



## MEMORANDUM

**TO:** Mayor and City Council

**FROM:** Chuck Lesniak, Environmental Officer  
Watershed Protection Department

**DATE:** October 31, 2013

**SUBJECT:** Staff Recommendations on the Use of Aggregate in Commercial Landscapes

This memo is a final report in response to City Council Resolution No. 20130523-078.

Earlier this year, individuals in the landscape architect community expressed concern about the City's regulations prohibiting the use of aggregates as a soil cover under plants in commercial landscape designs. As a result, Council directed staff to work with stakeholders to review City requirements regarding the use of aggregate materials in commercial landscaping and make any necessary recommendations for code or criteria changes. Aggregate materials in this context are regarded as any non-plant-based material used for ground cover in landscaping, and include decomposed granite, "mineral mulch", river rock, pebbles, crushed glass, and similar materials. In this document, the term "mulch" is intended to mean plant based materials used as a soil cover or amendment.

The resolution cites City Code Section 25-2-1003(D), which allows a required landscaped area to include features such as brick, stone, and aggregate if they do not predominate over the plant materials. It also cites the intent of City Council to promote landscaping that incorporates sustainable design features, minimizes treated water use, reduces storm water runoff, enhances infiltration, reduces building energy use, and is aesthetically pleasing as well as environmentally suitable with regard to water quality, air quality, urban heat island effect, and water conservation.

Staff held internal and external stakeholder meetings to discuss the issue. Following is a brief summary of the meetings:

### External Stakeholder Input

Three external stakeholder meetings were held on July 10, August 19, and September 16, 2013 to collect input and questions from the general public and the landscaping professionals. The external stakeholder meetings were publicized via the city of Austin's website and more specifically to stakeholders identified in the resolution, including members of the landscaping community e.g. design firms, vendors, real estate associations, the American Society of Civil Engineers (ASCE), the American Society of Landscape Architects (ASLA), and other interested parties. Comments were also received electronically from those not able to attend the meetings. Feedback from external stakeholders included:

- Broad support in the landscape community for the intent of the landscape ordinance, i.e. for landscaping in the City of Austin to represent an Austin style by emphasizing the use of native Central Texas plant communities.

- General support for the idea that landscape designs should be environmentally sustainable and protective of water quality, air quality, urban heat island effect and water conservation.
- Concern from some that current code is too prescriptive to allow for response to site conditions and to allow for aesthetic flexibility.
- Aggregate can be sized appropriately for slopes to prevent erosion and provide for infiltration of water into the underlying soils.
- Aggregates can be beneficial in areas of high traffic, where the alternate state is bare and compacted dirt.
- Concern that expanding use of aggregate would lead to aggravation of the heat island effect.
- Landscaping can be designed to prevent or limit exposure of aggregates to direct sunlight.
- Over the long-term aggregates can be a lower cost option for the property owner due to less frequent replacement.
- Plants that thrive when using aggregate in lieu of mulch frequently require less water, which is a significant consideration in current landscape design.
- Some difference of opinion regarding aggregate's effect on the landscape's ecological function, use in lieu of plant based mulch, and ability to stabilize a landscaped area.

#### Internal Staff Input

Three internal, interdepartmental meetings were held including representatives from the Watershed Protection Department, Austin Water, Austin Energy, Office of Sustainability, and Planning and Development Review Environmental Review Department, Arborist, and Landscape Inspection. Staff generally agreed that:

- Current code and criteria generally meet the goals of the Council resolution for environmental protection and sustainability.
- Current code does not allow for the use of aggregate in lieu of plant based mulch in landscaping.
- Aggregate should not be used in lieu of soil as a planting medium.
- Staff has significant concerns about the use of aggregate and potentially negative impacts on water quality, urban heat island, soil temperatures, and infiltration of water into soils (more on this below).
- Use of aggregates around trees is generally not an acceptable substitute for mulch except in areas where there is special need to alleviate soil compaction, and current code provides flexibility to allow this.
- There is a need for better communication between departments and programs to provide for more consistent application of landscape requirements.
- Definition of terms and requirements in City code and criteria would be helpful for understanding by both staff and the regulated community.
- Use of aggregate might be allowable using the Alternative Compliance path provided in the Environmental Criteria Manual; however, it is not completely clear.
- The City's landscape code and criteria have, for the most part, not been updated since the mid-1990's and could benefit from a comprehensive review.

#### Potential Problems Associated with Aggregate Use

Allowing extensive use of aggregate has the potential to create significant problems regarding water quality, air quality, urban heat island and water conservation including:

##### Water Quality

- Aggregates can erode and migrate from landscaped areas to storm drains and waterways if not installed properly (as can organic mulches).
- Fine aggregate, particularly the widely-used decomposed granite, can compact over time and function as impervious cover. This can increase stormwater runoff and prevent infiltration of rainfall into soils. The type of aggregate used in patios and footpaths may not be appropriate for use as a landscape feature.

### Urban Heat Island

- Aggregates exposed to sunlight retain heat, heat the soil and surrounding landscapes to a greater degree than organic mulches, and increase air temperatures which can increase the water needs of surrounding plants and cooling needs of surrounding buildings and exacerbate the urban heat island effect.
- In humid areas such as Austin, aggregates retain heat overnight, unlike in arid desert climates which tend to cool rapidly after day time heating.

### Soil Quality

- Aggregates contribute little to the soil, whereas organic mulches break down and enhance the soil.

