * 1.36 *** 0.21 * 0.49 * 0.18 * n d * 0.03 * 4.04 ** 0.02 * n d * n d * 1.67 * n d * 0.77 * 7.93 ***** 0.96 *** millieq/l 107.9 5.4 24.5 2.0 82.1 3.6 11.4 0.3 11.3 77 2.2 13 0.9 0.6 0.0 96.1 6.0 9.1 0.17 * 1.9 ** 17 fair/good sandy loam no fair 6.3% 32.5%
The following trace elements may be toxic The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants.		problems over 150 ppm good 20 - 30 ppm toxic over 800 toxic over 1 for many plants increasing problems start at 3 est. gypsum requirement-lbs./1000 sq. ft.	
relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage			

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #5 Victoria Park
Our ID No. 21-314-34, received Nov. 9, 2021

Dear Luke,

The soil pH is highly alkaline at 8.08. Ideally for best growth, the soil pH should normally be in the range of about 6.5 to 7.5. At least, the pH should be less than about 8.0. The pH can be frequently lowered with the addition of gypsum and with deep irrigation. High alkalinity reduces the availability of many nutrients.

Salinity or electrical conductivity is moderate at 1.18 millimho/cm.

Nitrogen, potassium, iron, boron and magnesium are moderate. Phosphorus, copper and sulfur are modest. Manganese and zinc are high. Sodium is modest. SAR (sodium adsorption ratio) is 1.9. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Soil moisture is low at about 13% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply agricultural gypsum (calcium sulfate) at 10 pounds per 1,000 square feet. Irrigate deeply and lower the alkalinity. Reduce the pH to less than 8.0.

Apply 12-12-12 at 8 pounds per 1,000 square feet now and about once per quarter. After about one year when phosphorus and potassium are higher, apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter in lieu of 12-12-12.

Soil Analyses Plant Analyses Water Analyses

Balance soil moisture with soil aeration.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Potassium sulfate (0-0-50) – 6 pounds

Triple superphosphate (0-45-0) – 4 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards or as needed, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

Irrigate deeply after amending the soil to help lower alkalinity. Lower the pH to less than 8.0.

Balance soil moisture with soil aeration.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,

A handwritten signature in cursive script that reads "Garn A. Wallace".

Garn A. Wallace, Ph. D.
GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60-120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium Saturation Extract pH value ECe (milli- mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft. relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage	***** high, ***** very high 21-314-34 #5 Victoria Park graphic 5.56 ** 75.63 *** 8.82 *** 1.62 **** 2.83 **** 0.24 ** 0.27 *** 551.52 **** 75.66 *** 72.75 ** 52.34 ** n d * 0.08 * 0.18 * 0.09 * 0.41 * 0.04 * n d * 0.01 * 0.64 * 0.05 * n d * n d * 1.82 * n d * 0.03 * 8.08 **** 1.18 *** millieq/l 123.5 6.2 29.0 2.4 89.0 3.9 19.7 0.5 12.9 145 4.1 30 2.2 0.5 0.0 98.2 6.1 12.4 0.16 * 1.9 ** 12 fair sandy loam no fair 2.7% 20.6%

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #11 Airport
Our ID No. 21-314-40, received Nov. 9, 2021

Dear Luke,

The soil pH is fairly highly alkaline at 8.00. Ideally for best growth, the soil pH should normally be in the range of about 6.5 to 7.5. At least, the pH should be less than about 8.0.

Salinity or electrical conductivity is moderate at 0.85 millimho/cm.

Nitrogen and boron are low. Phosphorus and sulfur are modest. Potassium and magnesium are moderate. Iron, zinc and copper are high. Sodium is modest. SAR (sodium adsorption ratio) is 1.2. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Soil moisture is low at about 10% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply agricultural gypsum (calcium sulfate) at 10 pounds per 1,000 square feet. Irrigate deeply and lower the alkalinity.

Apply 12-12-12 at 8 pounds per 1,000 square feet now and about once per quarter. After about one year when phosphorus and potassium are higher, apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter in lieu of 12-12-12.

Balance soil moisture with soil aeration.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed. If boron is low in the leaf tissues, apply boron.

