SUNSHINE CANYON Landfill
14747 San Fernando Road
Sylmar, CA 91342

January 31, 2019

Mr. Martins Aiyetiwa, P.E.
Senior Civil Engineer
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803-1331

Subject: Sunshine Canyon Landfill, Quarterly Vegetation Report
Fourth Quarter 2018 Vegetation Report

Mr. Aiyetiwa,

This report has been prepared in accordance with the following:

- Condition 18B of the Finding of Conformance;
- Condition 44A of the Condition Use Permit (CUP)
- Los Angeles City Condition [Q] C.8 of the Ordinance No. 172,933.

This report presents the progress of the site's landscaping and revegetation activities for the fourth quarter of 2018. The intent of these reports is to provide detailed information regarding the site's efforts related to vegetation including vegetation of interim and permanent slopes and activities conducted for the on-site sage mitigation areas.

Architerra Design Group continues to assist site personnel in evaluating current site conditions relating to vegetation and provide recommendations for future efforts. This report includes their assessment of the pilot sage vegetation area as well as recommendations for this area. Architerra's evaluation is in addition to the required quarterly monitoring performed by our consulting biologist.

1.0 Interim Slopes

For the purposes of this report, interim slopes are those defined as slope areas where no activities have taken place for 180 days or longer. CUP Condition 44A requires "a temporary hydroseed vegetation cover on any slope or landfill area that is projected to be inactive for a period of greater than 180 days".

1.1 Hydroseeding Activities

Based on the results of the trial project completed in August 2017, a 57 acre vegetative cover project using the approved seed mix was completed in mid-December 2017. Currently, these areas are established and in a dormant state, watering efforts will commence next year on an as-needed basis once the rainy season has passed.

The site completed hydroseeding approximately 15 acres; application of the approved seed mix was completed by the end of the fourth quarter in 2018.

2.0 Permanent Slopes

Permanent slopes are defined as those where no landfilling activities will be conducted in the future.

2.1 City

The permanent slopes on the City portion of Sunshine Canyon Landfill are located on the closed City South and City North areas of the site where no overliner will be placed during future cell development (Drawing 1 – Sage Mitigation Area). No vegetation activities were conducted on the permanent slopes on the City portion of the site during the fourth quarter of 2018.

2.2 County

No vegetation activities were conducted on the permanent slope areas on the County portion of the site during the fourth quarter of 2018 (Drawing 1 – Sage Mitigation Area).

3.0 Non-Permanent Cut Slopes

Prior quarterly vegetation reports have illustrated one area above the front terminal sedimentation basin and one area near the temporary bypass road as “non-permanent cut slopes”. An evaluation of these areas has been conducted and it has been determined that these areas are “permanent slopes” because no landfilling activities will be conducted against these slopes in the future.

4.0 Activities Conducted in Sage Mitigation Areas – 4Q2018

During the fourth quarter of 2018, the following activities were conducted in the sage mitigation areas at the landfill.

4.1 City South Sage Pilot Project Area – Deck C

The following activities were conducted:

- Maintenance activities removal of invasive plant species and weeding activities.
- Selective pruning of saltbush.

4.2 City South Deck B

The Deck B sage mitigation project began on April 9, 2018 and planting was completed by the end of the fourth quarter. Soil samples indicated low pH and high salinity, as a result Deck B underwent a leaching schedule. Additional soil amendments and resampling were completed before planting began, which took place during the fourth quarter. Pacific Restoration Group, Inc (PRG) has been working with Architerra for the completion of project. A summary of the progress is included in Attachment 3.

4.3 County Sage Mitigation Area

The County sage mitigation area is located on the western side of the County portion of Sunshine Canyon Landfill (Drawing 1). No revegetation activities were conducted in this area during the fourth quarter of 2018, and, as noted in multiple JMA progress reports, the conditions in this mitigation area have remained unchanged for some time. JMA notes in their attached third quarter vegetation report that this area is problematic for establishment of vegetation. Soil samples from this location indicate low pH, high salinity, and Boron present in native soils.

5.0 Assessments of Sage Mitigation Areas

Assessments of the site's sage mitigation areas are conducted by a qualified biologist on a quarterly basis. The following sections present a summary of

the recommendations for the sage mitigation areas from JMA (City and County sage mitigation areas) and Architerra (City South Sage Pilot Project Area (Deck C) and the proposed actions in response to the recommendations.

5.1 JMA Recommendations for City Sage Mitigation Areas

JMA's progress reports for the City Sage Mitigation Areas for the fourth quarter of 2018 are provided in Attachment 1. These reports include recommendations based on the assessments. Table 1 presents a summary of these recommendations and the proposed actions.

Table 1 – JMA Recommendations and Proposed Actions – City Sage Mitigation Areas, Fourth Quarter 2018

AREA	RECOMMENDATION		PROPOSED ACTION
Lower, Middle, and Upper Decks (Decks C, B, and A)	1	Weed Control – Implement a year-round weed control program to control non-native species.	A weed control program is already in place on Deck C as part of the pilot project and will continue. A weed control program on Decks B and A will be implemented along with the mitigation plans for these areas.
Lower, Middle, and Upper Decks (Decks C, B, and A)	2	Prohibit Access – Continue to prohibit vehicle access to mitigation areas.	Repairs to the T-post fencing will be made as needed.
Upper Deck (Deck A)	3	Improve root zone and soil conditions	This will be addressed when the plans for Deck A is developed. Actions were taken to address improving the root zone in Decks B & C; it is expected these same actions will be incorporated into the plans for Deck A.
Upper Deck (Deck A)	4	Plant natives in areas dominated with non-natives	This will be addressed when the plans for Deck A is developed. Various planting methods were used for the construction of the pilot project on Decks B & C; it is expected these same actions will be incorporated into the plans for Deck A.
Upper Deck (Deck A)	5	Reseeding – apply native seeds during the rainy season after soil mounds have been established	This will be addressed when plans for Deck A are developed

JMA also recommended that a monitoring biologist should be present during weed control activities or the native plants should be flagged to ensure only non-native species are removed. A monitoring biologist will be consulted prior to any weed control activities to ensure native plants are protected.

5.2 JMA Recommendations for County Sage Mitigation Area

Table 2 presents a summary of the recommendations proposed by JMA based on the assessment of the County Sage Mitigation Area and the proposed actions. Please refer to the full recommendations in the JMA reports in Attachment 2.

Table 2 – JMA Recommendations and Proposed Actions – County Sage Mitigation Area, Fourth Quarter 2018

AREA	RECOMMENDATION		PROPOSED ACTION
COUNTY SAGE MITIGATION AREA	1	Create benches to control soil erosion and improve soil conditions to improve plant establishment and seed dispersal	This recommendation will be considered at a later date
COUNTY SAGE MITIGATION AREA	2	Reseed and plant container plants	This recommendation will be considered at a later date
COUNTY SAGE MITIGATION AREA	3	Plant within view sheds	This recommendation will be considered at a later date
COUNTY SAGE MITIGATION AREA	4	Use soil amendments	This recommendation will be considered at a later date

5.3 Architerra Inspection for City South Sage Mitigation Pilot Project Area – Fourth Quarter 2018

The inspection report is included in Attachment 3 along with photos of the area taken at the photo stations.

5.4 Quarterly Assessment of City South Sage Pilot Project Area

The methodology for assessment of the City South Sage Pilot Project Area developed by JMA was included in the first quarter 2015 Vegetation Report. The evaluation report for the fourth quarter of 2018 based on this methodology is included in Attachment 4.

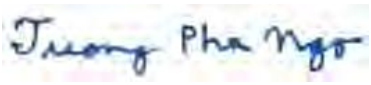
6.0 Status of Other Vegetated Areas

Big Cone Douglas Fir Tree Mitigation

As reported in the vegetation report for the first quarter of 2015, 200 Big Cone Douglas fir tree saplings were planted the third week of March 2015. These trees continue to be monitored and maintenance activities will be conducted in this mitigation area for the remainder of 2019. The report detailing the status of the numbers of Big Cones and Oaks onsite is included in Attachment 5.

Please do not hesitate to contact me at (818) 362-2096 if you have any questions.

Sincerely,



Tuong-Phu Ngo, P.E.
Environmental Manager
Sunshine Canyon Landfill

Cc: Mr. David Thompson, SCL LEA
Ms. Shikari Nakagawa-Ota, SCL LEA
Ms. Ly Lam, City of Los Angeles, Department of City Planning
Mr. Nicholas Hendricks, City of Los Angeles, Department of City Planning
Dr. Wen Yang, Los Angeles Regional Water Quality Control Board
Ms. Maria Masis, County of Los Angeles, Department of Regional Planning
Mr. Wayde Hunter, SCL CAC
Mr. Jim Aidukus, UltraSystems
County DPW Landfill Unit

Attachments

Attachment 1	JMA Progress Report, City-Side Sage Mitigation Area
Attachment 2	JMA Progress Report, County-Side Sage Mitigation Area
Attachment 3	Architerra Design Group, Field Observation Report, South City Sage Mitigation Pilot Project – 4Q2018
Attachment 4	JMA Quarterly Monitoring Report - Coastal Sage Scrub Pilot Study, 4Q2018
Attachment 5	Big Cone and Oak Tree Report

Drawing

Drawing 1	4Q2018 Site Vegetation Status and Activity

ATTACHMENT 1

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SUNSHINE CANYON LANDFILL MITIGATION SITES

Progress Report

City-Side Sage Mitigation Area

Submittal Date: December 17, 2018	**Inspection Date:** December 7, 2018
To: Tuong-phu Ngo, Environmental Manager	**From:** Greg Ainsworth, Monitoring Biologist **Prepared on behalf of Republic Services*

Lower Deck

General Comments:
The saltbush (*Atriplex polycarpa and A. lentiformis*) continues to dominate the vegetation cover. Seedlings of other native species such as *Encelia Californica*, *Artemisia californica, and Salvia sp.* occur within the saltbush canopy; however, in less quantity. Selective thinning of saltbush plants will encourage other natives to fill in.

Evidence of wildlife use is apparent within the Lower Deck based on the presence of tracks and scat, as well as individual species that were observed, including side-blotched lizard (*Uta stansburiana*), cottontail (*Sylvilagus bachmani*) and say's phoebe (*Sayornis saya*).

Native Plant Cover:	**Plant Health Issues:**	**Height of Native Species:**	**Native Species Richness:**
[ ] Dense	[ ] Disease/pests	[ ] 0" – 12"	[X] Low
[X] Moderate	[ ] Plant stress	[ ] 12" – 24"	[ ] Medium
[ ] Minimal	[ ] Herbivory	[X] 24" and above	[ ] High

Weed Conditions

[ ] Dense weed coverage	[ ] Weeds germinating /vegetative growth
[X] Moderate weed coverage (seeding in high density)	[ ] Weeds flowering
[ ] Minimal weed coverage	[ ] Weeds setting seed
	[X] Weed desiccant/dormant

Comments Most weeds are binning to sprout within the lower deck, including mustard (*Hirschfeldia incana*), wild oats (*Avena fatua*) and brome grasses (*Bromus sp.*). Larger plants of Russian thistle (*Kali tragus*) are scattered in various areas, but in low quantities.

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Middle Deck

General Comments:

Approximately 60% of the Middle Deck has been tilled in preparation for planting native seed. Planting will occur primarily in areas where native species have not previously established from prior seeding, largely due to the compacted and gravely soils that occurred prior to tilling. Large boulders have been strategically positioned within the planting area and straw waddles have been installed to control erosion, and to create basins for increasing germination.

There is a decent mixture of native species that have established on the Middle Deck from previous planting efforts that include California buckwheat (*Eriogonum fasciculatum foliosium*), black sage (*Salvia mellifera*), purple needlegrass (*Nessella pulchra*), California sagebrush, and chamise (*Adenostoma fasciculatum*).

