

Consideration of Artificial Turf Pilot Study:

***Follow-up to Questions
Raised at June 23, 2015
Board Meeting***



Board of Directors

July 28, 2015

Follow-up Questions

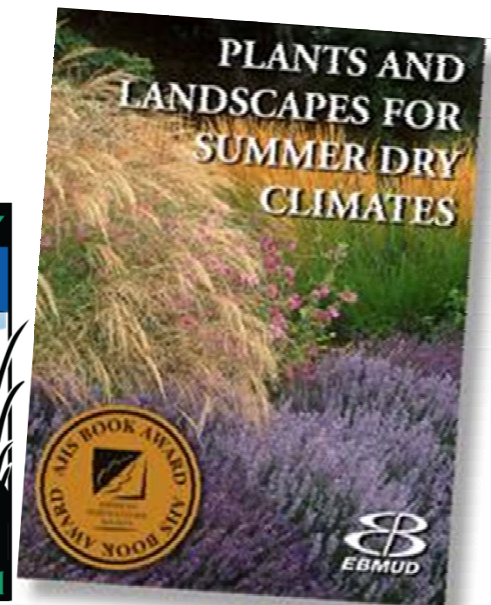


1. How does the District address sustainability on rebate and conservation options?
2. Provide additional specifics regarding artificial turf impacts related to heat island effects and water quality.
3. Provide specifics on whether the new generation of turf has improved with regard to:
 - environmental and disposal impacts (i.e. can it be recycled);
 - lifespan of various turf products
 - recycled material content
4. Provide a list of agencies that do not rebate artificial turf.