Solubor can be applied at about 1 ounce per 1,000 square feet in order supply 0.2 ounces of boron. Boron must be uniformly applied to the soil in order to avoid localized hot spots. Dissolve it in water and uniformly apply. Irrigate afterwards.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Ammonium sulfate (21-0-0) – 5 pounds

Potassium sulfate (0-0-50) – 6 pounds

Triple superphosphate (0-45-0) – 4 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

Balance soil moisture with soil aeration.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,



Garn A. Wallace, Ph. D.
GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate **** high, ***** very high	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60 -120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium Saturation Extract pH value ECe (milli-mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft.	21-314-40 #11 Airport graphic 5.28 ** 90.57 *** 11.11 **** 1.89 **** 3.66 **** 2.10 **** 0.16 ** 513.84 **** 79.98 *** 52.60 ** 62.31 ** 0.04 *** 0.09 * n d * 0.10 * 0.85 * 0.06 * n d * 0.02 * 0.89 * 0.06 * n d * n d * 2.08 * n d * 0.29 * 8.00 **** 0.85 *** millieq/l 99.5 5.0 21.1 1.7 49.8 2.2 13.3 0.3 9.2 26 0.7 10 0.7 0.6 0.0 103.8 6.5 7.9 0.06 * 1.2 * 9 fair/good sandy loam no fair/low 2.2% 21.5%
The following trace elements may be toxic The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants. problems over 150 ppm good 20 - 30 ppm toxic over 800 toxic over 1 for many plants increasing problems start at 3			
relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage			

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #1 Swim Center, 6-8"
Our ID No. 21-314-30, received Nov. 9, 2021

Dear Luke,

The soil pH is highly alkaline at 8.42. Ideally for best growth, the soil pH should normally be in the range of about 6.5 to 7.5. At least, the pH should be less than about 8.0. The pH can be frequently lowered with the addition of gypsum and with deep irrigation. High alkalinity reduces the availability of many nutrients.

Salinity or electrical conductivity is modest at 0.36 millimho/cm. Moderate salinity is beneficial. It can indicate the presence of nutrients. Excessively high salinity restricts water uptake. Normally, salinity should be less than about 2.5 millimho/cm.

Nitrogen, phosphorus, potassium, boron and sulfur are low. Manganese and magnesium are moderate. Iron, zinc and copper are high. Sodium is low. SAR (sodium adsorption ratio) is 1.6. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Aluminum is moderate. Aluminum restricts growth by interfering with the metabolism of phosphorus and calcium. It causes stunting and discoloration. Foliage may turn a dull gray green. Aluminum is high in poorly aerated soil and in overly acidic soils. Soluble calcium helps to reduce the toxicity of aluminum.

Soil moisture is low at about 37% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply agricultural gypsum (calcium sulfate) at 10 pounds per 1,000 square feet. Irrigate deeply and lower the alkalinity. Reduce the pH to less than 8.0.

Apply 12-12-12 at 8 pounds per 1,000 square feet now and about once per quarter. After about one year when phosphorus and potassium are higher, apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter in lieu of 12-12-12.

Balance soil moisture with soil aeration.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed. If boron is low in the leaf tissues, apply boron.

Solubor can be applied at about 1 ounce per 1,000 square feet in order supply 0.2 ounces of boron. Boron must be uniformly applied to the soil in order to avoid localized hot spots. Dissolve it in water and uniformly apply. Irrigate afterwards.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Potassium sulfate (0-0-50) – 8 pounds

Triple superphosphate (0-45-0) – 4 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.

11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

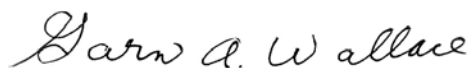
Irrigate deeply after amending the soil to help lower alkalinity. Lower the pH to less than 8.0. Afterwards, apply ammonium sulfate (21-0-0) at 8 pounds per 1,000 square feet. Ammonium sulfate (21-0-0) helps to reduce high alkalinity.

Balance soil moisture with soil aeration.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,



Garn A. Wallace, Ph. D.
GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60 -120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium Saturation Extract pH value ECe (milli- mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft. relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage	**** high, ***** very high 21-314-30 #1 Swim Center, 6-8" graphic 5.45 ** 45.37 ** 16.25 ***** 0.99 *** 2.28 **** 1.74 **** 0.11 ** 439.36 **** 52.32 *** 44.02 * 11.94 * n d * 0.19 * 1.36 *** 0.06 * 1.96 * 0.10 * n d * 0.01 * 1.51 ** n d * n d * n d * 2.03 * n d * 0.17 * 8.42 **** 0.36 * millieq/l 30.6 1.5 8.1 0.7 39.7 1.7 9.7 0.2 4.2 28 0.8 3 0.2 0.4 0.0 25.6 1.6 2.6 0.06 * 1.6 ** 7 fair/slow sandy loam no low/fair 6.5% 17.5%

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #10 City Hall
Our ID No. 21-314-39, received Nov. 9, 2021

Dear Luke,

The soil pH is moderately alkaline at 7.58.

