

MITIGATION AND MONITORING PLAN
POTRERO HILLS LANDFILL PHASE II EXPANSION
SOLANO COUNTY, CALIFORNIA

Corps File Number 26024N



Initial Submission January 31, 2006
1st Revision December 21, 2007
2nd Revision November 12, 2008
3rd Revision September 8, 2009
4th Revision July 15, 2010

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SOLANO COUNTY, CALIFORNIA**

Corps File Number 26024N

Submitted to

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Initial Submission January 31, 2006

1st Revision December 21, 2007

2nd Revision November 4, 2008

3rd Revision September 8, 2009

4th Revision July 15, 2010

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1.0 RESPONSIBLE PARTIES

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2.0 PROJECT REQUIRING MITIGATION

2.1 PLAN COVERAGE

This plan has been developed to mitigate impacts from the proposed expansion of the Potrero Hills Landfill (PHLF). Specific impacts addressed by this plan include impacts to jurisdictional waters of the United States, waters of the State (including wetlands determined to be isolated), special-status species, and special-status species habitats. In addition to addressing issues of concern to the federal regulatory agencies (*i.e.*, U.S. Army Corps of Engineers [Corps] and U.S. Fish and Wildlife Service [USFWS]), the plan also addresses the mitigation issues raised by local and state governments (*i.e.*, Solano County and Bay Conservation and Development Commission [BCDC]). The plan, therefore, serves as a single document that integrates the various environmental protection requirements of the permitting agencies in order to provide a comprehensive plan to mitigate the impacts of the landfill expansion on the grasslands and associated wetland ecosystem of the Potrero Hills.

2.2 PROJECT LOCATION

The Phase II landfill expansion site is located in the Potrero Hills of Solano County approximately 2 miles southeast of Suisun City and approximately 0.75 mile south of State Route (SR) 12. Travis Air Force Base is approximately 1 mile north of the project site (Figure 1). The landfill is accessed from SR 12 via Scally Road, Killdeer Road, and Potrero Hills Lane (Figure 2). The proposed project and mitigation areas are located within an approximately 1,400-acre area owned by the applicant, Potrero Hills Landfill (Figure 2). The horseshoe-shaped ridges of the Potrero Hills surround the existing Phase I landfill and the proposed Phase II expansion area. Montezuma Slough and its associated marshes lie south of the Potrero Hills.

2.3 SUMMARY OF OVERALL PROJECT

Potrero Hills Landfill, Inc. is proposing to expand the existing Potrero Hills Landfill (PHLF), a municipal solid waste landfill and resource recovery center located near the City of Suisun City in Solano County, California. The Phase II expansion (hereinafter referred to as the “proposed project”) will encompass 167.63 acres of land, and will impact approximately 1.86 acres of Section 404 jurisdictional wetlands and other waters of the U.S. that are also waters of the State, and 0.61 acre of pond habitat.

As a municipal solid waste landfill, PHLF accepts residual nonhazardous wastes for burial, as well as acting as a materials processing center where resource recovery activities are conducted and materials are diverted from landfilling through composting, wood recycling, concrete and asphalt rubble crushing and screening, metal salvage recovery, and other recycling services. The facility is owned and operated by Potrero Hills Landfill, Inc., a subsidiary of Waste Connections, Inc.

The currently permitted Phase I landfill comprises a 320-acre parcel. The active landfill module, three separate recycling areas, soil stockpiles, roads, other infrastructure, and a former sandstone quarry make up the operation areas of the site.

The proposed project entails the Phase II expansion of the PHLF, a municipal solid waste landfill with a service area encompassing the Bay Area, Central Valley, Sierra foothills and California North Coast within an approximately 150-mile radius. The project will increase the capacity of the landfill from its currently authorized 21.5 million cubic yards to approximately 83 million cubic yards, and will extend the life of the landfill from its current 10-years to approximately 35 years.

The currently permitted Phase I landfill commenced operations on the 320-acre parcel in 1986. The Phase I operation consists of 21 cells within which non-hazardous wastes are disposed. The operation also includes various landfill-associated facilities, including a old sandstone quarry, administrative and service buildings, truck scales, public unloading and recyclables handling area, wood waste and composting processing facility, concrete crushing facility, fueling facilities and washing facilities. Based on the current annual volume of material being brought to the landfill, the Phase I area will have reached its capacity by the Year 2010 (EDAW, 2003).

The proposed Phase II project will add 11 new cells to the existing landfill. Under the proposed project plans, the capacity of each cell will be substantially greater than under Phase I because each cell will have a higher final elevation (increasing from the currently permitted 220 feet MSL maximum elevation in a cell to a maximum of 345 feet MSL), allowing for a greater volume of material per unit area.

2.4 PROJECT COMPONENTS

The proposed Phase II project involves the components as described below. The project description is based on the draft environmental impact report (DEIR) (EDAW, 2003) but has been modified in response to comments on the project. These modifications have resulted in a revised project impact area that is approximately 30 percent less than that originally proposed. The project components are summarized below. The location of the components is shown in Figure 3. Some components of the Phase II development require amendments to existing permits or new permits. Other project components involve continuing ongoing operations and programs. Some of the components of the Phase II project include:

- Extending the landfill horizontally
- Increase the existing permitted landfill height
- Relocation of Spring Branch Creek drainage
- Operating 24 hours per day
- Adding biosolids to the composting operation
- Install a Truck/Container Washing Facility
- Revise Restrictions on the Night Lighting
- Bypass lane
- Upsizing existing off-site PG&E power lines
- Landfill Gas-to-Energy Facility
- Water Supply Well and Conveyance Pipeline System
- New Sedimentation Basin
- Compensating for impacts on wetlands and wildlife habitat

Extending the Landfill Horizontally. The Phase II project will extend the landfill onto adjacent parcels of land, expanding the landfill horizontally for increased landfill life. The Phase II landfill footprint will be approximately 167.63 acres and will be entirely contained within the Potrero Hills Valley. Figure 4 shows the conceptual sequence of landfill construction through 2045. Cell

construction will initially progress along the northern edge of the Phase II area, with cells along the southern landfill boundary being constructed after about 2015. The final cells to be constructed in the Phase II parcel will be in the southeast corner. The final area of the Phase I and II landfill to be constructed will be in the northwest corner of the Phase I parcel (Figure 4).

Increase the Existing Permitted Landfill Height. The Phase II project includes a vertical expansion of the height of the landfill to an elevation of 345 feet MSL. Phase II also includes adding additional wastes on top of Phase I landfill. A portion of the top of the landfill will be viewable from the north; active landfill zones will be operated behind a visibility barrier so they will be out of sight from off site. The Phase II Project would increase the existing permitted landfill footprint vertically to provide a longer active landfill life and streamline the site drainage. The Phase II project would extend the Phase I slopes eastward to match up with the westernmost landfill contours of the Phase II area.

Relocation of Spring Branch Creek Drainage. Relocating the southern surface water drainage network (tributaries to Spring Branch Creek, an intermittent water source) along the south side of the Phase II landfill will allow greater buttressing of the southern edge of the landfill and achieve vertical capacity expansion. No reduction of surface water-carrying capacity in channels and retention basins will occur. Two separate drainage systems will be constructed in the landfill to prevent the landfill from flooding and to divert runoff from the southern portion of the landfill off the cap. The drainage system will be constructed over the life of the proposed landfill (35 years), with additional sections being installed as the cells are built along the landfill southern boundary. The first of the drainage systems will carry water from the eastern Potrero Hills Valley west around the landfill. This drainage system will consist of a pipeline approximately 5,500 feet long that will pass under the soil buttress area along the southern border of the Phase I landfill area and Phase II expansion area. The downstream end of the pipeline will be located in the center of the Phase I landfill. The ultimate eastern end of the pipeline will be near the southeast corner of the Phase II area. The drainage feature will be designed to handle the 1,000-year storm to protect the landfill from flooding. Along its length, the pipeline will be bedded in native soil and overtopped entirely with soil materials. The pipeline will be constructed of pre-cast sections or of concrete poured in place with the segments being built in increments of approximately 200-600 feet every 3-5 years. The second system will be a surface channel to transport runoff from the southern portion of the landfill. Once the pipeline is constructed beneath the buttress, drainage runoff from the southern portion of the landfill will drain to a surface channel constructed on top of the buttress area. The surface channel will be protected from scouring with erosion control fabric. Each rise of the buttress area constructed as the adjacent zone of the landfill is built to higher elevations will contain a similarly constructed channel. A permanent drainage channel, with a long-term, stable channel lining will be constructed on top of the buttress when the final landfill cap is installed. The Phase I alignment was authorized in 1988 and 1995 pursuant to the provisions of Section 404 of the Clean Water Act, (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act (33 U.S.C. 403).

Operating 24 Hours per Day. The Phase II project would extend the current 20-hour per day operation to a 24-hour operation Monday through Friday and a 20-hour operation Saturday and Sunday. The applicant believes that increasing the landfill operation to 24 hours would achieve more flexibility in waste transport and remove more truck traffic from highways during daytime traffic congestion.

Adding Biosolids to the Composting Operation. The Phase II project will add biosolids to the composting operation as an additional material that can be composted. Additional food wastes also will be composted. The amount of these additional materials could total to 100 tons per day averaged over a 7-day period (TPD7). Appropriate operation techniques and procedures will be used to control dust and odors.

Install a Truck/Container Washing Facility. Construct a concrete-lined drive-through unit to reduce mud tracked out on the access road and to clean residues from hauling vehicles.

Revise Restrictions on the Night Lighting (Number of Lights). The Phase II Project change was authorized in the 2005 Use Permit approval and the 2006 Solid Waste Facility Permit revisions. A small number of lights will be used in a manner that avoids off-site reflection and glare.

Bypass Lane. A short access road bypass lane is available on old historic road paralleling a portion of the Potrero Hills Lane access road, providing an auxiliary access point to the facility to cope with transportation interruptions.

Upsizing Existing Off-Site PG&E Power Lines. The increased capacity of gas-fueled power generation equipment will require upsizing the existing off-site PG&E power lines. The existing line is not of sufficient voltage or current-carrying capacity to transmit the expected amount of electrical power that will be created from the conversion of landfill gas (up to 10 megawatts) (Figure 3).

Landfill Gas-to-Energy Facility. The size of this facility is anticipated to be up to 10 megawatts (MW). The location of the landfill gas-to-energy facility will be completely within the footprint of the Phase II expansion area (Figure 3). This component would also include new power line installations. A landfill gas-to-energy (LFGTE) facility could alternatively be a fuel production and distribution facility for methane-powered vehicles together with a smaller power generation facility, and/or a facility for distribution of pressurized or liquefied landfill gas that would be located near the existing flare station.

Water Supply Well and Conveyance Pipeline System. Four water storage tanks and associated conveyance systems would be constructed to utilize the existing north water well.

New Sedimentation Basin. A temporary silt control basin is proposed down-gradient from the east-most active landfill cell area.

Compensating for Impacts on Wetlands and Wildlife Habitat. Potrero Hills Landfill will compensate for impacts to wetlands and wildlife habitat due to expansion of the landfill footprint. Based on the results of the analysis conducted for biological resources, impacts on these resources will be compensated according to the criteria established in the EIR and by the Corps, USFWS, and California Department of Fish and Game (CDFG) (See Section 2.2 for additional detail on the Mitigation Components).

Mitigation for impacts to listed species and their habitat resulting from the proposed Phase II landfill expansion will be completed on five parcels or portions of parcels located immediately adjacent to the Phase II expansion area (i.e., Southern Hills parcel, Pond 5 Buffer of Phase II parcel, Eastern Valley area, Directors Guild parcel, and the Griffith Ranch area [Figure 2]). All five of the proposed mitigation areas are located within the Bay Conservation and Development Commission (BCDC) secondary marsh zone as is the proposed Phase II landfill. Preservation and management of the mitigation parcels for the benefit of listed wildlife and plants also will benefit common plant and animal species that will be impacted by the Phase II expansion and that rely on grassland and wetland habitats in the vicinity.

2.5 PROJECT SITE CHARACTERISTICS

2.5.1 Jurisdictional Areas

Areas subject to jurisdiction under Section 404 of the Clean Water Act on the Phase II expansion site are shown on the delineation map (Figure 5). Jurisdictional features include Spring Branch Creek and its tributary drainages as well as seven wetlands north and south of the creek. A total of 1.86 acres of jurisdictional waters of the U.S. including wetlands are included in the Phase II area proper. Acreage for each type of feature to be impacted by the proposed project is shown in Table A.

Table A: Jurisdictional Features (Waters of the United States) on the Phase II Expansion Site (Based on 2010 verified delineation).

	AREA (ACRES)	LENGTH (FEET)
<u>Wetlands</u>		
Seasonal Wetlands/Seeps	1.42	
Total Wetlands	1.42	
<u>Other Waters</u>		
Drainage A	0.08	720
Drainage B	0.18	1,400
Drainage C	0.17	1,850
Other Water A	0.004	
Total Other Waters	0.44	3,970
TOTAL JURISDICTIONAL AREA	1.86	3,970

2.5.2 Non-Jurisdictional Areas

The existing stock pond (Ponds 1 [0.39 acre]) in the Phase II parcel was determined not to be subject to jurisdiction under Section 404 of the Clean Water Act by the U.S. Army Corps of Engineers (Corps).¹ Pond 4 no longer exists, but it, too, was considered non-jurisdictional in the 2003 delineation. We expect that Ponds 1 and 4 will be considered waters of the State by the Regional Water Quality Control Board and as such will require mitigation for loss of wetland functions and values including their value as wildlife species habitat. Pond 1 is shown on the map as non-jurisdictional for purposes of the Corps permit (Figure 5). The acreage of the non-jurisdictional features to be impacted by the proposed project is shown in Table B.

Although Pond 5 (0.45 acres) lies within the proposed Phase II expansion area parcel, this pond will not be filled or impacted during landfill expansion due to its value as a tiger salamander breeding site and as a condition of approval in the EIR (Mitigation Measure 4.2-5). The Pond 5 buffer area, originally 18.1-acres, now includes approximately 41 acres along the entire southern edge of the Phase II parcel and will be preserved and managed as part of the Southern Hills parcel, which borders the Pond 5 Buffer area on the south and east sides (Figure 6). On the west side, the pond will be avoided by maintaining a 500-foot buffer zone between the pond and the proposed expansion area. To the north, the pond will be contiguous with the undeveloped eastern Potrero Hills Valley (Eastern Valley parcel). Pond 5 (0.45 acre) thus will be avoided during landfill expansion and therefore is not included in Table A or Table B.

¹ The berm on Pond 4 (0.22 acre) was removed in 2000. The pond no longer exists. Mitigation for Pond 4 and Pond 1 is included in this mitigation and monitoring plan.

Table B: Non-Jurisdictional Features (Waters of the State) on the Phase II Expansion Site.

FEATURE	AREA (ACRES)
<u>Ponds</u>	
Pond 1	0.39
Pond 4 (Not shown on the delineation map)	0.22
TOTAL NON-JURISDICTIONAL AREA	0.61

2.5.3 Aquatic Functions

Aquatic features on the Phase II expansion site include seasonal wetlands, drainage channels, and stock ponds. The drainage channels are part of the Spring Branch Creek drainage system and serve to transport water out of the valley. The drainages do not have well defined beds or banks and are swale-like, with grassy bottoms and so provide some filtering of sediments. Since the drainages are ephemeral in the Phase II area, they do not provide habitat for fish. Amphibians may use the drainages for hydration during the winter and early spring, but the drainages are dry by mid- to late spring. The seasonal wetlands in the Phase II area also provide hydration habitat for amphibians during the winter and early spring, but these areas are not deep enough to provide breeding habitat for species such as California tiger salamanders (*Ambystoma californiense*) or Pacific treefrog (*Pseudacris regilla*). These small wetlands store and release water slowly after the rainy season and support some hydrophytic plant species. Stock ponds provide habitat for common invertebrates such as California fairy shrimp (*Lindneriella occidentalis*) and waterboatmen (F. Corixidae) and provide essential breeding and larval development habitat for California tiger salamanders. California tiger salamanders have been observed breeding or attempting to breed in all of the stock ponds within the Phase II expansion area. The existing stock ponds in the Phase II area are all isolated ponds constructed by the ranchers to provide water to cattle that graze the area. These seasonal water sources also are used by other native species as water sources and foraging areas. The only other amphibian observed to breed in the stock ponds is the Pacific treefrog.

2.5.4 Hydrology and Topography

The proposed expansion area is located within the Potrero Hills of Solano County. The Potrero Hills are an isolated east-west trending ridge of consolidated sedimentary material (primarily shale and sandstone) that constitute part of the eastern edge of the California Coastal Range. The hills are isolated from the main part of the Coastal Range by the alluvial valleys of the Fairfield-Suisun area to the east and north and by the Suisun Bay and marsh system to the south. The hills form a horseshoe-shaped ridge around a main, central valley that is drained by the Spring Branch Creek and its tributary drainages.

The proposed expansion area generally drains west through the valley and toward Spring Branch Creek, which flows into Suisun Slough and eventually to Suisun Bay. Surface runoff flows through several ephemeral drainages which are somewhat discontinuous within the gently sloped hillsides and better defined within the flatter, valley portion of the site. Ephemeral drainages generally convey water only after a rainfall event and do not support long-term groundwater flows. There are no perennial creeks within the proposed project area.

A number of small seeps are present along the hillside that forms the southern boundary of the proposed project area. The seeps appear to be associated with old slumps and/or a shallow water

table. Two cattle stock ponds (Ponds 1, 5) are present on the Phase II area. A third pond, Pond 4, is no longer present onsite as the 2-foot high berm on the pond was removed in 2000.

The existing Phase I landfill area and proposed Phase II expansion area are located entirely within the main valley of the Potrero Hills (Figure 6). Elevations along the surrounding ridges range from 250 to 300 feet MSL, while valley bottom elevations range from 40-130 feet MSL.

Historically, the proposed project area has been used as rangeland for grazing cattle. An old homesite was located on the Phase II expansion site, but all that remains are some remnant foundations and a large, decrepit barn.

2.5.5 Soils

The soils throughout the project site were mapped by the USDA Natural Resources Conservation Service (formerly USDA Soil Conservation Service) in 1977 (Soil Conservation Service, 1977). Five primary soil phases are present on the project site and they include: Antioch-San Ysidro complex, 0-2% slopes (AoA); Antioch-San Ysidro complex, 2-9% (AsC); Altamont clay, 2-9% slopes (AcC); Altamont clay, 9-30% slopes (AcE); Altamont clay, 30-50% slopes (AcF2); Altamont-Diablo clays, 2-9% slopes (Amc); Gaviota sandy loam, 30-75% slopes (GaG2); and Millshom loam, 15-30% slopes (MmE). None of these soils are listed on the Solano County Hydric Soils List.

2.5.6 Vegetation

Upland Habitats. The primary vegetation type in the valley is annual grassland that is actively grazed. Grasslands are dominated by non-native species such as Italian ryegrass (*Lolium multiflorum*), wild oats (*Avena* spp.), soft chess (*Bromus hordeaceus*), ripgut (*B. diandrus*) and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*). The grasslands also contain extensive stands of the invasive exotic weed species, purple star thistle (*Centaurea calcitrapa*) and yellow star thistle (*C. solstitialis*). Despite dominance by non-native grasses and invasive weeds, the valley supports occasional stands of native grassland grasses and forbs including California poppy (*Eschscholzia californica*), tarplants (*Hemizonia* spp., *Centromadia* spp.), purple needle grass (*Nasella pulchra*), and slender wheatgrass (*Elymus trachycaulus*). One stand of johnny jump-up (*Viola pedunculata*) which is a primary food plant for Callippe silverspot butterfly (*Speyeria callippe callippe*), a federally listed endangered species, was observed in the Phase II area.

Wetland and Aquatic Habitat. The main drainage feature of the valley is Spring Branch Creek and its tributaries, an ephemeral drainage network that flows down the bottom of the valley (Figure 5). Spring Branch Creek currently flows west from the Phase II expansion area and onto the Phase I landfill area. The channel segment on the Phase I landfill is currently permitted and approved to be realigned and lined. The headwaters of the Spring Branch Creek ultimately flows into Suisun Marsh and supports a mix of upland and hydrophytic grasses and forbs and has no tree or shrub cover. In most of the drainage course reaches, the drainage does not have a distinguishable bed and bank and consists of a gentle swale feature that is barely distinguishable from the surrounding grassland landscape. This drainage receives runoff from the surrounding hills via several ephemeral channels that also support hydrophytic vegetation in some locations. A few small seeps with associated seasonal wetland vegetation are present on the hillsides. The Phase II expansion area currently contains two stock ponds (Ponds 1, 5). There are also a number of ephemeral drainages and seeps in the Phase II area.

2.5.7 Wildlife Habitat

Many common wildlife species use the Phase II project area and the adjacent eastern Potrero Hills Valley. Songbird species found in the grasslands include western kingbird (*Tyrannus verticalis*), western meadowlark (*Sturnella neglecta*), cliff and barn swallows (*Hirundo pyrrhonata* and *H. rustica*), horned lark (*Eremophila alpestris*), red-winged blackbird (*Agelaius phoeniceus*), Brewer's blackbird (*Euphagus cyanocephalus*), and northern mockingbird (*Mimus polyglottos*). Other common wildlife species that use the Phase II project site include Pacific treefrog (*Pseudacris regilla*), western toad (*Anaxyrus boreas*), gopher snake (*Pituophis melanoleucus*), common kingsnake (*Lampropeltis getulus*), ring-necked snake (*Diadophis punctatus*), western fence lizard (*Sceloporus occidentalis*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), California ground squirrel (*Spermophilus beecheyi*), deer mouse (*Peromyscus maniculatus*), California vole (*Microtus californicus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and coyote (*Canis latrans*).

Ground squirrels and their burrows are present throughout the Potrero Hills including the Phase II area, Eastern Valley and Southern Hills. Burrows are primarily located on the hill slopes or in and among the homesite foundations and debris. Fewer ground squirrel burrows occur in the central portion of the valley floor compared to the surrounding slopes. Ground squirrel burrows provide habitat for a variety of species that occur in the grasslands of the Potrero Hills including California tiger salamanders (*Ambystoma californiense*), burrowing owls (*Athene cunicularia*), and other small vertebrates and invertebrates.

The presence of water in the grassland habitat enhances the wildlife value of the area, and the ponds in the valley provide foraging or breeding habitat for many species, including the Pacific treefrog, cliff and barn swallows, striped skunk, and raccoon. Water birds, including waterfowl and shorebird species, use the ponds in winter. Mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), cinnamon teal (*Anas cyanoptera*), killdeer (*Charadrius vociferus*), and greater yellowlegs (*Tringa melanoleuca*) use the ponds for foraging and resting. The common wildlife species expected to occur in disturbed areas include the coyote, striped skunk, raccoon, and ring-billed gull (*Larus delawarensis*).

The Phase II expansion area provides potential habitat for a number of special-status plant and animal species (ESP, 2002). A list of special-status species potentially occurring in the Phase II area is shown in Appendix A. No listed plants occur within the proposed Phase II expansion area. The only listed animal species observed in the expansion area is the California tiger salamander. No listed vernal pool crustaceans or insects have been found in the valley.

2.5.8 Threatened/Endangered Species

In order to assess the presence of species listed or proposed for listing as threatened or endangered species under the federal Endangered Species Act on the Phase II expansion area and vicinity, biologists conducted reconnaissance and protocol-level surveys between 1998 and 2007. The findings of those surveys are summarized below. Protocol level surveys were conducted for the following species during this time period: vernal pool crustaceans, Callippe silverspot butterfly, California tiger salamanders, and rare plants.

Vernal Pool Crustaceans. Protocol-level surveys for listed vernal pool crustaceans were conducted in suitable aquatic habitats in the Phase II expansion area, eastern Potrero Hills Valley (Eastern Valley) and southern ridges and valley of the Potrero Hills (Southern Hills parcel) in 2000 and 2001. No listed fairy shrimp or tadpole shrimp were ever caught during the biweekly sampling. Although vernal pool fairy shrimp, Conservancy fairy shrimp, and vernal pool tadpole shrimp have been

observed in aquatic habitats adjacent to Potrero Hills Lane approximately 1.25 miles northwest of the Phase II area, none of these species was found in the aquatic habitats of the Phase II expansion area, eastern valley survey area, or in the Southern Hills parcel. Vernal pools along Scally Road about 1 mile north of the Phase II area have also been documented to support vernal pool tadpole shrimp and Conservancy fairy shrimp. The aquatic habitats in the valley do not have a hydrological connection to the Potrero Hills Lane area or pools north of the hills along Scally Road. In addition to being located in a separate watershed, the aquatic habitats in the Potrero Hills Valley where the Phase II expansion area is located are qualitatively different from those aquatic habitats north of the hills where vernal pool crustaceans occurs. The aquatic habitats in the valley are constructed stock ponds and small seasonal wetlands and seeps while those north of the hills are brackish marsh (Potrero Hills Lane) and vernal playa pools (Potrero Hills Lane and Scally Road).

The only anostracan crustacean observed during the surveys of the Phase II expansion area, eastern valley, and southern hills was California fairy shrimp (*Lindieriella occidentalis*). California fairy shrimp is not a listed species or a special-status species because they are commonly found in suitable habitats throughout northern California. This species sometimes is found together with listed fairy shrimp species such as vernal pool fairy shrimp, but it may also occur alone in pools without any other anostracans. This was the case for the Phase II expansion area and Eastern Valley area.

California fairy shrimp was observed consistently during the 2000 surveys in Ponds 1 and 5. In Pond 1, hundreds of individuals were caught in each sample. This population persisted into April 2000, but was undetectable (adults having completed their lifecycles) by May 2000. The number of California fairy shrimp in Pond 5 was much less than in Pond 1, but California fairy shrimp were observed here throughout the cooler winter/spring survey period of 2000. California fairy shrimp in Pond 5 completed their lifecycles about 2-4 weeks prior to those in Pond 1 during 2000.

Results of the 2001 surveys were similar to those of 2000. No listed fairy shrimp or tadpole shrimp were ever observed during the biweekly sampling. California fairy shrimp was observed in Pond 5, but was not observed in Pond 1 at anytime during the 2001 season. This observation was unexpected given the extremely large number of California fairy shrimp found in the Pond 1 in 2000. We have no explanation for this observation. All conditions at Pond 1 appeared to be the same in 2001 as in 2000. California fairy shrimp were also observed in Pond 7, in the hills southeast of the main valley (Southern Hills parcel) during 2001. During surveys of the project area in 2004, California fairy shrimp has been observed in both Ponds 1 and 5 (LSA field notes). Figure 7 shows the ponds where California fairy shrimp has been found within the Phase II expansion area and Eastern Valley.

Subsequent surveys for listed vernal pool crustaceans have also yielded negative results with no listed vernal pool crustaceans occurring in any of the pools within the Potrero Hills Valley (Phase II expansion area and Eastern Valley) or the Potrero Hills (Southern Hills and Griffith Ranch parcels). Results of those surveys are summarized below.

- During 2003-2004, protocol-level wet season surveys for listed vernal pool crustaceans were conducted on the Phase II expansion parcel, adjacent Eastern Valley area, the Southern Hills and the Griffith Ranch parcels. These surveys included ponds numbered 1, 2, 3, 3a (or 9), 4, 5, 6, 7, 8, an unnumbered spring box and the Griffith Ranch pond. No listed vernal pool branchiopods were observed. Non-listed branchiopods observed included California fairy shrimp in Ponds 1, 6 and 7 and California clam shrimp in various locations.
- Because vernal pool crustacean survey results were more than 5 years old, protocol-level surveys of the Phase II expansion parcel (including Pond 5 Buffer area), Southern Hills, Eastern Valley, Griffith Ranch, and Director's Guild parcel were initiated in the winter of

2006-2007 to update the survey results. Due to low rainfall during 2006-2007, many of the pools on the sites did not fill with water during the winter and the surveys in that season were not conclusive (LSA, 2007b). A second protocol-level wet season survey was therefore conducted in 2007-2008 (LSA, 2008a). The second wet season survey was followed by a protocol-level dry season survey in the summer of 2008 (LSA, 2008b). These three surveys satisfy the protocol guidelines for complete surveys. No listed vernal pool crustaceans were found in any of the stock ponds within the study area. The only fairy shrimp species observed in the ponds was California fairy shrimp that was observed in Ponds 1, 5, 6, 7, 8, and the Griffith Ranch stock pond. There are no vernal pools present on the project site. Stock ponds 1 and 4 constituted the potential habitat for this species on the project site. These ponds generally have highly turbid water due to disturbance by cattle and dry up during the late summer. None of these stock ponds supported Conservancy fairy shrimp during the surveys. Conservancy fairy shrimp were observed in the playa pool on the Director's Guild parcel during surveys in 2004, 2005, 2006, 2007, and 2008. Wetlands adjacent to the playa pool and drainage ditch also provide suitable habitat for this species.

Based on the results of the two sets of protocol-level surveys (2000-2001, and 2006-2008) no listed vernal pool crustaceans occur in the Phase II expansion area. Common vernal pool crustaceans have been found in the proposed expansion area, but no listed species were found to occur there.

California Tiger Salamander. Nocturnal surveys conducted in 1999 and 2000 resulted in the observation of adult California tiger salamanders throughout the Phase II expansion area and Eastern Valley. Adult tiger salamanders find suitable refuge in and around the old barns and home sites within the upland portions of the valley as well as in ground squirrel burrow complexes and soil cracks. Adult tiger salamanders were also observed at breeding ponds on a number of occasions during the 2000-2001 surveys. Figure 7 shows the locations where adult tiger salamanders have been observed. Burrows, soil cracks, and debris piles within the valley provide terrestrial habitat for this species.

Surveys for California tiger salamander larvae were carried out in April 2000, March 2001, and March 2003 during which time all the ponds in the Phase II expansion area, Eastern Valley, and Southern Hills were sampled. The purpose of these surveys was to identify breeding sites for this species. California tiger salamander larvae or eggs have been observed in all ponds within the Phase II expansion area (Ponds 1, 4, 5, and Spring Branch Creek below Pond 3) and in a spring box located near the eucalyptus grove in the southwest corner of the Phase II area. California tiger salamander larvae have also been observed in the Eastern Valley parcel and on the Southern Hills parcel in Ponds 2, 3, and 7. Adult salamanders have also been observed at Pond 6. Throughout the last few years, the number of larvae observed in the pools have been variable, with some pools only supporting a few larvae (Ponds 2 and 4) or larvae only in some years (Ponds 1, 3, and spring box). Ponds 5 and 7 typically have provided breeding habitat for California tiger salamanders whenever they have been surveyed with 100s to 1,000s of larvae inhabiting the pools. Regardless of the how the ponds perform in any given year, all ponds within the valley are considered breeding habitat, with Ponds 1, 3, 5, and 7 typically remaining inundated long enough (at least 10-12 weeks) to allow the larvae to metamorphose into adults. Figure 7 shows the location of CTS breeding ponds – Ponds 1, 2, 3, 5, 6, 7.

During May of 2006, breeding ponds were again sampled for tiger salamander larvae. 2006 was a year of above normal rainfall and ponds in the Potrero Hills and Potrero Hills Valley persisted well into the summer. California tiger salamander larvae were observed in Pond 1 of the Phase II parcel, Pond 5 of the in the Pond 5 Buffer area of the Phase II parcel, Pond 3 in the eastern Potrero Hills Valley, and Pond 7 in the Southern Hills parcel. All of these observations were sites that had been previously documented as tiger salamander breeding sites.

In 2007, biweekly surveys for vernal pool crustaceans were conducted in order to update the occurrence information for these species within the study area. Due to very low rainfall, none of the ponds within the Potrero Hills Valley or Southern Hills filled sufficiently for to allow California tiger salamanders to breed (LSA field observations). Adult and juvenile tiger salamanders were observed near Pond 5 under boards around the old barn after the rainy season began, but as the ponds never filled, the adult salamanders were not able to breed in 2007. Although the biologists conducting the vernal pool crustacean surveys were able to document some shallow ponding in the ponds during the late winter and early spring of 2007, it was of sufficient depth or duration to allow tiger salamanders to breed. Specific surveys for tiger salamander larvae were therefore not conducted.

In 2008, 2009, and 2010, ponds in the study area filled sufficiently to allow sampling for California tiger salamanders at pools within the study area. The average number of larvae captured per survey was 462 (n= 3) 744 (n= 3), and 408 (n=1) for 2008, 2009, and 2010, respectively.

Other Listed Invertebrates. Potential habitat for the Callippe silverspot butterfly (*Speyeria callippe callippe*) occurs within the Phase II expansion area, as well as off-site in the Southern Hills parcel based on the presence of the food plant for each species onsite. Potential habitat for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) occurs on the Southern Hills parcel based on the presence of a few elderberry shrubs along the slopes of the southern hills. Valley elderberry longhorn beetle, a species federally listed as threatened, spends the majority of its life as a larva in the pith of elderberry trees and shrubs. A number of isolated elderberry shrubs that could provide habitat for this species were observed growing in the rock outcrops on the middle and upper slopes of the hills on the south side of the valley. The approximate location of the plants is shown in Figure 7. The plants are outside the proposed Phase II expansion area on the Southern Hills parcel, and will not be impacted by landfill activities. Callippe silverspot butterfly is federally listed as an endangered species. Its larval food plant is *Viola pedunculata*. A small population of this plant was found in the northwest corner of the expansion area, west of Pond 1. A larger population was observed on the middle and upper slopes of the hills in the southwest corner of the Phase II expansion area and extends onto the adjacent Southern Hills parcel. The locations of both populations are shown in Figure 7. No Callippe silverspot butterflies were observed in the Phase II expansion area during systematic surveys for this species and this species is presumed absent from the project site (ESP, 2002). A habitat assessment for delta green ground beetle (*Elaphrus viridis*) was conducted on the Phase II expansion site, Potrero Hills Valley, and Southern Hills parcel in 2008 (Entomological Consulting Services (ECS), 2008a). These areas were found not to support habitat for delta green ground beetles (Entomological Consulting Services (ECS), 2008a). Presence-absence surveys for the beetles were conducted on the Director's Guild parcel, and at Ponds 1 and 7, but no beetles were found at any of the locations and the sites were determined to be unoccupied (Entomological Consulting Services (ECS), 2008b).

Plants. The proposed Phase II expansion area was surveyed for rare plants during the 2000 blooming period. Additional reconnaissance and focused surveys were conducted in 1998 and 2003, respectively. No plants, either listed or proposed for listing under the federal or state Endangered Species Act, have been observed on the Phase II expansion area. Additional follow-up surveys have been conducted in subsequent years.

Non-native grassland on the site is comprised of annual Mediterranean grasses such as Italian ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), hare barley (*Hordeum murinum* ssp. *leporinum*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and wild oat (*Avena barbata*). Several annual herbaceous weed forbs also dominate the site. The most notable are yellow and purple star-thistle (*Centaurea solstitialis* and *C. calcitrapa*),

Italian thistle (*Carduus pycnocephalus*) and milk thistle (*Silybum marianum*). A few individuals of artichoke thistle (*Cynara cardunculus*) were also noted.

There is a notable lack of woody vegetation on the site with the exception of a red willow tree (*Salix laevigata*) at Pond 1 and a grove of blue gum trees (*Eucalyptus globulus*) in the southwestern corner.

In spite of the dominance by non-native plants, there are a number of native plant species that occur on the project site. A concentration of native plants occurs on the hillside across from the old quarry site at the northern edge of the project. Native plants found on the project site include Johnny-jump-up (*Viola pedunculata*), common lomatium (*Lomatium utriculatum*), soap plant (*Chloragalum pomeridianum* var. *pomeridianum*), clay mariposa lily (*Calochortus argillosus*), harvest brodiaea (*Brodiaea elegans* ssp. *elegans*), blue dicks (*Dichelostemma capitatum* ssp. *capitatum*), white brodiaea (*Triteleia hyacinthina*), Ithuriel's spear (*Triteleia laxa*), common muilla (*Muilla maritima*), California poppy (*Eschscholzia californica*), several tarplants (*Hemizonia congesta* ssp. *luzulifolia*, *H. fitchii*, and *H. parryi* ssp. *parryi*, *Holocarpha heermannii* and *H. virgata*), purple needle grass (*Nasella pulchra*), slender wheatgrass (*Elymus trachycaulus*), purple sanicle (*Sanicula bipinnatifida*), checkerbloom (*Sidalcea malvaeflora* ssp. *malvaeflora*), blue-eye grass (*Sisyrinchium bellum*), and narrow-leaf mule-ears (*Wyethia angustifolia*).

A number of plants associated with alkaline soils occur on the project site. However, these plants are not sufficiently dominant to call this area an alkali community type. Species that occur on the project site associated with alkali soils include inland saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), brass buttons (*Cotula coronopifolia*), and alkali mallow (*Malvella leprosa*).

2.5.9 Critical Habitat for Listed Species

The proposed Phase II expansion area is located in Subunit 10F of the critical habitat for Conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), and Contra Costa goldfields (*Lasthenia conjugens*) (U.S. Fish and Wildlife Service, 2005a). Although the stock ponds in the Phase II expansion area are constructed features and not natural vernal pool or natural depressional features, they otherwise possess the primary constituent elements described for the three species. Primary constituent elements for the three vernal pool crustaceans whose critical habitat includes the Phase II area include the following:

- Topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools providing for dispersal and promoting hydroperiods of adequate length in the pools;
- Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18, 19, 41 or days for vernal pool fairy shrimp, Conservancy fairy shrimp, and vernal pool tadpole shrimp, respectively, in all but the driest years; thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands;
- Sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding; and

- Structure within the pools consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter (U.S.Fish and Wildlife Service, 2005a).

None of the listed vernal pool crustaceans were observed in the Phase II expansion area during the protocol-level surveys for these species, but the impacted ponds may be considered critical habitat for these species. The area that will be impacted by the proposed project is 0.61 acres (Pond 4 and Pond 1).

Seasonal wetlands in the Phase II expansion area also possess the primary constituent elements of critical habitat for Contra Costa goldfields. The primary constituent elements for this species are:

- Topographic features characterized by isolated mound and intermound complex within a matrix of surrounding uplands that result in continuously, or intermittently, flowing surface water in the depressional features including swales connecting the pools described in paragraph (c)(6)(ii) of this section, providing for dispersal and promoting hydroperiods of adequate length in the pools;
- Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and typically exclude both native and nonnative upland plant species in all but the driest years. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands (U.S.Fish and Wildlife Service, 2005b).

Seasonal wetlands in the Phase II expansion area do not support typical vernal pool plants, but they do possess the characteristics described in the second primary constituent element. Approximately, 1.86 acres of jurisdictional seasonal wetland will be impacted by the proposed project.

2.5.10 Non-Listed, Special-Status Species and Common Species

Wildlife. Other special-status species observed using the Phase II expansion area and Eastern Valley include tricolored blackbirds (*Agelaius tricolor*), long-billed curlews (*Numenius americanus*), and golden eagles (*Aquila chrysaetos*). These species use the area as foraging habitat, but have not been observed nor are expected to breed in the Phase II area. Tricolored blackbirds may nest in thistle and mustard patches in the southeast corner of the Phase I area (LSA field notes, 2010). A golden eagle nest lies in the middle of the Potrero Hills southern flank, southwest of the Phase I landfill. The proposed landfill expansion is not expected to impact any nesting areas for these species.

Burrowing owls have been incidentally observed using the Phase II area, Eastern Valley, and Southern Hills intermittently as wintering habitat in 2000, 2003, 2004, 2006, and 2007. However, since 1998, when biologists began conducting surveys on the site for species other than burrowing owls, no breeding activity has been observed. Surveys for nesting burrowing owls were conducted in the Phase II expansion area in May 2006. No burrowing owls or sign of owls was observed in the site. Results of these surveys suggest that the Phase II area is not used by burrowing owls as nesting habitat. Burrowing owls are wintering birds or transient birds that did not stay and nest within the valley.

The Potrero Hills Valley also provides habitat for a variety of common wildlife species that commonly occur in grasslands throughout the region on a year-round and seasonal basis. Species such as California vole, California ground squirrel, Botta' pocket gopher, Virginia opossum, striped skunk, Brewer's blackbirds, red-tailed hawk, barn owl, barn swallows, cliff swallows, western meadowlark, and American goldfinches have been observed on the site during surveys for listed species. Similar habitats in the eastern valley and adjacent hills will continue to provide habitat for these species with landfill development.

Plants. Two special-status plants, crownscale and San Joaquin spearscale are associated with alkali soils. Two subpopulations of San Joaquin spearscale were observed during the 1998 survey of the site. These populations were not observed again until 2004, even though botanists looked for the plants in the intervening years. This subpopulation of San Joaquin spearscale will be impacted by the proposed Phase II expansion project. A population of crownscale grows off the Phase II site immediately to the east. This population will not be impacted by the proposed project (Figure 8).

