TECHNICAL MEMORANDUM

To: Eric Koster
Yellow Pine Solar, LLC
700 Universe Boulevard
Juno Beach, Florida 33408

From: Henrik Christensen, Natural Resources Program Lead

Date: June 12, 2019, updated July 16, 2019

Re: **Results of Spring 2019 Supplemental Botanical Surveys for the Yellow Pine Solar Project / SWCA Project No. 37729**

INTRODUCTION

On March 4, 2019, the Bureau of Land Management Southern Nevada District Office (BLM) issued a Notice to Yellow Pine Solar, LLC requesting additional information for a Right-of-Way Application for the proposed Yellow Pine Solar Project (N-90788) located near Pahrump within Clark County, Nevada. As described in the Notice, the BLM requested that Yellow Pine Solar provide "a general floristic inventory during the spring of 2019." Under contract with Yellow Pine Solar, a BLM-approved botanist with SWCA Environmental Consultants (SWCA) completed the general floristic inventory on March 28, 2019 and observed that most of the annual plants were still in vegetative or budding stages; as a result, most of these plants, including a *Pediomelum* species, were not identifiable to species. On April 2, 2019, the BLM requested a "spring reconnaissance survey" in order to amend the October 2018 protocol level surveys (SWCA 2018) and as a follow-up to the March 28, 2019 survey. SWCA was contracted by Yellow Pine Solar to complete supplemental spring reconnaissance botanical surveys within the project Survey Area which includes the proposed project area and land for the development of a substation (Figure 1). The objectives of these surveys were to document general flora, survey for BLM-sensitive plant species, and confirm or reject the presence of *Pediomelum castoreum* within the Survey Area. SWCA completed supplemental reconnaissance-level botanical surveys along 19.54 miles of transect within the Survey Area on May 6 - 8, 2019; the methods and results of these surveys are described below.

METHODS

BLM-approved botanist Ian McCowen and biologist Mike Swink performed the supplemental botanical surveys by walking 12 east-west transects spanning the width of the Project Area. Each transect was 10 meters wide and grouped in pairs (see Figure 1). Survey transects were located such that all soil types within the project area were surveyed (NRCS 2017). In order to identify the greatest number of annual plants, SWCA conducted the survey during a phenologically suitable time when most of the annual plants were known to be flowering and identifiable. SWCA identified and recorded plant species that were observed both along transects and while traveling to and from transects within the project area. SWCA identified any unknown species in the field or with a voucher specimen at the SWCA Las Vegas office.

SWCA surveyors also revisited a population of an unknown *Pediomelum* species that was observed during the March 28, 2019 floristic inventory. Surveyors measured the lower calyx-tooth which can distinguish between *Pediomelum castoreum*, which is listed by the BLM as Sensitive (BLM 2017), and *P. mephiticum.* In *P. castoreum* the calyx tooth is larger at 4-6 mm wide, while in *P. mephiticum* it is narrower (2-3.5 mm wide).

