SUNSHINE CANYON Landfill
14747 San Fernando Road
Sylmar, CA 91342

April 30, 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
First Quarter 2019 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 first quarter of 2019. 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. Additionally, the site completed hydroseeding approximately 15 acres; application of the approved seed mix was completed during the fourth quarter of 2018. These areas had successful vegetation growth after the recent rains.

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 first quarter of 2019.

2.2 County

No vegetation activities were conducted on the permanent slope areas on the County portion of the site during the first quarter of 2019 (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 – 1Q2019

During the first quarter of 2019, 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 2018. 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 2018. 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 first quarter of 2019, 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

5.2 JMA Recommendations for City Sage Mitigation Areas

JMA's progress reports for the City Sage Mitigation Areas for the first quarter of 2019 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, First Quarter 2019

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.

5.3 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, First Quarter 2019

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

5.4 Architerra Inspection for City South Sage Mitigation Pilot Project Area – First Quarter 2019

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

5.5 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 first quarter of 2019

based on this methodology is included in Attachment 4 and Attachment 5 for Deck C and Deck B, respectively.

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.

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 – 1Q2019
Attachment 4	JMA Quarterly Monitoring Report - Coastal Sage Scrub Deck C Pilot Study, 1Q2019
Attachment 5	JMA Quarterly Monitoring Report - Coastal Sage Scrub Deck B Pilot Study, 1Q2019

Drawing

Drawing 1	1Q2019 Site Vegetation Status and Activity

ATTACHMENT 1

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

SUNSHINE CANYON LANDFILL MITIGATION SITES

Progress Report

City-Side Sage Mitigation Area

Submittal Date: April 29, 2019	**Inspection Date:** April 19, 2019
To: Tuong-phu Ngo, Environmental Manager	**From:** Greg Ainsworth, Monitoring Biologist **Prepared on behalf of Republic Services*

Lower Deck

General Comments:
Based on a qualitative visual assessment, the saltbush (*Atriplex polycarpa and A. lentiformis*) cover is currently thriving. Other native species such as *Encelia Californica*, *Artemisia californica,* and *Salvia sp.* are co-dominate throughout the lower deck due to the ongoing coastal sage scrub pilot study.

Wildlife species observed during the monitoring included white crowned sparrow, California towhee, and side-blotched lizard.

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

Comments: Overall weed growth is moderate to high. It does not appear that any weeding had been conducted since the prior monitoring period due to the presence of dense brome grass mats. Mustard was also more prevalent than during recent-past monitoring visits.

Middle Deck

General Comments:

The Middle Deck has been planted with native vegetation for the "Deck B Pilot Study". Planting occurred in areas where vegetation growth was previously problematic. Large boulders have also been placed in various locations throughout the Middle Deck as a part of the pilot study.

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

Previously vegetated areas generally consist of approximately 35% that is dominated by sage scrub plantings/seedlings, 30% by non-native grasses, and approximately 40% was recently planted for the pilot study. There is a decent mixture of native species that have previously established on the Middle Deck 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: A moderate amount of brome grasses (Bromus spp.) are present in open areas between shrub plants, which does not include the pilot study plots. It does not appear that weed control has taken place recently in the vegetated areas of the middle deck.

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.

Wild oats (*Avena fatua*), brome grasses and mustard generally dominate the non-native cover throughout the upper deck. Buckwheat is the dominant native plant that is present and appears to be noticeably denser in areas where it occurs compared to previous monitoring visits, likely as a result of spring rains. Overall natural recruitment within the Upper Deck is low, due to poor soil conditions and a general lack of water.

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

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

Comments: Weeds continue to grow without any level of control within the Upper Deck. Wild oats, brome grasses and mustard are currently dominant.

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 middle deck that are currently dominated with annual, non-native species have decent soil-texture conditions. These areas are not near as compacted as adjacent areas that are gravelly and mostly void of vegetation. In general, the soil texture within the vegetated areas with non-native vegetation is

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

friable down to approximately 8-12 inches in depth. Various planting methods (i.e., planting container plants and hydroseeding) may be used to re-establish native plants on the middle and upper decks where non-natives currently dominate.

• **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.

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

Progress Report

City-Side Sage Mitigation Area

Photo Locations

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

Progress Report

City-Side Sage Mitigation Area

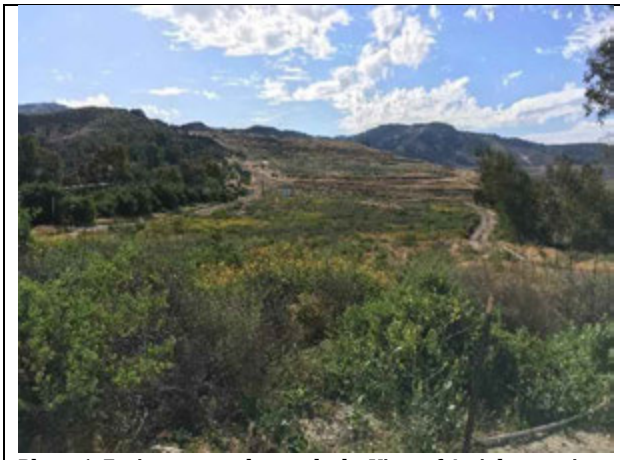


Photo 1. Facing west at lower deck. View of *Atriplex* species and California sunflower (*Encelia californica*) that dominate the vegetation cover.

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

Photo 3. Facing northeast at recently planted coastal sage scrub pilot study within the Middle Deck.