A third special-status plant, pappose tarplant (*Centromadia parryi* ssp. *parryi*), was also observed in the Phase II expansion area during surveys in 2006 and 2007. This plant was added to the CNPS List 1B subsequent to the original botanical surveys of the site. This population of pappose tarplant will be impacted as a result of the landfill expansion project (Figure 8).

The Phase II expansion area is dominated by non-native, annual grasses that also dominate the eastern valley and adjacent hills. A list of plant species observed in the Phase II expansion area is included as Appendix B.

3.0 MITIGATION DESIGN

3.1 LOCATION OF MITIGATION SITES

Mitigation will take place on five parcels: 1) the Southern Hills parcel, 2) the Pond 5 Buffer area on the Phase II parcel, 3) the Eastern Valley parcel, 4) the Eastern Hills parcel, 5) the Griffith Ranch area, and 6) the Director's Guild parcel. The Southern Hills and Griffith Ranch parcels are located immediately south and north of the Phase II expansion area, respectively. The Eastern Valley parcel is located directly east of the Phase II parcel and the Eastern Hills parcel lies directly east of the Eastern Valley parcel. The Director's Guild parcel is located about 0.25 miles north of the northern boundary of the expansion area on Griffith Ranch along Scally Road. Figure 2 shows the location of the mitigation parcels.

3.2 BASIS FOR DESIGN

Mitigation for project impacts to wetlands, water quality and endangered species involves the types of actions described below:

- Preservation, restoration, and creation of seasonal wetlands, ponds, and channels to replace and enhance wetland functions and values.
- Preservation, enhancement, and creation of breeding habitat and preservation and enhancement of associated upland habitat for California tiger salamanders.
- Preservation of critical habitat for listed vernal pool plants and vernal pool crustaceans.
- Implementation of measures designed to protect the California tiger salamander and other species during construction of the project.
- Implementation of the long-term management program on the lands retained as habitat lands to benefit the California tiger salamander and other grassland dependent species.
- Restoration and creation of seasonal wetlands and ponds on parcels contiguous with the Phase II expansion area and if necessary, in the off-site mitigation bank.

3.3 PROPOSED MITIGATION SITES

Mitigation for impacts on the Phase II landfill site will take place on lands owned by PHLF within and adjacent to the Potrero Hills but outside the Phase II expansion area. Figure 2 shows the location of the mitigation parcels.

The lands adjacent to the Phase II expansion area provide similar habitat values as those that will be impacted by the proposed project and are located in the secondary management zone. Preservation and enhancement of lands in and adjacent to the Potrero Hills will have a beneficial effect on the local populations of plants and animals that are impacted by the project. Parcels on which mitigation will be accomplished include the 428.7-acre Southern Hills parcel, the 41.23-acre Pond 5 Buffer area on the Phase II expansion parcel, the 160-acre Eastern Valley parcel, the 137.39-acre Eastern Hills parcel, the 83.8-acre Director's Guild parcel, and the 112-acre portion of the Griffith Ranch parcel.

All six parcels are currently owned by PHLF. Mitigation on these parcels will preserve and enhance seasonal wetlands and drainages on the Southern Hills, Pond 5 Buffer area, Eastern Valley, Eastern Hills, and Griffith Ranch parcels and unique vernal pools and seasonal wetlands on the Director's Guild parcel. In addition, restoration and management of six parcels will mitigate impacts to California tiger salamanders and its upland and aquatic habitat, potential vernal pool crustacean and vernal pool plant habitat, and habitat for common grassland species that inhabit the Potrero Hill area. Further descriptions of the six mitigation parcels are included in the following sections.

3.3.1 Southern Hills Parcel

Location. This parcel is located along the southern edge of the Potrero Hills Valley and within the southern hills of the Potrero Hills. The 428.7-acre parcel is located directly south of the Phase II expansion area and extends east toward the eastern end of the Potrero Hills as shown on Figure 2. The site is accessed from the existing (Phase I) landfill via a dirt road through the Phase II expansion area. A number of farm roads cross the property and extend onto adjacent properties to the south along Montezuma Slough. No public or county roads connect directly to the Southern Hills parcel. The site is located within the southern quarters of Sections 10 and 11, T4N, R1W, on the Denverton, California USGS 7.5 minute quadrangle.

Ownership. Present Owners of the Mitigation Site:

Potrero Hills Landfill, Inc.
PO Box 68
Fairfield, CA 94533
(707) 396-1366
(707) 432-4630, fax
Contacts: Jim Dunbar, PE

Expected Long-term Owners of the Mitigation Site; Parties Responsible for the Long-term Management of the Mitigation Site:

Retained Private Lands
Potrero Hills Landfill, Inc.
PO Box 68
Fairfield, CA 94533
(707) 396-1366
(707) 432-4630, fax
Contacts: Jim Dunbar, PE

A conservation easement will be placed on the retained private lands establishing these areas as plant and wildlife habitat in perpetuity. A draft conservation agreement is included as Appendix D.

Jurisdictional Areas. The delineation of waters of the U.S., including wetlands, for the Southern Hills study area was verified during a field visit with the Corp on March 10, 2010. A formal jurisdictional determination for the area will be completed as part of the approval of the individual permit. Potential waters of the United States on the PHLF Southern Hills parcel are seasonal wetlands, seeps, drainage channels, drainages with wetland characteristics, a roadside ditch, and a stock pond with a total area of 7.31 acres. The breakdown of acreage by type is shown in Table C. These features are mapped on Figure 10.

Table C: Jurisdictional Acreage on the Southern Hills Parcel.

	AREA (ACRES)	LENGTH (FEET)
<u>Wetlands</u>		
Seasonal Wetlands	5.65	-
Seeps	0.06	-
Seasonal Wetland Channel Segments	0.64	-
Total Wetlands	6.35	-
<u>Other Waters</u>		
Channel Segments	0.62	4,230
Stock Pond (Pond 7) ²	0.34	-
Total Other Waters	0.96	4,230
TOTAL JURISDICTIONAL AREA	7.31	4,230

Hydrology. There are numerous, small ephemeral drainages within the steep hillsides in the Southern Hills parcel. These drainages flow into the narrow valley that includes a large stock pond labeled as Pond 7 and Seasonal Wetland 4. In the southeastern portion of the Southern Hills parcel there are four drainages that flow to the south or east into Nurse Slough and Montezuma Slough and thence Suisun Bay. The Spring Branch Creek originate on the north side of the Southern Hills parcel and flow north into the eastern Potrero Hills Valley then west to Suisun Slough. All of these sloughs are connected to Suisun Bay, a navigable water of the United States.

Many of the drainages support areas of hydrophytic vegetation associated with soil seasonally saturated from surface runoff. One small seep and one constructed stock pond (labeled as Pond 7) were mapped on the Southern Hills parcel. The seep appears to be associated with groundwater issuing from fissures in the sedimentary bedrock. Pond 7 is within a drainage course that flows east off of the site and eventually drains to Nurse Slough.

Soils. The soils on the project site are mapped as Altamont clay, 2-9% slopes (AcC); Altamont clay, 9-30% slopes (AcE); Altamont clay, 30-50% slopes (AcF2); Altamont-Diablo clays, 2-9% slopes (Amc); Altamont-Diablo clays, 9 to 30 percent slopes, eroded (AmE2), Clear Lake clay, 0 to 2 percent slopes (CeA), Clear Lake clay, 2 to 5 percent slopes (CeB), Diablo-Ayar clays, 9 to 30 percent slopes, eroded (DaE2), Gaviota sandy loam, 30-75% slopes (GaG2); and Millsholm loam, 15-30% slopes (MmE) (Soil Conservation Service, 1977). The parent materials for the on-site soils are the siltstones and sandstones of the Potrero Hills. All the soils are well drained except for the Clear Lake clays, which are poorly drained. All the soils have slow permeability except for the Gaviota and Millsholm series which have moderately rapid to moderate permeability. None of these soils are listed on the Solano County Hydric Soils List. The Clear Lake clay, 0-2% slopes, may contain inclusions of Omni silty clay, which can be hydric if the water table is within 1.5 feet of the surface. Nonetheless, any soil may contain hydric inclusions.

Vegetation. The study area is dominated by non-native annual grassland and is used for cattle grazing. Dominant species include Italian ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*) and wild oat

² The Pond 7/Seasonal Wetland complex that provides breeding habitat for California tiger salamanders on the Southern Hills parcel is comprised of the 0.34 acre pond plus 3.43 acres of seasonal wetland located west of the berm.

(*Avena fatua*). Purple star thistle (*Centaurea calcitrapa*) is also very abundant throughout the project site. The Southern Hills parcel is generally lacking in any shrub or tree cover.

Wildlife Habitat. Wildlife habitats in the Southern Hills parcel are similar to those in the landfill expansion area and the Potrero Hills Valley and wildlife species using the Southern Hills parcel are similar to those using the adjacent valley. Annual grasslands, a stock pond, seasonal wetlands, and intermittent drainages provide habitat for wildlife on the parcel. No trees or groves of trees that could provide perches or nest sites for raptors or other wildlife occur on this parcel.

The parcel provides both upland and breeding habitat for California tiger salamanders. During 2003, Pond 7 had the highest estimated density of larvae among all the breeding ponds in the Potrero Hills Valley and Southern Hills. Burrowing owls have been observed during the winter on this parcel using the burrows as shelter and foraging in the grasslands. Burrowing owls have not been observed breeding on this or any of the other landfill parcels. Golden eagles, long-billed curlews, and tricolored blackbirds also use the Southern Hills parcel as they do the adjacent Potrero Hills Valley, but no nesting habitat exists on the parcel for these species. No listed vernal pool crustaceans were found in Pond 7, but California fairy shrimp were observed in this pond during surveys.

Present and Historical Uses of the Mitigation Area. The study site is predominantly grass-covered rolling hills and ridges used for grazing cattle. The site contains a few abandoned ranch structures, barbed wire cattle fencing, unpaved ranch roads, and stock ponds. Adjacent land uses include the PHLF to the northwest, the Goodrich Explosive Technology facilities to the northeast, and grazing land elsewhere.

Present and Proposed Uses of All Adjacent Areas. Land uses in the vicinity of the Southern Hills parcel are designated in the Suisun Marsh Plan. The existing Phase I Potrero Landfill is an allowable use in the plan. The central portion of the Potrero Hills Valley, north of the Southern Hills parcel is currently grazing land, but is proposed for the Phase II landfill expansion. The eastern Potrero Hills Valley will remain grazing land. The existing Goodrich Explosive Technologies facility will also remain active just northeast of the Southern Hills parcel. Other lands to the south, east and west of the Southern Hills parcel will remain as grazing lands.

3.3.2 Pond 5 Buffer Area

Location. This area is located along the southern edge of the Potrero Hills Valley. The 41.23-acre, Pond 5 Buffer area is located in the eastern extension of the Phase II expansion parcel as shown on Figure 2. The site is accessed from the existing (Phase I) landfill via a dirt road through the Phase II expansion area. A farm road crosses the property and extends onto adjacent properties to the south. No public or county roads connect directly to this parcel. The site is located within the southeast quarter of Section 10, T4N, R1W, on the Denverton, California USGS 7.5 minute quadrangle.

Ownership. Present Owners of the Mitigation Site:

Potrero Hills Landfill, Inc.
PO Box 68
Fairfield, CA 94533
(707) 396-1366
(707) 432-4630, fax
Contacts: Jim Dunbar, PE

Expected Long-term Owners of the Mitigation Site; Parties Responsible for the Long-term Management of the Mitigation Site:

Retained Private Lands

Potrero Hills Landfill, Inc.
PO Box 68
Fairfield, CA 94533
(707) 396-1366
(707) 432-4630, fax
Contacts: Jim Dunbar, PE

A conservation easement will be placed on the retained private lands establishing these areas as plant and wildlife habitat in perpetuity. A draft conservation agreement is included as Appendix D.

Jurisdictional Areas. A field delineation of waters of the U.S., including wetlands, was conducted on the Phase II parcel in December 2009 and a final jurisdictional determination was issued in February 2010. A single stock pond (Pond 5 = 0.45 acres) occurs in this portion of the Phase II parcel (see Figure 5). In addition, SW-19 (0.03 acres) and about 280 feet of Drainage B (0.04 acres) also would be preserved on this portion of the Phase II parcel. All of these areas are accounted for in the tables in Sections 2.5.1 and 2.5.2 and are called out here because this portion of the Phase II parcel will be preserved and managed with the other mitigation lands, particularly the Southern Hills parcel, with which the Pond 5 Buffer area is contiguous.

Hydrology. Runoff from the slopes above Pond 5 flows downslope and is captured in Pond 5. This large pond and the associated wetland adjacent to it capture a large portion of the run off from this section of the slopes. No drainage channel exits the pond. Drainage B captures run off in the western portion of the Pond 5 Buffer area which then flows downslope to Spring Branch Creek.

Soils. This parcel was originally delineated as part of the Phase II area. The soils throughout the Phase II area were mapped by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) in 1977 (Soil Conservation Service, 1977). Five primary soil phases are present on the project site and they include: Antioch-San Ysidro complex, 0-2% slopes (AoA); Antioch-San Ysidro complex, 2-9% (AsC); Altamont clay, 2-9% slopes (AcC); Altamont clay, 9-30% slopes (AcE); Altamont clay, 30-50% slopes (AcF2); Altamont-Diablo clays, 2-9% slopes (Amc); Gaviota sandy loam, 30-75% slopes (GaG2); and Millshom loam, 15-30% slopes (MmE). None of these soils are listed on the Solano County Hydric Soils List.

Vegetation. The study area is dominated by non-native annual grassland and is used for cattle grazing. Dominant species include Italian ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*) and wild oat (*Avena fatua*). Purple star thistle (*Centaurea calcitrapa*) is also very abundant throughout the project site. There are no trees or shrubs in this parcel.

Wildlife Habitat. Wildlife habitats on this parcel are similar to the Southern Hills parcel and the rest of the Phase II parcel in the Potrero Hills Valley. Annual grasslands, a stock pond, and a seasonal wetland provide habitat for wildlife on the parcel. Pond 5 has consistently been used as breeding site by California tiger salamanders and Pacific treefrogs. The site also provides habitat for California fairy shrimp, a common species of freshwater crustacean. A dilapidated barn provides cover for amphibians including California tiger salamanders during the winter and spring when adult and metamorph salamanders make their way to and from the pond. The barn is also used as a roost site for

great horned owls (*Bubo virginianus*). No trees or groves of trees that could provide perches or nest sites for raptors or other wildlife occur on this parcel.

Present and Historical Uses of the Mitigation Area. The parcel is at the southern edge of the Potrero Hills Valley and is predominantly grass-covered. South of the pond, the hills rise steeply to the ridge that lies within the adjacent Southern Hills parcel. The parcel and hill slopes are used for grazing cattle. The site contains a few abandoned ranch structures, barbed wire cattle fencing, unpaved ranch roads, and the stock pond. Adjacent land uses include the PHLF to the northwest, and grazing land elsewhere.

Present and Proposed Uses of All Adjacent Areas. The remainder of the Phase II parcel will be used for the landfill expansion. The Southern Hills parcel will be preserved and managed as plant and wildlife habitat. The eastern end of the Potrero Hills Valley will be used for cattle grazing as it is currently.

3.3.3 Eastern Valley Parcel

Location. The 160-acre Eastern Valley parcel is located adjacent to and directly east of the Phase II Expansion parcel and encompasses the eastern end of the Potrero Hills Valley as well as a portion the northeast facing slopes of the Potrero Hills outside the valley (Figure 2). The site is accessed from Phase II parcel via a dirt road. This area includes the entire northeast quadrant of Section 10, of the Denverton 7.5 minute USGS quad. The mitigation area is contiguous with the Southern Hills parcel to the south and has a connection to the southeast corner of the Griffith Ranch area to the north. The Assessor Parcel Numbers (APN's) for the Eastern Valley parcel is 004-61-20210.

Ownership. Present Owners of the Mitigation Site:

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Contacts: Jim Dunbar, PE

Expected Long-term Owners of the Mitigation Site; Parties Responsible for the Long-term Management of the Mitigation Site:

Retained Private Lands
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Fairfield, CA 94533
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(707) 432-4630, fax
Contacts: Jim Dunbar, PE

A conservation easement will be placed on the retained private lands establishing these areas as plant and wildlife habitat in perpetuity. A draft conservation agreement is included as Appendix D.

Jurisdictional Areas. The delineation of waters of the U.S., including wetlands, for the Eastern Valley study area was verified during a field visit with the Corp on January 26, 2010. A formal

jurisdictional determination for the area will be completed as part of the approval of the individual permit. Potential waters of the United States in the Eastern Valley area are seasonal wetlands, drainage channels, drainages with wetland characteristics, and a stock pond with a total area of 0.72 acres. The breakdown of acreage by type is shown in Table D. These features are mapped on Figure 10.

Table D: Jurisdictional Acreage in the Eastern Valley Parcel

	AREA (ACRES)	LENGTH (FEET)
<u>Wetlands</u>		
Seasonal Wetlands	0.20	-
Total Wetlands	0.20	-
<u>Other Waters</u>		
Channel Segments	0.14	1,540
Stock Ponds		-
Pond 3	0.34	
Pond 6	0.04	
<i>Stock Ponds Total</i>	<i>0.38</i>	
Total Other Waters	0.52	1,540
TOTAL JURISDICTIONAL AREA	0.72	1,540

Figure 10 also shows the location of non-jurisdictional features in the Eastern Valley area. This include one small quarry ponds (Ponds 2) that fill seasonally. This features is located on an excavated bench of the northern hills and does not have a connection to Spring Branch Creek or other jurisdictional features. The acreage of non-jurisdictional features is summarized in Table E.

Table E: Non-jurisdictional Acreage in the Eastern Valley Area.

FEATURE	AREA (ACRES)
Pond 2	0.12
TOTAL	0.12

Hydrology. The Spring Branch Creek originates on the north side of the Southern Hills parcel and flow north into the Eastern Valley then west to through the Phase II expansion parcel and Phase I landfill parcel to Suisun Slough. Suisun Slough is connected to Suisun Bay, a navigable water of the United States. Pond 2 on the excavated north side of the valley does not have an outlet and is not connected to any drainage. Drainages on the outer slopes of the Potrero Hills flow to the north and east and eventually flow to Nurse Slough.

Soils. The soils throughout the Potrero Hills Valley area were mapped by the USDA Natural Resources Conservation Service in 1977 (NRCS; formerly Soil Conservation Service). Soils in the eastern Valley are similar to those found in the Pond 5 Buffer area and Phase II expansion area. Five primary soil phases are present on the project site and they include: Antioch-San Ysidro complex, 0-2 percent slopes (AoA); Antioch-San Ysidro complex, 2-9 percent (AsC); Altamont clay, 2-9 percent slopes (AcC); Altamont clay, 9-30 percent slopes (AcE); Altamont clay, 30-50 percent slopes (AcF2);

Altamont-Diablo clays, 2-9 percent slopes (Amc); Gaviota sandy loam, 30-75 percent slopes (GaG2); and Millshom loam, 15-30 percent slopes (MmE). None of these soils are listed on the Solano County Hydric Soils List.

Vegetation. Vegetation in the Eastern Valley is similar to that described for the Phase II expansion area which is contiguous with the Eastern Valley area. A stand of eucalyptus trees occurs in the northeast corner of the area and a willow grows in the Pond 2. As in the Phase II parcel, the Spring Branch Creek in the Eastern Valley is swale-like and does not have a defined bed and bank along much of its course. Vegetation along the creek is therefore similar to the surrounding uplands. The northeast facing slopes of the Potrero Hills are dominated by annual grasses without any large trees present.

Wildlife Habitat. Wildlife habitats on this parcel are similar to the Southern Hills parcel and the Phase II parcel in the Potrero Hills Valley. Annual grasslands, stock ponds, and seasonal wetland provide habitat for wildlife on the parcel. Pond 3 has consistently been used as breeding site by California tiger salamanders and Pacific treefrogs. The site also provides habitat for California fairy shrimp and common freshwater invertebrates. A collapsed barn in the northeast corner of the area provides cover for amphibians including California tiger salamanders during the winter and spring when adult and metamorph salamanders make their way to and from the pond breeding ponds in the valley. A second intact pole barn occurs adjacent to the collapsed barn. The pole barn is used by cattle for shade and the rancher may provide supplemental feed to cattle in this area. A grove of eucalyptus lies adjacent to the barns and provides perches and possible nest sites for raptors or other birds that occur in this area.

Present and Historical Uses of the Mitigation Area. The Eastern Valley is predominantly grass-covered. North, south, and east the hills rise steeply to the ridges. The parcel and hill slopes are used for grazing cattle. The site contains a few abandoned ranch structures, barbed wire cattle fencing, unpaved ranch roads, and the stock ponds. Adjacent land uses include the Potrero Hills Landfill, and grazing land elsewhere.

Present and Proposed Uses of All Adjacent Areas. The Phase II parcel will be used for the landfill expansion. The southern portion of the Phase II parcel (Pond 5 Buffer area) will be used as mitigation lands and managed in conjunction with the Southern Hills. The Southern Hills parcel, Pond 5 Buffer, and Griffith Ranch mitigation areas will be preserved and managed as plant and wildlife habitat.

3.3.4 Eastern Hills Parcel

Location. The 137.39-acre Eastern Valley parcel is located adjacent to and directly east of the Eastern Valley parcel and encompasses the northeastern slopes of the Potrero Hills outside the valley (Figure 2). The site is most easily accessed from Explosive Technologies Road which intersects SR 12 north of the Potrero Hills. This area includes the entire northwest quadrant of Section 11, of the Denverton 7.5 minute USGS quad, with the exception of approximately 20-acres of in-holdings owned by Goodrich Explosive Technologies. The mitigation area is contiguous with the Southern Hills parcel to the south and shares its eastern boundary with the Eastern Valley parcel. The Assessor Parcel Numbers (APN's) for the Eastern Hills parcel is 004-61-20220.

Ownership. Present Owners of the Mitigation Site:

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PO Box 68
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(707) 396-1366
(707) 432-4630, fax

Contacts: Jim Dunbar, PE

Expected Long-term Owners of the Mitigation Site; Parties Responsible for the Long-term Management of the Mitigation Site:

Retained Private Lands
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Fairfield, CA 94533
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(707) 432-4630, fax
Contacts: Jim Dunbar, PE

A conservation easement will be placed on the retained private lands establishing these areas as plant and wildlife habitat in perpetuity. A draft conservation agreement is included as Appendix D.

Jurisdictional Areas. The delineation of waters of the U.S., including wetlands, for the Eastern Hills study area was verified during a field visit with the Corp on January 27, 2010. A formal jurisdictional determination for the area will be completed as part of the approval of the individual permit. Waters of the United States in the Eastern Hills area consist of a small seasonal wetland, and mostly of gullies that drain the slopes of the northeast face of the Potrero Hills. The total jurisdictional area is 0.51 acre. The breakdown of acreage by type is shown in Table F. These features are mapped on Figure 17.

Table F: Jurisdictional Acreage on the Eastern Hills Parcel

	AREA (ACRES)	LENGTH (FEET)
<u>Wetlands</u>		
Seasonal Wetlands	0.004	-
Total Wetlands	0.004	-
<u>Other Waters</u>		
Gullies	0.41	3,465
Ditches	0.08	1,220
Culverts	0.02	490
Total Other Waters	0.51	5,175
TOTAL JURISDICTIONAL AREA	0.51	5,175

There were no non-jurisdictional features on the Eastern Hills parcel.

Hydrology Surface runoff from the majority of the study area drains northward from the hills, across a gently-sloped piedmont, and into shallow swales which drain eastward into Luco Slough. The southeastern portion of the site drains southeastward via un-named intermittent channels into Hastings Slough or Nurse Slough. Drainage from the southwestern corner of the site drains southwestward into the off-site headwaters of Spring Branch Creek, which drains westward through the landfill property to First Mallard Branch. Spring Branch Creek has an ephemeral to seasonally

intermittent hydro-period west of the study site. Luco Slough, Hastings Slough, Nurse Slough, and First Mallard Branch are each tidal sloughs that drain into Suisun Slough, a traditional navigable water of the United States, approximately 4 miles west of the study site. Suisun Slough is tributary to Suisun Bay and Carquinez Strait.

No evidence of bedrock seeps was observed on the study site.

Soils. The soils on the project site's north facing slopes are mapped as Altamont-Diablo clays, 2-9 percent slopes (AmC); Antioch-San Ysidro complex, thick surface, 2 to 9 percent slopes (AsC); Dibble-Los Osos loam, 9 to 30 percent slopes (DbE); and Millsholm loam, 15 to 30 percent slopes (MmE). The soils on the ridge tops are mapped as Diablo-Ayar clays, 9 to 30 percent slopes, eroded (DaE2). The soils on the south facing slopes are mapped as Altamont clay, 9 to 30 percent slopes (map unit AcE); Altamont-Diablo clays, 9 to 30 percent slopes, eroded (AmE2); and Gaviota sandy loam, 30 to 75 percent slopes, eroded (GaG2), (USDA Soil Survey of Solano County, California, 1977).

The parent materials for the study site soils are the siltstones and sandstones of the Potrero Hills. All the soils are well drained except for the Antioch-San Ysidro complex, which is moderately well drained. All the soils have slow permeability except for the Antioch-San Ysidro complex, which has very slow permeability, and the Gaviota sandy loam, which has moderately rapid permeability. None of these soils are listed on the Solano County Hydric Soils List. Nonetheless, any soil may contain hydric inclusions.

Vegetation. The study area is dominated by non-native annual grassland and is used for cattle grazing. Dominant species include Italian ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), and wild oat (*Avena fatua*). Purple star thistle (*Centaurea calcitrapa*) is also very abundant throughout the project site. There are no shrubs or trees on the study site.

Wildlife Habitat. Wildlife habitats on this parcel are similar to the Southern Hills parcel and the Phase II parcel in the Potrero Hills Valley. Annual grasslands, stock ponds, and seasonal wetland provide habitat for wildlife on the parcel. Pond 3 has consistently been used as breeding site by California tiger salamanders and Pacific treefrogs. The site also provides habitat for California fairy shrimp and common freshwater invertebrates. A collapsed barn in the northeast corner of the area provides cover for amphibians including California tiger salamanders during the winter and spring when adult and metamorph salamanders make their way to and from the pond breeding ponds in the valley. A second intact pole barn occurs adjacent to the collapsed barn. The pole barn is used by cattle for shade and the rancher may provide supplemental feed to cattle in this area. A grove of eucalyptus lies adjacent to the barns and provides perches and possible nest sites for raptors or other birds that occur in this area.

Present and Historical Uses of the Mitigation Area. The Eastern Hills is predominantly grass-covered. The hills rise steeply to the ridge that surrounds the adjacent valley. The hill slopes are used for grazing cattle. Adjacent land uses include the Explosive Technologies facility and grazing land.

Present and Proposed Uses of All Adjacent Areas. The adjacent Eastern Valley parcel will be used as mitigation land managed as upland habitat for California tiger salamanders and other native animals and plants. Grazing will be used to manage the vegetation on the Eastern Valley parcel. Explosive Technologies will continue to operate as a facility that produces various defense related products.

3.3.5 Griffith Ranch Parcel

Location. The Griffith Ranch parcel is located on the east side of Scally Road approximately 0.5 mile south of State Highway 12 (Figure 2). Approximately 112 acres of the 143-acre parcel will be dedicated as mitigation lands. The remaining 31 acres in the southwest corner of the parcel will be retained by PHLF for access. The southern third of the Griffith Ranch encompasses a portion of the northern ridge of the Potrero Hills that descends northward to a gently-sloping flatland that makes up the northern two-thirds of the parcel. Vegetation is dominated by non-native grassland. A few blue gum (*Eucalyptus globulus*) trees located near what used to be an old ranch house/barn complex but these structures and trees are located on the PHLF portion of the parcel. Two occupied residences with outbuildings are located on a separate parcel, not owned by PHLF, that is surrounded on the south, east and north sides by the Griffith Ranch parcel. This separate parcel also contains a commercial animal internment site used primarily for burial of laboratory animals. The remainder of the Griffith Ranch parcel is fenced and currently grazed by cattle. Adjacent land uses include cattle ranching to the west, north, and east and the PHLF to the south and west. The Assessor Parcel Numbers (APN's) for Griffith Ranch are 004-61-20400 (main parcel) and 004-61-20070 (southwest corner extension).

Ownership. Present Owners of the Mitigation Site:

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Contacts: Jim Dunbar, PE

Expected Long-term Owners of the Mitigation Site; Parties Responsible for the Long-term Management of the Mitigation Site:

Retained Private Lands
Potrero Hills Landfill, Inc.
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Contacts: Jim Dunbar, PE

A conservation easement will be placed on the retained private lands establishing these areas as plant and wildlife habitat in perpetuity. A draft conservation agreement is included as Appendix D.

Jurisdictional Areas. The delineation of waters of the U.S., including wetlands, for the Griffith Ranch study area was verified during a field visit with the Corp on March 23, 2010. A formal jurisdictional determination for the area will be completed as part of the approval of the individual permit. Potential waters of the United States on the Griffith Ranch parcel are mapped as seasonal wetlands with a total area of 0.34 acre (Table G). These features are mapped on Figure 12.

Table G: Jurisdictional Acreage on the Griffith Ranch Parcel

	AREA (ACRES)	LENGTH (FEET)
<u>Wetlands</u>		
Seasonal Wetlands	0.22	-
Total Wetlands	0.22	-
<u>Other Waters</u>		
Stock Ponds	0.12	-
Total Other Waters	0.12	-
TOTAL JURISDICTIONAL AREA	0.34	-

Hydrology. The hydrology of the Griffith Ranch parcel results primarily from direct rainfall onto the site. The entire Griffith Ranch parcel drains northward from the ridge tops along the southern edge of the parcel. The drainage extends northward off the property, toward a west-draining playa pool and ponded swale approximately one-quarter mile to the north of the parcel. The ponded areas north of the parcel support goldfields (*Lasthenia* spp.) and other vernal pool vegetation. The ponding does not extend onto the north edge of the Griffith Ranch parcel, however. There are convex swales draining the hill slopes on the southern third of the parcel, but there are no drainage channels on the parcel. The topographic swales in the hills dissipate when they reach the shallow sloping piedmont that makes up the northern portion of the parcel. Other than small man-made ditches, all the drainage from this parcel occurs as dispersed sheet flow. The pool and swale complex to the north of the parcel drains westward to a playa pool in the eastern portion of the Directors Guild parcel along the west of Scally Road. All drainage from the Griffith Ranch parcel crosses onto the Directors Guild parcel. Under low stormwater runoff flows, this drainage is conveyed under Scally Road via a culvert. During periods of very high rainfall, the existing drainage conditions result in flooding of the road to a depth of about 12 inches. A small stock pond occurs on the site south of the water well. This pond persists for only a short time after winter rains stop and may fill and dry a number of times during the winter.

Soils. Soils on the Griffith Ranch parcel are mapped in the *Soil Survey of Solano County, California* (Soil Conservation Service, 1977) as Altamont clay, 30 to 50 percent slopes, eroded (AcF2); Altamont-Diablo clays, 2 to 9 percent slopes (AmC) and 9 to 30 percent slopes, eroded (AmE2); Antioch-San Ysidro complex, thick surface, 0 to 2 percent slopes (AsA) and 2 to 9 percent slopes (AsC); Diablo-Ayar clays, 9 to 30 percent slopes, eroded (DaE2); and Millsholm loam, 15 to 30 percent slopes (MmE). The Antioch-San Ysidro soils occur on the flatter areas on the northern two-thirds of the parcel. The remaining soils occur on the generally north facing hill slopes on the southern one-third of the parcel.

The Altamont, Diablo, and Ayar soils have a clay surface texture. The Antioch, San Ysidro, and Millsholm soils have a loam to sandy loam surface texture. Both the Antioch and San Ysidro soils have clay horizons within two feet of the surface. The Altamont, Antioch, and Diablo soils have slow to very slow permeability. Both the Antioch and San Ysidro soils have brown mottling within the upper 12 inches. The Antioch and San Ysidro soils are listed as hydric soils (Natural Resources Conservation Service, 2005).

Vegetation. The proposed mitigation area within the Griffith Ranch parcel is dominated by non-native annual grassland and is used for cattle grazing. Dominant species include Italian ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum*), soft chess (*Bromus hordeaceus*),

ripgrut brome (*Bromus diandrus*) and wild oat (*Avena barbata*). An invasive, weedy grass species, medusahead (*Taeniatherum caput-medusae*), also occurs on the parcel. Other common species include storksbill (*Erodium* spp.), geranium (*Geranium* spp.), purple and yellow star thistle (*Centaurea calcitrapa*, *C. solstitialis*), and spring vetch (*Vicia sativa*). Wetland plant species found on the parcel are curly dock (*Rumex crispus*), spiny-fruit buttercup (*Ranunculus muricatus*), annual bluegrass (*Poa annua*), Greene's popcorn-flower (*Plagiobothrys greenei*), and maroon-spot downingia (*Downingia concolor*).

Wildlife Habitat. Wildlife habitats on the Griffith Ranch parcel are similar to those on the Phase II expansion site and the Potrero Hills Valley and wildlife species using the Griffith Ranch parcel are similar to those using the adjacent valley. Annual grasslands, a small stock pond, and seasonal wetlands, provide habitat for wildlife on the parcel. Eucalyptus trees grow around the barns and outbuildings onsite. The small stock pond onsite was sampled for vernal pool crustaceans, but was not found to support any listed species. Additional protocol-level surveys for vernal pool crustaceans will be conducted in the 2007-2008 season. No California tiger salamander larvae were observed in the stock pond, either. This stock pond is small and shallow and does not have a hydroperiod sufficient to allow salamanders to complete larval development prior to the pond drying up. The pond was sampled in 2004 and no vernal pool crustaceans were observed in the pond (LSA, 2004).

Present and Historical Uses of the Mitigation Area. The proposed mitigation area is predominantly grass-covered rolling hills and a gently sloping plain used for grazing cattle. The site contains a small stock pond. Adjacent land uses include the PHLF to the southwest, a residence to the west, two residences surrounded by the Griffith Ranch parcel, and grazing land elsewhere. Scally Road is located on the west side of the parcel. At the end of the County road, an existing farm road climbs southward up and over the hills, providing limited access to the other PHLF properties.

Present and Proposed Uses of All Adjacent Areas. The proposed landfill expansion will occur in the Potrero Hills Valley south of the Griffith Ranch parcel. The 31-acre southwest corner of the portion of the parcel will be retained by PHLF as access to Phase II expansion area. Structures on the 31-acre PHLF portion of the Griffith Ranch parcel include a barn near the base of the hills and a well pump house just west of the barn. The remaining 112 acres encompassing the southeast, east, and north areas of the parcel will be dedicated as mitigation lands.

3.3.6 Director's Guild Parcel

Location. This parcel is located directly north of the Potrero Hills, just south of State Highway 12. The 83.8-acre parcel is bordered by Killdeer Road to the north, Scally Road to the east, private property to the south, and the Solano Garbage Company landfill and Potrero Hills Lane mitigation area to the west (Figure 2). The parcel is accessed via Killdeer Road and Scally Road. The parcel is located within the northeast quarter of Sections 4, T4N, R1W, on the Denverton, California USGS 7.5 minute quadrangle.

Ownership. Present Owners of the Mitigation Site:

Potrero Hills Landfill, Inc.
PO Box 68
Fairfield, CA 94533
(707) 396-1366
(707) 432-4630, fax
Contacts: Jim Dunbar, PE

Expected Long-term Owners of the Mitigation Site; Parties Responsible for the Long-term Management of the Mitigation Site:

Retained Private Lands

Potrero Hills Landfill, Inc.
PO Box 68
Fairfield, CA 94533
(707) 396-1366
(707) 432-4630, fax
Contacts: Jim Dunbar, PE

A conservation easement will be placed on the retained private lands establishing these areas as plant and wildlife habitat in perpetuity. A draft conservation agreement is included as Appendix D.

Jurisdictional Areas. The delineation of waters of the U.S., including wetlands, for the Director's Guild study area was verified during a field visit with the Corp on May 13, 2010. A formal jurisdictional determination for the area will be completed as part of the approval of the individual permit. Potential waters of the United States on the PHLF Director's Guild parcel are all mapped as seasonal wetlands with a total area of 61.87 acres mapped as seasonal wetland. Within the large seasonal wetland area on the parcel, a large playa pool and drainage ditch can be distinguished. The playa pool covers approximately 8.83 acres and the ditch covers about 0.2 acre. The breakdown of acreage by type is shown in Table H. These features are mapped on Figure 11.

Table H: Jurisdictional Acreage on the Director's Guild Parcel.

	AREA (ACRES)	LENGTH (FEET)
<u>Wetlands</u>		
Seasonal Wetlands	52.83	-
Ditch	0.21	1,035
Playa Pool	8.83	
Total Wetlands	61.87	-
TOTAL JURISDICTIONAL AREA	61.87	1,035

Hydrology. Surface flow from east of the Directors Guild parcel drains into a playa pool along the eastern edge of the parcel. This pool drains westward off the site via an excavated ditch in the center of the parcel. Runoff from the northern part of the parcel flows south into this ditch. Runoff from the hills south of the parcel flows north across the southern part of the parcel, joining the playa pool or the ditch. Some of the southwestern part of the parcel drains separately off site to the Potrero Hills Lane wetland mitigation area to the west. The excavated ditch continues west onto the adjacent Potrero Hills Lane wetland mitigation area, where it drains into Hill Slough on the adjacent California Department of Fish and Game Hill Slough Wildlife Area.

Runoff from both the Griffith Ranch and Director's Guild parcels drains westward through the pool/swale complex and ditch system into an adjacent tidal slough channel that connects to Hill Slough approximately one-half mile west of the Director's Guild parcel. Hill Slough is a navigable water of the United States. Hill Slough drains into Suisun Slough, which drains into Suisun Bay.

Soils. Soils on the Directors Guild parcel are mapped in the *Soil Survey of Solano County, California* (Soil Conservation Service, 1977) as Antioch-San Ysidro complex, thick surface, 0 to 2 percent

slopes (AsA); Pescadero clay loam (Pc); and Solano loam (Sh). The Pescadero clay occurs in the area of the ponded playa pool. The Antioch-San Ysidro complex soil occurs on the foot slope south of the pool, and the Solano loam occurs north of the pool.

The Pescadero and Solano soils are somewhat poorly drained. The Antioch-San Ysidro and Solano soils have very slow permeability, while the Pescadero soil has slow permeability. Pescadero clay loam has low chroma (Munsell chroma of 1) and mottling within the upper 12 inches, and is listed as hydric where ponded. Solano loam contains mottling within the upper 12 inches. The Solano loam may contain inclusions of Pescadero clay.

Vegetation. Vegetation includes the usual Mediterranean annual grasses and a variety of wetland plants ranging from facultative to obligate. Plants noted during the wetland survey are Italian ryegrass, Mediterranean barley, curly dock, fiddle dock (*Rumex pulcher*), and semaphore grass (*Pleuropogon californicus*). Plants on the parcel that indicate alkaline or saline conditions include brass buttons (*Cotula coronopifolia*), alkali heath (*Frankenia salina*), pickle weed (*Salicornia virginica*), and salt grass (*Distichlis spicata*). Five special-status plants have been found on the parcel: San Joaquin spearscale (*Atriplex joaquiniana*) (CNPS List 1B), crownscale (*Atriplex coronata*) (CNPS List 4), pappose tarplant (*Centromadia parryi* ssp. *parryi*) (CNPS List 1B), alkali milk-vetch (*Astragalus tener* var. *tener*) (CNPS List 1B), and Contra Costa goldfields (*Lasthenia conjugens*) (FE, CNPS List 1B). These species also are known to occur in alkaline or saline soils. Contra Costa goldfields (a federally listed endangered species) also occurs on the adjacent Potrero Hills Lane mitigation area to the west.

Wildlife Habitat. The seasonal wetlands providing suitable habitat for federally listed vernal pool crustaceans were sampled biweekly during the 2003-2004 rainy season. The pools were also sampled in the 2005-2006 and 2006-2007 rainy seasons. The playa pool supported vernal pool tadpole shrimp (*Lepidurus packardii*) and Conservancy fairy shrimp (*Branchinecta conservatio*), while the ditch that drains the playa pool was found to support Conservancy fairy shrimp. Although Director's Guild parcel is about 0.7 mile over the hill from a California tiger salamander breeding pond (Pond 1 in the Phase II expansion area), tiger salamanders were not observed breeding in the playa pool during the 2003-2004 season nor during the vernal pool crustacean surveys in subsequent years. Extensive, focused surveys for California tiger salamanders have not been conducted on this parcel, however. The playa pool and other areas of ponding on the parcel also support the federally listed Contra Costa goldfields (*Lasthenia conjugens*).