Salinity or electrical conductivity is modest at 0.29 millimho/cm. Moderate salinity is beneficial. It can indicate the presence of nutrients. Excessively high salinity restricts water uptake. Normally, salinity should be less than about 2.5 millimho/cm.

Nitrogen, manganese and boron are modest. Sulfur is low. Phosphorus, potassium and magnesium are moderate. Iron, zinc and copper are high. Sodium is low. SAR (sodium adsorption ratio) is 1.0. Aluminum is moderate. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Aluminum restricts growth by interfering with the metabolism of phosphorus and calcium. It causes stunting and discoloration. Foliage may turn a dull gray green. Aluminum is high in poorly aerated soil and in overly acidic soils. Soluble calcium helps to reduce the toxicity of aluminum.

Soil moisture is moderate at about 69% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply agricultural gypsum (calcium sulfate) at 10 pounds per 1,000 square feet. Irrigate deeply.

Apply 12-12-12 at 8 pounds per 1,000 square feet now and about once per quarter. After about 6 months when phosphorus and potassium are higher, apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter in lieu of 12-12-12.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed. If boron is low in the leaf tissues, apply boron.

Solubor can be applied at about 1 ounce per 1,000 square feet in order supply 0.2 ounces of boron. Boron must be uniformly applied to the soil in order to avoid localized hot spots. Dissolve it in water and uniformly apply. Irrigate afterwards.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Potassium sulfate (0-0-50) – 6 pounds

Triple superphosphate (0-45-0) – 3 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.

12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,



Garn A. Wallace, Ph. D.
GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate **** high, ***** very high	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60 -120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium Saturation Extract pH value ECe (milli-mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft. relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage	21-314-39 #10 City Hall graphic 9.34 *** 72.79 *** 47.94 ***** 0.52 ** 13.81 ***** 1.91 **** 0.14 ** 571.26 **** 90.15 *** 38.63 * 9.89 * 0.06 *** 0.24 * 1.26 *** 0.10 * 3.23 ** 0.26 * n d * n d * 2.96 ** 0.03 * n d * n d * 3.78 * n d * 0.16 * 7.58 **** 0.29 * millieq/l 25.5 1.3 6.8 0.6 22.1 1.0 8.3 0.2 3.0 29 0.8 15 1.1 0.5 0.0 12.3 0.8 2.7 0.07 * 1.0 * 7 fair sandy loam no low/fair 18.3% 26.4%

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.

pH and ECe are measured in a saturation paste extract. nd means not detected.

Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #12 Water Treatment
Our ID No. 21-314-41, received Nov. 9, 2021

Dear Luke,

The soil pH is highly alkaline at 8.02. Ideally for best growth, the soil pH should normally be in the range of about 6.5 to 7.5. At least, the pH should be less than about 8.0. The pH can be frequently lowered with the addition of gypsum and with deep irrigation. High alkalinity reduces the availability of many nutrients.

Salinity or electrical conductivity is modest at 0.44 millimho/cm. Moderate salinity is beneficial. It can indicate the presence of nutrients. Excessively high salinity restricts water uptake. Normally, salinity should be less than about 2.5 millimho/cm.

Nitrogen is modest. Sulfur is low. Potassium, boron, manganese and magnesium are moderate. Phosphorus, iron, zinc and copper are high. Sodium is low. SAR (sodium adsorption ratio) is 1.9. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Soil moisture is modest at about 60% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply gypsum at 10 pounds per 1,000 square feet.

Apply potassium sulfate (0-0-50) at 5 pounds per 1,000 square feet. Apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter.

Soil Analyses Plant Analyses Water Analyses

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Potassium sulfate (0-0-50) – 6 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

Soil Analyses Plant Analyses Water Analyses

Irrigate deeply after amending the soil to help lower alkalinity. Afterwards, apply ammonium sulfate (21-0-0) at 8 pounds per 1,000 square feet. Ammonium sulfate (21-0-0) helps to reduce high alkalinity.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,

A handwritten signature in cursive script that reads "Garn A. Wallace".

