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ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

July 18, 2012

Chris Kofron
Recovery Permit Coordinator
Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, CA 93003

Re: 90-Day Report on Wet Season Vernal Pool Branchiopod Surveys for the Chevron San Luis Obispo Tank Farm Site, 276 Tank Farm Road, San Luis Obispo, California (USFWS Reference Nos. 81440-2009-B-0180 [Chevron Tank Farm]; 81440-2010-B-0026 [Powell]; 81440-2009-B-0049 [Thomas])

Dear Mr. Kofron:

Padre Associates, Inc. (Padre) conducted wet season surveys of the San Luis Obispo Tank Farm (SLOTF) Site from late fall 2011 through spring 2012. One wet season survey effort was conducted to supplement protocol surveys that were completed at the SLOTF Site between 2003 and 2005. The additional surveys were conducted in response to the Conservation Recommendations provided in the Biological Opinion (BO) issued by the U.S. Fish and Wildlife Service (Service) for the San Luis Obispo Tank Farm Cultural Resources Surveys and Soil Assessment Activities (Reference No. 81440-2010-F-0396). The conservation recommendations requested that Chevron conduct updated surveys of vernal pool fairy shrimp (VPFS) habitat within the SLOTF Site that had been determined to be unoccupied during the 2003-2005 survey in order to evaluate the current occupancy of suitable habitat. The conservation recommendations also requested that Chevron conduct updated surveys of VPFS habitat in areas that may be suitable for the species, but were not assessed during previous surveys.

The wet season surveys were initiated in December 2011 upon authorization to proceed received from Julie Vanderwier via email dated November 29, 2011. Per the authorization letter, the surveys were conducted by Sarah Powell (Permit No. TE-063427-1) and Julie Thomas (TE-834492-4) in accordance with the Service survey protocols. This letter, along with datasheets for each of the sampling events (Appendix A) and figures depicting site location and pools sampled, comprise the 90-day report required by the Interim Survey Guidelines for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods (USFWS, 1996).

The SLOTF Site is located immediately south of the City of San Luis Obispo, in San Luis Obispo County. The Site occurs on both the north and south sides of Tank Farm Road, west of Santa Fe Road, northwest of the County Airport. The SLOTF is located in Section 11, Township 31 south, Range 12 east, Pismo Beach, California USGS 7.5-minute quadrangle (Figure 1). The Site is approximately 332 acres in size consisting of highly disturbed landscape from its prior uses as an oil storage facility. The Site currently supports annual grassland, serpentine bunchgrass, emergent freshwater marsh, riparian, and vernal pool/swale habitats. The vernal pool/swale habitat consists primarily of areas that become seasonally inundated within remnant tank rings, oil reservoirs, and containment berms constructed on the site during its prior use as a tank farm. The Site is currently used for cattle grazing. Chevron Environmental Management Company (CEMC) is planning to

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remediate the Site to address site contamination issues, restore the Site, and develop portions of the Site (~ 53 acres) consistent with the proposed land use plan.

The SLOTF Site was initially surveyed for listed vernal pool branchiopods through a series of dry season and wet season surveys conducted between the years of 2003 and 2005 (Rincon, 2005). These surveys identified the federally Threatened vernal pool fairy shrimp (*Branchinecta lynchi*) ("VPFS") and the non-listed California fairy shrimp (*Linderiella occidentalis*) as occurring in seasonally inundated habitat within the SLOTF Site. Based on the 2003-2005 surveys of 86 seasonal wetland features determined to provide potential habitat, 60 of those pools were determined to be occupied by *B. lynchi* as a result of collection and identification of the species, or assumed to be occupied based on observed hydrologic connectivity to occupied pools (Rincon, 2005). The 2011/2012 wet season surveys were initiated at the recommendation of the Service to provide updated information on the occupancy of VPFS within previously unoccupied or previously unsurveyed habitat areas at the SLOTF.

A total of 24 habitat areas were sampled at various stages of inundation throughout the 2011/2012 wet season. A total of 14 sampling events were conducted between initial inundation in late November and subsequent initial sampling in early December 2011 and the completion of surveys in late May 2012. Surveys were considered complete either upon final drying of pools or upon reaching 120 days of continuous inundation. After initial inundation, the site was checked continually at two week intervals and inundated areas were sampled. The first sampling occurred on December 2, 2011 when eight of the pools were inundated. Levels of inundation varied through the wet season depending on rainfall patterns, with pools generally inundated following one storm event in late November 2011, and then dry until late January 2012 when a large storm event inundated most of the features. Due to the long dry period through December and early January, many of the pools (even several of the long-lived pools) dried, and sampling was re-initiated in those pools after re-inundation in late January. Many of the pools dried again in February and became re-inundated with rainfall through March and April. Three large features (FS-54, FS-56, and FS-50a) had been continuously inundated for a period of 120 days by late March and the final sampling was conducted at these features on April 5, 2012. Four mid-size features (FS-70, FS-43, FS-44, and FS-50b) that had dried in December/January reached 120 days of continuous inundation in late May and the final sampling was conducted at these features on May 22, 2012. Two of the previously unoccupied habitat features (FS-83 and FS-84) remained dry throughout the 2011/2012 wet season and no sampling was conducted in these features.

VPFS were found in five pools previously determined to be unoccupied in the 2003-2005 surveys (FS-46, FS-66, FS-36, FS-15, and FS-16) and sampling was terminated in these pools once VPFS were recorded. In all five locations, VPFS were co-occurring with the California fairy shrimp and were far out-numbered by them. In most of the new occurrence locations, VPFS were found within the first two sampling events after inundation or re-inundation and were much larger in size, maturing more quickly than the co-occurring California fairy shrimp. The exception was FS-36, which had been inundated for a much longer period (greater than 80 days) when VPFS were first observed on April 19, 2012; rainfall in early April caused pool FS-36 to greatly expand in size and it is likely that this expansion triggered a VPFS hatching event. A re-hatch of California fairy shrimp was also observed in FS-36 during the April 19, 2012 sampling event, with two cohorts of California fairy shrimp (mature and immature) observed co-occurring in this pool along with the VPFS.

All other previously unoccupied features were intermittently inundated and sampled throughout the 2011/2012 wet season with no observations of VPFS. California fairy shrimp were found to occur in many of the habitat features that were unoccupied by VPFS. Table 1 indicates the dates of sampling and duration of inundation for each sampling location. Figure 2 indicates the corresponding location of each pool included in the supplemental wet season sampling effort. Figure 3 provides

representative photographs of the various habitat features and pools that were sampled during the 2011-2012 wet season.

In addition, there are three areas that were identified as "unmapped suitable habitat" in Figure 2 of the BO. These areas were routinely checked after rainfall events to determine whether pools providing potential habitat for VPFS occur within these areas. These areas are identified as Area 1, Area 2, and Area 3. These three areas do not provide suitable habitat and no sampling was conducted. Area 1 is part of an emergent perennial wetland that is contiguous with the North Marsh. The entire polygon identified as Area 1 is included within the marsh area. This area supports perennial wetland vegetation and does not dry in the summer and, therefore, would not provide suitable VPFS habitat (see Figure 3, Photograph 1 for a photo of Area 1). Area 2 occurs alongside the road, and is a topographic depression that appears as though it could become inundated in the rainy season. However, this area was routinely checked after each storm event and did not support any ponded areas during the wet season surveys (see Figure 3, photograph 2 for a photo of Area 2). Area 3 is a higher topographic area situated between two segments of the North Marsh. This area clearly supports upland vegetation (annual grasses and mustard) and was routinely checked after each storm event for areas of inundation. This area was not found to provide suitable habitat for the VPFS (see Figure 3, Photograph 3 for a photo of Area 3). There were no VPFS habitat features observed within any of the "unmapped suitable habitat" and, therefore, no sampling was conducted in these areas.

Several of the sampling areas (e.g. FS-43 and FS-54, also known as Reservoirs 5 and 7, respectively) routinely had high or very high pH and electrical conductivity (EC), much higher than the recognized thresholds for VPFS. VPFS typically occur in waters with a pH range of 6.3-8.5 with a mean of 6.8 and total dissolved solids (TDS) concentrations of 48-481 parts per million (ppm) with a mean of 185 ppm (Eriksen and Belk, 1999). Reservoir 7 routinely had pH measurements over 10 and EC greater than 2,000 µmhos (approx 1,000 ppm). Reservoir 5 routinely had a pH above 9 and EC greater than 1,000 µmhos (approx 500 ppm). In addition, both of these features have a very long hydroperiod (both were inundated greater than 120 days) and because of these conditions, it is not likely they would provide suitable habitat for the VPFS, even though they do dry briefly in the summer. There are several additional features (e.g. FS-56 and FS-50) that also have a very long hydroperiod (all sampled through >120 days of continuous inundation), and would not be likely to provide suitable habitat for the VPFS. In general, inundation of the pools in the southwestern portion of the SLOTF site are partially supported by a connection with shallow groundwater; therefore, the pools in this area are much longer lived, sometimes even not drying completely in the summer months. Many of the features in this area, with a longer hydroperiod, support the longer-lived California fairy shrimp, and it is likely that many of the larger features on the SLOTF site tend to provide conditions more favorable for the California fairy shrimp than for the VPFS.