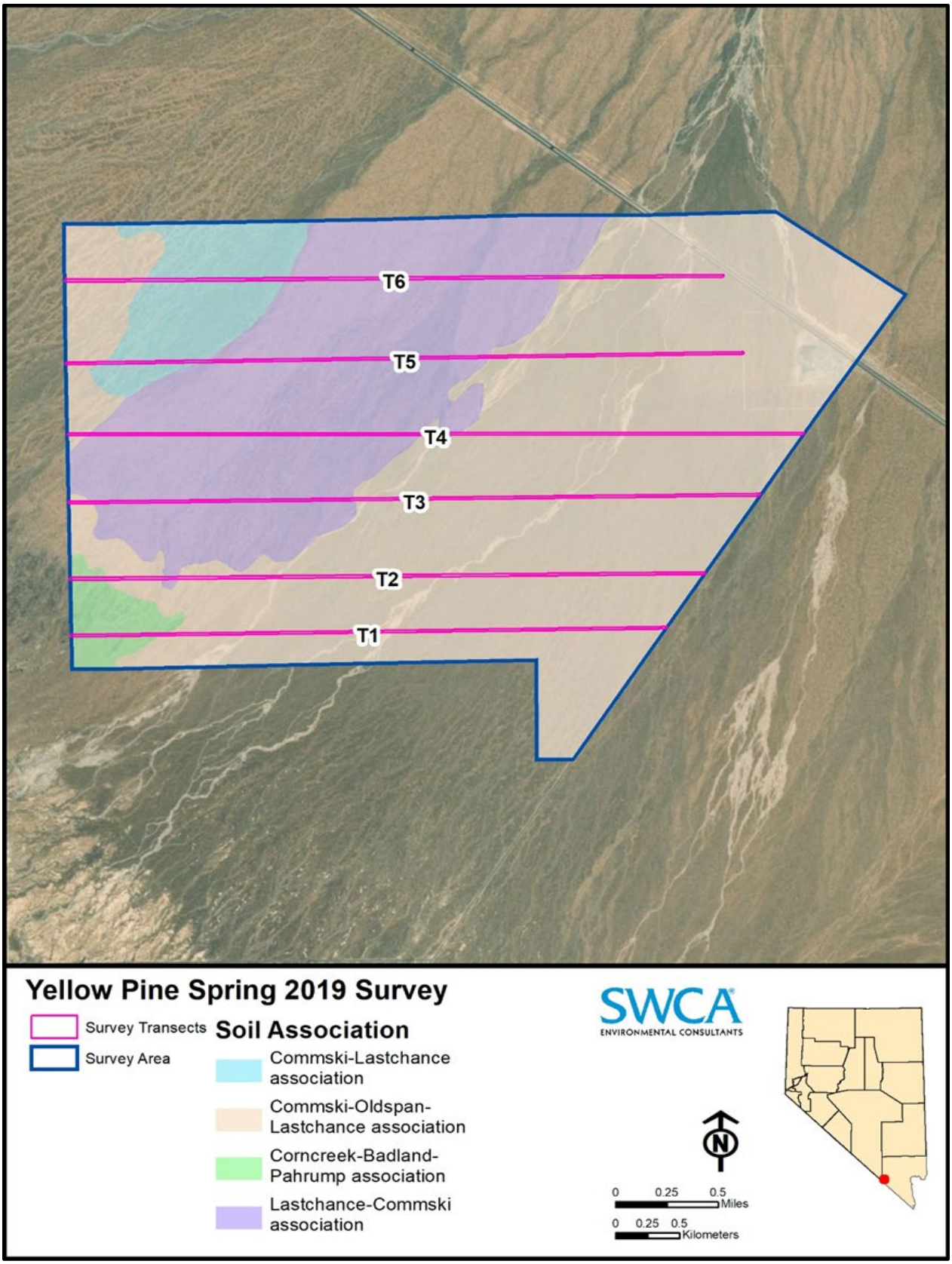

Figure 1. Supplemental Botanical Survey Area for the Yellow Pine Solar Project.

RESULTS

No BLM sensitive species were observed within the Survey Area along 19.54 miles of survey transects. The *Pediomelum* plant observed during the March 28, 2019 floristic inventory was relocated during these surveys and identified as *Pediomelum mephiticum*. *P. mephiticum* is known to occur within the Pahrump Valley (SEINet 2019) and is not a special status species. Several *P. mephiticum* plants were observed throughout the Survey Area.

A total of 96 plant species belonging to 31 families were identified within the Survey Area, including subspecies and varieties. A complete list of all plant taxa identified during the survey is included in Table 1.

Table 1. Plant Species Observed during the Spring 2019 Botanical Survey of the Yellow Pine Solar Survey Area.

Family	Scientific Name	Common Name
Agavaceae	*Yucca schidigera*	Mojave yucca
Asclepiadaceae	*Asclepias erosa*	desert milkweed
Asparagaceae	*Androstephium breviflorum*	pink funnel lily
Asteraceae	*Acamptopappus shockleyi*	Shockley's goldenhead
	Adenophyllum cooperi	Cooper's dogweed
	Ambrosia dumosa	burrobush
	Ambrosia eriocentra	woolly fruit bur ragweed
	Baileya multiradiata	desert marigold
	Chaenactis carphoclinia var. carphoclinia	pebble pincushion
	Chaenactis fremontii	pincushion flower
	Chaenactis macrantha	bighead dustymaiden
	Encelia virginensis	Virgin River brittlebush
	Glyptopleura setulosa	holy dandelion
	Gutierrezia microcephala	threadleaf snakeweed
	Hymenoclea salsola	burrobush
	Monoptilon bellioides	Mojave desertstar
	Prenanthella exigua	brightwhite
	Psathyrotes annua	annual psathyrotes
	Psilostrophe cooperi	whitestem paperflower
	Rafinesquia neomexicana	New Mexico plumeseed
	Stephanomeria pauciflora	brownplume wirelettuce
	Stylocline micropoides	woolyhead neststraw
	Xylorhiza tortifolia	Mojave woodyaster
Boraginaceae	*Amsinckia tessellata*	bristly fiddleneck
	Cryptantha pterocarya	wingnut cryptantha
	Pectocarya heterocarpa	chuckwalla combseed
	Pectocarya platycarpa	broadfruit combseed