Native Plant Cover:	**Plant Health Issues:**	**Height of Species:**	**Native Species Richness:**
[ ] Dense [ ] Moderate [X] Minimal	[ ] Disease/pests [ ] Plant stress [ ] Excessive herbivory	[ ] 0" – 12" [ ] 12" – 24" [X] 24" and above	[X] Low [ ] Medium [ ] High

Weed Conditions

[ ] Dense weed coverage [X] Moderate weed coverage (seeding in high density) [ ] Minimal weed coverage	[X] Weeds germinating /vegetative growth [X] Weeds flowering [ ] Weeds setting seed [ ] Weed desiccant/dormant

Comments: Weed coverage is low within the middle deck as a result of recent tilling and preparation for seeding; however, new sprouts of annual non-native grasses are emerging within the vegetated areas.

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UPPER DECK

General Comments: Overall, the Upper Deck continues to be sparsely covered with native vegetation, and total vegetation coverage is sparse due to compacted and poor soil conditions. Specifically, the soils to the north of the central access road are heavily compacted and gravelly and vegetation coverage in this area is especially sparse. Evidence of previous seeding is no longer discernible.

Annual wild oats (*Avena fatua*), brome grasses and mustard are beginning to sprout, and Russian thistle occurs in various location within the upper deck where soil are less compacted. Buckwheat is the dominant native plant, which is most prevalent at the southwestern portion of the upper deck. Overall natural recruitment within the Upper Deck is low due to poor soil conditions.

Native Plant Cover:	**Plant Health Issues:**	**Height of Species:**	**Native Species Richness:**
[ ] Dense [ ] Moderate [X] Minimal	[ ] Disease/pests [ ] Plant stress [ ] Excessive herbivory	[ ] 0" – 12" [ ] 12" – 24" [X] 24" and above	[X] Low [ ] Medium [ ] High

Weed Conditions

[ ] Dense weed coverage [X] Moderate weed coverage (seeding in high density) [ ] Minimal weed coverage	[X] Weeds germinating /vegetative growth [X] Weeds flowering [ ] Weeds setting seed [ ] Weed desiccant/dormant

Comments: Weeds continue to grow without any level of control within the Upper Deck. Weeds generally consist of Russian thistle, wild oats, brome grasses and mustard.

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RECOMMENDATIONS

Lower and Middle Decks

• **Weed control.** Implement a year-round weed control program to control non-native species. The weed control program should incorporate both chemical and mechanical control practices. Following weed control, any dead material harboring seeds should be removed to an off-site location to the extent feasible.

A monitoring biologist should be present during weed control activities or flag the native plants that should remain to ensure only non-native species are removed. A biologist should verify that the weed removal methodology is sound and does not encourage re-colonizing of non-natives. Weeding is best performed just before, or at the onset of flowering, but before seed set. If seeds are already present, additional care should be taken to remove the plants with the seeds attached, or the seeds should be removed from the plants prior to the plant removal. A consistent weed abatement schedule will reduce the potential for non-natives to set seed. Soil disturbance should be limited by hand weeding, where possible, and weeds should be disposed of off-site to avoid any reinfestation through reseeding or from plant propagules. If hand weeding is not possible, the monitoring biologist should be consulted regarding the appropriate method of weed removal. If there continues to be high incidence of weed infestation, weed control may need to be increased to every four to six weeks. Otherwise, weeds should continue to be monitored and controlled on a quarterly basis.

• **Prohibit access.** Continue to prohibit vehicle access to mitigation areas.

Upper Deck

• **Improve root zone and soil conditions.** Continue to investigate ways to import the soil layer to improve the root penetration and saturation zone to enable plant growth in heavily compacted areas. Consider applying soil in random undulations or uneven mounds to improve soil porosity and filtration and to control soluble salts from leaching from existing layer.

If permissible, prior to seeding (broadcast, hydroseeding, or drilling) native species, incorporate a soil amendment or mulch with high organic content by tilling into the top 12 inches of the existing compacted soils to improve soil texture, drainage, porosity, and aerobic conditions. If an organic mulch or soil amendment is not feasible or available, incorporate available soil from on-borrow sites within the landfill that have the appropriate, so long as these borrowed soils have been determined to not have toxic conditions such as boron or high salinity.

• **Plant natives in areas dominated with non-natives.** The vegetated areas on the Upper Deck that are currently dominated with annual, non-native species, as well as with native shrubs, have decent soil-texture conditions. These areas are not near as compacted as areas within the Upper Deck that are gravelly and mostly void of vegetation. In general, the soil texture within the vegetated areas with non-native vegetation is friable down to approximately 4-8 inches in depth. Various planting methods (i.e., broadcast, imprint, and hydroseeding) may be used to re-establish native plants on the Upper Deck where non-natives currently dominate.

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• **Weed control.** Implement a year-round weed control program to control non-native species. The weed control program should incorporate both chemical and mechanical control practices. Following weed control, any dead material harboring seeds should be removed to an off-site location to the extent feasible.

A monitoring biologist should be present during weed control activities or flag the native plants that should remain to ensure only non-native species are removed. A biologist should verify that the weed removal methodology is sound and does not encourage re-colonizing of non-natives. Weeding is best performed just before, or at the onset of flowering, but before seed set. If seeds are already present, additional care should be taken to remove the plants with the seeds attached, or the seeds should be removed from the plants prior to the plant removal. A consistent weed abatement schedule will reduce the potential for non-natives to set seed. Soil disturbance should be limited by hand weeding, where possible, and weeds should be disposed of off-site to avoid any reinfestation through reseeding or from plant propagules. If hand weeding is not possible, the monitoring biologist should be consulted regarding the appropriate method of weed removal. If there continues to be high incidence of weed infestation, weed control may need to be increased to every four to six weeks. Otherwise, weeds should continue to be monitored and controlled on a quarterly basis.

• **Reseeding.** Following the application of soil mounds as previously described, apply native seed (by means of broadcast seeding, hydroseeding or drilling) during the rainy season, between December and March, or prior to a forecasted rain event.

• **Prohibit access.** Continue to prohibit vehicle access to mitigation areas.

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Progress Report

City-Side Sage Mitigation Area

Photo Locations

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Progress Report

City-Side Sage Mitigation Area

Photo 1. Facing west at lower deck. View of *Atriplex lentiformis* entering dormancy with the pilot study area in the background.

Photo 2. Facing east at lower deck from western boundary.

Photo 3. Facing east at middle deck with lower deck visible in background. View of the area where seeding is occurring.

Photo 4. Facing west at the easterly-facing slope located between middle and upper decks. The vegetation on the slopes is dominated with mustard and brome grasses, both of which have senesced, as well as patches of California buckwheat.

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Progress Report

City-Side Sage Mitigation Area

Photo 5. Facing northeast at upper deck. This area is compacted and gravelly and continues to be problematic for supporting vegetation. Senesced non-native grasses, CA buckwheat, and Russian thistle are evident in the background.

Photo 6. Facing southwest at upper deck. The area shown in this photo is dominated by Russian thistle and senesced wild oats and brome grasses.

Photo 7. Facing southeast at the upper deck at the disturbed area that is currently dominated with brome grasses and Russian thistle.

ATTACHMENT 2

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SUNSHINE CANYON LANDFILL MITIGATION SITES

Progress Report

County-Side Sage Mitigation Area

Submittal Date: December 7, 2018	**Inspection Date:** December 17, 2018
To: Tuong-phu Ngo, Environmental Manager	**From:** Greg Ainsworth, Monitoring Biologist ***Prepared on behalf of Republic Services***

STATUS OF HYDROSEEDING

Conditions:

[ ] Fully covered [ ] Moderately covered [X] Barely covered

Comments:

Conditions on the county-side sage mitigation area remain relatively unchanged. Areas that are moderately covered with vegetation (native and non-native) are concentrated to the southern half of the slope. A substantial portion of the northern-half of the county-side mitigation area continues to be bare and problematic for establishment of vegetation, primarily because of erosion, steep slopes and toxic soils (See Recommendations).

Native plant coverage is similar to the previous quarterly monitoring reports. The southern-half of the mitigation area contains the most vegetation with a substantial portion of the vegetation cover dominated with native species, most notably California buckwheat, *Eriogonum fasciculatum*. Native plant coverage is assumed to be a direct result of hydroseeding; however, some natural recruitment is apparent based on the dense cover where native vegetation is present, and the various sizes and structure of the shrubs. Due to rocky (hydrophobic) soil conditions, soil erosion and Boron-toxic soils on the northern-half of the county-side mitigation area, minimal plant growth is present.

SEED MIX

Conditions:

[ ] No sign of germination	[ ] Dense cover of native plants from seed mix
[ ] No cover of native plants from seed mix	[X] Moderate cover of native plants from seed mix (where vegetation is present)
[ ] Sparse cover of native plants from seed mix	

Comments:

Similar to the hydroseeded areas, the other areas that are moderately covered with vegetation are concentrated in the southern-half of the slope. A substantial portion of the county-side mitigation area continues to be bare and problematic for vegetation to become established. However, in areas where vegetation is present, there is a moderate coverage of native species, mostly California buckwheat and *Encelia californica* is present, but in less quantities.

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Germination and plant growth from hydroseeding or seed mix is not discernible. Similar to previous monitoring periods, a moderate cover of native plants exists within vegetated areas. Annual non-native grasses and forbs currently dominate the understory and serve as ground cover in most of the vegetated areas. Brome grasses (*Bromus sp.*), wild oats (*Avena fatua*) and shortpod mustard (*Hirschfeldia incana*) are beginning to sprout, but still only comprise approximately 25 percent of the vegetation cover. California buckwheat dominates the native vegetation coverage, with California sagebrush (*Artemisia californica*) and California sunflower (*Encelia californica*) as co-dominants. These native species comprise of approximately 75 percent of the native vegetation cover (in areas where vegetation is present). Other less dominant native species observed include golden bush (*Ericameria linearifolia*), coyote brush (*Baccharis pilularis*), black sage (*Salvia millifera*), laurel sumac (*Malosma laurina*), and a small cluster of arroyo willow (*Salix lasiolepis*) trees that continue to thrive along the v-ditch that extends east-west through the center of the mitigation site.

OVERALL NATIVE PLANT CONDITIONS

Plant Cover:	**Plant Health Issues:**	**Height:**	**Species Richness:**
[ ] Dense [ ] Moderate [X] Minimal	[ ] Disease/pests [ ] Plant stress [ ] Excessive herbivory	[ ] 0" – 12" [X] 12" – 24" [ ] 24" and above	[ ] Low [X] Medium [ ] High

Comments:

Vegetation cover on the "county slope" is most prevalent on the southern half of the restoration area, with the greatest density of vegetation in the center. The majority of the northern and upper portions of the mitigation area continue to have minimal coverage due to erosion, rocky soils and boron toxicity. Bare areas and non-native annual grasses are intermixed, but characterizes the northern half of the restoration area. Native vegetation density and richness is good in vegetated areas, and the non-native grasses cover is typical of the native, undisturbed areas that surround the landfill.

As indicated previously, California buckwheat dominants the native cover with *Encelia californica* as a co-dominant. Establishment and regeneration of native vegetation is problematic on the upper and northern portions of the restoration area due to rocky soils with poor soil structure, and boron toxicity has made plant growth (i.e., seed germination and recruitment) difficult. The species richness is low to medium within vegetated areas; however, species richness is considerably low when considering the entire county-sage mitigation area.