Photo 4. Facing west at the easterly-facing slope located between middle and upper decks. The vegetation on the slopes below the upper deck is dominated with mustard and brome grasses. The dark areas of vegetation consist of California buckwheat.

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

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. Non-native grasses and some CA buckwheat shrubs are evident in the background.

Photo 6. Facing southwest at upper deck. The area shown in this photo is dominated by brome grasses and wild oats; however, some natives such as California buckwheat are present.

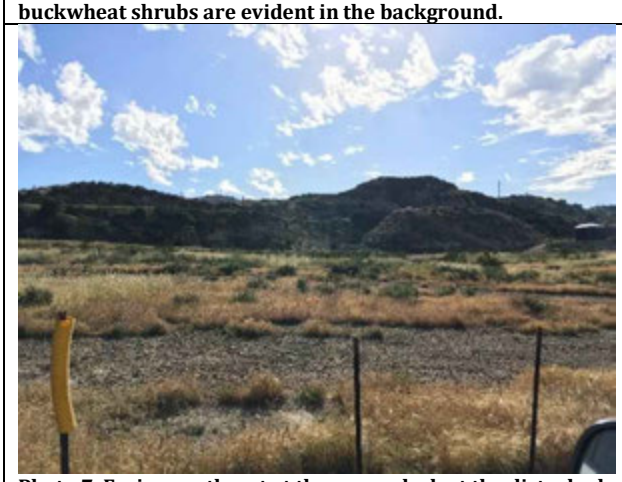


Photo 7. Facing southeast at the upper deck at the disturbed area that is currently dominated with desiccant brome grasses.

ATTACHMENT 2

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

SUNSHINE CANYON LANDFILL MITIGATION SITES

Progress Report

County-Side Sage Mitigation Area

Submittal Date: April 29, 2019	**Inspection Date:** April 19, 2019
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 native and non-native vegetation are concentrated. A substantial portion of the county-side mitigation area continues to be bare and problematic for establishment of vegetation, primarily because of highly eroded soils, steep slopes and Boron-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 that is noteworthy, which consists of the highest concentration of native species, mostly California buckwheat (*Eriogonum fasciculatum*) and California sunflower (*Encelia californica*). 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 of shrubs, and dozens of California sunflower seedlings are dispersed throughout the southern-half of the mitigation area. 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 [ ] No cover of native plants from seed mix [ ] Sparse cover of native plants from seed mix	[ ] Dense cover of native plants from seed mix [X] Moderate cover of native plants from seed mix (where vegetation is present)

Comments:

Similar to the hydroseeded areas, the other areas that are moderately covered with vegetation are concentrated. 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

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

California sunflower.

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. Desiccant brome grasses (*Bromus sp.*) and wild oats (*Avena fatua*), and shortpod mustard (*Hirschfeldia incana*) that is currently in a vegetative phase, comprise approximately 25 percent of the total cover. California buckwheat dominates the native vegetation coverage with California sagebrush 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 [X] Moderate [ ] Minimal	[ ] Disease/pests [ ] Plant stress [ ] Excessive herbivory	[ ] 0" – 12" [X] 12" – 24" [ ] 24" and above	[ ] Low [X] Medium [ ] High

Comments:

It should be noted that the plant cover rating above applies where vegetation is dominant in the southeastern portion of the mitigation area. Vegetation cover is moderate in the southeastern portion of the county-sage mitigation area and sparser along the upper slopes where rocky conditions occur. The majority of the northern and upper portions of the mitigation area continue to have minimal coverage. Bare areas and non-native annual grasses are intermixed; however, the northern and upper areas continue to be mostly bare where erosion and rocks are apparent. Native vegetation coverage is good in vegetated areas and the amount of non-native grasses that are present is expected when compared to sparsely covered areas of California buckwheat in the region.

As indicated previously, California buckwheat dominants the native cover with *Encelia californica* as a co-dominant. Establishment of vegetation is problematic 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.

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

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

Comments:

Annual, non-native weed species consist primarily of brome grasses and wild oats, which are currently desiccant, as well as patches of short-pod mustard. Other established weeds that were observed include red-stemmed filaree (*Erodium cicutarium*) and (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

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.

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

Progress Report

County-Side Sage Mitigation Area

Photo Locations

26623 Sierra Vista
Mission Viejo, CA 92692
949-367-1000
www.jma-ca.com

Progress Report

County-Side Sage Mitigation Area

Photo 1. Facing west at the county sage slope. Blooming California sunflower can be seen in this photos and a denser cover of native species that include sunflower and California buckwheat is present.

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:	04/18/19
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:	11:30am
WEATHER/TEMPERATURE:	Clear and Sunny 80°
ESTIMATED % COMPLETED:	100%
CONFORMANCE WITH SCHEDULE (+, -)	

WORK IN PROGRESS:	Weed abatement / Monitoring Period /Construction Observation
PRESENT ON SITE:	Gregg Denson

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 Deck C):