Table 1. Sampling Dates and Inundation Status of Pools at the SLO Tank Farm Site During 2011/2012 Wet Season Surveys

Pool No.	12/2/11	12/15/11	12/29/11	1/12/12	1/26/12	2/9/12	2/23/12	3/8/12	3/22/12	4/5/12	4/19/12	5/1/12	5/15/12	5/22/12
Pools North of Tank Farm Road														
Area 1														
Area 2														
Area 3														
FS-2														
FS-3														
FS-14														
FS-15											*	*B. lynchi* obs, no longer sampled		
FS-16											*	*B. lynchi* obs, no longer sampled		
FS-38														
FS-39														
FS-70														120 days
FS-71														
FS-72														
FS-73														
FS-74														
FS-83														
FS-84														
Pools South of Tank Farm Road														
FS-21														
FS-36											*	*B. lynchi* obs, no longer sampled		
FS-43														120 days
FS-44														120 days
FS-46						*	*B. lynchi* obs, no longer sampled							
FS-50a										120 days				
FS-50b														120 days
FS-52														
FS-54										120 days				
FS-56										120 days				
FS-66						*	*B. lynchi* obs, no longer sampled							
LEGEND:		= inundated on this sampling date				*	= Branchinecta lynchi observed in pool, no additional sampling conducted							
		= not inundated on this sampling date				120 days	= 120 days of continuous inundation, no additional sampling conducted							

Each sampling episode was conducted in accordance with the Interim Survey Guidelines (USFWS, 1996). Each pool was sampled in multiple locations and at various depths. Contents of the dip net were examined following each dip, and organisms were identified to a taxonomic level necessary to determine whether it was a listed species of vernal pool branchiopod. The surface area and depth of each sampling location was recorded during each sampling episode and recorded on data sheets. Additionally, water chemistry (electrical conductivity and pH) and weather conditions (air temperature, water temperature, and wind speed) were measured and recorded on datasheets. Photographs were taken of each pool from predetermined photopoint locations (Figure 3) to visually compare conditions among sampling episodes and selected representative photographs are presented in Figure 3. Data from each sampling episode were recorded on datasheets and are included under Appendix A of this letter.

In summary, VPFS were observed in five locations that were previously determined to be unoccupied habitat. These include FS-46 and FS-66 where VPFS were observed on February 9, 2012, and FS-15, FS-16, and FS-36 where VPFS were observed on April 19, 2012. These occurrences were documented on field datasheets and the Service was notified of the new occurrences via email in accordance with the notification requirements in the Interim Survey Guidelines. Based on prior agreement with the Service, voucher collections were not made of the new VPFS occurrences because extensive voucher collections were already made during previous survey efforts. All individuals of the VPFS collected during the 2011/2012 wet season sampling were returned to the pools from which they were collected. The VPFS Occupied Habitat Map was updated and is included as Figure 2. The newly identified occupied habitat amounts to an additional 0.8-acre of VPFS occupied habitat for a total of 32.6 acres of VPFS occupied habitat on the SLOTF Site.

I certify that the information in this survey report and the attached exhibits fully and accurately represent my work. Please contact Sarah Powell at (916) 857-1601 or by email at spowell@padreinc.com if you have any questions or require additional information.

Sincerely,

Sarah Powell
Permit No. TE-063427-1

Julie Thomas
Permit No. TE-834492-4

Enclosures

cc: Eric Snelling, Padre Associates, Inc.
Rik Williams, Chevron Environmental Management Company
Julie Vanderwier, U.S. Fish and Wildlife Service
Jenny Marek, U.S Fish and Wildlife Service

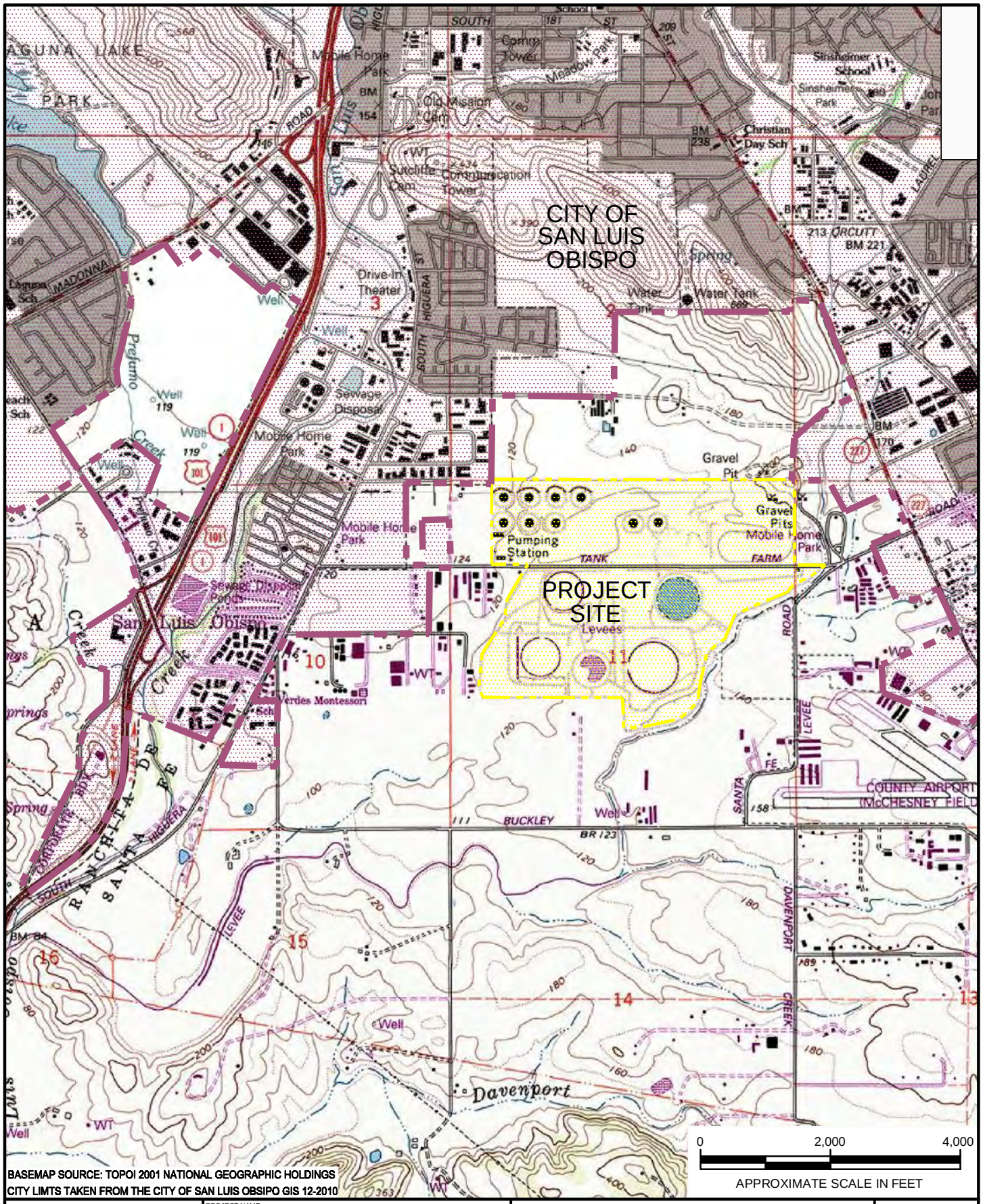
REFERENCES

Eriksen, C.H., and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas*. Mad River Press, Eureka, CA.

Rincon Consultants, Inc. 2005. *Unocal Corporation San Luis Obispo Tank Farm Comprehensive Fairy Shrimp Wet and Dry Season Survey Report*. October 18, 2005.

U.S. Fish and Wildlife Service. 1996. *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods*. U.S. Department of the Interior, April 19, 1996.

FIGURES



BASEMAP SOURCE: TOPOI 2001 NATIONAL GEOGRAPHIC HOLDINGS
CITY LIMTS TAKEN FROM THE CITY OF SAN LUIS OBSIPO GIS 12-2010

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PROJECT NAME:
CEMC
SAN LUIS OBISPO TANK FARM
San Luis Obispo, California

PROJECT NUMBER: 0601-3284
DATE: July 2012

SITE LOCATION MAP

FIGURE
1

Z:\Current Projects\0000-0000 CAD MASTER DRAWINGS\TANK FARM CHEVRON\Plate 1(Site Location).dwg, 7/16/2012 10:23:48 AM

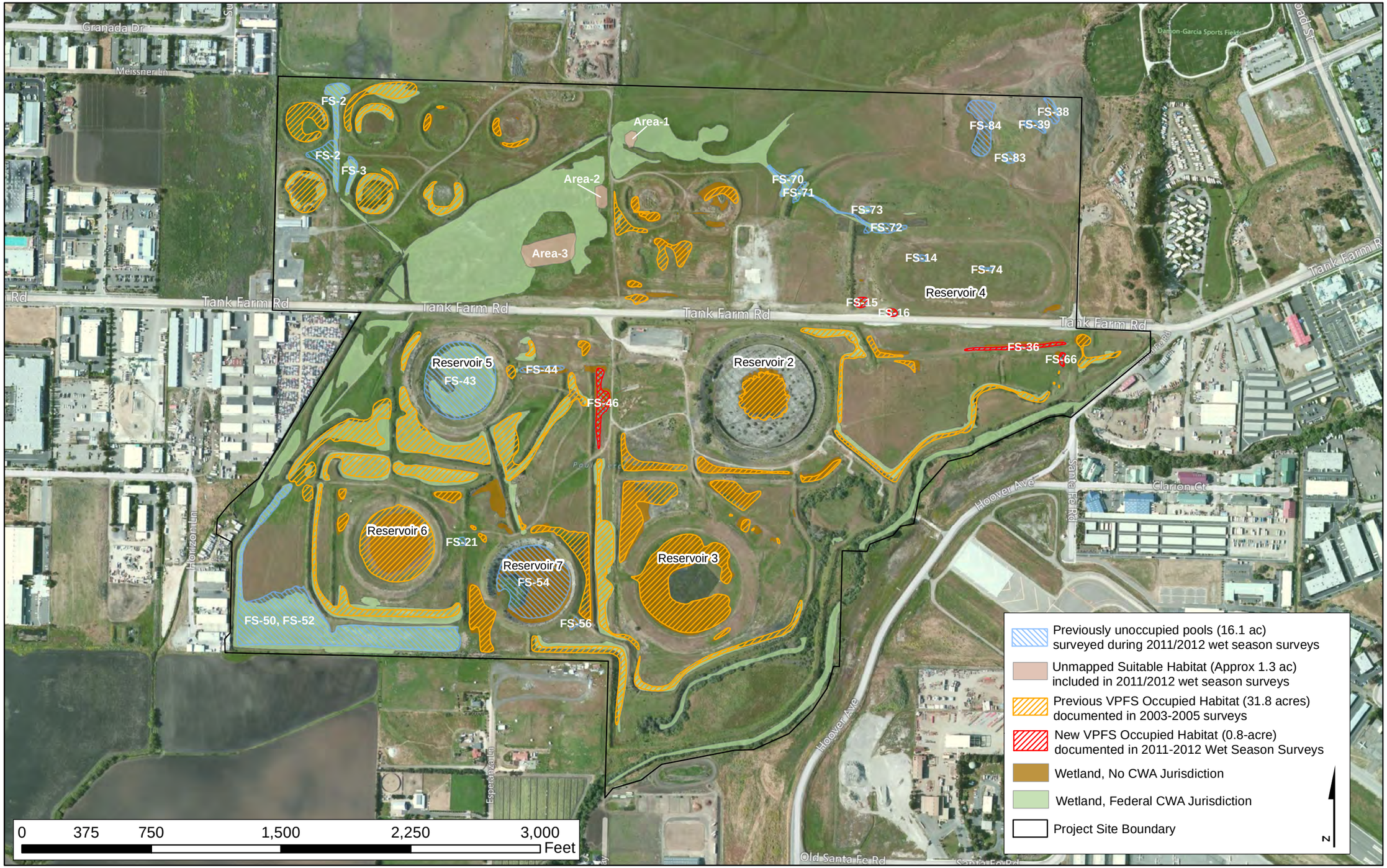

Figure 2
VPFS Occupied Habitat
San Luis Obispo Tank Farm Project Site

Photograph 1.