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WEED CONDITIONS	
Conditions: [ ] Dense weed coverage [X] Moderate weed coverage (seeding in high density) [ ] Minimal weed coverage	[ ] Weeds germinating [X] Weeds flowering [X] Weeds setting seed [ ] Weed desiccant/dormant
Comments: Annual, non-native weed species are beginning to sprout that consist primarily of brome grasses (*Bromus* sp.), shortpod mustard, red-stemmed filaree (*Erodium cicutarium*) and wild oats (*Avena fatua*). Other established weedy species that were observed include (native) telegraph weed (*Heterotheca grandiflora*). Russian thistle (*Salsola kali*) and tree tobacco (*Nicotiana glauca*) are scattered within the vegetated areas, but in less densities than the other non-native species noted above.	
MISCELLANEOUS	
Conditions: [ ] Trash [ ] Vandalism [ ] Erosion	
Comments: None	

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RECOMMENDATIONS

• **Create benches.** Consider creation of benches throughout the mitigation area to control soil erosion and to improve soil conditions to improve plant establishment and seed dispersal. This technique has been widely used on steep slopes and in areas where soil erosion is problematic. This technique also allows for opportunities to introduce a high quality soil layer above the poor soils that exist.

• **Reseed and plant container plants.** If creation of benches is feasible, planting methods should include Hydroseeding and broadcast seeding just before a forecasted rain event and planting with container plants with supplemental irrigation during the period of establishment. Container plants should only be planted if temporary irrigation source is available.

• **Plant within view sheds**. Consider planting native species on upper portion of the slope that is visible from public view sheds with appropriate native species. Planting should occur prior to fall/winter rains.

• **Use soil amendments.** Incorporate a soil amendment or mulch with high organic content in select areas as determined by a restoration specialist.

• **Signage.** Install signs indicating that the area is undergoing revegetation.

• **Weed control.** Continue weed control program as needed on a quarterly basis.

• **Prohibit access.** Continue to prohibit vehicle access to mitigation area. Extend fencing around southeastern and southern boundary of lower deck and review fencing on the upper deck to determine if additional area can be reasonably enclosed.

• **Employee awareness.** Conduct an employee awareness program to inform staff on the importance of preserving all restoration areas.

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Progress Report

County-Side Sage Mitigation Area

Photo Locations

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Progress Report

County-Side Sage Mitigation Area

Photo 1. Facing west at the county sage slope. Senesced grasses and forbs, and California buckwheat are currently the dominant species.

Photo 2. Facing west at the northern-half of the county sage hill, where plant growth has been problematic due to poor soil conditions.

ATTACHMENT 3

ARCHITERRA design group
landscape architecture and planning

ARCHITERRA DESIGN GROUP **FIELD OBSERVATION REPORT**

DATE OF VISIT:	12/28/18
PROJECT:	**Sunshine Canyon Mitigation Sites**
PROJECT NUMBER:	1214
PROJECT MANAGER:	Gregg Denson
SITE INSPECTION #:	
PURPOSE OF VISIT:	Review site conditions/Photo Catalog
TIME OF SITE VISIT:	10:00am
WEATHER/TEMPERATURE:	Extremely Windy (+40mph) and Cold (45°F)
ESTIMATED % COMPLETED:	100% Deck C 95% Deck B
CONFORMANCE WITH SCHEDULE (+, -)	Yes

WORK IN PROGRESS:	Weed abatement / Monitoring Period / Installation Review for Deck B Progress
PRESENT ON SITE:	Gregg Denson - Architerra Design Group (ADG), Fernando – Pacific Restoration Group (PRG)

A walk through was held this date to review plant establishment of Trial Site, Photo Catalog current growth and review weed abatement. Additional items noted during the site visit are as follows:

City-Side Sage Mitigation (Trial Site):

- Early season rains allowed many of the native species to come out of drought dormancy. There are some species which have begun to push new foliage and are recovering well from defoliation. Specifically, Coast Sunflower (*Encelia californica*), California Sagebrush (*Artemesia californica*), Black Sage (*Salvia mellifera*), Purple Sage (*Salvia leucophylla*), White Sage (*Salvia apiana*), Mexican Elderberry (*Sambucus mexicana*), Coyote Bush (*Baccharis pilularis*), and several of the Saltbush species (*Atriplex* sp.) are showing signs of regrowth.
- Much of the deck has begun to germinate with grass and native seedings. The contractor who is managing the trail site should immediately begin removal of invasive grasses and weeds. Last season, the contractor waited too long and many of the invasive plants flowered and put out new seed. Contractor should correctly identify and remove these targeted species: Russian Thistle (*Salsola* ssp.), Shortpod Mustard (*Hirshfeldia incana*), Barnyard Grass (*Echinochloa crus-galli*) and *Hordeum murinum* – False Barley/Mouse Barley that reappear every year.
- Timing on flush of new growth is slightly earlier than the previous year and with recent rains and we anticipate good growth and plenty of new germination of species on Deck C this Spring if winter rain pattern continues.

Shortpod Mustard sprouting in abundance

Invasive grasses establishing underneath existing Saltbush

New sprouting of *Encelia californica*

White Sage foliage emerging from Fall Dormancy

Seedling *Encelia Californica* germinating at on-grade irrigation lateral

Mule Deer tracks at Deck C

City-Side Sage Mitigation (Deck B):

- ADG has reviewed the installation of the Deck B mitigation area and found it substantially complete. Irrigation was operational at the time of review, however some coordination was needed between the maintenance personnel for the PM10 Berm and PRG due to the irrigation pump being turned off manually. PRG spoke with those personnel regarding Deck B and leaving the pump running automatically based off their watering schedule.
- PRG to manage daily watering to avoid irrigating during heavy wind events. Keep soils moist during active growing period and offset irrigation after storm events to minimize ponding/runoff and excessive watering.
- PRG needs to reset the straw wattles that were moved to allow equipment access. PRG should also replace any damaged straw wattles as there are still several months of potential storm events left in 2019. Adjust grading per photo (shown below) to eliminate water ponding at depressed area where soils were built up. A smaller swale shall be cut in to connect to the existing swale to the east.
- Seeding and container planting was completed and recent January rains should help to improve the leaching of the soils and germination of the seeded areas. Tubex (or equal) installation needs to occur to prevent browsing of vegetation.
- ADG has provided a layout of Deck B with the designated Photo Stations and Randomly Selected Quadrats for Greg Ainsworth to include into the next quarterly report.
- PRG shall continue to maintain the Deck B area and provide all turn-over items including as-builts.

View looking north-west – Deck B

View looking south-west – Deck B

View of container plant installation (*Opuntia littoralis*)

Invasive Bermuda Grass that needs to be removed – Deck B

Low spot on deck where water is ponding. Contractor to provide positive drainage to the south-east and cut in swale as marked to link up with swale near boulders on other side.

On-grade manifolded valves with branded valve numbering and staked laterals

View looking north-east with irrigation of valves #15, #16 and #17 in operation

View looking east along gravel access road with recently removed weeds (in piles at road)

View looking south-east of area between existing CSS

Signed: Gregg Denson Date: 1-21-19

DISTRIBUTION

Republic Services	☑	Contractor	☑
Project Manager (Gregg Denson)	☑	Other_____	☐

ARCHITERRA DESIGN GROUP
10221-A TRADEMARK STREET, RANCHO CUCAMONGA, CA 91730
Phone (909) 484-2800, Fax (909) 484-2802

RANDOM 50M² QUADRAT SAMPLING SELECTIONS

PHOTO STATIONS

QUADRAT "A"

QUADRAT "B"

QUADRAT "C"

QUADRAT "D"

QUADRAT "E"

QUADRAT "F"

QUADRAT "G"

QUADRAT "H"

QUADRAT "I"

Photo Station #1 - January 2018 (East)

Photo Station #1 - December 2018 (East)

Photo Station #1 - January 2018 (North)

Photo Station #1 - December 2018 (North)

Photo Station #1 - January 2018 (West)

Photo Station #1 - December 2018 (West)

Photo Station #2 - January 2018 (East)

Photo Station #2 - December 2018 (East)

Photo Station #2 - January 2018 (North)

Photo Station #2 - December 2018 (North)

Photo Station #2 - January 2018 (South)

Photo Station #2 - December 2018 (South)

Photo Station #3 - January 2018 (East)

Photo Station #3 - December 2018 (East)

Photo Station #3 - January 2018 (North)

Photo Station #3 - December 2018 (North)

Photo Station #3 - January 2018 (West)

Photo Station #3 - December 2018 (West)

Photo Station #4 - January 2018 (South)

Photo Station #4 - December 2018 (South)

Photo Station #4 - January 2018 (East)

Photo Station #4 - December 2018 (East)

Photo Station #4 - January 2018 (West)

Photo Station #4 - December 2018 (West)

Photo Station #5 - January 2018 (East)

Photo Station #5 - December 2018 (East)

Photo Station #5 - January 2018 (North)

Photo Station #5 - December 2018 (North)

Photo Station #5 - January 2018 (West)

Photo Station #5 - December 2018 (West)

Photo Station #6 - January 2018 (East)

Photo Station #6 - December 2018 (East)

Photo Station #6 - January 2018 (South)

Photo Station #6 - December 2018 (South)

Photo Station #6 - January 2018 (West)

Photo Station #6 - December 2018 (West)

Photo Station #7 - January 2018 (South)

Photo Station #7 - December 2018 (South)

Photo Station #7 - January 2018 (West)

Photo Station #7 - December 2018 (West)

Photo Station #7 - January 2018 (North)

Photo Station #7 - December 2018 (North)

Photo Station #8 - January 2018 (East)

Photo Station #8 - December 2018 (East)

Photo Station #8 - January 2018 (North)

Photo Station #8 - December 2018 (North)

Photo Station #8 - January 2018 (West)

Photo Station #8 - December 2018 (West)

Photo Station #9 - January 2018 (East)

Photo Station #9 - December 2018 (East)

Photo Station #9 - January 2018 (South)

Photo Station #9 - December 2018 (South)

Photo Station #9 - January 2018 (West)

Photo Station #9 - December 2018 (West)

ATTACHMENT 4

memorandum

date December 17, 2018

to Tuong-phu Ngo, Environmental Manager, Republic Services

from Greg Ainsworth, Consulting Biologist

subject Coastal Sage Scrub City South C Trial Plot Monitoring Report, Sunshine Canyon Landfill – 4th Quarter, 2018

INTRODUCTION

On December 7, 2018, biologist Greg Ainsworth monitored the coastal sage scrub revegetation area at the Landfill's City South 'C' Trial Plot, which constitutes the 4th quarter monitoring of the trial plot for 2018. The sample methodology generally followed the *Methodology for Monitoring Percent Cover and Species Richness within Each Seeded Application Method on the Coastal Sage Scrub Pilot Project at the Sunshine Canyon Landfill* (JMA, April 23, 2014). Quadrat sampling of the sage pilot study area consists of four, 50-meter quadrats that are randomly sampled within each of the following three seeded areas: hydroseed, imprint and hand broadcast. The quadrats were randomly selected prior to the first initial monitoring event from a grid that was placed over the entire trial plot, and each quadrat is delineated in the field with wooden stakes. As shown on the attached planting plan, each quadrat that was sampled was given a corresponding letter from A-L.

A total of 200 meters were sampled for each of the three seeded areas and the following data was collected in each quadrat that was sampled:

- **Percent basil cover (shrubs)** –Visual estimate of the amount of basil cover within each quadrat for all shrub species.
- **Percent basil cover (herbs)** – Visual estimate of the amount of basil cover within each quadrat for all herb species.
- **Percent bare ground** – Visual estimate of the amount of available bare ground with no vegetation, but suitable for plant growth.
- **Percent rock or other** – Visual estimate of the amount of unavailable ground for supporting plant growth. Inhibitors generally included rocks and boulders, irrigation lines and valve boxes, and mulch.
- **Percent canopy** – Visual estimate of the percent canopy of each shrub and herbaceous species.
- **Photographs** – A photograph was taken from the southwest corner (facing northeast) of each quadrat.