- After a robust winter of rains, several weed species have emerged over just the last few weeks and are flowering/going to seed. These include: Russian Thistle (*Salsola* ssp.), Shortpod Mustard (*Hirshfeldia incana*), Red Brome Grass (*Bromus madritensis*), False Barley *(Hordeum murinum.* Architerra Design Group, Inc. recommends that the maintenance contractor immediately begin removal of these invasive species and weed abatement. The weeds should be bagged/wrapped prior to removal so that the weed seeds do not spread. Contractor should target the species above and take care to not remove/damage new seedlings intermixed amongst the weeds. In addition to the deck, the understory of the PM10 Berm is loaded with Mustard and Brome Grass. This area should also be cleared of weeds to prevent wind dispersion of weed seed into the deck.
- The deck is abundant in blooms and many of the CSS native species are putting on a show. Some of these include, Coast Sunflower (*Encelia californica*), Black Sage (*Salvia mellifera*), Purple Sage (*Salvia leucophylla*), White Sage (*Salvia apiana*), Creeping Wild Rye (*Leymus triticoides*), Deerweed (*Lotus scoparius*), Mexican Elderberry (*Sambucus mexicana*), Foothill Needle Grass, *Stipa (Nasella) pulchra and lepida*. California Buckwheat (*Eriogonum fasciculatum*) is starting to push flowers and should be blooming within the next month or two.
- The consistent moisture for frequent rainfall and mild spring temperatures has allowed many new seedlings to emerge and several of the older species that were devoid of vegetation, are now pushing new growth.
- The straw wattles that were installed in 2017 now show signs of holding back soil fines and new plants (including weeds) have begun to establish were moisture is more available.

- PM10 Berm Oak Trees are also looking mush healthier than when they were reviewed in Summer 2018. The rains have allowed the trees to respond well with new growth and vigor.

Red Brome Grass has established and produced an abundance of weed seed.

Shortpod Mustard germinating along original irrigation laterals where soil erosion collects.

Invasive Shortpod Mustard blooming on PM10 Berm

Seedlings of Coast Sunflower (*Encelia californica*) and Salt Bush establishing within straw wattles placed in 2017

New emerging foliage from Saltbush that was devoid of vegetation

New foliage and flowers emerge from dried branches of the Deerweed (*Lotus scoparius*)

Seedlings of Coast Sunflower (*Encelia californica*) germinate from an area that temporarily held moisture during the winter rains

Large and heathy flowering Deerweed perennial

Lower swale at north side of deck blooming with Coast Sunflower. This swale was Slatbush dominant and thinned back a few years to allow new species to take over

Blooming Purple Sage and Coast Sunflower

Nevada Side-Blotched Lizard hiding in the understory of a Saltbush

Overall View of Deck C (Looking West)

City-Side Sage Mitigation (Deck B):

- Deck B has really started to germinate over the last few weeks. When observed in February, there was little germination, but now several annuals and grasses have established.
- In many portions of the deck you can see the evidence of the seed imprinting performed last year, mostly by the germination of native grasses and annuals. With the heavy rains that occurred, much of the dimpled pattern evident in the fall has vanished.

- The contractor has stayed on top of keeping the swales protected and has come back and regraded and reinforced the sediment erosion by installing new straw wattles behind existing ones.
- For the most part, PRG has kept the weeds to a minimum, but there are areas on the deck (adjacent to existing vegetation islands) where new weeds are emerging.
- During the last quarter, ADG staked the deck and established (9) nine random 50sq. meter quadrats for biological review and vegetation cover by Greg Ainsworth.

Leymus triticoides (Creeping Wild Rye) evident in spaced out dimpled pattern made from soil imprinting technique

Existing CSS vegetation along north side of Deck B

California Goldfields and California Poppy bloom on west side of Deck B

Annual Lupine beginning to bloom

Owls Clover and California Goldfields blooming along entire deck area

California Goldfields, Yarrow and Creeping Wild Rye within mulch at California Sagebrush

California Poppy, California Plantain and Tomcat Clover seedlings

California Poppy, California Goldfields and Wild Rye establishing on deck near container planted Yucca whipplei

New straw wattle installation behind original to help eliminate erosion

Signed: _____ Date: 4/28/19

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

Photo Station #1 - April 2018 (East)

Photo Station #1- April 2019 (East)

Photo Station #1 - April 2018 (North)

Photo Station #1 - April 2019 (North)

Photo Station #1 - April 2018 (West)

Photo Station #1 - April 2019 (West)

Photo Station #2 - April 2018 (East)

Photo Station #2 - April 2019 (East)

Photo Station #2 - April 2018 (North)

Photo Station #2 - April 2019 (North)

Photo Station #2 - April 2018 (South)

Photo Station #2 - April 2019 (South)

Photo Station #3 - April 2018 (East)

Photo Station #3 - April 2019 (East)

Photo Station #3 - April 2018 (North)

Photo Station #3 - April 2019 (North)

Photo Station #3 - April 2018 (West)

Photo Station #3 - April 2019 (West)

Photo Station #4 - October 2018 (South)

Photo Station #4 - October 2019 (South)

Photo Station #4 - October 2018 (East)

Photo Station **#4 - October 2019 (East)**

Photo Station #4 - October 2018 (West)

Photo Station $3 - October 2019 (West)

Photo Station #5 - April 2018 (East)

Photo Station #5 - April 2019 (East)

Photo Station #5 - April 2018 (North)

Photo Station #5 - April 2019 (North)

Photo Station #5 - April 2018 (West)

Photo Station #5 - April 2019 (West)

Photo Station #6 - April 2018 (East)

Photo Station #6 - April 2019 (East)

Photo Station #6 - April 2018 (North)

Photo Station #6 - April 2019 (North)

Photo Station #6 - April 2018 (West)

Photo Station #6 - April 2019 (West)

Photo Station #7 - April 2018 (East)

Photo Station #7 - April 2019 (East)

Photo Station #7 - April 2018 (West)

Photo Station #7 - April 2019 (West)

Photo Station #7 - April 2018 (North)

Photo Station #7 - April 2019 (North)

Photo Station #8 - April 2018 (East)

Photo Station #8 - April 2019 (East)

Photo Station #8 - April 2018 (North)

Photo Station #8 - April 2019 (North)

Photo Station #8 - April 2018 (West)

