Appendix C.6
Sensitive Resources Report-Vegetation

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Phillips 66

Sensitive Resources Report - Vegetation

Santa Maria Refinery Project Site, Rail-Spur Modification, San Luis Obispo County, California

APNs: #092-401-011, #092-401-013, #092-411-005

February 2015

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ARCADIS

Sensitive Resources Report - Vegetation

Phillips 66
Santa Maria Refinery Project
Rail-Spur Modification

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Acronyms and Abbreviations

ARCADIS	ARCADIS U.S., Inc.
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
GPS	global positioning system
ha	hectare
km	kilometers
m	meters
Site	Phillips 66 Santa Maria Refinery Project Site
ha	hectare
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey

1 Introduction

This report provides an updated analysis of the vegetation of a portion (approximately 700 acres) of the Phillips 66 Santa Maria Refinery Project Site ("the Site"), within the South County Planning Area of San Luis Obispo County (Phillips 66, Applicant; APN #092-401-011, #092-401-013, #092-411-005). The Site is located on Highway 1 approximately five miles (8.05 km) south of the intersection of Highway 1 and Halcyon Road on the Nipomo Mesa in San Luis Obispo County, California (Figure 1). Approximately 705 acres (283.3 ha) were mapped as part of the analysis reported here. The industrially zoned site is used for cattle grazing.

The Site is bordered to the north by industrial facilities, agricultural fields, and residential housing. It is bordered to the south by agriculture, by residential development to the east, and by undeveloped coastal dunes to the west. The majority of the proposed project work is located within and east of the active refinery area. The proposed development consists of extending an existing rail spur by approximately 2,000 yards (1,829 m). The maximum width of the rail spur extension area will be approximately 90 yards (82 m). The total area of potential disturbance is expected to be approximately 41.3 acres (16.7 ha).

ARCADIS conducted an initial habitat assessment in 2012 and 2013. At that time, ARCADIS primarily employed the Holland and Keil classification system to describe vegetation types. To support the current transition to the Sawyer, Keeler-Wolf, Evens classification system, ARCADIS broadly mapped the Holland communities to the Sawyer, Keeler-Wolf, Evens Alliances, though this was not done based on quantitative data analysis. The purpose of this current 2015 analysis is to formally assess and map all vegetation types in the study area in accordance with the Sawyer, Keeler-Wolf, and Evens approach (Figure 1).

The entire study area has supported cattle grazing for decades. As a result, even the highest quality native vegetation types within the study area are degraded with significantly lower species diversity and cover than in the comparable undisturbed condition of the same vegetation types west of the Union Pacific Railroad tracks.

2 Methods

ARCADIS mapped and sampled vegetation of the Site, with focus on the proposed rail spur modification area, in October 2012, April and June 2013, and in January and February, 2015. Mary Carroll (Sr. Project Ecologist), Wayne Ferren (Project Ecologist), and Mitch Siemens (Wildlife Biologist) participated in the field surveys at various times during the assessment.

Desktop Data Search: Prior to performing the fieldwork, ARCADIS conducted a review of documents concerning the Site and the surrounding areas, including a search of the California Natural Diversity Database (CNDDB; California Department of Fish and Wildlife [CDFW] 2015) for

the U.S.G.S. 7.5 minute series Oceano topographic quadrangle and the adjacent quadrangles (Arroyo Grande NE, Guadalupe, Nipomo, Santa Maria, Tar Spring Ridge, Orcutt, Casmalia, and Pismo Beach). The California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants (CNPS 2014) was also queried for appropriate habitat within the Oceano Quadrangle and adjacent quadrangles. Aerial photographs from approximately the last twenty years were also reviewed to better understand the history of the Site.

Botanical Surveys: ARCADIS botanical surveys encompass documentation of species composition, abundance, relative distribution, and community composition (including dominants, associates, and uncommon elements). The survey is intended to characterize the vegetation types, record plant species observed (along transects for the purpose of this analysis), and ascertain the likelihood for the occurrence of sensitive species in areas not observed during the survey by ARCADIS. Physiographic features are noted and correlated with plant distributions. The survey area encompassed the proposed rail line extension options and surrounding areas, which were verified utilizing global positioning system (GPS) coordinates of the route options in the field.

All plant species found in a recognizable condition along transects during ARCADIS' vegetation surveys for this focused study were recorded and are listed in Tables 1 and 2. Nomenclature follows the Jepson Manual: Vascular Plants of California, Second Edition (Baldwin et al. 2012). In addition, pertinent volumes of the Flora of North America (Flora of North America Editorial Committee, eds. 1993+) and a regional flora (Hoover 1970) were also utilized for plant identification. It is important to note that the list of vascular plant species on the Site presented in this report may not be comprehensive.

Vegetation Mapping: ARCADIS mapped and characterized all vegetation in the study areas based on direct field observations and with aerial photograph interpretation for surrounding buffer areas. During a combination of the site visits, the entire area was walked and observed by the ARCADIS field team; vegetation boundaries were identified; waypoints for many boundaries were recorded using a Garmin eTrex GPS unit; and vegetation polygons were drawn on aerial photographs for the preparation of the expanded and revised vegetation map (Figure 1).

Vegetation was mapped at the both the community and alliance level, according to CNPS/CDFW mapping protocols described in the CNPS A Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009) and digitized using ArcGIS software. Vegetation types are characterized by using Sawyer, Keeler-Wolfe, and Evens (2009) and the California Natural Diversity Database (CNDDB 2015). Photographs were taken of all mappable units, the minimum of which approximated one acre in general, although in general the two-acre national vegetation classification standard was applied when the scale of the habitats and vegetation units were appropriate for the coarser unit.

Vegetation Sampling and Analysis: To obtain quantitative information on the vegetation types so accurate interpretation of the types can be made and facilitate a comparison of the types,

ARCADIS located at least three transects in each of the types within the proposed rail spur corridor and sensitive types in proximity of the corridor. Absolute cover and density of plant species were measured in each of 10 square-meter plots along alternate sides of each transect. The numerical data were recorded on field datasheets and subsequently entered into spreadsheets for analysis, the results of which are presented in a summary table (Table 1).

3 Vegetation Categories, Alliances and Associations

In the following sections, the vegetation categories, alliances, and associations identified at the Site are described. All descriptions follow *A Manual of California Vegetation* (Sawyer et. al. 2009) or are modified to the closest provisional association. A total of nine vegetation associations within six alliances were initially identified and mapped from three main vegetation categories, based on plant habit (tree, shrub, herbaceous). Aspects of their definitions and descriptions relevant to the Site are included.

3.1 Forests and Woodlands

According to *A Manual of California Vegetation* forest and woodlands are areas were trees are evenly distributed and conspicuous throughout the stand. In areas where vegetation cover is greater than about 20%, tree canopy may be a low as 10% over denser layers of shrub and herbaceous species. In areas where vegetation is less than 20% total cover, trees may cover somewhat less than 10% (as low as about 8%) but are evenly distributed across the stand. Only one woodland alliance was observed at the site.

3.1.1 *Salix lasiolepis* Shrubland/Woodland Alliance [Arroyo willow thickets]

In this alliance *Salix lasiolepis* is dominant or co-dominant in the shrub or tree canopy, and other trees or large shrubs may be common understory associates, including blue elderberry (*Sambucus nigra* subsp. *caerulea*) and California blackberry (*Rubus ursinus*). Arroyo willows are generally less than 30 feet (10m) in height but can form thickets of considerable size, with open to continuous canopy and a variable herbaceous layer.

Membership rules: *S. lasiolepis* occurs at greater than 50% relative cover in the shrub or tree canopy or greater than or equal to 25% absolute-cover in the shrub or tree layer.

3.2 Shrublands

Shrublands are areas where woody shrubs or subshrubs are conspicuous throughout stand. When total vegetation cover is over approximately 20%, the tree layer, if present, is generally less than 10% cover; herbaceous species may total higher cover than shrubs. Shrubs are always at least 10% cover. In areas where total vegetation cover is less than 20%, total cover of shrubs may be

less than 10%, but are evenly distributed across the stand. The following are descriptions of the alliances and associates observed on Site.

Because *Ericameria ericoides* is associated with sensitive vegetation types in *A Manual of California Vegetation* (Sawyer et. al. 2009), for the purposes of this analysis, *Ericameria ericoides* was defined as an important associate if it had a minimum of 5% mean cover in a given vegetation type.

3.2.1 *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance [Silver dune lupine – mock heather scrub]

In this alliance *Lupinus chamissonis* (silver dune lupine) and *Ericameria ericoides* (mock-heather, dune- heather) occur together or singly in the shrub canopy, along with other shrubs; associated shrubs may include coastal bush lupine (*Lupinus arboreus*), California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), poison-oak (*Toxicodendron diversilobum*). Shrub height varies from three to five feet (1 m to 1.5 m) with open to continuous canopy and an open to intermittent herbaceous layer.

Membership rules: *L. chamissonis* and *E. ericoides* are conspicuous. For the purposes of this analysis, a conspicuous species had a minimum of 5% mean cover in a given vegetation type.

Associations include the following:

> *Lupinus chamissonis – Ericameria ericoides* Association: *Lupinus chamissonis* and *Ericameria ericoides* are often co-dominant. Areas lacking mock-heather or with minor amounts can be identified as the *Lupinus chamissonis* Association.
>
> *Ericameria ericoides* Association: *Ericameria ericoides* is the dominant or sole shrub in the shrub layer.
>
> *Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association (Provisional): Shrubland dominated by three shrub species, mock-heather, seacliff buckwheat (*Eriogonum parvifolium*), and black sage.
>
> *Ericameria ericoides – Frangula californica – Sambucus nigra* Association (Provisional): Shrubland dominated by three shrub species, mock-heather, California coffeeberry (*Frangula californica*), and blue elderberry.

3.2.2 Salvia mellifera Shrubland Alliance [Black sage scrub]

Saliva mellifera (black sage) is dominant or co-dominant in the shrub canopy, usually greater than 60% or combined with a coastal shrub species greater than 30% relative cover in the shrub layer.

Membership rule: *Salvia mellifera* > 60% relative cover in the shrub canopy.

One potential association was mapped on the Site:

> *Salvia mellifera – Ericameria ericoides* Association: *Salvia mellifera* and *Ericameria ericoides* are co-dominant or *Salvia mellifera* is the dominant shrub and has at least 30% relative cover in the shrub layer. Other shrubs relatively common in this association include California sagebrush, deerweed (*Acmispon glaber*), and California coffeeberry.

3.2.3 *Baccharis pilularis* Shrubland Alliance [Coyote brush scrub]

Coyote brush (*Baccharis pilularis* subsp. *consanguinea*) is dominant in this shrubland.

Membership rule: *Baccharis pilularis* has greater than 50% absolute cover in the shrub layer; has greater than 15% shrub cover over grassy understory; or has greater than 50% relative cover than other shrubs.

> *Baccharis pilularis* Association: *Baccharis pilularis* is the sole dominant in the shrub layer.
>
> *Baccharis pilularis – Ericameria ericoides* Association (Provisional): Coyote brush and mock-heather are both common in the shrub layer.

3.3 Herbaceous Vegetation

Herbaceous vegetation is dominated by non-woody plants, including graminoid and forb species, which are dominant throughout the stand. When total vegetation cover is greater than 20%, the layers for trees, shrubs, subshrubs, and trees, if present, are of lower cover than herbaceous species and less than 10%. If total vegetation cover is less than approximately 20%, shrubs, subshrubs, and/or trees may be present, but are less than 2-5% cover and are not evenly distributed across the stand.

At the Site, the most abundant non-native weedy species dominating herbaceous semi-natural stands are Saharan mustard (*Brassica tournefortii*), veldt grass (*Ehrharta calycina*), stork's-bill filaree (*Erodium botrys*), and foxtail barley (*Hordeum murinum*).

The following herbaceous stands have been mapped on Site:

3.3.1 *Brassica* and Other Mustards Semi-Natural Herbaceous Stands [Upland mustards]

This provisional alliance is not listed - *Brassica tournefortii* (Saharan mustard) Semi-natural Herbaceous Stands (Provisional). A form of this stand type is listed for the Mojave Desert in Sawyer, Keeler-Wolf, and Evens 2009; however, the species also is reported from the Central Coast (A Flora of the Santa Barbara Region, C. Smith 1998) and occurs in disturbed (ruderal) dune habitats such as those heavily grazed at the Nipomo Mesa.

At the Site, these stands are located in areas where cattle frequent and the soil is highly disturbed. Foxtail barley, a non-native Mediterranean grass, is a common associate, as are veldt grass and stork's-bill filaree. Saharan mustard and foxtail barley are associated with areas at which hay is placed as a supplemental food source for cattle.

3.3.2 *Ehrharta* Semi-Natural Herbaceous Stands (Provisional) [Non-native veldtgrass grassland]

There is no veldt grass (*Ehrharta calycina*) Semi-Natural Herbaceous Stands vegetation type in the Manual, but this vegetation type is proposed on a provisional basis in this summary. Veldt grass is a perennial grass that has commonly invaded sandy substrates on the Central Coast.

This provisional vegetation type is loosely based on *Ammophila arenaria* Semi-Natural Herbaceous Stands (European beachgrass swards, Sawyer, Keeler-Wolf, and Evens 2009). Veldt grass is a clump-forming grass that often is more widely spaced than European beachgrass, which forms rhizomatous colonies. As a result the non-native veldtgrass vegetation type has been mapped when veldt grass is dominant and has greater than 25% relative cover in the herbaceous layer as defined above.

3.3.3 *Bromus diandrus - Erodium botrys* Semi-Natural Herbaceous Stands [Annual brome grasslands]

Bromus diandrus - Erodium botrys Semi-Natural Herbaceous Stands on Site are dominated by ripgut brome (*Bromus diandrus*) or stork's-bill filaree (*Erodium botrys*), often in sparse shrubland and heavily disturbed places at the Site. This vegetation type is characterized by a mixture of native and non-native herbaceous species in areas where the shrub cover is less than 10%. At the Site, the low shrub cover is associated with heavy grazing but generally does not include areas where cattle linger and disturb the soil repeatedly, such as feeding areas, favoring the occurrence of *Brassica tournefortii* Semi-Natural Herbaceous Stands.

4 Findings

The following plant communities observed onsite have a California state ranking of S3 or higher (S1, S2), which are considered to be "threat" ranks by the CDFW Natural Diversity Database (CDFW 2015). Five vegetation associations in two alliances are classified as sensitive (Sawyer et al. 2009).

4.1 *Salix lasiolepis* Shrubland/Woodland Alliance [Arroyo willow thickets]

One stand covering 1.3 acres (0.5 ha) is located in the southwest corner of the Site (Figure 1: Veg Classification #1). No transects were sampled in this association. This wetland vegetation type is considered sensitive by CDFW (2015). This area is entirely outside the limits of disturbance for the project.

4.2 *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance [Silver dune lupine – mock heather scrub]

Approximately 429 acres (173.6 ha) were initially mapped as this vegetation alliance. *Lupinus chamissonis* averaged 1.6% cover and *Ericameria ericoides* averaged 3.7% cover in 2015 data from seven transects in this Alliance (Table 1). Total mean vegetation cover within this alliance was 58.6%, with 47.2% cover by non-native species and 11.4% cover by native species. Total mean shrub cover averaged 8.1%, which is below the threshold for the definition of a shrubland, which requires greater than 10% shrub cover (Sawyer et al. 2009). After reclassification of two associations in this alliance (Lupinus chamissonis – Ericameria ericoides Association and Ericameria ericoides Association), 220 acres (89.0 ha) of this alliance is now mapped in the study area (Figure 1: #2).

<u>*Lupinus chamissonis – Ericameria ericoides* Association</u>: Approximately 143 acres (57.9 ha) were initially mapped as this association. *Lupinus chamissonis* averaged 3.2% cover and *Ericameria ericoides* averaged 2.8% cover in 2015 transect data from three transects (Table 1). Total mean vegetation cover was 48.9%, with 10.5% native cover and 38.4% non-native cover.

Total mean shrub cover averaged 6.4%, which is below the threshold for the definition of a shrubland, which requires greater than 10% shrub cover (Sawyer et al. 2009). Qualitative observations suggest shrub cover exceeding 10% occurs in many areas mapped as the *Lupinus chamissonis – Ericameria ericoides* Association; however, the three randomly placed transects do not meet the target for calling this vegetation a shrubland. Based on the data, these areas should be reclassified as a non-native herbaceous vegetation type, such as Non-native Veldt Grass Semi-natural Stands (veldt grass with 20.3% mean cover, 41.6% relative cover).

<u>*Ericameria ericoides* Association</u>: Approximately 65.6 acres (26.5 ha) of the vegetation type originally mapped as the *Ericameria ericoides* Association is located at the Site. Three transects

were sampled in this association. Due to the sparse cover of shrubs and dense cover of non-native herbaceous species, this vegetation type was reclassified as *Erodium botrys* Semi-Natural Herbaceous Stands (Section 4.5).

Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera Association (Provisional): This association covers approximately 220 acres (89.0 ha) on stabilized dune slopes and shallow swales within the study area (Figure 1: see #2, Figure 2). It has the most extensive coverage of any of the vegetation types on the site. Four transects were sampled in this association. *Ericameria ericoides* occurred in all transects with a mean cover of 8.2%; sea-cliff buckwheat (*Eriogonum parvifolium)* occurred in half of all transects with a mean cover of 0.3%; and black sage occurred in one transect with a mean cover of 0.7%. Total mean vegetation cover was 60.4%, with 15% native cover and 45.4% non-native cover. Total mean shrub cover was 11.2%, which meets the 10% threshold of a shrubland (Table 1). This association covers 220 acres (89.0 ha) of the Site and is considered sensitive due to the presence of *Ericameria ericoides* greater than 5%.

Ericameria ericoides – Frangula californica – Sambucus nigra Association [Provisional]: During the initial mapping, this association was mapped within a narrow, fragmented band of vegetation in proximity to a road near the southern boundary of the Site. It may represent remnant vegetation resulting from fluvial processes or the path of an old fence along which the vegetation grew. As originally mapped, the association covered approximately 2.4 acres (0.97 ha). It is highly disturbed from the impacts of cattle grazing.

One transect was sampled in this association. *Ericameria ericoides* occurred at 0.2% cover, California coffee berry at 0% cover and black elderberry at 6.6% cover. Total vegetation cover was 66.6%, with 8.7% native cover and 57.9% non-native cover. Total native shrub cover was 6.8%. Based on the data, these areas should be reclassified as a non-native herbaceous vegetation type, such as Non-native Veldt Grass (12.3% mean cover) Semi-natural Stands. Dominant non-native herbaceous species included: foxtail barley, veldt grass, and narrowleaf iceplant with percent covers of 17.3%, 12.3% and 8.2%, respectively.

4.3 Salvia mellifera Shrubland Alliance [Black sage scrub]

Salvia mellifera Shrubland Alliance [Black sage scrub]

The *Salvia mellifera* Shrubland Alliance covers approximately 154.9 acres (62.7 ha) at the Site (Figure 1: #3). Six transects were sampled in this association. Mean cover of black sage was 14.6% and mean cover for mock heather was 4.5%, less than the 5% threshold for conspicuous (see Section 3.2.1).

One potential association was mapped on the Site, the *Salvia mellifera – Ericameria ericoides* Association, which was reassigned to the *Salvia mellifera* Shrubland Alliance after transect data indicated that *Ericameria ericoides* had a mean cover of less than 5%.

Total mean vegetation cover was 63.1%, with 24.8% native cover and 38.3% non-native cover. Total mean shrub cover was 21.5%, which meets the 10% threshold of a shrubland (Table 1). Dominant non-native herbaceous species were veldt grass (19.8% cover), and stork's bill filaree (1.4%).