To obtain estimate cover of each species, the point intercept method was used, which consisted of data collection points every 0.5 meter along the perimeter of each quadrat. Sampling began at the southwest corner of each quadrat and continued around the quadrat in a clockwise direction. The species located precisely at every 0.5-meter point was tallied, including areas of bare ground, rock and other.

RESULTS

Below are the average data collected for the hydroseed, imprint, and hand broadcast application areas. The number in parenthesis represents the previous quarterly monitoring results.

Quadrat Sampling:

Average Hydroseed – Quadrats A, B, C, D

Percent basil cover (shrubs) – 20% (17%)

Percent basil cover (herbs) – 16% (17%)

Percent bare ground – 45% (44%)

Percent rock or other – 3% (3%)

Percent canopy (shrub) – 44% (32%)

Percent canopy (herb) – 2% (6%)

Average Imprint – Quadrats E, F, G H

Percent basil cover (shrubs) – 20% (24%)

Percent basil cover (herbs) – 14% (11%)

Percent bare ground – 41% (43%)

Percent rock or other – 4% (8%)

Percent canopy (shrub) – 44% (32%)

Percent canopy (herb) – 11% (17%)

Average Hand Broadcast – Quadrats I, J, K L (average)

Percent basil cover (shrubs) – 28% (26%)

Percent basil cover (herbs) –24% (23%)

Percent bare ground – 15% (18%)

Percent rock or other – 3% (3%)

Percent canopy (shrub) – 67% (39%)

Percent canopy (herb) – 16% (18%)

Point Intercept:

The representation of each species within a quadrat was estimated by broad cover classes (<1%, 1-5%, 5-25%, 25-50%, 50-75% and >75%). The percent cover of each species based on the point intercept method is as follows:

Hydroseed– Quadrats A, B, C, D (average)

Species	% Cover Shrub	% Cover Herb
Acmispon glaber		
Adenostema fasciculatum		
Achillia mellifoluim		
Artemisia californica	1%	
Atriplex lentiformis	15%	
Atriplex polycarpa	21%	
Atriplex spinosa	1%	
Baccharis pilularis		
Encelia californica	7%	
Eschscholzia californica		
Leymus triticoides		
Mimulus aurantiacus longiflorus		
Nasella pulchra		
Other herb		<1%
Salvia mellifera		
Sisyrinchium bellum		
Vulpia microstachys		
Echinochloa crus-galli		
Salsola kali		<1%
Hordeum vulgare		
Bromus sp.		<1%
Hirshfeldia incana		2%

Imprint – Quadrats E, F, G H (average)

Species	% Cover Shrub	% Cover Herb
Adenostema fasciculatum		
Achillia mellifoluim		
Artemisia californica	3%	
Atriplex lentiformis	13%	
Atriplex polycarpa	26%	
Atriplex spinosa	1%	
Baccharis pilularis		
Encelia californica	2%	
Eschscholzia californica		
Eriogonum fasciculatum		
Leymus triticoides		
Mimulus aurantiacus longiflorus		
Nasella pulchra		
Sisyrinchium bellum		
Salvia apiana		

Salvia leucophylla	1%	
Salvia mellifera		
Echinochloa crus-galli		
Salsola kali		1%
Bromus sp.		7%
Hirshfeldia incana		0%
Centaurea melitensis		
Leymus triticoides		
Other herb		1%

Hand Broadcast – Quadrats I, J, K L (average)

Species	**% Cover Shrub**	**% Cover Herb**
Adenostema fasciculatum	1%	
Achillia mellifoluim		
Artemisia californica	1%	
Atriplex lentiformis	29%	
Atriplex polycarpa	13%	
Atriplex spinosa	1%	
Baccharis pilularis	1%	
Encelia californica	16%	
Eriogonum fasciculatum		
Eschscholzia californica		
Leymus triticoides		9%
Mimulus aurantiacus longiflorus		
Nasella pulchra		
Other herb		
Salvia apiana		
Salvia leucophylla	1%	
Salvia mellifera	1%	
Sisyrinchium bellum		
Hirshfeldia incana		
Vulpia microstachys		
Salsola kali		1%
Bromus sp.		15%

DISCUSSION

There was not a substantial change in the density or richness of species within the pilot study area compared to the 3rd quarter monitoring period of 2018. A large amount of annual non-native herbs and grasses are beginning to sprout. If seasonal rainfall is near average, it should be expected that there will be a high germination rate of non-native species throughout the pilot study site. As depicted in several of the photos (attached), *Atriplex lentiformis* is the most dominant plant throughout the pilot study area and is of highest concentration, with A. polycarpa as a co-dominant. Numerous seedlings of *Encelia californa* was observed throughout the pilot study area, most notably within the imprint and hand broadcast test plots.

Quadrats H, I and L have the greatest amount of relative cover, mostly comprised of *A. lentiformis and A. polycarpa*, because these quadrats are at a lower elevation from the other quadrats where water tends to

accumulate after rain events. The hand broadcast seeding method has the highest percentage of shrub canopy cover (i.e., *A. lentiformis*) compared to hydroseed and imprint seeding methods. That said, the northwest portion of the hand broadcast area (quadrats I and J) is at a low-point compared to the rest of the pilot study area, and as indicated above, water tends to pool in this area and therefore it has the greatest density of vegetation compared to other portions of the pilot study area. As noted in past monitoring reports, both the quadrat method and the point intercept method confirm that *A. lentiformis* has the highest relative cover of all plant species in the pilot study site, with *A. polycarpa* as a co-dominant. The qualitative monitoring results also confirm that these species are of highest abundance. Selective thinning of *Atriplex* in select areas will create openings and opportunities for natural recruitment and establishment of other native shrub species. Photographs of each quadrat are provided on the following pages, as well as the raw data obtained within each quadrat sampled.

Photograph Log

Quadrat A. Facing northeast from southwest corner.

Quadrat B. Facing northeast from southwest corner.

Quadrat C. Facing northeast from southwest corner.

Quadrat D. Facing northeast from southwest corner.

Quadrat E. Facing northeast from southwest corner.

Quadrat F. Facing northeast from southwest corner.

Quadrat G. Facing northeast from southwest corner.

Quadrat H. Facing northeast from southwest corner.

Quadrat I. Facing northeast from southwest corner.

Quadrat J. Facing northeast from southwest corner.

Quadrat K. Facing northeast from southwest corner.

Quadrat L. Facing northeast from southwest corner.

Quadrat Method: Raw Data

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
A	Encelia california		15%	40%	48%	2%	5%	40%
	Atriplex lentiformis						35%	
	Atriplex polycarpa						20%	
	Bromus sp							40%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
B	Encelia california		25%	20%	35%	2%	3%	
	Atriplex lentiformis						15%	
	Atriplex polycarpa						12%	
	Russian thistle							5%
	Bromus sp.							
	Mustard							
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
C	Atriplex lentiformis		12%	0%	60%	4%	3%	
	Atriplex polycarpa						20%	
	Atriplex spinosa						1%	
	Black sage						5%	
	Bromus sp.							
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
D	Encelia california		35%	2%	35%	4%	15%	
	Atriplex lentiformis						25%	
	Atriplex polycarpa						25%	
	Artemisia california						2%	
	Black sage						7%	
	Bromus sp.							3%
	Mustard							
	Russian thistle							
	Deerweed							
AVERAGE			**22%**	**16%**	**45%**	**3%**	**45%**	**2%**
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/unusable	% canopy (shrub)	% canopy (herb.)

E	Atriplex lentiformis		20%	18%	35%	4%	15%	
	Atriplex polycarpa						25%	
	Encelia california						3%	
	Atriplex spinosa						3%	
	Mustard							0%
	bromus sp.							18%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
F	Atriplex lentiformis		20%	23%	35%	5%	15%	
	Atriplex polycarpa						20%	
	Atiplex spinosa						8%	
	Russian thistle							
	Purple nightshade							
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
G	Atriplex lentiformis		25%	10%	30%	3%	15%	
	Atriplex polycarpa						35%	
	Encelia california						8%	
	Bromus sp.							10%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
H	Atriplex lentiformis		10%	3%	65%	5%	5%	
	Atriplex polycarpa						30%	
	Encelia california						0%	
	Black sage						5%	
	Mustard							3%
AVERAGE			**19%**	**14%**	**41%**	**4%**	**44%**	**11%**
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
I	Atriplex lentiformis		45%	18%	8%	3%	35%	
	Atriplex polycarpa						25%	
	Encelia california						10%	
	Purple sage						5%	
	Black sage						3%	
	Artemisia california						1%	
	Bromus sp.							18%
	Mustard							

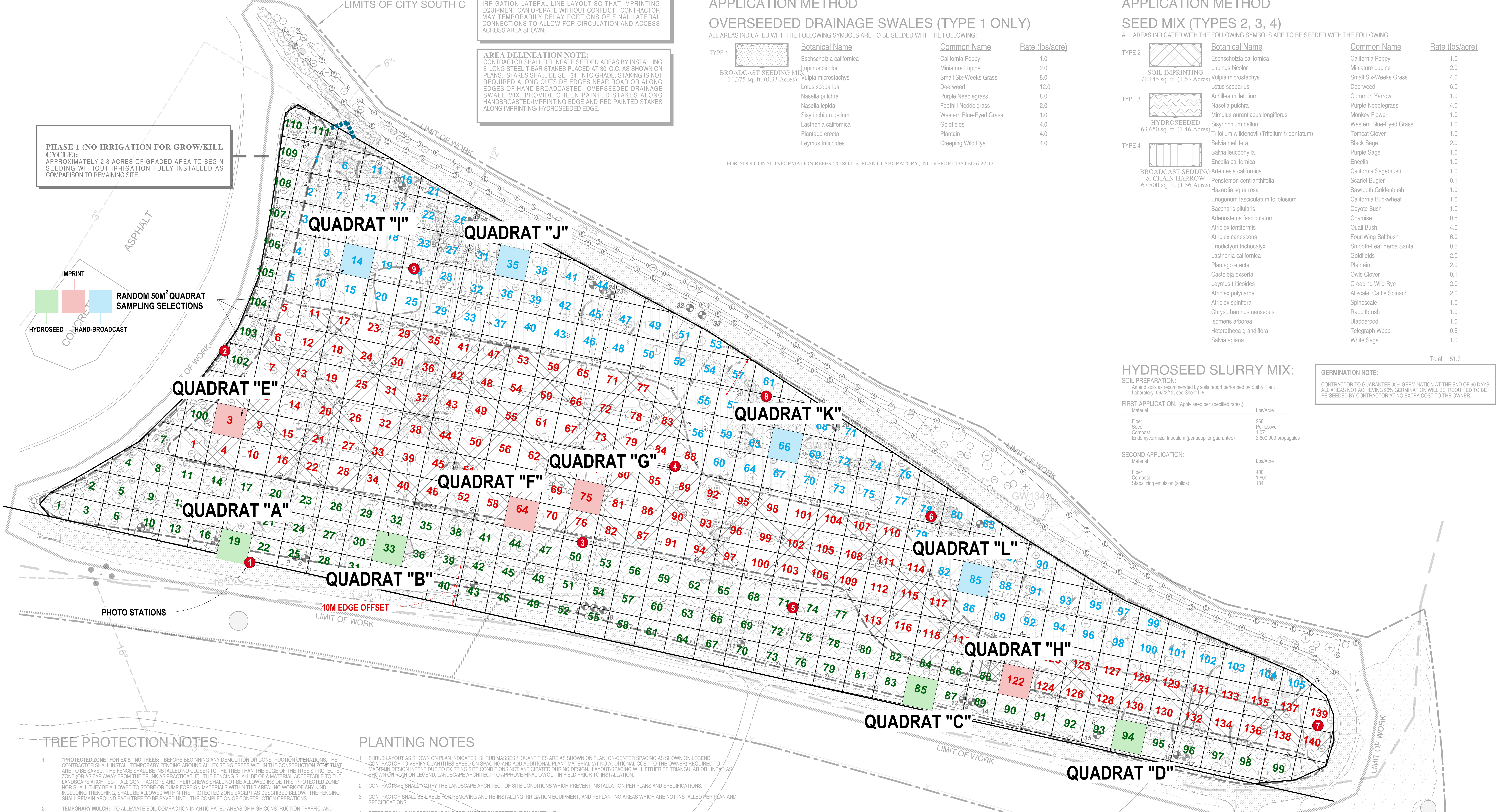
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
J	Atriplex lentiformis		30%	40%	5%	3%	30%	
	Atriplex polycarpa						5%	
	Atriplex spinosa						2%	
	Encelia california						20%	
	bromus sp.							40%
	Mustard							0%
	Russian thistle							0%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
K	Atriplex polycarpa		10%	35%	25%	3%	5%	
	Artemisia california						5%	
	Atriplex lentiformis						20%	
	Coyote bush						2%	
	Leymus triticoides							35%
	Mustard							
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
L	Atriplex polycarpa		25%	1%	20%	3%	15%	
	Atriplex lentiformis						30%	
	Artemisia california						10%	
	Encelia california						15%	
	Coyote bush						2%	
	Mustard							0%
	bromus sp.							0%
	Leymus triticoides							2%
AVERAGE			**28%**	**24%**	**15%**	**3%**	**72%**	**16%**