Photo Station #8 - April 2019 (West)

Photo Station #9 - April 2018 (East)

Photo Station #9 - April 2019 (East)

Photo Station #9 - April 2018 (North)

Photo Station #9 - April 2019 (North)

Photo Station #9 - April 2018 (West)

Photo Station #9 - April 2019 (West)

ATTACHMENT 4

memorandum

date April 29, 2019

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 – 1st Quarter, 2019

INTRODUCTION

On April 18, 2019, biologist Greg Ainsworth monitored the coastal sage scrub revegetation area at the Landfill's City South 'C' Trial Plot, which constitutes the 1st quarter monitoring of the Deck C trial plot for 2019. 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) – 23% (20%)

Percent basil cover (herbs) – 26% (16%)

Percent bare ground – 29% (45%)

Percent rock or other – 3% (3%)

Percent canopy (shrub) – 42% (44%)

Percent canopy (herb) – 11% (2%)

Average Imprint – Quadrats E, F, G H

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

Percent basil cover (herbs) – 16% (14%)

Percent bare ground – 20% (41%)

Percent rock or other – 5% (5%)

Percent canopy (shrub) – 34% (44%)

Percent canopy (herb) – 20% (11%)

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

Percent basil cover (shrubs) – 30% (28%)

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

Percent bare ground – 7% (15%)

Percent rock or other – 3% (3%)

Percent canopy (shrub) – 40% (67%)

Percent canopy (herb) – 22% (16%)

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	1%	
Adenostema fasciculatum		
Achillia mellifoluim		
Artemisia californica	1%	
Atriplex lentiformis	12%	
Atriplex polycarpa	11%	
Atriplex spinosa	1%	
Baccharis pilularis		
Centaurea melitensis		1%
Encelia californica	17%	
Eschscholzia californica		
Leymus triticoides		1%
Mimulus aurantiacus longiflorus		
Nasella pulchra		
Other herb		
Salvia mellifera	3%	
Sisyrinchium bellum		
Vulpia microstachys		
Echinochloa crus-galli		
Salsola kali		
Hordeum vulgare		
Bromus sp.		18%
Hirshfeldia incana/Brassica nigra		4%

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

Species	% Cover Shrub	% Cover Herb
Adenostema fasciculatum		
Achillia mellifoluim		
Artemisia californica		
Atriplex lentiformis	13%	
Atriplex polycarpa	12%	
Atriplex spinosa	1%	
Baccharis pilularis		
Encelia californica	7%	
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.		16%
Hirshfeldia incana		10%
Centaurea melitensis		
Leymus triticoides		1%
Foxtail barley		8%

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

Species	**% Cover Shrub**	**% Cover Herb**
Adenostema fasciculatum		
Achillia mellifoluim		
Artemisia californica	11%	
Atriplex lentiformis	11%	
Atriplex polycarpa	5%	
Atriplex spinosa	1%	
Baccharis pilularis		
Encelia californica	18%	
Eriogonum fasciculatum		
Eschscholzia californica		
Leymus triticoides		12%
Mimulus aurantiacus longiflorus		
Nasella pulchra		
Other herb		
Salvia apiana		
Salvia leucophylla	1%	
Salvia mellifera	1%	
Sisyrinchium bellum		
Hirshfeldia incana		3%
Vulpia microstachys		
Hordeum jubatum		4%
Bromus sp.		9%

DISCUSSION

There was not a substantial change in the richness of species within the pilot study area compared to the 4th quarter monitoring period of 2018. However, regeneration of *Encelia californica* was apparent throughout many of the survey plots, most notably in the hydroseed and hand broadcast plots. There was not a substantial change in the density of the shrub cover, however, in both the hydroseed and hand broadcast survey plots, *Encelia californica* has filled in areas where *Atriplex lentiformis* and *A. polycarpa* were previously dominant. It was also apparent that minimal to no non-native vegetation control has occurred for some time, due to the high amount of brome grasses and other non-native herbaceous species, such as *Centaurea melitensis* and mustard (*Hirshfeldia incana*) that are dominating the understory. As indicated above on page 2, the herbaceous cover in all of the survey plots, which is primarily comprised on non-native, invasive grasses, has increased substantially since the

last monitoring period. During the last monitoring period the non-native herbaceous cover was reported to be an average of 9.6% amongst all survey plots; whereas during this monitoring period the average non-native percent coverage was estimated to be 17.6%, a difference of 58%. As such, there has been a significant increase in the non-native herbaceous cover since the last monitoring period.

Quadrats H, I and L have the greatest amount of relative cover, mostly comprised of *A. lentiformis, A. polycarpa, and Encelia californica.* The hand broadcast plots have the greatest amount of non-native grass cover, which generally occurs in dense mats. 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* and *Encelia californica* as co-dominants. The qualitative monitoring results also confirm that these species are of highest abundance. The density of *Encelia californica* has noticeably increased throughout Deck A pilot study area, which was easy to discern since the speices was in bloom with its showy yellow flowers. 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.