Westerly view of area identified as Area 1. This was one of three areas identified as "Unmapped Suitable Habitat". Area 1 is the north marsh which is perennially inundated and supports emergent wetland vegetation. Area 1 does not support potential VPFS habitat. Photograph taken on 1/26/2012.

Photograph 2.

Northerly view of area identified as Area 2. This was one of three areas identified as "Unmapped Suitable Habitat". No inundation was observed in Area 2 during wet season surveys and, therefore, no sampling conducted. Photograph taken on 2/9/2012.

Photograph 3.

Westerly view of area identified as Area 3. This was one of three areas identified as "Unmapped Suitable Habitat". No inundation was observed in Area 2 during wet season surveys and, therefore, no sampling conducted. Photograph taken on2/9/2012.

Photograph 4.

Northerly view of FS-2 at maximum inundation during the 2011/2012 wet season. Photograph taken on 1/26/12.

Photograph 5.

Southeasterly view of FS-3. This pool was inundated twice during the 2011/2012 wet season. Photograph taken on 1/26/12.

Photograph 6.

Easterly view of FS-14. This pool was inundated twice during the 2011/2012 wet season. Photograph taken on 1/26/12.

Figure 3
Site Photographs
2011/2012 Wet Season VPFS Surveys
San Luis Obispo Tank Farm Site

Photograph 7.

Northerly view of FS-15. VPFS were observed in this pool on 4/19/12.

Photograph 8.

Easterly view of FS-16. VPFS were observed in this pool on 4/19/2012.

Photograph 9.

Northerly view of FS-38 at maximum inundation. This pool was inundated twice during the 2011/2012 wet season. Photograph taken on 1/26/12.

Photograph 10.

Easterly view of FS-39 at maximum inundation. This pool was inundated three times during the 2011/2012 wet season. Photograph taken on 1/26/12.

Photograph 11.

Southwesterly view of FS-70. This pool was continuously inundated for >120 days in May 2012. Photograph taken at final sampling on 5/22/2012.

Photograph 12.

Northeasterly view of FS-71. This pool was inundated twice during the 2011/2012 wet season. Photograph taken on 4/19/2012.

Figure 3
Site Photographs
2011/2012 Wet Season VPFS Surveys
San Luis Obispo Tank Farm Site

Photograph 13.

Northwesterly view of FS-72. This pool was inundated twice during the 2011/2012 wet season.

Photograph taken on 1/26/2012.

Photograph 14.

Easterly view of FS-73. This pool was inundated twice during the 2011/2012 wet season. Photograph taken on 4/19/2012.

Photograph 15.

Easterly view of FS-74. This pool was inundated twice during the 2011/2012 wet season. Photograph taken on 1/26/2012.

Photograph 16.

Easterly view of FS-83.This pool never became inundated during the 2011/2012 wet season. This photograph was taken on 1/26/2012 during the wettest survey effort of the year.

Photograph 17.

Northerly view of FS-84. This pool never became inundated during the 2011/2012 wet season. This photograph was taken on 1/26/2012 during the wettest survey effort of the year.

Photograph 18.

Northerly view of FS-21. This pool was inundated once during the 2011/2012 wet season. Photograph taken on 1/26/12.

Figure 3
Site Photographs
2011/2012 Wet Season VPFS Surveys
San Luis Obispo Tank Farm Site

Photograph 19.

Westerly view of FS-36. VPFS were observed in this pool on 4/19/12.

Photograph 20.

Westerly view of FS-43 (Reservoir 5). This reservoir was continuously inundated for >120 days in May 2012. Photograph taken at final sampling on 5/22/2012.

Photograph 21.

Easterly view of FS-44. This feature was continuously inundated for >120 days in May 2012. Photograph taken at final sampling on 1/26/0212.

Photograph 22.

Northerly view of FS-46. VPFS were observed in this pool on 2/9/2012. Photograph taken 2/9/2012.

Photograph 23.

Westerly view of FS-50a. The large southern portion of FS-50 was disconnected from the northern portion of FS-50, and was sampled separately as FS-50a.

Photograph of eastern portion of FS-50a taken on 1/26/2012.

Photograph 24.

Easterly view of FS-50a.

Photograph of western portion of FS-50a taken on 1/26/2012.

Figure 3
Site Photographs
2011/2012 Wet Season VPFS Surveys
San Luis Obispo Tank Farm Site

Photograph 25.

Northerly view of channel connecting FS-50a and FS-50b. This connection was continuously dry during the 2011/2012 wet season keeping FS-50a and 50b disconnected. Photograph taken on 1/26/2012.

Photograph 26.

Southerly view of FS-50b. This large pool occurs in the northern part of FS-50 and was disconnected from the southern part throughout the wet season. Sampling conducted separately as FS-50b. Photograph taken at maximum inundation on 1/26/2012.

Photograph 27.

Westerly view of FS-52, eastern pool. FS-52 consists of three separate pools that were very close proximity, and likely connected in some years, but disconnected during the 2011/2012 wet season. All were sampled as FS-52. This easternmost pool was only inundated once in January. Photograph taken on 1/26/2012.

Photograph 28.

Westerly view of FS-52, northern pool. Northern and southern pool were almost connected at maximum inundation. Photograph taken on 4/19/2012.

Photograph 29.

Westerly view of FS-52, southern pool. Northern and southern pool were almost connected at maximum inundation. Photograph taken on 4/19/2012.

Photograph 30.

Westerly view of FS-54 (Reservoir 7). This reservoir was continuously inundated for >120 days in April 2012. Photograph taken at final sampling on 4/5/2012.

Figure 3
Site Photographs
2011/2012 Wet Season VPFS Surveys
San Luis Obispo Tank Farm Site

 Photograph 31. Southerly view of FS-56. This pool was continuously inundated for >120 days in April 2012. Photograph taken at final sampling on 4/5/2012.	 Photograph 32. Easterly view of FS-66. VPFS were observed in this pool on 2/9/2012. Photograph taken 2/9/2012.

Figure 3
Site Photographs
2011/2012 Wet Season VPFS Surveys
San Luis Obispo Tank Farm Site

APPENDIX A
WET SEASON SURVEY DATASHEETS

padre associates, inc. ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 12/2/2011 **Time:** 1215-1745 **Surveyor** S. Powell/J. Thomas **Permit #:** TE-063427-1/TE-834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments									6710-11, 7560-61	Contiguous with adjacent perennial emergent wetland
Area 2		dry								6708-09, 7559	
Area 3		dry								6703-07, 7557-58	
FS-2		35		120	14.6	441	No		CLAD, COP, OST, C; adult dragonfly	6708-09, 6698-6702	pH=7.51, One linear pool plus small pool south of culvert
FS-3		dry								7556	
FS-14		dry								6724-25	
FS-15		dry								6720-21	
FS-16		dry								6722-23	
FS-38		45		208	13.6	270	*Linderiella occidentalis* (IM)	H	CLAD, COP, OST, CHIR	6742-44	pH=9.09
FS-39		dry								6740-41	
FS-70		35		240	13.9	529	No		COR, scuds, COP, CLAD	6716-17, 7563	pH=7.47; Cattails, brownish water
FS-71		dry								6718-19	
FS-72		dry								6726-30	
FS-73		dry								6731-32	
FS-74		dry								No photo	
FS-83		dry								6733-34	
FS-84		dry								6735-39	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 12/2/2011 – p.2 **Time:** 1215-1745 **Surveyor** S. Powell/J. Thomas **Permit #:** TE-063427-1/TE-834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		dry								7570	
FS-36		dry								6762-66, 7580	
FS-43		12		375	11.0	1083	No		OST, COR, midge larvae	6757-59, 7576	pH=8.84
FS-44		dry								6755-56	
FS-46		dry								6745-48	
FS-50a		35		1500	11.2	455	No		Midge larvae, COP	6751-52, 7573-74	pH=9.5
FS-50b		dry								No photo	
FS-52		12		80	15.6	435	*L. occidentalis*	H	COR, CLAD, OST, COP	6749-50, 7571- 72	pH=8.83; three pools
FS-54		12		55% of max	17.1	3556	No		CLAD, midge larvae	7569	pH=9.33
FS-56		25		25	11.0	212	*L. occidentalis* (IM)	H	CLAD	6753-54, 7575	pH=7.24
FS-66		dry								6760-61, 7578-79	

OTHER NOTES: cattle present throughout
WEATHER: wind: 2-4.5 mph **cloud cover:** 10 % **rain/fog/other:** N/A **Air Temp (°C):** 27.2

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net;
V = visual; NS = not sampled

ID Method: M = Microscope
H = Hand Lens X 15

Fairy shrimp: IM = immature
BL = *Branchinecta lynchi*
LO = *Linderiella occidentalis*
Lep = *Lepidurus* sp.

