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Mr. Jim Anderson
Phillips 66 Santa Maria Refinery
2555 Willow Rd
Arroyo Grande, CA 93420

Subject:

2015 Nipomo Lupine (*Lupinus nipomensis*) Survey Results Associated with the Proposed Rail Spur Project.

Date:
April 13, 2015

Contact:
Greg McGowan

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Our ref: 04597003.0000

Dear Mr. Anderson,

This letter report summarizes the results of the ARCADIS 2015 botanical survey for the federally-listed endangered Nipomo lupine (*Lupinus nipomensis*) in association with the proposed rail project at the Phillips 66 Santa Maria Refinery located at 2555 Willow Road in Arroyo Grande, San Luis Obispo County, California (the Site). The proposed rail project area is shown on the attached figure, along with observed locations of Nipomo lupine recorded during the 2015 survey.

This survey included the proposed rail project area, the emergency access road for the project, and surrounding areas east of the refinery. The survey also included re-visiting previously mapped occurrences of Nipomo lupine documented by the Land Conservancy and others and as recorded in the California Natural Diversity Data Base (CNDDB) within the Phillips 66 Santa Maria Refinery boundaries to confirm the species' presence, growing condition, map any changes in distribution, and to note any additions, absences, or errors. All of the findings will be provided to Phillips 66 digitally for their use in future project planning to avoid potential impacts.

1 Methods

1.1 Survey Dates and Personnel

Surveys for Nipomo lupines were conducted between March 18 and April 10, 2015, when Nipomo lupine was blooming and both flowers and foliage were easily identifiable; typically Nipomo lupine blooms in March and April and then goes to seed. The surveys were conducted by two ARCADIS biologists familiar with Nipomo lupines through prior surveys at the Site over numerous years as well as the California Native Plant Society (CNPS) Protocol for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (2009).

The focused surveys by ARCADIS encompassed approximately 44 personnel hours of survey time.

- Survey 1 was conducted on March 18, 2015 by Mitch Siemens, Biologist
- Survey 2 was conducted on March 23, 2015 by Mitch Siemens, Biologist
- Survey 3 was conducted on March 30 and 31, 2015 by Wayne Ferren, Project Ecologist and Mitch Siemens, Biologist.
- Survey 4 was conducted on April 10, 2015 by Mitch Siemens, Biologist

1.2 Review of Reference Colonies

Prior to the start of each day of Nipomo lupine surveys, four reference colonies of Nipomo lupine recently flagged by the Land Conservancy of San Luis Obispo County were visited by ARCADIS to review plant characteristics and associated habitat. Each of the pin flags in the 40 observed reference site locations were recorded on field maps, and global positioning system (GPS) coordinates were obtained using a Garmin eTrex Vista unit, along with population size estimates, phenological development, and associated species. The majority of the individuals in reference colonies were in bloom at the time of these visits, and provided documentation of the suitability of additional surveys elsewhere onsite. Many flags marked locations with no signs of Nipomo lupine this year; these were also recorded, since they indicate individuals that were present in prior surveys and provide information on the dynamics of the colonies through the years..

1.3 Survey Methods

ARCADIS plant surveys encompass the gathering of information on species composition, abundance, relative distribution, and community composition (including dominant species, associates, and uncommon elements), covering all areas on the project site on foot at least twice. Physiographic features are noted and correlated with plant distribution, with special attention paid to accessible drainages and wetlands, rocky/exposed outcrops, changes in soil type, and native communities existing on the site. All plant species found to be in a recognizable condition during the ARCADIS surveys were recorded. 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 were utilized for plant identification (Flora of North America Editorial Committee, eds. 1993+).

Surveys were conducted by walking in transects back and forth through the proposed rail project area, eastern emergency access road, and in a meandering fashion through reference population areas both east and west of the rail road tracks, and surrounding areas. A hand held GPS device was used to map all colonies of Nipomo lupine encountered during the survey. In addition to photographs, field notes documenting general habitat conditions within survey areas, associate plant species occurring with Nipomo lupine as well as number and reproductive status of lupines were recorded. A map of the entire Phillips 66 property boundary and including polygons of known Nipomo lupine locations was used to help determine appropriate survey areas and document progression of the current survey event.

Photographs of the survey area are included in Appendix A.

2 Results

Focused Nipomo-lupine surveys were conducted in March 2015, with biologists visiting reference colonies and then surveying the entire site to carefully search for Nipomo lupine.