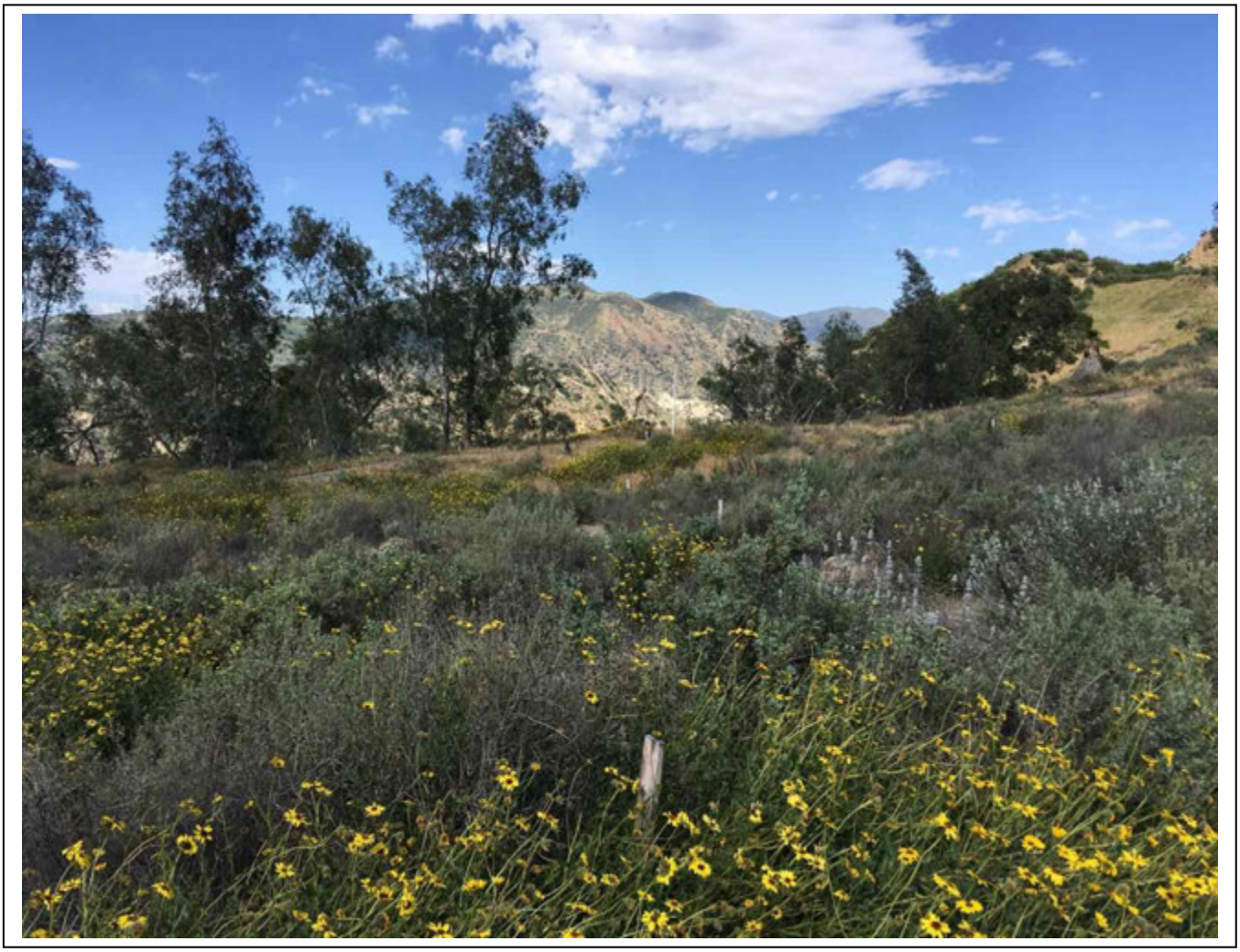
Quadrat C. Facing northeast from southwest corner.

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%	60%	4%	2%	15%	100%
	Atriplex lentiformis						30%	
	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		30%	35%	30%	2%	12%	
	Atriplex lentiformis						15%	
	Atriplex polycarpa						10%	
	Leymus triticoides							2%
	red brome							30%
	Mustard							12%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
C	Atriplex lentiformis		10%	3%	60%	4%	1%	
	Atriplex polycarpa						15%	
	Encelia california						1%	
	Black sage						5%	
	Brome/mustard							3%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
D	Encelia california		35%	7%	20%	4%	40%	
	Atriplex lentiformis						25%	
	Atriplex polycarpa						5%	
	Artemisia california						4%	
	Black sage						5%	
	Bromus sp.							2%
	Mustard							2%
	Tocalote							3%
	Deerweed							
AVERAGE			**23%**	**26%**	**29%**	**3%**	**42%**	**11%**
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/unusable	% canopy (shrub)	% canopy (herb.)
E	Atriplex lentiformis		20%	20%	15%	2%	5%	
	Atriplex polycarpa						8%	
	Encelia california						1%	
	Atriplex spinosa						1%	
	Mustard							15%
	bromus sp.							20%

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
F	Atriplex lentiformis		20%	25%	30%	3%	12%	
	Atriplex polycarpa						20%	
	Encelia california						1%	
	Bromes/Foxtail barley							50%
	mustard							2%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
G	Atriplex lentiformis		25%	15%	20%	2%		
	Atriplex polycarpa						15%	
	Encelia california						12%	
	Bromus/foxtail barley							29%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
H	Atriplex lentiformis		30%	2%	15%	12%	35%	
	Atriplex polycarpa						3%	
	Encelia california						15%	
	Buckwheat/CA Artemisia						6%	
	Mustard/Leymus							4%
AVERAGE			**24%**	**16%**	**20%**	**5%**	**34%**	**20%**
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
I	Atriplex lentiformis		45%	15%	5%	3%	20%	
	Atriplex polycarpa						3%	
	Encelia california						18%	
	Purple sage						3%	
	Black sage						3%	
	Artemisia california						3%	
	Bromus sp.							18%
	Mustard							
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
J	Atriplex lentiformis		25%	60%	2%	3%	20%	
	Atriplex polycarpa						1%	
	Atriplex spinosa						3%	
	Encelia california						18%	
	bromus sp.							15%
	Mustard							5%
	foxtail barley							15%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
K	Atriplex polycarpa		13%	3%	10%	2%	7%	
	Artemisia california						35%	
	Atriplex lentiformis						2%	
	Coyote bush						6%	
	tocalote							2%

	Mustard							3%
Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
L	Atriplex polycarpa		35%	3%	10%	2%	7%	
	Atriplex lentiformis						2%	
	Artemisia california						7%	
	Encelia california						35%	
	Coyote bush						5%	
	Mustard							2%
	bromus sp.							2%
	Leymus triticoides							
AVERAGE			**30%**	**20%**	**7%**	**3%**	**40%**	**12%**

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.