Present and Historical Uses of The Mitigation Area. The parcel is currently used as grazing land and appears to have been used in this way for the last 50-100 years. The northern portion of the parcel also may have been cultivated, likely for hay crops. Furrows and leveling are evident in the northern portion of the parcel. A remnant of a farmstead and barn occur on the site. The large playa pool forms a part of a larger complex of playa pools on both the east and west sides of Scally Road. The pool complex eventually drains to Hill Slough, west of Potrero Hills Lane, west of the Director's Guild parcel.

Present and Proposed Uses of All Adjacent Areas. Current land uses on the adjacent parcels include grazing lands. The former Solano Garbage Company landfill lies directly west of the northwest corner of the Director's Guild parcel. The Solano Garbage Company landfill has been closed and capped.

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4.0 HABITATS TO BE CREATED/RESTORED

4.1 COMPENSATION RATIOS

Table I below summarizes the compensation ratios for impacts associated with the Phase II landfill expansion and the parcels on which mitigation will occur.

Table I: Summary of Compensation Ratios, July 2010³

MITIGATION AREA	HABITAT TYPE								TOTAL (acres)
	CTS Upland Habitat	Grassland **	CTS Pond Habitat		Seasonal Wetlands		Swale/Channel		
			Preserve (acres)	Create (acres)	Preserve (acres)	Create (acres)	Preserve (acres)	Create (acres)	
Southern Hills	420.33	0.00	3.78	1.05	2.92	0.00	0.62 (4,230 ft)	0.00	428.70
Pond 5 Buffer Area	40.78	0.00	0.45	0.00	0.00	0.00	0.00	0.00	41.23
Eastern Valley†	159.16	0.00	0.50	0.00	0.20	0.00	0.14 (1,540 ft)	0.00	160.00
Eastern Hills†	136.87	0.00	0.00	0.00	0.004	0.00	0.51 (5,175 ft)	0.00	137.39
Griffith Ranch	105.99	0.00	0.00	0.73	0.34	4.07	0.00	1.03 (3,702 ft)	112.16
Director's Guild	0.00	20.74	0.00	0.00	61.66	0.42	0.21 (1,035 ft)	0.77 (1,898 ft)	83.80
TOTAL (acres)	863.13	20.74	4.73	1.78	65.12	4.49	1.48 (11,980 ft)	1.80 (5,600 ft)	963.28
Mitigation Ratio*	5.2:1	N/A	7.7:1	2.9:1	45.9:1	3.2:1	3.4:1 (3.0:1)	4.1:1 (1.4:1)	5.7:1

* Preserved/created:impacted

** Grassland on Director's Guild site is not occupied by CTS and not counted toward CTS mitigation.

N/A not applicable

†Eastern Valley parcel and Eastern Hills parcel were previously reported together as the Eastern Valley Area

Total Impact Area = 167.63 ac, Wetland Impact area = 1.86 (Seasonal Wetland = 1.42 ac, Waters = 0.44 ac. (Channel Length = 3,970 ft)) Pond Impact Area = 0.61 ac (Ponds 1 and 4), Upland Impact Area =165.16 ac

³ This table has been revised based on the revised delineation acreages for the Phase II Parcel and mitigation lands (Southern Hills, Eastern Valley, Eastern Hills, Griffith Ranch, Director's Guild parcels and the Pond 5 Buffer Area of the Phase II parcel). Field verifications with the Corps have been completed for all mitigation lands as of May 2010 and the acreages reported in this table are based on the field verified delineations. Jurisdictional determinations will be issued for each parcel concurrent with the individual permit. A jurisdictional determination for the Phase II parcel was issued by the Corps on February 26, 2010.

The proposed mitigation plan was developed to meet and exceed the mitigation requirements of the U.S. Army Corps of Engineers and Regional Water Quality Control Board for impacts to jurisdictional features. In addition, the plan mitigates impacts to isolated waters which are considered waters of the State. Finally, the plan provides mitigation for impacts to listed species and critical habitat for vernal pool plants and animals that will be impacted by the proposed project. The proposed mitigation exceeds the mitigation requirements of the final EIR for the project (EDAW, 2003; EDAW, 2005) as shown in Table J. The mitigation proposed in the plan addresses the independent analysis of impacts that has been conducted as part of the Section 7 consultation based on the change in the federal and State legal status of the California tiger salamander and critical habitat designation for vernal pool species.

4.2 LONG-TERM GOALS

The overall objectives of mitigation plan is to avoid impacts to sensitive habitats to the extent practicable and to replace the functions and values of sensitive habitats, jurisdictional areas, and non-jurisdictional areas that are lost as a result of project development. In addition, the plan will secure almost 964 acres within the secondary management area of the Suisun Marsh (Figure 9) to be preserved, managed, and enhanced for both listed and common plant and animal species. The proposed Phase II expansion area provides important breeding and foraging habitat for a variety of species most notably the federally and State listed California tiger salamander. However, adjacent parcels provide habitat for California tiger salamanders, plus vernal pool tadpole shrimp, Conservancy fairy shrimp, vernal pool fairy shrimp, Contra Costa goldfield, and other special-status plants and animals. Currently, these parcels are managed as grazing lands or not at all. Implementation of this plan will allow the habitats on the proposed mitigation parcels to be preserved in perpetuity as wildlife and plant habitat, and managed and enhanced for their biological value.

Avoidance of sensitive resources will be demonstrated on the Phase II expansion area by preservation of Pond 5 and the 41.23-acre buffer area that encompasses the southern portion of the Phase II parcel. This pond has consistently provided breeding habitat and larval development habitat for California tiger salamanders. Avoidance of this pond and buffer will allow this pond to continue this function into the future providing 100s to 1000s of tiger salamander metamorphs each year that will populate the Potrero Hills and adjacent lands.

Preservation, enhancement, and management of the Southern Hills, Eastern Valley, Griffith Ranch, and Director's Guild parcels will provide increased habitat value for both common and special-status species that rely on the grassland ecosystem of the Potrero Hills. Additional aquatic habitat will be created in the grasslands, providing additional habitat for species such as vernal pool crustaceans and Contra Costa goldfields and other vernal pool and wetland plants.

The existing jurisdictional features on the Southern Hills parcel, Eastern Valley parcel, Eastern Hills parcel, Griffith Ranch mitigation area, and Director's Guild parcel provide opportunities for preservation of both wetland and upland features and also allow for creation and restoration of sensitive habitats in the secondary management area (Figure 9). Preservation of existing habitats and creation of wetland features will provide additional habitat for special-status species as well as other common species that occur in the grassland and associated wetland ecosystem.

Mitigation will consist of the following components: (1) preservation of 863.13 acres of California tiger salamander upland habitat; (2) preservation of 20.74 acres of upland grassland habitat that is not California tiger salamander habitat (upland grasslands on the Director's Guild parcel); (3) preservation of 4.73 acres of pond habitat (breeding habitat for California tiger salamander); (4)

creation/restoration of 1.78 acres of pond habitat (breeding habitat for California tiger salamander); (5) preservation of 65.12 acres of seasonal wetlands; (6) creation of 4.49 acres of seasonal wetlands (7) preservation and enhancement of 1.49 acre (11,980 ft) of channel; and (8) creation of 1.80 acres (5,600 ft.) of swale/channel.

4.3 MITIGATION COMPONENTS

4.3.1 Upland Habitat

California Tiger Salamander. Mitigation to compensate for the loss of 165.160 acres of upland CTS habitat will be accomplished by preserving 420.33 acres on the Southern Hills parcel, 105.99 acres on the Griffith Ranch mitigation area, and 159.16 acres on the Eastern Valley parcel, and 136.87 acres on the Eastern Hills parcel (Table I). In addition, 40.78 acres of the Phase II parcel south of the expanded landfill and including Pond 5 (Pond 5 Buffer) will be preserved as upland habitat for California tiger salamanders and will be managed as wildlife habitat with the contiguous Southern Hills Parcel (Table I). Excluding both preserved and created ponds, wetlands, and channels from the acreages of these parcels, preserved uplands on the Southern Hills, Pond 5 Buffer area, Eastern Valley, Eastern Hills, and Griffith Ranch area comprises 863.13 acres. These upland areas are dominated by annual grasses and support numerous ground squirrels and gophers in whose burrows the adult tiger salamanders live. Ponds 3, 5, and 7 provide high quality breeding habitat for California tiger salamanders ensuring that the essential habitat requirements (breeding ponds adjacent to grasslands that support burrow donors [ground squirrels]) for this species are met on the Eastern Valley, Pond 5 Buffer, and Southern Hills sites, respectively. Ponds 2 and 6 in the Eastern Valley area provide lower quality breeding habitat than Ponds 3, 5, and 7, but salamanders have attempted to breed in both ponds, with adult salamanders having been observed at Pond 6 and eggs and larvae found in Pond 2⁴. Although these ponds are stock ponds, they are very stable with no sign of erosion on the berms. A review of historic topographic maps shows that Pond 7 has been in place since at least 1908, suggesting that this pond has provided breeding habitat for California tiger salamanders for over 100 years.

Although the EIR requirement for impacts to tiger salamander upland habitat was only 210 acres, the listing of this species as a threatened species under the federal Endangered Species Act warrants a greater mitigation commitment. For this reason, 963.28 acres of upland habitat and associated breeding and wetland habitat will be designated for this species. Preservation of approximately 863.13 acres of upland habitat represents a 5.2:1 mitigation ratio for the area to be impacted (165.160 acres). While on a gross acreage basis the mitigation ratio is approximately 5.7:1 (167.63 acre total impact area).

Mitigation in the range of 3:1 for impacts to grasslands (upland habitat) is consistent with the mitigation requirements for California tiger salamanders (M. Tovar, pers. com.) and is expected to fully compensate for impacts from the proposed Phase II expansion. Projects where this 3:1 ratio has been applied include the Freeport Regional Water Projects, PG&E Gas Line Repair in Solano County, and PG&E Tri Valley Capacity Increase Project in Alameda County (Jones & Stokes, 2005).

Mitigation on these parcels is expected to be successful as the parcels currently provide suitable upland habitat in the grasslands with abundant ground squirrel and gopher burrows in which juvenile and adult salamanders can find refuge and four breeding ponds (Ponds 2, 3, 5, and 7) that have been documented to be used consistently by this species. Limited sampling of the playa pool on the

⁴ In 2010, tiger salamander larvae were observed late in the season (April 30) in Pond 2. Water depth in the pond (12 inches) suggested that larvae would likely be able to metamorphose before the pond dried.

Director's Guild parcel has not yielded salamander larvae and so the playa pool has been removed from the calculation as a tiger salamander breeding pond. The playa pool is located within the dispersal distance of occupied habitat in the Potrero Hills (in the vicinity of Pond 1) and may become a breeding site for tiger salamanders in the future. The presence of fish in the playa pool during the winter may explain the absence of tiger salamander breeding at this site. Installation of a weir, drop structure or other control device in the ditch that connects the pool to Hill Slough is one of the measures that will be implemented to restore this pool to more natural conditions that may then make it functional as a California tiger salamander breeding site.

California Tiger Salamander Upland Habitat Enhancement. Preserved upland habitats for California tiger salamander will be enhanced for the benefit of this species through implementation of a grazing regime to maintain the annual grasslands in suitable condition for this species and its burrow donors – low grass height with limited build-up of thatch. The grazing plan is detailed in the Grassland Management Plan (LSA and ESP, 2009). In addition, an invasive weed control program will be implemented on the preserved uplands to control species such as yellow and purple star thistle, artichoke thistle, and Italian thistle (LSA and ESP, 2009). Control of non-native invasive species will allow native plants to colonize the grasslands. Poisoning or other lethal control measures for ground squirrels and their burrows on the mitigation lands will be prohibited. Non-lethal measures (e.g., live trapping, relocation to other portions of the mitigation areas, filling in burrows) may be implemented to remove ground squirrels and their burrows from areas where burrowing has damaged berms on stock ponds or the primary access roads, gates, or fences through the mitigation lands. Finally, the management of the preserved parcels will include annual monitoring of aquatic habitats for non-native species such as bullfrogs and fish that would negatively affect salamander larvae and breeding success.

An additional enhancement of the grassland areas will be the placement of rock piles or earthen berms in proximity to CTS breeding ponds. These rock piles and berms would attract ground squirrels and thereby provide additional burrowing habitat for CTS adults and juveniles in proximity to the breeding ponds. Rock piles and berms would only be placed in areas where ground squirrel burrows are sparse such as the Eastern Valley parcel east of Pond 3 and Griffith Ranch parcel near GR2. These features would be monitored annually to document ground squirrel colonization and burrow construction.

All of the parcels preserved as tiger salamander upland habitat are located within the secondary management zone, thereby providing mitigation proximate to the location where the impact will occur.

Common Species. In addition to providing mitigating impacts to California tiger salamander upland habitat, the preservation and management of almost 964 acres of grassland and associated wetlands in and around the Potrero Hills will secure in perpetuity habitat for a myriad of common plant and wildlife species that use the grasslands and low-hills of southern Solano County on a seasonal or year-round basis. Species such as red-tailed hawks (*Buteo jamaicensis*) and golden eagle (*Aquila chrysaetos*) hunt the low hills and grasslands of the Potrero Hills for prey throughout the year. These species also find nesting habitat in the groves of eucalyptus that have been planted throughout the hills. Other resident species that have been observed in and around the Phase II expansion area and that will benefit from the preservation of grasslands include Pacific treefrog (*Pseudacris regilla*), ring-necked snake (*Diadophis punctatus*), gopher snake (*Pituophis catenifer*), common kingsnake (*Lampropeltis getula*), red-shouldered hawk (*Buteo lineatus*), white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), great horned owl (*Bubo virginianus*), killdeer (*Charadrius vociferous*), savannah sparrow, red-winged blackbird (*Agelaius phoeniceus*), western meadowlark (*Sturnella neglecta*), California vole (*Microtus californicus*), California ground squirrel

(*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and bats (*Myotis* sp.). These species are resident species that inhabit the grasslands of the Potrero Hills and will continue to find suitable habitat on the mitigation parcels. Other species use the grasslands and associated wetlands of the Potrero Hills on a seasonal basis. These species will also find suitable habitat preserved on the mitigation parcels. Species such long-billed curlews (*Numenius americanus*) forage in the grasslands of the hills in winter, while American avocets (*Recurvirostra americana*), black-necked stilts (*Himantopus mexicanus*), and a variety of other shorebirds and waterfowl may be found foraging and resting in and around the playa pool of Director's Guild parcel during the winter and spring. Preservation of a large grassland area in the hills will provide secure habitat for these and many other species into the future. Planting of trees and shrubs at strategic locations on the mitigation sites as well as fencing seeps and wetland meadows from cattle grazing will provide additional nesting and foraging habitat for birds such as loggerhead shrikes (*Lanius ludovicianus*).

Plant species populations will also benefit from the preservation of large grassland areas in and around the Potrero Hills. Although a small population of San Joaquin spearscale (*Atriplex joaquiniana*) will be impacted by the proposed landfill expansion, at least 12 larger populations will be preserved on the Director's Guild parcel. Likewise, the pappose tarplant (*Centromadia parryi* ssp. *parryi*) populations impacted on the Phase II site will be mitigated through preservation of large populations of this species on the Director's Guild site. Seed collection from the impact area will also be implemented to avoid loss of the genetic diversity off these plant populations. Management of the grasslands on this parcel is expected to improve the suitability of the site for these and other native species and provide a secure habitat for the future.

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Table J: Comparison of Mitigation Requirements for Waters of the U.S., Waters of the State, and California Tiger Salamander Habitat Impacted by the Phase II Landfill Expansion Project.

	EIR Impact (ac)	Habitat Avoided (Pond 5 Buffer) (ac)	Impact to be Covered by Permit** (ac)	Mitigation Required in EIR			Mitigation Proposed in Mitigation Plan		
				Preserve (ac) (mitigation ratio)†	Create (ac) (mitigation ratio)†	Total Acres (mitigation ratio)†	Preserve (ac) (mitigation ratio)†	Create (ac) (mitigation ratio)†	Total Acres (mitigation ratio)†
<i>California Tiger Salamander Upland Habitat</i>									
Upland Habitat *	210	41.23	167.63 (reduced project impact area)	210 (1:1)		210 (1:1)	863.14 (5.2:1)		863.14 (5.3:1)
<i>Total Mitigation Acreage for Impacts to CTS Upland Habitat</i>				210		210	863.14		863.14
<i>Aquatic Habitats and Jurisdictional Areas</i>									
Pond Habitat (Ponds 1, 4, 5)	1.06	-0.45	0.61	1.22 (2:1)	0.61 (1:1)	1.83 (3:1)			
Pond Habitat as Mitigation for Impacts to Offsite Pond Upland Habitat (EIR Measure 4.2-5)				0.16 (Calculated in EIR)		0.16 (Calculated in EIR)			
Pond Total	1.06	-0.45	0.61	1.38 (2.3:1)	0.61 (1:1)	1.99 (3.3:1)	4.73 (7.7:1)	1.78 (2.9:1)	6.51 (11:1)

Table J: Continued

				Mitigation Required in EIR	Mitigation Proposed in Mitigation Plan				
	EIR Impact (ac)	Habitat Avoided (Pond 5 Buffer) (ac)	Impact to be Covered by Permit** (ac)	Preserve (ac) (mitigation ratio)†	Create (ac) (mitigation ratio)†	Total Acres (mitigation ratio)†	Preserve (ac) (mitigation ratio)†	Create (ac) (mitigation ratio)†	Total Acres (mitigation ratio)†
Seasonal Wetlands (Jurisdictional)	1.98		1.42	3.96 (2:1)	3.96 (2:1)	7.92 (4:1)			
Waters of the State (isolated waters – non-jurisdictional)	0.076		n/a	0.152 (2:1)	0.076 (1:1)	0.23 (3:1)			
Seasonal Wetland Total	2.06		1.42	4.11 (2:1)	4.04 (2:1)	8.15 (4:1)	65.12 (45.9:1)	4.49 (3.2:1)	69.61 (49.0:1)
Waters of the U.S.	0.44		0.44	0.88 (2:1)		0.88 (2:1)	1.48 (3.4:1)	1.80 (4.1:1)	3.28 (7.5:1)
<i>Total Mitigation Acreage for Impacts to Aquatic Habitat and Jurisdictional Areas</i>				6.37	4.65	11.02	71.33	8.07	79.40

† Mitigation ratio expressed as ratio of preserved or created habitat to impacted habitat,
 * An additional 20.74 ac. of upland grassland that is not considered occupied CTS habitat is preserved on Director’s Guild Parcel.
 **Wetland impact based on revised delineation and jurisdictional determination dated February 2010.

4.3.2 Aquatic Habitats

Design Criteria. The designs for the constructed seasonal pools are modeled after natural pool/swale cross sections observed from topographic surveys of vernal pool physiography within the general project area and on similar soil types in the region. Characteristics of existing “template” wetlands in the region were assessed to develop the design criteria. Soils color and texture at various locations in wetland and upland areas and topographic information such as pool depth and profiles were surveyed. A preliminary Basis of Design Report (Swanson Hydrology, 2009) has been prepared for the mitigation wetlands. This report provides additional detail on the seasonal wetland and pond creation proposed for the project. Particularly, the report includes engineering designs for the created ponds and wetlands to provide greater detail for where and how each feature will be constructed.

These design criteria are as follows:

Typical Depths (from top of jurisdictional side slopes)	0.6 – 1.2 feet
Typical Wetland Side Slopes	Between 14:1 and 32:1
Typical Upland Side Slopes	Between 7:1 and 36:1

One pond will be constructed adjacent to the seasonal pool complex. The pond will be designed to be deeper than the seasonal pools in order to provide habitat for California tiger salamander and other species that may prefer more turbid waters and who require longer inundations to complete their larval life stage. In the deeper pond, at least 20% of the pond area will be created to have a depth of 2 feet.

Range of Slopes along Swale Centerline	Between 0.0015 and 0.0025
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The constructed seasonal pools are designed to contribute runoff to downstream watersheds and include an outlet that will allow water to flow into an adjacent swale or low area and then into adjacent wetlands. Swales will be broad and shallow.

Under these criteria, the seasonal pools and swales constructed on the mitigation site will be visually similar in size and shape to natural pools in the immediate area.

Upland mound heights will range from 2 to 3 feet based on field observations at the Gridley Conservation Bank site and at a site northeast of Highway 113 and Robinson Road. Mound shapes will be oblong; mound lengths will range from 15 to 20 feet long and mound widths will range from 10 to 15 feet wide.

Seasonal Ponds. Pond habitat will be mitigated at a ratio of approximately 11:1 (preserved or created: impacted) as opposed to the 2:1 ratio required in the EIR. This increase in mitigation ratio is the result of the dedication of the Southern Hills, Pond 5 Buffer, Eastern Valley, and Griffith Ranch areas on which ponds will be preserved (Ponds 2, 3, 5, 6, and 7) and created (Ponds SH1, EV1, GR1, GR2).

The minimum mitigation for the loss of 0.61 acre of non-jurisdictional pond habitat is 1.22 acres. The proposed plan will preserve 4.73 acres of seasonal ponds and create an additional 1.78 acres of pond habitat. The preservation component also accommodates the additional pond preservation of 0.16 acres required by the EIR for impacts to the uplands around ponds that are located in the Eastern Valley that will be indirectly impacted by the Phase II expansion project.

Preservation of 4.73 acres of seasonal tiger salamander breeding ponds will be accomplished within lands owned by the Potrero Hills Landfill by preserving Pond 2, 3, and 6 (0.5 acre), Pond 5 (0.45 acre) and Pond 7/SW4 (3.78 acres) (Figure 7). The large playa pool on the Director's Guild site will also be preserved, but this pool is not counted in the mitigation acreage for salamander breeding ponds⁵.

The Southern Hills, Eastern Valley, and Griffith Ranch parcels will be the location for the creation of 1.78 acres of California tiger salamander breeding habitat and enhancement of the existing ponds for tiger salamander breeding and rearing.

- On the Southern Hills parcel, additional breeding habitat will be created in the seasonal wetland (SW4) upstream of Pond 7, a location where tiger salamanders are known to breed. The seasonal wetland upstream of Pond 7 encompasses 3.78 acres and provides breeding habitat during the peak winter inundation. However, this wetland is shallow and tends to dry prior to California tiger salamander larvae metamorphosing into adult salamanders. Excavating a pond approximately 2 feet deep in this wetland will prolong the inundation and allow salamander larvae to mature in this area. The excavated pond will be 0.35 acre (approximately 170 feet by 90 feet) (Figure 13). Increasing the depth of breeding habitat in the seasonal wetland upstream of Pond 7 will transform an area that currently serves as a sink for salamanders that breed in the wetland into suitable breeding habitat that will persist for a sufficient period to allow salamander larvae to metamorphose into adults in most years.
- A second breeding pond (SH1) will be created in the Southern Hills parcel (Figure 7). The pond will be about 0.35 acre and will be located in the western portion of the parcel west of the central wetland area along the southern parcel boundary. The pond location has been analyzed by a hydrologist and has sufficient watershed to support a pond with a hydroperiod suitable for successful tiger salamander larval development and metamorphosis (Swanson Hydrology, 2008).
- A third pond, located in the Eastern Valley portion of the Southern Hills parcel near the border of the two parcels, will also be created (EV1). The pond will be located on the channel of Spring Branch Creek like Pond 3 (Figure 16). The pond location has been analyzed by a hydrologist and has sufficient watershed to support a pond with a hydroperiod suitable for successful tiger salamander larval development and metamorphosis (Swanson Hydrology, 2008).
- Two additional breeding ponds will be created on the Griffith Ranch parcel north of the Potrero Hills (ponds GR1 and GR2: Figure 15). Pond GR1 will be approximately 0.38 acres in size and approximately 2 feet deep (Figure 15). Pond GR2 will be approximately 0.35 acres in size and would be designed with a hydroperiod sufficient for CTS reproduction and recruitment. The pond would be located within 1,000 feet of Pond 1. A known CTS breeding pond that will be impacted by the Phase II Expansion Project. Both of these ponds will add

⁵ Large playa pools are essential to the conservation of California tiger salamanders as these habitats provide stable and reliable breeding sites over long time periods (B. Shaffer, pers. com.). Recent work also suggests that seasonal pool habitat such as the playa pool on the Director's Guild site favor native tiger salamanders genotypes over non-native or hybrid genotypes, which makes these pools important for the overall conservation of the species (Fitzpatrick and Shaffer, 2005). Stock ponds, although important as breeding habitat in the Potrero Hills, are typically less reliable as breeding sites over long time periods as the berms and spillways may be eroded away and sediment may fill the pond. Although the playa pool has not been found to support salamanders, preserving this pond may provide a future site for natural colonization by California tiger salamanders or a possible translocation site. Preserving a combination of pond features will provide breeding habitat of both types for California tiger salamanders.

breeding habitat north of the Potrero Hills on preserved lands in the vicinity of a large natural playa pool complex.

- At Pond 5 in the Pond 5 buffer area, a berm will be created in the uplands south of the pond. The purpose of the berm will be direct additional runoff from the slopes above Pond 5 into Pond 5 rather than allowing runoff to flow northwest of the barn missing being captured in Pond 5. This measure is intended to enhance ponding in Pond 5 in years of low rainfall as it will help to capture as much of the runoff from the surrounding slopes as possible.
- Ponds 2, 3, 5, and 7 are used as seasonal water sources for cattle that graze the mitigation parcels. These ponds are used intensively by cattle, particularly in the late spring when temperatures rise and shade and water are limited. Pond 2, particularly receives heavy use disproportionate to its small size due to the presence of a willow along the pond bank that provides shade for the cattle. In order to limit impacts to Pond 2 as a tiger salamander breeding site, Pond 2 will be fenced and cattle will be allowed to access the pond only during the late winter and early spring (February-March) when the pond is full or after salamander larvae have metamorphosed and left the pond (late spring/early summer though mid winter). Depending on rainfall in any given year, cattle will be excluded from the pond after March. The purpose of the exclusion is to maximize the water quality and hydroperiod in the pond and minimize disturbance due to trampling. The pond will be monitored for California tiger salamander larvae annually and cattle will be allowed back into the pond area once the larvae have metamorphosed and left the pond or when the pond dries. Allowing cattle into the area after the pond has dried will prevent thatch buildup in the fenced pond area. Ponds 3, 5, and 7 will be monitored annually as well and portions of the ponds will be fenced if salamander production is found to be decreasing over time due to cattle impacts. All three of these ponds are much larger than Pond 2 and have historically been good producers of salamanders even with cattle present. Fences therefore would only be installed around Ponds 3, 4, and 5 if production was found to decrease. Fencing would also be installed around the created ponds if tiger salamander breed and rearing was negatively affected by grazing. If fences are installed, no more than half of the ponds 3, 5, or 7 will be fenced. The other half will remain available to cattle seasonally. Cattle will have access to the ponds once they dry to graze on the vegetation and remove thatch from the enclosed area. Alternatively, vegetation within the fenced pond areas may be removed manually during the dry season.

Seasonal Wetlands. Compensation for the loss of 1.86 acres of seasonal wetlands and waters of the State will include preservation of 65.12 acres of seasonal wetland habitat and creation of 4.49 acres of seasonal wetlands. Preservation of the 65.12 acres will be accomplished within lands owned by Potrero Hills Landfill by preserving seasonal wetlands located on the Southern Hills parcel, Pond 5 Buffer, Eastern Valley parcel, Eastern Hills parcel, Griffith Ranch mitigation area, and Director's Guild parcel. Preserved seasonal wetlands will include 2.92 acres on the Southern Hills parcel, 0.20 acres in the Eastern Valley parcel, 0.004 acres on the Eastern Hills parcel, 0.34 acres on the Griffith Ranch mitigation area, and 61.66 acres on the Director's Guild parcel. These wetlands will be preserved and enhanced as partial mitigation for impacts to seasonal wetlands on the Phase II expansion parcel. Enhancement will include control of invasive weeds in the wetlands and development of a grazing plan.

The second component of mitigation for impacts to the seasonal wetlands will entail creation of seasonal wetlands. The Griffith Ranch mitigation area, on the north side of the Potrero Hills, will be the site for creation of seasonal wetlands. The Griffith Ranch parcel encompasses 143 acres, of which approximately 112.16 acres will be established as mitigation lands. Within the 112-acre mitigation

area, 4.07 acres of seasonal wetlands will be created (Figure 15). This portion of the parcel lies at the base of the north ridge of the Potrero Hills and is adjacent to a large playa pool complex on an adjacent parcel. This playa pool complex extends west onto the Director's Guild parcel. Soils in the northern portion of the site are characteristic of vernal pool soils in the region.

Additional seasonal wetland habitat will be created by restoring a portion of the playa pool on the Director's Guild parcel. Approximately 0.42 acres of road fill material that was placed in the pool in the middle of the 20th century will be removed as part of the restoration activities on this parcel. Restoring the playa pool to its original configuration will provide additional habitat for listed vernal pool crustaceans and listed plants (i.e., Contra Costa goldfields). A total of 4.49 acres of seasonal wetlands will be created and restored on the Griffith Ranch and Director's Guild areas.

Channel. Mitigation for impacts to 0.44 acre (3,970 feet) of jurisdictional channel will be accomplished on the Southern Hills, Eastern Valley, Eastern Hills, Griffith Ranch, and Director's Guild parcels. The channel to be filled on the Phase II expansion area is swale-like throughout most of its course, with a poorly defined bed or bank. To mitigate for the fill of this channel, the plan includes a three-part mitigation that preserves and enhances existing channel on the Southern Hills, Eastern Valley, Eastern Hills, and Director's Guild parcels and creates new swale within the BCDC secondary marsh zone of the Director's Guild and Griffith Ranch parcels.

On the Southern Hills parcel, 0.62 acres (4,230 feet) of jurisdictional channel will be preserved and enhanced. In the Eastern Valley parcel, 0.14 acre (1,540 feet) of jurisdictional channel will be preserved and enhanced. In the Eastern Hills parcel, 0.51 acre (5,175 feet) of jurisdictional channel will be preserved and enhanced. On Director's Guild, the plan proposes to preserve and enhance a 0.21-acre (1,035 feet) ditch that connects the playa pool on the east side of the parcel with the ditches on the adjacent Potrero Hills Lane mitigation area. Enhancements to the grassland habitat on each parcel will include implementation of a grazing program on the parcels to maintain vegetation height and avoid thatch build-up and implementation of a weed abatement program to remove and control invasive weeds on the site that may displace native species. A total of 1.48 acres (11,980 feet) of channel will be preserved and enhanced on the three parcels for a mitigation ratio of 3.4:1 (preserved:impacted).

In addition to the enhancements of the existing drainage ditch, a new swale will be constructed on the Director's Guild parcel to reestablish the connection between the playa pool on the east side of the parcel with the vernal pool area on the west side of the parcel. Historically, the playa pool on the parcel formed part of a vernal pool complex through which water from the parcels east of Scally Road flowed west into Hill Slough. With the construction of the ditch sometime before 1937, this connection was modified, channeling water from the playa pool on the east side of the Director's Guild parcel to the marsh via a network of ditches rather than through smaller pools and swales. In order to recreate a more natural connection between the playa pool and marsh, a new swale will be constructed. This meandering swale will link the large playa pool on the east side of the Director's Guild parcel with the pool area on the west side of the property. The pool area on the west side of the Director's Guild parcel is contiguous with the vernal pool area on the adjacent Potrero Hills Lane mitigation area that eventually drains to Hill Slough via the culvert under Potrero Hills Lane. The location of the created swale is shown on Figure 11. The acreage of the created swale is 0.77 acres and the length of the created swale is 1,898 feet.

Additional swale acreage will also be created on the Griffith Ranch site. Figure 15 shows the seasonal pool and swale complex that is proposed to be constructed on this site. In addition to the 4.07 acres of

seasonal wetland to be created, 1.03 acre (3,702 feet) of swale will be constructed to link the wetland areas.

Fill of 0.44 acre (3,970 feet) of jurisdictional channel in the proposed expansion area will be mitigated by the preservation and enhancement of 1.48 acres (11,980 feet) of channel and creation of 1.80 acres (5,600 feet) of swale for a total mitigation of 3.28 acres (17,580 feet). All of this mitigation will occur within parcels located within the BCDC secondary management zone.

Vernal Pool Crustaceans and Vernal Pool Plant Critical Habitat. The Phase II expansion area lies within the critical habitat for three federally listed species (Subunit 10F): Conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardii*). None of these species was found within the proposed Phase II expansion area during protocol surveys conducted during the last 5 years⁶. However, the proposed project will result in modification to potential habitat for these species. EIR Mitigation Measure 4.2-2 requires mitigation for impacts to potential vernal pool crustacean habitat onsite at a ratio of 3:1 preservation (large pool/pond habitat) and 1.5:1 construction restoration for large pool/pond habitat areas. The impacted area and mitigation requirements are shown below in Table K.

Table K: Impacts to Vernal Pool Crustacean Habitat.

Vernal Pools Impacted	Impact Area	Preserve (3:1)	Construct/Restore (1.5:1)	Total
Ponds 1, 4	0.61	1.83	0.92	2.75

No impacts to vernal pool buffer zones will occur as a result of the Phase II landfill expansion. The landfill is located outside the contributing watershed of each of the preserved pools in the Potrero Hills Valley (Ponds 2, 3, 5, 6). Pond 3, the closest pond to the Phase II expansion area is approximately 185 feet east of the Phase II expansion area in the Eastern Valley parcel, beyond the 100 foot buffer. No mitigation for impacts to the pool buffer zone will be required under this measure.

The preservation of 4.73 acres of seasonal ponds, construction of 1.78 acres of additional pond habitat, construction of 4.49 acres of seasonal wetlands, preservation of 0.21 acres of channel on the Director’s Guild site, and creation of 1.80 acres of seasonal swale on the Griffith Ranch and Director’s Guild mitigation sites described in the previous sections is adequate to meet the EIR mitigation requirement.

In addition to meeting the mitigation requirements for impacts to vernal pool crustaceans, the plan provides mitigation for impacts to designated critical habitat that possesses the primary constituent elements for federally listed vernal pool crustaceans and vernal pool plant that will be impacted by the proposed Phase II expansion. As described in Section 2.4.9, the Phase II landfill expansion project will impact designated critical habitat for Conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields. Mitigation for impacts to vernal pool crustacean and vernal pool plant habitat will occur on the Director’s Guild and Southern Hills parcels.

The *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (U.S.Fish and Wildlife Service, 2005c) has set criteria for the percent of suitable habitat to be protected within each of the core areas of the vernal pool regions. For the Conservancy fairy shrimp, vernal pool fairy

⁶ Additional protocol-level surveys were initiated in 2006-2007 to updated and confirm these results.

shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields, the percent of suitable habitat that must be protected within the Jepson Prairie core area in order to recover the species has been set at 95 percent. In terms of this project, for every 0.5 acre of suitable habitat lost, 9.5 acres of suitable habitat must be protected. In the Phase II expansion area, 0.61 acres of habitat possessing the primary constituent elements for vernal pool crustaceans and 1.86 acres of habitat possessing the primary constituent elements for Contra Costa goldfields will be impacted by the proposed project. This will require preservation of 11.59 acres of suitable habitat for vernal pool crustaceans and 35.34 acres of suitable habitat for Contra Costa goldfields within the designated critical habitat unit (Jepson Prairie core area). These mitigation requirements will be met as follows: 1) preservation of 8.83 acres of playa pool on the Director’s Guild site, 2) plus preservation of 4.23 acres of habitat on the Southern Hills parcel (Pond 5 – 0.45 acre, Pond 7 – 0.34 acre, and Seasonal Wetland 4 [the wetland upstream of pond 7 that is inundated during the spring] – 3.44 acres) and 3) preservation of 0.5 acres of habitat in the Eastern Valley parcel (Ponds 2, 3, 6). The total amount of habitat to be preserved as mitigation for impacts to vernal pool crustacean critical habitat is 13.56 acres. Preservation of the 65.12 acres of seasonal wetlands on the Southern Hills (2.92 acres), Griffith Ranch (0.34 acres), Eastern Valley (0.20 acres), and Director’s Guild (61.66 acres) parcels will mitigate for impacts to Contra Costa goldfield critical habitat.

The playa pool on the Director’s Guild parcel has been documented to support Conservancy fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields. Vernal pool fairy shrimp were observed in smaller pools connected to the east-west ditch downstream from playa pool during 2010 survey, thereby, establishing the presence of this third listed vernal pool crustacean on the Director’s Guild parcel. The playa pool and associated ditch also provide suitable habitat for vernal pool fairy shrimp. The Director’s Guild parcel supports a robust population of Contra Costa goldfields. A survey in 2004 resulted in a density estimate of 20 goldfield plants per 0.25 square meter. This average density was for the western 3.2 acres portion of the playa pools that is typically carpeted with these plants each spring. Using the density estimate above, the number of Contra Costa goldfields on the Director’s Guild parcel in 2004 was conservatively estimated to be about 17,000,000. Using the same methodology, density counts and population estimates were made in each of the years 2004-2009. The results of the population estimates are shown in Table L.

Table L: Contra Costa Goldfield Population Estimates for the Director’s Guild Parcel.

Survey Year	Population Estimate
2004	17,000,000 plants
2005	14,700,000 plants
2006	15,672,891 plants
2007	33,939,707 plants
2008	19,352,841 plants
2009	34,243,494 plants

Source: (LSA, 2006,2007a, 2009.)

In most years, most of the plants were concentrated in the western portion of the playa pool, but this species also grows in the other seasonal wetlands onsite particularly in the wet areas along the northern fence line, in the eastern portion of the playa pool, and in the pool area contiguous with the Potrero Hills Lane mitigation area where a smaller population of Contra Costa goldfields grows. Pond and wetland features on the Southern Hills parcel do not support Contra Costa goldfields, but the ponds possess the primary constituent elements and are located within the Jepson core area, therefore, their preservation is considered suitable mitigation.

In addition to the preservation component, additional mitigation for these species will be provided by restoration of the following habitat areas on the Director's Guild parcel:

- **Playa Pool Restoration** – As part of the proposed mitigation, the project proponent will restore the large playa pool to its original extent and configuration. Sometime between 1937 and 1957, historic aerial photos show that fill was placed within the playa pool to form an elevated north-south road across the pool, likely as access to the barn and buildings south of the pool. We have estimated that this road fill currently covers about 0.42 acre of the original playa pool (Figure 11). Removing this fill will restore the original configuration of the playa pool and create additional playa pool habitat for vernal pool crustaceans and Contra Costa goldfields. The restored pool will provide about 4.8 percent more habitat for vernal pool crustaceans and Contra Costa goldfields than the existing pool. The entire 9.25-acre playa pool (8.83 acre existing pool + 0.42 acre restored pool [removed berm]) will be preserved and managed as habitat for these species. The quality of the habitat to be preserved is far superior to that which will be impacted as the preserved/restored habitat is a naturally occurring playa pool rather than created stock ponds. The playa pool also has been documented to support three listed species (Conservancy fairy shrimp, vernal pool tadpole shrimp, and Contra Costa goldfields) while the habitat that will be impacted in the valley has not been found to provide habitat for any of the listed vernal pool crustaceans or vernal pool plants.
- **Preservation of Existing Channel**– As described in the channel section, the existing ditch on the Director's Guild parcel provides habitat for listed vernal pool crustaceans. This channel represents 0.21 acre of additional habitat to be preserved and enhanced for vernal pool crustaceans on the Director's Guild parcel.
- **Preservation of Seasonal Wetlands** – Over 61 acres of seasonal wetland occur on the Director's Guild parcel (including the playa pool and ditch). These wetlands have been degraded over the years by disking and farming activities. In spite of the past activities, there are a number of areas on that still support rare plants and vernal pool crustaceans.
- **Creation of Swale Habitat** – The new swale to be constructed on the Director's Guild parcel will also provide habitat for listed vernal pool crustaceans like the existing channel. This will eventually add another 0.77 acre of vernal pool crustacean habitat onsite.

4.4 HYDROLOGY

4.4.1 Southern Hills Parcel

Three new ponds are proposed for the Southern Hills parcel. The first will be an excavated pond in the Pond 7/Seasonal Wetland 4 complex (Pond 7/SW4). The second will be a new stock pond in located in the western drainage of the parcel (Figure 14), and the third will be a new stock pond located at the border of the Eastern Valley and Southern Hills parcels in the Spring Branch Creek drainage (Figure 14).

The total area of excavated pond proposed at the Pond 7/SW4 complex will be 0.35 acre. This pond will be constructed within the existing 3.78-acre wetland/pond complex in the eastern third of the parcel (Figure 13). The excavated pond will be sustained by a combination of surface runoff and

groundwater infiltration. Precipitation during an average rainfall year for the nearest station in Solano County is 20.2 inches or 1.7 feet. Appendix C provides the monthly rainfall and evaporative demand for seasonal wetlands in this area based on normal precipitation and evapotranspiration (Eto). This analysis shows a water surplus or ability for the wet or ponded cycle to occur from late November/early December through February, excluding any direct ground seepage. Direct rainfall into the pool would provide approximately 0.5 feet of ponding during this surplus period.