Other fauna:
A = Anisoptera
CLAD = Cladocerans
CONC = Conchostracans
COP = Copepods
OST = Ostracods
E = Ephemerata
N = Notonectidae
Z = Zygoptera
H = Hydrophilidae
D = Dystiscidae
C = Corixidae
Other: amphibians, birds – specify as needed
B = Belostomatidae
G = Gerridae
M = Mosquito (Diptera: Culicidae)
P = Phantom midge (Diptera: Chaoboridae)
CHIR = Nonbiting midge (Diptera: Chironomidae)

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County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments									6788-90, 7759	Contiguous with perennial marsh
Area 2		dry								6783-84, 7757	
Area 3		dry								6785-87, 7758	
FS-2		< 3 cm								6780-82, 7755-S; 7756-N	2 puddles less than 3 cm
FS-3		dry								6778-79, 7754	
FS-14		dry								6799-6800	
FS-15		dry								6793-94	
FS-16		dry								6795-96	
FS-38		35		85	9.8	299	*Linderiella occidentalis* (IM)	H	OST, C, CHIR, flatworm	6811-12	pH=8.67, Pool shrinking due to lack of rain
FS-39		dry								6809-10	
FS-70		13		90	6.9	730	*L. occidentalis* (IM)	H	CLAD, COP, scuds; crawfish remains	7760-63	pH=7.86; deer on-site; cattails in pond
FS-71		dry								6791-92	
FS-72		dry								6801-02	
FS-73		dry								6803-04	
FS-74		dry								6797-98	
FS-83		dry								6807-08	
FS-84		dry								6805-06	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 12/15/2011 – pg. 2 **Time:** 0900-1500 **Surveyor** S. Powell/J. Thomas **Permit #:** TE-063427-1/TE-834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		dry								6825-26	
FS-36		dry								6813-17	
FS-43		10		112	15.6	2354	No		CLAD, COP, OST, C	6838-40	pH=8.72
FS-44		dry								6836-37	
FS-46		dry								6820-22	
FS-50a		32		644	12.7	368	No		COP, C	6834-35	pH=8.9, larger pool in SE portion of FS-50 (disconnected)
FS-50b		13		44	13.1	2819	*Linderiella occidentalis?* (IM)	H, M	CLAD, COP, OST, C, CHIR, mosq larv, mayfly larv, flatworm	6827-31	pH=8.3, Small pool at NW limits of FS-50, disconnected
FS-52		8		80	15.5	628	No		OST, CLAD, COP	6832-33, 7778	pH = 8.72
FS-54		16		4800	13.8	3130	No		CLAD, mayfly larvae	6823-24	pH=8.9
FS-56		25			10.8	122	*L. occidentalis* (IM)	H	COP, OST, CLAD, M	7773-74	pH = 7.08; water tea color; frog eggs (amorphous)
FS-66		dry								6818-6819	

OTHER NOTES:

WEATHER: wind: 1.3-2.8 mph **cloud cover:** 60 % **rain/fog/other:** drizzle **Air Temp (°C):** 9.8-17.9

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net;
V = visual; NS = not sampled

ID Method: M = Microscope
H = Hand Lens X 15

Fairy shrimp: IM = immature
BL = *Branchinecta lynchi*
LO = *Linderiella occidentalis*
Lep = *Lepidurus* sp.

Other fauna:
A = Anisoptera
CLAD = Cladocerans
CONC = Conchostracans
COP = Copepods
N = Notonectidae
Z = Zygoptera
H = Hydrophilidae
D = Dystiscidae
B = Belostomatidae
G = Gerridae
M = Mosquito (Diptera: Culicidae)
P = Phantom midge (Diptera: Chaoboridae)

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 12/29/2011 **Time:** 1100-1500 **Surveyor** S. Powell **Permit #:** TE-063427-1

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments									6846-47	Contiguous with perennial marsh
Area 2		dry								No photo	Dry last survey effort and no rain since last survey
Area 3		dry								No photo	Dry last survey effort and no rain since last survey
FS-2		dry								6841-43	
FS-3		dry								6844-45	
FS-14		dry								No photo	Dry last survey effort and no rain since last survey
FS-15		dry								No photo	Dry last survey effort and no rain since last survey
FS-16		dry								No photo	Dry last survey effort and no rain since last survey
FS-38		dry								6852-54	
FS-39		dry								No photo	Dry last survey effort and no rain since last survey
FS-70		dry								6848-51	
FS-71		dry								No photo	Dry last survey effort and no rain since last survey
FS-72		dry								No photo	Dry last survey effort and no rain since last survey
FS-73		dry								No photo	Dry last survey effort and no rain since last survey
FS-74		dry								No photo	Dry last survey effort and no rain since last survey
FS-83		dry								No photo	Dry last survey effort and no rain since last survey
FS-84		dry								No photo	Dry last survey effort and no rain since last survey

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 12/29/2011 **Time:** 1100-1500 **Surveyor** S. Powell **Permit #:** TE-063427-1

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		dry								No photo	Dry last survey effort and no rain since last survey
FS-36		dry								No photo	Dry last survey effort and no rain since last survey
FS-43		dry								6885-88	
FS-44		dry								No photo	Dry last survey effort and no rain since last survey
FS-46		dry								No photo	Dry last survey effort and no rain since last survey
FS-50a		31		420	16.5	458	No		COP, C, Fish, Crayfish	6870-79	pH=10.1
FS-50b		dry								6882-84	
FS-52		dry								6868-69	
FS-54		8		3200	20.7	4830	No		CLAD, A (larv), Chir 9larv), mayfly larvae	6855-65	pH=9.97, pool shrinking due to lack of rain
FS-56		15		35	15.2	295	*Linderiella occidentalis* (IM)	H	CLAD, COP, OST, M (larv), snail	6866-67	pH=8.13, FS still immature, no brood pouches observed
FS-66		dry								No photo	Dry last survey effort and no rain since last survey

OTHER NOTES:

WEATHER: wind: Ave 0.8-4.5 mph **cloud cover:** 10 % **rain/fog/other:** sunny **Air Temp (°C):** 19.0 – 24.5

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net; V = visual; NS = not sampled

ID Method: M = Microscope; H = Hand Lens X 15

Fairy shrimp: IM = immature; BL = *Branchinecta lynchi*; LO = *Linderiella occidentalis*; Lep = *Lepidurus* sp.

Other fauna: A = Anisoptera; CLAD = Cladocerans; CONC = Conchostracans; COP = Copepods; OST = Ostracods; E = Ephemerata; N = Notonectidae; Z = Zygoptera; H = Hydrophilidae; D = Dystiscidae; C = Corixidae; Other: amphibians, birds – specify as needed; B = Belostomatidae; G = Gerridae; M = Mosquito (Diptera: Culicidae); P = Phantom midge (Diptera: Chaoboridae); CHIR = Nonbiting midge (Diptera: Chironomidae); PTF = Pacific Tree Frog; AMPH = Amphipods

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 1/12/2012 **Time:** 1000-1300 **Surveyor** J. Thomas **Permit #:** TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		dry								No photo	Dry last survey effort and no rain since last survey
Area 3		dry								No photo	Dry last survey effort and no rain since last survey
FS-2		dry								No photo	Dry last survey effort and no rain since last survey
FS-3		dry								No photo	Dry last survey effort and no rain since last survey
FS-14		dry								No photo	Dry last survey effort and no rain since last survey
FS-15		dry								No photo	Dry last survey effort and no rain since last survey
FS-16		dry								No photo	Dry last survey effort and no rain since last survey
FS-38		dry								No photo	Dry last survey effort and no rain since last survey
FS-39		dry								No photo	Dry last survey effort and no rain since last survey
FS-70		dry								No photo	Dry last survey effort and no rain since last survey
FS-71		dry								No photo	Dry last survey effort and no rain since last survey
FS-72		dry								No photo	Dry last survey effort and no rain since last survey
FS-73		dry								No photo	Dry last survey effort and no rain since last survey
FS-74		dry								No photo	Dry last survey effort and no rain since last survey
FS-83		dry								No photo	Dry last survey effort and no rain since last survey
FS-84		dry								No photo	Dry last survey effort and no rain since last survey

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 1/12/2012 **Time:** 1000-1300 **Surveyor** J. Thomas **Permit #:** TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		dry								No photo	Dry last survey effort and no rain since last survey
FS-36		dry								No photo	Dry last survey effort and no rain since last survey
FS-43		dry								No photo	Dry last survey effort and no rain since last survey
FS-44		dry								No photo	Dry last survey effort and no rain since last survey
FS-46		dry								No photo	Dry last survey effort and no rain since last survey
FS-50a		30+		3780	10.6	587	No		COR, Clad, Cop	1040420 -424	pH=8.91
FS-50b		dry								No photo	Dry last survey effort and no rain since last survey
FS-52		dry								No photo	Dry last survey effort and no rain since last survey
FS-54		20		165	8.7	>3999	No		Clad	1040407 -411	pH=9.41; Several small pools
FS-56		10		24	7.5	305	*Linderiella occidentalis* (IM)	H	Clad, Ost, Cop, M, beetles	1040412 -419	pH=7.49; All L.O. had reddish eyes, no long antennae, brood sacs not yet apparent = still IM
FS-66		dry								No photo	Dry last survey effort and no rain since last survey

OTHER NOTES
WEATHER: wind: 5-10mph **cloud cover:** <10 % **rain/fog/other:** -- **Air Temp (°C):** 18-21

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net;
V = visual; NS = not sampled

Fairy shrimp: IM = immature
BL = *Branchinecta lynchi*
LO = *Linderiella occidentalis*
Lep = *Lepidurus* sp.