City South ‘C’ Trial Plot Planting Plan and Quadrat Layout

TYPE 2 SEED MIX NOTE:
CONTRACTOR TO COORDINATE TIMING OF SOIL IMPRINT WITH IRRIGATION LATERAL LINE LAYOUT SO THAT IMPRINTING EQUIPMENT CAN OPERATE WITHOUT CONFLICT. CONTRACTOR MAY TEMPORARILY DELAY PORTIONS OF FINAL LATERAL CONNECTIONS TO ALLOW FOR CIRCULATION AND ACCESS ACROSS AREA SHOWN.

AREA DELINEATION NOTE:
CONTRACTOR SHALL DELINEATE SEEDED AREAS BY INSTALLING 6' LONG STEEL T-BAR STAKES PLACED AT 30' O.C. AS SHOWN ON PLANS. STAKES SHALL BE SET 24" INTO GRADE. STAKING IS NOT REQUIRED ALONG OUTSIDE EDGES NEAR ROAD OR ALONG EDGES OF HAND BROADCASTED OVERSEEDED DRAINAGE SWALE MIX. PROVIDE GREEN PAINTED STAKES ALONG HANDBROASTED/IMPRINTING EDGE AND RED PAINTED STAKES ALONG IMPRINTING/ HYDROSEEDED EDGE.

PHASE 1 (NO IRRIGATION FOR GROW/KILL CYCLE):
APPROXIMATELY 2.8 ACRES OF GRADED AREA TO BEGIN SEEDING WITHOUT IRRIGATION FULLY INSTALLED AS COMPARISON TO REMAINING SITE.



APPLICATION METHOD
OVERSEEDED DRAINAGE SWALES (TYPE 1 ONLY)

ALL AREAS INDICATED WITH THE FOLLOWING SYMBOLS ARE TO BE SEEDED WITH THE FOLLOWING:

TYPE 1 — BROADCAST SEEDING MIX 14,375 sq. ft. (0.33 Acres)

Botanical Name	Common Name	Rate (lbs/acre)
Eschscholzia californica	California Poppy	1.0
Lupinus bicolor	Miniature Lupine	2.0
Vulpia microstachys	Small Six-Weeks Grass	8.0
Lotus scoparius	Deerweed	12.0
Nasella pulchra	Purple Needlegrass	8.0
Nasella lepida	Foothill Neddelgrass	2.0
Sisyrinchium bellum	Western Blue-Eyed Grass	1.0
Lasthenia californica	Goldfields	4.0
Plantago erecta	Plantain	4.0
Leymus triticoides	Creeping Wild Rye	4.0

FOR ADDITIONAL INFORMATION REFER TO SOIL & PLANT LABORATORY, INC. REPORT DATED 6-22-12

APPLICATION METHOD
SEED MIX (TYPES 2, 3, 4)

ALL AREAS INDICATED WITH THE FOLLOWING SYMBOLS ARE TO BE SEEDED WITH THE FOLLOWING:

TYPE 2 — SOIL IMPRINTING 71,145 sq. ft. (1.63 Acres)
TYPE 3 — HYDROSEEDED 63,650 sq. ft. (1.46 Acres)
TYPE 4 — BROADCAST SEDDING & CHAIN HARROW 67,800 sq. ft. (1.56 Acres)

Botanical Name	Common Name	Rate (lbs/acre)
Eschscholzia californica	California Poppy	1.0
Lupinus bicolor	Miniature Lupine	2.0
Vulpia microstachys	Small Six-Weeks Grass	4.0
Lotus scoparius	Deerweed	6.0
Achillea millefolium	Common Yarrow	1.0
Nasella pulchra	Purple Needlegrass	4.0
Mimulus aurantiacus longiflorus	Monkey Flower	1.0
Sisyrinchium bellum	Western Blue-Eyed Grass	1.0
Trifolium willdenovii (Trifolium tridentatum)	Tomcat Clover	1.0
Salvia mellifera	Black Sage	2.0
Salvia leucophylla	Purple Sage	1.0
Encelia californica	Encelia	1.0
Artemesia californica	California Sagebrush	1.0
Penstemon centranthifolia	Scarlet Bugler	0.1
Hazardia squarrosa	Sawtooth Goldenbush	1.0
Eriogonum fasciculatum foliolosium	California Buckwheat	1.0
Baccharis pilularis	Coyote Bush	1.0
Adenostema fasciculatum	Chamise	0.5
Atriplex lentiformis	Quail Bush	4.0
Atriplex canescens	Four-Wing Saltbush	6.0
Eriodictyon trichocalyx	Smooth-Leaf Yerba Santa	0.5
Lasthenia californica	Goldfields	2.0
Plantago erecta	Plantain	2.0
Casteleja exserta	Owls Clover	0.1
Leymus triticoides	Creeping Wild Rye	2.0
Atriplex polycarpa	Allscale, Cattle Spinach	2.0
Atriplex spinifera	Spinescale	1.0
Chrysothamnus nauseous	Rabbitbrush	1.0
Isomeris arborea	Bladderpod	1.0
Heterotheca grandiflora	Telegraph Weed	0.5
Salvia apiana	White Sage	1.0
	Total:	51.7

HYDROSEED SLURRY MIX:

SOIL PREPARATION:
Amend soils as recommended by soils report performed by Soil & Plant Laboratory, 06/22/12, see Sheet L-8.

FIRST APPLICATION: (Apply seed per specified rates.)

Material	Lbs/Acre
Fiber	268
Seed	Per above
Compost	1,071
Endomycorrhizal Inoculum (per supplier guarantee)	3,600,000 propagules

SECOND APPLICATION:

Material	Lbs/Acre
Fiber	400
Compost	1,600
Stabalizing emulsion (solids)	134

GERMINATION NOTE:
CONTRACTOR TO GUARANTEE 90% GERMINATION AT THE END OF 90 DAYS. ALL AREAS NOT ACHIEVING 90% GERMINATION WILL BE REQUIRED TO BE RE-SEEDED BY CONTRACTOR AT NO EXTRA COST TO THE OWNER.

TREE PROTECTION NOTES

1. **"PROTECTED ZONE" FOR EXISTING TREES:** BEFORE BEGINNING ANY DEMOLITION OR CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL INSTALL TEMPORARY FENCING AROUND ALL EXISTING TREES WITHIN THE CONSTRUCTION ZONE THAT ARE TO BE SAVED. THE FENCE SHALL BE INSTALLED NO CLOSER TO THE TREE THAN THE EDGE OF THE TREE'S PROTECTED ZONE (OR AS FAR AWAY FROM THE TRUNK AS PRACTICABLE). THE FENCING SHALL BE OF A MATERIAL ACEEPTABLE TO THE LANDSCAPE ARCHITECT. ALL CONTRACTORS AND THEIR CREWS SHALL NOT BE ALLOWED INSIDE THIS "PROTECTED ZONE", NOR SHALL THEY BE ALLOWED TO STORE OR DUMP FOREIGN MATERIALS WITHIN THIS AREA. NO WORK OF ANY KIND, INCLUDING TRENCHING, SHALL BE ALLOWED WITHIN THE PROTECTED ZONE EXCEPT AS DESCRIBED BELOW. THE FENCING SHALL REMAIN AROUND EACH TREE TO BE SAVED UNTIL THE COMPLETION OF CONSTRUCTION OPERATIONS.
2. **TEMPORARY MULCH:** TO ALLEVIATE SOIL COMPACTION IN ANTICIPATED AREAS OF HIGH CONSTRUCTION TRAFFIC, AND ONLY WHERE FENCING CANNOT BE SET OUTSIDE OF THE DRIPLINE, THE CONTRACTOR SHALL INSTALL A LAYER OF MULCH, 9" THICK MINIMUM, OVER ALL EXPOSED EARTH FROM THE TREE TRUNK TO 5' OUTSIDE OF THE DRIPLINE. THIS LAYER SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. WHEN PLANTING OPERATIONS ARE COMPLETED, THE MULCH SHALL BE REDISTRIBUTED THROUGHOUT ALL PLANTING AREAS IN A 3" THICK "PERMANENT" MULCH LAYER.
3. **NECESSARY WORK:** WHEN IT BECOMES NECESSARY TO ENTER THE "PROTECTED ZONE", SUCH AS FOR FINE GRADING, IRRIGATION INSTALLATION, AND PLANTING OPERATIONS, THE CONTRACTOR SHALL STRICTLY ADHERE TO THE FOLLOWING RULES:
   A. EVERY EFFORT SHALL BE MADE TO PRESERVE THE EXISTING GRADE AROUND LARGE TREES IN AS WIDE AN AREA AS POSSIBLE.
   B. TRENCHING WITHIN THE DRIPLINE OF EXISTING TREES SHALL BE PERFORMED BY HAND, AND WITH EXTREME CARE NOT TO SEVER ROOTS 1-1/2" IN DIAMETER AND LARGER. WHERE ROOTS 1-1/2" IN DIAMETER AND LARGER ARE ENCOUNTERED, THE CONTRACTOR SHALL TUNNEL UNDER SAID ROOTS. EXPOSED ROOTS THAT HAVE BEEN TUNNELED UNDER SHALL BE WRAPPED IN WET BURLAP AND KEPT MOIST WHILE THE TRENCH IS OPEN.
   C. WHERE ROOTS 2" IN DIAMETER OR LARGE MUST BE CUT DUE TO EXTENSIVE GRADE CHANGES, THOSE ROOTS MUST BE EXPOSED BY HAND DIGGING AND CUT CLEANLY. RAGGED CUTS GENERALLY DO NOT HEAL PROPERLY, AND MAY LEAVE THE TREE OPEN TO PESTS AND PATHOGENS.
   D. WHERE TRENCHING NEAR TREES HAS ALREADY OCCURRED FROM PREVIOUS CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL MAKE EVERY EFFORT TO CONFINE HIS TRENCHING OPERATIONS TO THE PREVIOUSLY-CREATED TRENCHES, WHILE ADHERING TO THE CONDITIONS SET FORTH IN 3B.
4. **POTENTIAL CONFLICTS:** THE CONTRACTOR SHALL NOTIFY THE OWNER AND ARBORIST SHOULD ANY POTENTIAL CONFLICTS ARISE BETWEEN THESE SPECIFICATIONS AND/OR LARGE ROOTS ENCOUNTERED IN THE FIELD, AND CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL NOT TAKE ANY ACTION IN SUCH CONFLICTS WITHOUT THE ARBORIST'S WRITTEN APPROVAL. THE ARBORIST SHALL HAVE FINAL AUTHORITY OVER ALL METHODS NECESSARY TO HELP ENSURE THE PROTECTION AND SURVIVAL OF EXISTING TREES.
6. **LANDSCAPE AND IRRIGATION (NATIVE OAKS ONLY):** ANY FUTURE LANDSCAPE AND IRRIGATION SHOULD ADHERE TO THE FOLLOWING GUIDELINES:
   A. NO IRRIGATION OR PLANTING SHOULD OCCUR CLOSER THAN 8'-10' FROM THE TRUNK.
   B. WHERE IRRIGATION DOES OCCUR WITHIN THE PROTECTED ZONE, DRIP IRRIGATION SHOULD BE USED WHEREVER POSSIBLE. ADDITIONALLY, ONLY LOW-WATER USING PLANTS SHOULD BE PLANTED WITHIN THE PROTECTED ZONE, SPACED FAR APART CLOSE TO THE TREE. PLANTS MAY BE SPACED CLOSER TOGETHER NEAR THE EDGE OF THE PROTECTED ZONE.