4.4 *Baccharis pilularis* Shrubland Alliance [Coyote brush scrub]

Areas of disturbed coastal scrub with a combination of shrub species including coyote brush and mock heather occur on the periphery of the Site (Figure 1: see #4a and #4b), and coyote brush scrub occurs in the vicinity of the stand of arroyo willow scrub. No transects were placed in coyote brush scrub due to the relatively low ecological sensitivity (Sawyer et al. 2009) and difficulty of access to disturbed areas in proximity to industrial operations.

Baccharis pilularis Association: *Baccharis pilularis* is the sole dominant in the shrub layer. It occurs as small patches in moist soil in proximity to the stand of arroyo willow scrub in the southwest corner of the Site (Figure 1: #4a). *Lupinus arboreus* (coastal dune lupine) is an occasional associate at this location.

Baccharis pilularis – Ericameria ericoides Association (Provisional): As mapped in Figure 1 (#4b), this association is generally restricted to disturbed areas in the western portion of the Site. Including the small patches of the *Baccharis pilularis* Association, the total cover approximates 14 acres (5.7 ha). California coffeeberry was an occasional associate and veldt grass can be dominant in the herbaceous cover.

4.5 Herbaceous Stands

The following Herbaceous Stands were observed on Site:

Brassica and Other Mustards Semi-Natural Herbaceous Stands

At the Site, these stands are located in areas where cattle frequent and the soil is highly disturbed. Foxtail barley, a non-native Mediterranean grass, is a common associate as are veldt grass and storkbill filaree. Approximately 29.7 acres (12.0 ha) occur on the Site distributed among several locations where cattle gather (Figure 1: see #5). Three transects were sampled in this stand. Percent mean cover of Saharan mustard was 13.5% and foxtail barley was 16.9%. These non-native species are associated with areas at which hay is placed as a supplemental food source for

cattle. Total cover by non-native herbaceous species was 71%. Storkbill filaree had 31.3% mean cover in these transects.

Ehrharta calycina Semi-Natural Herbaceous Stands (Provisional) [Non-native veldt grass grassland]

At the Site, veldt grass grassland tends to occur along dry dune ridges that virtually lack all shrub cover and with the reclassification is now mapped over approximately 176.3 acres (71.3 ha; Figure 1: see #6). Three transects were sampled in this stand. Mean cover of veldt grass was 8.9%. Total cover of non-native herbaceous species was 25%. Additional non-native species included storkbill filaree, with mean cover of 12.2%.

Erodium botrys Semi-Natural Herbaceous Stands (Provisional) [Non-native stork's-bill disturbed scrublands and waste places]

Erodium botrys Semi-Natural Herbaceous Stands cover approximately 10.5 acres (4.2 ha) in one vegetation polygon toward the west-central portion of the Site and partially within the proposed rail spur corridor (Figure 1: #7). Three transect were sampled in this stand. Total percent mean cover of storkbill filaree was 53.7% and total cover by non-native herbaceous species was 66.8%. Foxtail barley and veldt grass occurred at 4.6% and 3.3% respectively.

5 Project Impacts

The total area of potential disturbance is expected to be approximately 41 acres (16.7 h). Of that area, approximately 19.5 acres would occur within the existing refinery and coke storage area, and 27.5 acres would occur in undeveloped areas outside the existing refinery operations area. The following vegetation associations will be impacted by the development as illustrated by the limits of disturbance shown in Figure 1 the extent of each sensitive habitat is shown in Figure 2.

5.1 Sensitive Vegetation

Salix lasiolepis Shrubland/Woodland Alliance [Arroyo willow thickets]: This alliance is a type of wetland, dominated by arroyo willow, a hydrophytic species, and is considered sensitive although is given a state ranking of S4. No impacts to this area will occur.

Lupinus chamissonis – Ericameria ericoides Alliance: This alliance is given a state sensitivity ranking of S3 (Sawyer 2009, CDFW 2015) and hence the various associations within it receive this ranking, although some of these associations are provisional and listed herein because they are considered to occur on the Site. Approximately 8.4 acres (3.4 ha) of this vegetation would be impacted by the project alignment (Figure 1).

Baccharis pilularis – Ericameria ericoides Association (Provisional): Approximately 0.9 acres (0.4 ha) of this vegetation would be impacted by the current alignment of the rail spur.

5.2 Non-sensitive Vegetation

Salvia mellifera Shrubland Alliance [Black sage scrub]:
Approximately 11.3 (4.6 ha) of this non-sensitive vegetation would be impacted by the current alignment of the rail spur.

Brassica tournefortii (Saharan mustard) Semi-natural Herbaceous Stands (Provisional):
Approximately 1.1 acres (0.45 ha) of this non-sensitive vegetation would be impacted by the current alignment of the rail spur.

Ehrharta Semi-Natural Herbaceous Stands (Provisional) [Non-native veldt grass grassland]

Approximately 2.9 acres (1.2 ha) of this non-sensitive vegetation would be impacted by the current alignment of the rail spur.

Bromus diandrus - Erodium botrys Semi-Natural Herbaceous Stands: Approximately 4.4 acres (1.8 ha) of this non-sensitive vegetation would be impacted by the current alignment of the rail spur.

6 Conclusions

The study area included approximately 700 acres and employed quantitative data collection from on randomly selected transect locations. The total rail project disturbance outside the existing refinery operations area was mapped as 29 acres (11.7 ha). Of this area, a total of 9.3 acres (3.8 ha) of sensitive vegetation would be impacted by the current alignment of the rail spur. A total of 19.7 acres (8 ha) of non-sensitive vegetation would be impacted by the current alignment of the rail spur. As noted in the introduction, the entire study area has been subject to cattle grazing for decades and all of the native vegetation types are degraded.

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Tables

Table 1. Phillips Native Plant Cover and Density
Phillips 66 Sensitive Resources Report

Dominant Species		*Lupinus chamissonis – Ericameria ericoides* Association (Reclassified as Non-native Veldt Grass Semi-natural Stands)				
		Mean of Three Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Shrubs and Sub-shrub Species						
Acmispon glaber	deerweed	0.0%	0.0%	0.0%	0.0%	0.0%
Artemisia californica	California sagebrush	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	dune-heather	2.8%	2.6%	4.3%	5.6%	66.7%
Eriogonum parvifolium	coastal buckwheat, seacliff buckwheat	0.3%	0.6%	1.0%	0.7%	33.3%
Frangula californica	coffee berry	0.2%	0.3%	0.5%	0.3%	33.3%
Lupinus arboreus	coastal bush lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	3.2%	3.3%	5.6%	6.5%	66.7%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.0%	0.0%	0.0%	0.0%	0.0%
Sambucus nigra subsp. *caerulea*	elderberry	0.0%	0.0%	0.0%	0.0%	0.0%
Native Herbaceous Species						
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	0.1%	0.1%	0.2%	0.2%	66.7%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	0.0%	0.0%	0.0%	0.0%	0.0%
Calandrinia ciliata	redmaids	0.0%	0.0%	0.0%	0.0%	33.3%
Camissonia strigulosa	strigose sun cups	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.1%	0.1%	0.2%	0.2%	66.7%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%
Chorizanthe sp.	spineflower	0.0%	0.0%	0.0%	0.0%	0.0%
Corethrogyne filaginifolia	California aster	0.0%	0.0%	0.0%	0.0%	0.0%
Crassula connata	pygmy weed	0.0%	0.0%	0.0%	0.0%	0.0%
Croton californicus	California croton	0.1%	0.1%	0.2%	0.1%	33.3%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.0%	0.1%	0.1%	0.1%	33.3%
Eriophyllum multicaule	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	grassland tarweed	0.1%	0.1%	0.2%	0.1%	33.3%
Descurainia pinnata subsp. *menziesii*	Menzies' tansymustard	0.0%	0.0%	0.0%	0.0%	0.0%
Dichelostemma capitatum subsp. *capitatum*	blue dicks	0.0%	0.0%	0.0%	0.0%	0.0%
Dudleya lanceolata	lanceleaf liveforever	0.0%	0.1%	0.1%	0.1%	33.3%
Galium californicum subsp. maritimum	coastal California bedstraw	0.0%	0.0%	0.0%	0.0%	0.0%
Heterotheca grandiflora	telegraph weed	0.0%	0.0%	0.0%	0.0%	0.0%
Horkelia cuneata subsp. cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus bicolor	miniature lupine	0.2%	0.3%	0.5%	0.3%	33.3%
Lupinus nanus	sky lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Nuttallanthus texana	blue toadflax	0.0%	0.0%	0.0%	0.0%	0.0%
Plantago erecta	California plantain	0.1%	0.1%	0.1%	0.1%	33.3%
Pterostegia drymarioides	fairy mist	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	0.3%	0.5%	0.8%	0.5%	33.3%

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Dominant Species		*Lupinus chamissonis – Ericameria ericoides* Association (Reclassified as Non-native Veldt Grass Semi-natural Stands)				
		Mean of Three Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Non-native Herbaceous Species						
Avena barbata	slender wild oat	0.0%	0.0%	0.0%	0.0%	0.0%
Brassica tournefortii	Saharan mustard	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium murale	nettleleaf goosefood	0.0%	0.0%	0.0%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	0.0%	0.1%	0.1%	0.1%	33.3%
Ehrharta calycina	veldtgrass	20.3%	2.4%	4.0%	41.6%	100.0%
Erodium botrys	storkbill filaree	11.8%	20.4%	34.4%	24.1%	33.3%
Erodium cicutarium	redstem filaree	0.2%	0.2%	0.3%	0.4%	66.7%
Festuca myuros	rattail fescue	0.0%	0.1%	0.1%	0.1%	33.3%
Hordeum murinum	foxtail barley	0.6%	1.1%	1.8%	1.3%	33.3%
Hypochaeris glabra	smooth cat's ear	0.1%	0.1%	0.1%	0.1%	66.7%
Malva nicaeensis	bull mallow	0.0%	0.0%	0.0%	0.0%	0.0%
Malva parviflora	cheeseweed	0.0%	0.0%	0.0%	0.0%	0.0%
Polygonum aviculare	prostrate knotweed	0.0%	0.0%	0.0%	0.0%	0.0%
Rumex angiocarpus	sheep sorrel	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio vulgaris	common groundsel	0.0%	0.0%	0.0%	0.0%	0.0%
Spergula arvensis	corn spurry	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium sp.	clover	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica urens	annual stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%
Bare ground		15.0%	26.0%	43.8%		
Bare ground or thatch		56.1%	16.8%	28.2%		
Total cover by native species		**10.5%**	**1.7%**	**2.8%**		
Total cover by non-native species		38.4%	**22.1%**	**37.2%**		
Total vegetation cover		48.9%				
Relative cover by native species		**24.9%**	**12.2%**	**20.6%**		
Relative cover by non-native species		75.1%	**12.2%**	**20.6%**		
Total Cover by Native Shrubs and Sub-shrubs		**6.4%**	**2.0%**	**3.3%**		
Total Cover by Native Herbaceous Species		**4.1%**	**0.3%**	**0.5%**		

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Dominant Species		*Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association					*Ericameria ericoides – Frangula californica – Sambucus nigra* Association (Reclassified as Non-native Veldt Grass Semi-natural Stands)	
		Mean of Four Transects					One Transect	
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency	Mean Cover	Relative Cover
Shrubs and Sub-shrub Species								
Acmispon glaber	deerweed	0.1%	0.3%	0.3%	0.2%	25.0%	0.0%	0.0%
Artemisia californica	California sagebrush	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	dune-heather	8.2%	7.5%	8.8%	13.6%	100.0%	0.2%	0.3%
Eriogonum parvifolium	coastal buckwheat, seacliff buckwheat	0.3%	0.5%	0.6%	0.5%	50.0%	0.0%	0.0%
Frangula californica	coffee berry	0.2%	0.3%	0.4%	0.2%	25.0%	0.0%	0.0%
Lupinus arboreus	coastal bush lupine	0.0%	0.1%	0.1%	0.0%	25.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	1.8%	3.5%	4.1%	2.9%	25.0%	0.0%	0.0%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.7%	1.3%	1.5%	1.1%	25.0%	0.0%	0.0%
Sambucus nigra subsp. *caerulea*	elderberry	0.0%	0.0%	0.0%	0.0%	0.0%	6.6%	9.9%
Native Herbaceous Species								
Achillea millefolium	yarrow	0.0%	0.1%	0.1%	0.0%	25.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	0.1%	0.1%	0.1%	0.1%	25.0%	1.1%	1.7%
Calandrinia ciliata	redmaids	0.1%	0.1%	0.2%	0.2%	50.0%	0.0%	0.0%
Camissonia strigulosa	strigose sun cups	0.0%	0.1%	0.1%	0.1%	25.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.1%	0.2%	0.2%	0.2%	50.0%	0.2%	0.3%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.8%
Chorizanthe sp.	spineflower	0.2%	0.3%	0.3%	0.3%	50.0%	0.0%	0.0%
Corethrogyne filaginifolia	California aster	0.0%	0.1%	0.1%	0.0%	25.0%	0.0%	0.0%
Crassula connata	pygmy weed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Croton californicus	California croton	0.2%	0.3%	0.3%	0.3%	50.0%	0.0%	0.0%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%
Eriophyllum multicaule	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	grassland tarweed	0.5%	0.9%	1.1%	0.8%	25.0%	0.0%	0.0%
Descurainia pinnata subsp. *menziesii*	Menzies' tansymustard	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
Dichelostemma capitatum subsp. *capitatum*	blue dicks	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Dudleya lanceolata	lanceleaf liveforever	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Galium californicum subsp. maritimum	coastal California bedstraw	0.1%	0.2%	0.2%	0.1%	25.0%	0.0%	0.0%
Heterotheca grandiflora	telegraph weed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Horkelia cuneata subsp. cuneata	coast horkelia	0.1%	0.1%	0.1%	0.1%	25.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.5%	1.1%	1.3%	0.9%	25.0%	0.0%	0.0%
Lupinus bicolor	miniature lupine	0.1%	0.1%	0.1%	0.1%	25.0%	0.0%	0.0%
Lupinus nanus	sky lupine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Nuttallanthus texana	blue toadflax	0.1%	0.1%	0.1%	0.1%	25.0%	0.0%	0.0%
Plantago erecta	California plantain	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%
Pterostegia drymarioides	fairy mist	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	0.0%	0.1%	0.1%	0.0%	25.0%	0.0%	0.0%

Table 1. Phillips Native Plant Cover and Density
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Dominant Species		*Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association					*Ericameria ericoides – Frangula californica – Sambucus nigra* Association (Reclassified as Non-native Veldt Grass Semi-natural Stands)	
		Mean of Four Transects					One Transect	
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency	Mean Cover	Relative Cover
Non-native Herbaceous Species								
Avena barbata	slender wild oat	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Brassica tournefortii	Saharan mustard	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Bromus diandrus	ripgut brome	0.7%	1.3%	1.6%	1.1%	25.0%	**0.3%**	**0.5%**
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Chenopodium murale	nettleleaf goosefood	0.0%	0.0%	0.0%	0.0%	0.0%	**1.2%**	**1.7%**
Conicosia pugioniformis	narrow leaved iceplant	0.0%	0.0%	0.0%	0.0%	0.0%	**8.2%**	**12.3%**
Ehrharta calycina	veldtgrass	11.7%	6.5%	7.6%	19.3%	100.0%	**12.3%**	**18.5%**
Erodium botrys	storkbill filaree	16.6%	19.4%	22.8%	27.4%	50.0%	**0.1%**	**0.2%**
Erodium cicutarium	redstem filaree	0.5%	0.9%	1.0%	0.9%	50.0%	**0.0%**	**0.0%**
Festuca myuros	rattail fescue	0.0%	0.1%	0.1%	0.1%	25.0%	**0.0%**	**0.0%**
Hordeum murinum	foxtail barley	0.2%	0.4%	0.5%	0.3%	25.0%	**17.3%**	**26.0%**
Hypochaeris glabra	smooth cat's ear	0.1%	0.1%	0.2%	0.2%	50.0%	**0.1%**	**0.2%**
Malva nicaeensis	bull mallow	0.0%	0.0%	0.0%	0.0%	0.0%	**4.4%**	**6.6%**
Malva parviflora	cheeseweed	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Polygonum aviculare	prostrate knotweed	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Rumex angiocarpus	sheep sorrel	0.0%	0.1%	0.1%	0.0%	25.0%	**0.0%**	**0.0%**
Senecio vulgaris	common groundsel	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Spergula arvensis	corn spurry	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**0.0%**
Trifolium sp.	clover	0.0%	0.0%	0.0%	0.0%	25.0%	**0.0%**	**0.0%**
Urtica urens	annual stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%	**2.8%**	**4.2%**
Bare ground		38.5%	18.8%	22.1%			33.6%	
Bare ground or thatch		54.2%	22.6%	26.6%			44.8%	
Total cover by native species		**15.0%**	**7.1%**	**8.4%**			**8.7%**	
Total cover by non-native species		45.4%	**16.6%**	**19.5%**			57.9%	
Total vegetation cover		60.4%					66.6%	
Relative cover by native species		**23.8%**	**8.2%**	**9.6%**			**13.1%**	
Relative cover by non-native species		76.2%	**8.2%**	**9.6%**			86.9%	
Total Cover by Native Shrubs and Sub-shrubs		**11.2%**	**5.4%**	**6.3%**			**6.8%**	
Total Cover by Native Herbaceous Species		**3.8%**	**2.7%**	**3.2%**			**1.9%**	

Table 1. Phillips Native Plant Cover and Density
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Dominant Species		*Lupinus chamissonis – Ericameria ericoides* Shubland Alliance				
		Mean of Eight Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Shrubs and Sub-shrub Species						
Acmispon glaber	deerweed	0.0%	0.1%	0.1%	0.1%	0.0%
Artemisia californica	California sagebrush	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	dune-heather	3.7%	4.1%	6.9%	6.3%	100.0%
Eriogonum parvifolium	coastal buckwheat, seacliff buckwheat	0.2%	0.2%	0.3%	0.3%	0.0%
Frangula californica	coffee berry	0.1%	0.1%	0.2%	0.2%	0.0%
Lupinus arboreus	coastal bush lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	1.6%	1.6%	2.7%	2.8%	0.0%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.2%	0.4%	0.6%	0.4%	0.0%
Sambucus nigra subsp. *caerulea*	elderberry	2.2%	3.8%	6.4%	3.8%	0.0%
Native Herbaceous Species						
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	0.0%	0.1%	0.1%	0.1%	0.0%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	0.4%	0.6%	1.0%	0.7%	0.0%
Calandrinia ciliata	redmaids	0.0%	0.1%	0.1%	0.1%	0.0%
Camissonia strigulosa	strigose sun cups	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.2%	0.0%	0.1%	0.3%	100.0%
Chenopodium californicum	California goosefoot	0.2%	0.3%	0.5%	0.3%	0.0%
Chorizanthe sp.	spineflower	0.1%	0.1%	0.2%	0.1%	0.0%
Corethrogyne filaginifolia	California aster	0.0%	0.0%	0.0%	0.0%	0.0%
Crassula connata	pygmy weed	0.0%	0.0%	0.0%	0.0%	0.0%
Croton californicus	California croton	0.1%	0.1%	0.1%	0.1%	0.0%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.0%	0.0%	0.0%	0.0%	0.0%
Eriophyllum multicaule	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	grassland tarweed	0.2%	0.3%	0.4%	0.3%	0.0%
Descurainia pinnata subsp. *menziesii*	Menzies' tansymustard	0.0%	0.1%	0.1%	0.1%	0.0%
Dichelostemma capitatum subsp. *capitatum*	blue dicks	0.0%	0.0%	0.0%	0.0%	0.0%
Dudleya lanceolata	lanceleaf liveforever	0.0%	0.0%	0.0%	0.0%	0.0%
Galium californicum subsp. maritimum	coastal California bedstraw	0.0%	0.0%	0.1%	0.0%	0.0%
Heterotheca grandiflora	telegraph weed	0.0%	0.0%	0.0%	0.0%	0.0%
Horkelia cuneata subsp. cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.2%	0.3%	0.5%	0.3%	0.0%
Lupinus bicolor	miniature lupine	0.1%	0.1%	0.1%	0.1%	0.0%
Lupinus nanus	sky lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Nuttallanthus texana	blue toadflax	0.0%	0.0%	0.0%	0.0%	0.0%
Plantago erecta	California plantain	0.0%	0.0%	0.0%	0.0%	0.0%
Pterostegia drymarioides	fairy mist	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	0.1%	0.1%	0.2%	0.2%	0.0%