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.

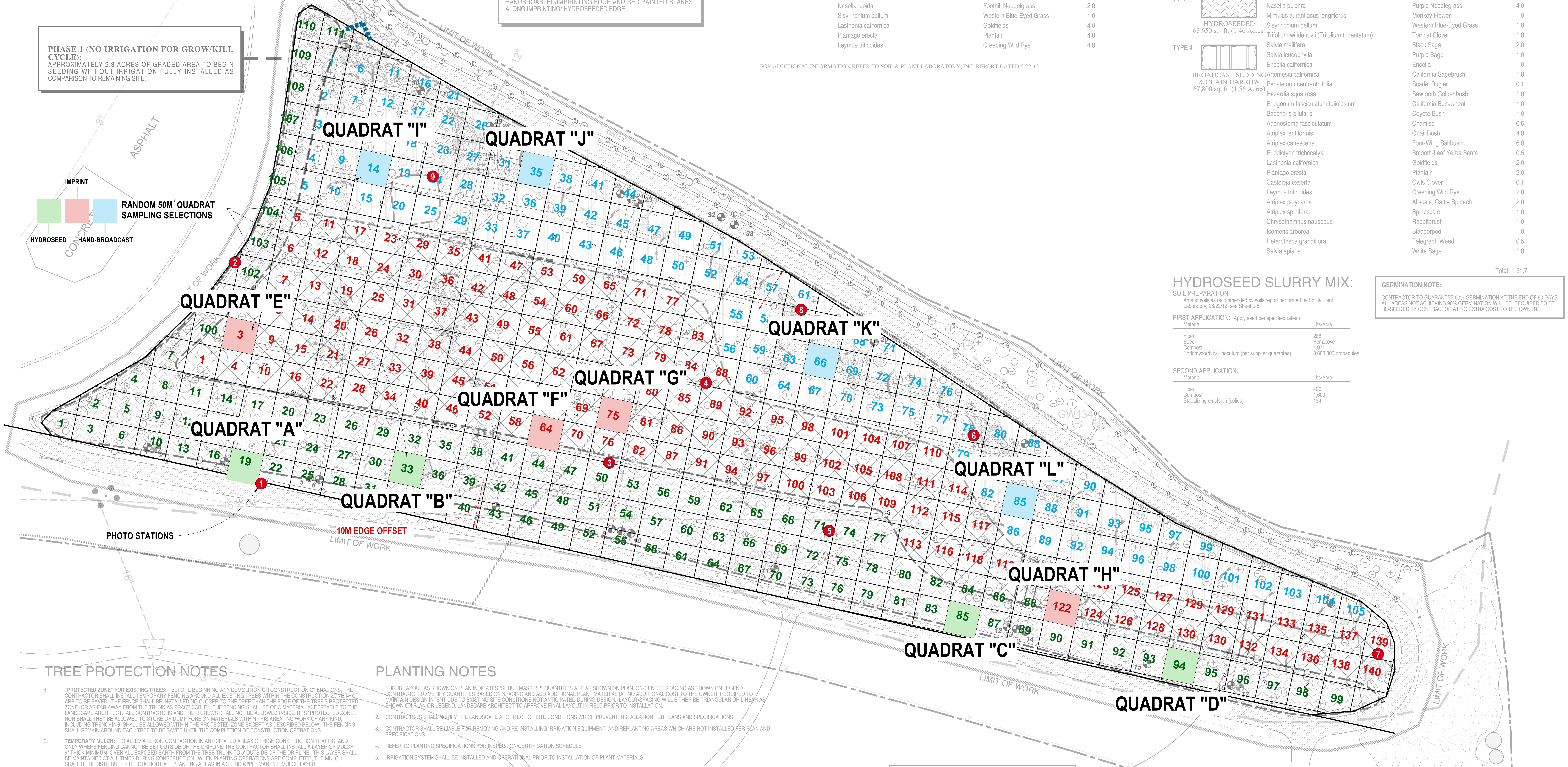
FIRST APPLICATION: (Apply seed per specified rates.)

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.



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

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.

Underground Service Alert
CALL BEFORE YOU DIG
Call: TOLL FREE
1-800 422-4133
TWO WORKING DAYS BEFORE YOU DIG

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.

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.

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

ARCHITERRA DESIGN GROUP
LANDSCAPE ARCHITECTURE
SITE PLANNING
10221-A Trademark Street
Rancho Cucamonga, CA 91730
(909) 484-2800
Fax (909) 484-2802
Richard Krumwiede
CA Lic. # 2834
AZ Lic. # 29115
NV Lic.# 446
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

memorandum

date April 29, 2019

to Tuong-phu Ngo, Environmental Manager, Republic Services

from Greg Ainsworth, Consulting Biologist

subject Deck B Coastal Sage Scrub Revegetation Monitoring Report, Sunshine Canyon Landfill – 1st Quarter, 2019

INTRODUCTION

On April 18, 2019, biologist Greg Ainsworth monitored the Deck B Coastal Sage Scrub Revegetation at the Landfill, which constitutes the 1st quarter monitoring for 2019. 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 revegetation area consists of nine, 50-meter quadrats that are randomly sampled throughout the revegetation area. 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-I.