Sustainability on Rebate And Conservation Options

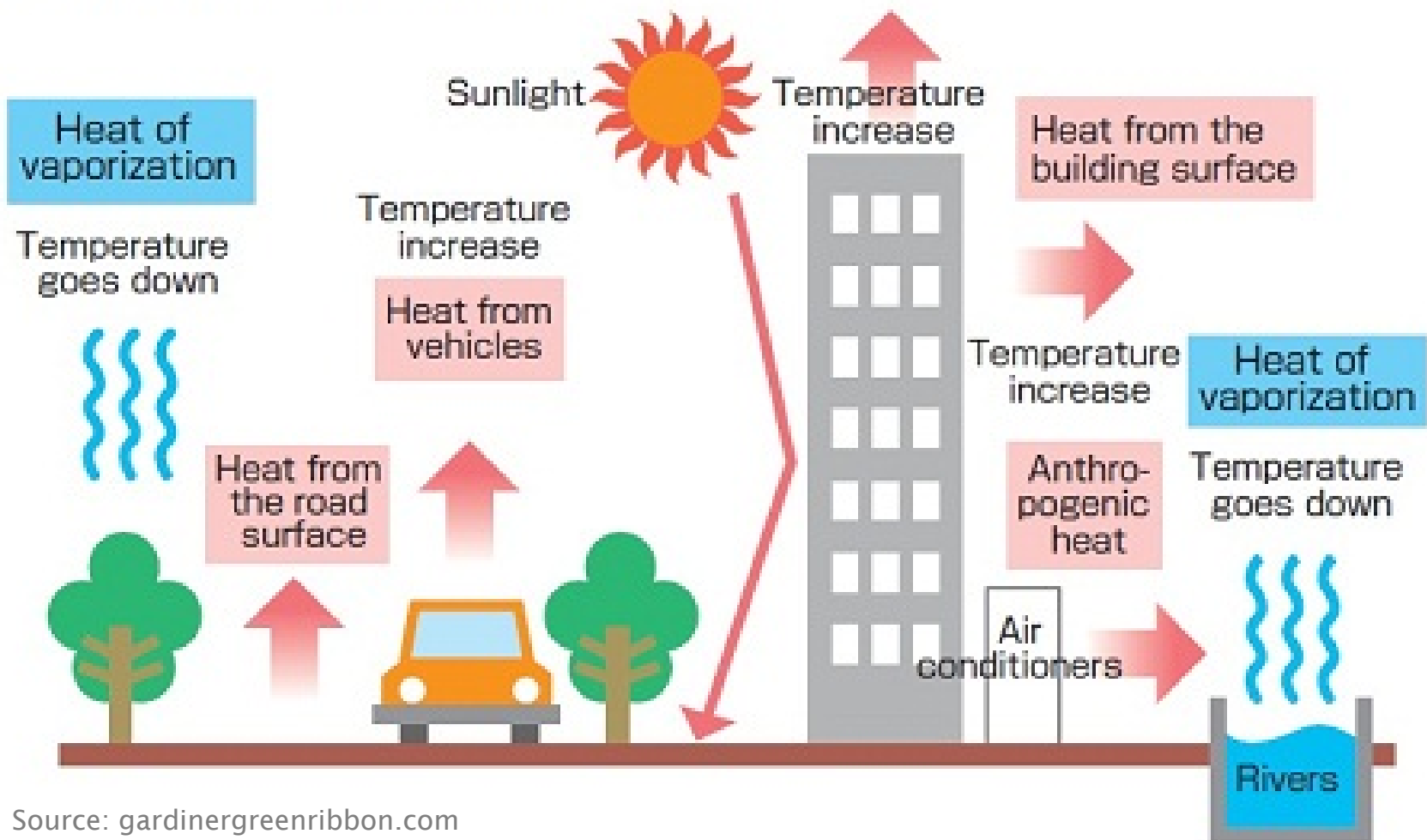


- Consider an integrated conservation of resources approach (i.e. water, energy, wastewater)
- Designed to minimize any potential direct and indirect environmental impacts
- Avoid trade off of conservation savings (i.e. water for energy and vice versa)
- Promote sustainable landscapes
 - landscape design/maintenance
 - solid waste reduction
 - water/energy conservation
 - water and air quality benefits
 - enhanced wildlife habitat)



Heat Island Effect

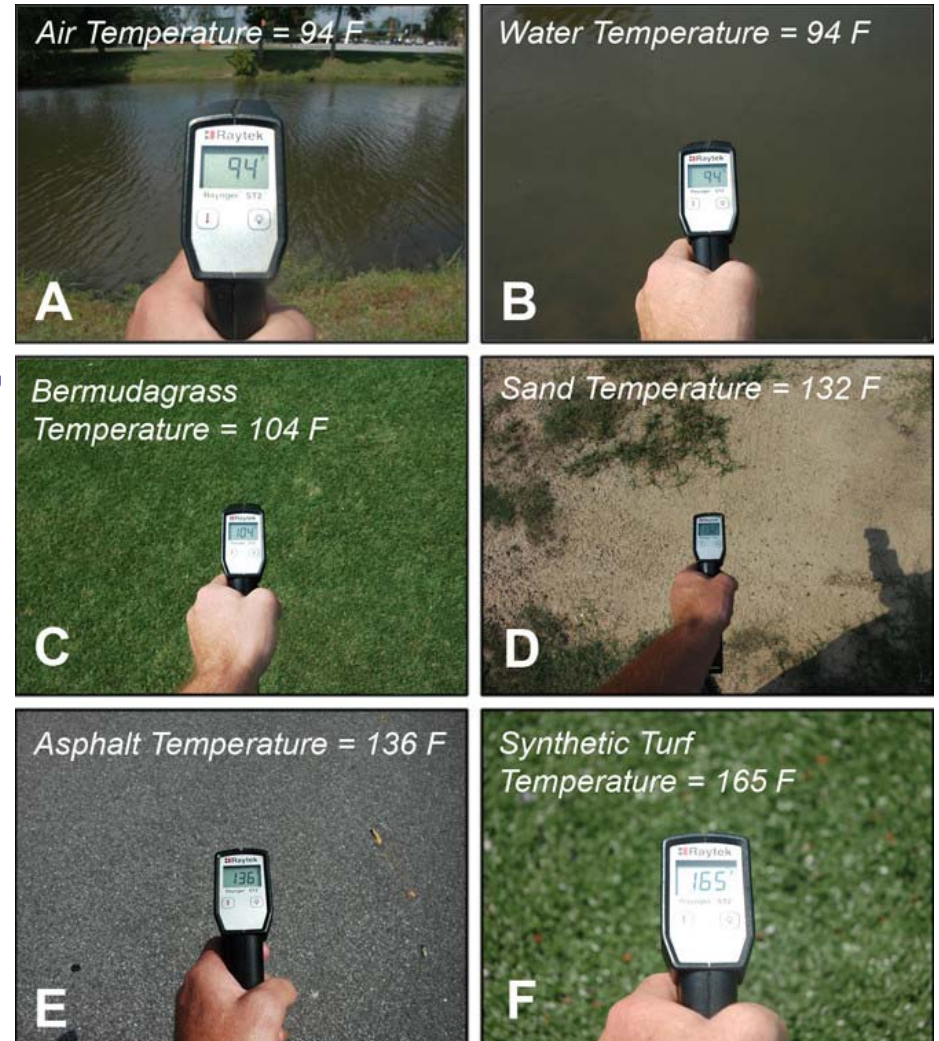
● How the Heat Island Phenomenon occurs



Heat Island Impacts



- Field studies have documented dramatic increases in surface temperatures compared to natural landscapes concrete, and asphalt.
 - up to 60° F hotter than grass, with surface temperatures reaching 160° F on summer days.
 - 58 to 75 degrees hotter than measured air temperature.
 - Water used to cool surface only temporary