Family	Scientific Name	Common Name
Brassicaceae	*Descurrania pinnata*	western tansymustard
	Lepidium densiflorum var. densiflorum	common pepperweed
	Lepidium fremontii var. fremontii	desert pepperweed
	Malcolmia africana	African mustard
	Sisymbrium orientale	Indian hedgemustard
Cactaceae	*Cylindropuntia echinocarpa*	Wiggins' cholla
	Cylindropuntia ramosissima	branched pencil cholla
	Echinocactus polycephalus	cottontop cactus
	Echinocereus engelmannii	Engelmann's hedgehog cactus
	Grusonia parishii	matted cholla
	Opuntia basilaris	beavertail pricklypear
Campanulaceae	*Nemacladus glanduliferus*	glandular threadplant
Chenopodiaceae	*Atriplex confertifolia*	shadscale saltbush
	Atriplex hymenelytra	desertholly
	Grayia spinosa	spiny hopsage
	Halogeton glomeratus	saltlover
	Krascheninnikovia lanata	winterfat
	Salsola tragus	prickly Russian thistle
	Stutzia covillei	Coville's orach
Cucurbitaceae	*Cucurbita palmata*	coyote gourd
Ephedraceae	*Ephedra nevadensis*	Nevada jointfir
Fabaceae	*Astragalus lentiginosus var. fremontii*	Fremont's milkvetch
	Astragalus lentiginosus var. variabilis	freckled milkvetch
	Astragalus nuttallianus	smallflowered milkvetch
	Pediomelum mephiticum	skunktop
	Prosopis glandulosa	honey mesquite
Geraniaceae	*Erodium cicutarium*	redstem stork's bill
Hydrophyllaceae	*Phacelia crenulata var. ambigua*	purplestem phacelia
	Phacelia fremontii	Fremont's phacelia
	Phacelia ivesiana	Ives' phacelia
Krameriaceae	*Krameria erecta*	littleleaf ratany
Lamiaceae	*Salazaria mexicana*	Mexican bladdersage
	Salvia dorrii	Abrams purple sage
	Mentzelia albicaulis	whitestem blazingstar
	Petalonyx nitidus	shinyleaf sandpaper plant
Malvaceae	*Sphaeralcea ambigua*	desert globemallow
Nyctaginaceae	*Mirabilus laevis*	wishbone-bush
Oleaceae	*Menodora spinescens*	spiny menodora

Family	Scientific Name	Common Name
Onagraceae	*Camissonia boothii spp. desertorum*	desert suncup
	Camissonia brevipes	yellow cups
	Camissonia refracta	narrowleaf suncup
	Oenothera suffrutescens	scarlet beeblossom
Papaveraceae	*Eschscholzia glyptosperma*	desert poppy
Plantaginaceae	*Plantago ovata*	desert indianwheat
Poaceae	*Achnatherum hymenoides*	Indian ricegrass
	Achnatherum speciosum	desert needlegrass
	Bromus rubens	red brome
	Bromus tectorum	cheat grass
	Pleuraphis rigida	big galleta
	Schismus barbatus	common Mediterranean grass
Polemoniaceae	*Allophyllum gilioides*	dense false gilyflower
	Eriastrum sparsiflorum	Great Basin woollystar
	Ipomopsis polycladon	manybranched ipomopsis
	Langloisia setosissima var. punctata	Great Basin langloisia
	Langloisia setosissima var. setosissima	Great Basin langloisia
	Linanthus jonesii	Jones' linanthus
Polygonaceae	*Chorizanthe brevicornu*	brittle spineflower
	Chorizanthe rigida	devil's spineflower
	Eriogonum brachypodum	Parry's buckwheat
	Eriogonum deflexum var. deflexum	flat crown buckwheat
	Eriogonum fasciculatum	Eastern Mojave buckwheat
	Eriogonum inflatum	desert trumpet
	Eriogonum trichopes	little desert trumpet
Ranunculaceae	*Delphinium parishii*	desert larkspur
Resedaceae	*Oligomeris linifolia*	lineleaf whitepuff
Rosaceae	*Prunus fasciculata*	desert almond
Scrophulariaceae	*Castilleja sp.*	paintbrush
Solanaceae	*Lycium andersonii*	water jacket
Zygophyllaceae	*Larrea tridentata*	creosote bush

REFERENCES

Bureau of Land Management (BLM). 2017. BLM Nevada Sensitive and Status Species List. Available at: https://www.blm.gov/policy/nv-im-2018-003. Accessed: May 6, 2019.

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