Garn A. Wallace, Ph. D.

GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Print Date Nov. 10, 2021 Location Palm Springs Requester Luke Morris, Community Works Design Group graphic interpretation: * very low, ** low, *** moderate **** high, ***** very high	Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60 -120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number 21-314-41 Sample Description #12 Water Treatment elements graphic phosphorus 24.99 ***** potassium 90.45 *** iron 33.24 ***** manganese 0.85 *** zinc 9.15 ***** copper 4.06 ***** boron 0.23 *** calcium 465.82 ***** magnesium 53.56 *** sodium 41.35 * sulfur 13.06 * molybdenum 0.06 *** nickel 0.13 * aluminum 0.41 ** arsenic 0.14 * barium 0.80 * cadmium 0.04 * chromium n d * cobalt n d * lead 1.33 ** lithium n d * mercury n d * selenium n d * silver n d * strontium 1.70 * tin n d * vanadium n d *	
The following trace elements may be toxic The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants.		Saturation Extract pH value 8.02 ***** ECe (milli-mho/cm) 0.44 ** calcium 19.1 millieq/l 1.0 magnesium 5.5 0.5 sodium 35.8 1.6 potassium 10.1 0.3 cation sum 3.2 chloride 48 1.4 nitrate as N 15 1.1 phosphorus as P 0.9 0.0 sulfate as S 20.3 1.3 anion sum 3.7 boron as B 0.21 ** SAR 1.9 ** est. gypsum requirement-lbs./1000 sq. ft. 7	
relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage		fair/slow sandy loam no low/fair 10.9% 18.3%	

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #7 Baristo
Our ID No. 21-314-36, received Nov. 9, 2021

Dear Luke,

The soil pH is highly alkaline at 8.12. Ideally for best growth, the soil pH should normally be in the range of about 6.5 to 7.5. At least, the pH should be less than about 8.0. The pH can be frequently lowered with the addition of gypsum and with deep irrigation. High alkalinity reduces the availability of many nutrients.

Salinity or electrical conductivity is modest at 0.35 millimho/cm. Moderate salinity is beneficial. It can indicate the presence of nutrients. Excessively high salinity restricts water uptake. Normally, salinity should be less than about 2.5 millimho/cm.

Nitrogen and sulfur are low. Boron is modest. Phosphorus, potassium, magnesium and manganese are moderate. Iron, zinc and copper are high. Sodium is low. SAR (sodium adsorption ratio) is 1.4. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Soil moisture is moderate at about 64% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply agricultural gypsum (calcium sulfate) at 10 pounds per 1,000 square feet. Irrigate deeply and lower the alkalinity. Reduce the pH to less than 8.0.

Apply 12-12-12 at 8 pounds per 1,000 square feet now and about once per quarter. After about 6 months when phosphorus and potassium are higher, apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter in lieu of 12-12-12.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed. If boron is low in the leaf tissues, apply boron.

Solubor can be applied at about 1 ounce per 1,000 square feet in order supply 0.2 ounces of boron. Boron must be uniformly applied to the soil in order to avoid localized hot spots. Dissolve it in water and uniformly apply. Irrigate afterwards.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Potassium sulfate (0-0-50) – 6 pounds

Triple superphosphate (0-45-0) – 3 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

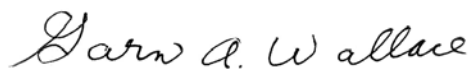
Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

Irrigate deeply after amending the soil to help lower alkalinity. Lower the pH to less than 8.0.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,



Garn A. Wallace, Ph. D.
GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate **** high, ***** very high	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60 -120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium	21-314-36 #7 Baristo graphic 11.89 *** 71.14 *** 34.59 ***** 0.66 *** 8.08 ***** 0.83 ***** 0.19 ** 540.24 ***** 62.76 *** 37.95 * 14.80 * 0.04 *** 0.13 * 1.38 *** 0.05 * 1.38 * 0.08 * n d * n d * 4.74 ** 0.02 * n d * n d * 2.65 * n d * 0.08 *
The following trace elements may be toxic The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants.		Saturation Extract pH value ECe (milli-mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft.	
problems over 150 ppm good 20 - 30 ppm toxic over 800 toxic over 1 for many plants increasing problems start at 3 relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage		8.12 ***** 0.35 * millieq/l 29.0 1.4 7.1 0.6 31.9 1.4 9.0 0.2 3.7 29 0.8 6 0.4 0.6 0.0 23.7 1.5 2.7 0.06 * 1.4 * 6 fair sandy loam no low/fair 13.3% 20.9%	

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #9 Dog Park
Our ID No. 21-314-38, received Nov. 9, 2021

Dear Luke,

The soil pH is moderately alkaline at 7.40.