The second new pond in the Southern Hills parcel (SH1) will be created in the drainage in the west end of the parcel. This pond will be approximately 0.35 acres in size and designed to hold water for at least 12 weeks to support California tiger salamander breeding and larval development.

A third new pond is also proposed for the Southern Hills parcel (EV1) (see Section 4.4.2 for explanation of the pond designation). This pond will be located in the Spring Branch Creek drainage at the border of the Eastern Valley and Southern Hills parcels. This pond will be approximately 0.35 acres in size and designed to hold water for at least 12 weeks to support California tiger salamander breeding and larval development.

A hydrological analysis of the proposed mitigation ponds (Swanson Hydrology, 2008) showed that there is sufficient watershed area to support the ponds and that the period of inundation would be sufficient for tiger salamander breeding. The results of the analysis are included in the technical memo in Appendix E.

For purposes of this analysis the rational method has been used to determine run-off that would be available to supply a pond or wetland. This method conservatively estimates the amount of run-off that can be captured and stored in the pond and wetland during a normal year. LSA has used this method to successfully construct approximately 30 acres of vernal pool/seasonal wetlands at three nearby sites in Solano County on similar soil types during the last 3 years.

For this calculation, the existing wetland/pond complex (Seasonal Wetland 4 [SW4]/Pond 7) in which the created pond would be excavated has a watershed area of 43 acres. The existing wetland pond complex is 3.78 acres (3.44 acres Seasonal Wetland 4, 0.34 acre Pond 7). The theoretical watershed contribution in this upland to wetland ratio can be illustrated during this November through March period under the following assumptions and calculations:

$$Q = (C)(\text{precipitation})(\text{area}), \text{ where}$$

$$Q = \text{volume of runoff}$$

$$C = \text{runoff coefficient of 0.45}$$

$$\text{Precipitation} = 15.9 \text{ inches (1.3 feet) from November through March}$$

$$\text{Watershed Area} = 43 \text{ acres}$$

$$Q = (0.45)(1.3 \text{ feet})(43 \text{ acres}) = 25.2 \text{ acre feet}$$

The net amount supplied to the 3.78-acre wetland/pond complex with a 43-acre watershed is therefore:

$$25.7 \text{ feet} = (1.3 \text{ feet direct precipitation} + 25.2 \text{ feet of runoff}) \text{ minus } 0.77 \text{ feet (9.2 inches) Eto from November through March}^7$$

⁷ See Mean Monthly Eto (column 2) in Appendix C.

Under this general water budget, in a normal year, the existing 3.78-acre wetland/pond complex would receive enough water to cover the entire wetland/pond to a depth of about 6 feet deep. Field observations show that the actual ponding is about 2 feet in the upper wetland area and 3-4 feet in the deeper pond area at the height of the inundation. This difference is likely attributable to seepage, percolation, evapotranspiration, and other vagaries of weather patterns that are not accounted for by this method. However, this analysis suggests that sufficient water is available for capture by the wetland/pond complex on the Southern Hills parcel to support a second ponded area within the complex that would be 0.35 acre in size and excavated to a depth of about 2 feet.

By creating a second deep pond in the Seasonal Wetland 4/Pond 7 complex, we can provide additional breeding habitat with sufficient hydroperiod (Swanson Hydrology, 2007) to allow additional CTS larvae to complete their metamorphosis and not get stranded and die in the seasonal wetlands.

4.4.2 Eastern Valley Parcel, Eastern Hills Parcel, and Pond 5 Buffer Area

No new ponds are to be created in the Eastern Valley parcel, Eastern Hills parcel, or the Pond 5 Buffer Area. A new pond will be created at the border of the Eastern Valley and Southern Hills parcels near the southeast corner of the Eastern Valley parcel. This pond was originally proposed to be located in the Eastern Valley parcel, but based on the hydrological analysis was moved further south along the Spring Branch Creek drainages onto the Southern Hills parcel. As the pond is located within the eastern portion of the Potrero Hills Valley, we have retained the designation EV1 for this created pond. Details regarding the pond are found in Section 4.4.1 Southern Hills.

4.4.3 Griffith Ranch Parcel

This parcel will be used for the majority of the wetland creation proposed for the three parcels. Within the northeast corner of the site, 4.07 acres of seasonal wetlands will be constructed along with 1.03 acres of seasonal swale and two California tiger salamander breeding pond (0.38-acre – GR1, 0.35-acre – GR2, each 2 feet deep). The watershed for this area is approximately 70 acres. Again, the rational method can be used to make a conservative estimate of run-off that can be captured for construction of the wetlands and pond on this site.

As in the previous calculations for the Southern Hills parcel, wetlands on this parcel will be sustained by a combination of precipitation, surface runoff, and groundwater infiltration. Precipitation during an average rainfall year for the nearest station in Solano County is 20.2 inches or 1.7 feet. Appendix C provides the monthly rainfall and evaporative demand for seasonal wetlands in this area based on normal precipitation and evapotranspiration (Eto). This analysis shows a water surplus or ability for the wet or ponded cycle to occur from late November/early December through February. Direct rainfall into the pools would provide approximately 0.5 feet of ponding during this surplus period.

The wetlands on this parcel will have a minimum direct watershed of approximately two times the constructed wetland size.

The theoretical watershed contribution in this 2:1 upland to wetland ratio can be illustrated during this November through March period under the following assumptions and calculations:

$$Q = (C)(\text{precipitation})(\text{area}), \text{ where}$$

$$Q = \text{volume of runoff}$$

$$C = \text{runoff coefficient of } 0.45$$

$$\text{Precipitation} = 15.9 \text{ inches (1.3 feet) from November through March}$$

Watershed Area = 2 acres

$$Q = (0.45)(1.3 \text{ feet})(2 \text{ acres}) = 1.17 \text{ acre feet}$$

The net amount supplied to a 1 acre wetland with a 2 acre watershed is therefore:

1.70 feet = (1.3 feet direct precipitation + 1.17 feet of runoff) minus 0.77 feet (9.2 inches) of Eto from November through March⁸

Under this general water budget, a one foot deep seasonal wetland would have an excess of 0.70 feet for spill/outflow/seepage on a “normal” or average basis. Ponding or the flooded cycle should also persist in each wetland into April in most years. This is the typical “wetted cycle” observed for seasonal pools in this region.

The actual watershed for the proposed Griffith Ranch site is 70 acres or 12 times larger than the proposed wetland/pond construction area. While this analysis does not completely address seepage, percolation, outflow, evapotranspiration, and other vagaries of weather patterns, this analysis suggests that sufficient water is available for capture by the created seasonal wetlands and ponds during normal water years. Measures are also incorporated into the Implementation Plan, Section 6.1, to minimize excessive seepage losses.

By creating breeding ponds on the site, we can provide additional breeding habitat north of the Potrero Hills ridgeline with sufficient hydroperiod (Swanson Hydrology, 2007, 2008) to allow additional CTS larvae to complete their metamorphosis and not get stranded and die in the seasonal wetlands.

4.4.4 Director’s Guild Parcel

The water source will continue to be storm and overland flows draining from the parcel itself, parcels to the east, and the northern slopes of the Potrero Hills. Restoration of the large vernal pool on this parcel will result in a small increase in the ponded area of the playa pool. Given that this pool provides continuous runoff to the Potrero Hills Lane mitigation area via the ditch, the small increase in ponded area is not expected to have any effect on the depth or extent of ponding in the playa pool. The constructed swale will also be constructed to take only the high flows exiting the playa pool and is not expected to affect the ponding in the playa pool.

4.5 FUNCTIONS AND VALUES OF THE CREATED WETLAND AREAS

The constructed wetlands are expected to have similar functions and values to the existing natural wetlands on the Phase II parcel. Most of the existing wetlands in the Phase II area are shallower and have broader side slopes. The creation of deeper pools and a higher density of pools that are interconnected by swales will enhance the functions and values of the habitats on the mitigation sites.

4.5.1 Hydrological Functions

Surface Water Storage. This function refers to the capacity of wetlands to pond water seasonally and to retain surface water for a long duration. This directly relates to the ability of the wetland to provide key functional values such as storm water retention and detention, sediment retention, aquatic habitat, and watering habitat to upland fauna. The constructed wetlands will have the capacity to pond

⁸ See Mean Monthly Eto (column 2) in Appendix C.

and retain surface waters throughout most of the rainy season. Surface waters are expected to last 2-4 to months during a normal hydrological year. In addition, the creation of pools that are larger or deeper than existing on-site pools will increase the surface water storage capacity of wetlands on the site.

Subsurface Water Exchange. This function refers to the potential for a dynamic exchange of subsurface waters between the wetland and the adjacent landscape. It relates to functional values such as nutrient and pollutant uptake and hydrological support for ecosystems down-gradient. The created wetlands will have the capability to perform this function. During the rainy season, the wetlands will likely receive subsurface inflows from saturated soils in the surrounding uplands. As spring progresses and the dry season approaches, subsurface water flow will be from the pools to the uplands. Initially, this lateral seepage will likely be limited because of the soil compaction associated construction of the pools and swales. The extent of compaction will vary, depending on the equipment used to construct the pools and swales. Seasonal wetlands constructed with equipment such as dozers and belly scrapers tend to be more compacted compared to those constructed with excavators; however, the side slope compaction tends to degrade over time as animals and plants establish. Typically, normal lateral seepage develops within 2 to 3 years of construction (S. Foreman, LSA Associates, pers. obs.). Subsurface seepage is typically restricted by the hard pan in vernal pool environments. The proposed designs for the constructed wetlands incorporate outflow areas into the natural drainage patterns of the site for surface flow and subsurface seepage.

Surface Water Conveyance. This function refers to the potential for inter-storm conveyance of concentrated flows into and out of the wetland via swales and other discernable surface features. It relates to functional values such as hydrological support for ecosystems down-gradient, nutrient and pollutant uptake, and habitat connectivity for aquatic species. The created wetlands will have the capability to perform this function. The constructed wetlands have been designed to direct surface and subsurface flow along existing drainage patterns and to contribute to downslope wetlands. The created wetlands will emulate the natural relationship between vernal pool/grassland habitat in this area.

4.5.2 Biogeochemical Functions

Element Removal. This function refers to the potential for a wetland to be removing nutrients and pollutants through biotic and abiotic processes. Such constituents in storm water runoff become concentrated in the wetland surface waters and then are ingested or absorbed by aquatic organisms and attached to the wetland's soils. The created wetlands will have the capability to perform this function. Runoff from the surrounding uplands will flow into the created wetlands and be detained there, allowing for nutrient or pollutant uptake.

Element Cycling. This function refers to the biogeochemical processes that allow wetland biota to assimilate and utilize nutrients and other compounds for life processes. These processes can be extremely important with respect to such functional benefits as food chain support for aquatic habitat, water quality enhancement, and production export in support of the local or regional food webs. Element cycling processes in wetlands are fueled by non-biotic sources of nutrients and other compounds (*e.g.*, urban or agricultural runoff), and by external and internal inflows of detritus. The created wetlands will have the capacity to perform this function. The wetlands will be well vegetated with relatively long hydroperiods, and detrital inflow from surrounding grasslands should be moderately high. These conditions should result in both internal and external production of detritus. The wetland's direct connection to downslope wetlands will allow for export of production of wetland biota.

4.5.3 Habitat Support Functions

Maintenance of Characteristic Vegetation. This function refers to a wetland's ability to support native hydrophytes and the associated habitat benefits for aquatic and terrestrial fauna. The constructed wetlands will perform this function. They are expected to be dominated by native hydrophytes characteristic of vernal pools in eastern Solano County. In addition, grassland and upland mound vegetation will be established to provide habitat for terrestrial fauna, including burrowing owls, California tiger salamanders, insects, and butterflies.

Maintenance of Characteristic Aquatic Invertebrates. This function refers to a wetland's capacity to provide the environmental conditions conducive to supporting the life histories of aquatic invertebrates, which are important links in the aquatic food web and associated habitat benefits. The created wetlands will perform this function. The expected hydroperiods (2-4 months of surface waters) will be adequate to support the life cycles of detritivorous aquatic invertebrates such as cladocerans, ostracods and rotifers. The wetland's hydroperiods will also be adequate for aquatic insects such as dragonflies, water boatmen and predaceous diving beetles that require longer periods for maturation. Common aquatic dipterans (mosquitos, crane flies, midges) are also likely to occur during the rainy season. The endangered vernal pool tadpole shrimp, threatened vernal pool fairy shrimp, and Conservancy fairy shrimp are known to occur on the Director's Guild site and on adjacent parcels. It is also likely that these species and other special-status fairy shrimp occur in the unsurveyed pools in the vicinity such as the large playa pool north of the Griffith Ranch. The constructed wetlands should provide suitable habitat for one or more of these species and may colonize the constructed seasonal pools and swales naturally on the Griffith Ranch and Director's Guild parcels.

Maintenance of Amphibian and Avian Populations. This function refers to capacity of a wetland to support the reproduction, larval development and feeding of amphibian species and resting, foraging, reproduction and cover habitat for birds. The created wetlands' hydroperiods are adequate to support the life cycle of amphibians that might be expected to occur in the area such as Pacific tree frog. Federally threatened California tiger salamanders are known to occur throughout the Potrero Hills as well as north of the Highway 12. The deeper constructed ponds will provide suitable habitat for this species. Common shorebirds that forage in shallow waters or saturated soils (*e.g.*, killdeer, greater yellowlegs and common snipe) will likely visit the seasonal wetlands and ponds during the rainy season. Bird species associated with the adjacent grasslands and ruderal habitat – including special-status bird – may also visit the wetlands, foraging for seeds and insects.

- **Maintenance of Populations of Sensitive Taxa.** This function refers to the capacity of a wetland to support special-status plants and wildlife. The threatened vernal pool fairy shrimp, endangered vernal pool tadpole shrimp and Conservancy fairy shrimp occur on the Director's Guild parcel. Contra Costa goldfields occurs on the Director's Guild parcel as well. These species could be expected to colonize the constructed wetlands and become established in other existing pools through natural dispersal mechanisms or direct translocation of individuals or cysts. In addition, the constructed wetlands and surrounding constructed grasslands/mounds will provide suitable habitat for other potentially occur special-status species such as: California tiger salamander, Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*), burrowing owls, Swainson's hawk (*Buteo swainsoni*), tricolored blackbird (*Agelaius tricolor*), golden eagle (*Aquila chrysaetos*), short-eared owl (*Asio flammeus*), mountain plover (*Charadrius montanus*), and northern harrier (*Circus cyaneus*).

Maintenance of Habitat Interspersion and Connectivity. This function refers to the spatial distribution of a wetland with respect to other aquatic habitats. It relates to the capacity of a wetland to persist over the long term by being part of a larger landscape with reserves of seeds, seed dispersal agents, pollinators, and fauna. It also relates to the ability of a wetland to recover from natural or human-caused disturbances. Physical connections between wetland sites is essential for providing optimal feeding, foraging and nesting opportunities for many wetland fauna. Reductions in these opportunities can reduce faunal diversity. Additionally, small homogeneous wetland areas have less ability to adapt to environmental or human-caused perturbations than do large heterogeneous sites. The created wetlands will perform this function.

4.5.4 Public Use

This function refers to the capability of a wetland to provide public education and/or recreational opportunities. At present public access to the mitigation parcels is not anticipated, but could be available for limited interpretive or educational purposes in the future.

4.6 VEGETATION

4.6.1 Southern Hills Parcel

Vegetation within the excavated pond will consist of a mix of hydrophytic graminoids and forbs that typically occur in the existing seasonal wetland in which the pond will be excavated. The topsoil from the excavated area will be saved during excavation and placed across the surface of the excavated wetland to provide a seed source for the new ponded area. The excavated pond bottom and sides are also expected to be seeded naturally from plants in the adjacent wetland area.

Vegetation within the created ponds will consist of a mix of hydrophytic graminoids and forbs that typically occur in natural seasonal ponds found in the Potrero Hills. Commercially available seed grown from local stock will be used to seed the edges of the created ponds.

4.6.2 Griffith Ranch Parcel

Vegetation within the created wetlands will consist of a mix of hydrophytic graminoids and forbs that typically occur in natural seasonal wetlands found on valley floor in the Fairfield/Suisun region. The surface layer of less than 5 percent of a donor pool/swale will be raked and then vacuumed to supply inoculum for the created pools. We will seek authorization from the USFWS to collect inoculum from areas supporting Contra Costa goldfields on the Director's Guild parcel, thereby increasing the number of Contra Costa goldfield populations on the mitigation sites. Contra Costa goldfields have been successfully seeded into constructed pools on nearby Travis Air Force Base (Collinge, 2003), and the project applicant would use this information from the Travis studies for seeding the Griffith Ranch mitigation site. Other donor pools may include the other seasonal pools on the Griffith Ranch parcel (soils from impacted stock ponds will not be used as seed inoculum). The inoculum will be spread thinly and evenly as the final layer on the surface of the created pools. Commercially available seed grown from local stock will supplement seeding in the created pools and swales if sufficient seed cannot be collected from local pools.

To further improve the site's overall habitat value, the graded uplands adjacent to the created wetlands will be seeded with a mix consisting of a cover crop, native annual and perennial grasses and forbs selected because they are native to the local area or grow in similar climates and are

commercially available. Species to be seeded into the created wetlands are listed in the Implementation section (Section 6.0) of this plan.

4.6.3 Director's Guild Parcel

Removal of the road will restore approximately 0.42 acre of playa pool habitat on this parcel. This additional acreage will serve to increase habitat for native flora as well as endangered plant species dependent on vernal pool habitats (*i.e.* Contra Costa goldfields). The restored area is expected to be seeded naturally by the plants in the pool. We will also provide additional inoculum in this area by collecting seeds from the adjacent pool sections and distributing the seeds over the restored area.

Vegetation within the created swale will consist of a mix of hydrophytic graminoids and forbs that typically occur in natural seasonal wetlands found on valley floor in the Fairfield/Suisun region. The surface layer of less than 5 percent of a donor pool/swale will be raked and then vacuumed to supply inoculum for the created swale. This inoculum will be spread thinly and evenly as the final layer on the surface of the swale. Commercially available seed grown from local stock will supplement seeding in the created swale swales if sufficient seed cannot be collected from local pools.

Adjacent uplands that are disturbed during swale construction will be seeded with a mix consisting of a cover crop, native annual and perennial grasses and forbs selected because they are native to the local area or grow in similar climates and are commercially available. Species to be seeded into the created swale are listed in the Implementation section of this plan.

4.7 WILDLIFE HABITAT

4.7.1 Southern Hills Parcel.

Three new seasonal ponds will be created within the 428.7-acre Southern Hills mitigation area. The first pond will be created upstream of Pond 7 to expand CTS breeding habitat. The pond will be constructed within the large wetland area (Seasonal Wetland 4/Pond 7 complex) upstream of Pond 7, an area that salamanders currently attempt to breed in, but which typically dries too soon to allow successful metamorphosis. This area has suitable topography and sufficient watershed area to assure prolonged ponding in deeper ponds in normal rainfall years.

CTS generally breed in seasonal ponds during the winter-spring rainy season. Breeding ponds should hold water continuously for 10-12 weeks, typically through the month of May, to allow time for larvae to fully metamorphose. Excavation in the wetland will be designed to: (1) maintain pond depths between 1 and 2 feet through the month of May; and (2) completely desiccate by the end of June during a typical rainfall year.

Two additional ponds will be created in the drainages on the site, one in the western portion of the site and the other in the northern portion of the site. These constructed ponds will be about 0.35 acre in size and provide sufficient water depth and duration to allow tiger salamanders to successfully reproduce and metamorphose in a normal rainfall year. The ponds will pond for at least 12 weeks but will be designed to dry each summer to prevent colonization by fish and/or other non-native predators (*i.e.*, bullfrogs).

The seasonal ponds on this site (SH1 and EV1) are expected to provide breeding habitat for common amphibians, vernal pool crustaceans, and other common crustaceans and insects. The created ponds will provide breeding habitat for California tiger salamanders and Pacific treefrogs. Aquatic habitat for these species currently occurs throughout the Potrero Hills Valley and Southern Hills parcel.

Adding the pond will provide a new area for both special-status and common species to breed and complete portions of their life cycles. Capturing and holding water on this site will increase wildlife diversity in this grassland by providing an additional pond that can be used for wildlife drinking water as well as foraging habitat for wildlife such as ducks and breeding habitat for amphibians and invertebrates.

The proposed seasonal ponds are a small change in the habitat of the Southern Hills parcel but this small change will triple the amount of breeding habitat for CTS in most years. As a result of creating an additional seasonal pond, feeding opportunities for wading birds, adult amphibians, crustaceans and insects are expected to increase. Populations of adult amphibians, such as the Pacific treefrog, may also expand due to an increased number of potential breeding sites in the landscape.

4.7.2 Eastern Valley Parcel

See Section 4.7.1 for information on pond EV1.

Within the Eastern Valley parcel, rock piles and soil berms will be created to attract ground squirrels to the center of the valley and provide cover for the ground squirrels. These features will be placed so as not to obstruct run off or movement, but to provide additional burrowing habitat for ground squirrels in the center of the valley. These additional burrows in proximity to California tiger salamanders breeding habitat in Ponds 2 and 3 will provide additional burrows in which juvenile and adult tiger salamanders can use as they move toward or away from the ponds seasonally.

4.7.3 Griffith Ranch Parcel

The seasonal pool complex and seasonal ponds on the Griffith Ranch parcel are expected to provide breeding habitat for common amphibians, vernal pool crustaceans, and other common crustaceans and insects. The created ponds will provide breeding habitat for California tiger salamanders and Pacific treefrogs. Aquatic habitat for California tiger salamanders is currently non-existent on the site. Adding the ponds and wetland features will provide new areas for both special-status and common species to breed and complete portions of their life cycles. Capturing and holding water on this site will increase wildlife diversity in this grassland by providing an additional habitat type not currently present.

Within the Griffith Ranch parcel, rock piles and soil berms will be created to attract ground squirrels and provide cover for them on the north side of the hills. These features will be placed so as not to obstruct run off or movement, but to provide additional burrowing habitat for ground squirrels. These additional burrows in proximity to constructed California tiger salamanders breeding habitat will provide additional burrows in which juvenile and adult tiger salamanders can use as they move toward or away from the ponds seasonally.

4.7.4 Director's Guild Parcel

Restoration of the vernal pool will serve to increase habitat for several threatened and endangered species (*i.e.* conservancy fairy shrimp, vernal pool tadpole shrimp). In addition, the creation of a new swale will reestablish a more natural, meandering connection between the playa pool on the east side of the parcel and the vernal pool area on the west side of the parcel. This new swale will create additional habitat for vernal pool crustaceans and plants as well. Currently, the vernal pool area on the Potrero Hills Lane mitigation area only receives input from the Director's Guild when the ditches overflow during high flows. The new swale will provide a more direct route for colonization from the playa pool to Potrero Hill Lane mitigation area vernal pool.

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5.0 SUCCESS CRITERIA AND MONITORING METHODS

5.1 PERFORMANCE CRITERIA

The following performance criteria will be used to determine mitigation success and will also provide a basis for determining the need for remedial (corrective) actions.

5.1.1 Reference Sites

The success of the mitigation will be determined by comparing the measured parameters on the mitigation sites to the same parameters on reference sites that support functioning ecosystems similar to the ones that are being created on the mitigation lands. Reference sites will be of two types: 1) the existing undisturbed habitats within the mitigation lands and 2) offsite areas such as the Gridley Bank that possess similar habitats to those on the mitigation lands. Onsite reference sites allow for a direct comparison between mitigation areas and reference sites as the environmental conditions including rainfall, wind, temperature will be nearly identical to the mitigation features being monitored. During each monitoring year, the mitigation features will be monitored usually within 2 days of the onsite reference sites. For the purposes of monitoring tiger salamander breeding and recruitment, existing tiger salamander breeding ponds 3, 5, and 7 will be the primary reference sites. These ponds have been documented to be reliable breeding sites producing 100s of larvae during normal rainfall years since 1998. California tiger salamanders larvae have been monitored quantitatively in these ponds for the past 4-5 years, providing a baseline of how the ponds perform relative to one another during a given survey. This information will be used to compare the monitoring data for the newly constructed ponds during the monitoring period. For wetland plant diversity, onsite reference ponds will be used. Existing onsite ponds (Ponds 3, 5, and 7 for the constructed stock ponds, and playa pool and smaller vernal pools on the Director's Guild site for constructed seasonal wetlands on the Griffith Ranch site) will be the primary reference sites for comparing wetland diversity over time. Offsite seasonal wetlands at preserves such as the Gridley Mitigation Bank would be secondary reference site for wetland diversity. For rare plant populations, existing rare plant populations on the Director's Guild, Southern Hills, Eastern Valley, and/or Eastern Hills parcels will be used as reference populations to determine appropriate blooming periods.

Offsite mitigation areas such as the Gridley Mitigation Bank will be a secondary reference site. The distance of the bank site from the Potrero Hills and different environmental conditions at the bank site (valley floor versus the Potrero Hills) may introduce minor differences in the response of plant and animal communities to weather and other environmental conditions in any given year. However, the bank site supports similar vegetation and wildlife communities as the mitigation lands and is generally comparable to the mitigation lands in and around the Potrero Hills. The secondary site would be used only if the primary reference sites fail to yield results during monitoring efforts, in which case we would use the secondary site for comparison. Offsite (secondary) reference sites would be monitored usually within 3 days of monitoring activities at the mitigation sites.

5.1.2 Southern Hills Parcel

After ten years, a minimum of 1.05 acres of new seasonal pond will be established on this parcel (0.35-acre pond SH1, 0.35-acre secondary ponded area in the Pond 7/Seasonal Wetland 4 complex, and 0.35-acre pond EV1). The period during which seasonal ponds remain inundated in a normal rainfall year shall be appropriate to support California tiger salamander breeding and metamorphosis

(approximately 12 weeks). Although these ponds are primarily created as breeding habitat for CTS, they will also possess seasonal wetland characteristics equivalent to Ponds 3, 5, and 7.

Performance Criterion 1. Constructed Pond Period of Inundation. The period of inundation shall be a minimum of 12 weeks of continuous inundation in a normal rainfall year for all constructed ponds (SH1, EV1, secondary ponded area in Pond 7/Seasonal Wetland 4 complex). This criterion will be achieved in the first year of monitoring and each subsequent year. If the ponds fail to hold water for the required period, remedial actions will be taken to increase the ponds ability to hold water. This may include adding clay to the pond bottoms or compacting the pond bottoms.

Performance Criterion 2. CTS Breeding and Metamorphosis. The created seasonal ponds shall provide breeding and larval development habitat for CTS. At the end of 10 years, there will be evidence that the pond has 1) been used as breeding habitat by CTS (eggs or larvae observed) and 2) that larvae have metamorphosed from the constructed ponds in normal rainfall years.

- In order to document breeding attempts, a survey of each pond will be conducted within 2 weeks of the ponds filling to document the presence of California tiger salamander eggs in the ponds. Depending on the pond size, 1-5 egg frames will be placed in each breeding pond (both preserved and constructed) and checked for the presence of eggs. Egg frames will be placed in the ponds after the first rain and removed from the pond once the eggs have hatched. The number of eggs per frame will be recorded. This criterion would be partially met if eggs (or larvae) are observed in the constructed ponds by the end of the monitoring period.
- At least 3 surveys for California tiger salamander larvae will be conducted each year in both the constructed and preserved ponds. Larvae will be sampled quantitatively and reported either on an area or volume basis (e.g., nm.larvae per square ft or nm.larvae per cubic ft). This criterion would be partially met if constructed ponds are shown to support larvae late in the season that show evidence that they will transform before the pond dries. By the end of the monitoring period, larvae should be present in the constructed ponds during normal rainfall years whenever larvae are present in reference ponds. Wildlife monitoring procedures are detailed in Section 5.4.

Performance Criterion 3. Wildlife Species Diversity. At the end of the 10-year wildlife-monitoring period, the mitigation lands shall support at least 90 percent of the native vertebrate species characteristic of the Southern Hills area prior to project development.

Performance Criterion 4. Hydrophytic Plant Species. At the end of the 10-year monitoring period, the created seasonal pond habitat shall be within at least 80 percent of the mean relative cover by hydrophytic species⁹ in the reference sites (Ponds 3, 5, 7). The relative cover of hydrophytic species shall not be less than 51 percent in order to meet minimum wetland vegetation parameter criteria.

Interim performance criteria are as follows:

Year 2 - relative cover shall have at least 51 percent relative cover of hydrophytic species.

⁹ Hydrophytic species" are defined in accordance with USFWS 1988.

Year 4 - relative cover shall have at least 60 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 6 - relative cover shall have at least 70 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 8 - relative cover shall have at least 75 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 10 - relative cover shall have at least 80 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Performance Criterion 5. Native Plant Species. At the end of the 10-year monitoring period, the relative cover of native hydrophytic plant species shall be within the range of relative native hydrophytic plant species cover for the reference site (Ponds, 3, 5, 7).

Interim performance criteria are as follows:

Year 1 - the seasonal ponds will show establishment of native hydrophytic plant species.

Years 2 through 10 - the relative cover of native plant species will increase annually.

Performance Criterion 6. Invasive Exotic Plant Species¹⁰. By the end of the 10-year monitoring period, absolute cover by invasive exotic plants in the created wetlands and adjacent uplands shall be no greater than 5 percent. Invasive species control programs will also be implemented in the uplands of the parcel where artichoke thistle (*Cynara cardunculus*) and purple star thistle (*Centaurea calcitrapa*) are of primary concern. In the uplands, invasive weeds will be reduced by 90 percent areal coverage by the end of the 10-year monitoring period.

Performance Criterion 7. Plant Species Diversity. At the end of the 10-year monitoring period, the seasonal ponds shall support at least 80 percent of native hydrophytes characteristic of seasonal ponds on the Southern Hills parcel (Pond 7), the preserved Pond 5 Buffer area (Pond 5), and the Eastern Valley (Pond 3). The preserved grasslands shall support at least 95 percent of native species characteristic of the site prior to project implementation.

Performance Criterion 8. Seasonal Pond Acreage. At the end of the 10-year monitoring period, the mitigation area shall support at least 1.05 acre of new seasonal pond. This pond area will be delineated using standard methods employed during Corps delineations to determine this area.

5.1.3 Pond 5 Buffer Area

The Pond 5 Buffer area is located along the southern edge of the proposed Phase II landfill and contains the preserved Pond 5 and associated uplands. The mitigation area is contiguous with the Southern Hills parcel and will be managed together with the Southern Hills parcel. No new ponds or wetlands are proposed for construction on this mitigation area; therefore, pond creation performance criteria are not applicable to this parcel.

¹⁰ Invasive exotic plant species are those species classified as "List A" species by California Exotic Pest Plant Council (California Exotic Pest Plant Council (CalEPPC), 1999).

Performance Criterion 1. Wildlife Species Diversity. At the end of the 10-year wildlife-monitoring period, the mitigation lands shall support at least 90 percent of the native vertebrate species characteristic of the Phase II area prior to project development.

Performance Criterion 2. Invasive Exotic Plant Species¹¹. By the end of the 10-year monitoring period, absolute cover by invasive exotic plants in the preserved pond and adjacent uplands shall be no greater than 5 percent. Invasive species control programs will also be implemented in the uplands of the parcel where purple star thistle (*Centaurea calcitrapa*) is of primary concern. In the uplands, invasive weeds will be reduced by 90 percent areal coverage by the end of the 10-year monitoring period compared to pre-project conditions.

Performance Criterion 3. Plant Species Diversity. At the end of the 10-year monitoring period, the preserved pond shall support at least 90 percent of native hydrophytes characteristic of the ponds prior to project implementation. The preserved grasslands, including the disturbed grasslands where berm construction occurs, shall support at least 95 percent of native species characteristic of the site prior to project implementation.

Performance Criterion 4. Seasonal Pond Acreage. At the end of the 10-year monitoring period, the mitigation area shall support at least 0.45-acre of seasonal pond, which is the pre-project pond area. This pond area will be delineated using standard methods employed during Corps delineations to determine this area.

5.1.4 Eastern Valley Parcel

The Eastern Valley parcel does not have any new ponds proposed within its boundaries. EV1 will be constructed on the Southern Hills parcel near the southeastern corner of the Eastern Valley parcel. Therefore, pond creation performance criteria are not applicable to this parcel.

Performance Criterion 1. Wildlife Species Diversity. At the end of the 10-year wildlife-monitoring period, the mitigation lands shall support at least 90 percent of the native vertebrate species characteristic of the Phase II area prior to project development.

Performance Criterion 2. Maintenance of the Movement Corridor. At the end of the 10-year wildlife-monitoring period, the mitigation lands shall provide an unobstructed movement corridor for wildlife linking the Southern Hills parcel with the Griffith Ranch parcel to the north. A site visit each year will document any new features placed or constructed on the site during the previous year, noting whether they are permanent or temporary and assessing their ability to impede wildlife movement across the site. No permanent features that may impede wildlife movement will be constructed on the site and temporary features (i.e., temporary road that may be needed for maintenance of power lines) will be restored to pre-project conditions within 6 months.

Performance Criterion 3. Invasive Exotic Plant Species¹². By the end of the 10-year monitoring period, absolute cover by invasive exotic plants in the preserved ponds and adjacent uplands shall be no greater than 5 percent. Invasive species control programs will also be implemented in the uplands of the parcel where artichoke thistle (*Cynara cardunculus*) and purple star thistle (*Centaurea*

¹¹ Invasive exotic plant species are those species classified as “List A” species by California Exotic Pest Plant Council (California Exotic Pest Plant Council (CalEPPC), 1999).

¹² Invasive exotic plant species are those species classified as “List A” species by California Exotic Pest Plant Council (California Exotic Pest Plant Council (CalEPPC), 1999).

calcitrapa) are of primary concern. In the uplands, invasive weeds will be reduced by 90 percent areal coverage by the end of the 10-year monitoring period.

Performance Criterion 4. Plant Species Diversity. At the end of the 10-year monitoring period, the preserved ponds shall support at least 90 percent of native hydrophytes characteristic of the ponds prior to project implementation. The preserved grasslands shall support at least 95 percent of native species characteristic of the site prior to project implementation.

Performance Criterion 5. Seasonal Pond Acreage. At the end of the 10-year monitoring period, the mitigation area shall support at least 0.5-acre of seasonal pond, which is the pre-project pond area. This pond area will be delineated using standard methods employed during Corps delineations to determine this area.

5.1.5 Eastern Hills Parcel

The Eastern Hills parcel does not have any new ponds proposed or any preserved ponds within its boundaries. This parcel preserves grasslands at the east end of the Potrero Hills and provides additional upland habitat for CTS. Therefore, pond creation performance criteria are not applicable to this parcel.

Performance Criterion 1. Wildlife Species Diversity. At the end of the 10-year wildlife-monitoring period, the mitigation lands shall support at least 95 percent of the native vertebrate species characteristic of the Eastern Hills parcel prior to project development.

Performance Criterion 2. Maintenance of the Movement Corridor. At the end of the 10-year wildlife-monitoring period, the mitigation parcel shall provide an unobstructed movement corridor for wildlife linking the Southern Hills parcel with lands to the north. A site visit each year will document any new features placed or constructed on the site during the previous year, noting whether they are permanent or temporary and assessing their ability to impede wildlife movement across the site. No new permanent features that may impede wildlife movement will be constructed on the site and temporary features (i.e., temporary road that may be needed for maintenance of power lines) will be restored to pre-project conditions within 6 months.

Performance Criterion 3. Invasive Exotic Plant Species¹³. Invasive species control programs will also be implemented in the uplands of the parcel where purple star thistle (*Centaurea calcitrapa*) is of primary concern. In the uplands, invasive weeds will be reduced by 90 percent areal coverage by the end of the 10-year monitoring period.

Performance Criterion 4. Plant Species Diversity. At the end of the 10-year monitoring period, the preserved grasslands shall support at least 95 percent of native species characteristic of the site prior to project implementation.

5.1.6 Griffith Ranch Parcel

After 10 years, 4.07 acres of seasonal wetland habitat, 1.03 of seasonal swale, and 0.73 acres of seasonal pond will be created on the Griffith Ranch parcel. The dominant vegetation in the seasonal wetlands is dependent on hydrology, so the composition of the vegetation is subject to annual changes

¹³ Invasive exotic plant species are those species classified as "List A" species by California Exotic Pest Plant Council (California Exotic Pest Plant Council (CalEPPC), 1999).

depending on rainfall. Colonization by native and naturalized hydrophytic grasses and forbs must occur in sufficient numbers to meet performance standard criteria.

The performance standards are intended to be reasonable measures on which to base analysis of monitoring results, to determine trends (*i.e.* are wetland conditions establishing), and the potential need for corrective actions.

Performance Criterion 1. Constructed Pond Period of Inundation. The period of inundation shall be a minimum of 12 weeks of continuous inundation in a normal rainfall year for all constructed ponds (GR1 and GR2). This criterion will be achieved in the first year of monitoring and each subsequent year. If the ponds fail to hold water for the required period, remedial actions will be taken to increase the ponds' ability to hold water. This may include adding clay to the pond bottoms or compacting the pond bottoms.

Performance Criterion 2. CTS Breeding and Metamorphosis. The created seasonal ponds shall provide breeding and larval development habitat for CTS. At the end of 10 years, there will be evidence that the ponds have 1) been used as breeding habitat by CTS (eggs or larvae observed) and 2) that larvae have metamorphosed from the constructed ponds in normal rainfall years.

- In order to document breeding attempts, a survey of each pond will be conducted within 2 weeks of the ponds filling to document the presence of California tiger salamander eggs in the ponds. Depending on the pond size, 1-5 egg frames will be placed in each breeding pond (both preserved and constructed) and checked for the presence of eggs. Egg frames will be placed in the ponds after the first rain and removed from the pond once the eggs have hatched. The number of eggs per frame will be recorded. This criterion would be partially met if eggs (or larvae) are observed in the constructed ponds by the end of the monitoring period.
- At least three surveys for California tiger salamander larvae will be conducted each year in both the constructed and preserved ponds. Larvae will be sampled quantitatively and reported either on an area or volume basis (e.g., nm.larvae per square ft or nm.larvae per cubic ft). This criterion would be partially met if constructed ponds are shown to support larvae late in the season that show evidence that they will transform before the pond dries. By the end of the monitoring period, larvae should be present in the constructed ponds during normal rainfall years whenever larvae are present in reference ponds. Wildlife monitoring procedures are detailed in Section 5.4.

Performance Criterion 3. Wildlife Species Diversity. At the end of the 10-year wildlife-monitoring period, the mitigation lands shall support at least 95 percent of the native vertebrate species characteristic of the Griffith Ranch parcel prior to project development.

Performance Criterion 4. Hydrophytic Plant Species – Seasonal Ponds. At the end of the 10-year monitoring period, the created seasonal pond habitat shall be within at least 80 percent of the mean relative cover by hydrophytic species¹⁴ in the reference sites (Ponds 3, 5, 7). The relative cover of hydrophytic species shall not be less than 51 percent in order to meet minimum wetland vegetation parameter criteria.

¹⁴ Hydrophytic species" are defined in accordance with USFWS 1988.

Interim performance criteria are as follows:

Year 2 - relative cover shall have at least 51 percent relative cover of hydrophytic species.

Year 4 - relative cover shall have at least 60 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 6 - relative cover shall have at least 70 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 8 - relative cover shall have at least 75 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 10 - relative cover shall have at least 80 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Performance Criterion 5. Hydrophytic Plant Species – Seasonal Wetlands. At the end of the 10-year monitoring period, the constructed wetland habitat shall be within at least 80 percent of the mean relative cover by hydrophytic species¹⁵ in the reference site (Director's Guild vernal pools (excluding the playa pool)). The relative cover of hydrophytic species shall not be less than 51 percent in order to meet minimum wetland vegetation parameter criteria.

Interim performance criteria are as follows:

Year 2 - relative cover shall have at least 51 percent relative cover of hydrophytic species.

Year 4 - relative cover shall have at least 60 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 6 - relative cover shall have at least 70 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 8 - relative cover shall have at least 75 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 10 - relative cover shall have at least 80 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Performance Criterion 6. Native Plant Species. At the end of the 10-year monitoring period, the relative cover of native hydrophytic plant species shall be within the range of relative native hydrophytic plant species cover for the reference site (Ponds, 3, 5, 7).

Interim performance criteria are as follows:

Year 1 - the seasonal ponds will show establishment of native hydrophytic plant species.

Years 2 through 10 - the relative cover of native plant species will increase annually.

¹⁵ Hydrophytic species are defined in accordance with (Reed, Jr., 1988).