Table 1. Phillips Native Plant Cover and Density
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Dominant Species		*Lupinus chamissonis – Ericameria ericoides* Shubland Alliance				
		Mean of Eight Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Non-native Herbaceous Species						
Avena barbata	slender wild oat	0.0%	0.0%	0.0%	0.0%	0.0%
Brassica tournefortii	Saharan mustard	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	ripgut brome	0.3%	0.3%	0.6%	0.5%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium murale	nettleleaf goosefood	0.4%	0.7%	1.1%	0.7%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	2.7%	4.7%	8.0%	4.7%	0.0%
Ehrharta calycina	veldtgrass	14.8%	4.8%	8.1%	25.2%	100.0%
Erodium botrys	storkbill filaree	9.5%	8.5%	14.3%	16.2%	100.0%
Erodium cicutarium	redstem filaree	0.2%	0.3%	0.4%	0.4%	0.0%
Festuca myuros	rattail fescue	0.0%	0.0%	0.0%	0.0%	0.0%
Hordeum murinum	foxtail barley	6.0%	9.8%	16.4%	10.3%	100.0%
Hypochaeris glabra	smooth cat's ear	0.1%	0.0%	0.1%	0.1%	100.0%
Malva nicaeensis	bull mallow	1.5%	2.5%	4.3%	2.5%	0.0%
Malva parviflora	cheeseweed	0.0%	0.0%	0.0%	0.0%	0.0%
Polygonum aviculare	prostrate knotweed	0.0%	0.0%	0.0%	0.0%	0.0%
Rumex angiocarpus	sheep sorrel	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio vulgaris	common groundsel	0.0%	0.0%	0.0%	0.0%	0.0%
Spergula arvensis	corn spurry	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium sp.	clover	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica urens	annual stinging nettle	0.9%	1.6%	2.7%	1.6%	0.0%
Bare ground		29.0%	12.4%	20.9%		
Bare ground or thatch		51.7%	6.0%	10.2%		
Total cover by native species		**11.4%**	**3.2%**	**5.4%**		
Total cover by non-native species		47.2%	**9.8%**	**16.6%**		
Total vegetation cover		58.6%				
Relative cover by native species		**20.6%**	**6.5%**	**11.0%**		
Relative cover by non-native species		79.4%	**6.5%**	**11.0%**		
Total Cover by Native Shrubs and Sub-shrubs		**8.1%**	**2.7%**	**4.5%**		
Total Cover by Native Herbaceous Species		**3.3%**	**1.2%**	**2.0%**		

Table 1. Phillips Native Plant Cover and Density
Phillips 66 Sensitive Resources Report

Dominant Species		*Salvia mellifera – Ericameria ericoides* Association				
		Mean of Six Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Shrubs and Sub-shrub Species						
Acmispon glaber	deerweed	0.8%	1.7%	1.4%	1.2%	33.3%
Artemisia californica	California sagebrush	0.6%	0.9%	0.8%	0.9%	50.0%
Ericameria ericoides	dune-heather	4.5%	5.0%	4.1%	7.2%	100.0%
Eriogonum parvifolium	coastal buckwheat, seacliff buckwheat	0.0%	0.0%	0.0%	0.0%	0.0%
Frangula californica	coffee berry	0.9%	2.0%	1.7%	1.3%	33.3%
Lupinus arboreus	coastal bush lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.1%	0.2%	0.2%	0.2%	16.7%
Salvia mellifera	black sage	14.6%	12.5%	10.3%	23.1%	83.3%
Sambucus nigra subsp. *caerulea*	elderberry	0.0%	0.0%	0.0%	0.0%	0.0%
Native Herbaceous Species						
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	0.4%	0.6%	0.5%	0.6%	50.0%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	0.0%	0.0%	0.0%	0.0%	0.0%
Calandrinia ciliata	redmaids	0.0%	0.1%	0.1%	0.1%	16.7%
Camissonia strigulosa	strigose sun cups	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.0%	0.1%	0.1%	0.1%	33.3%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%
Chorizanthe sp.	spineflower	1.8%	2.9%	2.4%	2.9%	50.0%
Corethrogyne filaginifolia	California aster	0.0%	0.1%	0.1%	0.1%	16.7%
Crassula connata	pygmy weed	0.1%	0.1%	0.1%	0.1%	33.3%
Croton californicus	California croton	0.0%	0.0%	0.0%	0.0%	0.0%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.0%	0.0%	0.0%	0.0%	0.0%
Eriophyllum multicaule	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	16.7%
Deinandra increscens subsp. *increscens*	grassland tarweed	0.0%	0.0%	0.0%	0.0%	0.0%
Descurainia pinnata subsp. *menziesii*	Menzies' tansymustard	0.0%	0.0%	0.0%	0.0%	0.0%
Dichelostemma capitatum subsp. *capitatum*	blue dicks	0.0%	0.0%	0.0%	0.0%	16.7%
Dudleya lanceolata	lanceleaf liveforever	0.0%	0.0%	0.0%	0.0%	0.0%
Galium californicum subsp. maritimum	coastal California bedstraw	0.0%	0.0%	0.0%	0.0%	0.0%
Heterotheca grandiflora	telegraph weed	0.0%	0.0%	0.0%	0.0%	0.0%
Horkelia cuneata subsp. cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.9%	1.7%	1.4%	1.3%	50.0%
Lupinus bicolor	miniature lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus nanus	sky lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Nuttallanthus texana	blue toadflax	0.0%	0.0%	0.0%	0.0%	16.7%
Plantago erecta	California plantain	0.1%	0.2%	0.2%	0.2%	16.7%
Pterostegia drymarioides	fairy mist	0.0%	0.0%	0.0%	0.0%	16.7%
Senecio blochmaniae	dune ragwort	0.0%	0.0%	0.0%	0.0%	0.0%

Table 1. Phillips Native Plant Cover and Density
Phillips 66 Sensitive Resources Report

Dominant Species		*Salvia mellifera – Ericameria ericoides* Association				
		Mean of Six Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Non-native Herbaceous Species						
Avena barbata	slender wild oat	0.0%	0.0%	0.0%	0.0%	0.0%
Brassica tournefortii	Saharan mustard	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.7%	0.9%	0.7%	1.1%	66.7%
Chenopodium murale	nettleleaf goosefood	0.0%	0.0%	0.0%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	0.1%	0.2%	0.2%	0.1%	16.7%
Ehrharta calycina	veldtgrass	19.8%	5.6%	4.6%	31.3%	100.0%
Erodium botrys	storkbill filaree	0.7%	1.8%	1.5%	1.2%	16.7%
Erodium cicutarium	redstem filaree	1.4%	3.2%	2.6%	2.2%	33.3%
Festuca myuros	rattail fescue	0.2%	0.3%	0.2%	0.3%	50.0%
Hordeum murinum	foxtail barley	0.0%	0.0%	0.0%	0.0%	16.7%
Hypochaeris glabra	smooth cat's ear	0.4%	0.7%	0.6%	0.6%	50.0%
Malva nicaeensis	bull mallow	0.0%	0.0%	0.0%	0.0%	0.0%
Malva parviflora	cheeseweed	0.0%	0.0%	0.0%	0.0%	0.0%
Polygonum aviculare	prostrate knotweed	0.0%	0.0%	0.0%	0.0%	0.0%
Rumex angiocarpus	sheep sorrel	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio vulgaris	common groundsel	0.0%	0.0%	0.0%	0.0%	0.0%
Spergula arvensis	corn spurry	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium sp.	clover	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica urens	annual stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%
Bare ground		16.6%	17.0%	14.0%		
Bare ground or thatch		51.6%	7.0%	5.8%		
Total cover by native species		**24.8%**	**8.7%**	**7.2%**		
Total cover by non-native species		**38.3%**	**7.5%**	**6.2%**		
Total vegetation cover		**63.1%**				
Relative cover by native species		**41.8%**	**15.2%**	**12.5%**		
Relative cover by non-native species		**58.2%**	**15.2%**	**12.5%**		
Total Cover by Native Shrubs and Sub-shrubs		**21.5%**	**9.1%**	**7.5%**		
Total Cover by Native Herbaceous Species		**3.4%**	**4.9%**	**4.0%**		

Table 1. Phillips Native Plant Cover and Density
Phillips 66 Sensitive Resources Report

Dominant Species		*Brassica tournefortii* (Asian mustard) Semi-natural Herbaceous Stands				
		Mean of Three Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Shrubs and Sub-shrub Species						
Acmispon glaber	deerweed	0.0%	0.0%	0.0%	0.0%	0.0%
Artemisia californica	California sagebrush	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	dune-heather	0.0%	0.0%	0.0%	0.0%	0.0%
Eriogonum parvifolium	coastal buckwheat, seacliff buckwheat	0.0%	0.0%	0.0%	0.0%	0.0%
Frangula californica	coffee berry	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus arboreus	coastal bush lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.0%	0.0%	0.0%	0.0%	0.0%
Sambucus nigra subsp. *caerulea*	elderberry	0.0%	0.0%	0.0%	0.0%	0.0%
Native Herbaceous Species						
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	0.0%	0.0%	0.0%	0.0%	0.0%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	1.2%	2.0%	3.4%	1.5%	16.7%
Calandrinia ciliata	redmaids	0.1%	0.2%	0.3%	0.1%	16.7%
Camissonia strigulosa	strigose sun cups	0.2%	0.3%	0.5%	0.2%	16.7%
Camissoniopsis micrantha	miniature sun-cups	0.0%	0.0%	0.0%	0.0%	16.7%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%
Chorizanthe sp.	spineflower	0.6%	1.1%	1.8%	0.8%	16.7%
Corethrogyne filaginifolia	California aster	0.0%	0.0%	0.0%	0.0%	0.0%
Crassula connata	pygmy weed	0.0%	0.0%	0.0%	0.0%	0.0%
Croton californicus	California croton	0.1%	0.1%	0.1%	0.1%	16.7%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.6%	1.1%	1.8%	0.8%	16.7%
Eriophyllum multicaule	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	grassland tarweed	1.8%	1.9%	3.2%	2.4%	33.3%
Descurainia pinnata subsp. *menziesii*	Menzies' tansymustard	0.0%	0.0%	0.0%	0.0%	0.0%
Dichelostemma capitatum subsp. *capitatum*	blue dicks	0.0%	0.0%	0.0%	0.0%	0.0%
Dudleya lanceolata	lanceleaf liveforever	0.0%	0.0%	0.0%	0.0%	0.0%
Galium californicum subsp. maritimum	coastal California bedstraw	0.0%	0.0%	0.0%	0.0%	0.0%
Heterotheca grandiflora	telegraph weed	0.0%	0.0%	0.0%	0.0%	0.0%
Horkelia cuneata subsp. cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.0%	0.0%	0.0%	0.0%	16.7%
Lupinus bicolor	miniature lupine	0.3%	0.5%	0.8%	0.3%	16.7%
Lupinus nanus	sky lupine	0.4%	0.7%	1.2%	0.5%	16.7%
Nuttallanthus texana	blue toadflax	0.0%	0.0%	0.0%	0.0%	0.0%
Plantago erecta	California plantain	0.3%	0.5%	0.8%	0.4%	16.7%
Pterostegia drymarioides	fairy mist	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	0.0%	0.0%	0.0%	0.0%	0.0%

Table 1. Phillips Native Plant Cover and Density
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Dominant Species		*Brassica tournefortii* (Asian mustard) Semi-natural Herbaceous Stands				
		Mean of Three Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Non-native Herbaceous Species						
Avena barbata	slender wild oat	0.1%	0.1%	0.2%	0.1%	16.7%
Brassica tournefortii	Saharan mustard	13.5%	6.4%	10.7%	17.6%	50.0%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium murale	nettleleaf goosefood	0.0%	0.0%	0.0%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	0.0%	0.0%	0.0%	0.0%	0.0%
Ehrharta calycina	veldtgrass	4.6%	6.7%	11.3%	6.0%	50.0%
Erodium botrys	storkbill filaree	31.3%	25.9%	43.6%	40.8%	50.0%
Erodium cicutarium	redstem filaree	2.5%	2.2%	3.8%	3.3%	50.0%
Festuca myuros	rattail fescue	0.0%	0.0%	0.0%	0.0%	0.0%
Hordeum murinum	foxtail barley	16.9%	18.9%	31.8%	22.1%	33.3%
Hypochaeris glabra	smooth cat's ear	0.0%	0.0%	0.0%	0.0%	33.3%
Malva nicaeensis	bull mallow	0.0%	0.0%	0.0%	0.0%	0.0%
Malva parviflora	cheeseweed	0.0%	0.1%	0.1%	0.0%	16.7%
Polygonum aviculare	prostrate knotweed	0.0%	0.0%	0.0%	0.0%	0.0%
Rumex angiocarpus	sheep sorrel	0.1%	0.2%	0.3%	0.1%	16.7%
Senecio vulgaris	common groundsel	0.0%	0.0%	0.0%	0.0%	0.0%
Spergula arvensis	corn spurry	0.3%	0.5%	0.8%	0.4%	16.7%
Trifolium sp.	clover	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica urens	annual stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%
Bare ground		16.3%	19.9%	33.6%		
Bare ground or thatch		25.3%	13.3%	22.4%		
Total cover by native species		**5.6%**	**6.3%**	**10.6%**		
Total cover by non-native species		71.0%	**18.2%**	**30.7%**		
Total vegetation cover		76.6%				
Relative cover by native species		**8.3%**	**10.6%**	**17.9%**		
Relative cover by non-native species		91.7%	**10.6%**	**17.9%**		
Total Cover by Native Shrubs and Sub-shrubs		**0.0%**	**0.0%**	**0.0%**		
Total Cover by Native Herbaceous Species		**5.6%**	**6.3%**	**10.6%**		

Table 1. Phillips Native Plant Cover and Density
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Dominant Species		*Ehrharta calycina* Semi-Natural Herbaceous Stands				
		Mean of Three Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Shrubs and Sub-shrub Species						
Acmispon glaber	deerweed	0.1%	0.2%	0.3%	0.3%	16.7%
Artemisia californica	California sagebrush	8.0%	13.9%	23.4%	19.6%	16.7%
Ericameria ericoides	dune-heather	0.0%	0.0%	0.0%	0.0%	0.0%
Eriogonum parvifolium	coastal buckwheat, seacliff buckwheat	0.0%	0.0%	0.0%	0.0%	0.0%
Frangula californica	coffee berry	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus arboreus	coastal bush lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.0%	0.0%	0.0%	0.0%	0.0%
Sambucus nigra subsp. *caerulea*	elderberry	0.0%	0.0%	0.0%	0.0%	0.0%
Native Herbaceous Species						
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	1.7%	1.6%	2.7%	4.1%	50.0%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	0.0%	0.0%	0.0%	0.0%	0.0%
Calandrinia ciliata	redmaids	0.3%	0.4%	0.7%	0.6%	33.3%
Camissonia strigulosa	strigose sun cups	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	1.1%	2.0%	3.3%	2.8%	16.7%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%
Chorizanthe sp.	spineflower	2.9%	2.8%	4.7%	7.1%	33.3%
Corethrogyne filaginifolia	California aster	0.0%	0.0%	0.0%	0.0%	0.0%
Crassula connata	pygmy weed	0.3%	0.5%	0.8%	0.7%	16.7%
Croton californicus	California croton	0.0%	0.0%	0.0%	0.0%	16.7%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.1%	0.1%	0.1%	0.1%	16.7%
Eriophyllum multicaule	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	grassland tarweed	0.0%	0.0%	0.0%	0.0%	0.0%
Descurainia pinnata subsp. *menziesii*	Menzies' tansymustard	0.0%	0.0%	0.0%	0.0%	0.0%
Dichelostemma capitatum subsp. *capitatum*	blue dicks	0.0%	0.0%	0.0%	0.0%	0.0%
Dudleya lanceolata	lanceleaf liveforever	0.0%	0.0%	0.0%	0.0%	0.0%
Galium californicum subsp. maritimum	coastal California bedstraw	0.0%	0.0%	0.0%	0.0%	0.0%
Heterotheca grandiflora	telegraph weed	0.0%	0.0%	0.0%	0.0%	0.0%
Horkelia cuneata subsp. cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.1%	0.2%	0.3%	0.3%	16.7%
Lupinus bicolor	miniature lupine	0.3%	0.5%	0.9%	0.8%	16.7%
Lupinus nanus	sky lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Nuttallanthus texana	blue toadflax	0.0%	0.0%	0.0%	0.0%	0.0%
Plantago erecta	California plantain	1.0%	1.0%	1.8%	2.3%	50.0%
Pterostegia drymarioides	fairy mist	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	0.0%	0.0%	0.0%	0.0%	0.0%

Table 1. Phillips Native Plant Cover and Density
Phillips 66 Sensitive Resources Report

Dominant Species		*Ehrharta calycina* Semi-Natural Herbaceous Stands				
		Mean of Three Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Non-native Herbaceous Species						
Avena barbata	slender wild oat	1.2%	2.0%	3.4%	2.9%	16.7%
Brassica tournefortii	Saharan mustard	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium murale	nettleleaf goosefood	0.0%	0.0%	0.0%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	0.1%	0.2%	0.3%	0.2%	16.7%
Ehrharta calycina	veldtgrass	8.9%	8.3%	14.0%	21.7%	33.3%
Erodium botrys	storkbill filaree	12.2%	16.8%	28.3%	29.8%	50.0%
Erodium cicutarium	redstem filaree	0.8%	1.0%	1.7%	2.0%	50.0%
Festuca myuros	rattail fescue	0.1%	0.2%	0.3%	0.2%	16.7%
Hordeum murinum	foxtail barley	0.0%	0.0%	0.0%	0.0%	16.7%
Hypochaeris glabra	smooth cat's ear	0.6%	0.5%	0.9%	1.6%	50.0%
Malva nicaeensis	bull mallow	0.0%	0.0%	0.0%	0.0%	0.0%
Malva parviflora	cheeseweed	0.0%	0.0%	0.0%	0.0%	0.0%
Polygonum aviculare	prostrate knotweed	0.0%	0.0%	0.0%	0.0%	0.0%
Rumex angiocarpus	sheep sorrel	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio vulgaris	common groundsel	0.0%	0.0%	0.0%	0.0%	16.7%
Spergula arvensis	corn spurry	0.5%	0.2%	0.4%	1.3%	50.0%
Trifolium sp.	clover	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica urens	annual stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%
Bare ground		36.4%	33.2%	55.9%		
Bare ground or thatch		59.8%	11.9%	20.1%		
Total cover by native species		**15.8%**	**14.1%**	**23.8%**		
Total cover by non-native species		25.0%	**21.2%**	**35.8%**		
Total vegetation cover		40.8%				
Relative cover by native species		**42.7%**	**40.4%**	**68.2%**		
Relative cover by non-native species		57.3%	**40.4%**	**68.2%**		
Total Cover by Native Shrubs and Sub-shrubs		**8.1%**	**14.1%**	**23.7%**		
Total Cover by Native Herbaceous Species		**7.7%**	**0.1%**	**0.2%**		