A total of 450 square meters were sampled 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.
- **Average absolute percent cover** - A quantitative assessment was completed using the point-intercept method.
- **Photographs** – A photograph was taken from the southwest corner (facing northeast) of each quadrat.

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:

Quadrat A – Soil imprinting (with hand broadcast overseeded drainage swales)

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
A		50	1%	7%	85%	5%		
	Coyote bush						1%	
	Purple needlegrass							12%

Quadrat B – Soil imprinting

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
B		50	2%	40%	30%	5%		
	CA Artemisia						1%	
	Encelia californica						4%	
	Sambucas nigra ssp. caerulea						1%	
	Hazardia squarosa						1%	
	Yucca whipplei						1%	
	Achillea millefolium							3%
	Mustard							30%
	Tocalote							20%
	Purple needlegrass							3%
	Lasthenia californica							7%
	Salvia apiana						1%	

Quadrat C – Broadcast seeding

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
C		50	2%	25%	40%	5%		
	Artemisia californica						2%	
	Salvia apiana						2%	
	Opuntia littoralis						1%	
	Baccharis sp.						2%	
	Mustard							1%
	Lasthenia californica							5%
	Vulpia microstachys							45%
	CA poppy							1%
	Achillea millefolium							4%
	Isocoma menziesii						1%	

Quadrat D – Broadcast seeding (with soil imprinting)

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
D		50	1%	40%	20%	5%		
	Sambucas nigra ssp. caerulea						2%	
	Salvia apiana						1%	
	Achillea millefolium							6%
	Lasthenia californica							2%
	Mustard							2%
	Vulpia microstachys							50%

Quadrat E – Soil imprinting and hand broadcast

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/unusable	% canopy (shrub)	% canopy (herb.)
E		50	1%	15%	65%	7%		
	Eriogonum fasciculatum foliosium						1%	
	Vulpia microstachys							30%
	Achillea millefolium							2%

Quadrat F – Soil imprinting

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
F		50	2%	18%	55%	5%		
	Baccharis pilularis						2%	
	CA artemisia						1%	
	CA poppy							1%
	Vulpia microstachys							35%
	Achillea millefolium							5%
	Lasthenia californica							2%

Quadrat G – Soil imprinting (with hand broadcast overseeded drainage swales)

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
G		50	2%	15%	50%	10%		
	Baccharis pilularis						1%	
	CA poppy						2%	
	Vulpia microstachys							30%
	Lasthenia californica							1%

Quadrat H – Soil imprinting

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
H		50	1%	15%	50%	5%		
	Baccharis pilularis						1%	
	Sambucas nigra ssp. caerulea						1%	
	Vulpia microstachys							20%
	Achillea millefolium							1%
	Lasthenia californica							1%

Quadrat I – Broadcast seeding (with soil imprinting)

Quadrat	Species	Size (sq. meters)	% basal (shrub)	% basal (herb.)	% Bare	% Rock/ unusable	% canopy (shrub)	% canopy (herb.)
I		50	2%	20%	65%	3%		
	Baccharis pilularis						1%	
	Atriplex lentiformis						2%	
	Foxtail barley							2%
	Vulpia microstachys							30%
	Achillea millefolium							2%

<u>Point Intercept</u>:

To obtain estimate cover of each species and each cover class (i.e., native shrub, and native and non-native herbaceous), the point intercept method was used. The absolute percent cover was determined by taking a point at every 0.5 meter along the perimeter of each 50-meter quadrat (A-I). 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. The average of all quadrates was then calculated to determine the absolute percent cover of each cover class throughout the Deck B area. A photograph was taken at the southwest corner of each quadrat to depict the change in cover over time. Below are the percent cover of each quadrat based on the point intercept method.

<u>Note to reviewer: the results of the point intercept method will be provided in the second quarter monitoring report</u>.

Quadrat A – Soil imprinting (with hand broadcast overseeded drainage swales)

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Quadrat B – Soil imprinting

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Quadrat C – Broadcast seeding

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Quadrat D – Broadcast seeding (with soil imprinting)

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Quadrat E – Soil imprinting and hand broadcast

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Quadrat F – Soil imprinting

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Quadrat G – Soil imprinting (with hand broadcast overseeded drainage swales)

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Quadrat H – Soil imprinting

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Quadrat I – Broadcast seeding (with soil imprinting)

Species	Native shrub	Native herbaceous	Non-native Herbaceous

Average Absolute Percent Cover of All Quadrats

Species	Native shrub	Native herbaceous	Non-native Herbaceous
Average of each cover class			

DISCUSSION

The Deck B Revegetation Area was planted in November 2018. Above average rainfall in the winter of 2018 and 2019 has encouraged germination throughout the revegetation area of both native and non-native herbaceous species. Vegetation such as small six-weeks grass (*Vulpia microstachys*) that was planted by the soil imprinting method appear to have established well throughout the revegetation area; however, areas that were hand broadcasted also show a high germination and establishment rate of native grasses, most notably small six-weeks grass and purple needlegrass (*Nassella pulchra*). Unfortunately, the above average rain not only helped the desired native species to germinate and establish from soil imprinting, but it also provided an ideal growing conditions for invasive non-native species to establish, such as tocalote (*Centaurea melitensis*), mustard (*Brassica nigra*), and brome grasses (*Bromus sp.*).

