



March 5, 2024  
2023-005.07

Ms. Mitzi Kim Rios  
Los Angeles County Public Works  
900 South Fremont Avenue, 9th Floor  
Alhambra, California 91803

**Re: *Devil's Gate Reservoir Restoration Project – Phase 3 Restoration Qualitative Monitoring Conducted on January 30, 2024***

## **1.0 INTRODUCTION**

The purpose of this letter report is to document the results of qualitative monitoring (horticultural) conducted for the Devil's Gate Reservoir Restoration Project (Project), located in the City of Pasadena, Los Angeles County, California. The qualitative monitoring was conducted in the planted and or seeded portions of the Phase 3 mitigation areas including DG-4 WOUS, DG-4 WOUS Connections, DG-4A, the Tire Wash, and the Side Slopes. Due to the timing of container plant and stake installation being late in the ideal planting season in DG-4 WOUS, DG-4 WOUS Connections, DG-4A, and the Tire Wash, these areas were not seeded during the initial seed application effort. In addition, only a portion of the Side Slopes was seeded during the initial seed application effort due to access issues in these areas from wet soils. The seeding in DG-4 WOUS, DG-4 WOUS Connections, DG-4A, the Tire Wash, and the remainder of the Side Slopes was completed during a follow-up seeding effort which was initiated in November of 2023. The monitoring is being conducted in accordance with the Final Habitat Restoration Plan (HRP) for the Project. Active sediment removal is occurring on an annual basis within the sediment removal areas for the Project and habitat restoration is being conducted onsite around the perimeter of the sediment removal areas.

ECORP is responsible for conducting qualitative monitoring and compliance review of restoration efforts in each of the mitigation areas. ECORP is also responsible for preparing monitoring reports, which typically include the following information:

- Overall health of container plants.
- Observations and recommendations related to container plant establishment.
- Germination of native plant species from seed application and natural recruitment.
- Level of germination of nonnative plant species.
- Soil condition.
- Other observations and recommendations as appropriate.

Qualitative monitoring was conducted by Carley Adams on January 30, 2024. Field data collected during the monitoring event is provided as Appendix A. This report documents the third monthly qualitative monitoring visit for the Phase 3 mitigation areas.

## 2.0 QUALITATIVE MONITORING IN THE PHASE 3 MITIGATION AREAS

### 2.1 Brief Summary of Plant Installation

During the Phase 3 plant installation effort that was completed on April 28, 2023, a total of 4,124 4-inch container plants and a total of 4,967 cuttings were installed in the DG-4 WOUS, DG-4 WOUS Connections, and DG-4A mitigation areas. In addition, a total of 81 1-gallon container plants were installed in the Tire Wash mitigation area. Container plants and stakes were not installed in the Side Slopes mitigation areas; however, these areas were included in the weed removal effort and seeding effort. Table 1 lists container plant species and the numbers installed in each of the Phase 3 mitigation areas.

Scientific Name	Common Name	DG-4 WOUS	DG-4 WOUS Connections	DG-4A	Tire Wash	Total
<i>Artemisia douglasiana</i>	Mugwort	192	21	537	0	750
<i>Baccharis pilularis</i>	Coyote bush	192	21	537	0	750
<i>Baccharis salicifolia</i>	Mulefat (stakes)	506	55	1,414	0	1,975
<i>Populus fremontii</i>	Fremont's cottonwood	192	21	537	0	750
<i>Rosa californica</i>	California rose	192	21	537	0	750
<i>Rubus ursinus</i>	California blackberry	192	21	537	0	750
<i>Salix gooddingii</i>	Black willow (stakes)	383	42	1,071	0	1,496
<i>Salix lasiolepis</i>	Arroyo willow (stakes)	383	42	1,071	0	1,496
<i>Sambucus mexicana</i>	Mexican elderberry	96	10	268	0	374
<i>Acmispon glaber</i>	Deerweed	0	0	0	9	9
<i>Artemisia californica</i>	California sagebrush	0	0	0	24	24
<i>Encelia californica</i>	California brittlebush	0	0	0	10	10
<i>Eriogonum fasciculatum</i>	California buckwheat	0	0	0	24	24
<i>Isocoma menziesii</i>	Menzie's goldenbush	0	0	0	5	5
<i>Salvia mellifera</i>	Black sage	0	0	0	9	9
<b>Total</b>		<b>2,328</b>	<b>254</b>	<b>6,509</b>	<b>81</b>	<b>9,172</b>