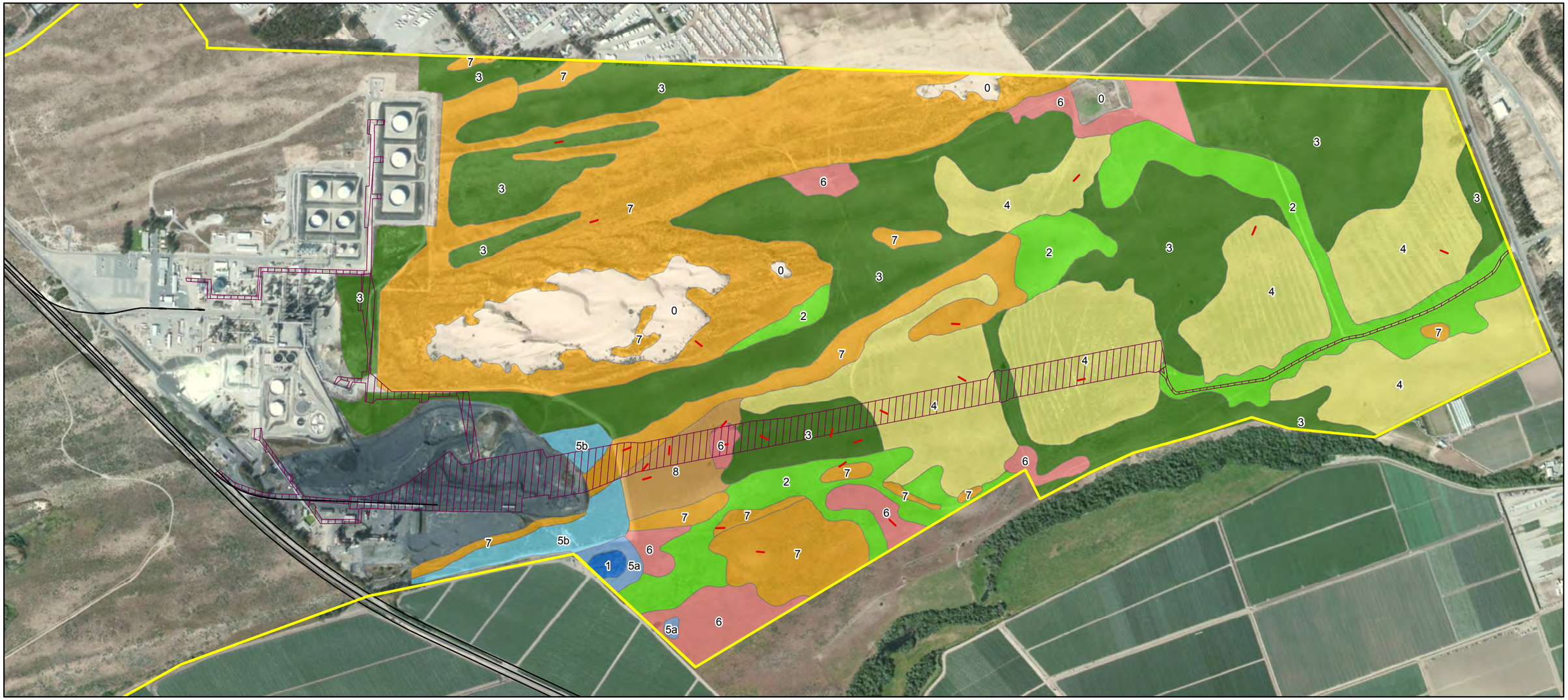
Table 1. Phillips Native Plant Cover and Density
Phillips 66 Sensitive Resources Report

Dominant Species		*Erodium botrys* Semi-Natural Herbaceous Stands (Originally mapped as *Ericameria ericoides* Association)				
		Mean of Three Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Shrubs and Sub-shrub Species						
Acmispon glaber	deerweed	0.0%	0.0%	0.0%	0.0%	16.7%
Artemisia californica	California sagebrush	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	dune-heather	3.0%	5.2%	8.8%	4.0%	16.7%
Eriogonum parvifolium	coastal buckwheat, seacliff buckwheat	0.0%	0.0%	0.0%	0.0%	16.7%
Frangula californica	coffee berry	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus arboreus	coastal bush lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.0%	0.0%	0.0%	0.0%	0.0%
Sambucus nigra subsp. *caerulea*	elderberry	0.0%	0.0%	0.0%	0.0%	0.0%
Native Herbaceous Species						
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	0.3%	0.3%	0.6%	0.4%	50.0%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	0.0%	0.0%	0.0%	0.0%	0.0%
Calandrinia ciliata	redmaids	0.4%	0.3%	0.5%	0.6%	50.0%
Camissonia strigulosa	strigose sun cups	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.2%	0.4%	0.6%	0.3%	33.3%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%
Chorizanthe sp.	spineflower	0.2%	0.3%	0.6%	0.3%	16.7%
Corethrogyne filaginifolia	California aster	0.0%	0.0%	0.0%	0.0%	0.0%
Crassula connata	pygmy weed	0.0%	0.0%	0.0%	0.0%	0.0%
Croton californicus	California croton	0.2%	0.1%	0.2%	0.2%	33.3%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.0%	0.0%	0.0%	0.0%	0.0%
Eriophyllum multicaule	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	grassland tarweed	2.3%	3.4%	5.8%	3.0%	50.0%
Descurainia pinnata subsp. *menziesii*	Menzies' tansymustard	0.0%	0.0%	0.0%	0.0%	0.0%
Dichelostemma capitatum subsp. *capitatum*	blue dicks	0.0%	0.0%	0.0%	0.0%	16.7%
Dudleya lanceolata	lanceleaf liveforever	0.0%	0.0%	0.0%	0.0%	0.0%
Galium californicum subsp. maritimum	coastal California bedstraw	0.0%	0.0%	0.0%	0.0%	0.0%
Heterotheca grandiflora	telegraph weed	0.0%	0.0%	0.0%	0.0%	16.7%
Horkelia cuneata subsp. cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus bicolor	miniature lupine	0.2%	0.1%	0.2%	0.2%	50.0%
Lupinus nanus	sky lupine	0.0%	0.0%	0.0%	0.0%	0.0%
Nuttallanthus texana	blue toadflax	0.0%	0.0%	0.0%	0.0%	0.0%
Plantago erecta	California plantain	0.7%	0.4%	0.7%	1.0%	50.0%
Pterostegia drymarioides	fairy mist	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	0.0%	0.0%	0.0%	0.0%	0.0%

Table 1. Phillips Native Plant Cover and Density
Phillips 66 Sensitive Resources Report

Dominant Species		*Erodium botrys* Semi-Natural Herbaceous Stands (Originally mapped as *Ericameria ericoides* Association)				
		Mean of Three Transects				
Scientific Name	Common Name	Mean Cover	Standard Deviation	90% Confidence Interval	Relative Cover	Frequency
Non-native Herbaceous Species						
Avena barbata	slender wild oat	0.0%	0.0%	0.0%	0.0%	0.0%
Brassica tournefortii	Saharan mustard	0.1%	0.2%	0.4%	0.2%	16.7%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium murale	nettleleaf goosefood	0.0%	0.0%	0.0%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	2.7%	4.6%	7.8%	3.6%	16.7%
Ehrharta calycina	veldtgrass	3.3%	3.2%	5.3%	4.4%	33.3%
Erodium botrys	storkbill filaree	53.7%	23.0%	38.7%	72.2%	50.0%
Erodium cicutarium	redstem filaree	0.7%	0.5%	0.9%	0.9%	50.0%
Festuca myuros	rattail fescue	0.5%	0.2%	0.4%	0.6%	50.0%
Hordeum murinum	foxtail barley	4.6%	2.2%	3.7%	6.1%	50.0%
Hypochaeris glabra	smooth cat's ear	0.2%	0.3%	0.5%	0.3%	50.0%
Malva nicaeensis	bull mallow	0.0%	0.0%	0.0%	0.0%	0.0%
Malva parviflora	cheeseweed	0.0%	0.0%	0.0%	0.0%	0.0%
Polygonum aviculare	prostrate knotweed	0.0%	0.0%	0.0%	0.0%	16.7%
Rumex angiocarpus	sheep sorrel	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio vulgaris	common groundsel	0.0%	0.0%	0.0%	0.0%	0.0%
Spergula arvensis	corn spurry	0.0%	0.1%	0.1%	0.0%	16.7%
Trifolium sp.	clover	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica urens	annual stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%
Bare ground		10.3%	17.8%	30.1%		
Bare ground or thatch		27.6%	16.9%	28.5%		
Total cover by native species		**7.5%**	**4.5%**	**7.6%**		
Total cover by non-native species		66.8%	**18.6%**	**31.4%**		
Total vegetation cover		74.3%				
Relative cover by native species		**10.8%**	**8.1%**	**13.7%**		
Relative cover by non-native species		89.2%	**8.1%**	**13.7%**		
Total Cover by Native Shrubs and Sub-shrubs		**3.0%**	**5.2%**	**8.7%**		
Total Cover by Native Herbaceous Species		**4.5%**	**2.4%**	**4.0%**		

Figures



Site Features Legend

- Property Boundary
- Existing Rail Line
- Limits of Disturbance
- Vegetation Transect

Vegetation Classification (* - Sensitive Vegetation Type)

Salix lasiolepis Shrubland/Woodland Alliance [Arroyo willow thickets]
1. *Salix lasiolepis* Association*

Lupinus chamissonis – Ericameria ericoides Shrubland Alliance [Silver dune lupine – mock heather scrub]
2. *Ericameria ericoides* Association*
3. *Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association*

4. *Salvia mellifera* Shrubland Alliance [Black sage scrub]
(Formerly *Salvia mellifera – Ericameria ericoides* Association*)

Baccharis pilularis Shrubland Alliance [Coyote brush scrub]
5a. *Baccharis pilularis* Association
5b. *Baccharis pilularis – Ericameria ericoides* Association *

Brassica and Other Mustards Semi-Natural Herbaceous Stands
6. *Brassica tournefortii* (Saharan mustard) Semi-natural Herbaceous Stands (Provisional)

Ehrharta Semi-Natural Herbaceous Stands (Provisional) [Non-native veltgrass grassland]
7. *Ehrharta calycina* Semi-Natural Herbaceous Stands (Provisional)

Erodium Semi-Natural Herbaceous Stands (Provisional)
8. *Erodium botrys* Semi-Natural Herbaceous Stands (Provisional)

0. Non-Vegetated / Unclassified

NOTES:
1. The mapped alliances and associations are based on the dominant native species. In most areas, the native plant communities are degraded and support varying but relatively high concentrations of veldt grass and other non-native species.
2. Vegetation and sensitive species mapping based on ARCADIS field surveys in October 2012, April 2013, June 2013, January 2015, and February 2015.
3. Limits of Disturbance include both temporary and permanent disturbance areas.
4. Imagery accessed through BING Maps Aerial via ArcGIS Online Layer Packages by ESRI (12/1/2010) (c) 2010 Microsoft Corporation and its data suppliers accessed on 2/18/2015 through ArcGIS 10.

N

0 800 1,600
SCALE IN FEET

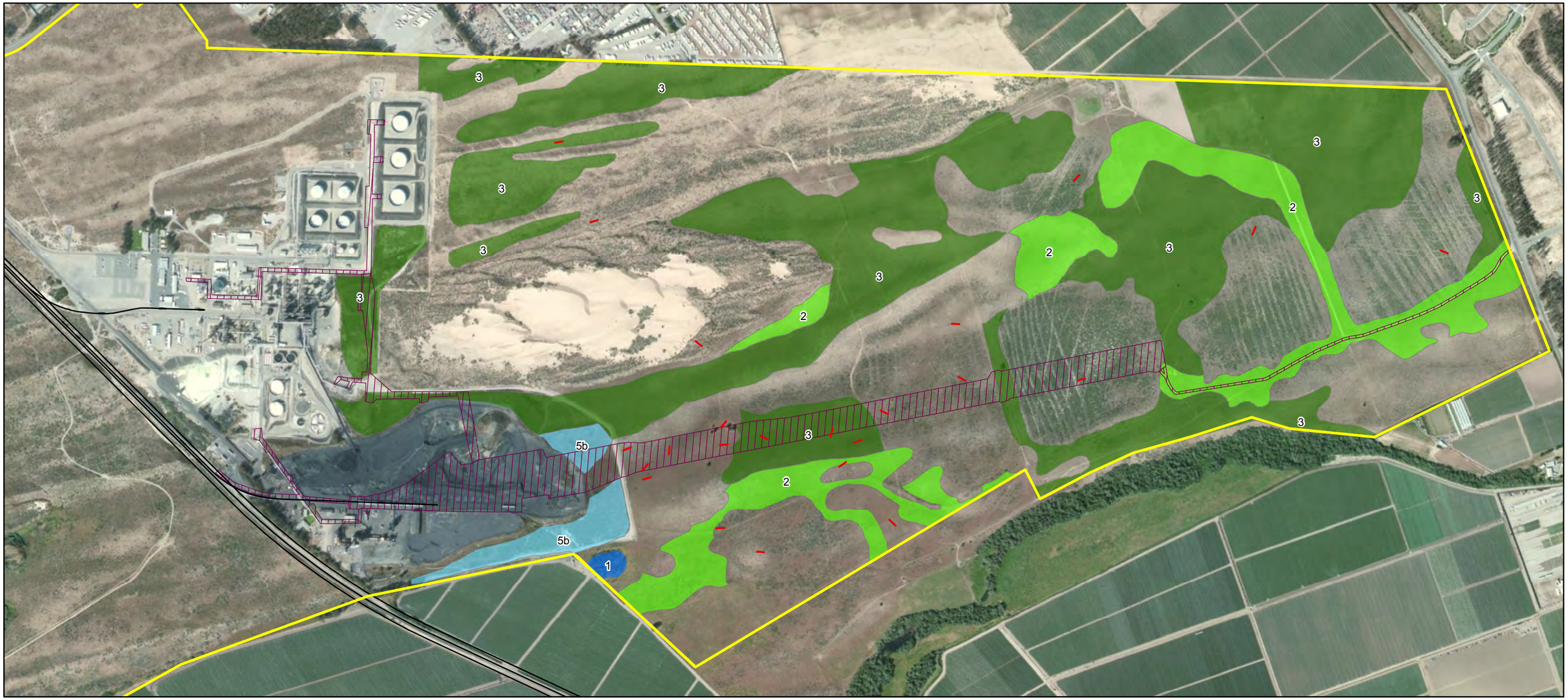
Phillips 66
Santa Maria Refinery Rail Project

EXISTING HABITATS

ARCADIS

FIGURE
1

ENV: San Luis Obispo \\corparcgis\DataArcGisData\ Z:\GISPROJECTS_ENV\Phillips66\GIS\Projects\020215\Fig 1 ExistingHabitats_SURVEYED_20150211_REVISED_20150219.mxd 2/18/2015 dffische
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet



Site Features Legend

- Property Boundary
- Existing Rail Line
- Limits of Disturbance
- Vegetation Transect

Vegetation Classification (* - Sensitive Vegetation Type)

Salix lasiolepis Shrubland/Woodland Alliance [Arroyo willow thickets]
1. *Salix lasiolepis* Association*

Lupinus chamissonis – Ericameria ericoides Shrubland Alliance [Silver dune lupine – mock heather scrub]
2. *Ericameria ericoides* Association*
3. *Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association*

Baccharis pilularis Shrubland Alliance [Coyote brush scrub]
5b. *Baccharis pilularis – Ericameria ericoides* Association *

NOTES:
1. The mapped alliances and associations are based on the dominant native species. In most areas, the native plant communities are degraded and support varying but relatively high concentrations of veldt grass and other non-native species.
2. Vegetation and sensitive species mapping based on ARCADIS field surveys in October 2012, April 2013, June 2013, January 2015, and February 2015.
3. Limits of Disturbance include both temporary and permanent disturbance areas.
4. Imagery accessed through BING Maps Aerial via ArcGIS Online Layer Packages by ESRI (12/1/2010) (c) 2010 Microsoft Corporation and its data suppliers accessed on 2/18/2015 through ArcGIS 10.

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SCALE IN FEET

Phillips 66
Santa Maria Refinery Rail Project

SENSITIVE HABITATS

ARCADIS

FIGURE
2

ENV: San Luis Obispo \\corparcgis\Data\ArcGisData\ Z:\GISPROJECTS_ENV\Phillips66\GIS\Projects\020215\Fig 2 ExistingHabitats_SURVEYED_SensitiveAssociations.mxd 2/18/2015 dffische
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

Imagine the result

Phillips 66 Company

Sensitive Resources Report – Botanical Addendum

Santa Maria Refinery Rail-Project

San Luis Obispo County, California

APNs: #092-401-011, #092-401-013, #092-411-005

July, 2015

ARCADIS

Sensitive Resources Report – Botanical Addendum

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Santa Maria Refinery Rail Project

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Project Ecologist

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Date:
July 2015

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1 Existing Habitats: Transects and Wildlife Survey Areas

Acronyms and Abbreviations

ARCADIS	ARCADIS U.S., Inc.
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
ESHA	Environmentally Sensitive Habitat
GPS	global positioning system
ha	hectare
km	kilometers
m	meters
Site	Phillips 66 Santa Maria Refinery Project Site
ha	hectare
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey

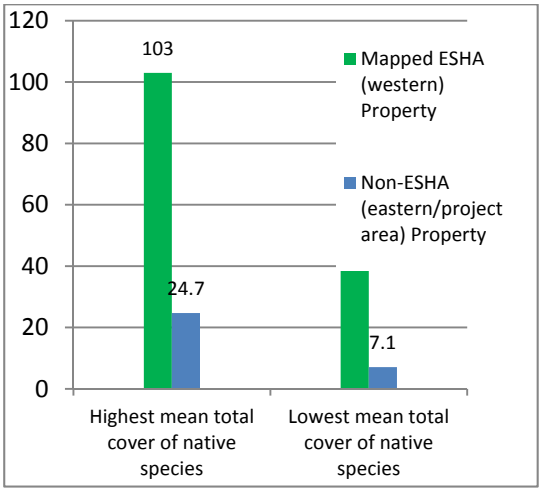
1 Executive Summary

To further evaluate vegetation types on the Phillips 66 Company (Phillips 66) property located on the Nipomo Mesa in San Luis Obispo County, California, two focused studies were completed in July, 2015: one east of the Union Pacific Railroad property that bisects the Phillips 66 property, and one west of the railroad property. These field studies addressed two objectives: (1) to compare vegetation east and west of the railroad to determine if there is equivalency of environmental sensitivity; and (2) to further evaluate the previously mapped *Saliva mellifera* Shrubland Alliance, and the relationship between *Ericameria* and *Saliva* – dominated vegetation. To accomplish the first objective, 19 new transects with 10 plots each were placed west of the railroad in vegetation mapped as Environmentally Sensitive Habitat Area (ESHA) by the County of San Luis Obispo and certified by the California Coastal Commission; and five additional transects (i.e., additional to the transects located during previous investigative efforts) with 10 plots each were located east of the railroad property, generally in the proposed rail project area, for a total of 28 transects east of the railroad property in areas of vegetation mapped previously as *Salvia mellifera* Shrubland Alliance. Plant species cover was measured in 10 plots along each transect.