2.1 Reference Sites

Reference sites include locations within the Phillips 66 property boundary where known colonies of Nipomo lupine are documented and mapped according to resource mapping information in the California Natural Diversity Database (CNDDB 2015). These sites are generally located north of the refinery complex and east of the mainline Union Pacific railroad tracks that bisect the Phillips 66 property. Other colonies occur in the dunes complex west of the mainline Union Pacific tracks as well as one colony immediately east of the refinery tank farm and several colonies outside the Phillips 66 property to the north (Figure 1). Prior to the ARCADIS surveys, the Land Conservancy of San Luis Obispo had visited the reference sites and had placed pink pin flags next to individual Nipomo lupine plants they had encountered during their surveys. The ARCADIS survey effort included visiting each of the observed reference site locations marked with flags during the four survey days.

Three colonies consisting of 18 individual Nipomo lupine plants were identified by ARCADIS that had not were not flagged at the time of the ARCADIS surveys. ARCADIS collected waypoint information at each of the Nipomo lupine colonies encountered during the survey (Table1). The following bullets summarize the findings:

- 17 locations (41%) supported one or more Nipomo lupines; of these, 11 location supported vegetative individuals and 11 locations supported reproductive individuals;
- 77 living Nipomo lupines were observed in all, with an average of 2 living plants per location and a minimum of zero (dead or missing plants) and a maximum of 35 living plants;
- 42 locations supported either living Nipomo lupines, wilted/dead Nipomo lupines plants, or pink flags; there were a total of 77 plants and 503 flags in these 42 locations, with an average of 14 plants or flags per location and a minimum of zero plants and a maximum of 105 plants or flags observed;
- 69% of the flagged colonies were observed to have only Nipomo lupines that had died before producing flowers;
- Almost half of the living Nipomo lupines were observed in an old abandoned road bed that parallels the current beach access road west of the mainline Union Pacific railroad in a single colony (colony 20), with 35 living Nipomo lupines and an additional 35 flags.

2.2 Rail Spur Corridor

The rail project corridor was surveyed twice, on March 23 and on March 30 and 31, 2015; no Nipomo lupines were observed anywhere in the project corridor area.

The March 23, 2015 survey included the entire length of the proposed rail spur footprint in addition to select locations with potentially suitable habitat to the east of the proposed rail spur. The March 30 and 31, 2015 survey included buffer areas north of the rail spur with potentially suitable habitat characteristics. Surveyed buffer habitat included all relatively sparsely-vegetated areas typically dominated by herbaceous species and not covered by scrub vegetation in which Nipomo lupine is not likely to occur based on field observations. In the latter situations, however, open areas within the dense scrub were examined for Nipomo lupine especially when herbaceous species typically found growing with Nipomo lupine were observed. Examples of these associated species include common cryptantha (*Cryptantha clevelandii*), California croton (*Croton californica*), and California plantain (*Plantago erecta*).

During this survey, the two biologists began their search at the west end of the rail spur corridor and walked east along the length of the corridor, each concentrating his survey effort to his respective half of the corridor width. Select adjoining areas north of the rail spur were also investigated in a similar fashion.

No Nipomo lupines were observed in or near the rail spur corridor.

2.3 Emergency Access Road at East End of Rail Spur

Both sides of the existing dirt road that connects the eastern terminus of the proposed rail spur extension and Highway 1 were surveyed by ARCADIS on March 30, 2015 as part of the EVA road survey. The survey in this location involved walking a meandering path and searching for Nipomo lupine over an approximately 50 foot (15.2m) buffer on each side of the dirt road.

No Nipomo lupines were observed along the emergency access route at the east end of the rail spur.

2.4 Area Surrounding Refinery Tank Farm

The refinery tank farm is located at the northeast corner of the refinery complex and the ARCADIS survey included areas immediately northeast, east, and south of the tank farm. There are known occurrences (reference sites) of Nipomo lupine in this area that were indicated on the map used by ARCADIS during the surveys. However, there were no pink pin flags observed during the surveys by ARCADIS suggesting the area may not have been observed in the recent Land Conservancy surveys.

The ARCADIS surveys in this location identified three separate colonies of Nipomo lupine containing three, seven, and eight individual plants respectively (also mentioned above in the section describing “reference sites”). All three of these colonies were located within the existing mapped polygons of known Nipomo lupine occurrences (Figure 1, Table 1). Two of the un-flagged colonies were located in dune swales east of the tank farm and one colony was located in a dune swale northwest of the tank farm.

2.5 Beach Access Road West of Railroad Tracks

The beach access road survey area is located west of the refinery complex and on the west side of the mainline Union Pacific property that bisects the Phillips property.