All plants were installed according to the methods described in Section 4.11 of the HRP. Planting holes for all container plants were dug to a width twice the size of the root ball and to a depth slightly deeper than the depth of the root ball so that the root crown was 1 inch below grade following installation. Prior to installation, all plants were thoroughly watered in their containers and the soil in planting holes was

wetted with at least 1 gallon of water. Planting holes were backfilled with native soil and irrigation basins, approximately 2 feet in width, were formed around the base of each plant. Rocks greater than 2 inches in diameter were removed to the extent possible from the backfill soil. All container plants were irrigated with at least 1 gallon of water immediately following installation and basin creation.

## 2.2 Qualitative Monitoring Methods

Qualitative monitoring occurs monthly following the 120-day Plant Establishment Period for the remainder of Year 1 (8 months). Following Year 1, qualitative monitoring will occur quarterly during Years 2 and 3 and twice per year during Years 4 through 10. The purpose of the qualitative monitoring is to assess container plant health and vigor and monitor the success of the mitigation areas.

During the January 30, 2024 visit all Phase 3 mitigation areas were walked, the health and vigor of container plants were documented, germination from seeding and natural recruitment was noted, and the irrigation lines were inspected for functionality. In addition, the level of nonnative and invasive weed cover was estimated for each of the Phase 3 mitigation areas.

## 2.3 Qualitative Monitoring Results

### 2.3.1 DG-4 WOUS/DG-4 WOUS Connections

The overall health of the container plants in DG-4 WOUS and DG-4 WOUS Connections was noted as being good; however, some were starting to show signs of seasonal dieback. A negligible percentage of the container plants and stakes in DG-4 WOUS and DG-4 WOUS Connections were noted as showing signs of stress and a negligible amount were noted as being dead or missing. This is slightly lower than the percentage of plants that were showing stress during the previous monitoring visit. Stress may be occurring as a result of 1) transplant shock, 2) herbivory by rabbits or other wildlife, 3) competition from nonnative and invasive weeds, 4) misplaced emitters, or 5) recreational traffic through the mitigation areas. Formal mortality counts will be taken for DG-4 WOUS and DG-4 WOUS Connections during the 2024 quantitative monitoring and will be included in the 2024 annual reporting. The majority of the recently planted mulefat (*Baccharis salicifolia*) and willow (*Salix* spp.) stakes were noted as showing signs of new growth; however, some were starting to show signs of seasonal dieback. Some of the container plants were noted as lacking well defined basins and should have their basins properly constructed and/or repaired. The installation of plants in the DG-4 WOUS and DG-4 WOUS Connections mitigation areas appears to have been completed successfully. The current issues identified during the monitoring visit are not expected to have an effect on the continued growth of the plants in the mitigation area. Photos 1 through 4 in Appendix B document the mitigation areas during the monitoring visit.

Native plant germination from seed application and natural recruitment was noted throughout the DG-4 WOUS and DG-4 WOUS Connections mitigation areas. The native species observed sprouting in the DG-4 WOUS and DG-4 WOUS Connections mitigation areas included mugwort (*Artemisia douglasiana*), tall flatsedge (*Cyperus eragrostis*), California buckwheat (*Eriogonum fasciculatum*), common knotweed (*Persicaria lapathifolia*), ladies' tobacco (*Pseudognaphalium californicum*), and stinging nettle (*Urtica dioica*). Native cover was estimated to be approximately 40 percent during the monitoring visit.