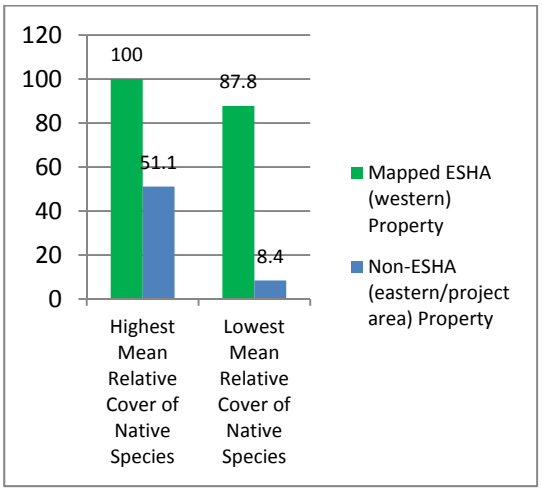
Analysis of the transect results indicates the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance west of the railroad, classified as ESHA, has significantly greater native shrub cover and overall native cover than vegetation east of the railroad, and supports colonies of locally endemic and sensitive plant species including *Erigeron blochmaniae* and *Senecio blochmaniae*. In contrast, vegetation mapped as the same *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance east of the railroad has sparser cover, in general lacks local endemic species, and is impacted by cattle grazing. Habitats west of the railroad are more complex, are less degraded, and exhibit a higher level of ecological health than vegetation types east of the railroad, which are less complex, exhibit a greater degree of degradation, and exhibit a lower level of ecological health. Results of the initial and additional studies confirm that vegetation east of the railroad is not equivalent in terms of composition or habitat function to the vegetation mapped as ESHA west of the railroad, and that the eastern area has been properly treated as non-ESHA by the County.

Significant differences in native vegetation were recorded. The first two charts below provide the overall findings for native cover in the sampled vegetation areas:

Mean Total Cover of Native Species in Surveyed Alliances and Associations

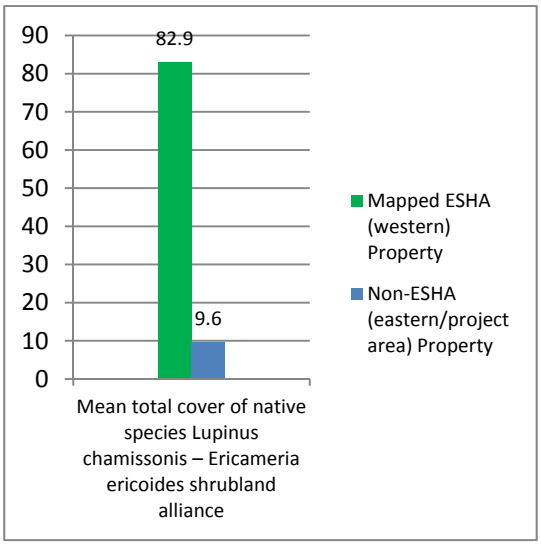


Mean Relative Cover of Native Species in Surveyed Alliances and Associations

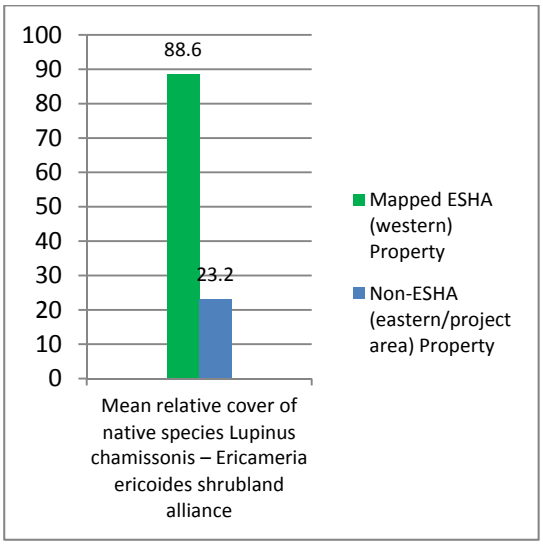


In assessing the *Lupinus chamissonis – Ericameria ericoides* shrubland alliance in mapped ESHA west of the railroad property compared to the eastern property, the data indicate a stark difference in the character and quality of the vegetation:

Mean Total Cover of Native Species in *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance



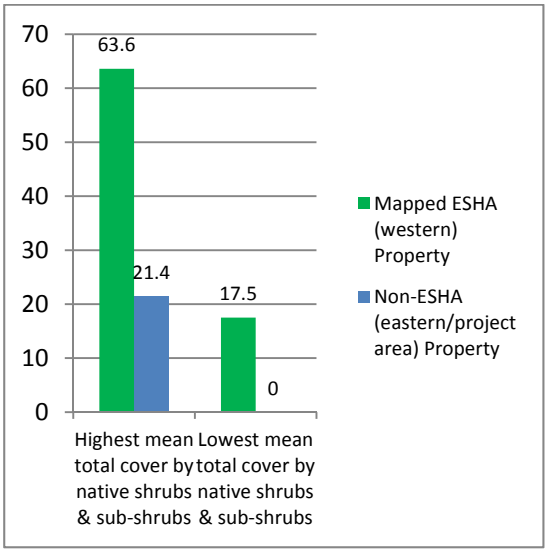
Mean Relative Cover of Native Species in *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance



ARCADIS also compared the cover by different native vegetation structural components between the mapped ESHA on the western property to the eastern property in the project

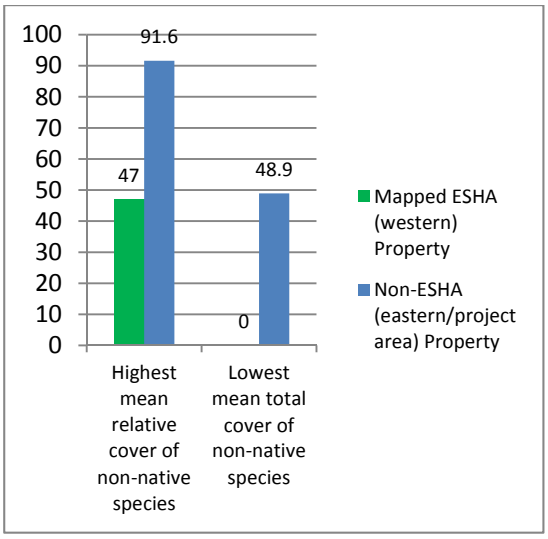
area.

Mean Total Cover by Native Shrubs and Subshrubs



ARCADIS also assessed the cover by non-native species in both areas:

Mean Relative Cover by Non-Native Species



Of additional importance regarding equivalency of environmental sensitivity between the two areas, the east side is relatively flat with consistent low topographic relief in the vicinity of the proposed rail spur corridor, whereas west of the railroad there is consistently high topographic relief, mixing of wetland and upland habitat types, and extensive areas with dynamic dune processes that provide a high degree of ecological complexity. Example habitats west of the railroad include dune crests, north and south-facing dune slopes, dune swales, dune swale wetlands, Jack Lake, and dune flats. There is significant contrast in overall ecological health and sensitivity between the two portions of the Phillips 66 property, which is a major focus of these additional studies.

Additional assessment of vegetation east of the railroad, within the heavily grazed and periodically cut vegetation, demonstrates that the *Salvia mellifera* Shrubland Alliance was previously mapped accurately, including large portions of the proposed rail spur corridor.

2 Introduction

This report serves as an addendum to the prior analyses of the vegetation of the Phillips 66 Santa Maria Refinery Rail Project Site ("the Site"). The Site is located on Highway 1 approximately five miles (8.05 km) south of the intersection of Highway 1 and Halcyon Road on the Nipomo Mesa in unincorporated San Luis Obispo County, California (Figure 1). The Site is bordered to the north by agriculture fields, industrial facilities and residential housing. It is bordered to the south by agriculture, by residential development to the east, and by undeveloped coastal dunes to the west, also a focus of the additional work reported in this Addendum.

ARCADIS conducted an initial habitat assessment in 2012 and 2013. At that time, ARCADIS primarily employed the Holland and Keil classification system to describe vegetation types. To support the current transition to the Sawyer, Keeler-Wolf, Evens classification system, ARCADIS broadly mapped the Holland communities to the Sawyer, Keeler-Wolf, Evens Alliances, though this was not done based on quantitative data analysis. In June 2015 ARCADIS conducted a quantitative assessment to formally map the vegetation types in the study area in accordance with the Sawyer, Keeler-Wolf, and Evens approach. The purpose of the additional 2015 work reported in this Addendum is two-fold: (1) to compare vegetation in mapped ESHA west of the railroad property, to the vegetation east of the railroad (generally in the project area) to determine if there is equivalency of environmental sensitivity; and (2) to further evaluate the previously mapped *Saliva mellifera* Shrubland Alliance, and the relationship between *Ericameria* and *Saliva* – dominated vegetation.

The entire study area east of the railroad tracks has supported cattle grazing for decades. As a result, even the highest quality native vegetation types within this portion of the study area are degraded with significantly lower species diversity, cover, and frequency than in the undisturbed condition of the same vegetation types west of the Union Pacific Railroad tracks, which have not

been grazed or cut. Furthermore, many areas of sensitive vegetation west of the railroad tracks have been managed for eradication of veldt grass, including use of herbicides and manual weeding of this invasive nonnative grass.

3 Methods

ARCADIS mapped and sampled vegetation of the Site, with focus on the proposed rail project area, in October 2012, in April and June 2013, in January and February 2015, and in June and July 2015. Mary Carroll (Sr. Project Ecologist), Wayne Ferren (Project Ecologist), and Mitch Siemens (Wildlife Biologist) participated in the field surveys at various times during the assessment. The fieldwork for this Addendum was performed by Wayne Ferren and Mitch Siemens on July 13 – 16, 2015 east and west of the railroad property.

Desktop Data Search: Prior to performing each of the episodes of fieldwork, ARCADIS conducted a review of documents concerning the Site and the surrounding areas, including a search of the California Natural Diversity Database (CNDDB; California Department of Fish and Wildlife [CDFW] 2015) for the U.S.G.S. 7.5 minute series Oceano topographic quadrangle and the adjacent quadrangles (Arroyo Grande NE, Guadalupe, Nipomo, Santa Maria, Tar Spring Ridge, Orcutt, Casmalia, and Pismo Beach). The California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants (CNPS 2014) was also queried for appropriate habitat within the Oceano Quadrangle and adjacent quadrangles. Aerial photographs from approximately the last twenty years were also reviewed to better understand the history of the Site.

Botanical Surveys: ARCADIS botanical surveys encompass documentation of species composition, abundance, relative distribution, and community composition (including dominants, associates, and uncommon elements). The additional survey is intended to provide further characterization of the vegetation types east and west of the railroad that bisects the property and record plant species observed (along transects for the purpose of this additional analysis). Physiographic features are noted and correlated with plant distributions. The survey area included the proposed rail extension and surrounding areas, which were verified utilizing global positioning system (GPS) coordinates in the field, and representative sites west of the railroad within the Phillips 66 property boundary. Coordinates for all additional transects were recorded using GPS and these sites are noted on Figure 1.

All plant species found in a recognizable condition along transects during ARCADIS' vegetation surveys for this focused study were recorded and are listed in Tables 1, 2, and 3. Nomenclature follows the Jepson Manual: Vascular Plants of California, Second Edition (Baldwin et al. 2012). In addition, pertinent volumes of the Flora of North America (Flora of North America Editorial Committee, eds. 1993+) and a regional flora (Hoover 1970) were also utilized for plant identification.

It is important to note that the list of vascular plant species on the Site presented in this addendum report may not be comprehensive.

Vegetation Mapping: Vegetation polygon boundaries for previously mapped vegetation in and around the proposed project area east of the railroad property were reviewed during the process of installing and measuring transects and potential boundary modifications were noted if new transect results suggested changes to the current boundaries. Vegetation types west of the railroad were quantitatively characterized, but the various vegetation types were not delineated and mapped. Except for the dune swales and other wetland habitats, the majority of the western portion of the Site would be classified within the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance. Eighteen of the 19 transects installed west of the railroad were located within this vegetation type.

During previous studies by ARCADIS (2015), vegetation was mapped at both the community and alliance levels, according to CNPS/CDFG mapping protocols described in the CNPS A Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009) and digitized using ArcGIS software. Vegetation types were characterized by using Sawyer, Keeler-Wolfe, and Evens (2009) and the California Natural Diversity Database (CNDDB 2015). Photographs were taken of all mappable units, the minimum of which was approximately one acre, although in general the two-acre national vegetation classification standard was applied when the scale of the habitats and vegetation units were appropriate for the coarser unit. Additional photographs were taken for the work associated with this addendum including at transects and sites for wildlife surveys. Representative photographs are provided in Appendix A.

Vegetation Sampling and Analysis: To obtain quantitative information on the vegetation types for an accurate characterization and comparison of areas east and west of the railroad, ARCADIS located 19 new transects west of the railroad and five additional transects east of the railroad (i.e., additional to the 23 transects located during previous investigative efforts), resulting in a total of 28 transects east of the railroad in and around the project area. Transect sites were selected to obtain representative examples of vegetation from different habitats using characteristic habitat parameters (slope, aspect, degree of wetness), vegetation types, and management treatments. Absolute cover and density of plant species were measured in each of 10 square-meter plots along alternate sides of each 20 meter transect. The numerical data were recorded on field datasheets and subsequently entered into spreadsheets for analysis, the results of which are presented in summary tables (Tables 1 -3).

West of the railroad in mapped ESHA, 19 new transects were placed in the following alliances and associations:

- *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance [upland – 18 transects]

- *Lupinus chamissonis* Association
- *Ericameria ericoides* Association
- *Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association
- *Ericameria ericoides – Prunus fasciculatus* var. *punctata* Association

- *Carex barbarae* Herbaceous Alliance [wetland – 1 transect]

East of the railroad in and around the proposed project area, an additional five transects were placed in the following alliances and associations:

- *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance [1 transect with 16 total of all included associations]
    - *Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Shrubland Alliance
- *Salvia mellifera* Shrubland Alliance [4 transects]

4 Vegetation Categories, Alliances, and Associations

In the following subsections, the vegetation categories, alliances, and associations identified at the Site are described. In some cases (e.g., *Salix lasiolepis* Shrubland/Woodland Alliance), there are no anticipated impacts to the vegetation type associated with the project, but the community characteristics are provided herein for reference to support the comparison of the vegetation in different areas of the Phillips 66 property. Survey results are discussed in Section 5. All descriptions follow *A Manual of California Vegetation* (Sawyer et. al. 2009) or are modified to the closest provisional association. A total of ten vegetation associations within seven alliances were initially identified and mapped from three main vegetation categories, based on plant habit (tree, shrub, herbaceous). Aspects of their definitions and descriptions relevant to the Site are included.

4.1 Forests and Woodlands

According to *A Manual of California Vegetation* forest and woodlands are areas where trees are evenly distributed and conspicuous throughout the stand. In areas where vegetation cover is greater than about 20%, tree canopy may be a low as 10% over denser layers of shrub and herbaceous species. In areas where vegetation is less than 20% total cover, trees may cover somewhat less than 10% (as low as about 8%) but are evenly distributed across the stand. Only one woodland alliance was observed at the site.

4.1.1 *Salix lasiolepis* Shrubland/Woodland Alliance [Arroyo willow thickets]

In this alliance *Salix lasiolepis* is dominant or co-dominant in the shrub or tree canopy, and other trees or large shrubs may be common understory associates, including blue elderberry (*Sambucus nigra* subsp. *caerulea*) and California blackberry (*Rubus ursinus*). Arroyo willows are generally less than 30 feet (10m) in height but can form thickets of considerable size, with open to continuous canopy and a variable herbaceous layer.

Membership rules: *S. lasiolepis* occurs at greater than 50% relative cover in the shrub or tree canopy or greater than or equal to 25% absolute-cover in the shrub or tree layer.

Salix lasiolepis Shrubland/Woodland Alliance occurs east of the railroad, as reported in ARCADIS (2015), and west of the railroad, as reported herein. Because the proposed rail spur corridor would not impact this vegetation, no transects were added to the various sites located west of the railroad. However, one transect was placed adjacent to a dune swale characterized by the *Salix lasiolepis* Shrubland/Woodland Alliance because an additional vegetation type, the *Carex barbarae* Herbaceous Alliance, was observed and this alliance is not known to occur on the east side of the property.

4.2 Shrublands

Shrublands are areas where woody shrubs or subshrubs are conspicuous throughout stand. When total vegetation cover is over approximately 20%, the tree layer, if present, is generally less than 10% cover; herbaceous species may total higher cover than shrubs. Shrubs are always at least 10% cover. In areas where total vegetation cover is less than 20%, total cover of shrubs may be less than 10%, but are evenly distributed across the stand. The following are descriptions of the alliances and associates observed on Site.

4.2.1 *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance [Silver dune lupine – mock heather scrub]

In this alliance, *Lupinus chamissonis* (silver dune lupine) and *Ericameria ericoides* (mock-heather, dune-heather) occur together or singly in the shrub canopy, along with other shrubs; associated shrubs may include coastal bush lupine (*Lupinus arboreus*), California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), and poison-oak (*Toxicodendron diversilobum*). Shrub height varies from three to five feet (1m to 1.5 m) with open to continuous canopy and an open to intermittent herbaceous layer.

Membership rules: *L. chamissonis* and/or *E. ericoides* are conspicuous. The manual does not define the term "conspicuous." For the purposes of this analysis, a "conspicuous" species was conservatively defined as having a minimum of 5% mean cover in a given vegetation type.

Associations include the following:

> *Lupinus chamissonis – Ericameria ericoides* Association: *Lupinus chamissonis* and *Ericameria ericoides* are often co-dominant. Areas lacking mock-heather or with minor amounts can be identified as the *Lupinus chamissonis* Association.
>
> *Ericameria ericoides* Association: *Ericameria ericoides* is the dominant or sole shrub in the shrub layer.
>
> *Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association (Provisional): Shrubland dominated by three shrub species, mock-heather, seacliff buckwheat (*Eriogonum parvifolium*), and black sage.
>
> *Ericameria ericoides – Frangula californica – Sambucus nigra* Association (Provisional): Shrubland dominated by three shrub species, mock-heather, California coffeeberry (*Frangula californica*), and blue elderberry.
>
> *Ericameria ericoides – Prunus fasciculata var. punctata* Association (Provisional): Shrubland dominated by two shrub species mock-heather (Ericameria ericoides) and desert almond (*Prunus fasciculata* var. *punctata*, a coastal form of the species).

4.2.2 Salvia mellifera Shrubland Alliance [Black sage scrub]

Saliva mellifera (black sage) is dominant or co-dominant in the shrub canopy, usually greater than 60% or combined with a coastal shrub species greater than 30% relative cover in the shrub layer.

4.2.3 *Baccharis pilularis* Shrubland Alliance [Coyote brush scrub]

Coyote brush (*Baccharis pilularis* subsp. *consanguinea*) is dominant in this shrubland.

Membership rule: *Baccharis pilularis* has greater than 50% absolute cover in the shrub layer; has greater than 15% shrub cover over grassy understory; or has greater than 50% relative cover than other shrubs.

Baccharis pilularis Association: *Baccharis pilularis* is the sole dominant in the shrub layer.

Baccharis pilularis – Ericameria ericoides Association (Provisional): Coyote brush and mock-heather are both common in the shrub layer.

4.3 *Herbaceous Vegetation*

Herbaceous vegetation is dominated by non-woody plants, including graminoid and forb species, which are dominant throughout the stand. When total vegetation cover is greater than 20%, the layers for trees, shrubs, subshrubs, and trees, if present, are of lower cover than herbaceous species and less than 10%. If total vegetation cover is less than approximately 20%, shrubs, subshrubs, and/or trees may be present, but are less than 2-5% cover and are not evenly distributed across the stand.

At the Site, the most abundant non-native weedy species dominating herbaceous semi-natural stands are Saharan mustard (*Brassica tournefortii*), veldt grass (*Ehrharta calycina*), *Erodium botrys* (stork's-bill filaree), and foxtail barley (*Hordeum murinum*).

The following herbaceous stands have been mapped on Site:

4.3.1 *Brassica* and Other Mustards Semi-Natural Herbaceous Stands [Upland mustards]

This provisional alliance is not listed - *Brassica tournefortii* (Saharan mustard) Semi-natural Herbaceous Stands (Provisional). A form of this stand type is listed for the Mojave Desert in Sawyer, Keeler-Wolf, and Evens 2009); however, the species also is reported from the Central Coast (A Flora of the Santa Barbara Region, C. Smith 1998) and occurs in disturbed (ruderal) dune habitats such as those heavily grazed at the Nipomo Mesa.