ID Method: M = Microscope
H = Hand Lens X 15

Other fauna:
A = Anisoptera
CLAD = Cladocerans
CONC = Conchostracans
COP = Copepods
OST = Ostracods
E = Ephemerata
N = Notonectidae
Z = Zygoptera
H = Hydrophilidae
D = Dystiscidae
C = Corixidae
Other: amphibians, birds – specify as needed
B = Belostomatidae
G = Gerridae
M = Mosquito (Diptera: Culicidae)
P = Phantom midge (Diptera: Chaoboridae)
CHIR = Nonbiting midge (Diptera: Chironomidae)

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 1/26/2012 **Time:** 0900-1730 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1 , TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments									6893-95	Contiguous with perennial marsh
Area 2		dry								6896-97	
Area 3		dry								6898-6901	
FS-2		36		525	12.3	464	No		COP, OST, C, CHIR, FW snail, PTF egg masses	6889-92	pH=7.74, clear to bottom
FS-3		20		358	15.2	264	No		COP	8144	pH=7.32; Very windy
FS-14		20		90	20.9	391	No		Ost, COP	8149	
FS-15		30		276	17.6	128	IM – 1000s		COP, CHIR	8148	pH = 7.35; PTF eggs on grass stems in pond
FS-16		34		515	16.1	113	No		COP, OST, CHIR	6902-03	pH=7.61, clear to bottom
FS-38		98		231	15.6	186.5	No			6919-20	pH=8.56, clear to bottom
FS-39		45		44	19.1	161	No		COP	8151	pH=8.37; Very clear water
FS-70		60+		80%	15.6	195	IM – 100s		COP, scud	8146-47	pH=7.34; Heard treefrogs
FS-71		35		84	12.4	205	FS nauplii (IM)	H	COP, CHIR, PTF egg masses		pH=7.46, not clear to bottom
FS-72		25		225	22	610	No		COP, OST, M	8150	pH = 8.25; 3 separate pools
FS-73		15		231	17.4	184.5	No		COP, CHIR	6910-11	pH=7.59, clear to bottom
FS-74		13		115 (25)	19.3	228	No		COP, C, CHIR	6904-09	pH=7.68, clear to bottom, several disconnected pools
FS-83		dry								6915-16	
FS-84		dry								6912-14	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 1/26/2012 **Time:** 0900-1730 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1 , TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		10		44 (5)	20.2	151.8	No		COP, flatworms	6926-28	pH=7.23, clear to bottom, two disconnected pools
FS-36		48		430	17.6	81.4	FS nauplii (IM)	H	CLAD, COP, CHIR, PTF adult vocalization	6921-22	pH=7.56, not clear to bottom
FS-43		28		60% max	17.2	662	FS nauplii (IM) 10's	H	COP, OST, C, CHIR, beetles, PTF vocalization	6939-42	pH=8.69, clear to bottom
FS-44		35		50	17.2	101	IM – 1000s		PTR eggs, OST, COP, CHIR	8162	pH = 7.04; PTF vocalization
FS-46		73		1080 (45)	17.9	92	FS nauplii (IM) 1000's	H	COP, beetles	6923-25	pH=7.18, not clear to bottom, two separate pools (disconnected)
FS-50a		>60		1530	15.5	220	No		COP	6933-38	pH=10.11, not clear to bottom, two lg disconnected pools, one sm pool (Julie sampled sm pool as FS-50b)
FS-50b		50+		80%	16.8	371	No		COP	8161	pH = 7.47; Receives flow from FS-47
FS-52		15 (9)		184 (31.5)	21	215	FS nauplii (IM)	H	COP, OST, CHIR	6929-32	pH=9.72, clear to bottom, two disconnected pools
FS-54		20		80% of base covered	21.3	1371	No		None	8157-59	pH = 9.04; Cows drinking water
FS-56		75+		130	17.3	92	IM- nauplii		OST, COP, CHIR	8160	pH = 6.91; FS rehatch
FS-66		45		90	20.8	85	IM- 1000s		COP, OST, beetles	8152	pH=7.25; Tea-colored water, PTF egg masses

OTHER NOTES:

WEATHER: wind: Ave 4.5 mph (gusts up to 14 mph) **cloud cover:** 20 % **rain/fog/other:** sunny **Air Temp (°C):** 18.5-22.5

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net;
V = visual; NS = not sampled

Fairy shrimp: IM = immature
BL = *Branchinecta lynchi*
LO = *Linderiella occidentalis*
Lep = *Lepidurus* sp.

ID Method: M = Microscope
H = Hand Lens X 15

Other fauna:

A = Anisoptera	N = Notonectidae	B = Belostomatidae
CLAD = Cladocerans	Z = Zygoptera	G = Gerridae
CONC = Conchostracans	H = Hydrophilidae	M = Mosquito (Diptera: Culicidae)
COP = Copepods	D = Dystiscidae	P = Phantom midge (Diptera: Chaoboridae)
OST = Ostracods	C = Corixidae	CHIR = Nonbiting midge (Diptera: Chironomidae)
E = Ephemerata	PTF = Pacific Tree Frog	Other: amphibians, birds – specify as needed

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 2/9/2012 **Time:** 0800-1600 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1 , TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		dry								6946-47	
Area 3		dry								6948-50	
FS-2		24		88 (2)	8.4 (9.9)	464 (632)	*Linderiella occidentalis* 10's	H	COP, OST, M (larv), PTF egg masses	6943-45	pH=8.32, clear to bottom, lots of filamentous algae
FS-3		dry								8288	
FS-14		dry								8324	
FS-15		17		40	13.2	178	*L. occidentalis* - IM		OST, CLAD, flatworm, COR	8300-09	pH = 7.7
FS-16		11		18	15.3	156.1	*L. occidentalis* 100's	H	COP, OST, flatworms, M (larv + adult)	6956-57	pH=7.45, clear to bottom
FS-38		60		105	17.5	171	No		COP, OST, CHIR (larv), M (larv + adult), PTF egg masses	6970-71	pH=9.69, clear to bottom
FS-39		dry								6967-69	
FS-70		50		37,500	13	285	*L. occidentalis* 100's - IM	H	OST, COP, CLAD, scuds	8289-99	pH = 7.81
FS-71		5		2 (0.5)	11.5	360	*L. occidentalis* 100's	H	COP, OST, M (larv)	6951-55	pH=7.7, clear to bottom, pool almost dry
FS-72		<3 cm								8325	
FS-73		dry								6962-63	
FS-74		dry								6958-61	
FS-83		dry								6966	
FS-84		dry								6964-65	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 2/9/2012 **Time:** 0800-1600 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1 , TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		dry								6976-77	
FS-36		45		462	17.9	101.9	*L. occidentalis* (IM)	H	CLAD, COP, OST, CHIR (larv), FW snail, mallards	6972-73	pH=7.41, clear to bottom
FS-43		30		50% max	20.9	1015	*L. occidentalis* 100's	H	CLAD, COP, OST, C, PTF tadpoles, mallards	6986-88	pH=9.18, clear to bottom
FS-44		30		135	19.4	152	*L. occidentalis* 10,000's - IM	H	COP, CLAD, OST, beetles, midge larvae	8389	pH=7.61
FS-46		60		410	18.7	111	*L. occidentalis* 1000's, *B. lynchi* 10's	H	CLAD, COP, OST, C, beetles, CHIR (larv)PTF, bufflehead, mallard	6974-75	pH=7.08, not clear to bottom
FS-50a		60		1500	16.7	287	No		CLAD, COP, coots	6982-83	pH=9.53, not clear to bottom, two lg disconnected pools, one sm pool (sm pool sampled as FS-50b)
FS-50b		60		570	17.6	453	*L. occidentalis* 1000's	H	COP, OST, PTF, garter snake	6984-85	pH=7.67, not clear to bottom
FS-52		9		90 (80)	23.7	400	*L. occidentalis* 10's	H	CLAD, COP, OST, C, PTF tadpoles	6978-81	pH=7.94
FS-54		45		70%	23	1685	No		OST, COP, CLAD (very large), beetles, COR – very few of all	8351	pH=9.63
FS-56		69		160	20	132	*L. occidentalis* 10,000's - mature	H	OST, COP, CLAD, snails, beetles, PTF	8352	pH=7.10
FS-66		20		44	22.9	120	*B lynchi* – 100s; *L occidentalis* – 1000's	H	PTF, OST, COP, flatworm	8350	pH=7.49

WEATHER: wind: Ave 1-5 mph **cloud cover:** 10 % **rain/fog/other:** sunny **Air Temp (°C):** 13.7-24.2

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net; V = visual; NS = not sampled

ID Method: M = Microscope; H = Hand Lens X 15

Fairy shrimp: IM = immature; BL = *Branchinecta lynchi*; LO = *Linderiella occidentalis*; Lep = *Lepidurus* sp.

Other fauna: A = Anisoptera; CLAD = Cladocerans; CONC = Conchostracans; COP = Copepods; OST = Ostracods; E = Ephemerata; N = Notonectidae; Z = Zygoptera; H = Hydrophilidae; D = Dystiscidae; C = Corixidae; PTF = Pacific Tree Frog; B = Belostomatidae; G = Gerridae; M = Mosquito (Diptera: Culicidae); P = Phantom midge (Diptera: Chaoboridae); CHIR = Nonbiting midge (Diptera: Chironomidae); Other: amphibians, birds – specify as needed

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 2/23/2012 **Time:** 0800-1530 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1, TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		dry								6992-93	
Area 3		dry								6994-97	
FS-2		Dry								6989-91	
FS-3		Dry								8406	
FS-14		Dry								7006-07, 8409	
FS-15		Dry								7002-03, 8408	
FS-16		Dry								7004-7005	
FS-38		29		51	14.4	240	*L. occidentalis* 100's	H	CLAD, CONC, COP, OST, CHIR (larv), PTF tadpoles, flatworms	7025-26	pH=8.68, clear to bottom
FS-39		Dry								7023-24	
FS-70		36		290	12.3	419	*L. occidentalis* low 100's	H	CLAD, COP, scuds, PTF tadpoles)	6998-99	pH=7.38, clear to bottom
FS-71		Dry								7000-01	
FS-72		Dry								7012-13, 8410	
FS-73		Dry								7014-17	
FS-74		Dry								7008-11	
FS-83		Dry								7021-22	
FS-84		Dry								7018-20	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 2/23/2012 - page 2 **Time:** 0800-1530 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1,TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		Dry								7059-60	
FS-36		35		330	18.2	100	*L. occidentalis* 1000's	H	CONC, COP, OST,C, M, PTF tadpoles, beetles, flatworms, mallards	7030-37	pH=8.01, clear to bottom
FS-43		26		50% max	23.0	1277	*L. occidentalis* 10's	H	CLAD, CONC, OST, PTF (tadpoles + adults), mayfly (larv)	7061-63	pH=9.13, clear to bottom
FS-44		25		135	19.7	214	*L. occidentalis* 100's	H	COP, D	8439	pH =8.0; very densely vegetated with grasses and filamentous algae
FS-46		NS									No longer sampled – BL observed on 2/9/12
FS-50a		>60		1040 (3200)	17.0	349	No		CLAD, COP, coots	7048-49	pH=8.8, not clear to bottom, two lg disconnected pools, one sm pool (sm pool sampled as FS-50b)
FS-50b		35		900	20.6	573	*L. occidentalis* 1000's	H	CLAD, CONC, COP, OST, PTF tadpoles, crayfish, mayfly (larv), mallards	7055-58	pH=8.42, not clear to bottom
FS-52		Dry								7043-45	
FS-54		20		70% of max	24.8	1830	No		CLAD, C, mayfly (larv)	7038-40	pH=10.0, clear to bottom
FS-56		47		120	17.4	181.6	*L. occidentalis* 1000's	H	OST	7041-42	pH=8.12, not clear to bottom
FS-66		NS								8411	No longer sampled – BL observed on 2/9/12