Performance Criterion 7. Invasive Exotic Plant Species¹⁶. By the end of the 10-year monitoring period, absolute cover by invasive exotic plants in the created wetlands and adjacent uplands shall be no greater than 5 percent. Invasive species control programs will also be implemented in the uplands of the parcel where artichoke thistle (*Cynara cardunculus*) and purple star thistle (*Centaurea calcitrapa*) are of primary concern. In the uplands, invasive weeds will be reduced by 90 percent areal coverage by the end of the 10-year monitoring period.

Performance Criterion 8. Plant Species Diversity. At the end of the 10-year monitoring period, the seasonal ponds shall support at least 80 percent of native hydrophytes characteristic of seasonal ponds on the Southern Hills parcel (Pond 7), the preserved Pond 5 Buffer area (Pond 5), and the Eastern Valley (Pond 3). The preserved grasslands shall support at least 95 percent of native species characteristic of the site prior to project implementation.

Performance Criterion 9. Seasonal Pond Acreage. At the end of the 10-year monitoring period, the mitigation area shall support at least 0.73 acre of new seasonal pond. This pond area will be delineated using standard methods employed during Corps delineations to determine this area.

Performance Criterion 10. Wetland Acreage. By the end of the five-year monitoring period, the mitigation site shall support at least 5.44 acres of Section 404-jurisdictional area. This wetland area will be delineated using standard methods employed during Corps delineations to determine this area.

5.1.7 Director's Guild Parcel

After 10 years, approximately 0.42 acre of playa pool habitat will be restored on the Director's Guild parcel. An additional 0.77 acres of seasonal swale will also be created. The dominant vegetation in the vernal pool basin is dependent on hydrology, so the composition of the vegetation is subject to annual changes depending on rainfall. Colonization by native and naturalized hydrophytic grasses and forbs is likely; however, vernal pool indicator species must be present in sufficient numbers to meet performance standard criteria.

The performance standards are intended to be responsible measures on which to base analysis of monitoring results, to determine trends (*i.e.* are wetland/vernal conditions establishing), and the potential need for corrective actions.

Performance Criterion 1. Wildlife Species Diversity. At the end of the 10-year wildlife-monitoring period, the mitigation lands shall support at least 95 percent of the native vertebrate species characteristic of the Director's Guild parcel prior to project development. Populations of all of the listed species (Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp) must be documented to exist on the site following project implementation.

Performance Criterion 2. Hydrophytic Plant Species – Seasonal Wetlands. At the end of the 10-year monitoring period, the constructed and restored wetland habitat shall be within at least 80 percent of the mean relative cover by hydrophytic species¹⁷ in the reference site (Director's Guild playa pool for the restored berm area, and Director's Guild vernal pools and ponded ditch for the created swale). The relative cover of hydrophytic species shall not be less than 51 percent in order to meet minimum wetland vegetation parameter criteria.

¹⁶ Invasive exotic plant species are those species classified as "List A" species by California Exotic Pest Plant Council (California Exotic Pest Plant Council (CalEPPC), 1999).

¹⁷ Hydrophytic species are defined in accordance with (Reed, Jr., 1988).

Interim performance criteria are as follows:

Year 2 - relative cover shall have at least 51 percent relative cover of hydrophytic species.

Year 4 - relative cover shall have at least 60 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 6 - relative cover shall have at least 70 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 8 - relative cover shall have at least 75 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Year 10 - relative cover shall have at least 80 percent of the mean relative cover by hydrophytic species in the reference sites (but shall not be lower than 51 percent total relative cover of hydrophytic species).

Performance Criterion 3. Native Plant Species. At the end of the 10-year monitoring period, the relative cover of native hydrophytic plant species shall be within the range of relative native hydrophytic plant species cover for the reference site (Director's Guild playa pool and vernal pools).

Interim performance criteria are as follows:

Year 1 - the seasonal ponds will show establishment of native hydrophytic plant species.

Years 2 through 10 - the relative cover of native plant species will increase annually.

Performance Criterion 4. Invasive Exotic Plant Species¹⁸. By the end of the 10-year monitoring period, absolute cover by invasive exotic plants in the created wetlands and adjacent uplands shall be no greater than 5 percent. Invasive species control programs will also be implemented in the uplands of the parcel where perennial pepperweed (*Lepidium latifolium*) is of primary concern. In the uplands, invasive weeds will be reduced by 90 percent areal coverage by the end of the 10-year monitoring period.

Performance Criterion 5. Plant Species Diversity. At the end of the 10-year monitoring period, the restored berm area and created swale shall support at least 80 percent of native hydrophytes characteristic of the Director's Guild playa pool and vernal pools. The preserved grasslands shall support at least 95 percent of native species characteristic of the site prior to project implementation.

Performance Criterion 6. Wetland Acreage. By the end of the 10-year monitoring period, the mitigation site shall support an additional 0.42 acre of playa pool (restored berm) and 0.77 acre (1,898 ft) of seasonal swale. Preserved seasonal wetland acreage (65.12 acre) and seasonal swale acreage (0.21 acre) shall be the same as prior to project implementation. This wetland area will be delineated using standard methods employed during Corps delineations to determine this area.

Performance Criterion 7. Vernal Pool Crustacean Habitat. By the end of the 10-year monitoring period, the restored portions of the playa pool (restored berm) and the constructed swale shall support listed vernal pool crustaceans. The berm area shall support the same species observed in the east and

¹⁸ Invasive exotic plant species are those species classified as "List A" species by California Exotic Pest Plant Council (California Exotic Pest Plant Council (CalEPPC), 1999).

west basins of the onsite playa pool. The constructed swale shall support at least one of the listed vernal pool crustaceans observed in the playa pool or smaller vernal pools onsite. Presence of listed vernal pool crustaceans will be assessed using standard sampling methods for vernal pool crustaceans approved by the USFWS.

5.2 VEGETATION MONITORING

5.2.1 All Mitigation Parcels

Quantitative sampling methodology will be used to monitor vegetation parameters. To assess plant cover in seasonal wetlands/vernal pools, a minimum of 5 one-meter square plots (quadrats) will be established at random locations within the created wetlands. Random plot locations will vary each sampling year. Quantitative sampling will also be conducted in one reference site located within the larger adjacent vernal pool area.

Cover will be estimated by cover classes (<5 percent, 5-15 percent, 16-25 percent, 26-50 percent, 51-75 percent, 76-100 percent) for each species (native and non-native). Unequal cover class intervals allow for an easier estimation of species-cover to area relationships than do equal class intervals. Moreover, the less abundant species, or species with small areal cover, sometimes have an important diagnostic significance, which requires a finer breakdown in the lower scale values as compared to the larger scale values (Mueller-Dombois and Ellenberg, 1974). For mapping of jurisdictional wetland acreage, standard Corps delineation methodology will be applied (Environmental Laboratory, 1987).

5.3 HYDROLOGY MONITORING

Hydrology monitoring will be completed each year throughout the 10-year monitoring period. All monitoring will be conducted by a qualified biologist or hydrologist familiar with aquatic habitats in Solano County. Observations of hydrology monitoring and developing problems and recommendations for remedial actions will be detailed in the annual monitoring reports.

5.3.1 Southern Hills Parcel

Ponds designed for CTS breeding and rearing shall maintain pond depths between 1 and 2 feet through May of each year. Pond depths will be measured by installing a simple staff gage at the lowest point in the pond. Pond water levels and specific conductance (an index for salinity) will be monitored monthly from October through June as part of the hydrologic monitoring program. This frequency of site visits will assure that the new ponds are functioning correctly. Specific conductance data will provide important information on the potential suitability of pond habitat for salamander breeding, reproduction, and rearing.

5.3.2 Eastern Valley Parcel and Pond 5 Buffer Area

The ponds preserved for CTS breeding and rearing shall maintain pond depths between 0.5 and 2 feet through May of each year. Pond depths will be measured by installing a simple staff gage at the lowest point in the pond. Pond water levels and specific conductance (an index for salinity) will be monitored monthly from October through June as part of the hydrologic monitoring program. Specific conductance data will provide important information on the suitability parameters of pond habitat for salamander breeding, reproduction, and rearing and will be used to compare created Pond data.

5.3.3 Griffith Ranch Parcel

The target water regime for the seasonal wetlands on the Griffith Ranch is to provide continuous ponding for between 30 and 90 days in a normal rainfall year. Given the proximity of the created pools to the large playa pools on the adjacent property, it is likely that the seasonal wetlands on the Griffith Ranch property will develop with a major component of vernal pool plant species such as are found in the few small wetlands that currently exist on the site. Water depth in the created wetlands will be monitored at least once a month during the rainy season by checking a permanent staff gage installed in each of the created wetlands.

Ponds designed for CTS breeding and rearing shall maintain pond depths between 1 and 2 feet through May of each year. Pond depths will be measured by installing a simple staff gage at the lowest point in the pond. Pond water levels and specific conductance (an index for salinity) will be monitored monthly from October through June as part of the hydrologic monitoring program. This frequency of site visits will assure that the new ponds are functioning correctly. Specific conductance data will provide important information on the potential suitability of pond habitat for salamander breeding, reproduction, and rearing.

5.3.4 Director's Guild Parcel

Hydrologic monitoring of the restored playa pool on the Director's Guild parcel will consist of visual observation of the pool during inundation. The restored portion of the pool will be inundated for approximately the same amount of time as the adjacent undisturbed portion of the pool. The goal will be to provide continuous inundation between 30 and 90 days in a normal rainfall year. This period will be desirable to allow vernal pool crustacean populations the opportunity to hatch and reproduce and to favor the establishment of vernal pool plants such as Contra Costa goldfields in the restored section of the pool. As long as the hydrophytic vegetation criteria are met, no specific requirement for inundation will be made.

5.4 WILDLIFE MONITORING

As one of the goals of the mitigation plan is to create and enhance habitat for native wildlife that will be impacted by the proposed Phase II landfill expansion, monitoring of wildlife species will be conducted during each year of the 10-year wildlife monitoring period. Wildlife monitoring will be conducted by qualified biologists with appropriate permits or authorizations for handling listed species that occur on the mitigation parcels. Monitoring of listed species will be coordinated with the responsible wildlife agencies. Observations of wildlife monitoring and the general wildlife surveys, and any developing problems and recommendations for remedial actions will be detailed in the annual monitoring reports.

5.4.1 Southern Hills Parcel

Breeding activity by CTS will be monitored each year by monitoring egg laying activity and sampling larvae at the constructed and preserved ponds. Egg laying will be monitored at the ponds by installing 1-5 egg frames (1/4 meter square frames with string stretched across the frame) in each constructed and preserved pond (depending on pond size) prior to or immediately after the first rain of the season. The egg frames will be monitored weekly once the ponds have filled. The number of eggs observed on each frame will be counted and the frames and eggs returned to the pond. Frames will be removed from the ponds once the eggs hatch. Presence of CTS eggs will be positive confirmation of breeding at the pond.

California tiger salamander larval development will be monitored each year between about March and May (starting date for surveys for CTS larvae will depend on the rainfall and filling of the ponds each year). Surveys will entail sampling the created and preserved ponds at least three times each year (once each month March through May) to document the presence of CTS larvae and determine the density of larvae in the ponds on either a pond area or pond volume basis. Each pond will be sampled quantitatively to determine the density of CTS larvae in the pond during each month. A representative sample of the CTS larvae also will be measured and the length of the larvae each month will be recorded for both the created and preserved ponds. Water depth in the ponds will be measured during each sampling event. The density of CTS larvae in created pond will be compared to the density of the preserved pond. Since breeding in any pond is dependent on salamanders being able to reach the ponds and find a mate there, no specific larval density is required, but all ponds will be shown to be used as breeding and larval development habitat in order to meet the success criteria. Notes on prey and/or potential predators observed in the ponds also will be recorded. An assessment of the likelihood of larvae being able to successfully metamorphose will be made during the last survey each year. Additional surveys beyond May will be necessary in years with prolonged inundation.

A general wildlife survey of the Southern Hills parcel will be conducted each year in the late winter and spring to document the wildlife diversity observed onsite. This survey will focus primarily on birds, but all vertebrates observed will be recorded. Species diversity prior to the project development will be compared to diversity during the monitoring period.

5.4.2 Eastern Valley Parcel, Eastern Hills Parcel, and Pond 5 Buffer Area

Monitoring for California tiger salamanders and wildlife on the Eastern Valley and Pond 5 Buffer Area will be the same as that described for the Southern Hills parcel above.

A general wildlife survey of the Eastern Hills parcel will be conducted each year in the late winter and spring to document the wildlife diversity observed onsite. This survey will focus primarily on birds, but all vertebrates observed will be recorded. Species diversity prior to the project development will be compared to diversity during the monitoring period. No ponds occur on this site, so monitoring of aquatic habitats is not required.

5.4.3 Griffith Ranch Parcel

Seasonal pool complex on the site will be monitored at least three times per year to assess colonization of the seasonal pool by vernal pool crustaceans or use of the pools and ponds as breeding habitat by CTS. Surveys will be conducted in late fall/winter when the species are likely to be present and observable.

California tiger salamander breeding activity will be monitored each year between about March and May (starting date for surveys for CTS larvae will depend on the rainfall and filling of the ponds each year). Surveys will entail sampling the created and preserved ponds at least three times each year (once each month March through May) to document the presence of CTS larvae and determine the density of larvae in the ponds. Each pond will be sampled quantitatively to determine the density of CTS larvae in the pond during each month. A representative sample of the CTS larvae also will be measured and the length of the larvae each month will be recorded for both the created and preserved ponds. Water depth in the ponds will be measured during each sampling event. The density of CTS larvae in created pond will be compared to the density of the preserved pond. Since breeding in any pond is dependent on salamanders being able to reach the ponds and find a mate there, no specific larval density is required, but all ponds will be shown to be used as breeding and larval development

habitat in order to meet the success criteria. Notes on prey and/or potential predators observed in the ponds also will be recorded. An assessment of the likelihood of larvae being able to successfully metamorphose will be made during the last survey each year. Additional surveys beyond May will be necessary in years with prolonged inundation.

A general wildlife survey of the Griffith Ranch parcel will be conducted each year in the late winter and spring to document the wildlife diversity observed onsite. This survey will focus primarily on birds, but all vertebrates observed will be recorded.

5.4.4 Director's Guild Parcel

Vernal pool crustaceans will be monitored at least three times each year during after the playa pool has filled to confirm the presence of listed vernal pool crustaceans in the preserved and restored portion of playa pool and the preserved and created ditch and swale on the parcel. Surveys will be conducted in the late fall/winter when the species are present and observable. Data on playa pool depth and turbidity will also be recorded. The presence of potential prey will be noted. The distribution and abundance of listed species on the site will be compared to the results from previous years.

Surveys for California tiger salamanders will be conducted three times per year in the playa pool to document the potential colonization of the site from animals displaced from Pond 1. Standard survey methods for tiger salamander larvae will be employed.

A general wildlife survey of the Director's Guild parcel will be conducted each year in the late winter and spring to document the wildlife diversity observed onsite. This survey will focus primarily on birds, but all vertebrates observed will be recorded. This list will be supplemented with the list of aquatic species both vertebrate and invertebrate observed in the aquatic habitats onsite.

5.4.5 All Mitigation Parcels

All created and restored ponds and seasonal pools will be managed on a continuing basis to control bullfrogs and predatory fish. All pools and ponds on the mitigation parcels will be surveyed twice annually to detect the presence of bullfrogs and/or predatory fishes. The surveys will be conducted in May and July. Any locations found to support bullfrogs, bullfrog tadpoles, or predatory fishes (*e.g.*, *Gambusia*, carp, sunfish) will be noted for follow-up surveys and control efforts. Control programs will be implemented annually as necessary.

The monitor will also search for and document evidence of wildlife use in mitigation areas. Human interference impacts will be assessed at all sites. Impacts will be assessed with particular care in the seasonal pond areas, due to their potential breeding of special-status species. Corrective actions will be recommended, if necessary. A plan will then be developed and implemented to remediate the impacts.

If interim monitoring visits suggest that the performance standards will not be met in five years, the applicant will submit a corrective actions plan as discussed below in Section 7 – Contingency Measures.

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6.0 IMPLEMENTATION PLAN

6.1 SALVAGE OF SALAMANDERS IN THE PHASE II EXPANSION AREA

Prior to initiating ground disturbing activities within the Phase II parcel, trapping will be conducted to remove adult and juvenile CTS from the work area. The salvage plan is described in Appendix F.¹⁹

A barrier fence constructed of Ertec (Ertec Environmental Systems, Alameda, CA) E-fence material will be constructed at the perimeter of the Phase II area. The fence will be attached to the inside of a standard to 4-strand barbed wire fence. The E-fence material will be 30 inches wide. Five inches of the material will be buried in a trench and backfilled leaving 25 inches of E-fence above ground to provide a continuous barrier around the site to prevent CTS from entering the Phase II work area. The barrier fence will be maintained around the perimeter of the Phase II throughout the active life of the landfill.

Salvage within the Phase II area will occur in three phases. The first phase will include the southern portion of the Phase II area including the tributaries of the Spring Branch Creek channel. The second phase will be the northern half of the Phase II area, excluding the area around Pond 1. Pond 1 will be preserved as a breeding site for tiger salamanders for at least 5 years after project initiation. The third phase, therefore, will be the area around Pond 1 prior to removal of the pond.

Trapping will be conducted using the standard drift fence and pitfall traps technique. The perimeter barrier fence will serve as the drift fence, with traps placed approximately every 33 ft along the fence. At least 2 arrays in an "X" configuration will be installed in the center of the salvage area to capture animals moving within the Phase II trapping area but not reaching the perimeter. These arrays will increase the probability of removing salamanders from the proposed Phase II landfill expansion area. Animals captured in the Phase II area will be relocated to burrows in the adjacent preserved mitigation lands. Data on animal size, sex, and conditions will be recorded and reported in the annual trapping report.

6.2 CONSTRUCTION MONITORING

Construction activities including excavation, grading, topsoil stockpiling, soil compaction, and supplemental seeding and planting, will be monitored by a biological monitor (site monitor), who will have expertise in the field of wetland creation. The biological monitor will be present to monitor project set-up and mobilization, supervise mitigation construction and ensure resource permit compliance. The biological monitor tasks will include but not be limited to the following activities:

- Approve locations for exclusion fencing, access routes, staging areas, and soil stockpiles;
- Conduct pre-construction surveys for sensitive species;
- Notify construction personnel of sensitive species and/or protected habitats near construction areas;

¹⁹ Dates in the salvage plan assume that all federal and state permits will be issued in the third quarter of 2010. If issuance of the permits is delayed, then the schedule in Appendix F will be offset by one year.

- Apprise construction personnel of relevant permit conditions and assist them with meeting the conditions in an efficacious and efficient manner;
- Approve the final grading and top-soiling of mitigation features; and
- Log all construction activities affecting sensitive species and protected habitats and prepare monitoring reports.

6.3 EQUIPMENT ACCESS AND STAGING

Equipment access and staging areas for mitigation construction will be designated specific routes and areas to minimize impacts to mitigation lands. The equipment access and staging areas will be established according to the following guidelines:

- Staging will not be permitted within approved areas only.
- Staging area boundaries will be staked by the contractor in the field and identified on project plans prior to construction and approved by the biological monitor.
- After grading and construction is completed, the staging areas will be rehabilitated to an appropriate condition. Rehabilitation of the staging areas may include light grading and seeding, if appropriate;
- Seeding activities will consist of scarifying the soil surface by hand or with light equipment followed by hand broadcasting of seed and light raking of the soil surface. Where prescribed, hand seeding or hydroseeding will be conducted no earlier than mid-October.

6.4 SITE PREPARATION

6.4.1 Southern Hills Parcel and Pond 5 Buffer Area

All work on the constructed, mitigation pond will be accomplished during the summer or early fall, prior to the first rains. Site preparation activities will include the salvage of existing topsoil from the excavated area of the seasonal wetland. Three new ponds will be created in the Southern Hills: the deepened pond in Pond 7/Seasonal Wetland 4 complex, SH1, and EV1. The new pond area will be created by excavating a portion of the 3.78-acre Seasonal Wetland 4 upstream of Pond 7. Pond SH1 will be constructed in the western drainage of the Southern Hills parcel, and Pond EV1 will be constructed in the Spring Branch Creek drainage near the Eastern Valley parcel-Southern Hills parcel boundary. For all the new ponds, side slopes will be gently graded to facilitate movement of CTS adults and post-metamorphs to and from the pond. The pond will be over excavated and lined with the salvaged topsoil. No supplemental seeds of hydrophytic plant species will be sown in the deepened pond of the pond/wetland complex as existing topsoil will contain sufficient seed to allow reestablishment of wetland plants in the new pond. The berms and edges of Ponds SH1 and EV1 will be seeded with a seed mix appropriate for the pond.

On the Pond 5 Buffer Area, a berm will be created south of the pond to direct flow from the slopes into the pond.

The following describes the basic steps for the construction on the mitigation sites:

Bench Mark Establishment: The project biologist will establish a permanent bench mark location for use in construction and monitoring. The bench mark will be designated as having a relative elevation of 100.00. All rough and final grading elevations shall be made relative to this elevation.

Boundary Marking: The margins of the proposed ponds will be staked using GPS equipment (minimum 1 meter accuracy). Soils within the proposed seasonal pond will then be evaluated for textural stratigraphy and presence/absence of pockets or locations of highly permeable soils. The boundaries of all other existing natural features to be protected (*i.e.*, adjacent wetland habitat) will also be staked and protected with construction fencing or similar materials, as needed, for the duration of all construction work. No operation or storage of any construction equipment or materials will be allowed in the protected areas.

Top Soil Salvage: Existing top soil (the top 3 to 4 inches) within the construction site will be scraped/collected and stockpiled separately for later placement in adjacent uplands. Topsoil will be windrowed no higher than six feet, and will be covered with filter fabric or burlap, not plastic.

Rough Grading. The pond features will be excavated to a depth of approximately 2-3 inches below the design bottom and side slope elevations. The on-site biologist will make minor grade adjustments as needed to attain the range of variation required by the plans. Additional compaction will be conducted as needed to obtain at least 90 percent relative compaction for the bottom of the pools and swales. A laser level will be regularly used during the grading process to ensure that approximate design elevations and slopes are achieved.

Water Verification. The graded seasonal pond features will be tested for water holding capacity by pumping a minimum 6-inches of water into them prior to the rainy season and observing the period of time that water is retained. If water is lost at a rate in excess of what would be expected under normal pan evaporation rates, than additional clay soils will be added and/or additional compaction will be conducted, and the wetlands will be subsequently re-tested.

Final Grading. Following spreading of topsoils, site grading will be conducted using light equipment to establish a final micro-topography consistent with designed variations in elevation and depth. Grades will be surveyed to ensure consistency with the design specifications. The biologist will make the final determination as to the acceptability of final grades for upland disposal areas.

Site Clean-up. Following construction, all construction debris and existing trash will be removed from the surface of the mitigation bank area. Removed material will be either properly disposed of within an authorized landfill area.

6.4.2 Griffith Ranch Parcel

The following describes the basic steps for the wetland construction:

Bench Mark Establishment: The project biologist will establish a permanent bench mark location for use in construction and monitoring. The bench mark will be designated as having a relative elevation of 100.00. All rough and final grading elevations shall be made relative to this elevation.

Boundary Marking: The margins of the proposed wetlands will be staked using GPS equipment (minimum 1 meter accuracy). Soils within the proposed wetland basins and swales will then be evaluated for textural stratigraphy and presence/absence of pockets or locations of highly permeable soils. If unsuitable soil conditions are identified, the wetland locations may be relocated or the unsuitable soils excavated and replaced with suitable material. The boundaries of all other existing

natural features to be protected (*i.e.*, adjacent wetland habitat) will also be staked and protected with construction fencing or similar materials, as needed, for the duration of all construction work. No operation or storage of any construction equipment or materials will be allowed in the protected areas.

Top Soil Salvage: Existing top soil (the top 3 to 4 inches) within the construction site will be scraped/collected and stockpiled separately for later placement on the mounds and adjacent uplands. Topsoil will be windrowed no higher than six feet, and will be covered with filter fabric or burlap, not plastic.

Rough Grading. The wetland features will be excavated to a depth of approximately 2-3 inches below the design bottom and side slope elevations. The on-site biologist will make minor grade adjustments as needed to attain the range of variation required by the plans. Additional compaction will be conducted as needed to obtain at least 90 percent relative compaction for the bottom of the pools and swales. A laser level will be regularly used during the grading process to ensure that approximate design elevations and slopes are achieved. Excavated soil will be used to create inter-pool mounds adjacent to the vernal pools and swales.

Water Verification. The graded seasonal pool features will be tested for water holding capacity by pumping a minimum 6-inches of water into them prior to the rainy season and observing the period of time that water is retained. If water is lost at a rate in excess of what would be expected under normal pan evaporation rates, than additional clay soils will be added and/or additional compaction will be conducted, and the wetlands will be subsequently re-tested.

Final Grading. Following spreading of topsoils, site grading will be conducted using light equipment to establish a final micro-topography consistent with designed variations in elevation and depth. Grades will be surveyed to ensure consistency with the design specifications. The biologist will make the final determination as to the acceptability of final grades for both wetland and upland disposal areas.

Site Clean-up. Following construction, all construction debris and existing trash will be removed from the surface of the mitigation bank area. Removed material will be either properly disposed of within an authorized landfill area.

6.4.3 Director's Guild Parcel

Restoration and enhancement activities on this parcel will include removal of fill material from the playa pool to restore its original configuration and excavation of a new meander channel to convey overflow from the playa pool west to the vernal pool at the west side of the parcel. Flow will also be allowed to continue down the existing ditch in order to provide water to the ditches on the north side of the Potrero Hills Lane mitigation area

Restoration of the playa pool will utilize the following guidelines:

Bench Mark Establishment: The project biologist will establish a permanent bench mark location for use in construction and monitoring. The bench mark will be designated as having a relative elevation of 100.00. All rough and final grading elevations shall be made relative to this elevation.

Boundary Marking: The margins of the meander channels will be staked and surveyed-in. Soils along the proposed channel will then be evaluated for textural stratigraphy and presence/absence of pockets or locations of highly permeable soils. If unsuitable soil conditions are identified, the channel routes may be modified or the unsuitable soils excavated and replaced with suitable material. The

boundaries of all existing natural features to be protected (*i.e.*, adjacent wetland habitat) will also be staked and protected with construction fencing or similar materials, as needed, for the duration of all construction work. No operation or storage of any construction equipment or materials will be allowed in the protected areas.

Rough Grading. The wetland features will be excavated to a depth of approximately 2-3 inches below the design bottom and side slope elevations. The on-site biologist will make minor grade and alignment adjustments as needed to attain the range of variation required by the plans. Additional compaction will be conducted as needed to obtain at least 90 percent relative compaction on the bottom of the channels. A laser level will be regularly used during the grading process to ensure that approximate design elevations and slopes are achieved. Excavated soil will be used to create inter-pool mounds adjacent to the channel and existing vernal pools and swales.

Final Grading. Site grading will be conducted using light equipment to establish a final micro-topography consistent with designed variations in elevation and depth. Grades will be surveyed to ensure consistency with the design specifications. The biologist will make the final determination as to the acceptability of final grades for both wetland and upland disposal areas.

Site Clean-up. Following construction, all construction debris and existing trash will be removed from the surface of the mitigation bank area. Removed material will be either properly disposed of within an authorized landfill area.

6.5 PLANTING AND SEEDING

6.5.1 Southern Hills Parcel, Eastern Valley Parcel, and Griffith Ranch

Wetlands. Inoculum will be obtained from other existing wetlands on the mitigation sites or other approved local sources. In particular, the project applicant will seek approval from the USFWS to collect seeds from pools supporting Contra Costa goldfields on the Director's Guild parcel for use in seeding the created pools on the Griffith Ranch parcel. Seed and thatch from existing wetlands will be raked and vacuumed and placed in constructed wetlands. No more than 5 percent of the seed and thatch will be removed from an existing wetland. Seed will not be collected from stock ponds in the Phase II expansion area.

The general method to be employed will be as follows. A 1-meter square patch of top soil will be collected from existing pools in the area and will be applied to the created wetland surfaces. Less than 5 percent from each pool will be taken as inoculum, and spread at the rate of approximately 1-2 lbs. per constructed pool. The inoculate will be broadcast over the newly prepared surface of the constructed wetland areas, raked into the top soil layer and then rolled with a sod roller (but not compacted) to ensure good seed to soil contact. Seeding will occur in the fall. Supplemental seed will include Pacific meadow foxtail (*Alopecurus saccatus*), meadow barley (*Hordeum brachyantherum*), hair grass (*Deschampsia danthonoides*), semaphore grass (*Pleuropogon californicus*), bicolor lupine (*Lupinus bicolor*), tomcat clover (*Trifolium wildenovii*), popcorn flower (*Plagiobothrys nothofulvus*) and goldfields (*Lasthenia* spp.).

Bare areas among pools will be scarified to a depth of 1-3 inches, and inter-pool mounded soils from pool spoils will be lightly raked to create a seed bed prior to seed application. Alternatively, the seed may be drilled if conditions will allow it. The seed will be applied at the beginning of the rainy season. These pool and swale grasslands/uplands will be seeded with an appropriate native grass/forb mix using local genetic stock whenever feasible. The wetland seed mix is shown in Table M.

Table M. Wetland Seed Mix

Common Name	Scientific Name	# per acre seed rate in PLS (pure live seed)
California barley	<i>Hordeum brachyantherum</i> ssp. <i>californicum</i>	6
dwarf lupine	<i>Lupinus nanus</i>	2
bicolor lupine	<i>Lupinus bicolor</i>	2
purple needlegrass	<i>Nassella pulchra</i>	8
tomcat clover	<i>Trifolium wildenovii</i>	2
Johnny-tuck	<i>Triphysaria eriantha</i>	2

Adjacent grasslands that are disturbed during construction of the seasonal wetland and the berm near Pond 5 would be seeded with the seed mix shown in Table N.

Table N. Grassland Seed Mix

Common Name	Scientific Name	# per acre seed rate in PLS (pure live seed)
Purple sanicle	<i>Sanicula bipinnatifida</i>	2
dwarf lupine	<i>Lupinus bicolor</i>	3
Johnny-tuck	<i>Triphysaria eriantha</i>	2
blue dicks	<i>Dichelostemma pulchellum</i>	1
blow wives	<i>Achrychaena mollis</i>	1

If available for local collection on-site or off-site, the following forbs may be directly seeded into areas where conditions are favorable:

- Wetland edges: white hyacinth (*Triteleia hyacinthina*), dense-flower owl's clover (*Castilleja densiflora*).
- Grassland-swale areas: narrow-leaf milkweed (*Asclepias fascicularis*), Great Valley gumplant (*Grindelia camporum*), California aster (*Aster chilensis*), and annual water aster (*A. subulatus* var. *ligulatus*).
- Grassland-mound areas (inter-pool mounds): blue dicks (*Dichelostema pulchellum*), purple sanicle (*Sanicula bipinnatifida*), common lomatium (*Lomatium utriculatum*), blow-wives (*Achrychaena mollis*), Fremont's tidy tips (*Layia fremontii*), yarrow (*Achillea millefolium*).

Woody Vegetation. The Potrero Hills, Potrero Hills Valley, and area north of the hills largely lack trees and shrubs that provide perches and nest sites for birds. As part of the enhancements to the mitigation sites, trees and shrubs will be planted in appropriate locations to provide nest sites and cover for native birds. Native trees and shrubs will be planted on the Southern Hills parcel in and

around the wet meadow located in the center of the site along its southern border. This wet meadow also will be fenced to control cattle grazing in the wetland. Native trees such as willows and other dense, native shrubs will be used in the meadow area. Additional tree and shrub plantings will be scattered throughout the mitigation parcels in areas where suitable environmental conditions exist. Trees and shrubs planted on the mitigation sites will be low growing species (6-20 feet) to discourage use of the trees as nest sites for corvids. A planting plan will be prepared that details the location of the trees and shrubs.

In addition to the planting of trees and shrubs on the mitigation parcels, existing trees and shrubs such as those on the remainder portion of the Griffith Ranch and those in the Eastern Valley will be preserved.

6.5.2 Director’s Guild Parcel

Restoration of the large vernal pool may require a component of revegetation. Natural recruitment from the adjacent vernal pool plant community will be augmented by seeding and planting as determined by LSA restoration biologists. Additional inoculant could be obtained from existing vernal pools onsite or other approved local sources.

A 1-meter square patch of topsoil will be collected from six existing pools in the area and will be applied to the created wetland surfaces. The inoculant will be broadcast over the newly prepared surface of the constructed wetland areas, raked into the top soil layer and then rolled with a sod roller (but not compacted) to ensure good seed to soil contact. Seeding will occur in the fall.

6.6 IRRIGATION

Seeding and planting will be completed in the fall before the onset of the rainy season, and precipitation and runoff are expected to provide sufficient moisture for seed germination and plantings. No irrigation is planned for mitigation sites where the wetland creation sites will be dominated by annual grasses and forbs.

Trees and shrubs planted on the Southern Hills and Griffith Ranch sites will be irrigated as needed to establish the woody vegetation.

6.7 IMPLEMENTATION SCHEDULE

The mitigation work is anticipated to begin in the spring/summer of 2011. The mitigation work will be completed prior to the landfill construction within the Phase II area which will occur over an approximately 20 year period.

Table O: Implementation Schedule.†

Action	Seasonal Schedule
Salvage of CTS	Fall 2010
Topsoil Salvage	Summer 2011
Site Preparation, Grading, Soil Emplacement	Summer 2011
Seeding	Fall 2011

Action	Seasonal Schedule
Exotic Weed Control	4 times per year during monitoring period
Hydrology Monitoring	Monthly during rainy season
Vegetation Monitoring	Spring 2012 – Spring 2021
Wildlife Monitoring	Winter/Spring 2012 – Winter/Spring 2021
Reporting	As-Built Report 6 weeks after completion of Site preparation and grading Annual Report – September 30

† Dates in the Implementation Schedule assume that all federal and state permits will be issued in the third quarter of 2010. If issuance of the permits is delayed, then the schedule will be offset by one year.

7.0 MANAGEMENT AND MAINTENANCE DURING MONITORING PERIOD

The primary management goals for the Phase II Expansion Project mitigation areas are to protect and/or enhance the biological values of the seasonal wetland and grassland ecosystems by maintaining habitats that support native plants and animals associated with this ecosystem, including special-status species. The principal management tasks to achieve these goals are:

- Minimizing the extent of non-native grasses and the accumulation of thatch;
- Reducing the size and number of occurrences of noxious weed species.

Thatch or residual dry matter consists of dead plant material at various stages of decomposition. Grazing, or other methods of removal, such as mowing, cutting, or burning, prevents the accumulation of thatch and increases nutrient cycling. Opening up of the herbaceous canopy by appropriately-timed removal of thatch can promote the growth of native perennial grasses and native forbs by increasing light penetration and availability of nutrients, thereby increasing seed germination and seedling establishment.

Controlling weed infestation may also promote the increase in the number and diversity of native plants. Weeds may be controlled by direct intervention with physical, biological, or chemical methods or by grazing.

Livestock-grazing will be the primary management tool to minimize cover by non-native grasses and the accumulation of thatch, as well as reduce occurrences of other noxious weeds within the mitigation area. Directed weed control actions will be employed in areas that support high densities of weeds. A rotational grazing program may be implemented in the future, *i.e.*, mitigation areas will not be grazed every year, but instead fences will be installed to keep cattle out of certain portions for a predetermined time.

Short and long-term maintenance measures to be performed include trash removal, hand removal and EPA-labeled herbicide treatment of invasive exotic plant species; the necessary permits will be secured from appropriate agencies if it becomes necessary to use aquatic pesticides for weed control. Exotic vegetation, known to occur on or near the site, that may need to be controlled, includes: Italian thistle, artichoke thistle, purple star thistle, yellow star thistle, pepperweed, and black mustard. Hand removal techniques will be emphasized to the extent feasible. Where herbicide treatments are deemed to be the most effective control method, spraying of individual plants or plant clusters will be conducted. Applications of herbicides will be conducted by qualified individuals with the appropriate licenses.

7.1 MANAGEMENT AND MAINTENANCE PROGRAMS

7.1.1 Grazing

Grazing within the Southern Hills, Eastern Valley, Eastern Hills, Griffith Ranch, and Directors' Guild parcels will be conducted under a third-party lease. The grazing lease will include provisions for some "flexibility" with respect to livestock availability.

The grazing prescriptions outlined below may be modified by the project applicant in co-operation with the grazing lessee and the resource manager; however, the modifications will be minimal in order to avoid impacts to the biological resources on the property. The prescription may also be subject to change as a result of recent or future research results (for example by Solano Land Trust) and on-site adaptive management practices.

A Grassland Management Plan has been prepared that gives additional details about the proposed grazing on the mitigation sites (LSA and ESP, 2009). The GMP should be referred to for those additional details. Although not part of the mitigation lands for this project, grassland management activities stipulated in the GMP will also be employed on Griffith Ranch remainder parcel and undeveloped portions of the Phase II expansion parcel.²⁰

Goals and Objectives. Livestock grazing and other management activities will be used on the mitigation parcels to achieve the following goals: 1) optimizing biodiversity and habitat values for California tiger salamanders, burrowing owl, other special-status species, and common grassland species; 2) to ensure that management actions do not have adverse effects on other species and their habitats; and 3) to reduce wildfire hazards. The following specific objectives will be achieved to realize these general goals.

- *Use livestock grazing as a resource management tool to maintain and enhance biodiversity.* Management strategies will use modern resource conservation practices based on scientific principals and incorporation of monitoring results to adjust, improve, and refine those practices using adaptive management. Stocking rates will be calculated initially to allow for moderate grazing use levels with minimum levels of residual dry matter (RDM) left after the grazing season to protect soils, maximize forage production and provide for desirable plant species composition (Bartolome et al., 2002). Residual dry matter is the old plant material left standing or on the ground at the beginning of a new growing season (typically early fall immediately prior to the first rains). The moderate level of grazing will leave a grass stubble height of 2-3 inches and an initial RDM level of about 750 pounds per acre at the end of the grazing season. This level is appropriate for California tiger salamander and burrowing owl management objectives and favors native grasses and forbs by removing non-native grass competition and associated thatch. Accumulation of high levels of thatch or RDM from non-native grasses around breeding pond margins and surrounding uplands can impede overland migration of juvenile and adult California tiger salamander leading to increased predation and desiccation (Robins and Vollmar, 2002). This level of grazing early in the growing season is also consistent with enhancement of vernal pool and playa habitat on the Director's Guild. For example, a study in South Sacramento County showed that removal of cattle grazing from vernal pools significantly reduced ponding duration and native plant and animal abundance (Marty, 2005; Pyke and Marty, 2005). Also, a positive correlation between the intensity of sheep grazing and cover of native species in vernal pool habitats was documented

²⁰ Development of the Phase II expansion parcel will proceed over the course of about 20 years. In the interim period, undeveloped grasslands will be grazed and managed like the contiguous mitigation lands of the Southern Hills, Pond 5 Buffer, and Griffith Ranch.

on the Jepson Prairie (Phytosphere Research, 2001; Witham, 2006a). Stocking levels will be adjusted based on monitoring results and yearly rainfall levels. Approximately 800 pounds of forage (dry weight) is required for one AUM. Therefore if a given soil type (for example MmE) produces 2,000 pounds per acre in an average year, 1,250 pounds of forage could be consumed if 750 pounds per acre is left as RDM. This translates to a stocking rate of about 1.3 AUM's per acre.

- *Eliminate or minimize impacts associated with unrestricted year-long use by cattle.* Impacts from unrestricted yearlong grazing can include soil erosion, and the establishment and spread of invasive non-native plant species such as yellow star-thistle, purple star-thistle, and medusahead, because of lowered competition from palatable and desirable plant species. To achieve this objective, perimeter fencing will be installed and maintained to prevent cattle access from adjacent private land. New barbed wire fence will be installed where gaps exist to consolidate each parcel into a single grazing unit. Old fencing that is no longer necessary will be removed. A seasonal grazing program, generally from October through June and resting the unit from grazing during the late-summer/early-fall dry season, will allow for more control and flexibility over management of vegetation resources. This season of use is consistent with that recommended for the East Wilcox Ranch unit of the Greater Jepson Prairie Ecosystem Reserve (Witham, 2006b) which is especially relevant to the Director's Guild parcel because of the occurrence in both areas of vernal pool flora and fauna.

Grazing use during the wet season (late-fall to late-spring) allows for more even grazing use patterns as livestock disperse over widespread areas. Specifically, grazing animals derive a large portion of their water intake from the green forage and less from ponds, channels, and other water sources. Limiting grazing to the wet season would exert less pressure on wetland habitats. Grazing early in the season when native grasses are generally dormant and competing non-native grasses are green would also concentrate grazing use on the non-native annual grasses to the competitive advantage of natives. Early grazing prior to seed ripening of invasive non-native annual plant species could also be used for weed control. It would also be most beneficial for California tiger salamander to concentrate livestock grazing beginning in late fall (October-December) with livestock removed or reduced in late spring or early summer (May-June) during juvenile transformation and migration. Removal of cattle too early could have negative impacts due to less pool turbidity, resulting in higher predation levels to tiger salamander larvae. These guidelines will be considered preliminary and adjustments made in response to monitoring results.