At the Site, foxtail barley, a non-native Mediterranean grass, is a common associate, as are veldt grass and stork's-bill filaree. Saharan mustard and foxtail barley are associated with areas at which hay is placed as a supplemental food source for cattle.

4.3.2 *Ehrharta* Semi-Natural Herbaceous Stands (Provisional) [Non-native veldtgrass grassland]

There is no veldt grass (*Ehrharta calycina*) Semi-Natural Herbaceous Stands vegetation type in the Manual, but this vegetation type is proposed on a provisional basis in this summary. Veldt grass is a perennial grass that has invaded sandy substrates on the Central Coast.

This provisional vegetation type is based on the *Ammophila arenaria* Semi-Natural Herbaceous Stands (European beachgrass swards, Sawyer, Keeler-Wolf, and Evens 2009). Veldt grass is a clump-forming grass that often is more widely spaced than European beachgrass, which forms rhizomatous colonies. As a result the non-native veldt grass vegetation type has been mapped when veldt grass is dominant and has greater than 25% relative cover in the herbaceous layer as defined above.

4.3.3 *Bromus diandrus - Erodium botrys* Semi-Natural Herbaceous Stands [Annual brome grasslands]

Bromus diandrus - Erodium botrys Semi-Natural Herbaceous Stands on Site are dominated by ripgut brome (*Bromus diandrus*) or *Erodium botrys* (stork's-bill filaree), often in sparse shrubland and heavily disturbed places at the Site. This vegetation type is characterized by a mixture of native and non-native herbaceous species in areas where the shrub cover is less than 10%. At the Site, the low shrub cover is associated with heavy grazing but generally does not include areas where cattle linger and disturb the soil repeatedly, such as feeding areas, favoring the occurrence of *Brassica tournefortii* Semi-Natural Herbaceous Stands.

5 Findings

The findings below are organized based on the objectives of assessing the characteristic and functional equivalency of the habitats and vegetation west and east of the railroad property that bisects the Site, and of confirming the characterization and mapping of the *Saliva mellifera* Shrubland Alliance on Site.

5.1 *Equivalency of Environmental Sensitivity West and East of the Railroad*

Mapped ESHA - Habitats and Vegetation West of the Railroad: Habitats west of the railroad are characteristic of high-quality dune environments in coastal central California. Observed habitats include dune crests, north and south-facing dune slopes, dune swales, dune swale wetlands, and dune flats. Dynamic, characteristic coastal processes are also present. Ecologically healthy, native vegetation types with characteristic native plant cover, consistent presence of local endemic and sensitive species dominate the landscape. Land management in this area has eliminated off-road vehicle (ORV) usage and included weed eradication to restore the historic degradation from the ORV usage.

Transect data from the mapped ESHA that occurs west of the railroad (Table 1), reveal the following:

- Mean total cover of native species in alliances and associations west of the railroad ranges from 52.3% to 103%, ***significantly greater (higher) than east of the railroad.*** Mean total cover in ESHA areas (west of the railroad) ranges from 400% - 700% higher than in the study areas east of the railroad tracks and refinery.
- Mean relative cover of native species in alliances and associations west of the railroad ranges from 87.8% to 100%, ***significantly greater (higher) than east of the railroad.*** Mean relative cover in ESHA areas (west of the railroad) ranges from 1000% - 2000% higher than in the study areas east of the railroad tracks and refinery.
- Mean total cover of native species in the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance (16 transects) west of the railroad is 82.9% and mean relative cover is 88.6%, ***significantly greater (higher) than east of the railroad.*** Mean native cover in ESHA areas (west of the railroad) supporting this alliance ranges from 400% - 900% higher than in the study areas east of the railroad tracks and refinery.
- Mean total cover by native shrubs and subshrubs (19 transects) west of the railroad ranges from 17.5% to 63%, and within dune scrub from 20.1% to 63%, ***significantly greater (higher) than east of the railroad.*** Mean total cover by native shrubs and subshrubs in ESHA areas (west of the railroad) ranges from 300% - 1700% higher than in the study areas east of the railroad tracks and refinery.
- Mean total cover by native herbaceous species (19 transects) west of the railroad ranges from 9% to 63.6%, ***significantly greater (higher) than east of the railroad.*** Mean total cover by native herbaceous species in ESHA areas (west of the railroad) ranges from 900% - 1300% higher than in the project areas east of the railroad tracks and refinery.
- Mean total and relative cover of nonnative species (19 transects) west of the railroad ranges from 0% to 47%; the high cover percent is characteristic of sites where there is no eradication of nonnative species; this is ***significantly less weed cover than east of the railroad.***
- Mean cover by sensitive plant species west of the railroad:
    - *Erigeron blochmaniae* (CNPS list 1B.2: rare, threatened, or endangered; endemic to California): 0.2% mean cover (range 4.2% - 15%) cover in dune scrub transects; ***not present on transects east of the railroad.***
    - *Erysimum suffrutescens* (CNPS list 4.2 – limited distribution; local concern species): 0.2% mean cover (range 0 – 0.8%) cover 16 in dune scrub transects; ***not present in transects east of the railroad.***
    - *Prunus fasciculata* var. *punctata* (CNPS list 4.3 – limited distribution; local concern species): 5% mean cover (range 0% - 21%) in 16 dune scrub transects; **not present in transects east of the railroad.**
    - *Senecio blochmaniae* (CNPS list 4.2 – limited distribution; local concern species): 6% mean cover (range 0% to 15%) in 16 dune scrub transects; ***significantly greater (higher) cover than east of the railroad.***

These results demonstrate that vegetation west of the railroad has high cover of native species and low cover of nonnative species; has characteristic shrub cover by native dune shrub species; and supports sensitive plant species known to occur in dune habitats of the region. The complex array of habitats, presence of characteristic dynamic coastal processes, connectivity with large contiguous open space areas, and observed high ecological health differ significantly, both quantitatively and qualitatively, from that which is found on the east side of the railroad.

Habitats and Vegetation East of the Railroad: Habitats east of the railroad are highly degraded due to long-term cattle grazing, fragmentation by a series of roads, vegetation cutting, and placement of straw bales for cattle containing invasive weed species that now dominate large areas of the landscape. Much of the vegetation is uncharacteristically sparse and in some sites is dominated by non-native, invasive herbaceous species classified as the *Brassica tournefortii* (Saharan Mustard) Herbaceous Alliance, *Erodium botrys* (Storksbill) Herbaceous Alliance, and the *Ehrharta calycina* (Veldtgrass) Herbaceous Alliance vegetation types (ARCADIS 2015).

On the eastern portion of the Phillips66 property, transect data for the mapped *Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association (within the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance (Table 2 and 3; ARCADIS 2015) has sparse cover compared to similar vegetation west of the railroad. It includes many nonnative herbaceous species and in general lacks the presence or has low cover of sensitive local endemic plant species (ARCADIS 2015).

Also within and in proximity to the rail spur corridor (Figure 1), the *Salvia mellifera* Shrubland Alliance is grazed, partially cut, and fragmented by unpaved roads. As noted in ARCADIS (2015), this vegetation type is not considered sensitive and lacks locally-endemic plant species. *Salvia mellifera* Shrubland Alliance was not observed west of the railroad and was not identified among the 19 transects placed on west of the railroad.

Transect data east of the railroad (Tables 2 & 3) reveal the following:

- Mean total cover of native species in alliances and associations ranges from 7.1% to 24.7%, ***significantly less than the west side*.**
- Mean relative cover of native species in alliances and associations ranges from 8.4% to 51.1 %, ***significantly less than the west side*.**
- Mean total cover of native species in the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance (9 transects) is 9.6% and mean relative cover is 23.2%, ***significantly less than the west side.***
- Mean total cover by native shrubs and subshrubs in alliances and associations (28 transects) ranges from 0% to 21.4%, ***significantly less than the west side*.**

- Mean total cover by native herbaceous species in alliances and associations (28 transects) ranges from 0.7% to 7.4%, ***significantly less than the west side.***
- Mean total and relative cover of nonnative species in alliances and associations (28 transects) ranges from 48.9% to 91.6%, ***significantly higher non-native cover than the west side.***
- Mean cover by sensitive plant species:
    - *Erigeron blochmaniae* (CNPS list 1B.2: rare, threatened, or endangered; endemic to California): ***not present in the 28 transects***
    - *Erysimum suffrutescens* (CNPS list 4.2 – limited distribution; local concern species): ***not present in the 28 transects***
    - *Prunus fasciculata* var. *punctata* (CNPS list 4.3 – limited distribution; local concern species): ***significantly less than west of the railroad.***

Additional transects east of the railroad installed and measured in July 2015 (Figure 1, Tables 2 & 3) support the findings reported previously in ARCADIS (2015) and are consistent with the above statements regarding the findings of vegetation surveys east of the railroad. Because previous surveys east of the railroad were conducted during wet season conditions, native annual species were observed that did not appear on transects east or west of the railroad in July. Continuing drought conditions also may have influenced some of the findings. Nonetheless, the significantly lower cover of native species and higher cover of nonnative species, and the general lack of sensitive plant species demonstrated that the habitats and vegetation east of the railroad property are not equivalent to, and lack the environmental sensitivity of the habitats and vegetation west of the railroad tracks.

5.2 *Presence of Salvia mellifera Shrubland Alliance*

As noted in Table 3, four transects were placed in polygons previously mapped as the *Salvia mellifera* Shrubland Alliance east of the railroad, including sites within and outside of the proposed rail spur corridor, to confirm the presence of this alliance as reported previously (ARCADIS 2015). Results of the additional transects include the mean cover of *S. mellifera* at 33.3%, with a relative cover of native shrubs at 74.6%. Mean cover of *Ericameria ericoides* was less than 5% (3.8%), indicating this vegetation does not meet the criteria to include *E. ericoides* within the classification nomenclature. As reported in ARCADIS (2015), the mean cover of *E. ericoides* in the *Salvia mellifera* Shrubland Alliance was calculated at 4.5%, also less than the 5% cover required for inclusion in the vegetation name as having a “conspicuous” presence. No sites sampled west of the railroad fit the criteria of the *Salvia mellifera* Shrubland Alliance. Other than wetland vegetation associated with some dune swales, all upland vegetation west of the railroad was determined to

belong to various associations within the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance.

5.3 *Comparison of Salvia mellifera and Ericameria ericoides-dominated Areas East and West of the Railroad*

A part of the evaluation of the presence of the *Salvia mellifera* Shrubland Alliance east of the railroad is a consideration of the relationship of this vegetation to types with a conspicuous presence of *Ericameria ericoides* (5% or greater cover), which could require treatment of the vegetation as a sensitive community.

As noted above, on the property east of the railroad, extensive areas of vegetation mapped as *Salvia mellifera* Shrubland Alliance (Figure 1) support less than 5% *E. ericoides* and hence are not considered sensitive per the CNDDB listings (ARCADIS 2015). Other areas are mapped in one of several associations within the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance because in part *E. ericoides* has a conspicuous presence including two areas that overlap with the proposed rail project footprint. Boundaries between these two types of vegetation are often transitional because small patches meeting the criteria of one type are often intergraded in the other type. ARCADIS mapped this vegetation at the two-acre minimum scale based on representative quantitative transect data, resulting in relatively large areas of similar vegetation within the same mapped polygon.

A second comparison can be made in regards to the presence of *E. ericoides*-dominated vegetation both east and west of the railroad, which also contributes to the discussion of environmental sensitivity. West of the railroad, vegetation associations within the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance exhibit a maximum cover of 48.6% and a combined mean cover of 21.6% *E. Ericameria* (16 transects), and a total native cover of 82.9%. East of the railroad, vegetation associations within the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance exhibit a maximum mean cover of 20% and a combined mean cover of 4.5% *E. ericoides*, and a total mean native cover of 9.6%. Clearly, not all examples of *Ericameria*-dominated vegetation are the same or have the same ecological health or environmental sensitivity. The information and analysis presented as a result of the previous and additional vegetation surveys demonstrate that the overall condition of surveyed areas east of the railroad within the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance are not equivalent to the same plant community in mapped ESHA areas west of the railroad property.

6 Conclusions

As detailed in Sections 5.0, the results of new vegetation sampling and analysis demonstrate that the vegetation on the Phillips 66 property west of the railroad is characterized by the following:

- a complex topography and dynamic terrain with many habitat types including sensitive upland (active and semi-stabilized dunes) and wetland types;
- no grazing or vegetation cutting as part of the management strategy; upland vegetation classified mostly as the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance, including several vegetation associations;
- low cover of invasive nonnative plants;
- a relatively high cover of native shrubs and total native cover in the sensitive dune environment;
- a relatively high frequency of locally-endemic, sensitive plant species among the upland transects sampled;
- connectivity to other coastal environments potentially important for the movement and maintenance of native wildlife associated with the Nipomo Mesa; and
- focused eradication of veldt grass.

In contrast, the results of additional vegetation sampling and analysis demonstrate that the vegetation on the Phillips 66 property east of the railroad tracks is highly degraded and does not provide comparable ecological characteristics or functions as indicated by the following:

- a relatively low and generally stable terrain with few habitat types;
- heavy, long-term cattle grazing and periodic cutting of portions of the vegetation as part of the management strategy;
- no focused eradication of veldtgrass over most of the site;
- high cover of invasive nonnative plants including several herbaceous vegetation alliances, and particularly as part of the groundcover of some of the shrubland alliances;
- relatively low cover of native shrubs in portions of the upland vegetation;
- a relatively low frequency of locally-endemic, sensitive plant species among the upland transects sampled;
- an isolated situation relative to other coastal environments, potentially impacting the movement and maintenance of native wildlife associated with the Nipomo Mesa; and
- upland vegetation classified mostly as non-sensitive types including the *Salvia mellifera* Shrubland Alliance.

ARCADIS concludes that the west side of the Phillips 66 property differs significantly, both quantitatively and qualitatively, from that which is found on the east side of the railroad.

7 References

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Tables

Dominant Species		*Lupinus chamissonis – Ericameria ericoides* Association Transects						
		% cover (mean)						
Scientific Name	Common Name	T5-W	T8-W	T13W	T16-W	T17-W	T18-W	Mean of 6 Transects
		Shrubs and Sub-shrub Species						
Acmispon glaber	deerweed	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%	0.3%
Artemisia californica	California sagebrush	0.0%	0.0%	0.0%	0.0%	29.6%	0.0%	4.9%
Artemisia dracunculus	tarragon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	mock-heather	40.5%	22.7%	14.5%	28.3%	22.9%	48.6%	29.6%
Eriogonum parvifolium	seacliff buckwheat	12.8%	7.0%	0.0%	15.0%	0.0%	0.0%	5.8%
Frangula californica	California coffeeberry	0.0%	0.0%	0.0%	0.0%	0.0%	60.0%	10.0%
Lupinus chamissonis	silver dune lupine	41.7%	17.3%	0.0%	0.0%	0.0%	0.0%	9.8%
Prunus fasciculatus var. punctata	desert almond	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%	1.7%
Salix lasiolepis	arroyo willow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Native Herbaceous Species						
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	3.0%	0.0%	0.0%	0.5%
Calandrinia ciliata	redmaids	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carex praegracilis	clustered field sedged	0.0%	0.0%	3.0%	3.0%	3.0%	0.0%	1.5%
Carex barbarae	Santa Barbara sedge	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cardionema ramosissimum	sandmat	0.0%	0.0%	3.0%	0.0%	2.0%	2.0%	1.2%
Castilleja affinis	Indian paintbrush	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%
Castilleja exserta	owl's clover	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.3%
Chorizanthe diffusa	spineflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cirsium occidentale	cobweb thistle, western thistle	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Corethrogyne filaginifolia	California aster	0.0%	5.0%	10.8%	4.3%	6.8%	5.0%	5.3%
Croton californicus	California croton	0.0%	0.0%	5.0%	0.0%	25.0%	5.0%	5.8%
Deinandra increscens subsp. *increscens*	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Dudleya lanceolata	blue dicks	0.0%	0.0%	2.0%	2.0%	2.5%	0.0%	1.1%
Erigeron blochmaniae	Blochman's erigeron, Blochman's leafy daisy	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erysimum suffrutescens	suffrutescent wallflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Horkeia cuneata var cuneata	coast horkelia	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Lastarriaea coriacea	leather spineflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Linanthus californicus	prickly phlox	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%
Melica imperfecta	Coast Range melic	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	0.0%	50.0%	0.0%	5.0%	9.0%	0.0%	10.7%
Stephanomeria virgata	virgate stephanomeria	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica dioica	stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Dominant Species		*Lupinus chamissonis – Ericameria ericoides* Association Transects						
		% cover (mean)						
Scientific Name	Common Name	T5-W	T8-W	T13W	T16-W	T17-W	T18-W	Mean of 6 Transects
		Non-native Herbaceous Species						
Ammophila arenaria	European beach grass	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	3.4%	0.0%	0.0%	0.6%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.8%
Ehrharta calycina	veldtgrass	4.1%	3.8%	11.9%	3.7%	3.5%	11.6%	6.4%
Festuca myuros	rattail fescue	0.0%	0.0%	0.0%	4.0%	0.0%	0.0%	0.7%
Bare ground		37.2%	31.9%	47.4%	50.3%	59.8%	28.8%	42.6%
Bare ground or thatch		61.9%	88.1%	78.9%	63.0%	71.2%	40.1%	67.2%
Total cover by native species		**107.0%**	**112.0%**	**40.3%**	**60.6%**	**100.8%**	**122.6%**	**90.6%**
Total cover by non-native species		**107.0%**	**112.0%**	**38.3%**	11.1%	3.5%	16.6%	**48.1%**
Relative cover by native species		**107.0%**	**112.0%**	**38.3%**	**84.5%**	**96.6%**	**88.1%**	**87.8%**
Relative cover by non-native species		**109.0%**	**112.0%**	**38.3%**	15.5%	3.4%	11.9%	**48.3%**
Total Cover by Native Shrubs and Sub-shrubs		**68.5%**	**89.3%**	**20.8%**	**43.3%**	**52.5%**	**108.6%**	**63.8%**
Total Cover by Native Herbaceous Species		**55.7%**	**82.3%**	**23.8%**	**17.3%**	**48.3%**	**14.0%**	**40.2%**