This area contained several known and previously flagged reference colonies of Nipomo lupine, including the largest colony of 105 plants (colony 27), the colony with the most living plants (35 live plants, colony 20), and the locations with the least number of individuals (one dead plant per flagged location).

During the ARCADIS survey west of the railroad, waypoints were collected at the flagged colonies encountered totaling 14 locations, and there were no Nipomo lupine plants identified that had not been previously flagged. The observations include the following:

- 52 living Nipomo lupines or 66% of the 77 observed living plants were located west of the railroad;
- A majority of these living plants (49 plants) were observed at three locations along an abandoned, sandy and partly overgrown road north of and parallel to the current beach access road (see attached photographs).
- A total of 257 plants or flags, or 45% of all plants or flags, were observed west of the railroad;

2.6 Summary of Nipomo Lupine Survey Results

No Nipomo lupine individuals or colonies were found in or near the proposed rail project area (including the EVA road) and no individuals or colonies were found outside the previously mapped areas on the Phillips 66 property (Figure 1). Surveys conducted by ARCADIS documented three colonies of Nipomo lupine that had not been flagged in 2015 by the Land Conservancy, in addition to the 39 colonies or solitary plants that had been previously flagged. All 42 colonies, however, are located within known polygons for the species at the Site, based on the California Natural Diversity Database (CNDDB 2015, Figure 1, Table 1). The ARCADIS survey effort did not identify any Nipomo lupine individuals or colonies outside of those areas already indicated on maps for the species recorded in CNDDB (2015).

Within the 42 identified and mapped sites, 571 plants or flags were counted, and within this total, 77 live Nipomo lupines were observed, including vegetative, budding, flowering, and fruiting individuals (Table 1). Live plants occurred at 17 locations (41% of the 42 locations), 11 or 65% of which contained one or more vegetative plants and 11 or 65% of which contained one or more reproductive plants.

Colonies are located in a variety of dune habitats including dune slopes, swales, and flats and various orientations including all but west-facing habitats, with an apparent slight preference for those with mostly a north-facing aspect.

3 Discussion

Observations made during the ARCADIS 2015 focused surveys of Nipomo lupine suggest the species is present in the same locations as mapped by the Land Conservancy through numerous annual surveys and as recorded in the CNDDB (Figure 1). A total of 77 living Nipomo lupines in 17 locations were observed during the 2015 ARCADIS survey. A total of 42 locations (Nipomo colonies or solitary plants) were mapped by ARCADIS, including approximately 571 individual plants or flags at sites identified by the Land Conservancy or ARCADIS (Figure 1, Table 1). In some cases, however, Nipomo lupine plants at flagged locations were dead or absent.

In all cases, the colonies consisted of rather tightly-clustered, small individuals. Colonies occur on the east and west side of the Union Pacific mainline railroad property that bisects the Phillips 66 property. Plants were observed at sites with northern, southern, and eastern orientations, but a majority appeared to occur at sites with sloping northern orientations. Some sites were heavily grazed with soils disturbed by cattle, others were not grazed. Vegetation types included the *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance (Silver dune lupine – mock-heather scrub) and *Ehrharta calycina* Semi-natural Herbaceous Stands (Veldt grass stands), a vegetation type proposed by ARCADIS.

Native species commonly associated with Nipomo lupine included the shrub dune-heather and sometimes silver dune lupine, as well as several native herbaceous perennial species (Table 1), especially California croton (*Croton californicus*). Nipomo lupine was also observed growing with native annuals such as small-fruited seaside fiddleneck *(Amsinckia spectabilis* var. *microcarpa*), dwarf lupine (*Lupinus bicolor*), narrow-leaf spineflower (*Chorizanthe angustifolia*), common cryptantha (*Cryptantha clevelandii*), and California plantain (*Plantago californica*), and California malacothrix (*Malacothrix californica*). Nipomo lupine does not appear to grow in dune scrub vegetation dominated by black sage (*Salvia mellifera* Alliance) and in fine-grained, loamy soils that are characterized by coast tarweed (*Deinandra increscens* subsp. *increscens*) and a variety of non-native herbaceous species such as storksbill filaree (*Erodium botrys*). Veldt grass (*Ehrharta calycina*), an invasive non-native grass, was present at all sites and dominant at some.

Of the 17 locations with live Nipomo lupines, 11 or 65% of the locations included plants in a reproductive state. Individual colonies were observed to include budding, flowering, and fruiting plants. Similarly, 11 or 65% of the 17 locations included vegetative plants with no reproductive features. All but one of the 39 sites with dead plants or flags without an adjacent plant included only vegetative plants that had produced foliage but died before developing buds, flowers, and fruits. The early senescence of plants may be the result of the extended dry periods between precipitation events.