OTHER NOTES:

WEATHER: wind: Ave 1-1 - 3.5 mph **cloud cover:** 0 % **rain/fog/other:** sunny **Air Temp (°C):** 18.6 – 30.1

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net;
V = visual; NS = not sampled

ID Method: M = Microscope
H = Hand Lens X 15

Fairy shrimp: IM = immature
BL = *Branchinecta lynchi*
LO = *Linderiella occidentalis*
Lep = *Lepidurus* sp.

Other fauna:
A = Anisoptera
CLAD = Cladocerans
CONC = Conchostracans
COP = Copepods
OST = Ostracods
E = Ephemerata
N = Notonectidae
Z = Zygoptera
H = Hydrophilidae
D = Dystiscidae
C = Corixidae
PTF = Pacific Tree Frog
B = Belostomatidae
G = Gerridae
M = Mosquito (Diptera: Culicidae)
P = Phantom midge (Diptera: Chaoboridae)
CHIR = Nonbiting midge (Diptera: Chironomidae)
Other: amphibians, birds – specify as needed

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 3/8/2012 **Time:** 0800-1400 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1 , TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial emergent wetland
Area 2		Dry								No photo	Dry last survey effort and no rain since last survey
Area 3		Dry								No photo	Dry last survey effort and no rain since last survey
FS-2		Dry								7086-88	
FS-3		Dry								7083-85	
FS-14		Dry								No photo	Dry last survey effort and no rain since last survey
FS-15		Dry								No photo	Dry last survey effort and no rain since last survey
FS-16		Dry								No photo	Dry last survey effort and no rain since last survey
FS-38		Dry								7092-7100	Soil still moist, layer of desiccated invertebrates in bottom of pool (OST, CONC)
FS-39		Dry								No photo	Dry last survey effort and no rain since last survey
FS-70		33		120		573	*L. occidentalis* low 10's	H	CLAD, COP, OST, CHIR, scuds AMPH, PTF (tadpoles)	7089-7091	pH=8.14, not clear to bottom
FS-71		Dry								No photo	Dry last survey effort and no rain since last survey
FS-72		Dry								No photo	Dry last survey effort and no rain since last survey
FS-73		Dry								No photo	Dry last survey effort and no rain since last survey
FS-74		Dry								No photo	Dry last survey effort and no rain since last survey
FS-83		Dry								No photo	Dry last survey effort and no rain since last survey
FS-84		Dry								No photo	Dry last survey effort and no rain since last survey

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 3/8/2012 **Time:** 0800-1400 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1 , TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		dry								No photo	Dry last survey effort and no rain since last survey
FS-36		20		165	15.1	134	*L. occidentalis* 1000's (IM*)	H	CONC, COP, OST, M (larv), PTF (tadpoles), D, flatworms	7103-7105	pH=7.0, not clear to bottom (*no brood pouches yet)
FS-43		32		50% max	24.7	1598	No		CLAD, OST, D, C, M (larv), water mite, PTF (tadpoles)	7122-7123	pH=9.27, clear to bottom No *L. occidentalis* remaining
FS-44		25		148	22.7	268	No		Garter snake on bank, OST, M	15-17	pH=7.58; Pool filled with mats of dead veg and filamentous algae
FS-46		NS									No longer sampled – BL observed on 2/9/12
FS-50a		60		1040 (3200)	15.1	357	No		CLAD, COP, OST, C, CHIR, coots, blackbirds	7113-7118	pH=9.0, not clear to bottom, two lg disconnected pools, one sm pool (sm pool sampled as FS-50b
FS-50b		40+		932	22.9	916	*L. occidentalis* 10s to low 100's	H	CLAD, OST, COP, PTR, beetles	14	pH=8.4; 3 separate pools
FS-52		dry								7109-12	
FS-54		15		50% of max	23.5	2150	No		CLAD, PTF (tadpoles)	7106-7108	pH=10.23, clear to bottom
FS-56		> 60 cm		175	18.7	269	*L. occidentalis* 100's	H	Beetles (mature and nymph), OST	13	pH=7.42
FS-66		NS									No longer sampled – BL observed on 2/9/12

OTHER NOTES:

WEATHER: wind: Ave 0.8-4.5 mph **cloud cover:** 10 % **rain/fog/other:** sunny **Air Temp (°C):** 19.0 – 24.5

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net; V = visual; NS = not sampled

ID Method: M = Microscope; H = Hand Lens X 15

Fairy shrimp: IM = immature; BL = *Branchinecta lynchi*; LO = *Linderiella occidentalis*; Lep = *Lepidurus* sp.

Other fauna: A = Anisoptera; CLAD = Cladocerans; CONC = Conchostracans; COP = Copepods; OST = Ostracods; E = Ephemerata; N = Notonectidae; Z = Zygoptera; H = Hydrophilidae; D = Dystiscidae; C = Corixidae; Other: amphibians, birds – specify as needed; B = Belostomatidae; G = Gerridae; M = Mosquito (Diptera: Culicidae); P = Phantom midge (Diptera: Chaoboridae); CHIR = Nonbiting midge (Diptera: Chironomidae); PTF = Pacific Tree Frog; AMPH = Amphipods

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 3/22/2012 **Time:** 0800-1500 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1 , TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		Dry								7129-30	
Area 3		Dry								7131-34	
FS-2		36		130 (95)	13.8	409	No		COP, C, CHIR, Scuds (AMPH), crayfish	7126-28	pH=7.06, clear to bottom
FS-3		Dry								7124-25	
FS-14		Dry								7143-44	
FS-15		12		21	14.8	215	FS nauplii (IM) 100's	H	COP	7139-40	pH=7.68, clear to bottom recently re-inundated (3/17)
FS-16		15		40	14.7	245	No		COP, CHIR	7141-42	pH=7.56, clear to bottom recently re-inundated (3/17)
FS-38		55		70	15.2	287	No		D, CHIR	7159-60	pH=9.06, clear to bottom recently re-inundated (3/17)
FS-39		15		12	15.3	305	No		Beetles, COP, flatworms, PTF eggs	7157-58	pH=7.99
FS-70		33		176	15.2	519	No		COP, scuds, beetles, COR	11	pH=8.10
FS-71		Dry								7135-38	
FS-72		Dry								7148-49	
FS-73		Dry								7150-51	
FS-74		Dry								7145-47	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 3/22/2012 **Time:** 0800-1500 **Surveyor** S. Powell-J. Thomas **Permit #:** TE-063427-1, TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		Dry								7168-69	
FS-36		15		270	18.4	137.8	*L. occidentalis* 100's FS nauplii (IM) (rehatch) 100's	H	CLAD,CONC, COP, OST, PTF (tadpoles), D, flatworms	7163-64	pH=7.76, not clear to bottom
FS-43		26		50% max	23.7	1375	No		CLAD, COP, OST, D, C, CHIR, water mite, flatworm, PTF (tadpoles),	7176-78	pH=9.41, clear to bottom; killdeer, mallards, shorebirds
FS-44		25		133	22.2	237	*L. occidentalis* 10s – low 100's (IM)	H	D, M, COP, OST, PTF eggs, midge, beetles	14	pH=7.76; Dense mats of dead veg in pool, filamentous algae
FS-46		NS									No longer sampled – BL observed on 2/9/12
FS-50a		>60		1300 (3200)	17.2	373	No		CLAD, COP, C, CHIR, coots, mallards, Northern shoveler	7174-75	pH=9.15, not clear to bottom, two lg pools, one sm pool (sm pool sampled as FS-50b
FS-50b		40+		550	19.5	1031	No		OST, COP, CLAD, PTF eggs	13	
FS-52		15, 13		132, 125	22.6, 18.6	292, 236	FS nauplii 10's rehatch, both pools	H	CLAD, COP, D	7170-73	pH=9.38, 9.55, clear to bottom (two disconnected pools - North, South)
FS-54		18		80% of max	21.7	2270	No		CLAD, C, flatworms Killdeer, shorebirds	7165-67	pH=10.15, clear to bottom
FS-56		75		210 (approx 85%)	18.3	176	*L. occidentalis* 100's (IM)	H	OST, COP, CLAD, D, PTF-adult	12	pH=7.53
FS-66		NS									No longer sampled – BL observed on 2/9/12

WEATHER: wind: Ave 1.6-5.3 mph **cloud cover:** overcast-20 % **rain/fog/other:** fog in am/sun in pm **Air Temp (°C):** 11.4-12

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net; V = visual; NS = not sampled

ID Method: M = Microscope; H = Hand Lens X 15

Fairy shrimp: IM = immature; BL = *Branchinecta lynchi*; LO = *Linderiella occidentalis*; Lep = *Lepidurus* sp.