Salinity or electrical conductivity is modest at 0.59 millimho/cm. Moderate salinity is beneficial. It can indicate the presence of nutrients. Excessively high salinity restricts water uptake. Normally, salinity should be less than about 2.5 millimho/cm.

Nitrogen, magnesium and boron are moderate. Phosphorus, potassium, iron, manganese, zinc and copper are high. Sulfur is low. Sodium is low. SAR (sodium adsorption ratio) is 1.2. The concentrations of common non-essential heavy metals are low. Aluminum is high.

Aluminum restricts growth by interfering with the metabolism of phosphorus and calcium. It causes stunting and discoloration. Foliage may turn a dull gray green. Aluminum is high in poorly aerated soil and in overly acidic soils. Soluble calcium helps to reduce the toxicity of aluminum.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Soil moisture is low at about 16% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Balance soil moisture with soil aeration.

Soil Analyses Plant Analyses Water Analyses

Apply agricultural gypsum (calcium sulfate) at 10 pounds per 1,000 square feet.

Apply calcium ammonium nitrate (27-0-0) at 4 pounds per 1,000 square feet about once per quarter. Nitrogen is not currently needed. Nitrate helps to increase soil aeration.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

For site maintenance, apply calcium ammonium nitrate (27-0-0) at 4 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,



Garn A. Wallace, Ph. D.
GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate **** high, ***** very high	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60 -120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium	21-314-38 #9 Dog Park graphic 56.44 ***** 140.26 **** 124.92 ***** 1.32 **** 10.17 ***** 2.18 **** 0.22 *** 473.29 **** 76.01 *** 43.80 * 23.52 * 0.07 *** 0.25 * 4.00 **** 0.06 * 0.50 * 0.07 * n d * 0.03 * 0.53 * 0.04 * n d * n d * n d * 1.78 * n d * 0.31 *
The following trace elements may be toxic The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants.		Saturation Extract pH value ECe (milli-mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft.	
problems over 150 ppm good 20 - 30 ppm toxic over 800 toxic over 1 for many plants increasing problems start at 3		7.40 *** 0.59 ** millieq/l 53.1 2.7 12.1 1.0 38.6 1.7 22.0 0.6 5.9 30 0.8 28 2.0 1.7 0.1 34.6 2.2 5.1 0.11 * 1.2 * 7 fair sandy loam no fair/low 3.1% 19.7%	
relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage			

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.

pH and ECe are measured in a saturation paste extract. nd means not detected.

Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABORATORIES, LLC

365 Coral Circle

El Segundo, CA 90245

phone (310) 615-0116 fax (310) 640-6863

November 11, 2021

Luke Morris, luke@cwdg.fun
Community Works Design Group
4649 Brockton Avenue
Riverside, CA 92506

RE: Palm Springs, #8 New Park
Our ID No. 21-314-37, received Nov. 9, 2021

Dear Luke,

The soil pH is modestly highly alkaline at 7.93. Limestone is present. It induces iron deficiency in acid-loving plants.

Salinity or electrical conductivity is moderate at 1.52 millimho/cm.

Nitrogen and sulfur are low. Potassium and magnesium are moderate. Boron is modest. Phosphorus, iron, manganese, zinc and copper are high. Sodium is low. SAR (sodium adsorption ratio) is 0.7. The concentrations of common non-essential heavy metals are low.

Ideally, SAR should be less than about 3. High sodium and high SAR values limit soil physical properties, reduces water percolation, decreases soil aggregate stability, increases clay dispersion, increases swelling of expandable clays, increases surface crusting and reduces soil tilth. High sodium also restricts the uptake of competitive ions such as potassium and calcium.