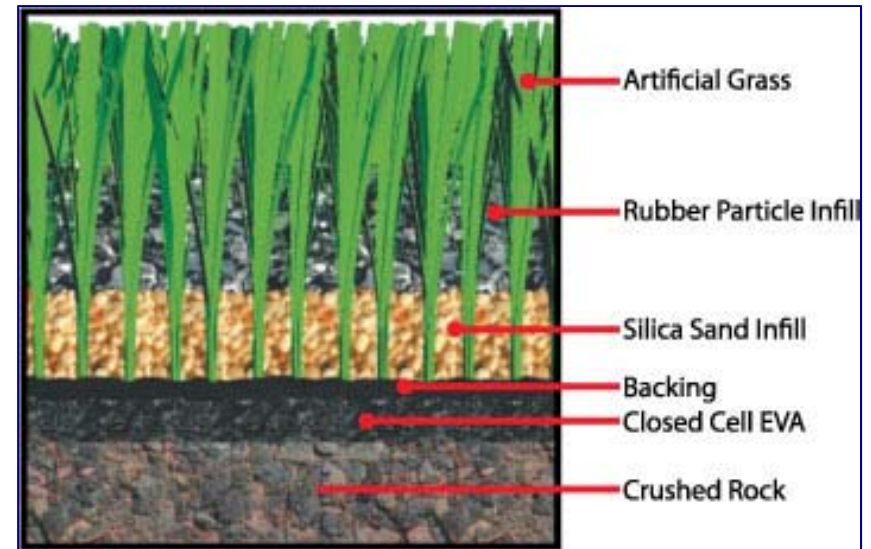
Source: Clemson University

Additional Specifics Regarding Artificial Turf Impacts



Water Quality Impacts

- Leaching of substances from runoff
- Studies show local effects for aquatic organisms
- Recycled rubber and associated leachate are found to contain a variety of metals (including lead, cadmium, copper, mercury, and zinc) as well as organic pollutants.



Source: imagineplayground.com.au

Additional Specifics on New Generation of Artificial Turf



Environmental and Disposal Impacts

- Typically, most artificial turf products are landfilled at the end of their useful life along with the soil.
- Synthetic Turf Council states some artificial turf infill can be cleaned and some material reused onsite or recycled (e.g. an additive to rubber asphalt).
- Filling material like cork can break down or the filling material can become contaminated with dirt, compacted or washed away.
- In Italy, new synthetic turf fields contain a new thermoplastic infill material thought to be nontoxic.

Additional Specifics on New Generation of Artificial Turf



Lifespan of various turf products

- Manufacturing process similar to carpet industry.
- Early 1970s, artificial turf came under scrutiny due to safety and quality concerns (wear, fading, poor seams).
- Newer synthetic turf products are chemically treated to be resistant to ultraviolet rays.
- Newer materials more wear-resistant, softer, less abrasive, and more similar to natural grass.
- Most studies, estimates relate to sports fields with a projected lifespan of 10 to 12 years, after which the material must be disposed of appropriately.

Additional Specifics on New Generation of Artificial Turf



Recycled Material Content

- Synthetic grass fibers typically made of nylon or polypropylene (some polyethylene).
- Infill and base layers components may contain recycled rubber (e.g. tires).
- An alternative for infill is plant-derived materials such as coconut husks and cork.
- *Ecofill*, a new polyolefin-based granule makes claims to disperse heat more efficiently, is highly shock absorbent, and is 100% recyclable.

Sample List of Bay Area Agencies That Do Not Rebate Artificial Turf



| | | |
|------------------------------|------------------------------------|--|
| Alameda County Water Dist. | City of Mountain View | Menlo Park |
| California Water Service Co. | City of Palo Alto | Mid-Peninsula Water District |
| City of Benicia | City of Redwood City | Napa County |
| City of Brisbane | City of Sacramento | Purissima Hills Water District |
| City of Cotati | City of San Jose | San Jose Water Company |
| City of Cupertino | City of Santa Clara Water & Sewer | Santa Clara Valley Water Dist. |
| City of Daly City | City of Santa Rosa | Solano County Water Agency |
| City of Fairfield | City of Sonoma | Stanford University Utilities |
| City of Foster City | Stockton Municipal Utilities Div. | Town of Los Altos |
| City of Hayward | City of Sunnyvale | Town of Windsor |
| City of Hollister | City of Vacaville | Valley of the Moon Water Dist. |
| City of Menlo Park | City of Vallejo | Water Resources Association of San Benito County |
| City of Milpitas | Coastside County Water District | |
| City of Morgan Hill | Dublin San Ramon Services District | |