Other fauna: A = Anisoptera; CLAD = Cladocerans; CONC = Conchostracans; COP = Copepods; OST = Ostracods; N = Notonectidae; Z = Zygoptera; H = Hydrophilidae; D = Dystiscidae; C = Corixidae; E = Ephemerata; B = Belostomatidae; G = Gerridae; M = Mosquito (Diptera: Culicidae); P = Phantom midge (Diptera: Chaoboridae); CHIR = Nonbiting midge (Diptera: Chironomidae); Other: amphibians, birds – specify as needed; PTF = Pacific Tree Frog; AMPH = Amphipods

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 4/5/2012 **Time:** 0800-1400 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1, TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		dry									
Area 3		dry									
FS-2		20		80	7.2	458	No		CLAD, COP, OST, C, PTF tadpoles	7179-81	pH=7.73, clear to bottom
FS-3		Dry									
FS-14		Dry								7193-94	
FS-15		Dry								7184-85	
FS-16		Dry								7186-87	
FS-38		46		48	9.1	259	*L. occidentalis* low 100's	H	CLAD, COP, OST, D, PTF tadpole	7203-04	pH=9.69, clear to bottom
FS-39		Dry								7201-02	
FS-70		36		200	10.8	611	No		CLAD, COP, scud, beetles, PTR tadpoles	37	pH=8.32
FS-71		Dry								7182-83	
FS-72		Dry								7191-92	
FS-73		Dry								7195-96	
FS-74		Dry								7188-90	
FS-83		Dry								7199-7200	
FS-84		Dry								7197-98	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 4/5/2012 **Time:** 0800-1400 **Surveyor** S. Powell, J.Thomas **Permit #:** TE-063427-1, TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		Dry									
FS-36		10		110	12.8	152.6	*L. occidentalis* low 100's	H	CONC, COP, OST, D, M (larv) PTF (tadpoles), flatworms	7227-29	pH=8.10, not clear to bottom
FS-43		23		50% max	21.2	1498	No		CLAD, COP, C, water mite, PTF (tadpoles)	7271-73	pH=9.48, clear to bottom
FS-44		25		105	21.2	274	No		COP, OST, beetle, M	44	pH=7.95; dense mats dead veg and filamentous algae
FS-46		NS									No longer sampled – BL observed on 2/9/12
FS-50a		>60		1300 (2400)	16.6	393	No		CLAD, COP, OST, C, mallards, killdeer		pH=8.78, not clear to bottom, two lg disconnected pools, one sm pool (sm pool sampled as FS-50b). Julie sampled FS-50b.
FS-50b		>40		615	18.5	1372	No		COR, NOT, PTR, CLAD, OST, COP, midge, beetle	43	
FS-52 (N, S)		11, 9		95, 80	21.1, 20.9	425, 430	*L. occidentalis* 10's, both pools	H	CLAD, CONC, COP, OST, D, CHIR, PTF tadpoles	7233, 7234-7235	pH=9.6, 9.02, clear to bottom (two disconnected pools - North, South)
FS-54		18		80% of max	18.7	2660	No		CLAD, PTF tadpoles	7230-32	pH=10.19, clear to bottom
FS-56		70		185	14.9	151	No		PTR tadpoles, COR, COP, OST, midge, beetle, gastropod	38-42	
FS-66		NS								7218-19	No longer sampled – BL observed on 2/9/12

OTHER NOTES:

WEATHER: wind: Ave 4.8-6.5 mph **cloud cover:** 0 % **rain/fog/other:** windy/cold **Air Temp (°C):** 9.5-15

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net; V = visual; NS = not sampled

ID Method: M = Microscope; H = Hand Lens X 15

Fairy shrimp: IM = immature; BL = *Branchinecta lynchi*; LO = *Linderiella occidentalis*; Lep = *Lepidurus* sp.

Other fauna: A = Anisoptera; CLAD = Cladocerans; CONC = Conchostracans; COP = Copepods; OST = Ostracods; E = Ephemerata; PTF = Pacific Tree Frog; N = Notonectidae; Z = Zygoptera; H = Hydrophilidae; D = Dystiscidae; C = Corixidae; Other: amphibians, birds – specify as needed; AMPH = Amphipods; B = Belostomatidae; G = Gerridae; M = Mosquito (Diptera: Culicidae); P = Phantom midge (Diptera: Chaoboridae); CHIR = Nonbiting midge (Diptera: Chironomidae)

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 4/19/2012 **Time:** 1000-1700 **Surveyor** S. Powell, J.Thomas **Permit #:** TE-063427-1, TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		dry								7427-28	
Area 3		dry								7429-31	
FS-2		18		148	17.0	717	No		CLAD, COP, D, C, CHIR AMPH, snail, mallard	7366-68	pH=7.54, clear to bottom
FS-3		13		56	19.4	377	No		CLAD, COP, OST	7369-70; 708	pH=7.95, clear to bottom Re-inundated on 4/10/2012
FS-14		10		6	26.2	590	No		COP, OST, flatworm	710	pH=8.45
FS-15		28		12	22.0	195	LO (IM) low 100's BL - 1 male	H	OST, PTF egg masses, D, C	7373-74	pH=7.96, clear to bottom Re-inundated on 4/10/2012
FS-16		30		440	24.3	117.6	LO (IM) low 100's BL - 3 male 1 female	H	OST, PTF egg masses, C, mallards	7375-76	pH=8.04, clear to bottom Re-inundated on 4/10/2012
FS-38		>60		150	21.6	252	No		CLAD, COP, OST, PTF tadpole	7425-26	pH=9.48, clear to bottom
FS-39		8		4	27	327	No	No	None	712	pH-8.16
FS-70		>>45		400	19.6	416	No		Scud, COP, CLAD, COR, A	709	pH=7.84
FS-71		25		92	19.2	209	*L. occidentalis* (IM) 100's	H	COP, OST, CHIR, flatworm	7371-72	pH=7.85, clear to bottom Re-inundated on 4/10/2012
FS-72		25		36	26	590	No		OST, flatworm, COR, beetle	711	pH=8.69
FS-73		12		200	26.5	220	No		OST, C	7419-20	pH=8.78, clear to bottom Re-inundated on 4/10/2012
FS-74		18		92, 49, 1,1	26.7	352	No		COP, D, C, mallards	7415-18	pH=8.54, clear to bottom Re-inundated on 4/10/2012, 4 small separate pools
FS-83		dry								7423-24	
FS-84		dry								7321-22	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 4/19/2012 **Time:** 1000-1700 **Surveyor** S. Powell, J.Thomas **Permit #:** TE-063427-1, TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		Dry								7458-59	
FS-36		35		544	24.0	92.8	LO (M+IM) 1000's BL (IM) low 100's	H	OST, D, PTF (tadpoles)	7456-57	pH=8.68, clear to bottom
FS-43		32		70% max	26.0	1104	No		CLAD, OST, PTF tadpoles, D, C, CHIR, water mite, snail	7464-66	pH=9.42, clear to bottom
FS-44		20		260	24.8	163	No		OST, COP, CLAD, PTR tadpoles, midge larvae, beetles		pH=8.05
FS-46		NS									No longer sampled – BL observed on 2/9/12
FS-50a		Dry									No longer sampled > 120 days inundation
FS-50b		>>45		95%	24	811	No		E,O, COR, PTR eggs, midge larvae	713	pH = 8.61
FS-52 (N, S)		12, 20		161, 600	27.8, 27.2	144, 244	No		CLAD, CONC, OST, D, C, CHIR, PTF tadpoles, killdeer, shorebird	7460-63	pH=9.3, clear to bottom (two pools almost connected)
FS-54		NS									No longer sampled > 120 days inundation
FS-56		NS									No longer sampled > 120 days inundation
FS-66		NS									No longer sampled – BL observed on 2/9/12

OTHER NOTES:

WEATHER: wind: Ave 3.2-10.5 mph **cloud cover:** 0 % **rain/fog/other:** sunny/windy **Air Temp (°C):** 18.7-24.7

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net; V = visual; NS = not sampled

ID Method: M = Microscope; H = Hand Lens X 15

Fairy shrimp: IM = immature; BL = *Branchinecta lynchi*; LO = *Linderiella occidentalis*; Lep = *Lepidurus* sp.

Other fauna:
A = Anisoptera
CLAD = Cladocerans
CONC = Conchostracans
COP = Copepods
OST = Ostracods
E = Ephemerata
PTF = Pacific Tree Frog
AMPH = Amphipods (scuds)
N = Notonectidae
Z = Zygoptera
H = Hydrophilidae
D = Dystiscidae
C = Corixidae
Other: amphibians, birds – specify as needed
B = Belostomatidae
G = Gerridae
M = Mosquito (Diptera: Culicidae)
P = Phantom midge (Diptera: Chaoboridae)
CHIR = Nonbiting midge (Diptera: Chironomidae)

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 5/1/2012 **Time:** 0815-1415 **Surveyor** S. Powell **Permit #:** TE-063427-1

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		dry								7485-86	
Area 3		dry								7487-90	
FS-2		25		216	15.4	689	No		CLAD, COP, C, CHIR, M, AMPH, PTF tadpole, mallard	7480-82	pH=7.45, clear to bottom
FS-3		Dry								7483-84	
FS-14		Dry								7500-01	
FS-15		20		60	15.7	290	LO low 10's No BL	H	CLAD, OST, PTF tadpoles, AMPH, CHIR, M (larv)	7496-97	pH=8.25, clear to bottom
FS-16		12		32	15.6	244	No		CLAD, OST, AMPH, CHIR, M (larv)	7498-99	pH=7.86, clear to bottom
FS-38		42		90	17	306	No		CLAD, OST, C PTF tadpole	7514-15	pH=8.43, clear to bottom
FS-39		Dry								7512-13	
FS-70		45		650	17.1	366	No		CLAD, COP, N, PTF tadpoles, CHIR, AMPH, water mite, great egret	7491-92	pH=8.01, clear to bottom
FS-71		Dry								7493-94	
FS-72		Dry								7504-05	
FS-73		Dry								7506-07	
FS-74		Dry								7502-03	
FS-83		Dry								7510-11	
FS-84		Dry								7508-09	

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 5/1/2012 **Time:** 0815-1415 **Surveyor** S. Powell **Permit #:** TE-063427-1