Soil moisture is low at about 8% of field capacity. Ideally, soil moisture should be moderate such as about 65% to 78% of field capacity. If soil moisture is too low, growth ceases. If soil moisture is too high for over several days, growth is restricted. Water fills the pores which normally convey air to the roots. With insufficient soil aeration, metabolic activity is curtailed and in addition organic acids are formed that also inhibits proper root function. Excessive soil moisture is more damaging in hot weather because root respiration is faster and the solubility of oxygen in water is reduced.

Recommendations for maintenance fertilization

Apply gypsum at 10 pounds per 1,000 square feet.

Apply potassium sulfate (0-0-50) at 5 pounds per 1,000 square feet. Apply ammonium sulfate (21-0-0) at 5 pounds about once per quarter.

Balance soil moisture with soil aeration.

Monitor the site with periodic soil and leaf tissue testing. Adjust the fertility and irrigation programs as needed.

Recommendations for soil renovation

General soil preparation on a square foot basis. Broadcast the following uniformly; rates are per 1,000 square feet for a 6-inch lift. Incorporate them homogeneously 6" deep.

Ammonium sulfate (21-0-0) – 5 pounds

Potassium sulfate (0-0-50) – 6 pounds

Agricultural gypsum - 10 pounds

Organic soil amendment - about 4 cubic yards, sufficient for 3% to 5% soil organic matter on a dry weight basis

Organic soil amendment:

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. Organic matter shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen for soil amending.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	12	copper	100	selenium	20
cadmium	15	lead	200	silver	10
chromium	150	mercury	10	vanadium	50
cobalt	30	molybdenum	20	zinc	200
		nickel	100		

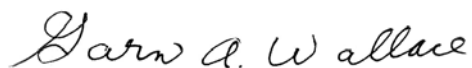
Higher amounts of salinity or boron may be present if the soils are to be preleached to reduce the excess or if the plant species will tolerate the salinity and/or boron.

Balance soil moisture with soil aeration.

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter.

Monitor the turf with periodic soil and leaf tissue testing. Adjust the maintenance program as needed.

Sincerely,

A handwritten signature in cursive script that reads "Garn A. Wallace".

Garn A. Wallace, Ph. D.

GAW:n

WALLACE LABS 365 Coral Circle El Segundo, CA 90245 (310) 615-0116		SOILS REPORT Location Requester graphic interpretation: * very low, ** low, *** moderate **** high, ***** very high	Print Date Nov. 10, 2021 Receive Date 11/9/21
ammonium bicarbonate/DTPA extractable - mg/kg soil Interpretation of data low medium high 0 - 7 8-15 over 15 0-60 60 -120 121-180 0 - 4 4 - 10 over 10 0- 0.5 0.6- 1 over 1 0 - 1 1 - 1.5 over 1.5 0- 0.2 0.3- 0.5 over 0.5 0- 0.2 0.2- 0.5 over 1		Sample ID Number Sample Description elements phosphorus potassium iron manganese zinc copper boron calcium magnesium sodium sulfur molybdenum nickel aluminum arsenic barium cadmium chromium cobalt lead lithium mercury selenium silver strontium tin vanadium	21-314-37 #8 New Park graphic 28.26 ***** 111.30 *** 53.57 ***** 5.42 ***** 1.70 ***** 0.92 ***** 0.20 ** 405.86 ***** 53.86 *** 31.99 * 154.20 *** 0.04 *** 0.11 * 0.18 * 0.10 * 0.90 * 0.01 * n d * 0.05 * 0.89 * n d * n d * n d * n d * 1.69 * n d * 0.22 *
The following trace elements may be toxic The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants.		Saturation Extract pH value ECe (milli-mho/cm) calcium magnesium sodium potassium cation sum chloride nitrate as N phosphorus as P sulfate as S anion sum boron as B SAR est. gypsum requirement-lbs./1000 sq. ft.	7.93 ***** 1.52 *** millieq/l 271.2 13.6 36.0 3.0 43.4 1.9 22.1 0.6 19.0 44 1.2 2 0.2 0.4 0.0 284.8 17.8 19.2 0.13 * 0.7 * 5 fair sandy loam yes low/fair 1.3% 16.7%
problems over 150 ppm good 20 - 30 ppm toxic over 800 toxic over 1 for many plants increasing problems start at 3 relative infiltration rate estimated soil texture lime (calcium carbonate) organic matter moisture content of soil half saturation percentage			

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
 pH and ECe are measured in a saturation paste extract. nd means not detected.
 Analytical data determined on soil fraction passing a 2 mm sieve.