Nonnative weed cover in DG-4 WOUS and DG-4 WOUS Connections was estimated at approximately 15 to 20 percent, which is approximately 5 percent higher than what was observed during the previous monitoring visit. Nonnative species observed included black mustard (*Brassica nigra*), poison hemlock (*Conium maculatum*), and wand mullein (*Verbascum virgatum*). Most of the nonnative weeds observed in these mitigation areas were just starting to germinate and were not going to flower or seed. As weed abatement continues in the mitigation areas, it is anticipated that the seed bank of nonnative and invasive weeds will decrease. It should be noted that active bird nests are preventing weed abatement from occurring in portions of this mitigation area. Work will resume in these areas once the nests have fledged or have been deemed inactive by a qualified avian biologist.

### **2.3.2 DG-4A**

The overall health of the container plants in DG-4A was noted as being good; however, some were starting to show signs of seasonal dieback. Approximately less than 10 percent of the container plants and stakes were noted as showing signs of stress and a negligible amount were noted as being dead or missing. This is approximately the same percentage of plants that were showing stress during the previous monitoring visit. This included the remaining container plants from the first installation and the replacement container plants that were installed to replace the container plants and stakes planted in the middle section of DG-4A that appeared to be dead or in a condition unlikely to recover during previous monitoring visits. Stress may be occurring due to similar reasons described for DG-4 WOUS and DG-4 WOUS Connections. It should also be noted that a portion of DG-4A was inundated for two short periods of time during January and February of 2023; however, the inundation does not appear to have contributed to higher levels of stress or mortality in these areas. Formal mortality counts will be taken for DG-4A during the 2024 quantitative monitoring and will be included in the 2024 annual reporting. Some of the container plants were noted as lacking well defined basins and should have their basins properly constructed and/or repaired. The installation of plants in the DG-4A mitigation area appears to have been completed successfully and the installation of the replacement container plants should increase native cover. The current issues identified during the monitoring visit are not expected to have an effect on the continued growth of the plants in the mitigation area. Photos 5 through 9 in Appendix B document the mitigation area during the monitoring visit.

Native plant germination from seed application and natural recruitment was noted throughout the DG-4A mitigation area. Native plants such as mugwort, mulefat, tall flatsedge, salt heliotrope (*Heliotropium curassavicum*), Menzie's goldenbush (*Isocoma menziesii*), Hooker's evening primrose (*Oenothera elata*), and phacelia (*Phacelia spp.*) were observed sprouting in the mitigation area. Native cover was estimated to be approximately 45 percent during the monitoring visit.

Nonnative weed cover in the DG-4A mitigation area ranged from approximately 10 to 20 percent during the monitoring visit which is approximately 5 percent higher than what was observed during the previous monitoring visit. Nonnative species observed included black mustard, poison hemlock, and perennial pepperweed (*Lepidium latifolium*). Most of the nonnative weeds observed in this mitigation area were just starting to germinate. As weed abatement continues in the mitigation areas, it is anticipated that the seed bank of nonnative and invasive weeds will decrease; however, perennial pepperweed easily resprouts from rhizomatous roots that can be difficult to fully remove with hand tools.

### 2.3.3 Tire Wash

The overall health of the container plants in the Tire Wash mitigation area was noted as being good. Approximately 5 percent of the container plants were noted as showing varied levels of stress, which is approximately the same percentage of plants that were showing stress during the previous monitoring visit. This included the remaining container plants from the first installation and the replacement container plants that were installed to replace the container plants that were either missing or appeared to be dead or in a condition unlikely to recover during previous monitoring visits. Stress may be occurring due to similar reasons described for DG-4 WOUS and DG-4 WOUS Connections. Formal mortality counts will be taken for the Tire Wash during the 2024 quantitative monitoring and will be included in the 2024 annual reporting. Some of the container plants were noted as lacking well defined basins and should have their basins properly constructed and/or repaired. The installation of plants in the Tire Wash mitigation area appears to have been completed successfully. The current issues identified during the monitoring visit are not expected to have an effect on the continued growth of the plants in the mitigation area. Photo 10 in Appendix B documents the mitigation area during the monitoring visit.

Native plant germination from natural recruitment was noted throughout the Tire Wash mitigation area. Native plants such as deerweed (*Acmispon glaber*), California sagebrush (*Artemisia californica*), California encelia (*Encelia californica*), telegraph weed (*Heterotheca grandiflora*), and ladies' tobacco were observed sprouting in the mitigation area. Native cover was estimated to be approximately 50 percent during the monitoring visit.