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		Dry									
FS-36		38		497	18.4	112	No		CLAD, COP, OST, D, CHIR, M, PTF tadpoles, mallard	7516-17	pH=7.87, clear to bottom
FS-43		32		60% max	19.9	1324	No		CLAD, PTF tadpoles, D, C, CHIR, watermite, snail	7528-29	pH=9.24, clear to bottom
FS-44		38		200	18.8	203	No		CLAD, OST, PTF tadpoles, Z, D, CHIR, M, Mayfly (larv), snail, water mite	7526-27	pH=8.15, not clear to bottom
FS-46		NS									No longer sampled – BL observed on 2/9/12
FS-50a		NS									No longer sampled > 120 days inundation
FS-50b		>60		1030	18.8	802	No		CLAD, COP, OST, Z, C, PTF tadpoles, beetles (adult)	7524-25	pH=8.44, not clear to bottom
FS-52 (S)		16		116	19.1	365	No		CLAD, OST, D, C, CHIR, PTF tadpoles, M (larv), crayfish claw	7520-23	pH=8.34, clear to bottom north pool dry, south pool inundated
FS-54		NS									No longer sampled > 120 days inundation
FS-56		NS									No longer sampled > 120 days inundation
FS-66		NS									No longer sampled – BL observed on 2/9/12

OTHER NOTES:

WEATHER: wind: Ave 1.2-4.5 mph **cloud cover:** 0 % **rain/fog/other:** fog **Air Temp (°C):** 14.4-16.1

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net;
V = visual; NS = not sampled

ID Method: M = Microscope
H = Hand Lens X 15

Fairy shrimp: IM = immature
BL = *Branchinecta lynchi*
LO = *Linderiella occidentalis*
Lep = *Lepidurus* sp.

Other fauna:
A = Anisoptera
CLAD = Cladocerans
CONC = Conchostracans
COP = Copepods
OST = Ostracods
E = Ephemerata
PTF = Pacific Tree Frog
AMPH = Amphipods (scuds)
N = Notonectidae
Z = Zygoptera
H = Hydrophilidae
D = Dystiscidae
C = Corixidae
B = Belostomatidae
G = Gerridae
M = Mosquito (Diptera: Culicidae)
P = Phantom midge (Diptera: Chaoboridae)
CHIR = Nonbiting midge (Diptera: Chironomidae)
Other: amphibians, birds – specify as needed

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 5/15/2012 **Time:** 0830-1200 **Surveyor** S. Powell, J. Thomas **Permit #:** TE-063427-1, TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		Dry								No photo	Dry last survey effort and no rain since last survey
Area 3		Dry								No photo	Dry last survey effort and no rain since last survey
FS-2		Dry									
FS-3		Dry								No photo	Dry last survey effort and no rain since last survey
FS-14		Dry								7548-49	
FS-15		Dry								7541-42	No longer sampled – BL observed on 4/19/12
FS-16		Dry								7543-44	No longer sampled – BL observed on 4/19/12
FS-38		Dry								7556-57	
FS-39		Dry								7554-55	
FS-70		40-50		300	18.0	490	No		COR, CLAD, beetles, midge largae	4	pH=7.88
FS-71		Dry								7539-40	
FS-72		Dry								7550-51	
FS-73		Dry								7552-53	
FS-74		Dry								7545-47	
FS-83		Dry								No photo	Dry last survey effort and no rain since last survey
FS-84		Dry								No photo	Dry last survey effort and no rain since last survey

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 5/15/2012 **Time:** 0830-1200 **Surveyor** S. Powell, J.Thomas **Permit #:** TE-063427-1, TE834492-4

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pools South of Tank Farm Road

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools South of Tank Farm Road											
FS-21		Dry								No photo	Dry last survey effort and no rain since last survey
FS-36		NS									No longer sampled – BL observed on 4/19/12
FS-43		17		35% max	24.3	1690	No		CLAD, PTF tadpoles, C, watermite, killdeer, RWBB	7562-7564	pH=9.24, clear to bottom
FS-44		15		74	19.3	223	No		CLAD, OST, midge, beetle	6	pH=7.05
FS-46		NS									No longer sampled – BL observed on 2/9/12
FS-50a		NS									No longer sampled > 120 days inundation
FS-50b		>60		90%	21.7	979	No		COR, N, CLAD, PTR tadpoles, M, E, gastropods, beetles	5	pH=8.46
FS-52 (S)		3		10	27.8	750	No		OST, D, C, PTF tadpoles, M (larv), mayfly (larv)	7560-7561	pH=7.3, not clear to bottom north pool dry, south pool almost dry
FS-54		NS									No longer sampled > 120 days inundation
FS-56		NS									No longer sampled > 120 days inundation
FS-66		NS									No longer sampled – BL observed on 2/9/12

OTHER NOTES:

WEATHER: wind: Ave 3.0 mph **cloud cover:** 0-10 % **rain/fog/other:** ___ **Air Temp (°C):** 22.7-23

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net;
V = visual; NS = not sampled

Fairy shrimp: IM = immature
BL = *Branchinecta lynchi*
LO = *Linderiella occidentalis*
Lep = *Lepidurus* sp.

ID Method: M = Microscope
H = Hand Lens X 15

Other fauna:
A = Anisoptera
CLAD = Cladocerans
CONC = Conchostracans
COP = Copepods
OST = Ostracods
E = Ephemerata
PTF = Pacific Tree Frog
AMPH = Amphipods (scuds)
N = Notonectidae
Z = Zygoptera
H = Hydrophilidae
D = Dystiscidae
C = Corixidae
Other: amphibians, birds – specify as needed
B = Belostomatidae
G = Gerridae
M = Mosquito (Diptera: Culicidae)
P = Phantom midge (Diptera: Chaoboridae)
CHIR = Nonbiting midge (Diptera: Chironomidae)

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 5/22/2012 **Time:** 1315-1500 **Surveyor** S. Powell- **Permit #:** TE-063427-1

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pool ID	Depth: est. max (cm)		Surface area: est. max (m^2)		Water temp (°C)	EC (µmhos)	Fairy shrimp presence (species/IM)	ID (M or H)	Other fauna	Photo?	Comments (voucher taken, etc.)
	est. max	max today	est. max	max today							
Pools North of Tank Farm Road											
Area 1	See comments										Contiguous with perennial marsh
Area 2		Dry								No photo	Dry last survey effort and no rain since last survey
Area 3		Dry								No photo	Dry last survey effort and no rain since last survey
FS-2		Dry								No photo	Dry last survey effort and no rain since last survey
FS-3		Dry								No photo	Dry last survey effort and no rain since last survey
FS-14		Dry								No photo	Dry last survey effort and no rain since last survey
FS-15		Dry									No longer sampled – BL observed on 4/19/12
FS-16		Dry									No longer sampled – BL observed on 4/19/12
FS-38		Dry								No photo	Dry last survey effort and no rain since last survey
FS-39		Dry								No photo	Dry last survey effort and no rain since last survey
FS-70		32		224	24.5	531	No		CLAD, C, PTF tadpole, garter snake	7565-7566	pH=8.0, clear to bottom
FS-71		Dry								No photo	Dry last survey effort and no rain since last survey
FS-72		Dry								No photo	Dry last survey effort and no rain since last survey
FS-73		Dry								No photo	Dry last survey effort and no rain since last survey
FS-74		Dry								No photo	Dry last survey effort and no rain since last survey
FS-83		Dry								No photo	Dry last survey effort and no rain since last survey
FS-84		Dry								No photo	Dry last survey effort and no rain since last survey

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VERNAL POOL FIELD MONITORING DATA SHEET
WET SEASON SURVEY

Site/Project Name: SLO Tank Farm **Date** 5/22/2012 **Time:** 1315-1500 **Surveyor** S. Powell- **Permit #:** TE-063427-1

County: San Luis Obispo **USGS Quad:** Pismo **Lat:** _____ **Long:** _____ **Section, Township, Range:** Section 11, T-31S, R-12E

Land use: Grazing (prior oil uses) **Disturbance and intensity (LMH):** High

Pools South of Tank Farm Road											
FS-21		Dry								No photo	Dry last survey effort and no rain since last survey
FS-36		NS									No longer sampled – BL observed on 4/19/12
FS-43		17		30% max	28.3	1860	No		C, D, CHIR, beetle, water mite	7573-7575	pH=9.4, clear to bottom
FS-44		24		165	23.0	200	No		CLAD, OST, D, CHIR, snails, mayfly larv, Mosq larv, beetle	7571-7572	pH=6.06, not clear to bottom
FS-46		NS									No longer sampled – BL observed on 2/9/12
FS-50a		NS									No longer sampled > 120 days inundation
FS-50b		>40		280	25.1	1020	No		C, beetle, PTF tadpole	7567-7568	pH=9.45, not clear to bottom
FS-52 (S)		3		10	27.8	750	No		OST, D, C, PTF tadpoles, M (larv), mayfly (larv)	7560-7561	pH=7.3, not clear to bottom north pool dry, south pool almost dry
FS-54		NS									No longer sampled > 120 days inundation
FS-56		NS									No longer sampled > 120 days inundation
FS-66		NS									No longer sampled – BL observed on 2/9/12

OTHER NOTES:

WEATHER: wind: Ave 12.0 mph, gusts to 30-40 mph **cloud cover:** 0 % **rain/fog/other:** ___ **Air Temp (°C):** 23.2-24.1

Sampling Method: D = dip net, 1/8" mesh; B = brine shrimp net; V = visual; NS = not sampled

ID Method: M = Microscope
H = Hand Lens X 15

Fairy shrimp: IM = immature
BL = *Branchinecta lynchi*
LO = *Linderiella occidentalis*
Lep = *Lepidurus* sp.

Other fauna:
A = Anisoptera
CLAD = Cladocerans
CONC = Conchostracans
COP = Copepods
OST = Ostracods
E = Ephemerata
PTF = Pacific Tree Frog
AMPH = Amphipods (scuds)
N = Notonectidae
Z = Zygoptera
H = Hydrophilidae
D = Dystiscidae
C = Corixidae
Other: amphibians, birds – specify as needed
B = Belostomatidae
G = Gerridae
M = Mosquito (Diptera: Culicidae)
P = Phantom midge (Diptera: Chaoboridae)
CHIR = Nonbiting midge (Diptera: Chironomidae)