Yearlong grazing is also not feasible under current conditions because only seasonal ponds for livestock drinking water are present on the Southern Hills parcel. Cattle on the Southern Hills parcel currently are watered on adjacent private land. An existing well and water trough occurs on private property adjacent to the Griffith Ranch parcel. This also provides a permanent livestock drinking water source for the Director's Guild parcel through a pipeline across Scally Road.

Development of additional permanent and reliable water sources on the Southern Hills parcel would allow for more flexibility for grazing operations. This would allow for grazing for short periods outside of the October-June seasonal window if prescribed by the Resource Manager to achieve biodiversity goals, or to help control invasive non-native plants. As with all management actions, the grazing season will be adjusted based on yearly weather patterns and monitoring results using an adaptive management approach.

- *Use cattle grazing as a tool to help control invasive non-native plant species.* Research has shown that cattle grazing can help control weeds through the impacts of herbivory on target species as documented below.

- *Use goat grazing and/or non-grazing treatments such as burning, mowing, herbicide use, biological controls (insects) and seeding with natives to help achieve biodiversity goals.*
 - Grazing by goats will be considered to help control invasive non-native species that are not palatable to cattle, or that prescribed cattle grazing has been ineffective in controlling. This will require confining the goats with a herder to a small area using temporary fencing and water. Because goat products are not in large demand and goat grazing is not economically viable, goat operations would likely need to be subsidized.
 - Non-grazing weed control treatments such as herbicides, mowing, or biological controls (in coordination with the Solano County Agriculture Department and/or Solano Weed Management Area) will also be used as necessary. Burning will also be considered, although it may not be feasible due to air quality concerns and other constraints. Weed control treatments will be followed up by seeding with native grasses and forbs for long-term increases in biodiversity.

Grazing Prescriptions (Period and Length of Grazing). Two basic criteria will determine the season of grazing and the length of the grazing period:

- Acceptable grazing dates based on weather conditions;
- Minimum residual dry matter (RDM) estimates.

The standard grazing season for the mitigation parcels will be between October and June, with the exact dates subject to change due to environmental conditions. Potential modifications to the grazing schedule accommodate special weed abatement activities, other means of thatch reduction, or availability of livestock. Animals may be added during years of greater forage production and fewer animals will be grazed during dry years with less forage.

The amount of forage/herbaceous cover (RDM) can be measured or visually assessed. Livestock will be removed when the RDM decreases to 500 - 750 lbs. per acre. This level of RDM can be assessed based on the following:

- Rangeland shows evidence of extensive grazing;
- Residual vegetation is patchy, with vegetation grazed to 1 - 5 inches in height;
- Bare soils are evident.

Establishing a limit of 500 - 750 lbs. RDM per acre will prevent over-grazing and ensure that enough plant matter is left to provide seed for the following year and enough cover to prevent erosion from wind and water. Decisions pertaining to modifications to the standard grazing periods, and the amount of remaining RDM will be made by the resource manager or grazing consultant, in cooperation with the grazing lessee.

Type of Livestock. Cattle are preferred for grazing the mitigation parcels for two reasons: 1) cattle prefer to graze grass rather than forbs (broadleaved plants), so would be more effective in reducing non-native grass thatch and would have less impact on native wildflowers and special-status plants as compared with sheep or goats; and 2) there is more demand for cattle forage than for sheep or goat forage, allowing more income from leases that could be available for range improvements or ecological restoration.

As an alternative, horses would be allowed to graze as they also prefer grass and there could be some demand for forage for horses used in ranch operations. Although likely to require a subsidy, goat grazing may be useful and cost effective for small scale site-specific weed control treatments by confining goats to infested areas using temporary fencing and water trailers.

Watering Troughs. Water troughs will be installed at a number of locations on the mitigation parcels to distribute stock more evenly and where the disturbance to the substrate and vegetation by a large number of congregating animals is minimal. Preliminary locations for water troughs are described in the Grassland Management Plan (LSA and ESP, 2009) in Section 2.3.7.

7.1.2 Exotic Weed Control

Based in part on guidelines from the Solano County Weed Management Area (Solano County Weed Management Area (SCWMA), 2002) and the Greater Jepson Prairie Ecosystem Regional Management Plan (Witham, 2006a) exotic weed species can be controlled (but not necessarily eliminated) through a combination of treatments such as those described here and in the Grassland Management Plan (LSA and ESP, 2009). Species that will receive treatment as part of the exotic weed control program include:

- **Artichoke thistle (*Cynara cardunculus*).** This species is of the highest priority for control, because it occurs in a relatively few, discrete patches that could easily be eradicated. It is also highly competitive and virtually eliminates desirable plant species where it grows. It can be controlled by removing the flower-heads and spraying with the selective herbicide Garlon 3A® in March, or by cutting and spraying the base with 25 percent glyphosphate (Roundup®) from February through May.

Note: Artichoke thistle occurs only on the Southern Hills parcel where it was mapped by LSA in 2006.

- **Barbed goatgrass (*Aegilops triuncialis*).** This species is a top priority for control because it is apparently a recent introduction and has a high risk of spreading. It is unpalatable to livestock and out-competes more desirable forage species. It spreads rapidly in the fur of livestock and through wind dispersal of the seed heads. This species will be targeted for eradication before it has a chance to spread further. The Southern Hills parcel will be thoroughly surveyed for occurrences of goatgrass, which will be eradicated. Barbed goatgrass is most effectively controlled by two consecutive years of burning prior to seed maturation in the late spring or early summer. If burning is not feasible, repeated treatments with glyphosphate (Roundup®) for at least two consecutive years may be conducted prior to seed maturation in the early spring (February-April) followed by seeding of natives. Since glyphosphate is a non-selective herbicide, it should be applied by wicking or site-specific spot spraying to minimize impacts on non-target species. Repeated mowing of spot infestations of goatgrass prior to seed maturation may also be effective.
- **Perennial pepperweed (*Lepidium latifolium*).** This species is a Category B invasive noxious weed and is rated high as an invasive weed by Cal-IPC (California Invasive Plant Council (Cal-IPC), 2006). It occurs on the Director's Guild parcel. This species is a high priority for control as it spreads quickly and forms a monoculture that can cause significant degradation of wetland and riparian habitats. Heavy grazing or mowing in the winter (January-February) followed by spraying the resprouting plants from mid-March through mid-May with a form of glyphosphate (Rodeo®) that is approved for use in aquatic sites will be conducted as it was shown to be more effective than herbicide alone (Renz and DiTomaso, 1998; Renz and

DiTomaso, 2004). Since glyphosphate is a non-selective herbicide, it should be applied by wicking or site-specific spot spraying to minimize impacts on non-target species. Selective herbicides that have proven effective on this species may also be used, including 2,4-D, Telar®, or Arsenal®/Chopper®/Stalker® (Solano County Weed Management Area (SCWMA), 2002). Repeated treatments will probably be necessary to eradicate perennial pepperweed. The latter two herbicides should not be used near standing water.

Note: Perennial (broad-leaved) peppergrass occurs in one vernal pool and in ditches within and along the Director's Guild parcel. In May of 2007, seedlings of this species were hand-pulled in the vernal pool and resprouts were sprayed with Rodeo® in September. This species occurs in greater densities on the Hill Slough West Habitat Restoration Demonstration Project (CDFG). Control of this species on this preserve will be necessary in order for the control/eradication on the Director's Guild parcel to be successful.

- **Purple star-thistle (*Centaurea calcitrapa*).** Although rated as a moderate priority invasive weed by the Cal-IPC (California Invasive Plant Council (Cal-IPC), 2006), this species is a high priority for control on the Potrero Hills sites because it is prevalent throughout Solano County creating more impacts than a statewide rating system would indicate. This species, unlike yellow star-thistle, is unpalatable to livestock at all life stages and in some areas dense stands of this weed can preclude cattle from grazing (Witham, 2006a). Therefore, this species is not effectively controlled by grazing. It is typically a biennial or perennial species, with rosettes forming the first year followed by flowering the second and subsequent years. Application of glyphosphate in the late spring-early summer on the rosettes and early blooming plants after adjacent desirable annual species have set seed is an effective control (Amme, 1985). Care must be taken to limit treatment to areas devoid of native perennials as this herbicide is non-selective. Selective herbicides that are effective in these cases include 2,4-D; Clopyralid (Transline®), Dicamba®; or Garlon 3A® (Solano County Weed Management Area (SCWMA), 2002). Areas to be treated will be mowed in the early spring prior to seed set to remove standing purple star-thistle flowers and open the treated areas to grazing (DiTomaso pers. com., reported in Witham, 2006a). The herbicides should be applied on a site-specific basis to minimize impacts as they can affect desirable non-target broadleaved plants (especially Transline).

Note: Control/eradication of purple star thistle, which is prevalent on the Griffith Ranch parcel and less common on the Director's Guild, will be carried out by using a combination of mechanical and chemical means. This plant will also be removed in, and around the wet meadow on the Southern Hills parcel.

- **Yellow star-thistle (*Centaurea solstitialis*).** This species is rated as a high priority invasive species by the Cal-IPC (California Invasive Plant Council (Cal-IPC), 2006). A combination of techniques is most effective in controlling this annual species, including grazing, mowing, burning, herbicide use, and biological controls. Mid- to late spring grazing (May-June), before the plant has produced spines but after bolting, may control seed production and spread to a limited degree (Thomsen et al., 1996). Early summer grazing could be expected to reduce the number of flowers and the biomass of the plants but probably not the density of this plant on the landscape. If needed in the opinion of the Resource Manager, the grazing termination date may be extended to allow continued grazing at specified areas of infestation of star-thistle.

Where the Resource Manager determines that infestations of star-thistle are threatening the biological integrity of undeveloped lands, particularly with respect to listed animal species, a more focused management approach may be implemented. Under this approach, the infested area could be separated with temporary fencing. Grazing would be postponed within the enclosure to allow growth and elongation of the grasses and star-thistle, and then high intensity grazing would be applied during the period when star-thistle begins to emerge from the rosette and flower. Repeated treatments would be required to maintain that control. Extra livestock management would be required to keep extra animals at the site past the normal grazing period, maintain the fencing, and manage the animals. If the Resource Manager deems it appropriate, sheep or goats may be used instead of cattle for intensively managed grazing treatment of invasive species. In small areas where grazing is not feasible, mowing during the same period will be used to control yellow star-thistle. If possible, prescribed burning during this period would also help to control this species.

The Resource Manager may also consider use of one or more of the biological control agents offered by the U.S. Department of Agriculture (USDA) for yellow star-thistle. Six species of insects have been approved by the USDA for use in controlling yellow star-thistle. Three weevil species (*Bangasternus orientalis*, *Eustenopus villosus* and *Larinus curtus*) and three fly species (*Urophora sirunaseva*, *Chaetorellia australis* and *C. succinea*) can significantly reduce seed production over the long term if applied properly (Pitcairn, 1998). This option, in combination with the regular grazing regime, may be an effective long term management approach. This option would be developed by the Resource Manager in close consultation with and the approval of the USDA and the California Department of Agriculture. Finally, herbicides such as Roundup®; 2,4-D; Dicamba; or Garlon 3A® can be used to control infestations of this species if applied by personnel with a QAL prior to seed set. Clopyralid (Transline) is effective on yellow star-thistle as both a pre- and post-emergent. It is most effective when applied to the early rosette stage in January or February. Transline can severely impact certain desirable native broad-leafed plants so should be used on a site-specific basis.

- **Medusa-head (*Taeniatherum caput-medusae*).** Although this plant is not palatable after flowers have developed because of stiff pointed awns, and is low in palatability the rest of the year due to high silica content, early spring grazing when the plant is still relatively palatable may limit the spread of medusa-head (Bossard et al., 2000). If deemed appropriate by the Resource Manager, intensive grazing treatments such as those described above for star-thistle using temporary fencing could be conducted where concentrations of medusa-head occur. A carefully managed combination of prescribed fire, grazing, herbicide treatments and reseeded with native perennial grasses may be the most effective treatment of medusa-head (McKell et al., 1962) and will be considered where medusa-head is seriously threatening resource values. Medusa-head may be susceptible to intensive grazing prior to seed set from mid-February to mid-May. Treatment with glyphosphate between mid-March and mid-May may also be effective in controlling medusa-head.
- **Spiny and rough cocklebur (*Xanthium spinosum*, *X. strumarium*).** These species are not listed by Cal-IPC, but are known as “among of the world’s worst weeds” (Holm et al., 1977). The seeds are easily spread as the “hooks” on the fruits get caught in animal fur and human clothing. The species frequently outcompetes other, more desirable wetland plants, and the seeds are poisonous to livestock (Pitcher, 1989, 2001). This species occurs in and around stock ponds and seasonal wetlands in the mitigation areas, especially around stock ponds 3, 5, and 7. Hand pulling or mowing prior to the burs (fruits) forming can be an effective control

as is spraying (again prior to burs forming) with a broadleaf selective herbicide such 2,4-D or Banvel (Pitcher, 1989, 2001).

- **Other invasive species.** Other invasive non-native plants that have been identified on the mitigation parcels include sweet fennel (*Foeniculum vulgare*), bull thistle (*Cirsium vulgare*), Skeleton weed (*Chondrilla juncea*), field bindweed (*Convolvulus arvensis*), prickly ox-tongue (*Picris echioides*), Italian thistle (*Carduus pycnocephalus*), and milk thistle (*Silybum marianum*). These species will be inventoried and considered for control when they present a significant management problem, show evidence of rapid spread, or when they become priority targets as other higher priority invasive species are controlled.

Malvella leprosa is a native species growing on alkaline soils. This species may be considered a noxious weed in agronomic crops, orchards, and pasture lands (toxic to sheep and cattle), but in our opinion it is not a weed to be eliminated in those alkaline areas on the mitigation sites where it grows.

A large portion of the land surrounding the expanded landfill (Griffith Ranch mitigation area, Pond 5 Buffer Area, Southern Hills parcel, Eastern Valley, eastern Hills, and Director's Guild parcel) will be preserved and managed in perpetuity as mitigation for the operation of the expanded landfill. Management measures outlined in this document and in the Grassland Management Plan (LSA and ESP, 2009) are designed to control noxious weeds using a variety of management techniques, such as grazing, mowing, and burning (where feasible). In addition to these plans, an comprehensive exotic-species control/restoration/management plan will also be developed as a supplement to the other plans. The exotic-species control/restoration/management plan will utilize the monitoring results, from monitoring conducted for the MMP and GMP, to develop additional management measures for controlling noxious weeds.

Herbicides will be used in accordance with recommendations by the manufacturer to control some weedy plant species. Usage (including timing and other seasonal restrictions) will be specified and/or modified by the restoration specialist to minimize applications during periods of high activity by non-targeted species.

7.1.3 Rodent Control

Rodent burrows (by ground squirrel or pocket gopher) are critical to the survival of several animals, including California tiger salamander, present within the mitigation sites. Rodent control will *not* be permitted within the mitigation areas.

7.1.4 Corvid Abatement Program

In order to minimize the effect of subsidizing corvid predators, PHLF will develop a corvid abatement program. The program will expand the abatement program currently targeted at gulls that uses pyrotechnics, falcons, and dogs. Other measures will also be developed to limit food to the corvid predators, particularly during the spring breeding season. Measures will include:

- Minimizing the amount of time that waste is left uncovered,
- Minimizing the active face of the landfill, and
- Sufficiently compacting the waste to reduce its desirability as a food source or as feeding grounds.

A monitoring program will be implemented to assess the success of the abatement program and to recommend and implement changes to the program as needed. A qualified wildlife biologist will assess the effectiveness of the program at least twice a year and make recommendations regarding changes to the program if needed.

PHLF will have a qualified wildlife biologist review the design of new fixed structures such as light poles or transmission line towers that may provide nesting sites for corvids. The biologist will recommend ways to limit the suitability of the new structures as corvids nest sites.

Trees and shrubs planted on the mitigation sites will be low growing (6-20 feet) so as to be less attractive to corvids as nest sites.

7.2 MAINTENANCE SCHEDULE

Weed control activities will occur four times per year for a minimum of five years. A long-term maintenance plan will be outlined in the final annual report submitted to the Corps, RWQCB and CDFG prior to sign-off. The program will be performed in perpetuity and will include repair of significant erosion.

7.3 RESPONSIBLE PARTIES

PHLF will be responsible for all short and long-term maintenance of onsite mitigation areas.

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8.0 MONITORING REPORTS

8.1 AS-BUILT REPORT

As-built reports will be submitted 6 weeks after completion of site preparation and seeding.

8.2 ANNUAL REPORTS

Annual reports will be submitted to the Corps, RWQCB, and CDFG by September 30 of each year until the end of the monitoring period. The annual reports will include an evaluation of the progress of the mitigation site towards the performance standards, photographs taken from standardized photo points, and maintenance notes. The report will briefly discuss the findings of the monitoring visits and will include a discussion of the conditions of the vernal pool, wetlands, and drainage channels, the necessity for reseeding, and recommendations for future maintenance and monitoring activities. The reports will include lists of animals and animal signs observed in the project area (based on the annual wildlife surveys and incidental observation).

Additional reports will be produced if a need for major corrective action is identified. These reports will identify the performance problem and will include a schedule for taking corrective action. These reports will be submitted to the Corps, RWQCB, and CDFG within 90 days of the date that a need for corrective action is recognized.

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9.0 CONTINGENCY MEASURES

9.1 INITIATING PROCEDURES

Remedial measures to correct non-attainment of success criteria may include one or more of the following: regrading, reseeding or replanting. Other measures may apply as appropriate, if approved by the Corps, RWQCB, USFWS, and CDFG.

Should monitoring in year 1 indicate that there is insufficient inflow or water retention in some wetlands, then minor regrading or adjustments in outlet elevations may be made to achieve proper hydrologic functioning. Prior to any regrading, if necessary, the top three inches of soil should be scraped and temporarily stockpiled to ensure seed bank survival. Following regrading, the topsoil will be re-spread in the depression and the surrounding upland area seeded and as described above in the Implementation section. Regrading will be conducted only in the late summer/early fall, after all the plants have set seed.

Should monitoring indicate that soils are allowing water to percolate at an excessive rate (and assuming there are adequate water inputs to the pools and ponds), then additional clay subsoils will be obtained spread onto the bottom of the wetland area as needed. Prior to application, the top three inches of soil will be scraped from the pools or ponds and temporarily stockpiled. All exposed soil will be seeded as described above in the Implementation section. This work will be conducted in the late summer/early fall, if necessary.

Accelerated erosion of onsite watersheds as indicated by qualitative observation should be corrected by minor re-grading of uplands and local reseeding and mulching. Further erosion of offsite watersheds is unlikely based on existing patterns of use. However, should it occur, temporary silt fencing will be installed (keyed into the soil surface) on the upslope part of the pools to trap incoming sediment. Following vegetative stabilization of the area, the silt fences will be removed and the accumulated sediment disposed of properly.

Insufficient germination/survival of seeds and plugs (assuming adequate soil moisture levels) will be corrected locally by reseeding and/or replanting. Seeds and plants will be obtained from local sources only and in such a way that donor populations would not be adversely affected.

If in the opinion of the U.S. Fish and Wildlife Service, California Department of Fish and Game, and PHLF, mitigation cannot be completed or is unsuccessful onsite, then an alternative mitigation site may be used to accomplish the mitigation goals. The preferred alternative site is the Elsie Gridley Preserve located northeast of the Potrero Hills. This mitigation bank could be used to satisfy mitigation requirements in the event that restoration and construction activities are unsuccessful on the mitigation parcels. Every effort will be made, however, to mitigate all impacts from the Phase II expansion in the secondary management zone in order to provide a nexus between the impact and mitigation.

9.2 CONTINGENCY FUNDING

The project applicant has purchased credits from the Gridley Preserve to be kept in reserve as a contingent mitigation measure. The project applicant will include contingency funding in the mitigation implementation and monitoring budgets to ensure that remedial work can be completed in an appropriate and timely manner.

10.0 COMPLETION OF MITIGATION RESPONSIBILITIES

10.1 NOTIFICATION

When the initial monitoring period is complete or when the final success criteria have been met (whichever is later), the Corps and RWQCB shall be notified by letter that the mitigation requirements have been met. This letter will accompany the final annual report detailing the attainment of the performance criteria as established in the plan. The annual report will include an overall evaluation of the success of the mitigation project and current jurisdictional wetland delineation, including data sheets, and biological survey results.

10.2 CONFIRMATION

Following receipt of the final monitoring report, the Corps and RWQCB will confirm the successful completion of the mitigation requirements. If additional monitoring is required, written notification of the additional requirements will be provided to the project applicant detailing the additional monitoring requirements and the basis for the additional monitoring.

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11.0 LONG-TERM MANAGEMENT

11.1 PROPERTY OWNERSHIP

The six mitigation areas will continue to be owned by PHLF following completion of the mitigation requirements. PHLF will therefore be responsible for the long-term management of these lands. Correspondence regarding the mitigation sites should be addressed to:

Potrero Hills Landfill, Inc.
PO Box 68
Fairfield, CA 94533
(707) 396-1366
(707) 432-4630, fax
Attn: Jim Dunbar, PE

11.2 RESOURCE MANAGER

Prior to mitigation sign-off, PHLF will identify a qualified long-term Resource Manager who is licensed by the State as a certified rangeland manager and acceptable to the regulating agencies. The Resource Manager could be hired as a part-time employee of the Landfill, a consultant under contract to the Landfill, or a staff member of a non-profit public benefit land trust (e.g., the Solano Land Trust) provided under a conservation agreement. The Resource Manager may employ laborers or technicians to provide maintenance, erosion control, weed control, and trash removal activities. Funding for these activities, including salaries, will be provided by grazing fees and the Mitigation Endowment Fund. The Resource Manager's responsibilities and duties will include working with the grazing lessee (see below) to:

- Maintain fencing, livestock water facilities, and signage;
- Coordinate and oversee trash removal;
- Coordinate and oversee thatch (residual dry matter-RDM) removal, invasive non-native plant species control, and native plant revegetation activities;
- Review biological/rangeland monitoring data;
- Maintain records of RMP activities, correspondence, and decisions;
- Conduct general inspections of the mitigation areas;
- Recommend and implement corrective actions to attain the goals of the RMP;
- Coordinate with the Solano County Mosquito Abatement District to expedite mosquito control measures;
- Ensure compliance with rules and regulations protecting resource values and coordinate enforcement activities with the Solano County Sherriff's Department;
- Recommend and implement volunteer educational or habitat restoration programs.

11.3 SITE PROTECTION

11.3.1 Funding

The Project applicant will fund all the mitigation work described in this Plan, including creation and monitoring of the mitigation areas, and implementation of the grassland management plan and exotic

weed control plan. Additionally, the project applicant will fund the completion of all legal documents to place all preserved lands in conservation easements. The Project applicant will establish an endowment for implementation of this mitigation plan. The non-wasting principal of the endowment will generate sufficient money to annually implement this plan in perpetuity. The amount of the endowment will be determined in consultation with the County, U.S. Fish and Wildlife Service, and the California Department of Fish and Game.

11.3.2 Conservation Easements on Preserved Lands

Following acceptance of this plan by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG), the 963-acre mitigation area consisting of the Southern Hills parcel (APN 0046120440), Pond 5 Buffer Area of the Phase II expansion Parcel (southern corner of APN 0046120450), Eastern Valley (APN 0046120210), Eastern Hills (00461220220), the Griffith Ranch parcel (APN 0046120400), and the Director's Guild parcel (APN 0046130170) will be protected by a conservation easement running with the lands in perpetuity. The conservation easements will be in favor of the California Department of Fish and Game or another conservation organization (e.g., Solano Land Trust), and will be recorded within 6 months of acceptance of this plan by the U.S. Fish and Wildlife Service and the California Department of Fish and Game. The easement will be in a format approved by both agencies. A draft conservation agreement is included in Appendix D.

11.4 LONG-TERM MANAGEMENT PLAN

A long term management plan will be prepared by Potrero Hills Landfill's biological consultants by the end of Year 5 of the monitoring period. The long term management plan will identify the tasks that will be implemented by the resource manager (long-term manger) on a periodic basis to maintain the site as wildlife and plant habitat in perpetuity. In addition, the plan will identify monitoring schedules for listed and special-status species and actions to be implemented if declines in species are identified. The plan will be submitted to the Corps, USFWS, and CDFG for review and approval. Data gathered during the first 5 years of monitoring will be used to determine the appropriate actions for long-term management.

12.0 REPORT PREPARATION

12.1 LSA ASSOCIATES, INC.

Timothy Lacy, LSA Project Manager/Wildlife Biologist

Steve Foreman, Principal/Wildlife Biologist

Rebecca Doubledee, Wildlife Biologist

Greg Gallagher, GIS Specialist/Botanist

Eva Buxton, Senior Botanist

Lori Banister, GIS Specialist/Biologist

12.2 ENVIRONMENTAL STEWARDSHIP AND PLANNING, INC.

Steve Peterson, AICP/Managing Principal

Amanda Rose, Senior Associate

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13.2 PERSONAL COMMUNICATIONS

Brad Shaffer. University of California at Davis May 2005.

Michelle Tovar, USFWS Biologist, Sacramento Field Office. Meeting with Potrero Hills Landfill November 28, 2007.

APPENDIX A

SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING ON THE PHASE II POTRERO HILLS LANDFILL EXPANSION SITE

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Appendix A. Special-Status Species Potentially Occurring on the
Phase II Potrero Hills Landfill Expansion Site

Table 4.2-1 Special-Status Species Potentially Occurring in the Potrero Hills Landfill Expansion Area					
Species	Federal	State	CNPS	Habitat	Potential for Occurrence
Plants					
Alkali milkvetch <i>Astragalus tener</i> var. <i>tener</i>			1B	Playas, grasslands (adobe clay), vernal pools (alkaline)	Unlikely to occur; not found during surveys.
Heartscale <i>Atriplex cordulata</i>			1B	Meadows, grasslands (sandy)/saline or alkaline	Unlikely to occur; not found during surveys.
Brittlescale <i>Atriplex depressa</i>			1B	Meadows, playas, grasslands, vernal pools/alkaline, clay	Not found during surveys of expansion area, but observed elsewhere in the valley.
San Joaquin spearscale <i>Atriplex joaquiniana</i>			1B	Meadows, playas, grasslands/ alkaline	Not found during year 2000 or 2003 surveys, however this species was found in 1998 and 2004 within the proposed project area.
Pappose tarplant <i>Centromadia parryi</i> ssp. <i>parryi</i>			1B	Chaparral, coastal prairie, meadows and seeps, marshes and swamps, valley and foothill grassland (vernally mesic/often alkaline)	Observed during surveys of the Phase II area in 2006 and 2007.
Hispid birds-beak <i>Cordylanthus mollis</i> ssp. <i>hispidus</i>			1B	Meadows, playas, grasslands/ alkaline	Unlikely to occur; not found during surveys.
Recurved larkspur <i>Delphinium recurvatum</i>			1B	Grasslands, vernal pools/ alkaline	Unlikely to occur; not found during surveys.
Dwarf downingia <i>Downingia pusilla</i>			2	Grasslands (mesic), vernal pools	Unlikely to occur; not found during surveys.
Adobe lily <i>Fritillaria pluriflora</i>			1B	Grasslands/often adobe	Unlikely to occur; not found during surveys.
Brewer's western flax <i>Hesperolinon breweri</i>			1B	Grassland, mostly serpentinite	Unlikely to occur; no serpentinite present and not found during surveys.
Carquinez goldenbush <i>Isocoma arguta</i>			1B	Grasslands, alkaline	Unlikely to occur; not found during surveys.

Species	Federal	State	CNPS	Habitat	Potential for Occurrence
Contra Costa goldfields <i>Lasthenia conjugens</i>	E		1B	Playas (alkaline), grasslands, vernal pools/mesic	Unlikely to occur; not found during surveys.
Legenere <i>Legenere limosa</i>			1B	Vernal pools	Unlikely to occur; not found during surveys.
Showy Indian clover <i>Trifolium amoenum</i>	E	-	1B	Grasslands, sometimes serpentinite	Unlikely to occur; not found during surveys.

Species	USFWS	CDFG	CNPS	Habitat	Potential for Occurrence
Invertebrates					
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T		N/A	Vernal pools and other seasonal wetlands	Could occur; suitable habitat present, but not found during surveys.
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	E		N/A	Vernal pools and other seasonal wetlands	Could occur; suitable habitat present, but not found during surveys.
California fairy shrimp <i>Lindleriella occidentalis</i>			N/A	Vernal pools and other seasonal wetlands	Known to occur.
Vernal pool tadpole shrimp <i>Lepidurus packardi</i>	E		N/A	Vernal pools and other seasonal wetlands	Could occur; suitable habitat present, but not found during surveys.
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T		N/A	Elderberry shrubs	Could occur; elderberry shrubs present.
Callippe silverspot butterfly <i>Speyeria callippe callippe</i>	E		N/A	Grasslands with hills, nectar plants, and larval food plants (<i>Viola pedunculata</i>)	Unlikely to occur; not found during surveys.
Amphibians					
California tiger salamander <i>Ambystoma californiense</i>	T	SC,CSC	N/A	Vernal pools and small ponds for breeding; seek cover in burrows, rock crevices, and under logs	Known to occur.

Table 4.2-1 Special-Status Species Potentially Occurring in the Potrero Hills Landfill Expansion Area					
Species	USFWS	CDFG	CNPS	Habitat	Potential for Occurrence
California red-legged frog <i>Rana aurora draytonii</i>	T	CSC	N/A	Deep, still or slow-moving water with dense shrubby riparian and/or emergent vegetation.	Unlikely to occur; not found during surveys.
Reptiles					
Western pond turtle <i>Actinemys marmorata</i>		CSC	N/A	Still waters, ponds, slow streams with instream or bank resting sites	Unlikely to occur; not found during surveys.
Birds					
White-tailed kite <i>Elanus leucurus</i>		CSC FP	N/A	Forage in grasslands and agricultural fields; nest in isolated trees or small woodland patches	Could occur; suitable foraging and nesting habitat present.
Northern harrier <i>Circus cyaneus</i>		CSC	N/A	Grasslands and freshwater marsh	Could occur; suitable foraging habitat present, but no suitable nesting habitat present.
Ferruginous hawk <i>Buteo regalis</i>		CSC	N/A	Forages in grasslands, agricultural fields, and other open habitats	Could occur; suitable foraging habitat present, but not within breeding range.
Golden eagle <i>Aquila chrysaetos</i>		CSC FP	N/A	Forages in grasslands and other open habitats; nests on cliffs and in tall trees.	Suitable foraging habitat present, known to nest in eucalyptus grove approximately 1,500 feet south of landfill (JSA, 1995).
Merlin <i>Falco columbarius</i>		CSC	N/A	Forages in grasslands, agricultural fields, marshes, and other open habitats	Could occur; suitable foraging habitat present, but not within breeding range.
Prairie falcon <i>Falco mexicanus</i>			N/A	Forages in grasslands, agricultural fields, marshes, and other open habitats	Could occur; suitable foraging habitat present, but not expected to nest nearby.

Table 4.2-1 Special-Status Species Potentially Occurring in the Potrero Hills Landfill Expansion Area					
Species	USFWS	CDFG	CNPS	Habitat	Potential for Occurrence
Peregrine falcon <i>Falco peregrinus</i>		E	N/A	Forages in marshes and grasslands.	Could occur; suitable foraging habitat present, but not expected to nest nearby.
Long-billed curlew <i>Numenius americanus</i>		CSC	N/A	Marshes, grasslands, irrigated, pastures, alfalfa, and fallow fields	Known to occur; suitable foraging habitat present, but not within breeding range.
Short-eared owl <i>Asio flammeus</i>		CSC	N/A	Forages in open habitats; nests in marsh and grasslands	Could occur; suitable foraging habitat present, but no suitable nesting habitat.
Burrowing owl <i>Athene cunicularia</i>		CSC	N/A	Grasslands and agricultural fields	Known to occur in winter; suitable foraging and nesting habitat present, but has not been observed to nest onsite.
Loggerhead shrike <i>Lanius ludovicianus</i>		CSC	N/A	Forages in grasslands, and agricultural fields; nests in scattered shrubs and trees	Known to occur; suitable foraging habitat present, but nesting habitat very limited.
Tricolored blackbird <i>Agelaius tricolor</i>		CSC	N/A	Forages in grasslands and agricultural fields; nests in freshwater marsh with dense cattails and tules, and dense riparian scrub	Known to occur; suitable foraging habitat present, but no suitable nesting habitat onsite.
<p>Federal Listing Categories: E Federal Endangered T Federal Threatened C Federal Candidate Species PT Proposed for Listing as Threatened State Listing Categories: E California Endangered T California Threatened SC State Candidate CSC California Species of Concern FP Fully Protected California Native Plant Society (CNPS) Categories: 1B Plant rare or endangered in California and elsewhere 2 Plant rare or endangered in California, but more common elsewhere N/A Not applicable</p> <p>Source: EDAW, 2005. Draft Environmental Impact Report for the Potrero Hills Landfill Expansion Project. Report No.: SCH#2003032112 Prepared for Solano County Department of Environmental Management. Prepared by EDAW, Sacramento, CA.</p>					

APPENDIX B

PLANT SPECIES OBSERVED AT THE PHASE II POTRERO HILLS LANDFILL EXPANSION SITE, SOLANO COUNTY

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Appendix B. Plant Species Observed on the Potrero Hills Landfill Phase II Expansion Site and Mitigation Sites.

Plant Species Observed at the Phase II Expansion Area Potrero Hills Landfill, Solano County March 24 and 25, May 6 and 7, June 25, August 20 and 21, 2008	
Species	Common Name
<i>Achillea millefolium</i>	common yarrow
<i>Achyrachaena mollis</i>	blow-wives
<i>Aegilops truncialis</i>	barbed goatgrass
<i>Agoseris grandiflora</i>	bigflower agoseris
<i>Agrostis pallens</i>	thin grass
<i>Aira caryophyllea</i>	silver hairgrass
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	common fiddleneck
<i>Anagallis arvensis</i>	scarlet pimpernel
<i>Anthoxanthum odoratum</i>	sweet vernal grass
<i>Atriplex cordulata</i> *	heartscale
<i>Atriplex joaquiniana</i> *	San Joaquin spearscale
<i>Avena barbata</i>	slender wild oat
<i>Avena fatua</i>	wild oats
<i>Baccharis pilularis</i>	coyote brush
<i>Bellardia trixago</i>	Mediterranean lineseed
<i>Blennosperma nanum</i> var. <i>nanum</i>	common blennosperma
<i>Brassica nigra</i>	black mustard
<i>Briza minor</i>	little rattlesnake grass
<i>Brodiaea elegans</i>	harvest brodiaea
<i>Bromus alopecurosus</i>	weedy brome
<i>Bromus diandrus</i>	ripgut grass
<i>Bromus hordeaceus</i>	soft chess
<i>Bromus madritensis</i>	compact brome
<i>Calandrinia ciliata</i>	red maids
<i>Callitriche marginata</i>	California water-starwort
<i>Calystegia</i> sp.	morning-glory
<i>Capsella bursa-pastoris</i>	shepherd's purse
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Centaurea calcitrapa</i>	purple star thistle
<i>Centaurea solstitialis</i>	yellow star thistle
<i>Centromadia parryi</i> ssp. <i>parryi</i>	pappose tarplant
<i>Cerastium glomeratum</i>	mouse-ear chickweed
<i>Chamomilla suaveolens</i>	pineapple weed
<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	soap plant
<i>Chondrilla juncea</i>	skeleton weed
<i>Cirsium vulgare</i>	bull thistle
<i>Claytonia perfoliata</i>	miner's lettuce
<i>Convolvulus arvensis</i>	field bindweed
<i>Cotula coronopifolia</i>	brass buttons
<i>Crassula connata</i>	sand pygmyweed

Plant Species Observed at the Phase II Expansion Area Potrero Hills Landfill, Solano County March 24 and 25, May 6 and 7, June 25, August 20 and 21, 2008	
Species	Common Name
<i>Croton setigerus</i>	dove weed
<i>Crypsis schoenoides</i>	cowpond grass
<i>Cynara cardunculus</i>	artichoke thistle
<i>Cynodon dactylon</i>	Bermuda grass
<i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>	blue dicks
<i>Distichlis spicata</i>	saltgrass
<i>Eleocharis macrostachya</i>	common spikerush
<i>Elymus glaucus</i>	blue wildrye
<i>Erodium botrys</i>	long-beaked filaree
<i>Erodium cicutarium</i>	red-stemmed filaree
<i>Erodium moschatum</i>	white-stemmed filaree
<i>Eryngium aristulatum</i> var. <i>aristulatum</i>	button celery
<i>Eschscholzia californica</i>	California poppy
<i>Eucalyptus camaldulensis</i>	red gum
<i>Filago gallica</i>	narrow-leaved gallica
<i>Foeniculum vulgare</i>	fennel
<i>Frankenia salina</i>	alkali heath
<i>Geranium dissectum</i>	cut-leaf geranium
<i>Geranium molle</i>	cranes-bill geranium
<i>Gnaphalium luteo-album</i>	weedy cudweed
<i>Grindelia camporum</i>	Great Valley gumplant
<i>Hemizonia congesta</i>	hayfield tarweed
<i>Hemizonia fitchii</i>	Fitch's tarweed
<i>Hesperis matronalis</i> var. <i>sparsiflora</i>	evax
<i>Heterotheca grandiflora</i>	telegraph weed
<i>Holcarpha virgata</i>	narrow tarplant
<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i>	meadow barley
<i>Hordeum marinum</i> ssp. <i>gussonianum</i>	Mediterranean barley
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail barley
<i>Hypochaeris glabra</i>	smooth cat's ear
<i>Hypochaeris radicata</i>	rough cat's ears
<i>Juncus balticus</i>	Baltic rush
<i>Juncus bufonius</i>	toad rush
<i>Juncus</i> sp.	rush
<i>Lactuca saligna</i>	willowleaf lettuce
<i>Lactuca serriola</i>	prickly lettuce
<i>Lamium amplexicaule</i>	henbit
<i>Lasthenia californica</i>	California goldfields
<i>Lepidium nitidum</i> var. <i>nitidum</i>	shining peppergrass
<i>Leymus triticoides</i>	creeping wild rye
<i>Lilaea scilloides</i>	flowering quillwort
<i>Lolium multiflorum</i>	Italian ryegrass
<i>Lomatium</i> sp.	biscuitroot

Plant Species Observed at the Phase II Expansion Area Potrero Hills Landfill, Solano County March 24 and 25, May 6 and 7, June 25, August 20 and 21, 2008	
Species	Common Name
<i>Lotus corniculatus</i>	birdfoot trefoil
<i>Lotus wrangelianus</i>	common trefoil
<i>Lupinus bicolor</i>	dove lupine
<i>Lythrum hyssopifolium</i>	hyssop loosestrife
<i>Malva neglecta</i>	bull mallow
<i>Malvella leprosa</i>	alkali mallow
<i>Medicago polymorpha</i>	burclover
<i>Melilotus indica</i>	sourclover
<i>Microseris acuminata</i>	needle microseris
<i>Microseris douglasii</i> ssp. <i>douglasii</i>	Douglas microseris
<i>Microseris douglasii</i> ssp. <i>tenella</i>	Douglas' silverpuffs
<i>Montia fontana</i>	water chickweed
<i>Nassella pulchra</i>	purple needle grass
<i>Nerium oleander</i>	oleander
<i>Parapholin incurva</i>	sickle grass
<i>Phalaris paradoxa</i>	Hood canary grass
<i>Picris echioides</i>	bristly ox-tongue
<i>Plagiobothrys stipitatus</i> var. <i>micranthus</i>	valley popcorn flower
<i>Plagiobothrys greenii</i>	Greene's popcorn flower
<i>Plantago erecta</i>	California plantain
<i>Plantago lanceolata</i>	English plantain
<i>Pleuropogon californicus</i>	semaphore grass
<i>Poa annua</i>	annual bluegrass
<i>Poa bulbosa</i>	bulbous bluegrass
<i>Polygonum arenastrum</i>	common knotweed
<i>Polypogon monspeliensis</i>	rabbit foot grass
<i>Psilocarpus</i> sp.	woolly marbles
<i>Ranunculus muricatus</i>	prickly-fruited buttercup
<i>Raphanus sativus</i>	wild radish
<i>Rumex acetosella</i>	sheep sorrel
<i>Rumex crispus</i>	curly dock
<i>Rumex pulcher</i>	fiddle dock
<i>Salix laevigata</i>	red willow
<i>Sanicula bipinnata</i>	poison sanicle
<i>Sanicula bipinnatifida</i>	purple sanicle
<i>Scandix pecten-veneris</i>	shepherd's needles
<i>Senecio vulgaris</i>	common groundsel
<i>Sidalcea malviflora</i> ssp. <i>malviflora</i>	common checkerbloom
<i>Silene gallica</i>	windmill pink
<i>Silybum marianum</i>	milk thistle
<i>Sinapis arvensis</i>	charlock
<i>Sisymbrium officinale</i>	hedge mustard
<i>Sisyrinchium bellum</i>	blue-eyed grass

Plant Species Observed at the Phase II Expansion Area Potrero Hills Landfill, Solano County March 24 and 25, May 6 and 7, June 25, August 20 and 21, 2008	
Species	Common Name
<i>Spergula arvensis</i> ssp. <i>arvensis</i>	stickwort
<i>Stellaria media</i>	chickweed
<i>Thaeniatherum caput-medusae</i>	Medusahead
<i>Torilis nodosa</i>	knotted hedge parsley
<i>Tragopogon porrifolius</i>	oyster plant
<i>Trifolium depauperatum</i> var. <i>depauperatum</i>	cowbag clover
<i>Trifolium depauperatum</i> var. <i>truncatum</i>	common pale sack clover
<i>Trifolium hirtum</i>	rose clover
<i>Trifolium fragiferum</i>	strawberry clover
<i>Trifolium glomeratum</i>	clustered clover
<i>Trifolium subterraneum</i>	subterranean clover
<i>Trifolium variegatum</i>	white-tipped clover
<i>Trifolium willdenovii</i>	tomcat clover
<i>Triphysaria eriantha</i> ssp. <i>eriantha</i>	butter-and-eggs
<i>Triphysaria pusilla</i>	dwarf owl's clover
<i>Triphysaria versicolor</i> ssp. <i>faucibarbata</i>	smooth owl's-clover
<i>Triteleia hyacinthina</i>	white brodiaea
<i>Triteleia laxa</i>	Ithuriel's spear
<i>Veronica peregrine</i> ssp. <i>xalapensis</i>	purslane speedwell
<i>Vicia villosa</i> ssp. <i>varia</i>	winter vetch
<i>Viola pedunculata</i>	Johnny-jump-up
<i>Vulpia myuros</i> var. <i>myuros</i>	zorro grass
<i>Wyethia angustifolia</i>	narrow-leaf mule-ears
<i>Xanthium spinosum</i>	spiny clotbur

Note. * Special-status species.