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PLANTING NOTES

1. SHRUB LAYOUT AS SHOWN ON PLAN INDICATES "SHRUB MASSES." QUANTITIES ARE AS SHOWN ON PLAN, ON-CENTER SPACING AS SHOWN ON LEGEND. CONTRACTOR TO VERIFY QUANTITIES BASED ON SPACING AND ADD ADDITIONAL PLANT MATERIAL (AT NO ADDITIONAL COST TO THE OWNER) REQUIRED TO MAINTAIN DESIGN INTENT DUE TO EXISTING SITE CONDITIONS NOT ANTICIPATED DURING DESIGN. LAYOUT/SPACING WILL EITHER BE TRIANGULAR OR LINEAR AS SHOWN ON PLAN OR LEGEND. LANDSCAPE ARCHITECT TO APPROVE FINAL LAYOUT IN FIELD PRIOR TO INSTALLATION.
2. CONTRACTORS SHALL NOTIFY THE LANDSCAPE ARCHITECT OF SITE CONDITIONS WHICH PREVENT INSTALLATION PER PLANS AND SPECIFICATIONS.
3. CONTRACTOR SHALL BE LIABLE FOR REMOVING AND RE-INSTALLING IRRIGATION EQUIPMENT, AND REPLANTING AREAS WHICH ARE NOT INSTALLED PER PLAN AND SPECIFICATIONS.
4. REFER TO PLANTING SPECIFICATIONS FOR INSPECTION/CERTIFICATION SCHEDULE.
5. IRRIGATION SYSTEM SHALL BE INSTALLED AND OPERATIONAL PRIOR TO INSTALLATION OF PLANT MATERIALS.
6. TREES AND SHRUBS SHALL BE PLANTED AFTER GRAVEL PLACEMENT, BUT NOT BEFORE IRRIGATION COVERAGE TEST NO. 1 HAS BEEN APPROVED. (SEE SPECIFICATIONS).
7. LANDSCAPE CONTRACTOR SHALL TAKE FOUR (4) SOIL SAMPLES FROM THE SITE AT LOCATIONS APPROVED BY THE LANDSCAPE ARCHITECT. THE SAMPLES SHALL BE TAKEN AT A DEPTH OF 6" AFTER ROUGH GRADING AND SUBMITTED TO AN APPROVED SOIL AND PLANT LABORATORY FOR AGRICULTURAL SUITABILITY TESTING. THE COST OF TESTING SHALL BE INCLUDED IN THE CONTRACTOR'S BID.
8. THE RECOMMENDATIONS OF THE SOIL REPORT SHALL SUPERSEDE THE SOIL PREPARATION AND BACKFILL MIX SPECIFICATIONS (SEE SPECIFICATIONS). THE CONTRACTOR SHALL SUBMIT A COPY OF ALL SOILS REPORTS TO THE LANDSCAPE ARCHITECT PRIOR TO MODIFICATION OF THESE SPECIFICATIONS.
9. SHREDDED MULCH INSTALLATION: INSTALL SHREDDED MULCH WITHIN BASINS OF ALL TREE AND SHRUB CONTAINER PLANTS PERDETAILS AND SPECIFICATIONS UNLESS OTHERWISE INDICATED ON PLANS.
10. CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS AND/OR REPLACEMENT OF ANY DAMAGED LANDSCAPE AREAS BEYOND THE LIMIT OF WORK, INCLUDING REPAIRING ANY IRRIGATION LINES/SPRINKLER HEADS, THAT IS A DIRECT RESULT OF THE LANDSCAPE CONSTRUCTION AND/OR HIS SUB-CONTRACTOR. REPLACEMENT ITEMS SHALL BE EXACT DUPLICATION OF ORIGINAL WORK OR PLANTS, UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT.
11. CLEAN-UP SHALL TAKE PLACE ON A DAILY BASIS UNLESS OTHERWISE APPROVED BY THE OWNER'S REPRESENTATIVE.
12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ALL GRADES AND FLOW LINES AS SHOWN ON THE GRADING PLAN.
13. SOIL AMENDMENTS SHALL BE PLACED AND INCORPORATED INTO SOILS AS DESIGNATED IN THE SOILS TEST COMPLETED BY SOILS AND PLANT LABORATORY, INC. DATED JUNE 22, 2012 PRIOR TO INSTALLATION OF PLANTS AND SEEDING. ANY ADDITIONAL SOIL AMENDMENTS NEEDED AS A RESULT OF THE SOIL TESTING, AS REQUIRED BY CONTRACTOR, SHALL BE PLACED PRIOR TO SEEDING AND PLANTING OF CONTAINER PLANTS.
14. PLANT MATERIAL SHALL BE FROM LOCAL SOURCES, AND WHERE POSSIBLE, FROM WITHIN SUNSHINE CANYON REGION.
15. CONTAINER PLANTS SHALL BE OBTAINED FROM A LOCAL SUPPLIER OR COMMERCIAL NURSERY EXPERIENCED IN THE PROPAGATION OF NATIVE PLANT SPECIES. PRIOR TO DELIVERY, THE ROOT SYSTEMS OF THE PLANTS WILL BE INSPECTED BY THE RESTORATION SPECIALIST TO ENSURE THAT ROOTS ARE STRAIGHT AND WELL ESTABLISHED. ROOT-BOUND PLANTS (THOSE WITH COILED ROOTS) WILL NOT BE ACCEPTED.
16. CONTAINER PLANTS SHALL BE INSTALLED ONLY BETWEEN NOVEMBER 1 AND MARCH 1 AND WHEN NATURAL RAINFALL OR IRRIGATION HAS MOISTENED THE SOIL. IN ALL PLANTING AREAS THE SOIL SURFACE WILL CONTAIN RESIDUAL MOISTURE WITHIN THE ROOT ZONE OF THE CONTAINER PLANTS TO BE INSTALLED. IF THE SOIL DOES NOT CONTAIN SUFFICIENT MOISTURE, THEN PRIOR TO INSTALLATION THE PLANTING AREA WILL BE WATERED FOR THREE CONSECUTIVE DAYS TO ADEQUATELY SATURATE THE SOIL TO A MINIMUM DEPTH OF ONE AND ONE-HALF TIMES THE DEPTH OF THE CONTAINERS TO BE PLANTED. WHEN THE SOIL HAS DRAINED TO FIELD CAPACITY (FULL MOISTURE CONTENT AFTER DRAINAGE OF SOIL PORE SPACE), AND WHEN THE SOIL IS DRY ENOUGH TO SUPPORT FOOT TRAFFIC, THE PLANTS INDICATED FOR THE SITE WILL BE PLANTED USING THE FOLLOWING PROCEDURE:
   - WITH A STANDARD EXCAVATION DEVICE (SHOVEL, AUGER, ETC.) EXCAVATE A HOLE SOMEWHAT WIDER THAN THE CONTAINER AND ONE INCH LESS THAN THE DEPTH OF THE CONTAINER TO THE CROWN OF THE ROOT BALL.
   - EACH PLANTING HOLE WILL BE FILLED WITH WATER AND ALLOWED TO DRAIN UNTIL NO FREE MOISTURE REMAINS IN THE HOLE.
   - IMMEDIATELY AFTER DRAINING, THE PLANT WILL BE REMOVED CAREFULLY FROM ITS CONTAINER AND THE ROOT VOLUME LOOSENED SOMEWHAT WITH GENTLE PRESSURE ON THE SIDES OF THE ROOT MASS.
   - THE PLANT WILL IMMEDIATELY BE PLACED IN THE PLANTING HOLE SO THAT THE TOP OF THE CONTAINER SURFACE WILL BE SLIGHTLY HIGHER THAN THE SOIL SURFACE AFTER REFILLING.
   - BACKFILL THE HOLE WITH NATIVE SOIL, MINIMIZING LARGE ORGANIC AND ROCK MATTER THAT MAY INHIBIT ROOT GROWTH.
   - FIRMLY PRESS DOWN SOIL AROUND THE ROOT-BALL TO ELIMINATE AIR SPACE WITHIN THE SOIL AND TO ENSURE GOOD ROOT TO SOIL CONTACT.
   - MAKE SURE THAT THE CROWN OF THE ROOT MASS IS AT OR SLIGHTLY ABOVE GRADE.
   - CREATE A STRUCTURAL BASIN AT THE OUTSIDE EDGE OF THE ROOT BALL TO SEQUESTER RAINWATER IN A LOCATION WHERE IT WILL INFILTRATE THE ROOT BALL.
   - DO NOT CREATE A DEPRESSION THAT WILL CAUSE WATER TO POND IN DIRECT CONTACT WITH THE STEM OF THE PLANT.

HYDROSEEDED AREA AND SOIL IMPRINT AREA DELINEATION, RED MARKER POSTS SHALL BE PLACED AT 30' O.C. SEE AREA DELINEATION NOTE ABOVE.

PLANTING LEGEND:

SYMBOL CALLOUT	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	QTY
SHRUBS					
S-1	Artemisia californica	California Sagebrush	1 gal.	50/Acre	234
S-2	Baccharis pilularis	Coyote Bush	1 gal.	45/Acre	210
S-3	Mimulus auranticus longiflorus	Monkey Flower	1 gal.	30/Acre	140
S-4	Sambucus mexicana	Blue Elderberry	5 gal.	15/Acre	70
EX-1	Existing Vegetation to remain				

PHOTO SUBMITTAL NOTE:
ALL PLANT MATERIAL, INCLUDING TREES, SHRUBS, AND VINES, SHALL BE INSPECTED AND APPROVED BY THE RESTORATION SPECIALIST AND/OR LANDSCAPE ARCHITECT, VIA PHOTO SUBMITTALS, PRIOR TO DELIVERY TO SITE. PHOTO SUBMITTALS SHALL INCLUDE NURSERY SUPPLIER AND DATE OF PHOTOS. ANY MATERIAL DELIVERED TO SITE WITHOUT APPROVAL IS SUBJECT TO REJECTION. PHOTO SUBMITTALS SHALL BE SENT TO RESTORATION SPECIALIST AND/OR LANDSCAPE ARCHITECT A MINIMUM OF 48 HOURS PRIOR TO SHIPMENT OF MATERIAL. SUBMITTALS SHOULD INCLUDE SOME TYPE OF SCALE REFERENCE IN PHOTO (I.E. PERSON, MEASURING TAPE, ETC.). TREES SHALL BE NOTED WITH HEIGHT (FROM FINISH GRADE IN CONTAINER) AND CANOPY HEAD SIZE. LANDSCAPE ARCHITECT SHALL BE NOTIFIED OF SCHEDULED NURSERY DELIVERY TIMES A MINIMUM OF 24 HOURS PRIOR TO SHIPMENT. REFER TO PLANTING SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS REGARDING QUALITY OF NURSERY STOCK.