4 Conclusion

The findings from the surveys indicate the presence of Nipomo lupine in previously mapped locations on the Phillips 66 property is consistent with prior annual mapping efforts. The surveys also support previous findings that suggest the species does not occur south and east of the active dune habitat east of the refinery, including the proposed rail spur project area and surrounding buffer (Figure 1).

Please let me know if you have any questions or if I can be of further assistance.

Sincerely,

Greg McGowan
Principal Ecologist

Attachments

5 References

Baldwin, B. G., Goldman, D. H., Keil, D. J., Patterson, R., and Rosatti, T. I. (eds.) 2012. The Jepson Manual. Vascular plants of California. 2nd ed. University of California Press, Berkeley, CA 1600 pp.

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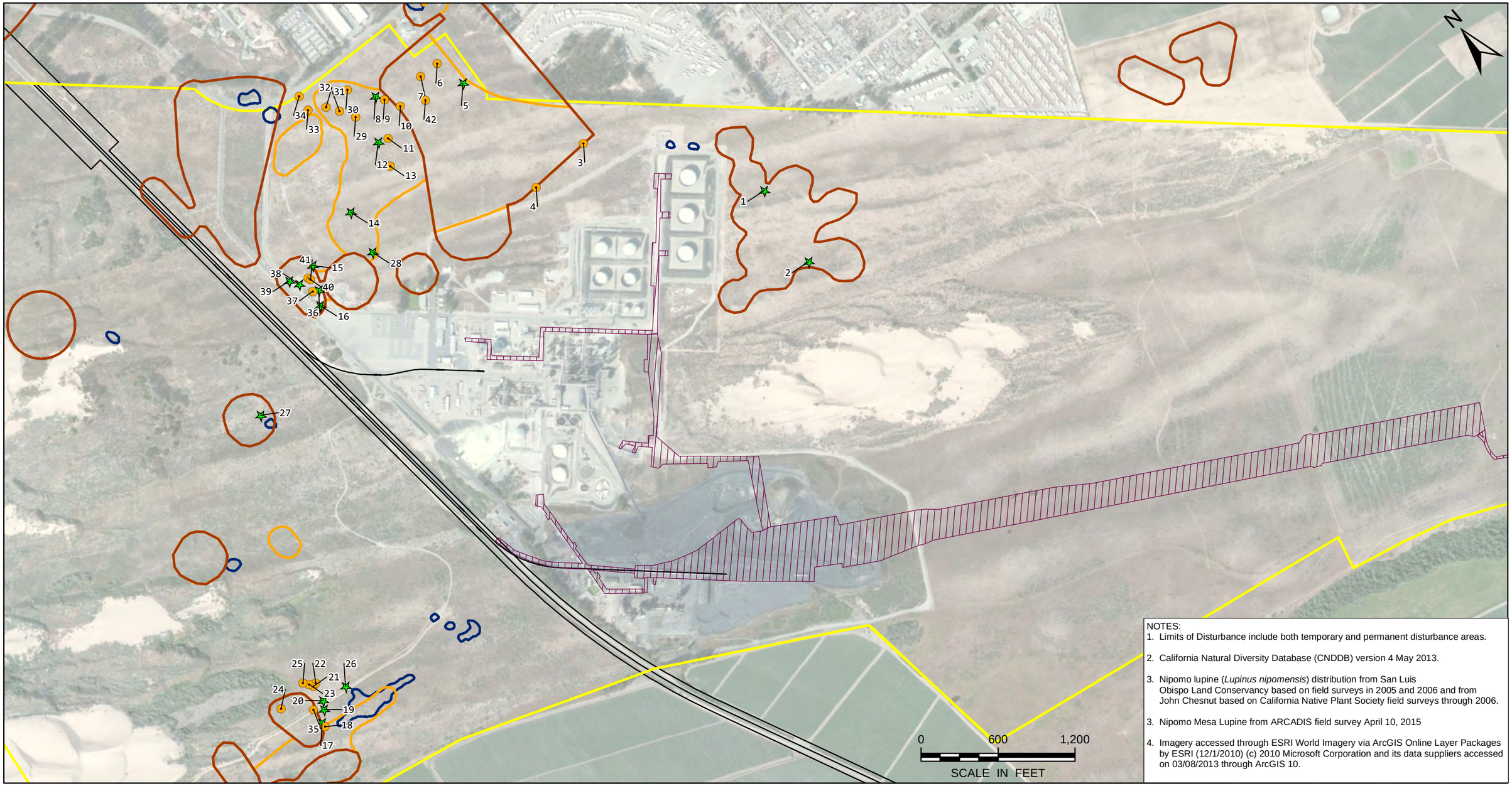
Location Number	Waypoint(s)	General Location	Habitat	Dominant vegetation	# individuals or flags (including dead and absent plants)	# live individuals	Reproductive status					Notes	Associated Species
							% of live colony vegetative only	% live colony reproductive	estimated % live colony in bud only	estimated % live colony in bloom, with buds/fruits	estimated % live colony in fruit only		
1	1,2,3,5,6, 7,8,9	east of refinery tanks	dune swale	*Ehrharta calycina* semi-natural stands	8	4	50	50	50	0	0	Cattle disturbance including dung among lupine plants, many annual plants. No flagging observed.	scattered *Ericameria ericoides* with *Amsinckia spectabilis var. microcarpa, Plantago erecta, Croton californica, Chaenactis glabriuscula var. glabriuscula, Cryptantha clevelandii,Lupinus bicolor, Malacothrix californica, Chorizanthe* sp.
2	10, 11	east of refinery tanks	dune swale	*Ehrharta calycina* semi-natural stands	7	4	50	50	50	0	0	Cattle disturbance including dung among lupine plants, many annual plants. No flagging observed.	scattered *Ericameria ericoides* and *Frangula californica* with *Cardionema ramosissima, Castilleja densiflora, Erodium botrys, Spergula arvensis, Hypochaeris glabra, Amsinckia spectabilis* var. *microcarpa, Croton californica, Horkelia cuneata* var. *cuneata, Chorizanthe* sp.
3	12	north of refinery, west of cattle gate	north-facing dune slope	*Ehrharta calycina* semi-natural stands	3	0	0	0	0	0	66	Cattle disturbance including dung among lupine plants, few annual plants. Two of three dead plants appear to have produced fruit. No flagging observed.	scattered *Ericameria ericoides* with *Cryptantha clevelandii, Plantago erecta, Castilleja densiflora, Croton californica, Dichelostemma capitata, Bromus diandrus, Hypochaeris glabra*