Native shrubs that was planted from containers are doing well and thriving. Native shrub species that were planted by soil imprinting or broadcasting are germinating and were barely noticeable during the monitoring; however, the absolute cover of native shrubs is expected to increase dramatically by the 2nd quarter monitoring that will be conducted in June.

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.

Deck B Revegetation Quadrat Sampling Map

RANDOM 50M² QUADRAT SAMPLING SELECTIONS

PHOTO STATIONS

QUADRAT "A"

QUADRAT "B"

QUADRAT "C"

QUADRAT "D"

QUADRAT "E"

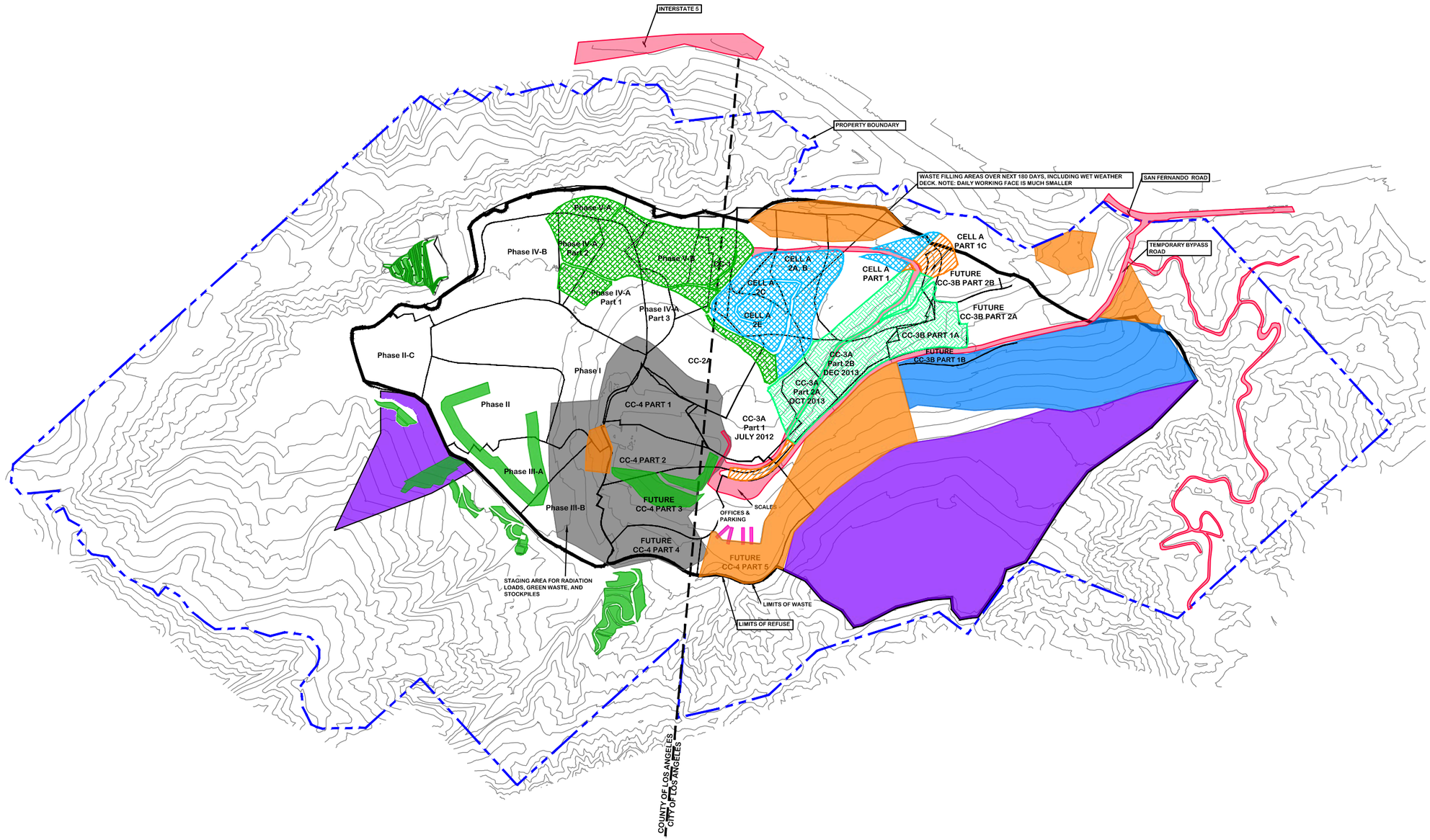
QUADRAT "F"

QUADRAT "G"

QUADRAT "H"

QUADRAT "I"

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 First QUARTER 2019	
	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.
	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
DRAWN BY: C BARRETT
CHECKED BY: C BARRETT
APPROVED BY: C BARRETT

DIGALERT 811

Geo-Logic ASSOCIATES
2777 E. GUASTI RD.
ONTARIO, CA 91761
909) 626-2282
www.geo-logic.com

REPUBLIC SERVICES

SUNSHINE CANYON LANDFILL
SYLMAR, CALIFORNIA
SITE VEGETATION STATUS AND ACTIVITY

Q1 2019

DWG NO. 1

PROJECT NO. SO18.0001

C:\Users\cbarrett\Documents\Allied-Republic\Sunshine Canyon LF\Exhibits\2014.0023 - VEGETATION STATUS AND ACTIVITY\01_CAD\B_GLA-OWCS\SO18.0001-SCL-2018Q3- Vegetation Status Map.dwg Nov 05, 2018 - 2:11pm By: cbarrett