### Plant Adaptability

- Many plants are not well adapted to growing with aggregate placed as a soil cover.
- Aggregate is unsuitable as a growing medium in lieu of soil.
- Nearby plants and trees may be impacted by increased soil and air temperatures.

### Water Conservation

- Plants and trees not adapted to higher soil and air temperatures can require more water.

### Potential Benefits Associated with Aggregate Use

- Is more stable on slopes than mulch when using larger sized aggregate.
- Less compaction of soil when using larger sized aggregate in high-traffic areas
- Lower replacement cost than mulch over time in certain applications
- Can reduce water needs when planted with compatible plants , particularly when located in shaded areas

### Recommendations

While current code is effective in meeting the City's environmental and sustainability goals, after consideration of input from external and internal stakeholders it appears that City requirements could be modified to provide greater flexibility to the landscape community and still meet the City's goals. We recommend that limited use of aggregate as a soil cover in lieu of plant based mulch should be allowed with specific criteria that address the possible negative impact of aggregates. Furthermore, with the same or similar limitations aggregate could be used as a permanent soil cover in combination with plants on other disturbed areas of a site. Specific recommendations are to:

1. Revise the Land Development Code and Environmental Criteria Manual to allow the use of aggregate in lieu of mulch under the following conditions:
  - a. The use of aggregate should not functionally increase impervious cover. This can be achieved by using washed and screened materials to prevent compaction and filling of pore spaces.
  - b. Aggregate should only be used in areas shaded by buildings or plants. Areas to be shaded by new plantings should be measured using a percentage of the bed coverage of the mature plant or within 1-2 years growth.
  - c. The plants recommended for planting with aggregate should either be native to Central Texas rocky, limestone soils or be an adapted plant with similar required growing conditions.
  - d. When aggregate is used in planting beds, it should be used only as a soil cover and not as a planting medium (not in place of the soil).
  - e. Where aggregate is used it should have borders around it to contain the material and prevent migration of the aggregate.
  - f. The aggregate should be sized appropriately to be permanently stable on the given slope.
2. Update the Environmental Criteria Manual for clarity.
  - a. Standardize language regarding aggregate and mulch and eliminate confusion by discerning between size classes of aggregate and eliminating references to the terms 'mineral mulch', 'inorganic mulch', and 'gravel mulch';

- b. Clarify that finer aggregates such as decomposed granite are not suitable for steep slopes. Discerning between size classes in the criteria will assist in this clarification.
3. Determine if the current Alternative Compliance in the Environmental Criteria Manual is a viable mechanism to allow the use of aggregate as recommended using current criteria, and until rules changes take effect.
4. Continue to prohibit the use of aggregates as a substitute for mulch under preserved or newly planted trees except in areas of high foot traffic or other situations that may cause soil compaction. Current rules allow the City arborist discretion in this area.
5. Improve consistency of application of City requirements and departmental communication through a series of PDRD staff trainings on aggregate use.
6. Provide resources to conduct a broader review and revision, if necessary, of the landscape portion of the ECM, including the Appendix N (plant list), possibly as part of the Land Development Code review that is currently underway.
7. Create a guide for residential homeowners on use of aggregate in residential landscaping with the specific goal of educating on proper use and dissuading complete lawn replacement with pure aggregate.

As directed by the Council resolution, the Environmental Board was presented the staff preliminary report on October 16, 2013. The Board took action to support the preliminary staff report with some additional recommendations (see attached). The Board recommendations were generally incorporated into this final report.

#### Next Steps

Most of the staff recommendations can be implemented through changes to the Environmental Criteria Manual, which can be initiated and processed by staff. We intend to begin that process in our next regular revision cycle, which begins in January 2014, with adoption likely in September 2014. However, code changes are necessary to make clear that aggregate can be used in lieu of mulch and to clarify terms in the ordinance. These code changes will require initiation by Council or the Planning Commission's Code and Ordinance Committee. It is our intent to ensure that all stakeholders have ample opportunity to participate in the code and criteria revision process.

Should you have any questions or comments, please contact me at 512-974-2699.

Cc: Marc Ott, City Manager  
Sue Edwards, Assistant City Manager  
Victoria J. Li, P.E., Director, Watershed Protection Department  
Greg Guernsey, Director, Planning and Development Review Department  
Lucia Athens, Chief Sustainability Officer

Attachment



ENVIRONMENTAL BOARD RECOMMENDATION 20131006 005C

Date: October 16, 2013

Subject: Briefing and request for recommendation on staff report regarding use of aggregate in landscaping, Council Resolution No. 20130523-

Motion By: Robert Deegan

Second By: James Schissler

**Rationale:**

Whereas the use of aggregate mulch may be appropriate in the Austin landscape under certain conditions

**Therefore**, the Environmental Board recommends approval of the memo with the following board conditions:

1. Edit memo to clearly list benefits of aggregate mulch
2. Recommend revisions to the Environmental Criteria Manual with clear direction as to conditions under which aggregate mulch should be allowed without Alternative Equivalent Compliance (AEC)
3. Allow aggregate mulch in any condition irrigated by stormwater runoff
4. Minimize disincentive to creating attractive, water efficient landscapes that can replace managed turf
5. Involve stakeholders in the process of developing specific recommendations and Criteria Manual revisions
6. Develop clear AEC pathway for the interim period

**Vote** 6-0-0-1

**For:** Deegan, Gary, Maxwell, Perales, Schissler and Walker

**Against:** None

**Abstain:** None

**Absent:** Mary Ann Neely

**Approved By:**

Dr. Mary Gay Maxwell, Chair