Plant Species Observed at the Pond 5 Buffer Area (Phase II parcel) Potrero Hills Landfill, Solano County March 24, , May 5, 6 and 7, June 25, August 20, 2008	
Species	Common Name
<i>Achillea millefolium</i>	common yarrow
<i>Achyrrachaena mollis</i>	blow-wives
<i>Aegilops truncialis</i>	barbed goat grass
<i>Agoseris grandiflora</i>	bigflower agoseris
<i>Aira caryophyllea</i>	silver hairgrass
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	common fiddleneck
<i>Asclepias fascicularis</i>	narrow-leaf milkweed
<i>Avena barbata</i>	slender wild oat
<i>Bellardia trixago</i>	Mediterranean lineseed
<i>Blennosperma nanum</i> var. <i>nanum</i>	common blennosperma
<i>Brassica nigra</i>	black mustard
<i>Brisa minor</i>	little quaking grass
<i>Brodiaea elegans</i>	harvest brodiaea
<i>Bromus alopecurus</i>	weedy brome
<i>Bromus diandrus</i>	riggut grass
<i>Bromus hordeaceus</i>	soft chess
<i>Bromus madritensis</i>	compact brome
<i>Calandrinia ciliata</i>	red maids
<i>Calystegia subacaulis</i>	hillside false bindweed
<i>Capsella bursa-pastoris</i>	shepherd's purse
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Castilleja attenuata</i>	narrow-leaved owl's clover
<i>Centaurea calcitrapa</i>	purple star thistle
<i>Cerastium glomeratum</i>	mouse-ear chickweed
<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	soap plant
<i>Chondrilla juncea</i>	skeleton weed
<i>Cirsium vulgare</i>	Bull thistle
<i>Convolvulus arvensis</i>	field bindweed
<i>Crassula connata</i>	sand pygmyweed
<i>Croton setigerus</i>	dove weed
<i>Cynara cardunculus</i>	artichoke
<i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>	blue dicks
<i>Epilobium brachycarpum</i>	annual tall willowherb
<i>Erodium botrys</i>	long-beaked filaree
<i>Erodium cicutarium</i>	red-stemmed filaree
<i>Erodium moschatum</i>	white-stemmed filaree
<i>Eschscholzia californica</i>	California poppy
<i>Filago gallica</i>	narrow-leaved gallica
<i>Geranium dissectum</i>	cut-leaf geranium
<i>Geranium molle</i>	cranes-bill geranium
<i>Gnaphalium luteo-album</i>	weedy cudweed
<i>Hemizonia congesta</i>	hayfield tarweed

Plant Species Observed at the Pond 5 Buffer Area (Phase II parcel) Potrero Hills Landfill, Solano County March 24, , May 5, 6 and 7, June 25, August 20, 2008	
Species	Common Name
<i>Hemizonia fitchii</i>	Fitch's tarweed
<i>Hesperevax sparsiflora</i> var. <i>sparsiflora</i>	evax
<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i>	meadow barley
<i>Hordeum marinum</i> ssp. <i>gussonianum</i>	Mediterranean barley
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail barley
<i>Hypochaeris glabra</i>	smooth cat's ear
<i>Juncus balticus</i>	Baltic rush
<i>Koeleria macrantha</i>	prairie junegrass
<i>Lagophylla ramosissima</i>	branched lagophylla
<i>Lepidium latifolium</i>	perennial peppergrass
<i>Lepidium latipes</i> var. <i>latipes</i>	dwarf peppergrass
<i>Lepidium nitidum</i> var. <i>nitidum</i>	shining peppergrass
<i>Lepidium oxycarpum</i>	sharp-pod peppergrass
<i>Leymus triticoides</i>	creeping wild rye
<i>Lolium multiflorum</i>	Italian ryegrass
<i>Lotus corniculatus</i>	birdfoot trefoil
<i>Lotus wrangelianus</i>	common trefoil
<i>Lupinus bicolor</i>	dove lupine
<i>Lythrum hyssopifolium</i>	hyssop loosestrife
<i>Malva neglecta</i>	mallow
<i>Malvella leprosa</i>	alkali mallow
<i>Medicago polymorpha</i>	burclover
<i>Micropus californicus</i>	California rock rose
<i>Microseris douglasii</i> ssp. <i>tenella</i>	Dougl's silverpuffs
<i>Montia fontana</i>	water chickweed
<i>Nassella pulchra</i>	purple needle grass
<i>Picris echioides</i>	bristly ox-tongue
<i>Plagiobothrys greenei</i>	Greene's popcornflower
<i>Plantago erecta</i>	California plantain
<i>Plantago lanceolata</i>	English plantain
<i>Poa annua</i>	annual bluegrass
<i>Poa bulbosa</i>	bulbous bluegrass
<i>Polygonum arenastrum</i>	common knotweed
<i>Polypogon monspeliensis</i>	rabbitfoot grass
<i>Ranunculus californicus</i>	California buttercup
<i>Ranunculus muricatus</i>	prickly-fruited buttercup
<i>Raphanus sativus</i>	wild radish
<i>Rumex acetosella</i>	sheep sorrel
<i>Rumex crispus</i>	curly dock
<i>Rumex pulcher</i>	fiddle dock
<i>Sanicula bipinnata</i>	poison sanicle
<i>Scandix pecten-veneris</i>	shepherd's needles
<i>Senecio vulgaris</i>	common groundsel

Plant Species Observed at the Pond 5 Buffer Area (Phase II parcel) Potrero Hills Landfill, Solano County March 24, , May 5, 6 and 7, June 25, August 20, 2008	
Species	Common Name
<i>Sidalcea malviflora</i> ssp. <i>malviflora</i>	common checkerbloom
<i>Silene gallica</i>	windmill pink
<i>Silybum marianum</i>	milk thistle
<i>Sisymbrium officinale</i>	hedge mustard
<i>Sisyrinchium bellum</i>	blue-eyed grass
<i>Spergula arvensis</i> ssp. <i>arvensis</i>	stickwort
<i>Spergularia marina</i>	salt marsh sand-spurrey
<i>Taeniatherum caput-medusae</i>	Medusa-head
<i>Trifolium depauperatum</i> var. <i>truncatum</i>	common pale sack clover
<i>Trifolium gragiferum</i>	strawberry clover
<i>Trifolium hirtum</i>	rose clover
<i>Trifolium willdenovii</i>	tomcat clover
<i>Triphysaria eriantha</i> ssp. <i>eriantha</i>	butter-and-eggs
<i>Triphysaria versicolor</i> ssp. <i>faucibarbata</i>	smooth owl's-clover
<i>Triteleia laxa</i>	Ithuriel's spear
<i>Urtica urens</i>	dwarf nettle
<i>Vicia benghalensis</i>	purple vetch
<i>Vicia sativa</i> ssp. <i>nigra</i>	common vetch
<i>Vicia villosa</i> ssp. <i>varia</i>	winter vetch
<i>Viola pedunculata</i>	Johnny-jump-up
<i>Vulpia myuros</i> var. <i>myuros</i>	zorro grass
<i>Wyethia angustifolia</i>	narrow-leaf mule-ears
<i>Xanthium strumarium</i>	cochlebur

**Plant Species Observed at the Eastern Valley Mitigation Area
Potrero Hills Landfill, Solano County
March 12, 25, and 27, May 5, June 23, 24, and 25, August 18 and 20, 2008**

Species	Common Name
<i>Achillea millefolium</i>	common yarrow
<i>Achyrachaena mollis</i>	blow-wives
<i>Aegilops truncialis</i>	barbed goatgrass
<i>Agoseris grandiflora</i>	bigflower agoseris
<i>Aira caryophyllea</i>	silver hairgrass
<i>Amaranthus blitoides</i>	mat amaranth
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	common fiddleneck
<i>Amsinckia menziesii</i> var. <i>menziesii</i>	rancher's fireweed
<i>Asclepias fascicularis</i>	narrow-leaved milkweed
<i>Atriplex coronata</i> var. <i>coronata</i> *	crownscale
<i>Avena barbarta</i>	slender wild oat
<i>Avena fatua</i>	wild oat
<i>Baccharis pilularis</i>	coyote brush
<i>Bellardia trixago</i>	Mediterranean linseed
<i>Brassica nigra</i>	black mustard
<i>Briza maxima</i>	rattlesnake grass
<i>Briza minor</i>	little rattlesnake grass
<i>Brodiaea elegans</i>	harvest brodiaea
<i>Bromus alopecuroides</i>	weedy brome
<i>Bromus diandrus</i>	ripgut grass
<i>Bromus hordeaceus</i>	soft chess
<i>Bromus madritensis</i> ssp. <i>rubens</i>	red brome
<i>Calandrinia ciliata</i>	red maids
<i>Callitriche marginata</i>	California water-starwort
<i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>	morning-glory
<i>Capsella bursa-pastoris</i>	shepherd's purse
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Castilleja attenuata</i>	Valley tassels
<i>Castilleja exserta</i> ssp. <i>exserta</i>	purple owl's-clover
<i>Centaurea calcitrapa</i>	purple star thistle
<i>Centaurea melitensis</i>	tocolote
<i>Centaurea solstitialis</i>	yellow star thistle
<i>Centromadia parryi</i> ssp. <i>parryi</i>	pappose tarplant
<i>Cerastium glomeratum</i>	mouse-ear chickweed
<i>Chamomilla suaveolens</i>	pineapple weed
<i>Chlorogalum pomeridianum</i>	soap plant
<i>Chondrilla juncea</i>	skeleton weed
<i>Cirsium vulgare</i>	Bull thistle
<i>Claytonia perfoliata</i>	miner's lettuce
<i>Convolvulus arvensis</i>	field bindweed
<i>Cotula australis</i>	southern brassbuttons

**Plant Species Observed at the Eastern Valley Mitigation Area
Potrero Hills Landfill, Solano County
March 12, 25, and 27, May 5, June 23, 24, and 25, August 18 and 20, 2008**

Species	Common Name
<i>Cotula coronopifolia</i>	brassbuttons
<i>Crassula connata</i>	sand pygmyweed
<i>Croton setigerus</i>	dove weed
<i>Crypsis schoenoides</i>	cowpond grass
<i>Cynara cardunculus</i>	artichoke thistle
<i>Cynodon dactylon</i>	Bermuda grass
<i>Cynosurus echinatus</i>	hedgehog dogtail
<i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>	blue dicks
<i>Distichlis spicata</i>	salt grass
<i>Elymus glaucus</i>	blue wildrye
<i>Epilobium brachycarpum</i>	tall annual willowherb
<i>Erodium botrys</i>	long-beaked filaree
<i>Erodium cicutarium</i>	red-stemmed filaree
<i>Erodium moschatum</i>	white-stemmed filaree
<i>Eschscholzia californica</i>	California poppy
<i>Eucalyptus globulus</i>	blue gum
<i>Filago gallica</i>	narrow-leaved gallica
<i>Foeniculum vulgare</i>	fennel
<i>Frankenia salina</i>	alkali heath
<i>Geranium dissectum</i>	cut-leaf geranium
<i>Geranium molle</i>	cranes-bill geranium
<i>Gnaphalium canescens</i>	cudweed
<i>Hemizonia congesta</i>	hayfield tarweed
<i>Hemizonia fitchii</i>	Fitch's tarweed
<i>Hemizonia parryi</i> ssp. <i>parryi</i>	Parry's spikeweed
<i>Hesperervax caulescens</i>	hogwallow starfish
<i>Hesperervax sparsiflora</i> var. <i>sparsiflora</i>	evax
<i>Holocarpha virgata</i>	narrow tarplant
<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i>	meadow barley
<i>Hordeum marinum</i> ssp. <i>gussonianum</i>	Mediterranean barley
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail barley
<i>Hypochaeris glabra</i>	smooth cat's ear
<i>Hypochaeris radicata</i>	rough cat's ears
<i>Juncus balticus</i>	Baltic rush
<i>Juncus bufonius</i>	Toad rush
<i>Lactuca saligna</i>	willowleaf lettuce
<i>Lagophylla ramosissima</i>	common hareleaf
<i>Lepidium latipes</i> var. <i>latipes</i>	dwarf peppergrass
<i>Lepidium nitidum</i> var. <i>nitidum</i>	shining peppergrass
<i>Lepidium oxycarpum</i>	sharp-pod peppergrass
<i>Leymus triticoides</i>	creeping wildrye
<i>Lilaea scilloides</i>	flowering quillwort

**Plant Species Observed at the Eastern Valley Mitigation Area
Potrero Hills Landfill, Solano County
March 12, 25, and 27, May 5, June 23, 24, and 25, August 18 and 20, 2008**

Species	Common Name
<i>Lolium multiflorum</i>	Italian ryegrass
<i>Lolium perenne</i>	perennial ryegrass
<i>Lotus corniculatus</i>	birdfoot trefoil
<i>Lotus wrangelianus</i>	common trefoil
<i>Lupinus bicolor</i>	dove lupine
<i>Lupinus formosus</i> var. <i>formosus</i>	lupine
<i>Lupinus succulentus</i>	succulent annual lupine
<i>Malva neglecta</i>	cheeseweed
<i>Malvella leprosa</i>	alkali mallow
<i>Marah fabaceus</i>	California man-root
<i>Medicago polymorpha</i>	burclover
<i>Melilotus indica</i>	sourclover
<i>Microseris douglasii</i> ssp. <i>tenella</i>	Douglas' microseris
<i>Muilla maritima</i>	common muilla
<i>Nassella pulchra</i>	purple needle grass
<i>Parapholis incurva</i>	sickle grass
<i>Phalaris paradoxa</i>	hood canarygrass
<i>Picris echioides</i>	bristly ox-tongue
<i>Plagiobothrys stipitatus</i>	valley popcornflower
<i>Plagiobothrys greenei</i>	Greene's popcornflower
<i>Plantago erecta</i>	California plantain
<i>Poa annua</i>	annual bluegrass
<i>Polygonum arenastrum</i>	common knotweed
<i>Polypogon monspeliensis</i>	rabbitfoot grass
<i>Ranunculus californicus</i>	California buttercup
<i>Ranunculus muricatus</i>	prickly-fruited buttercup
<i>Raphanus sativus</i>	wild radish
<i>Rumex acetosella</i>	sheep sorrel
<i>Rumex crispus</i>	curly dock
<i>Rumex pulcher</i>	fiddle dock
<i>Salix laevigata</i>	red willow
<i>Sanicula bipinnata</i>	poison sanicle
<i>Sanicula bipinnatifida</i>	purple sanicle
<i>Scandix pecten-veneris</i>	shepherd's needles
<i>Senecio vulgaris</i>	common groundsel
<i>Silene gallica</i>	windmill pink
<i>Silybum marianum</i>	milk thistle
<i>Sinapis arvensis</i>	charlock
<i>Sisymbrium officinale</i>	hedge mustard
<i>Sisyrinchium bellum</i>	blue-eyed grass
<i>Soliva sessilis</i>	soliva
<i>Sonchus asper</i> ssp. <i>asper</i>	prickly sow thistle

**Plant Species Observed at the Eastern Valley Mitigation Area
Potrero Hills Landfill, Solano County
March 12, 25, and 27, May 5, June 23, 24, and 25, August 18 and 20, 2008**

Species	Common Name
<i>Spergula arvensis</i> ssp. <i>arvensis</i>	stickwort
<i>Spergularia</i> sp.	sand spurry
<i>Stellaria media</i>	chickweed
<i>Taeniatherum caput-medusae</i>	Medusa-head
<i>Torilis nodosa</i>	knotted hedge-parsley
<i>Tragopogon porrifolius</i>	oyster plant
<i>Trifolium campestre</i>	hop trefoil
<i>Trifolium depauperatum</i> var. <i>amplectens</i>	pale sack clover
<i>Trifolium depauperatum</i> var. <i>truncatum</i>	common pale sack clover
<i>Trifolium dubium</i>	shamrock
<i>Trifolium fragiferum</i>	strawberry clover
<i>Trifolium glomeratum</i>	clustered clover
<i>Trifolium hirtum</i>	rose clover
<i>Trifolium subterraneum</i>	subterranean clover
<i>Trifolium variegatum</i>	white-tipped clover
<i>Trifolium willdenovii</i>	tomcat clover
<i>Triphysaria eriantha</i> ssp. <i>eriantha</i>	butter-and-eggs
<i>Triphysaria pusilla</i>	dwarf owl's clover
<i>Triteleia laxa</i>	Ithuriel's spear
<i>Urtica urens</i>	dwarf nettle
<i>Vicia americana</i> var. <i>americana</i>	American vetch
<i>Vicia benghalensis</i>	purple vetch
<i>Vicia sativa</i> ssp. <i>sativa</i>	spring vetch
<i>Vicia villosa</i>	winter vetch
<i>Viola pedunculata</i>	Johnny-jump-up
<i>Vulpia bromoides</i>	six-weeks fescue
<i>Vulpia myuros</i>	foxtail fescue
<i>Wyethia angustifolia</i>	narrow-leaf mule-ears
<i>Xanthium strumarium</i>	cochlebur

Note. * Special-status species.

Plant Species Observed at the Potrero Hills Landfill Expansion Area, Solano County March 27, April 20, May 23, June 29, and August 22, 2000	
Species	Common Name
<i>Achyrachaena mollis</i>	Blow-wives
<i>Aegilops ovata</i>	Ovate goatgrass
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	Common fiddleneck
<i>Anagallis arvensis</i>	Scarlet pimpernel
<i>Anthemis cotula</i>	Mayweed
<i>Asclepias fascicularis</i>	Narrow-leaf milkweed
<i>Atriplex coronata</i> var. <i>coronata</i>	Crowscale*
<i>Avena barbata</i>	Slender wild oats
<i>Bellardia trixago</i>	Bellardia
<i>Brassica nigra</i>	Black mustard
<i>Briza minor</i>	Rattlesnake grass
<i>Brodiaea elegans</i> ssp. <i>elegans</i>	Harvest brodiaea
<i>Bromus diandrus</i>	Ripgut grass
<i>Bromus hordeaceus</i>	Soft chess
<i>Bromus madritensis</i> ssp. <i>rubens</i>	Red brome
<i>Calandrinia ciliata</i>	Red maids
<i>Callitriche</i> sp.	Water-starwort
<i>Calochortus argillosus</i>	Clay mariposa lily
<i>Capsella bursa-pastoris</i>	Shepherd's purse
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Castilleja attenuata</i>	Valley tassels
<i>Centaurea calcitrapa</i>	Purple star thistle
<i>Centaurea melitensis</i>	Tocalote
<i>Centaurea solstitialis</i>	Yellow star thistle
<i>Cerastium glomeratum</i>	Mouse-ear chickweed
<i>Chenopodium</i> sp.	Goosefoot
<i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i>	Soap plant
<i>Chondrilla juncea</i>	Skeleton weed
<i>Cirsium vulgare</i>	Bull thistle
<i>Claytonia perfoliata</i>	Miner's lettuce
<i>Convolvulus arvensis</i>	Orchard bindweed
<i>Cotula coronopifolia</i>	Brass buttons
<i>Crassula connata</i>	Pygmyweed
<i>Crypsis schoenoides</i>	Swamp grass
<i>Cynara cardunculus</i>	Artichoke thistle
<i>Cyperus eragrostis</i>	Nut sedge
<i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>	Blue dicks
<i>Distichlis spicata</i>	Saltgrass
<i>Eleocharis macrostachya</i>	Common spikerush
<i>Elymus trachycaulis</i>	Slender wheatgrass
<i>Eremocarpus setigerus</i>	Turkey mullein
<i>Erodium botrys</i>	Long-beaked filaree/storksbill

Plant Species Observed at the Potrero Hills Landfill Expansion Area, Solano County March 27, April 20, May 23, June 29, and August 22, 2000	
Species	Common Name
<i>Erodium cicutarium</i>	Red-stemmed filaree/storksbill
<i>Erodium moschatum</i>	White-stemmed filaree/storksbill
<i>Eryngium aristulatum</i> var. <i>aristulatum</i>	Button celery
<i>Eschscholzia californica</i>	California poppy
<i>Eucalyptus globulus</i>	Blue gum
<i>Euphorbia spathulata</i>	Spatulate spurge
<i>Filago gallica</i>	Narrow-leaved gallica
<i>Frankenia salina</i>	Alkai heath
<i>Gastridium ventricosum</i>	Nitgrass
<i>Geranium dissectum</i>	Cut-leaf geranium
<i>Grindelia camporum</i>	Gumplant
<i>Hemizonia congesta</i> ssp. <i>luzulifolia</i>	Hayfield tarweed
<i>Hemizonia fitchii</i>	Fitch's spikeweed
<i>Hemizonia parryi</i> ssp. <i>parryi</i>	Pappose spikeweed
<i>Hesperevax sparsiflora</i> var. <i>sparsiflora</i>	Evax
<i>Heterotheca grandiflora</i>	Telegraph weed
<i>Holocarpha heermannii</i>	Heermann tarweed
<i>Holocarpha virgata</i>	Virgate tarweed
<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i>	Meadow barley
<i>Hordeum marinum</i> ssp. <i>gussonianum</i>	Mediterranean barley
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	Hare barley
<i>Hypochaeris glabra</i>	Smooth cat's ear
<i>Hypochaeris radicata</i>	Hairy cat's ear/false dandelion
<i>Iva axillaris</i> ssp. <i>robustior</i>	Poverty weed
<i>Juncus balticus</i>	Baltic rush
<i>Juncus bufonius</i> var. <i>bufonius</i>	Toad rush
<i>Lactuca saligna</i>	Wall lettuce
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lepidium nitidum</i> var. <i>nitidum</i>	Shining peppergrass
<i>Leymus triticoides</i>	Creeping wild-rye
<i>Lolium multiflorum</i>	Italian ryegrass
<i>Lomatium utriculatum</i>	Common lomatium
<i>Lotus corniculatus</i>	Birdsfoot lotus
<i>Lotus humistratus</i>	Hill lotus
<i>Lupinus bicolor</i>	Dove lupine; dwarf lupine
<i>Lythrum hyssopifolium</i>	Hyssop loosestrife
<i>Malva nicaeensis</i>	Bull mallow
<i>Malvella leprosa</i>	Alkali-mallow
<i>Medicago polymorpha</i>	Burr clover
<i>Melilotus indica</i>	Yellow sweetclover
<i>Microseris douglasii</i> ssp. <i>douglasii</i>	Douglas' microseris
<i>Muilla maritima</i>	Common muilla
<i>Nassella pulchra</i>	Purple needle grass

Plant Species Observed at the Potrero Hills Landfill Expansion Area, Solano County March 27, April 20, May 23, June 29, and August 22, 2000	
Species	Common Name
<i>Nerium oleander</i>	Oleander
<i>Picris echioides</i>	Bristly ox-tongue
<i>Phalaris aquatica</i>	Harding grass
<i>Phalaris paradoxa</i>	Paradox canary grass
<i>Plagiobothrys bracteatus</i>	Bracted allocarya
<i>Plagiobothrys stipitatus</i> var. <i>micranthus</i>	Small-flowered stipitate allocarya
<i>Plagiobothrys greenei</i>	Greene's allocarya
<i>Plantago lanceolata</i>	English plantain
<i>Plantago major</i>	Common plantain
<i>Pleuropogon californicus</i>	Semaphore grass
<i>Poa annua</i>	Annual bluegrass
<i>Polygonum arenastrum</i>	Yard knotweed
<i>Polypogon maritimus</i>	Mediterranean beard grass
<i>Polypogon monspeliensis</i>	Rabbitsfoot grass
<i>Psilocarphus oregonus</i>	Oregon woolly-marbles
<i>Ranunculus californicus</i>	California buttercup
<i>Ranunculus muricatus</i>	Prickly-fruited buttercup
<i>Raphanus sativus</i>	Wild radish
<i>Rorippa nasturtium-aquaticum</i>	Watercress
<i>Rumex acetosella</i>	Sheep sorrel
<i>Rumex crispus</i>	Curly dock
<i>Rumex pulcher</i>	Fiddle dock
<i>Salicornia virginica</i>	Pickleweed
<i>Salix laevigata</i>	Red willow
<i>Sanicula bipinnatifida</i>	Purple sanicle
<i>Scandix pecten-veneris</i>	Shepherd's needles
<i>Senecio vulgaris</i>	Groundsel
<i>Sidalcea malvaeflora</i> ssp. <i>malvaeflora</i>	Checkerbloom
<i>Silene gallica</i>	Windmill pinks/catchfly
<i>Silybum marianum</i>	Milk thistle
<i>Sinapis arvensis</i>	Charlock
<i>Sisyrinchium bellum</i>	Blue-eyed grass
<i>Soliva sessilis</i>	Soliva
<i>Sonchus asper</i>	Prickly sow-thistle
<i>Spergula arvensis</i>	Corn spurry
<i>Spergularia rubra</i>	Sand spurry
<i>Stellaria media</i>	Chickweed
<i>Taeniatherum caput-medusae</i>	Medusa-head
<i>Torilis nodosa</i>	Knotted hedge parsley
<i>Tragopogon porrifolius</i>	Purple salsify
<i>Trifolium ciliolatum</i>	Tree clover
<i>Trifolium depauperatum</i> var. <i>amplectens</i>	Pale sack clover
<i>Trifolium depauperatum</i> var. <i>truncatum</i>	Pale sack clover

Plant Species Observed at the Potrero Hills Landfill Expansion Area, Solano County March 27, April 20, May 23, June 29, and August 22, 2000	
Species	Common Name
<i>Trifolium fragiferum</i>	Strawberry clover
<i>Trifolium hirtum</i>	Rose clover
<i>Trifolium subterraneum</i>	Subterranean clover
<i>Trifolium variegatum</i>	White-tipped clover
<i>Trifolium willdenovii</i>	Tomcat clover
<i>Triphysaria eriantha</i> ssp. <i>eriantha</i>	Butter-and-eggs
<i>Triphysaria pusilla</i>	Dwarf owl's clover
<i>Triteleia hyacinthine</i>	White brodiaea
<i>Triteleia laxa</i>	Ithuriel's spear
<i>Typha domingensis</i>	Southern cattail
<i>Vicia sativa</i> ssp. <i>nigra</i>	Common vetch
<i>Vicia sativa</i> ssp. <i>sativa</i>	Spring vetch
<i>Vicia villosa</i> ssp. <i>varia</i>	Winter vetch
<i>Viola pedunculata</i>	Johnny-jump-up
<i>Vulpia bromoides</i>	Six-weeks fescue
<i>Vulpia microstachys</i> var. <i>pauciflora</i>	Pacific fescue
<i>Vulpia myuros</i> var. <i>hirsute</i>	Zorro grass
<i>Vulpia myuros</i> var. <i>myuros</i>	Zorro grass
<i>Wyethia angustifolia</i>	Narrow-leaf mule-ears
<i>Xanthium spinosum</i>	Spiny cocklebur

Plant Species Observed at Potrero Hills in Spring and Early Summer 2004 SOUTHERN HILLS	
Scientific Name	Common Name
<i>Achillea millefolium</i>	Yarrow
<i>Achyrachaena mollis</i>	Blow-wives
<i>Aegilops triuncialis</i>	Goat-grass
<i>Agoseris heterophylla</i>	Annual dandelion
<i>Aira caryophylla</i>	Air-grass
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	Fiddleneck
<i>Anagallis arvensis</i>	Scarlet pimpernel
<i>Asclepias speciosa</i>	Showy milkweed
<i>Asclepias fascicularis</i>	Narrow-leaf milkweed
<i>Avena barbata</i>	Slender oats
<i>Avena fatua</i>	Wild oats
<i>Baccharis pilularis</i>	Coyote brush
<i>Bellardia trixago</i>	Bellardia
<i>Brassica nigra</i>	Black mustard
<i>Brassica rapa</i>	Field mustard
<i>Briza minor</i>	Little quaking-grass
<i>Brodiaea elegans</i>	Harvest brodiaea
<i>Bromus diandrus</i>	Ripgut brome
<i>Bromus hordeaceus</i>	Soft chess
<i>Bromus madritensis</i> ssp. <i>rubens</i>	Red brome
<i>Calandrinia ciliata</i>	Red-maids
<i>Calochortus argillosus</i>	Clay mariposa lily
<i>Calystegia purpurata</i> ?	Morning-glory
<i>Calystegia subacaulis</i>	Hill morning-glory
<i>Capsella bursa-pastoris</i>	Shepherd's purse
<i>Cardaria draba</i>	Heart-podded hoary cress
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Castilleja attenuata</i>	Valley tassels
<i>Centaurea calcitrapa</i>	Purple starthistle
<i>Centaurea melitensis</i>	Tocalote
<i>Cerastium glomeratum</i>	Mouse-ear chickweed
<i>Chamomilla suaveolens</i>	Pineapple weed
<i>Chlorogalum pomeridianum</i>	Soap root
<i>Chondrilla juncea</i>	Skeleton weed
<i>Cirsium quercetorum</i>	Brownie thistle

Plant Species Observed at Potrero Hills in Spring and Early Summer 2004 SOUTHERN HILLS	
Scientific Name	Common Name
<i>Cirsium vulgare</i>	Bull-thistle
<i>Claytonia perfoliata</i>	Miner's lettuce
<i>Convolvulus arvensis</i>	Field bindweed
<i>Cotula coronopifolia</i>	Brass-buttons
<i>Crassula connata</i>	Pygmy-weed
<i>Cynara cardunculus</i>	Artichoke thistle
<i>Cynodon dactylon</i>	Bermuda-grass
<i>Dichelostemma capitatum</i>	Blue-dicks
<i>Distichlis spicata</i>	Saltgrass
<i>Downingia</i> sp.	Downingia
<i>Eleocharis macrostachya</i>	Common spike-rush
<i>Elymus glaucus</i>	Blue wildrye
<i>Elymus multisetus</i>	Squirreltail
<i>Epilobium brachycarpum</i>	Panicled willow-herb
<i>Eremocarpus setigerus</i>	Turkey mullein
<i>Erodium botrys</i>	Broad-leaved filaree
<i>Erodium cicutarium</i>	red-stemmed filaree
<i>Eryngium vaseyi</i>	Coyote thistle
<i>Eschscholzia californica</i>	California poppy
<i>Eucalyptus globulus</i>	Blue-gum
<i>Filago gallica</i>	Fluffweed
<i>Foeniculum vulgare</i>	Sweet fennel
<i>Geranium dissectum</i>	Cut-leaf geranium
<i>Geranium molle</i>	Dove's-foot geranium
<i>Gnaphalium californicum</i>	California cudweed
<i>Grindelia camporum</i>	Gumplant
<i>Hemizonia fitchii</i>	Fitch's tarweed
<i>Hesperexax caulescens*</i>	Hesperexax
<i>Hirschfeldia incana</i>	Mediterranean mustard
<i>Hordeum brachyantherum</i>	Meadow barley
<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	Mediterranean barley
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	Hare barley
<i>Hypochaeris glabra</i>	Smooth cat's-ear
<i>Hypochaeris radicata</i>	Hairy cat's-ear
<i>Juncus balticus</i>	Baltic rush
<i>Juncus bolanderi</i>	Bolander's rush

Plant Species Observed at Potrero Hills in Spring and Early Summer 2004 SOUTHERN HILLS	
Scientific Name	Common Name
<i>Juncus bufonius</i>	Toad-rush
<i>Juncus capitatus</i>	Capped rush
<i>Juncus mexicanus</i>	Mexican rush
<i>Juncus uncialis</i>	Inch-high rush
<i>Juncus xiphioides</i>	Iris-leaved rush
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lathyrus vestitus</i> var. <i>vestitus</i>	Woodland pea
<i>Leontodon taraxacoides</i>	Hawkbit
<i>Lepidium oxycarpum</i>	Sharp-pod pepperweed
<i>Lessingia filaginifolia</i>	California aster
<i>Leymus triticoides</i>	Creeping wildrye
<i>Lolium multiflorum</i>	Italian wildrye
<i>Lomatium dasycarpum</i>	Hog fennel
<i>Lotus corniculatus</i>	Bird's-foot trefoil
<i>Lotus humistratus</i>	Hill lotus
<i>Lotus purshianus</i>	Spanish pea
<i>Lupinus bicolor</i>	Miniature lupine
<i>Lupinus nanus</i>	Sky lupine
<i>Lupinus</i> sp.	Lupine
<i>Lythrum hyssopifolium</i>	Hyssop's loosestrife
<i>Malva neglecta</i>	Cheeseweed
<i>Malvella leprosa</i>	Alkali mallow
<i>Marah fabaceus</i>	Wild cucumber
<i>Medicago lupulina</i>	Black medic
<i>Medicago polymorpha</i>	Bur-clover
<i>Melica californica</i>	California melic-grass
<i>Melilotus indica</i>	Yellow sweet-clover
<i>Micropus californicus</i>	Slender cottonweed
<i>Microseris douglasii</i>	Douglas' microseris
<i>Mimulus guttatus</i>	Marsh monkey-flower
<i>Nassella pulchra</i>	Purple needlegrass
<i>Parapholis incurva</i>	Sickle-grass
<i>Parentucellia viscosa</i>	Parentucellia
<i>Perideridia kelloggii</i>	Yampah
<i>Phalaris aquatica</i>	Harding grass
<i>Phalaris paradoxa</i>	Hood canary grass

Plant Species Observed at Potrero Hills in Spring and Early Summer 2004 SOUTHERN HILLS	
Scientific Name	Common Name
<i>Picris echioides</i>	Prickly ox-tongue
<i>Plagiobothrys greenei</i>	Green's popcorn-flower
<i>Plagiobothrys nothofulvus</i>	Valley popcorn-flower
<i>Plagiobothrys stipitatus</i> ssp. <i>micranthus</i>	Slender popcorn-flower
<i>Plagiobothrys stipitatus</i> ssp. <i>stipitatus</i>	Large-flowered popcorn-flower
<i>Plantago erecta</i>	California plantain
<i>Plantago lanceolata</i>	English plantain
<i>Plantago major</i>	Common plantain
<i>Poa annua</i>	Annual blue-grass
<i>Polypogon monspeliensis</i>	Rabbit's-foot grass
<i>Ranunculus californicus</i>	California buttercup
<i>Ranunculus hebecarpus</i>	Downy buttercup
<i>Ranunculus muricatus</i>	Spiny-fruit buttercup
<i>Rorippa curvisiliqua</i>	Curve-pod yellow-cress
<i>Rorippa nasturtium-aquaticum</i>	Water-cress
<i>Rumex acetocella</i>	Sheep sorrel
<i>Rumex crispus</i>	Curly dock
<i>Rumex pulcher</i>	Fiddle-dock
<i>Salix laevigata</i>	Red willow
<i>Sambucus mexicana</i>	Blue elderberry
<i>Sanicula bipinnata</i>	Poison sanicle
<i>Sanicula bipinnatifida</i>	Purple sanicle
<i>Sanicula tuberosa</i>	Sanicle
<i>Scandix pecten-veneris</i>	Shepherd's needle
<i>Scirpus robustus</i>	Alkali bulrush
<i>Scrophularia californica</i>	California beeplant
<i>Senecio vulgaris</i>	Common groundsel
<i>Sidalcea malvaeflora</i>	Checkerbloom
<i>Silene gallica</i>	Windmill pink
<i>Silybum marianum</i>	Milk-thistle
<i>Sisymbrium officinale</i>	Hedge mustard
<i>Sisyrinchium bellum</i>	Blue-eyed grass
<i>Soliva sessilis</i>	Soliva
<i>Sonchus asper</i>	Prickly sow-thistle
<i>Spergula arvensis</i>	Field spurrey
<i>Taeniatherum caput-medusae</i>	Medusa-head

Plant Species Observed at Potrero Hills in Spring and Early Summer 2004 SOUTHERN HILLS	
Scientific Name	Common Name
<i>Taraxacum officinale</i>	Dandelion
<i>Torilis nodosa</i>	Hedge pars ley
<i>Toxicodendron diversilobum</i>	Poison oak
<i>Trifolium depauperatum</i>	Balloon clover
<i>Trifolium dubium</i>	Shamrock
<i>Trifolium fragiferum</i>	Strawberry clover
<i>Trifolium hirtum</i>	Rose clover
<i>Trifolium pratense</i>	Red clover
<i>Trifolium subterraneum</i>	Subterranean clover
<i>Trifolium wildenovii</i>	Tomcat clover
<i>Triphysaria eriantha</i>	Johnny-tuck
<i>Triteleia hyacinthina</i>	White brodiaea
<i>Triteleia laxa</i>	Ithuriel's spear
<i>Vicia benghalensis</i>	Purple vetch
<i>Vicia sativa</i>	Spring vetch
<i>Viola pedunculata</i>	Johnny-jump-up
<i>Vulpia bromoides</i>	Six-week fescue
<i>Vulpia myuros</i> ssp. <i>myuros</i>	Rattail fescue
<i>Wyethia angustifolia</i>	Narrow-leaved mule's-ears
<i>Xanthium spinosum</i>	Spiny cocklebur
<i>Xanthium strumarium</i>	Cocklebur

* Special-status species

Native species.....83 (51%)

Non-native species....81 (49%)

Plant Species Observed at Potrero Hills in Spring and Early Summer 2004 EASTERN VALLEY	
Scientific Name	Common Name
<i>Achillea millefolium</i>	Yarrow
<i>Achyrachaena mollis</i>	Blow-wives
<i>Agoseris heterophylla</i>	Annual dandelion
<i>Amsinckia intermedia</i>	Fiddleneck
<i>Atriplex coronata</i> var. <i>coronata</i> *	Heartscale
<i>Avena barbata</i>	Slender oats
<i>Avena fatua</i>	Wild oats
<i>Bellardia trixago</i>	Bellardia
<i>Brassica nigra</i>	Black mustard
<i>Briza minor</i>	Little quaking-grass
<i>Bromus diandrus</i>	Ripgut brome
<i>Bromus hordeaceus</i>	Soft chess
<i>Bromus madritensis</i> ssp. <i>rubens</i>	Red brome
<i>Callitriche marginata</i>	Water starwort
<i>Calystegia subacaulis</i>	Hill morning-glory
<i>Capsella bursa-pastoris</i>	Shepherd's purse
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Castilleja attenuata</i>	Valley tassels
<i>Centaurea calcitrapa</i>	Purple starthistle
<i>Cerastium glomeratum</i>	Mouse-ear chickweed
<i>Chamomilla suaveolens</i>	Pineapple weed
<i>Convolvulus arvensis</i>	Field bindweed
<i>Cotula coronopifolia</i>	Brass-buttons
<i>Cynodon dactylon</i>	Bermuda grass
<i>Dichelostemma capitatum</i>	Blue-dicks
<i>Distichlis spicata</i>	Saltgrass
<i>Eremocarpus setigerus</i>	Turkey mullein
<i>Erodium botrys</i>	Broad-leaved filaree
<i>Erodium cicutarium</i>	red-stemmed filaree
<i>Eschscholzia californica</i>	California poppy
<i>Eucalyptus globulus</i>	Blue-gum
<i>Filago gallica</i>	Filago
<i>Frankenia salina</i>	Alkali heath
<i>Hemizonia fitchii</i>	Fitch's tarweed
<i>Hesperivax caulescens</i> *	Hogwallow starfish
<i>Hirschfeldia incana</i>	Mediterranean mustard
<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i>	Meadow barley
<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	Mediterranean barley