Dominant Species		*Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association							*Ericameria ericoides – Prunus fasciculata* Association	
		% cover (mean)								
Scientific Name	Common Name	T6-W	T7-W	T9-W	T12-W	T15-W	T19-W	Mean of 6 Transects	T14-W	Mean of 1 Transects
		Shrubs and Sub-shrub Species								
Acmispon glaber	deerweed	0.0%	0.0%	0.0%	3.0%	0.0%	15.0%	3.0%	0.0%	0.0%
Artemisia californica	California sagebrush	0.0%	29.6%	0.0%	0.0%	0.0%	0.0%	4.9%	0.0%	0.0%
Artemisia dracunculus	tarragon	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	mock-heather	12.4%	27.5%	27.4%	39.0%	20.2%	36.0%	27.1%	22.0%	22.0%
Eriogonum parvifolium	seacliff buckwheat	0.0%	0.0%	0.0%	0.0%	0.0%	29.2%	4.9%	0.0%	0.0%
Frangula californica	California coffeeberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Prunus fasciculatus var. punctata	desert almond	0.0%	12.4%	0.0%	0.0%	0.0%	0.0%	2.1%	21.3%	21.3%
Salix lasiolepis	arroyo willow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	40.8%	49.0%	0.0%	21.7%	0.0%	0.0%	18.6%	0.0%	0.0%
		Native Herbaceous Species								
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	5.0%	0.0%	0.8%	0.0%	0.0%
Calandrinia ciliata	redmaids	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%
Carex praegracilis	clustered field sedged	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carex barbarae	Santa Barbara sedge	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cardionema ramosissimum	sandmat	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	3.3%	0.0%	0.0%
Castilleja affinis	Indian paintbrush	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Castilleja exserta	owl's clover	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	3.0%
Chenopodium californicum	California goosefoot	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%
Chorizanthe diffusa	spineflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cirsium occidentale	cobweb thistle, western thistle	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	0.5%	0.0%	0.0%
Corethrogyne filaginifolia	California aster	0.0%	15.0%	0.0%	1.0%	9.0%	0.0%	4.2%	5.0%	5.0%
Croton californicus	California croton	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Dudleya lanceolata	blue dicks	1.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.5%	0.0%	0.0%
Erigeron blochmaniae	Blochman's erigeron, Blochman's leafy daisy	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.2%	0.0%	0.0%
Erysimum suffrutescens	suffrutescent wallflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Horkeia cuneata var cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Linanthus californicus	prickly phlox	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Melica imperfecta	Coast Range melic	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	3.0%	5.0%	3.0%	10.0%	5.0%	8.3%	5.7%	0.0%	0.0%
Stephanomeria virgata	virgate stephanomeria	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica dioica	stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Dominant Species		*Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association							*Ericameria ericoides – Prunus fasciculata* Association	
		% cover (mean)								
Scientific Name	Common Name	T6-W	T7-W	T9-W	T12-W	T15-W	T19-W	Mean of 6 Transects	T14-W	Mean of 1 Transects
		Non-native Herbaceous Species								
Ammophila arenaria	European beach grass	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	2.5%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%
Conicosia pugioniformis	narrow leaved iceplant	0.0%	1.0%	0.0%	5.0%	0.0%	0.0%	1.0%	0.0%	0.0%
Ehrharta calycina	veldtgrass	6.0%	2.3%	30.0%	7.7%	4.6%	2.0%	8.8%	0.0%	0.0%
Festuca myuros	rattail fescue	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bare ground		53.0%	40.0%	38.5%	49.2%	15.0%	44.1%	40.0%	25.1%	25.1%
Bare ground or thatch		74.7%	53.3%	61.3%	72.2%	56.9%	63.6%	63.7%	60.7%	60.7%
Total cover by native species		**41.4%**	**89.5%**	**35.4%**	**53.0%**	**62.2%**	**90.5%**	**62.0%**	**52.3%**	**52.3%**
Total cover by non-native species		6.0%	3.3%	30.0%	12.7%	4.6%	2.0%	9.8%	3.5%	3.5%
Relative cover by native species		**87.3%**	**96.4%**	**54.1%**	**80.7%**	**93.1%**	**97.8%**	**84.9%**	**93.7%**	**93.7%**
Relative cover by non-native species		12.7%	3.6%	45.9%	19.3%	6.9%	2.2%	15.1%	6.3%	6.3%
Total Cover by Native Shrubs and Sub-shrubs		**12.4%**	**69.5%**	**27.4%**	**42.0%**	**20.2%**	**80.2%**	**42.0%**	**43.3%**	**43.3%**
Total Cover by Native Herbaceous Species		**29.0%**	**20.0%**	**8.0%**	**11.0%**	**42.0%**	**10.3%**	**20.1%**	**9.0%**	**9.0%**

Dominant Species		*Ericameria ericoides* Association					*Lupinus chamissonis* Association	
		% cover (mean)						
Scientific Name	Common Name	T1-W	T4-W	T10-W	T11-W	Mean of 4 Transects	T2-W	Mean of 1 Transects
		Shrubs and Sub-shrub Species						
Acmispon glaber	deerweed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Artemisia californica	California sagebrush	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Artemisia dracunculus	tarragon	6.6%	3.5%	11.0%	6.6%	6.9%	0.0%	0.0%
Ericameria ericoides	mock-heather	35.0%	55.0%	20.1%	6.5%	29.2%	0.0%	0.0%
Eriogonum parvifolium	seacliff buckwheat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Frangula californica	California coffeeberry	0.0%	96.3%	21.3%	0.0%	29.4%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	0.0%	0.0%	0.0%	0.0%	0.0%	32.5%	32.5%
Prunus fasciculatus var. punctata	desert almond	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Salix lasiolepis	arroyo willow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
		Native Herbaceous Species						
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%	5.3%
Calandrinia ciliata	redmaids	0.0%	0.0%	0.0%	3.8%	1.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Carex praegracilis	clustered field sedged	3.8%	18.3%	0.0%	6.6%	7.2%	0.0%	0.0%
Carex barbarae	Santa Barbara sedge	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cardionema ramosissimum	sandmat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Castilleja affinis	Indian paintbrush	0.0%	0.0%	0.0%	0.0%	0.0%	6.0%	6.0%
Castilleja exserta	owl's clover	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium californicum	California goosefoot	0.0%	0.0%	5.0%	0.0%	1.3%	0.0%	0.0%
Chorizanthe diffusa	spineflower	0.0%	0.0%	2.5%	0.0%	0.6%	0.0%	0.0%
Cirsium occidentale	cobweb thistle, western thistle	0.0%	0.0%	3.0%	0.0%	0.8%	0.0%	0.0%
Corethrogyne filaginifolia	California aster	6.6%	7.5%	3.0%	0.0%	4.3%	22.0%	22.0%
Croton californicus	California croton	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	manystemmed woolly sunflower	0.0%	0.0%	0.0%	1.0%	0.3%	0.0%	0.0%
Dudleya lanceolata	blue dicks	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erigeron blochmaniae	Blochman's erigeron, Blochman's leafy daisy	0.0%	0.0%	3.0%	0.0%	0.8%	15.0%	15.0%
Erysimum suffrutescens	suffrutescent wallflower	1.0%	0.0%	0.0%	2.0%	0.8%	0.0%	0.0%
Horkeia cuneata var cuneata	coast horkelia	6.5%	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.0%	0.0%	13.7%	32.0%	11.4%	0.0%	0.0%
Linanthus californicus	prickly phlox	0.0%	0.0%	0.0%	28.6%	7.2%	0.0%	0.0%
Melica imperfecta	Coast Range melic	2.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	0.0%	0.0%	0.0%	0.0%	0.0%	15.3%	15.3%
Stephanomeria virgata	virgate stephanomeria	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica dioica	stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Dominant Species		*Ericameria ericoides* Association					*Lupinus chamissonis* Association	
		% cover (mean)						
Scientific Name	Common Name	T1-W	T4-W	T10-W	T11-W	Mean of 4 Transects	T2-W	Mean of 1 Transects
		Non-native Herbaceous Species						
Ammophila arenaria	European beach grass	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	ripgut brome	0.0%	0.0%	3.6%	0.0%	0.9%	0.0%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	6.3%	0.0%	1.6%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	0.0%	0.0%	0.0%	35.0%	8.8%	0.0%	0.0%
Ehrharta calycina	veldtgrass	0.0%	0.0%	0.0%	0.0%	0.0%	7.2%	7.2%
Festuca myuros	rattail fescue	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bare ground		32.0%	16.7%	24.3%	0.0%	18.2%	16.8%	16.8%
Bare ground or thatch		60.6%	32.3%	54.4%	0.0%	36.8%	64.6%	64.6%
Total cover by native species		**61.5%**	**180.6%**	**82.6%**	**87.1%**	**103.0%**	**96.1%**	**96.1%**
Total cover by non-native species		0.0%	0.0%	9.9%	35.0%	11.2%	7.2%	7.2%
Relative cover by native species		**100.0%**	**100.0%**	**89.3%**	**71.3%**	**90.2%**	**93.0%**	**93.0%**
Relative cover by non-native species		0.0%	0.0%	10.7%	28.7%	9.8%	7.0%	7.0%
Total Cover by Native Shrubs and Sub-shrubs		**41.6%**	**154.8%**	**52.4%**	**13.1%**	**65.5%**	**32.5%**	**32.5%**
Total Cover by Native Herbaceous Species		**19.9%**	**25.8%**	**30.2%**	**74.0%**	**37.5%**	**63.6%**	**63.6%**

Dominant Species		Potential *Lupinus chamissonis – Ericameria ericoides* Shubland Alliance	*Carex barbara-Urtica dioeca* Association		*Carex barbarae* Herbaceous Alliance
		% cover (mean)			
Scientific Name	Common Name	Mean of 16 Transects	T3-W	Mean of 1 Transects	Mean of 1 Transects
		Shrubs and Sub-shrub Species			
Acmispon glaber	deerweed	0.7%	0.0%	0.0%	0.0%
Artemisia californica	California sagebrush	2.0%	0.0%	0.0%	0.0%
Artemisia dracunculus	tarragon	1.4%	0.0%	0.0%	0.0%
Ericameria ericoides	mock-heather	21.6%	0.0%	0.0%	0.0%
Eriogonum parvifolium	seacliff buckwheat	2.1%	0.0%	0.0%	0.0%
Frangula californica	California coffeeberry	7.9%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	8.5%	0.0%	0.0%	0.0%
Prunus fasciculatus var. punctata	desert almond	5.0%	0.0%	0.0%	0.0%
Salix lasiolepis	arroyo willow	0.0%	17.5%	17.5%	17.5%
Salvia mellifera	black sage	3.7%	0.0%	0.0%	0.0%
		Native Herbaceous Species			
Achillea millefolium	yarrow	1.3%	0.0%	0.0%	0.0%
Calandrinia ciliata	redmaids	0.2%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.2%	0.0%	0.0%	0.0%
Carex praegracilis	clustered field sedged	1.7%	0.0%	0.0%	0.0%
Carex barbarae	Santa Barbara sedge	0.0%	37.0%	37.0%	37.0%
Cardionema ramosissimum	sandmat	0.9%	0.0%	0.0%	0.0%
Castilleja affinis	Indian paintbrush	1.4%	0.0%	0.0%	0.0%
Castilleja exserta	owl's clover	0.6%	0.0%	0.0%	0.0%
Chenopodium californicum	California goosefoot	0.5%	0.0%	0.0%	0.0%
Chorizanthe diffusa	spineflower	0.1%	0.0%	0.0%	0.0%
Cirsium occidentale	cobweb thistle, western thistle	0.3%	0.0%	0.0%	0.0%
Corethrogyne filaginifolia	California aster	8.2%	0.0%	0.0%	0.0%
Croton californicus	California croton	1.2%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	manystemmed woolly sunflower	0.1%	0.0%	0.0%	0.0%
Dudleya lanceolata	blue dicks	0.3%	0.0%	0.0%	0.0%
Erigeron blochmaniae	Blochman's erigeron, Blochman's leafy daisy	4.0%	0.0%	0.0%	0.0%
Erysimum suffrutescens	suffrutescent wallflower	0.2%	0.0%	0.0%	0.0%
Horkeia cuneata var cuneata	coast horkelia	0.4%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	2.3%	0.0%	0.0%	0.0%
Linanthus californicus	prickly phlox	1.6%	0.0%	0.0%	0.0%
Melica imperfecta	Coast Range melic	0.1%	0.0%	0.0%	0.0%
Senecio blochmaniae	dune ragwort	6.3%	0.0%	0.0%	0.0%
Stephanomeria virgata	virgate stephanomeria	0.0%	6.5%	6.5%	6.5%
Urtica dioica	stinging nettle	0.0%	18.4%	18.4%	18.4%

Dominant Species		Potential *Lupinus chamissonis – Ericameria ericoides* Shubland Alliance	*Carex barbara-Urtica dioeca* Association		*Carex barbarae* Herbaceous Alliance
		% cover (mean)			
Scientific Name	Common Name	Mean of 16 Transects	T3-W	Mean of 1 Transects	Mean of 1 Transects
		Non-native Herbaceous Species			
Ammophila arenaria	European beach grass	0.1%	0.0%	0.0%	0.0%
Bromus diandrus	ripgut brome	0.8%	0.0%	0.0%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.5%	0.0%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	2.1%	0.0%	0.0%	0.0%
Ehrharta calycina	veldtgrass	4.5%	0.0%	0.0%	0.0%
Festuca myuros	rattail fescue	0.1%	0.0%	0.0%	0.0%
Bare ground		33.1%	39.3%	39.3%	39.3%
Bare ground or thatch		65.1%	39.3%	39.3%	39.3%
Total cover by native species		**82.9%**	**54.5%**	**54.5%**	**54.5%**
Total cover by non-native species		21.7%	0.0%	0.0%	0.0%
Relative cover by native species		**88.6%**	**100.0%**	**100.0%**	**100.0%**
Relative cover by non-native species		23.5%	0.0%	0.0%	0.0%
Total Cover by Native Shrubs and Sub-shrubs		**46.1%**	**17.5%**	**17.5%**	**17.5%**
Total Cover by Native Herbaceous Species		**41.3%**	**37.0%**	**37.0%**	**37.0%**

Table 2 - Native Plant Cover Data (Combined Survey Results)

Dominant Species		*Lupinus chamissonis – Ericameria ericoides* Association Transects				*Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association						*Ericameria ericoides – Frangula californica – Sambucus nigra* Association		*Lupinus chamissonis – Ericameria ericoides* Shubland Alliance
		% cover (mean)												
Scientific Name	Common Name	T2-E	T3-E	T21-E	Mean of 3 Transects	T1-E	T14-E	T15-E	T16-E	T24-E	Mean of 5 Transects	T19	Mean of 1 Transects	Mean of 9 Transects
Shrubs and Sub-shrub Species														
Acmispon glaber	deerweed	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Artemisia californica	California sagebrush	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Baccharis pilularis	coyote-bush	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	mock-heather	0.0%	3.2%	5.1%	2.8%	1.7%	15.8%	1.8%	13.5%	20.0%	10.6%	0.2%	0.2%	4.5%
Eriogonum parvifolium	seacliff buckwheat	0.0%	1.0%	0.0%	0.3%	0.0%	1.0%	0.0%	0.1%	0.0%	0.2%	0.0%	0.0%	0.2%
Frangula californica	California coffeeberry	0.5%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.6%	0.0%	0.1%	0.0%	0.0%	0.1%
Lupinus chamissonis	silver dune lupine	6.6%	0.0%	2.9%	3.2%	0.0%	0.0%	7.1%	0.0%	0.0%	1.4%	0.0%	0.0%	1.5%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	0.0%	0.0%	0.0%	0.0%	2.6%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.2%
Sambucus nigra subsp. *caerulea*	blue elderberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.6%	6.6%	2.2%
Toxicodendron diversilobum	poison-oak	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Native Herbaceous Species														
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	0.0%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	1.1%	1.1%	0.4%
Calandrinia ciliata	redmaids	0.0%	0.0%	0.1%	0.0%	0.0%	0.3%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
Camissonia strigulosa	strigose sun cups	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.0%	0.2%	0.2%	0.1%	0.0%	0.4%	0.0%	0.2%	0.0%	0.1%	0.2%	0.2%	0.1%
Cardionema ramosissimum	sand carpet	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.5%	0.2%
Chorizanthe sp.	spineflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
Corethrogyne filaginifolia	California aster	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Croton californicus	California croton	0.0%	0.0%	0.2%	0.1%	0.6%	0.1%	0.0%	0.0%	2.0%	0.5%	0.0%	0.0%	0.2%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	manystemmed woolly sunflower	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	1.9%	2.2%	0.8%	0.0%	0.0%	0.3%
Dudleya lanceolata	lanceleaf liveforever	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eriophyllum multicaule	branched woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Galium californicum subsp. *maritimum*	coastal California bedstraw	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%
Horkeia cuneata var. cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.4%	0.0%	0.0%	0.1%
Lupinus bicolor	miniature lupine	0.0%	0.5%	0.0%	0.2%	0.0%	0.0%	0.0%	0.3%	0.0%	0.1%	0.0%	0.0%	0.1%
Lupinus nanus	sky lupine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Melica imperfecta	Coast Range melic	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Nuttallanthus texana	blue toadflax	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Plantago erecta	California plantain	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Pterostegia drymarioides	fairy mist	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Non-native Herbaceous Species														
Avena barbata	slender wild oat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Brassica tournefortii	Saharan mustard	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	0.0%	0.5%	0.3%	0.3%	0.3%
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium murale	nettleleaf goosefood	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	1.2%	0.4%
Conicosia pugioniformis	narrow leaved iceplant	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.2%	8.2%	2.7%
Ehrharta calycina	veldtgrass	22.5%	20.7%	17.8%	20.3%	19.0%	12.2%	12.3%	3.2%	7.0%	10.7%	12.3%	12.3%	14.5%
Erodium botrys	storkbill filaree	0.0%	35.3%	0.0%	11.8%	0.0%	29.5%	0.0%	36.8%	18.8%	17.0%	0.1%	0.1%	9.6%
Erodium cicutarium	redstem filaree	0.0%	0.4%	0.3%	0.2%	0.0%	0.3%	0.0%	1.9%	0.0%	0.4%	0.0%	0.0%	0.2%
Festuca myuros	rattail fescue	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Dominant Species		*Salvia mellifera* Shrubland Alliance										*Brassica tournefortii* (Asian mustard) Semi-natural Herbaceous Stands				Provisional *Ehrharta calycina* Semi-Natural Herbaceous Stands				Provisional *Erodium botrys* Semi-Natural Herbaceous Stands			
		% cover (mean)														% cover (mean)							
Scientific Name	Common Name	T5-E	T6-E	T7-E	T17-E	T22-E	T23-E	T27-E	T28-E	T29-E	T30-E	Mean of 10 Transects	T12-E	T13-E	T20-E	Mean of 3 Transects	T4-E	T8-E	T18-E	Mean of 3 Transects	T9-E	T10-E	T11-E	Mean of 3 Transects
Shrubs and Sub-shrub Species																								
Acmispon glaber	deerweed	0.0%	0.4%	4.3%	0.0%	0.0%	0.0%	5.0%	0.0%	3.5%	6.0%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%
Artemisia californica	California sagebrush	0.0%	2.3%	0.2%	0.0%	0.9%	0.0%	3.0%	7.8%	8.6%	30.0%	5.3%	0.0%	0.0%	0.0%	0.0%	0.0%	24.0%	0.0%	8.0%	0.0%	0.0%	0.0%	0.0%
Baccharis pilularis	coyote-bush	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	5.0%	10.0%	0.0%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Ericameria ericoides	mock-heather	3.3%	13.7%	0.5%	6.5%	0.2%	3.1%	0.0%	15.0%	0.0%	0.0%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.0%	0.0%	3.0%
Eriogonum parvifolium	seacliff buckwheat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Frangula californica	California coffeeberry	0.0%	0.0%	0.0%	5.0%	0.0%	0.1%	14.0%	10.0%	37.5%	0.0%	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus chamissonis	silver dune lupine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mimulus aurantiacus subsp. *aurantiacus*	bush monkeyflower	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Salvia mellifera	black sage	19.5%	3.1%	29.0%	0.0%	27.5%	8.5%	36.0%	30.0%	31.5%	35.5%	22.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sambucus nigra subsp. *caerulea*	blue elderberry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Toxicodendron diversilobum	poison-oak	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.5%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Native Herbaceous Species																								
Achillea millefolium	yarrow	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Acmispon maritimus var. *maritimus*	coastal lotus	0.0%	0.1%	0.0%	0.5%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	3.3%	1.6%	0.2%	1.7%	0.1%	0.7%	0.1%	0.3%
Amsinckia spectabilis var. *microcarpa*	small-fruited seaside fiddleneck	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Calandrinia ciliata	redmaids	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.1%	0.7%	0.0%	0.1%	0.3%	0.7%	0.6%	0.1%	0.4%
Camissonia strigulosa	strigose sun cups	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Camissoniopsis micrantha	miniature sun-cups	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	3.4%	0.0%	0.0%	1.1%	0.1%	0.7%	0.0%	0.2%
Cardionema ramosissimum	sand carpet	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium californicum	California goosefoot	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chorizanthe sp.	spineflower	0.0%	0.1%	4.5%	6.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	1.9%	0.6%	0.0%	3.2%	5.6%	2.9%	0.6%	0.0%	0.0%	0.2%
Corethrogyne filaginifolia	California aster	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Croton californicus	California croton	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.2%	0.3%	0.0%	0.2%
Cryptantha clevelandii	Cleveland's white forget-me-not	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.9%	0.6%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Deinandra increscens subsp. *increscens*	manystemmed woolly sunflower	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%	1.7%	1.8%	0.0%	0.0%	0.0%	0.0%	0.1%	0.6%	6.2%	2.3%
Dudleya lanceolata	lanceleaf liveforever	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eriophyllum multicaule	branched woolly sunflower	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Galium californicum subsp. *maritimum*	coastal California bedstraw	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Horkeia cuneata var. cuneata	coast horkelia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lastarriaea coriacea	leather spineflower	0.0%	0.1%	0.7%	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%
Lupinus bicolor	miniature lupine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.3%	0.0%	0.0%	1.0%	0.3%	0.3%	0.1%	0.2%	0.2%
Lupinus nanus	sky lupine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Melica imperfecta	Coast Range melic	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%	2.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Nuttallanthus texana	blue toadflax	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plantago erecta	California plantain	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.9%	0.3%	0.3%	2.2%	0.5%	1.0%	1.2%	0.4%	0.6%	0.7%
Pterostegia drymarioides	fairy mist	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Non-native Herbaceous Species																								
Avena barbata	slender wild oat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	3.5%	1.2%	0.0%	0.0%	0.0%	0.0%
Brassica tournefortii	Saharan mustard	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.9%	7.4%	20.1%	13.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%
Bromus diandrus	ripgut brome	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus madritensis subsp. *rubens*	red brome	0.6%	2.4%	0.6%	0.0%	0.0%	0.7%	0.0%	1.0%	15.6%	13.8%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chenopodium murale	nettleleaf goosefood	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Conicosia pugioniformis	narrow leaved iceplant	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.1%	0.0%	8.0%	0.0%	2.7%
Ehrharta calycina	veldtgrass	26.5%	25.0%	12.6%	17.5%	15.0%	21.9%	17.8%	0.0%	7.8%	8.5%	15.3%	0.7%	0.7%	12.3%	4.6%	16.4%	0.0%	10.2%	8.9%	6.3%	3.6%	0.0%	3.3%
Erodium botrys	storkbill filaree	0.0%	0.0%	0.0%	4.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	24.3%	59.9%	9.6%	31.3%	3.4%	1.6%	31.5%	12.2%	53.0%	31.1%	77.0%	53.7%
Erodium cicutarium	redstem filaree	0.0%	0.5%	0.0%	8.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	1.5%	1.0%	5.1%	2.5%	2.0%	0.1%	0.5%	0.8%	1.2%	0.1%	0.8%	0.7%
Festuca myuros	rattail fescue	0.0%	0.7%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.1%	0.5%	0.3%	0.7%	0.5%