SPOTTING OF THE PLANTS:
ALL PLANTS SHALL BE SPOTTED IN GROUPS THROUGHOUT THE SEEDED SITE FOR A NATURAL APPEARANCE AS SHOWN. UNDER THE DIRECTION OF THE RESTORATION SPECIALIST AND/OR THE LANDSCAPE ARCHITECT, MODIFICATIONS MAY BE MADE TO EACH AREA TO ENSURE STRUCTURAL DIVERSITY BASED ON THE SPECIES AND PLANT SIZES. THE SPACING DISTANCES GIVEN IN THE PLANTING PALETTE CAN BE USED AS GUIDELINES FOR AVERAGE DISTANCES, BUT THE LANDSCAPE CONTRACTOR SHALL AVOID REGULAR PATTERNS TO ENSURE A NATURAL APPEARANCE.

P-220B (100' S)
LIMITS OF CITY SOUTH C

PLAN CROSS REFERENCES

FOR NOTES AND LEGENDS, SEE THIS SHEET
FOR DETAILS, SEE SHEET L-8
FOR CORRESPONDING GRADING PLAN SEE SHEET L-2
FOR CORRESPONDING IRRIGATION PLAN SEE SHEET L-5

NORTH

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LANDSCAPE ARCHITECTURE
SITE PLANNING
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TX. Lic. # 1884

L.A. SEAL

LICENSED LANDSCAPE ARCHITECT
Richard W. Krumwiede 2834
Signature
7-31-14
Renewal Date
9-28-12
Date
STATE OF CALIFORNIA

PROJECT / CLIENT

CITY SOUTH C TRIAL PLOT
SUNSHINE CANYON LANDFILL
14747 SAN FERNANDO ROAD
SYLMAR, CA 91342

SHEET TITLE

PLANTING PLAN

REVISIONS

DRAWN BY	GPD/JGG
CHECKED BY	JRC
DATE	9/28/12
SCALE	1" = 30'
JOB NUMBER	1214
SHEET NUMBER	L-7

ATTACHMENT 5

SUNSHINE CANYON LANDFILL

Oak Tree and Bigcone Douglas-Fir Monitoring Report No. 26

Prepared for:

Sunshine Canyon Landfill
Republic Services, Inc.
14747 San Fernando Road
Sylmar, CA 91342

Prepared by:

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Mission Viejo, CA 92692
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Contact Person:
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January 2, 2019

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Coast live oaks deducted from mitigation bank for 2018 removals (2:1 ratio)	48
Current balance of coast live oaks in the mitigation bank	**48**

Canyon oak

Previous number of canyon oaks required for mitigation	26
Canyon oaks removed in 2018 (CC-4 Project)	7
Canyon oaks required for mitigation for 2018 removals (2:1 ratio)	14
Number of canyon oaks needed for mitigation	**40**

Big Cone Douglas Fir Trees

Previous number of big cone Douglas firs required for mitigation	84
Big cone Douglas fir trees removed in 2018 (CC-4 Project)	7
Big cone Douglas fir trees required for mitigation for 2018 removals (5:1 ratio)	35
Number of big cone Douglas firs needed for mitigation	**119**

2.0 Background

This monitoring report has been prepared to meet the requirements of Conditional Use Permit (CUP) and Oak Tree Permit (OTP) #86312-(5), dated February 19, 1991 for the Sunshine Canyon Landfill Extension Project. This is the 26th annual monitoring report that has been prepared in accordance with the OTP.

Oak Trees

As of 2007, all oak trees planted on the "city-side" of the Sunshine Canyon Landfill (landfill) for city-side mitigation had met their minimum size requirement. Therefore, the monitoring period for city-side coast live oak mitigation is completed.

Coast live oaks

A surplus of coast live oak (*Quercus agrifolia*) trees was previously planted in the landfill's mitigation areas, which now serves as a mitigation bank for the landfill to draw from for future removals of coast live oak trees located on the "county-side" of the landfill.

- 2018 - 24 coast live oaks were removed for the CC-4 project.

The mitigation ratio for coast live oaks is 2:1 (10:1 for heritage-size trees). Prior to 2018, there were 96 coast live oak trees remaining in the landfill's mitigation bank. 24 coast live oak tree were removed in 2018; therefore, there are 48 coast live oaks remaining in the mitigation bank.

Canyon live oaks

- 2011 - 7 canyon live oaks, and one (1) heritage-size canyon live oak, were removed for the construction of a detention basin.
- 2016 – 1 canyon live oak removed for the SCE Power Pole project.
- 2018 – 7 canyon live oaks were removed for the CC4 Buttress project.

The mitigation ratio for canyon live oaks is 2:1, and 10:1 for heritage-size trees; therefore, a total of 40 canyon oaks are needed to meet the landfill's mitigation requirement.

Big Cone Douglas Fir Trees

- Prior to 2010 - 40 big cone Douglas fir trees were removed from the county-side of the landfill.
- 2011 - 11 big cone Douglas fir trees were removed from the landfill for the construction of a detention basin.
- 2015 - one (1) big cone fir was removed during the construction of the Flare 8 Project
- 2018 – 7 big cone Douglas fir trees removed for the CC4 Buttress project.

According to the CUP and OTP, the required mitigation ratio for big cone Douglas fir removals is 5:1. Each big cone Douglas fir mitigation tree must be a minimum of 0.5-inches in diameter and monitored for a 7-year period for mitigation to be deemed complete. 200 big cone Douglas fir mitigation trees were planted at the landfill's Mitigation Area 7B for the removals that occurred prior to 2010. Based on previous monitoring conducted prior to 2010, it was determined that 176 big cone Douglas firs had completed the 7-year monitoring period and 24 big cone trees are still required to complete the 7-year monitoring period for the initial 40 that were removed prior to 2010 (See Table 2). As indicated above,

19 big cone Douglas firs were removed in 2011, 2015 and 2018, respectively, requiring an additional 95 big cone Douglas firs needed for mitigation. Therefore, the total of big cone Douglas fir trees required for mitigation is currently 119.

Approximately 250 big cone fir saplings were planted in Mitigation Area 7B in 2015, all of which currently have a trunk diameter less than 0.5 inches. Based on the 2018 annual survey, several of these plantings have died due to a lack of adequate irrigation. Table 1 below summarizes the big cone Douglas fir treed that are required for mitigation as a result of removals that have occurred since prior to 2010.

Table. 1 Big Cone Douglas Fir Removals and Mitigation Requirement

Removals	No. of Big Cone Trees Removed	Mitigation Ratio	Total Mitigation Trees
Prior to 2010	40	5:1	200
Detention Basin Project (2011)	11	5:1	55
Flare 8 Project (2015)	1	5:1	5
CC-4 Buttress Project (2018)	7	5:1	35
		Subtotal	**295**
Number of big cone Douglas fir trees that have completed 7-year monitoring period			176
		Total needed for mitigation	**119**

3.0 Methods

Data for this monitoring report (No. 26) was collected by Certified Arborist Greg Ainsworth on December 14, 2018. Tree locations and survey data were collected from the base of each tree. A health assessment was performed that included an evaluation of vigor based on such parameters as amount of new growth, leaf color, abnormal bark, dead wood, evidence of wilt, excessive necrosis or leaf necrosis, thinning of crown, and severe fire damage. The tree's overall health was determined based on these factors and in comparison of the typical archetype tree of this species.

A subjective alphabetical ranking ("A" being best and "F" being worst) was assigned for the overall health of each tree. Below are the definitions used to define each health rating.

- A = Excellent: Healthy, vigorous tree, free of signs of stress, disease, or pest infestation. Minimal signs or symptoms of biotic or abiotic related damage.

- B = Good: Less than 25% of the tree affected by signs of stress, disease/pest infestation, herbivory, or fire damage. Some maintenance measures may need to be implemented, such as pruning of dead wood due to biotic or abiotic related damage.

- C = Fair: Overall appearance healthy, 25-50% of tree shows evidence of stress, disease/pest infestation, herbivory, or fire damage. A substantial amount of maintenance may be needed or tree exhibits sign or symptoms of biotic or abiotic related damage.

- D = Poor: Greater than 50% of tree shows signs of stress, disease/pest infestation, appears to be in state of rapid decline, or exhibits sign or symptoms of severe biotic or abiotic related damage. Degree of decline may vary. A substantial amount of maintenance may be needed.

- F = Dead; exhibits no sign of recovery.

4.0 Results

Coast Live Oak Trees

A total of 24 coast live oak trees were removed for the CC-4 Buttress Project. At a 2:1 mitigation ratio, a total of 48 coast live oaks have been deducted from the landfill's oak mitigation bank, leaving 48 remaining in the bank.

Canyon Oak Trees

In 2011, 7 canyon live oaks, and one Heritage-size canyon live oak tree were removed for the construction of a detention basin; in 2016, one(1) canyon live oak was removed for the SCE Power Pole project; and, in 2018, 7 canyon live oaks were removed for the CC4 Buttress project. The mitigation ratio for canyon live oaks is 2:1, and 10:1 for Heritage-size trees; therefore, a total of 24 canyon oaks are needed for mitigation.

Bigcone Douglas Fir Trees

As indicated in Table 1, a total of 119 big cone Douglas fir trees are needed for mitigation. Based on the monitoring conducted on December 14, 2018, there are 43 big cone Douglas fir trees over 0.5 inches in (trunk) diameter that are alive. 27 big cones are in excellent [A] condition (compared to 32 in 2017), 12 are in good [B] condition (compared to 9 in 2017), 4 are in fair [C] condition (compared to 4 in 2017), none are in poor [D] condition (compared to none in 2016), and 4 big cone Douglas firs have died since the last monitoring period.

Data collected for the big cone Douglas fir trees are provided below in **Table 2**.

Table 2. Bigcone Douglas Fir Monitoring Data
March 28, 2017

	Previous Monitoring Data (2/6/2018)			Current Monitoring Data (12/14/2018)			
Tree No.	Dia (inches)	Height (feet)	Grade	Dia (inches)	Height (feet)	Grade	Start Date of 7-Year Monitoring
1400			Dead			Dead	--
1401	1.5	4.0	A	2.5	5.4	A	5/23/13
1402	2.0	5.0	A	3.0	6.1	A	5/23/2013
1403	2.2	5.7	A	3.0	6.5	A	5/23/2013
1404	2.5	6.4	A	3.0	6.4	A	5/23/2013
1405	2.5	5.8	A	3.4	6.5	A	5/23/2013
1406	3.2	6.0	A	4.5	7.0	A	5/23/2013
1407	3.6	7.0	A	4.5	7.0	A	5/23/2013
1408	--	--	Dead	--	--	Dead	--
1409	--	--	Dead	--	--	Dead	--
1410	--	--	Dead	--	--	Dead	--
1411	--	--	Dead	--	--	Dead	--
1412	2.3	7.0	B	3.0	7.0	B	5/23/2013
1413	2.0	5.4	A	2.8	5.6	A	12/11/2014
1414	1.7	5.2	B	2.0	5.0	B	5/23/2013
1415	--	--	Dead	--	--	Dead	--
1416	1.5	5.4	B	2.0	5.2	B	5/23/2013
1417	2.1	5.10	A	2.2	6.0	A	5/23/2013
1418	2.4	6.0	A	2.9	6.0	A	5/23/2013
1419	2.6	6.5	A	3.1	6.11	A	5/23/2013
1420	2.8	6.9	A	4.0	7.2	A	5/23/2013
1421			Dead			Dead	--
1422	2.0	5.10	A	2.5	6.1	A	5/23/2013
1423	--	--	Dead	--	--	Dead	--