Nonnative weed cover in the Tire Wash mitigation area was estimated at approximately 2 percent, which is approximately 3 percent less than the percentage of nonnative cover that was observed during the previous monitoring visit. Nonnative species observed included black mustard and red-stemmed filaree (*Erodium cicutarium*). Most of the nonnative weeds observed in this mitigation area were just starting to germinate. As weed abatement continues in the mitigation areas, it is anticipated that the seed bank of nonnative and invasive weeds will decrease.

### 2.3.4 Side Slopes

Container plants were not installed on the Side Slopes, but a portion of these areas were seeded with native plant species. Native plant growth was noted throughout the Side Slopes, likely both from natural recruitment and from seeding. Portions of the Side Slopes that were previously noted as having significant erosion that occurred as a result of heavy rainfall during the 2023 wet season and following the tropical storm that occurred in late August 2023 were noted as having been repaired during previous monitoring visits and were included in the supplemental seeding effort which was initiated in November of 2023. As of this monitoring visit, the recently hydroseeded areas showed minimal germination. Native plants such as mulefat, Phacelia, and black willow (*Salix gooddingii*) were observed sprouting on the Side Slopes. The black willow that was sprouting appeared to be coming from natural recruitment. Overall native cover was estimated to be approximately 45 percent during the monitoring visit; however, native cover in the areas without erosion was estimated to be 55 to 60 percent. Photos 11 and 12 in Appendix B document the Side Slopes during the monitoring visit.

Nonnative weed cover on the Side Slopes was estimated at approximately 10 to 15 percent, which is approximately 5 percent higher than the level of weed cover that was observed during the previous monitoring visit and portions of the Side Slopes had evidence of recent weed abatement. Nonnative species observed on the Side Slopes included black mustard, perennial pepperweed, tree tobacco (*Nicotiana glauca*), and castor bean (*Ricinus communis*). Most of the nonnative weeds observed in this mitigation area were just starting to germinate; however, some were starting to flower and will soon go to seed. These areas should be weeded prior to seed production. As weed abatement continues in the mitigation areas, it is anticipated that the seed bank of nonnative and invasive weeds will decrease; however, perennial pepperweed easily resprouts from rhizomatous roots that can be difficult to fully remove with hand tools.

## **3.0 RECOMMENDATIONS**

### **3.1 Nonnative Plant Control**

Nonnative weed cover ranged from approximately 2 percent to 20 percent in the various mitigation areas. During the monitoring visit, the majority of the weed growth observed within the mitigation areas was mostly vegetative and was not flowering or seeding; however, species that were observed to be in flower should be removed prior to seed production. Regular maintenance and removal of nonnative weeds is of the highest priority for all of the mitigation areas and side slopes to reduce competition between native and nonnative plants. A focus should be placed on removing the weeds and nonnatives from the basins of each of the container plants and cuttings; however, nonnative weeds just outside of the planting areas can migrate into the planting areas via seed dispersal. Outside of the nesting bird season, a focus should also be made to remove nonnative weeds in areas where least Bell's vireos are likely to nest during the breeding season (i.e., in the vicinity of the least Bell's vireo nest that was active in 2020). Nonnative plants and weeds that have gone to seed should be bagged and removed from the mitigation area. Without the use of herbicides, control of the nonnatives will be extremely difficult so the frequency and level of effort will need to be increased to provide control until the native plants and seedlings have a chance to grow and outcompete the nonnatives. In particular, it is important to maintain long-term perennial pepperweed management to reduce competition and allow native plants to germinate. In addition, dodder should be removed from container plants in the mitigation areas. Although many species of dodder are native, this parasitic plant can be harmful to younger shrubs and trees that are not yet established and can even cause mortality.