4	13	north of refinery, west of cattle gate	north-facing dune slope	*Ehrharta calycina* semi-natural stands	13	0	0	0	0	0	0	Cattle disturbance including dung among lupine plants, few annual plants	scattered *Ericameria ericoides* with *Cryptantha clevelandii, Dudleya lanceolata, Cardionema ramosissima, Bromus diandrus, Chorizanthe* sp.
5	14	north of refinery toward Rt. 1	south-facing dune slope	*Ehrharta calycina* semi-natural stands	7	1	0	100	0	0	100	Shallow dune crest depression	scattered *Ericameria ericoides, Lupinus chamissonis and Eriogonum parvifolium* with *Acmispon maritima*, *Cardionema ramosissima, Plantago erecta, Erodium botrys, Spergula arvensis, Hypochaeris glabra, Croton californica, Horkelia cuneata* var. *cuneata, Camissonia strigulosa, Chorizanthe* sp.
6	15	north of refinery toward Rt. 1	slightly north-facing dune slope	*Ehrharta calycina* semi-natural stands	1	0	0	0	0	0	0	Very dry	scattered *Ericameria ericoides* with *Cryptantha clevelandii, Castilleja densiflora, Dudleya lanceolata, Croton californica, Horkelia cuneata var. cuneata, Camissonia strigulosa, Chorizanthe sp.*
7	16	north of refinery toward Rt. 1	slightly north-facing dune slope to flat	*Ehrharta calycina* semi-natural stands	21	0	0	0	0	0	0	More colonies to the west (dune slopes and swales)	scattered *Ericameria ericoides, Lupinus chamissonis and Eriogonum parvifolium* with *Cryptantha clevelandii, Croton californica, Dudleya lanceolata*, *Chorizanthe* sp.
8	17	north of refinery toward Rt. 1	shallow dune swale	*Lupinus chamissonis-Ericameria ericoides* Alliance	6	1	0	100	0	0	100	Cattle disturbance including dung among lupine plants, few annual plants	with *Ehrharta calycina, Cryptantha clevelandii, Croton californica, Plantago erecta, Chorizanthe* sp.
9	18	north of refinery toward Rt. 1	shallow dune swale	*Lupinus chamissonis-Ericameria ericoides* Alliance	3	0	0	0	0	0	0	Cattle disturbance including dung among lupine plants, few annual plants	with *Ehrharta calycina, Cryptantha clevelandii, Croton californica, Plantago erecta, Chorizanthe* sp.
10	19	north of refinery toward Rt. 1	shallow dune swale	*Lupinus chamissonis-Ericameria ericoides* Alliance	19	0	0	0	0	0	0	Dead or missing plants	scattered *Ericameria ericoides, Ehrharta calycina, Lupinus chamissonis and Eriogonum parvifolium, Chorizanthe* sp.
11	20	east of entrance road	dune swale	*Ehrharta calycina* semi-natural stands	6	0	0	0	0	0	0	Dead or missing plants. Cattle dung present	Plantago erecta, Erodium botrys, Chorizanthe sp., Croton californica
12	21	east of entrance road	dune swale	*Ehrharta calycina* semi-natural stands	30	1	0	100	0	100	0	Evidence of cattle	Chorizanthe sp., Croton californica