	Previous Monitoring Data (2/6/2018)			Current Monitoring Data (12/14/2018)			
Tree No.	Dia (inches)	Height (feet)	Grade	Dia (inches)	Height (feet)	Grade	Start Date of 7-Year Monitoring
1424	2.5	6.7	A	3.1	6.7	A	5/23/2013
1425	--	--	Dead	--	--	Dead	--
1426	--	--	Dead	--	--	Dead	--
1427	3.0	6.8	B	3.0	6.10	B	5/23/2013
1428	--	--	Dead	--	--	Dead	--
1429	2.4	6.8	A	2.8	7.0	A	5/23/2013
1430	1.2	3.0	A	3.0	1.2	A	12/30/2015
1431	4.9	10.0	A	5.0	10.0	A	5/23/2013
1432	3.0	7.0	A	3.0	7.5	A	5/23/2013
1433	--	--	Dead	--	--	Dead	--
1434	2.9	5.11	A	2.6	5.11	A	5/23/2013
1435	--	--	Dead	--	--	Dead	--
1436	1.1	4.0	A	1.1	4.0	A	12/30/2015
1437	--	--	Dead	--	--	Dead	--
1438	--	--	Dead	--	--	Dead	--
1439	2.3	6.4	A	2.6	6.4	A	5/23/2013
1440	1.10	5.9	A	--	--	Dead	--
1441	2.0	5.10	B	2.5	5.11	B	5/23/2013
1442	2.2	6.8	B	2.6	6.8	B	5/23/2013
1443	--	--	Dead	--	--	Dead	--
1444	3.0	7.1	A	4.0	6.8	A	5/23/2013
1445	3.0	7.7	A	3.5	7.10	A	5/23/2013
1446	2.4	6.5	C	--	--	Dead	--
1447	5.9	11.0	A	6.0	12.0	A	5/23/2013
1448	--	--	Dead	--	--	Dead	--
1449	--	--	Dead	--	--	Dead	--
1450	--	--	Dead	--	--	Dead	--

	Previous Monitoring Data (2/6/2018)			Current Monitoring Data (12/14/2018)			
Tree No.	Dia (inches)	Height (feet)	Grade	Dia (inches)	Height (feet)	Grade	Start Date of 7-Year Monitoring
1451	3.6	6.6	A	3.6	6.9	A	5/23/2013
1452	--	--	Dead	--	--	Dead	--
1453	2.4	6.5	A	2.4	6.5	B	5/23/2013
1454	2.5	6.2	A	2.8	6.2	B	5/23/2013
1455	1.6	5.2	C	--	--	Dead	--
1456	--	--	Dead	--	--	Dead	--
1457	2.3	6.0	C	2.3	6.0	B	5/23/2013
1458	2.6	6.0	B	2.6	6.0	B	5/23/2013
1459	--	--	Dead	--	--	Dead	--
1460	--	--	Dead	--	--	Dead	--
1461	--	--	Dead	--	--	Dead	--
1462	--	--	Dead	--	--	Dead	--
1463	1.9	5.4	B	2.0	5.4	B	5/23/2013
1464			Dead			Dead	--
1465	3.0	7.1	A	3.0	7.1	C	5/23/2013
1466	--	--	Dead	--	--	Dead	--
1467	2.2	5.7	B	2.6	6.2	B	5/23/2013
1468	--	--	Dead	--	--	Dead	--
1469	--	--	Dead	--	--	Dead	--
1470	--	--	Dead	--	--	Dead	--
1471	1.6	4.0	B	1.8	4.0	C	5/23/2013
1472	2.0	4.0	B	2.2	4.0	C	5/23/2013
1473	3.0	7.0	A	3.0	5.6	C	5/23/2013
1474	--	--	Dead	--	--	Dead	--
1475	--	--	Dead	--	--	Dead	--
1476	3.0	7.0	A	3.1	7.0	A	5/23/2013
1477	--	--	Dead	--	--	Dead	--

	Previous Monitoring Data (2/6/2018)			Current Monitoring Data (12/14/2018)			
Tree No.	Dia (inches)	Height (feet)	Grade	Dia (inches)	Height (feet)	Grade	Start Date of 7-Year Monitoring
1478	--	--	Dead	--	--	Dead	--
1479	--	--	Dead	--	--	Dead	--
1480			Dead	--	--	Dead	--
1481	--	--	Dead	--	--	Dead	--
1482	--	--	Dead	--	--	Dead	--
1483	--	--	Dead	--	--	Dead	--
1484	--	--	Dead	--	--	Dead	--
1485	--	--	Dead	--	--	Dead	--
1486	2.0	5.1	C	--	--	Dead	--
1487	1.2	4.5	B	2.3	4.8	C	5/23/2013
1488	1.7	4.8	B	2.5	5.9	B	5/23/2013
1489	1.2	4.0	C	1.9	4.6	B	5/23/2013
1490	--	--	Dead	--	--	Dead	--
1491	--	--	Dead	--	--	Dead	--
1492	--	--	Dead	--	--	Dead	--
1493	--	--	Dead	--	--	Dead	--
1494	--	--	Dead	--	--	Dead	--
1495	--	--	Dead	--	--	Dead	--
1496	--	--	Dead	--	--	Dead	--
BC 19	--	--	Dead	--	--	Dead	--
BC 20	--	--	Dead	--	--	Dead	--
BC 21	--	--	Dead	--	--	Dead	--
BC 9	--	--	Dead	--	--	Dead	--

5.0 Recommendations

1. Remove herbivore cages around bigcones that are “over crowded” in the cages. Retain cages on smaller trees as determined by the monitoring biologist.

2. Most of the tree tags are missing on the big cone Douglas fir mitigation trees; therefore, re-tag all of the mitigation trees for identification purposes.

3. Maintain the big cone Douglas fir trees that were planted in 2015, so that they can be used to mitigate the fir trees that have been removed from the landfill.

4. Plant a minimum of 40 canyon oak trees to meet the mitigation requirements for the canyon oaks that have been removed. Canyon oak mitigation trees should be planted in an area suitable for successful growth and establishment within the county-side of the landfill at a location determined by an arborist.

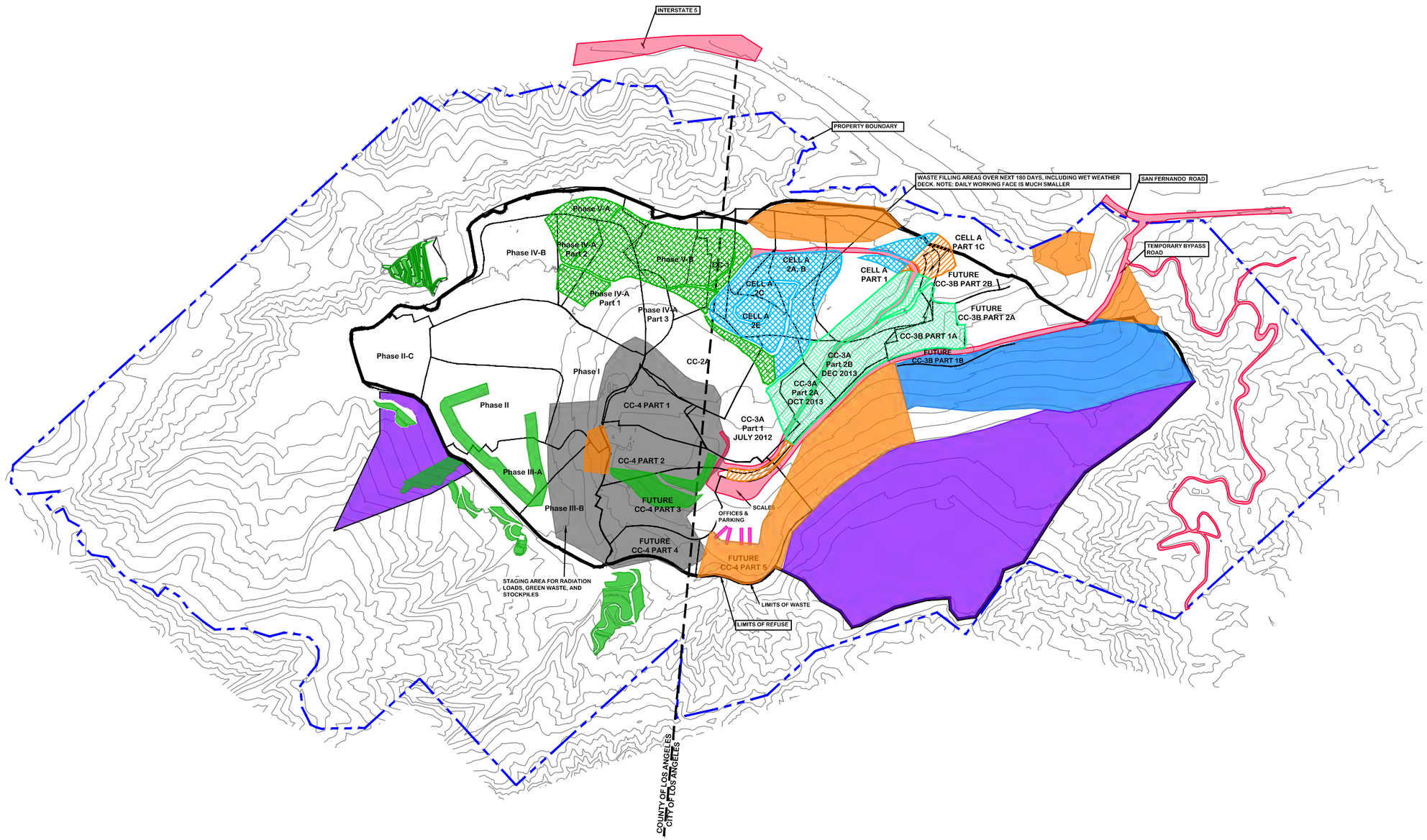
APPENDIX A:
Big Cone Douglas Fir Location Map

Sunshine Canyon Landfill (BFI)

Figure 1

Bigcone Douglas Fir Mitigation Trees in Area 7B

DRAWING 1



NORTH

GRAPHIC SCALE

500' 0' 250' 500' 1000' 2000'

LEGEND

- 1500 EXISTING 50 FT CONTOUR
- PROPERTY BOUNDARY
- EXISTING APPROVED LINERS
- EXISTING ROADS
- LIMITS OF REFUSE

VEGETATION STATUS MD ACTIVITY 4th QUARTER 2018	
	NON-PERMANENT CUT SLOPES WITH JUTE MATE OR STRAW WATTLES, SAGE SEED MIX (NOT MITIGATION AREA)
	SAGE MITIGATION AREA, FINAL SLOPES
	INTERIM COVER HYDROSEEDING (PRE-2008)
	CURRENT AND NEXT QUARTER ACTIVE AREAS. ALSO INCLUDES ROADS AND BUILDINGS.
	4Q2017 HYDROSEED APPLICATION
	VEGETATION PILOT PROJECT USING INTERIM SEED MIX
	CLOSURE TURF
	POSI-SHELL INSTALLATION
	VEGETATIVE COVER USING INTERIM SEED MIX
	VEGETATIVE COVER OVER DISKED POSI-SHELL

FOR_REVIEW_ONLY

EXISTING TOPOGRAPHY PREPARED BY COOPER AERIAL SURVEYS DATED FEBRUARY 5, 2018

REV. NO.	DATE	DESCRIPTION	APPROVED BY
REV1	DATE1	DESCRIPTION	DRAWN1
REV2	DATE2	DESCRIPTION2	DRAWN2
REV3	DATE3	DESCRIPTION3	DRAWN3
REV4	DATE4	DESCRIPTION4	DRAWN4
REV5	DATE5	DESCRIPTION5	DRAWN5
REV6	DATE6	DESCRIPTION6	DRAWN6

DATE OF ISSUE: NOV 2018
DESIGNED BY: C BARRETT
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SITE VEGETATION STATUS AND ACTIVITY

Q4 2018

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