### **3.2 Irrigation**

The irrigation system was inspected for functionality and appeared to be properly installed. Irrigation was not actively occurring during the monitoring visit. Some of the emitters were observed to be outside of the container plant basins, likely due to erosion, water flow, and/or public interference. Twice weekly watering events should be conducted for the container plants unless adequate rainfall occurs. After watering, the container plant basins should have at least 0.5 inch of saturation depth. Continual maintenance of the irrigation system should be conducted to ensure all plants are evenly watered and the

tube emitters are placed at the base of the container plants. Watering of the areas that were only seeded is not recommended.

### **3.3 Herbivory**

Only minor herbivory of container plants was observed in the Phase 3 mitigation areas. Minor herbivory generally will not kill the plants, but continued monitoring should be conducted during future visits to determine if herbivory is worsening. As the plants become more established, they will be less susceptible to the effects of herbivory. It should be noted that cages were installed by Nature's Image around container plants that appeared to be most susceptible to herbivory following container plant installation; however, if herbivory becomes an issue for the Phase 3 mitigation areas, additional caging around affected and/or favored container plants may be warranted.

### **3.4 Erosion**

Portions of the Side Slopes that were previously noted as having significant erosion that occurred as a result of heavy rainfall during the 2023 wet season and following the tropical storm that occurred in late August 2023 were noted as having been repaired during previous monitoring visits and were included in the supplemental seeding effort which was completed in November of 2023. As more perennial plants become established on the Side Slopes, erosion should become less of an issue; however, action will need to be taken to repair the damage caused by the erosion and measures should be taken to reduce damage from erosion in the future. During future monitoring events, erosion should continue to be monitored in all planted areas and if warranted, erosion Best Management Practices should be installed in appropriate areas. This may only require the installation of straw wattles at select sites to prevent existing rills from becoming larger.

If you have any questions about the information presented in this letter, please contact me at [Cadams@ecorpconsulting.com](mailto:Cadams@ecorpconsulting.com) or (714) 732-9266.

Sincerely,



February 16, 2024  
Carley (Lancaster) Adams  
Senior Biologist

## **LIST OF APPENDICES**

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Appendix A – Field Notes

Appendix B – Photo Documentation



## **APPENDIX A**

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Field Notes



## Phase 3 Quad

C. Adams

~~1/30/24~~ 1/30/24DG-4 wous

- Cont. plants showing seasonal dieback  $\rightarrow$  negligible stress
- Native germ: CYPERA PURPLA, ARTDOU, PSECAL, URTOID, ERIFAS
- Nonnative germ: CONMAC, BRANIG wand mullen  $\sim 15-20\%$ .
- ~~cover~~ cover  $\rightarrow$  mostly veg.
- Next preventing work towards reservoir
- Side Slopes -

- ~~Hydroseeds not germinating yet~~
- Hydroseeds w/ minimal germ: BACSAL, Phacelia  $\sim 45\%$  cover
- SALGHO germ from natural petr.
- DG-4A  $\sim 15-20\%$  in South

- North  $\sim 10-15\%$  weed cover - Same in mid

- Cont. plants showing seasonal dieback
- Native germ: CYPERA, BACSAL, ARTDOU, ISOMEN, HELCUR, Phacelia
- Nonnative germ: CONMAC, BRANIG, LEPLAT  $\sim 5-10\%$  cover
- Native cover  $\sim 45\%$ .



• Tire Wash Area

- Cont. plants healthy  
~ 5% stressed

• Native germ: ARTCAL, ACINICIA  
PSECAL, HETGIRA, ERIFAS,  
ENCAL ~ 50% cover

• Nonnative germ: BRANIC  
EROCIL ~ 2% cover

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**APPENDIX B**

Photo Documentation





Photo 1. Overview DG-4 WOUS & WOUS Connections



Photo 2. Overview DG-4 WOUS & WOUS Connections





Photo 3. Overview DG-4 WOUS & WOUS Connections



Photo 4. Overview DG-4 WOUS & WOUS Connections





Photo 5. Overview DG-4A



Photo 6. Overview DG-4A





Photo 7: Overview DG-4A



Photo 8: Overview DG-4A





Photo 9: Overview DG-4A



Photo 10: Overview Tire Wash





Photo 11: Overview Side Slopes



Photo 12: Overview Side Slopes