Location Number	Waypoint(s)	General Location	Habitat	Dominant vegetation	# individuals or flags (including dead and absent plants)	# live individuals	Reproductive status					Notes	Associated Species
							% of live colony vegetative only	% live colony reproductive	estimated % live colony in bud only	estimated % live colony in bloom, with buds/fruits	estimated % live colony in fruit only		
13	22	east of entrance road	north-facing dune slope	*Ehrharta calycina* semi-natural stands	7	0	0	0	0		0	Dead or missing plants. Cattle dung present	*Ehrharta calycina, Ericameria ericoides, Horkelia cuneata, Dudleya lanceolata*
14	23	east of entrance road	dune swale	*Ehrharta calycina* semi-natural stands	3	1	0	100	0	0	100	Dead plants present	*Ehrharta calycina, Ericameria ericoides, Horkelia cuneata, Dudleya lanceolata*
15	24	east of entrance road, west of dirt road	slight north-facing dune slope to flat	*Ehrharta calycina* semi-natural stands	63	3	100	0	0	0	0	Dense cluster of Nipomo lupine	scattered *Ericameria ericoides* with *Cardionema ramosissima, Cryptantha clevelandii, Croton californica, Plantago erecta, Bromus diandrus, Chaenactis glabriuscula* subsp. *glabriuscula*
16	25	East of entrance road, 40 m west of helipad	Slight south facing dune slope to flat	*Ericameria ericoides Association*	6	2	100	0	0	0	0	Immediately adjacent to asphalt road	*Ericameria ericoides, Ehrharta calycina, Cryptantha clevelandii*
17	27	west or railroad, south of road	flat	*Ericameria ericoides Association*	9	1	0	100	0	100	0	One wilted in fruit	*Ericameria ericoides, Cryptantha clevelandii, Castilleja exserta*
18	28	west or railroad, south of road	flat	*Ericameria ericoides Association*	2	0	0	0	0	0	0	One wilted seedling, one missing	*Ericameria ericoides, Cryptantha clevelandii, Castilleja exserta*
19	29	west or railroad, south of road	flat	*Ericameria ericoides Association*	1	1	100	0	0	0	0	One wilted plant	*Ehrharta calycina, Ericameria ericoides, Chorizanthe* sp., *Croton californica, Corethrogyne filaginifolia*
20	30	west of railroad in abandoned sandy road	old road bed	*Ericameria ericoides Association*	70	35	75	25	25	0	0	Dense colony of Nipomo lupine	with *Ehrharta calycina, Croton californica, Cardionema ramosissima, Corethrogyne filaginifolia, Castilleja densiflora, Acmispon maritima, Chorizanthe* sp.
21	31	west of railroad, north of road	flat	*Ericameria ericoides Association*	1	0	0	0	0	0	0	Missing	*Ehrharta calycina, Ericameria ericoides*
22	32	west of railroad, north of road	flat	*Ericameria ericoides Association*	1	0	0	0	0	0	0	Missing	*Ehrharta calycina, Ericameria ericoides*
23	33	west of railroad, north of road	flat	*Ericameria ericoides Association*	1	0	0	0	0	0	0	Missing	*Ehrharta calycina, Ericameria ericoides*
24	34	west of railroad, north of road	flat	*Ericameria ericoides Association*	1	0	0	0	0	0	0	Missing	*Ehrharta calycina, Ericameria ericoides*
25	35	west of railroad, north of road	flat	*Ericameria ericoides Association*	1	0	0	0	0	0	0	Missing	*Ehrharta calycina, Ericameria ericoides*
26	36, 37	west of railroad in abandoned sandy road	old road bed	*Ericameria ericoides* Association	36	1	100	0	0	0	0	19 plants and 17 plants on old two track road	with *Ehrharta calycina, Acmispon glaber, Acmispon maritima, Abronia umbellata, Croton californica, Cardionema ramosissima, Horkelia cuneata* var. *cuneata, Cryptantha clevelandii*
27	38	west of railroad	south-facing slope	*Ericameria ericoides* Association	105	14	28	72	64	8	0	Dense colony of Nipomo lupine	with *Ehrharta calycina, Croton californica, Corethrogyne filaginifolia, Cardionema ramoissisima, Castilleja densiflora, Cryptantha clevelandii, Lessingia texana, Plantago erecta, Mucronea californica.*