Table 2 - Native Plant Cover Data (Combined Survey Results)

Dominant Species		*Lupinus chamissonis – Ericameria ericoides* Association Transects				*Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association						*Ericameria ericoides – Frangula californica – Sambucus nigra* Association		*Lupinus chamissonis – Ericameria ericoides* Shubland Alliance	*Salvia mellifera* Shrubland Alliance											*Brassica tournefortii* (Asian mustard) Semi-natural Herbaceous Stands				Provisional *Ehrharta calycina* Semi-Natural Herbaceous Stands				Provisional *Erodium botrys* Semi-Natural Herbaceous Stands			
		% cover (mean)													% cover (mean)															% cover (mean)						
Scientific Name	**Common Name**	**T2-E**	**T3-E**	**T21-E**	**Mean of 3 Transects**	**T1-E**	**T14-E**	**T15-E**	**T16-E**	**T24-E**	**Mean of 5 Transects**	**T19**	**Mean of 1 Transects**	**Mean of 9 Transects**	**T5-E**	**T6-E**	**T7-E**	**T17-E**	**T22-E**	**T23-E**	**T27-E**	**T28-E**	**T29-E**	**T30-E**	**Mean of 10 Transects**	**T12-E**	**T13-E**	**T20-E**	**Mean of 3 Transects**	**T4-E**	**T8-E**	**T18-E**	**Mean of 3 Transects**	**T9-E**	**T10-E**	**T11-E**	**Mean of 3 Transects**
Hordeum murinum	foxtail barley	0.0%	1.9%	0.0%	0.6%	0.0%	0.8%	0.0%	0.0%	0.0%	0.2%	17.3%	17.3%	6.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	37.3%	13.5%	0.0%	16.9%	0.0%	0.0%	0.1%	0.0%	2.1%	5.2%	6.4%	4.6%
Hypochaeris glabra	smooth cat's ear	0.0%	0.1%	0.1%	0.1%	0.0%	0.2%	0.0%	0.3%	0.0%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	1.9%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	**0.2%**	0.0%	0.1%	0.1%	0.0%	0.5%	1.2%	0.2%	0.6%	0.6%	0.1%	0.1%	0.2%
Rumex angiocarpus	sheep sorrel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Senecio vulgaris	common groundsel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Spergula arvensis	corn spurry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	0.0%	0.0%	0.9%	0.3%	0.4%	0.8%	0.4%	0.5%	0.1%	0.0%	0.0%	0.0%
Trifolium sp.	clover	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Urtica urens	annual stinging nettle	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	2.8%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bare ground		45.0%	0.0%	0.0%	15.0%	60.8%	36.7%	41.6%	15.0%	48.7%	38.5%	33.6%	33.6%	29.0%	16.1%	10.9%	29.6%	42.9%	0.0%	0.0%	16.5%	22.3%	22.5%	#REF!	**#REF!**	0.0%	10.4%	38.5%	16.3%	0.0%	64.9%	44.4%	36.4%	30.9%	0.0%	0.0%	10.3%
Bare ground or thatch		61.0%	37.4%	69.8%	56.1%	68.1%	38.9%	78.3%	31.3%	58.6%	54.2%	44.8%	44.8%	51.7%	49.6%	48.4%	46.5%	44.8%	57.5%	62.8%	49.6%	65.4%	46.1%	49.4%	**52.0%**	21.7%	14.2%	40.0%	25.3%	68.3%	64.9%	46.2%	59.8%	34.0%	40.3%	8.4%	27.6%
Total cover by native species		**7.2%**	**5.5%**	**8.6%**	**7.1%**	**5.5%**	**18.1%**	**8.9%**	**20.2%**	**24.2%**	**13.1%**	**8.6%**	**8.6%**	**9.6%**	**23.4%**	**20.0%**	**39.2%**	**23.9%**	**28.6%**	**13.5%**	**68.0%**	**70.8%**	**93.1%**	**71.5%**	**24.7%**	**0.0%**	**4.2%**	**12.4%**	**5.5%**	**7.8%**	**31.3%**	**7.6%**	**15.6%**	**3.1%**	**12.1%**	**7.2%**	**7.5%**
Total cover by non-native species		22.7%	58.4%	18.1%	33.1%	19.0%	43.1%	12.3%	45.0%	25.8%	29.8%	42.3%	42.3%	35.0%	27.1%	28.7%	13.6%	32.0%	15.0%	23.5%	17.8%	1.0%	43.4%	22.3%	**23.3%**	76.7%	82.6%	48.5%	69.3%	22.9%	4.0%	46.4%	24.4%	63.7%	48.3%	85.4%	65.8%
Relative cover by native species		**24.1%**	**8.5%**	**32.1%**	**21.6%**	**22.3%**	**29.6%**	**41.8%**	**31.0%**	**48.4%**	**31.2%**	**16.9%**	**16.9%**	**23.2%**	**46.3%**	**41.1%**	**74.2%**	**42.7%**	**65.6%**	**36.5%**	**79.3%**	**98.6%**	**68.2%**	**76.2%**	**51.1%**	**0.0%**	**4.8%**	**20.4%**	**8.4%**	**25.4%**	**88.8%**	**14.0%**	**42.7%**	**4.6%**	**20.0%**	**7.8%**	**10.8%**
Relative cover by non-native species		75.9%	91.5%	67.9%	78.4%	77.7%	70.4%	58.2%	69.0%	51.6%	68.8%	83.1%	83.1%	76.8%	53.7%	58.9%	25.8%	57.3%	34.4%	63.5%	20.7%	1.4%	31.8%	23.8%	**48.9%**	100.0%	95.2%	79.6%	91.6%	74.6%	11.2%	86.0%	57.3%	95.4%	80.0%	92.2%	89.2%
Total Cover by Native Shrubs and Sub-shrubs		**7.1%**	**4.2%**	**8.0%**	**6.4%**	**4.9%**	**16.8%**	**8.9%**	**14.2%**	**20.0%**	**11.2%**	**6.8%**	**6.8%**	**8.1%**	**23.4%**	**19.5%**	**34.0%**	**11.5%**	**28.6%**	**11.7%**	**68.0%**	**67.8%**	**91.1%**	**71.5%**	**21.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**24.4%**	**0.0%**	**8.1%**	**0.1%**	**9.0%**	**0.1%**	**3.0%**
Total Cover by Native Herbaceous Species		**0.1%**	**1.3%**	**0.6%**	**0.7%**	**0.6%**	**1.3%**	**0.0%**	**6.0%**	**4.2%**	**2.0%**	**1.8%**	**1.8%**	**1.5%**	**0.0%**	**0.6%**	**5.2%**	**12.4%**	**0.0%**	**1.8%**	**0.0%**	**3.0%**	**2.0%**	**0.0%**	**3.3%**	**0.0%**	**4.2%**	**12.4%**	**5.5%**	**7.8%**	**7.0%**	**7.6%**	**7.4%**	**3.1%**	**3.1%**	**7.2%**	**4.4%**

Table 3 - Native Plant Cover Data - July 2015 Surveys

Dominant Species		*Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association		*Salvia mellifera* Shrubland Alliance				
Scientific Name	Common Name	T24-E	Mean of 1 Transects	T27-E	T28-E	T29-E	T30-E	Mean of 4 Transects
Acmispon glaber	**deerweed**	**0.0%**	**0.0%**	**5.0%**	**0.0%**	**3.5%**	**6.0%**	**3.6%**
Artemisia californica	**California sagebrush**	**0.0%**	**0.0%**	**3.0%**	**7.8%**	**8.6%**	**30.0%**	**12.4%**
Baccharis pilularis	**coyote-bush**	**0.0%**	**0.0%**	**10.0%**	**5.0%**	**10.0%**	**0.0%**	**6.3%**
Ericameria ericoides	**mock-heather**	**20.0%**	**20.0%**	**0.0%**	**15.0%**	**0.0%**	**0.0%**	**3.8%**
Frangula californica	**California coffeeberry**	**0.0%**	**0.0%**	**14.0%**	**10.0%**	**37.5%**	**0.0%**	**15.4%**
Salvia mellifera	**black sage**	**0.0%**	**0.0%**	**36.0%**	**30.0%**	**31.5%**	**35.5%**	**33.3%**
Toxicodendron diversilobum	**poison-oak**	**0.0%**	**0.0%**	**9.5%**	**0.0%**	**0.0%**	**0.0%**	**2.4%**
Croton californicus	**California croton**	**2.0%**	**2.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Deinandra increscens* subsp. *increscens	**manystemmed woolly sunflower**	**2.2%**	**2.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Melica imperfecta	**Coast Range melic**	**0.0%**	**0.0%**	**0.0%**	**3.0%**	**2.0%**	**0.0%**	**1.3%**
Bromus madritensis subsp. *rubens*	red brome	0.0%	0.0%	0.0%	1.0%	15.6%	13.8%	**7.6%**
Ehrharta calycina	veldtgrass	7.0%	7.0%	17.8%	0.0%	7.8%	8.5%	**8.5%**
Erodium botrys	storkbill filaree	18.8%	18.8%	0.0%	0.0%	0.0%	0.0%	**0.0%**
Festuca myuros	rattail fescue	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	**5.0%**
Bare ground		48.7%	48.7%	16.5%	22.3%	22.5%	13.3%	**18.7%**
Bare ground or thatch		58.6%	58.6%	49.6%	65.4%	46.1%	49.4%	**52.6%**
Total cover by native species		**24.2%**	**24.2%**	**68.0%**	**70.8%**	**93.1%**	**71.5%**	**75.9%**
Total cover by non-native species		25.8%	**25.8%**	17.8%	1.0%	43.4%	22.3%	**21.1%**
Relative cover by native species		**48.4%**	**48.4%**	**79.3%**	**98.6%**	**68.2%**	**76.2%**	**80.6%**
Relative cover by non-native species		51.6%	**51.6%**	20.7%	1.4%	31.8%	23.8%	**19.4%**
Total Cover by Native Shrubs and Sub-shrubs		**20.0%**	**20.0%**	**68.0%**	**67.8%**	**91.1%**	**71.5%**	**74.6%**
Total Cover by Native Herbaceous Species		**4.2%**	**4.2%**	**0.0%**	**3.0%**	**2.0%**	**0.0%**	**1.3%**

ARCADIS

Figures

Site Features Legend

- Property Boundary
- Existing Rail Line
- Proposed Emergency Vehicle Access_(EVA)
- Vegetation Transect (ARCADIS 2015)
- Vegetation Transect (LEIDOS 2015)

Vegetation Classification (* - Sensitive Vegetation Type)

- SL, *Salix lasiolepis* Shrubland/Woodland Alliance* [Arroyo willow thickets]
- SLb, *Salix lasiolepis* Shrubland/Woodland Alliance* (Stormwater detention basin)
- LE, *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance [Silver dune lupine – mock--heather scrub]*
- LE-ES, *Ericameria ericoides – Eriogonum parvifolium – Salvia mellifera* Association*
- SM, *Salvia mellifera* Shrubland Alliance [Black sage scrub] (Formerly *Salvia mellifera – Ericameria ericoides* Association)*
- BP, *Baccharis pilularis* Shrubland Alliance [Coyote brush scrub]
- BP-BE, *Baccharis pilularis – Ericameria ericoides* Association*
- Br, *Brassica* and Other Mustards Semi-Natural Herbaceous Stands
- Br-Bt, *Brassica tournefortii* (Saharan mustard) Semi-natural Herbaceous Stands (Provisional)
- Eh, *Ehrharta* Semi-Natural Herbaceous Stands (Provisional) [Non-native veldtgrass grassland]
- Er, *Erodium* Semi-Natural Herbaceous Stands (Provisional)
- Er-Eb, *Erodium botrys* Semi-Natural Herbaceous Stands (Provisional)
- Pt, Planted trees
- Non-Vegetated/Unclassified

NOTES:

1. The mapped alliances and associations are based on the dominant native species. In most areas, the mapped native plant communities are degraded and support varying but relatively high concentrations of veldt grass and other non-native species.
2. Vegetation and sensitive species mapping based on ARCADIS field surveys in October 2012, April 2013, June 2013, January - April 2015 and July 2015.
3. Limits of Disturbance include both temporary and permanent disturbance areas.
4. Imagery accessed through ArcGIS Online World Imagery Layer Package by ESRI (12/1/2010) (c) 2010 Microsoft Corporation and its data suppliers accessed on 7/28/2015 through ArcGIS 10.

N

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SCALE IN FEET

Phillips 66
Santa Maria Refinery Rail Project

EXISTING HABITATS

ARCADIS

FIGURE
1

ENV: San Luis Obispo \\corparcgis\Data\ArcGisData\ Z:\GISPROJECTS_ENV\Phillips66\GIS\Projects\072015\Fig 1 ExistingHabitats_SURVEYED_REVISED_20150720.mxd 7/28/2015 baldwinb
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

Appendix A

Phillips 66 Vegetation Survey

Transect T1 (west): *Ericameria ericoides* Association

View looking West

Photograph # 973

July 13, 2015

Phillips 66 Vegetation Survey

Transect T2 (west): *Lupinus chamissonis* Association

View looking West

Photograph # 977

July 13, 2015

Phillips 66 Vegetation Survey

Transect T6 (west): *Ericameria ericoides* Association

View looking East

Photograph # 986

July 14, 2015

Phillips 66 Vegetation Survey

Transect T7 (west): *Ericameria ericoides* – *Eriogonum parvifolium* – *Saliva mellifera* Association

View looking Northeast

Photograph # 988

July 14, 2015

Phillips 66 Vegetation Survey

Transect T8 (west): *Lupinus chamissonis – Ericameria ericoides* Association

View looking East

Photograph # 990

July 14, 2015

Phillips 66 Vegetation Survey

Transect T10 (west): *Ericameria ericoides* Association

View looking West

Photograph # 993

July 14, 2015

Phillips 66 Vegetation Survey

Transect T11 (west): *Ericameria ericoides* Association

View looking East

Photograph # 999

July 14, 2015

Phillips 66 Vegetation Survey

Transect T13 (west): *Lupinus chamissonis – Ericameria ericoides* Association

View looking West

Photograph # 1033

July 14, 2015

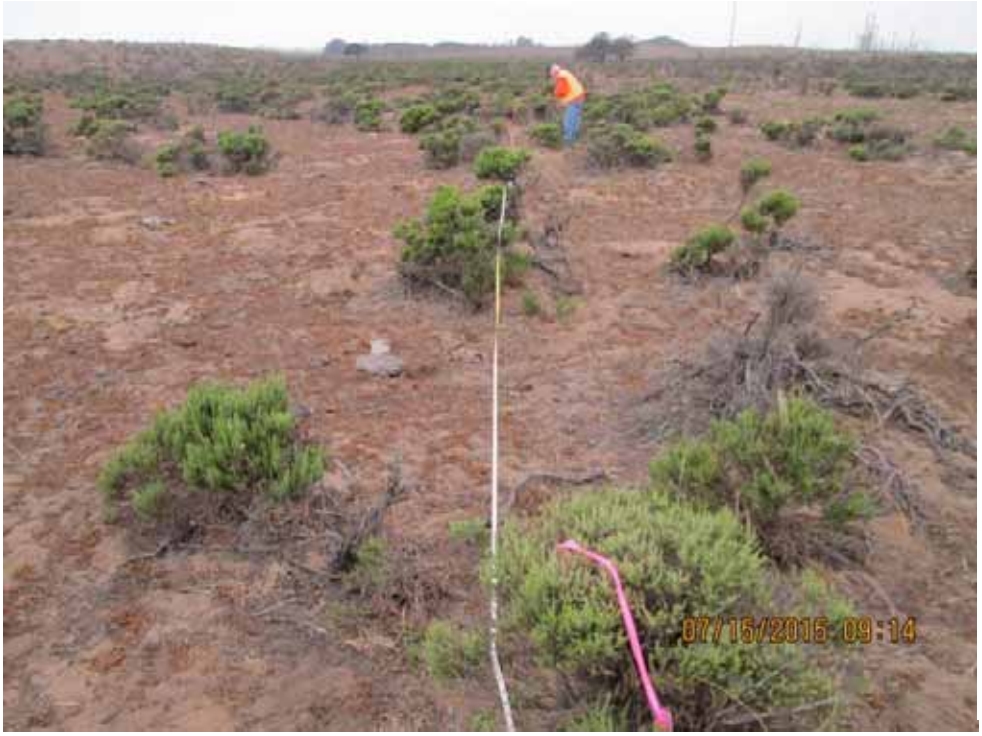
Phillips 66 Vegetation Survey

Transect T15 (west): *Lupinus chamissonis – Ericameria ericoides* Association

View looking West

Photograph # 1008

July 14, 2015



Phillips 66 Vegetation Survey

Transect T24 (east): *Ericameria ericoides – Eriogonum parvifolium – Saliva mellifera* Association

View looking West

Photograph # 1011

July 15, 2015

Phillips 66 Vegetation Survey

Transect T27 (east): *Salvia mellifera* Shrubland Alliance

View looking West

Photograph # 1014

July 15, 2015