Location Number	Waypoint(s)	General Location	Habitat	Dominant vegetation	# individuals or flags (including dead and absent plants)	# live individuals	Reproductive status					Notes	Associated Species
							% of live colony vegetative only	% live colony reproductive	estimated % live colony in bud only	estimated % live colony in bloom, with buds/fruits	estimated % live colony in fruit only		
28	39	west of refinery, east of entrance road	slight north-facing dune slope to flat	*Ericameria ericoides* Association	27	1	100	0	0	0	0	Some wilted plants observed at flags	*Ehrharta calycina, Croton californica, Cryptantha clevelandii, Ericameria ericoides*
29	40, 41, 42, 43, 44, 45, 46	dune east of entrance road and south of Rt. 1	north, south, and east-facing dune slope to flat	*Ehrharta calycina* semi-natural stands	60	0	0	0	0	0	0	Some dead plants show evidence of fruiting/ seed production	scattered *Ericameria ericoides*
30	47	dune south of Rt. 1, east of entrance road	north facing	*Ehrharta calycina* semi-natural stands	19	0	0	0	0	0	0	Nipomo lupine plants dead or missing	with *Ehrharta calycina, Cryptantha clevelandii, Croton californica, Plantago erecta, Chorizanthe* sp.
31	48	dune crest and slope south of Rt. 1	north-east facing slope near dune crest	*Ehrharta calycina* semi-natural stands	11	0	0	0	0	0	0	Nipomo lupine plants dead or missing	scattered *Ericameria ericoides* with *Bromus diandrus* and *Plantago erecta*
32	49	dune crest and slope south of Rt. 1	east-facing slope near dune crest	*Ehrharta calycina* semi-natural stands	2	0	0	0	0	0	0	Similar to #48 but the more species; Nipomo lupine plants dead or missing	scattered *Ericameria ericoides* with *Prunus fascicularis* var. *punctata, Horkelia cuneata* var. *cuneata, Dudleya lanceolata, Croton californica, Bromus diandrus* and *Plantago erecta*
33	50	east-west dune swale south of Rt. 1	dune swale	*Ehrharta calycina* semi-natural stands	3	0	0	0	0	0	0	Some Nipomo lupine plants living	scattered *Ericameria ericoides* and *Lupinus chamissonis* with *Cryptantha clevelandii, Chaenactis glabriuscula* subsp. *glabriuscula, Castilleja densiflora, Plantago erecta, Amsinckia spectabilis* var. *spectabilis* , *Lupinus bicolor, Erodium cicutarium*
34	51	south side of Rt. 1 inside fence	roadside with mixed soils	*Lupinus chamissonis-Ericameria ericoides* Alliance	8	0	0	0	0	0	0	Nipomo lupine plants dead or missing	with *Ehrharta calycina, Croton californica, Cryptantha clevelandii, Plantago erecta, Bromus diandrus, Brassica tournefortii*
35	55	west of RR tracks	in active two-track road	*Ericameria ericoides* Association	2	0	0	0	0	0	0	Located in center of active two-track road; no vegetation	with *Ehrharta calycina, Acmispon glaber, Acmispon maritima, Abronia umbellata, Croton californica, Cardionema ramosissima, Horkelia cuneata* var. *cuneata, Cryptantha clevelandii*
36	56	east of entry road; 35 m NW of helipad within barbed wire enclosure	flat	*Ehrharta calycina* semi-natural stands	3	1	100	0	0	0	0	Lots of chipped asphalt at surface	with *Ehrharta calycina, Acmispon glaber, Ericameria ericoides*
37	57	east of entry road; 50 m NW of helipad within barbed wire enclosure	flat	*Ehrharta calycina* semi-natural stands	2	0	0	0	0	0	0	Two dead seedlings visible at surface. Lots of chipped asphalt at surface.	with *Ehrharta calycina, Acmispon glaber, Ericameria ericoides, Lupinus chamissonis, Dudleya* sp.
38	58	east of entry road; 75m NW of helipad within barbed wire enclosure	flat	*Ehrharta calycina* semi-natural stands	8	5	20	80	80	0	0	Lots of chipped asphalt at surface	with *Ehrharta calycina, Acmispon glaber, Ericameria ericoides, Lupinus chamissonis, Dudleya sp., Croton californica, Cardionema ramosissima*
39	59	east of entry road; 100m NW of helipad within barbed wire enclosure	flat	*Ehrharta calycina* semi-natural stands	1	1	0	100	0	0	100	Located approximately 10 feet east of entry road	with *Ehrharta calycina, Acmispon maritima, Ericameria ericoides, Lupinus chamissonis, Dudleya sp., Croton californica, Cryptantha clevelandii, Plantago erecta*
40	60	East of entry road; 100m NW of helipad within barbed wire enclosure	flat	*Ehrharta calycina* semi-natural stands	1	0	0	0	0	0	0	Chipped asphalt prevalent	with *Ehrharta calycina, Acmispon glaber, Ericameria ericoides, Croton californica, Cardionema ramosissima*

Location Number	Waypoint(s)	General Location	Habitat	Dominant vegetation	# individuals or flags (including dead and absent plants)	# live individuals	Reproductive status					Notes	Associated Species
							% of live colony vegetative only	% live colony reproductive	estimated % live colony in bud only	estimated % live colony in bloom, with buds/fruits	estimated % live colony in fruit only		
41	61	east of entry road; 100m NW of helipad within barbed wire enclosure	flat	*Ehrharta calycina* semi-natural stands	1	0	0	0	0	0	0	One wilted/ dead plant. Chipped asphalt prevalent	with *Ehrharta calycina, Acmispon glaber, Ericameria ericoides, Croton californica, Cardionema ramosissima*
42	62	north of refinery toward Rt. 1	Slightly south facing top of dune swale	*Ehrharta calycina* semi-natural stands	1	0	0	0	0	0	0	More colonies to the north and east (dune slopes and swales)	*Chorizanthe* sp., *Croton californica, Plantago erecta, Cardionema ramosissima*
Total observed Nipomo lupines and/or flags					**580**	**77**							
Mean number of observed Nipomo lupines and/or flags					**13.8**	**2.0**							



NOTES:
1. Limits of Disturbance include both temporary and permanent disturbance areas.
2. California Natural Diversity Database (CNDDB) version 4 May 2013.
3. Nipomo lupine (*Lupinus nipomensis*) distribution from San Luis Obispo Land Conservancy based on field surveys in 2005 and 2006 and from John Chesnut based on California Native Plant Society field surveys through 2006.
3. Nipomo Mesa Lupine from ARCADIS field survey April 10, 2015
4. Imagery accessed through ESRI World Imagery via ArcGIS Online Layer Packages by ESRI (12/1/2010) (c) 2010 Microsoft Corporation and its data suppliers accessed on 03/08/2013 through ArcGIS 10.

Legend

- Property Boundary
- Existing Rail Line
- Limits of Disturbance
- Mapped Nipomo Lupine from CNDDB
- Mapped Nipomo Lupine from SLO Land Conservancy 2006
- Mapped Nipomo Lupine from John Chesnut

Nipomo Mesa Lupine April 2015 Survey

- Present
- Absent
- 1 Observation Location Number

Phillips 66
Santa Maria Refinery Rail Project.

NIPOMO MESA LUPINE

ARCADIS

FIGURE
1

Z:\GISPROJECTS_ENV\Phillips66\GIS\Projects\040715\Figure1_NipomoMesaLupine.mxd 4/18/2015 DFischer
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

Phillips 66 Nipomo lupine Survey

A reference population of Nipomo lupine is indicated by pink flags recently placed by the Land Conservancy of San Luis Obispo next to individual Nipomo lupine plants.

Photograph # 445

March 18, 2015

Phillips 66 Nipomo lupine Survey

Flagged Nipomo lupine reference population.

Photograph # 452

March 18, 2015

Phillips 66 Nipomo lupine Survey

The red arrow points to a withered Nipomo lupine seedling. Note the base of the pin flag below and to the right of the seedling.

Photograph # 456

March 18, 2015

Phillips 66 Nipomo lupine Survey

Photograph showing a recently placed pink flag indicating the presence of a live Nipomo lupine, which can be seen here at the base of the flag (red arrow).

Photograph # 459

March 18, 2015

Phillips 66 Nipomo lupine Survey

One of several Nipomo lupines found during the ARCADIS surveys that was not currently flagged.

Photograph # 466

March 18, 2015

Phillips 66 Nipomo lupine Survey

Surveys were conducted in spring 2015. This photograph was taken near several of the Nipomo lupine reference populations. Note the blooming annual flowers including common cryptantha, fiddleneck and owl's clover.

Photograph # 450

March 18, 2015