Plant Species Observed at Potrero Hills in Spring and Early Summer 2004 EASTERN VALLEY	
Scientific Name	Common Name
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	Hare barley
<i>Hypochoeris glabra</i>	Smooth cat's-ear
<i>Juncus balticus</i>	Baltic rush
<i>Juncus bufonius</i>	Toad-rush
<i>Lepidium oxycarpum</i>	Sharp-pod pepperweed
<i>Lolium multiflorum</i>	Italian wildrye
<i>Lotus corniculatus</i>	Bird's-foot trefoil
<i>Lotus purshianus</i>	Spanish clover
<i>Lupinus bicolor</i>	Miniature lupine
<i>Malva neglecta</i>	Cheeseweed
<i>Malvella leprosa</i>	Alkali mallow
<i>Medicago lupulina</i>	Black medic
<i>Medicago polymorpha</i>	Bur-clover
<i>Melilotus indica</i>	Yellow sweet-clover
<i>Micropus californicus</i>	Slender cottonweed
<i>Microseris douglasii</i>	Douglas' microseris
<i>Nassella pulchra</i>	Purple needlegrass
<i>Picris echioides</i>	Prickly ox-tongue
<i>Plagiobothrys greenei</i>	Green's popcorn-flower
<i>Plantago elongata</i>	Slender plantain
<i>Plantago lanceolata</i>	English plantain
<i>Poa annua</i>	Annual blue-grass
<i>Polypogon monspeliensis</i>	Rabbit's-foot grass
<i>Ranunculus muricatus</i>	Spiny-fruit buttercup
<i>Rumex acetocella</i>	Sheep sorrel
<i>Rumex crispus</i>	Curly dock
<i>Salix laevigata</i>	Red willow
<i>Scandix pecten-veneris</i>	Shepherd's needle
<i>Senecio vulgaris</i>	Common groundsel
<i>Silene gallica</i>	Windmill pink
<i>Silybum marianum</i>	Milk-thistle
<i>Sisyrinchium bellum</i>	Blue-eyed grass
<i>Spergula arvensis</i>	Field spurrey
<i>Taeniatherum caput-medusae</i>	Medusa-head
<i>Taraxacum officinale</i>	Common dandelion
<i>Torilis arvensis</i>	Hedge parsley
<i>Trifolium dubium</i>	Shamrock
<i>Trifolium hirtum</i>	Rose clover
<i>Trifolium subterraneum</i>	Subterranean clover

Plant Species Observed at Potrero Hills in Spring and Early Summer 2004 EASTERN VALLEY	
Scientific Name	Common Name
<i>Trifolium wildenovii</i>	Tomcat clover
<i>Triphysaria eriantha</i>	Johnny-tuck
<i>Triphysaria pusilla</i>	Dwarf owl's-clover
<i>Triteleia hyacinthina</i>	White brodiaea
<i>Triteleia laxa</i>	Ithuriel's spear
<i>Vicia benghalensis</i>	Purple vetch
<i>Viola pedunculata</i>	Johnny-jump-up
<i>Vulpia bromoides</i>	Six-week fescue

* Special-status species

Native species.....35 (41%)

Non-native species.....50 (59%)

Plant Species Observed at Potrero Hills in Spring and Early Summer of 2004 GRIFFITH RANCH PARCEL	
Scientific Name	Common Name
<i>Achyrachaena mollis</i>	Blow-wives
<i>Amaryllis belladonna</i>	Naked lady
<i>Anagallis arvensis</i>	Scarlet pimpernel
<i>Anthemis cotula</i>	Mayweed
<i>Avena barbata</i>	Slender oats
<i>Brodiaea elegans</i>	Harvest brodiaea
<i>Bromus diandrus</i>	Ripgut brome
<i>Bromus hordeaceus</i>	Soft chess
<i>Calandrinia ciliata</i>	Red-maids
<i>Capsella bursa-pastoris</i>	Shepherd's purse
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Centaurea calcitrapa</i>	Purple starthistle
<i>Centaurea solstitialis</i>	Yellow starthistle
<i>Cerastium glomeratum</i>	Mouse-ear chickweed
<i>Chlorogalum pomeridianum</i>	Soap root
<i>Cirsium vulgare</i>	Bull-thistle
<i>Convolvulus arvensis</i>	Field bindweed
<i>Cotula coronopifolia</i>	Brass-buttons
<i>Cynara cardunculus</i>	Artichoke thistle
<i>Dichelostemma capitatum</i>	Blue-dicks
<i>Downingia concolor</i>	Downingia
<i>Epilobium</i> sp.	Willow-herb
<i>Eremocarpus setigerus</i>	Turkey mullein
<i>Erodium botrys</i>	Broad-leaved filaree
<i>Erodium cicutarium</i>	red-stemmed filaree
<i>Eschscholzia californica</i>	California poppy
<i>Eucalyptus</i> sp.	Eucalyptus
<i>Geranium molle</i>	Dove's-foot geranium
<i>Hemizonia fitchii</i>	Fitch's tarweed
<i>Hesperex caulescens</i>	Hesperex
<i>Hirschfeldia incana</i>	Mediterranean mustard
<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	Mediterranean barley

Plant Species Observed at Potrero Hills in Spring and Early Summer of 2004 GRIFFITH RANCH PARCEL	
Scientific Name	Common Name
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	Hare barley
<i>Hypochaeris glabra</i>	Smooth cat's-ear`
<i>Juncus bufonius</i>	Toad rush
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lepidium nitidum</i>	Pepperweed
<i>Leucanthemum vulgare</i>	Ox-eye daisy
<i>Leucojum vernum</i>	Snowflake
<i>Lolium multiflorum</i>	Italian wildrye
<i>Lomatium utriculatum</i>	Spring gold
<i>Lupinus bicolor</i>	Miniature lupine
<i>Lythrum hyssopifolium</i>	Hyssop's loosestrife
<i>Malva nicaeensis</i>	Cheeseweed
<i>Medicago polymorpha</i>	Bur-clover
<i>Mimulus guttatus</i>	Marsh monkey-flower
<i>Narcissus</i> sp.	Daffodil
<i>Parentucellia viscosa</i>	Parentucellia
<i>Picris echioides</i>	Prickly ox-tongue
<i>Plagiobothrys greenei</i>	Greene's popcorn-flower
<i>Plagiobothrys stipitatus</i> var. <i>micranthus</i>	Slender popcorn-flower
<i>Plantago lanceolata</i>	English plantain
<i>Plantago major</i>	Common plantain
<i>Poa annua</i>	Annual bluegrass
<i>Ranunculus muricatus</i>	Spiny-fruit buttercup
<i>Raphanus sativus</i>	Wild radish
<i>Rumex crispus</i>	Curly dock
<i>Rumex pulcher</i>	Fiddle-dock
<i>Sanicula bipinnatifida</i>	Purple sanicle
<i>Scandix pecten-veneris</i>	Shepherd's purse
<i>Schinus molle</i>	Brazilian pepper
<i>Senecio vulgaris</i>	Common groundsel
<i>Silybum marianum</i>	Milk-thistle
<i>Sisyrinchium bellum</i>	Blue-eyed grass
<i>Spergula arvensis</i>	Field spurrey

Plant Species Observed at Potrero Hills in Spring and Early Summer of 2004 GRIFFITH RANCH PARCEL	
Scientific Name	Common Name
<i>Stellaria media</i>	Common chickweed
<i>Taeniatherum caput-medusae</i>	Medusa-head
<i>Trifolium hirtum</i>	Rose clover
<i>Triphysaria eriantha</i>	Johnny-tuck
<i>Triphysaria pusilla</i>	Dwarf owl's-clover
<i>Triteleia hyacinthina</i>	White brodiaea
<i>Urtica dioica</i>	Stinging nettle
<i>Vicia sativa</i>	Spring vetch
<i>Viola pedunculata</i>	Johnny-jump-up
<i>Vulpia myuros</i>	Six-week fescue
<i>Wyethia angustifolia</i>	Narrow-leaved mule's-ears

Native species.....26 (34%)

Non-native species.....50 (66%)

Plant Species Observed at Potrero Hills in Spring 2003 and Spring and Early Summer 2004 DIRECTOR'S GUILD PARCEL	
Scientific Name	Common Name
<i>Achyrachaena mollis</i>	Blow-wives
<i>Aira caryophyllea</i>	Air-grass
<i>Alopecurus saccatus</i>	Pacific foxtail
<i>Anagallis arvensis</i>	Scarlet pimpernel
<i>Astragalus tener</i> var. <i>tener</i> *	Alkali milkweed
<i>Atriplex coronata</i> var. <i>coronata</i> *	Heartscale
<i>Atriplex joaquiniana</i> *	San Joaquin spearscale
<i>Atriplex triangularis</i>	Fathen
<i>Avena barbata</i>	Slender oats
<i>Briza minor</i>	Little quaking-grass
<i>Brodiaea minor</i>	Vernal pool brodiaea
<i>Brodiaea elegans</i>	Harvest brodiaea
<i>Bromus diandrus</i>	Ripgut brome
<i>Bromus hordeaceus</i>	Soft chess
<i>Callitriche</i> sp.	Water starwort
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Castilleja attenuata</i>	Valley tassels
<i>Centaurea calcitrapa</i>	Purple starthistle
<i>Centaurea solstitialis</i>	Yellow starthistle
<i>Cerastium glomeratum</i>	Mouse-ear chickweed
<i>Chamomilla suaveolens</i>	Pineapple weed
<i>Cicendia quadrangularis</i>	Oregon timwort
<i>Cirsium vulgare</i>	Bull-thistle
<i>Claytonia perfoliata</i>	Miner's lettuce
<i>Convolvulus arvensis</i>	Field bindweed
<i>Coronopus didymus</i>	Swine cress
<i>Cotula coronopifolia</i>	Brass-buttons
<i>Crassula connata</i>	Pygmy-weed
<i>Cressa truxillensis</i>	Alkali-weed
<i>Cynara cardunculus</i>	Artichoke thistle
<i>Damsonium californicum</i>	Fringed water-plantain
<i>Deschampsia danthonioides</i>	Annual hairgrass
<i>Distichlis spicata</i>	Saltgrass
<i>Downingia concolor</i>	Maroon-spot downingia
<i>Downingia insignis</i>	Downingia
<i>Eleocharis macrostachya</i>	Common spike-rush

Plant Species Observed at Potrero Hills in Spring 2003 and Spring and Early Summer 2004 DIRECTOR'S GUILD PARCEL	
Scientific Name	Common Name
<i>Epilobium brachycarpum</i>	Panicled willow-herb
<i>Epilobium</i> sp.	Willow-herb
<i>Eremocarpus setigerus</i>	Turkey mullein
<i>Erodium botrys</i>	Broad-leaved filaree
<i>Erodium cicutarium</i>	red-stemmed filaree
<i>Eryngium aristulatum</i> var. <i>aristulatum</i>	Button-celery
<i>Eryngium vaseyi</i>	Coyote thistle
<i>Filago gallica</i>	Filago
<i>Foeniculum vulgare</i>	Sweet fennel
<i>Frankenia salina</i>	Alkali heath
<i>Gastridium ventricosum</i>	Nitgrass
<i>Geranium dissectum</i>	Cut-leaf geranium
<i>Glyceria declinata</i>	Mannagrass
<i>Hemizonia fitchii</i>	Fitch's tarweed
<i>Hesperavex caulescens</i> *	Hogwallow starfish
<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i>	Meadow barley
<i>Hordeum depressum</i>	Dwarf barley
<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	Mediterranean barley
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	Hare barley
<i>Hypochoeris glabra</i>	Smooth cat's-ear
<i>Hypochoeris radicata</i>	Hairy cat's-ear
<i>Iva axillaris</i>	Small-flower sumpweed
<i>Juncus bufonius</i>	Toad-rush
<i>Juncus capitatus</i>	Capped rush
<i>Juncus uncialis</i>	Inch-high rush
<i>Kickxia elatine</i>	Inch-high fluellin
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lasthenia californica</i>	California goldfields
<i>Lasthenia conjugens</i> *	Contra Costa goldfields
<i>Lasthenia fremontii</i>	Fremont's goldfields
<i>Lasthenia glaberrima</i>	Smooth goldfields
<i>Lasthenia glabrata</i>	Yellow-ray goldfields
<i>Lasthenia platycarpha</i>	Alkali goldfields
<i>Layia chrysanthemoides</i>	Smooth tidy-tips
<i>Lepidium latifolium</i>	Broad-leaved peppergrass
<i>Lepidium latipes</i>	Dwarf pepperweed
<i>Lepidium nitidum</i>	Peppergrass

Plant Species Observed at Potrero Hills in Spring 2003 and Spring and Early Summer 2004 DIRECTOR'S GUILD PARCEL	
Scientific Name	Common Name
<i>Lepidium oxycarpum</i>	Sharp-pod pepperweed
<i>Lilaea scilloides</i>	Flowering quillwort
<i>Lolium multiflorum</i>	Italian wildrye
<i>Lotus corniculatus</i>	Bird's-foot trefoil
<i>Lotus humistratus</i>	Hill lotus
<i>Lupinus bicolor</i>	Miniature lupine
<i>Lythrum hyssopifolium</i>	Hyssop's loosestrife
<i>Malvella leprosa</i>	Alkali mallow
<i>Medicago lupulina</i>	Black medic
<i>Medicago polymorpha</i>	Bur-clover
<i>Microseris douglasii</i>	Douglas' microseris
<i>Myosurus minimus</i>	Mouse-tail
<i>Nassella pulchra</i>	Purple needlegrass
<i>Parapholis incurva</i>	Sickle-grass
<i>Phalaris aquatica</i>	Harding grass
<i>Picris echioides</i>	Prickly ox-tongue
<i>Pilularia americana</i>	American pillwort
<i>Plagiobothrys greenei</i>	Green's popcorn-flower
<i>Plagiobothrys stipitatus</i> ssp. <i>micranthus</i>	Slender popcorn-flower
<i>Plantago coronopus</i>	Cut-leaf plantain
<i>Plantago elongata</i>	Slender plantain
<i>Plantago erecta</i>	California plantain
<i>Plantago lanceolata</i>	English plantain
<i>Pleuropogon californicus</i>	Semaphore grass
<i>Poa annua</i>	Annual blue-grass
<i>Pogogyne zizyphoroides</i>	Pogogyne
<i>Polygonum arenastrum</i>	Yard knotweed
<i>Polypogon monspeliensis</i>	Rabbit's-foot grass
<i>Polypogon maritimus</i>	Mediterranean beard grass
<i>Psilocarphus brevissimus</i> var. <i>brevissimus</i>	Woolly-marbles
<i>Psilocarphus oregonus</i>	Oregon woolly-heads
<i>Psilocarphus tenellus</i>	Slender woolly-heads
<i>Ranunculus muricatus</i>	Spiny-fruit buttercup
<i>Raphanus sativus</i>	Wild radish
<i>Rumex crispus</i>	Curly dock
<i>Rumex pulcher</i>	Fiddle-dock
<i>Sagina apetala</i>	Dwarf pearlwort

Plant Species Observed at Potrero Hills in Spring 2003 and Spring and Early Summer 2004 DIRECTOR'S GUILD PARCEL	
Scientific Name	Common Name
<i>Salicornia virginica</i>	Pickleweed
<i>Scirpus robustus</i>	Alkali bulrush
<i>Senecio vulgaris</i>	Common groundsel
<i>Silybum marianum</i>	Milk-thistle
<i>Sinapis arvensis</i>	Mustard
<i>Spergula arvensis</i>	Field spurrey
<i>Spergularia macrotheca</i> var. <i>leucantha</i>	Sandspurry
<i>Stellaria media</i>	Chickweed
<i>Taeniatherum caput-medusae</i>	Medusa-head
<i>Trifolium depauperatum</i> var. <i>truncatum</i>	Balloon clover
<i>Trifolium dubium</i>	Shamrock
<i>Trifolium fragiferum</i>	Strawberry clover
<i>Trifolium hirtum</i>	Rose clover
<i>Trifolium variegatum</i>	Variegated clover
<i>Trifolium wildenovii</i>	Tomcat clover
<i>Triphysaria eriantha</i>	Johnny-tuck
<i>Triphysaria pusilla</i>	Dwarf owl's-clover
<i>Triteleia hyacinthina</i>	White brodiaea
<i>Triteleia laxa</i>	Ithuriel's spear
<i>Vicia benghalensis</i>	Purple vetch
<i>Vicia sativa</i>	Spring vetch
<i>Vulpia bromoides</i>	Six-week fescue
<i>Vulpia myuros</i> ssp. <i>myuros</i>	Rattail fescue
<i>Wyethia angustifolia</i>	Narrow-leaved mule's-ears
<i>Xanthium strumarium</i>	Cocklebur

* Special-status species

Native species.....73 (54%)

Non-native species.....62 (46%)

APPENDIX C

MONTHLY RAINFALL AND EVAPORATIVE DEMAND FOR SEASONAL WETLANDS NEAR FAIRFIELD, CA

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Monthly Rainfall and Evaporative Demand for Seasonal Wetlands Near Fairfield, California			
Month	Mean Monthly Eto^{1,2} <i>(inches)</i>	Mean Monthly Precipitation³ <i>(inches)</i>	Water Surplus or Deficit⁴ <i>(inches)</i>
October	4.2	1.9	-2.3
November	2	2.4	0.4
December	1.1	2.7	1.6
January	1	3.6	2.6
February	1.7	4.2	2.5
March	3.4	3.0	-0.4
April	5.5	0.9	-4.6
May	6.9	0.6	-6.3
June	8.1	0.3	-7.8
July	8.5	0.1	-8.4
August	7.5	0.1	-7.4
September	5.8	0.4	-5.4
Annual Total	55.7	20.2	-35.5

Notes:

1. Eto, the reference evapotranspiration, is a measure of the combined processes of water loss by evaporation and water transfer to the air through plant tissue. Water losses from vernal pools are likely to be equal to or lower than the reference evapotranspiration, which was developed for agricultural crops such as alfalfa.
2. Eto data used in the above calculation is from CIMIS station #6, located in Davis, California. The record from which the monthly average values were derived extends from August 1982 to the present, a sufficient length of time over which reasonable estimates of long term averages can be made.
3. Precipitation data used in the above calculation is from CIMIS station #6, located in Davis, California. The record from which the monthly average values were derived extends from August 1982 to the present, a sufficient length of time over which reasonable estimates of long term averages can be made.
4. The monthly estimates of water surplus or deficit are based on long-term averages. Actual conditions in a given year may vary considerably from these values.

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APPENDIX D

DRAFT CONSERVATION AGREEMENT

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**CONSERVATION EASEMENT DEED
Potrero Hills Landfill Mitigation Project**

THIS CONSERVATION EASEMENT DEED ("Conservation Easement") is made as of the 21st day of December, 2007, by Potrero Hills Landfill, Inc. ("Grantor"), in favor of _____ ("Grantee"), with reference to the following facts:

RECITALS

A. Grantor is the sole owner in fee simple of certain real property containing approximately 963 acres, located in the County of Solano, State of California , and including designated Assessor's Parcel Number(s) 004-612-0440 (Southern Hills), 004-61-20210 (Eastern Valley), 004-61-20400 (Griffith Ranch), 004-613-0170 (Director's Guild), and the east extension of parcel 004-612-0450 (the "Property"). The Property is legally described in **Exhibit A** and depicted on the map in **Exhibit B** attached to this Conservation Easement and incorporated in it by this reference.

B. The Property possesses wildlife and habitat values (collectively, "Conservation Values") of great importance to Grantee, the people of the State of California and the people of the United States, including, among other things, the specific Conservation Values identified in Recital C, below.

C. The Property provides high quality habitat for California tiger salamander (*Ambystoma californiense*), vernal pool tadpole shrimp (*Lepidurus packardii*), Conservancy fairy shrimp (*Branchinecta conservatio*), Contra Costa goldfield (*Lasthenia conjugens*), San Joaquin spearscale (*Atriplex joaquiniana*), alkali milk-vetch (*Astragalus tener* var. *tener*), and pappose tarplant (*Centromadia parryi* ssp. *parryi*) and contains annual grassland, playa pool, wet meadows and seeps, and stock ponds, and restored, created, enhanced and/or preserved jurisdictional waters of the United States including wetlands.

D. Grantee is authorized to hold easements pursuant to CA Civil Code § 815.3. Specifically, Grantee is [*choose applicable statement: a tax-exempt nonprofit organization qualified under section 501(c) (3) of the Internal Revenue Code of 1986, as amended, and qualified to do business in California which has as its primary purpose the preservation of land*]

in its natural, scenic, forested or open space condition or use OR a governmental entity identified in CA Civil Code Section 815.3(b) and otherwise authorized to acquire and hold title to real property].

E. The United States Fish and Wildlife Service ("USFWS"), an agency within the United States Department of the Interior, has jurisdiction over the conservation, protection, restoration and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of these species within the United States pursuant to the Endangered Species Act, 16 U.S.C. § 1531, *et seq.*, the Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661-666c, the Fish and Wildlife Act of 1956, 16 U.S.C. § 742(f), *et seq.*, and other provisions of federal law.

F. This Conservation Easement provides mitigation for impacts of approved projects affecting wetlands and associated habitats and species, pursuant to the Conservation Bank Agreement, by and between Potrero Hills Landfill, Inc. and the USFWS, USFWS File No. XXX, entered into concurrently with this Conservation Easement, and the Bank Development Plan (the "Development Plan") and Bank Management Plan (the "Management Plan") created under the Conservation Bank Agreement. The USFWS is referred to in this Conservation Easement as the "Signatory Agency".

COVENANTS, TERMS, CONDITIONS AND RESTRICTIONS

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and pursuant to the laws of the United States and the State of California, including California Civil Code § 815, *et seq.*, Grantor hereby voluntarily grants and conveys to Grantee a conservation easement in perpetuity over the Property.

1. Purposes. The purposes of this Conservation Easement are to ensure that the Property will be retained forever in its natural, restored, or enhanced condition as contemplated by the Conservation Bank Agreement, the Development Plan and the Management Plan, and to prevent any use of the Property that will impair or interfere with the Conservation Values of the Property as so restored or enhanced. Grantor intends that this Conservation Easement will confine the use of the Property to activities that are consistent with such purposes, including, without limitation, those involving the preservation, restoration and enhancement of native species and their habitats implemented in accordance with the Conservation Bank Agreement, the Development Plan and the Management Plan.

A final, approved copy of the Conservation Bank Agreement, the Development Plan and the Management Plan, and any amendments thereto approved by the Signatory Agencies, shall be kept on file at the office of the Signatory Agency. If Grantor, or any successor or assign, requires an official copy of the Conservation Bank Agreement, the Development Plan or the Management Plan, it should request a copy from one of the Signatory Agency at its address for notices listed in Section 12 of this Conservation Easement.

The Conservation Bank Agreement, the Development Plan and the Management Plan are incorporated by this reference into this Conservation Easement as if fully set forth herein.

2. Grantee's Rights. To accomplish the purposes of this Conservation Easement, Grantor hereby grants and conveys the following rights to Grantee and to the USFWS as a third-party beneficiary of this Conservation Easement:

(a) To preserve and protect the Conservation Values of the Property.

(b) To enter the Property at reasonable times in order to monitor compliance with and otherwise enforce the terms of this Conservation Easement, the Conservation Bank Agreement, the Development Plan and the Management Plan; and to implement at Grantee's sole discretion Development Plan and Management Plan activities that have not been implemented, provided that Grantee shall not unreasonably interfere with Grantor's authorized use and quiet enjoyment of the Property.

(c) To prevent any activity on or use of the Property that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features of the Property that may be damaged by any act, failure to act, or any use or activity that is inconsistent with the purposes of this Conservation Easement.

(d) The right to require that all mineral, air and water rights as Grantee deems necessary to preserve and protect the biological resources and Conservation Values of the Property shall remain a part of and be put to beneficial use upon the Property, consistent with the purposes of this Conservation Easement.

(e) All present and future development rights appurtenant to, allocated, implied, reserved or inherent in the Property; such rights are hereby terminated and extinguished, and may not be used on or transferred to any portion of the Property, nor any other property adjacent or otherwise.

3. Prohibited Uses. Any activity on or use of the Property that is inconsistent with the purposes of this Conservation Easement is prohibited. Without limiting the generality of the foregoing, the following uses and activities by Grantor, Grantor's agents, and third parties are expressly prohibited:

(a) Unseasonable watering; use of fertilizers, pesticides, biocides, herbicides or other agricultural chemicals; weed abatement activities; incompatible fire protection activities; and any and all other activities and uses which may adversely affect the purposes of this Conservation Easement, except as otherwise specifically provided in the Development Plan or the Management Plan.

(b) Use of off-road vehicles and use of any other motorized vehicles except on existing roadways, except as otherwise specifically provided in the Development Plan or the Management Plan.

(c) Agricultural activity of any kind, except grazing for vegetation management as specifically provided in the Development Plan or the Management Plan.

(d) Recreational activities, including, but not limited to, horseback riding, biking, hunting or fishing, except for personal, non-commercial, recreational activities of the Grantor, so long as such activities are consistent with the purposes of this Conservation

Easement, and recreational activities (if any) as specifically provided in the Development Plan or the Management Plan.

- (e) Commercial or industrial uses.
- (f) Any legal or de facto division, subdivision or partitioning of the Property.
- (g) Construction, reconstruction, erecting or placement of any building, billboard or sign, or any other structure or improvement of any kind, except as otherwise specifically provided in the Development Plan or the Management Plan]
- (h) Depositing or accumulation of soil, trash, ashes, refuse, waste, bio-solids or any other materials.
- (i) Planting, introduction or dispersal of non-native or exotic plant or animal species.
- (j) Filling, dumping, excavating, draining, dredging, mining, drilling, removing or exploring for or extracting minerals, loam, soil, sands, gravel, rocks or other material on or below the surface of the Property, or granting or authorizing surface entry for any of these purposes;
- (k) Altering the surface or general topography of the Property, including building roads or trails, paving or otherwise covering the Property with concrete, asphalt or any other impervious material, except as otherwise specifically provided in the Development Plan or the Management Plan.
- (l) Removing, destroying, or cutting of trees, shrubs or other vegetation, except as required by law for (1) fire breaks, (2) maintenance of existing foot trails or roads, (3) prevention or treatment of disease, or as otherwise specifically provided in the Development Plan or the Management Plan.
- (m) Manipulating, impounding or altering any natural water course, body of water or water circulation on the Property, and any activities or uses detrimental to water quality, including but not limited to degradation or pollution of any surface or sub-surface waters, except as otherwise specifically provided in the Development Plan or the Management Plan.
- (n) Without the prior written consent of Grantee, which Grantee may withhold, transferring, encumbering, selling, leasing, or otherwise separating the mineral rights or water rights for the Property; changing the place or purpose of use of the water rights; abandoning or allowing the abandonment of, by action or inaction, any water or water rights, ditch or ditch rights, spring rights, reservoir or storage rights, wells, ground water rights, or other rights in and to the use of water historically used on or otherwise appurtenant to the Property.
- (o) Engaging in any use or activity that may violate, or may fail to comply with, any relevant federal, state, or local laws, regulations, and policies applicable to Grantee, the Property, or the use or activity in question.

4. Grantor's Duties.

(a) Grantor shall undertake all reasonable actions to prevent the unlawful entry and trespass by persons whose activities may degrade or harm the Conservation Values of the Property or that are otherwise inconsistent with this Conservation Easement. In addition, Grantor shall undertake all necessary actions to perfect and defend rights of Grantee and third-party beneficiaries under Section 2 of this Conservation Easement, and to implement the Conservation Bank Agreement, the Development Plan and the Management Plan.

(b) Grantor shall not transfer, encumber, sell, lease, or otherwise separate the mineral, air or water rights for the Property, or change the place or purpose of use of the water rights, without first obtaining the written consent of Grantee, which Grantee may withhold. Grantor shall not abandon or allow the abandonment of, by action or inaction, any of Grantor's right, title or interest in and to any water or water rights, ditch or ditch rights, spring rights, reservoir or storage rights, wells, ground water rights, or other rights in and to the use of water historically used on or otherwise appurtenant to the Property including, without limitation: (i) riparian water rights; (ii) appropriative water rights; (iii) rights to waters which are secured under contract with any irrigation or water district, to the extent such waters are customarily applied to the Property; or (iv) any water from wells that are in existence or may be constructed in the future on the Property.

(c) Grantor shall install and maintain a fence reasonably satisfactory to Grantee around the Property to protect the Conservation Values of the Property, including but not limited to wildlife corridors.

5. Reserved Rights. Grantor reserves to itself, and to its personal representatives, heirs, successors, and assigns, all rights accruing from Grantor's ownership of the Property, including the right to engage in or permit or invite others to engage in all uses of the Property that are not prohibited or limited by, and are consistent with the purposes of, this Conservation Easement.

6. Grantee's Remedies. USFWS, as a third-party beneficiary under this Conservation Easement, shall have the same rights as Grantee under this section to enforce the terms of this Conservation Easement. If Grantee determines that a violation of the terms of this Conservation Easement has occurred or is threatened, Grantee shall give written notice to Grantor of such violation and demand in writing the cure of such violation. If Grantor fails to cure the violation within thirty (30) days after receipt of written notice and demand from Grantee, or if the cure reasonably requires more than thirty (30) days to complete and Grantor fails to begin the cure within the thirty (30)-day period or fails to continue diligently to complete the cure, Grantee may bring an action at law or in equity in a court of competent jurisdiction to enforce this Conservation Easement, to recover any damages to which Grantee may be entitled for violation of the terms of this Conservation Easement or for any injury to the Conservation Values of the Property, to enjoin the violation, *ex parte* as necessary, by temporary or permanent injunction without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies, or for other equitable relief, including, but not limited to, the restoration of the Property to the condition in which it existed prior to any violation or injury. Without limiting the liability of Grantor, Grantee may apply any damages recovered to the cost of undertaking any corrective action on the Property.

If Grantee, in its sole discretion, determines that circumstances require immediate action to prevent or mitigate damage to the Conservation Values of the Property, Grantee may

pursue its remedies under this Conservation Easement without prior notice to Grantor or without waiting for the period provided for cure to expire. Grantee's rights under this section apply equally to actual or threatened violations of the terms of this Conservation Easement. Grantor agrees that Grantee's remedies at law for any violation of the terms of this Conservation Easement are inadequate and that Grantee shall be entitled to the injunctive relief described in this section, both prohibitive and mandatory, in addition to such other relief to which Grantee may be entitled, including specific performance of the terms of this Conservation Easement, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. Grantee's remedies described in this section shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity, including but not limited to, the remedies set forth in Civil Code § 815, *et seq.* The failure of Grantee to discover a violation or to take immediate legal action shall not bar Grantee from taking such action at a later time.

If at any time in the future Grantor or any successor in interest or subsequent transferee uses or threatens to use the Property for purposes inconsistent with or in violation of this Conservation Easement then, notwithstanding Civil Code § 815.7, CDFG, the California Attorney General or any third-party beneficiary of this Conservation Easement has standing as an interested party in any proceeding affecting this Conservation Easement.

6.1. Costs of Enforcement. All costs incurred by Grantee, where Grantee is the prevailing party, in enforcing the terms of this Conservation Easement against Grantor, including, but not limited to, costs of suit and attorneys' and experts' fees, and any costs of restoration necessitated by negligence or breach of this Conservation Easement shall be borne by Grantor.

6.2. Grantee's Discretion. Enforcement of the terms of this Conservation Easement by Grantee or USFWS shall be at the discretion of Grantee or USFWS, and any forbearance by Grantee or USFWS to exercise its rights under this Conservation Easement in the event of any breach of any term of this Conservation Easement shall not be deemed or construed to be a waiver of such term or of any subsequent breach of the same or any other term of this Conservation Easement or of any rights of Grantee (or any rights of USFWS, as a third-party beneficiary) under this Conservation Easement. No delay or omission by Grantee or USFWS in the exercise of any right or remedy shall impair such right or remedy or be construed as a waiver.

6.3. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury to or change in the Property resulting from (i) any natural cause beyond Grantor's control, including, without limitation, fire not caused by Grantor, flood, storm, and earth movement, or any prudent action taken by Grantor under emergency conditions to prevent, abate, or mitigate significant injury to the Property resulting from such causes; or (ii) acts by Grantee or its employees.

6.4. USFWS Right of Enforcement. All rights and remedies conveyed to Grantee under this Conservation Easement shall extend to and are enforceable by USFWS. These rights are in addition to, and do not limit, the rights of enforcement under the [BEI *or* Conservation Bank Agreement], the Development Plan or the Management Plan.

7. Fence Installation and Maintenance. Grantor agrees to install and maintain a fence as described in section 4, Grantor's Duties.

8. Access. This Conservation Easement does not convey a general right of access to the public.

9. Costs and Liabilities. Grantor retains all responsibilities and shall bear all costs and liabilities of any kind related to the ownership, operation, upkeep, and maintenance of the Property. Grantor agrees that neither Grantee nor USFWS shall have any duty or responsibility for the operation, upkeep or maintenance of the Property, the monitoring of hazardous conditions on it, or the protection of Grantor, the public or any third parties from risks relating to conditions on the Property. Grantor remains solely responsible for obtaining any applicable governmental permits and approvals required for any activity or use permitted by this Conservation Easement, including permits and approvals required from Grantee acting in its regulatory capacity, and any activity or use shall be undertaken in accordance with all applicable federal, state, local and administrative agency laws, statutes, ordinances, rules, regulations, orders and requirements.

9.1. Taxes; No Liens. Grantor shall pay before delinquency all taxes, assessments (general and special), fees, and charges of whatever description levied on or assessed against the Property by competent authority (collectively "Taxes"), including any Taxes imposed upon, or incurred as a result of, this Conservation Easement, and shall furnish Grantee or USFWS with satisfactory evidence of payment upon request. Grantor shall keep the Property free from any liens (other than a security interest that is expressly subordinated to this Conservation Easement, as provided in Section 14 (k)), including those arising out of any obligations incurred by Grantor for any labor or materials furnished or alleged to have been furnished to or for Grantor at or for use on the Property.

9.2. Hold Harmless. Grantor shall hold harmless, protect and indemnify Grantee and its directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each an "Indemnified Party" and, collectively, "Indemnified Parties") from and against any and all liabilities, penalties, costs, losses, damages, expenses (including, without limitation, reasonable attorneys' fees and experts' fees), causes of action, claims, demands, orders, liens or judgments (each a "Claim" and, collectively, "Claims"), arising from or in any way connected with: (a) injury to or the death of any person, or physical damage to any property, resulting from any act, omission, condition, or other matter related to or occurring on or about the Property, regardless of cause, unless due solely to the negligence of Grantee or any of its employees; (b) the obligations specified in Sections 4, 9, and 9.1; and (c) the existence or administration of this Conservation Easement. If any action or proceeding is brought against any of the Indemnified Parties by reason of any such Claim, Grantor shall, at the election of and upon written notice from Grantee, defend such action or proceeding by counsel reasonably acceptable to the Indemnified Party or reimburse Grantee for all charges incurred for services of the Attorney General in defending the action or proceeding.

9.3. Extinguishment. If circumstances arise in the future that render the purposes of this Conservation Easement impossible to accomplish, this Conservation Easement can only be terminated or extinguished, in whole or in part, by judicial proceedings in a court of competent jurisdiction.

9.4. Condemnation. The purposes of this Conservation Easement are presumed to be the best and most necessary public use as defined at CA Code of Civil Procedure Section 1240.680 notwithstanding CA Code of Civil Procedure Sections 1240.690 and 1240.700.

10. Transfer of Conservation Easement. This Conservation Easement may be assigned or transferred by Grantee upon written approval of the Signatory Agencies, which approval shall not be unreasonably withheld or delayed, but Grantee shall give Grantor and the Signatory Agencies at least thirty (30) days prior written notice of the transfer. Approval of any assignment or transfer may be withheld in the reasonable discretion of the Signatory Agencies if the transfer will result in a single owner holding both this Conservation Easement and fee title to the Property and, upon such transfer, the doctrine of merger would apply to extinguish the Conservation Easement by operation of law, unless, prior to assignment of transfer, an alternate method or mechanism to achieve the purposes of this Conservation Easement following such merger has been provided for. Grantee may assign or transfer its rights under this Conservation Easement only to an entity or organization authorized to acquire and hold conservation easements pursuant to Civil Code § 815.3 (or any successor provision then applicable) or the laws of the United States and reasonably acceptable to the Signatory Agencies. Grantee shall require the assignee to record the assignment in the county where the Property is located. The failure of Grantee to perform any act provided in this section shall not impair the validity of this Conservation Easement or limit its enforcement in any way.

11. Transfer of Property. Grantor agrees to incorporate the terms of this Conservation Easement by reference in any deed or other legal instrument by which Grantor divests itself of any interest in all or any portion of the Property, including, without limitation, a leasehold interest. Grantor agrees that the deed or other legal instrument shall also incorporate by reference the [BEI *or* Conservation Bank Agreement], the Development Plan, the Management Plan and any amendment(s) to those documents. Grantor further agrees to give written notice to Grantee and the Signatory Agencies of the intent to transfer any interest at least thirty (30) days prior to the date of such transfer. Grantee or the Signatory Agencies shall have the right to prevent subsequent transfers in which prospective subsequent claimants or transferees are not given notice of the terms, covenants, conditions and restrictions of this Conservation Easement (including the exhibits and documents incorporated by reference in it). If Grantor proposes to transfer fee title to the Property to the then Grantee of this Conservation Easement, and if the doctrine of merger would apply and extinguish the Conservation Easement by operation of law upon such transfer, then the transfer shall be subject to the prior written approval of the Signatory Agencies, which approval shall not be unreasonably withheld or delayed. Approval of any such transfer that is subject to the approval of the Signatory Agencies may be withheld in the reasonable discretion of the Signatory Agencies unless, prior to such transfer, an alternate method or mechanism to achieve the purposes of this Conservation Easement following such merger has been provided for. The failure of Grantor to perform any act provided in this section shall not impair the validity of this Conservation Easement or limit its enforceability in any way.

12. Notices. Any notice, demand, request, consent, approval, or other communication that Grantor or Grantee desires or is required to give to the other shall be in writing, with a copy to each of the Signatory Agencies, and be served personally or sent by recognized overnight courier that guarantees next-day delivery or by first class United States mail, postage fully prepaid, addressed as follows:

To Grantor: Potrero Hills Landfill, Inc.
PO Box 68
Fairfield, CA 94533
Attn: Jim Dunbar, PE

To Grantee: _____

To USFWS: United States Fish and Wildlife Service
2800 Cottage Way, W-2605
Sacramento, CA 95826-1846
Attn: Field Supervisor

or to such other address a party or a Signatory Agency shall designate by written notice to Grantor, Grantee and the Signatory Agency. Notice shall be deemed effective upon delivery in the case of personal delivery or delivery by overnight courier or, in the case of delivery by first class mail, five (5) days after deposit into the United States mail.

13. Amendment. This Conservation Easement may be amended only by mutual written agreement of Grantor and Grantee, and written approval of the Signatory Agencies (which approval shall not be unreasonably withheld or delayed). Any such amendment shall be consistent with the purposes of this Conservation Easement and California law governing conservation easements and shall not affect its perpetual duration. Any such amendment shall be recorded in the official records of the county in which the Property is located, and Grantee shall promptly provide a conformed copy of the recorded amendment to the Grantor and the Signatory Agencies.

14. Additional Provisions.

(a) Controlling Law. The interpretation and performance of this Conservation Easement shall be governed by the laws of the State of California, disregarding the conflicts of law principles of such state, and applicable federal law, including the ESA.

(b) Liberal Construction. Despite any general rule of construction to the contrary, this Conservation Easement shall be liberally construed to effect the purposes of this Conservation Easement and the policy and purpose of Civil Code § 815, *et seq.* If any provision in this instrument is found to be ambiguous, an interpretation consistent with the purposes of this Conservation Easement that would render the provision valid shall be favored over any interpretation that would render it invalid.

(c) Severability. If a court of competent jurisdiction voids or invalidates on its face any provision of this Conservation Easement, such action shall not affect the remainder of this Conservation Easement. If a court of competent jurisdiction voids or invalidates the application of any provision of this Conservation Easement to a person or circumstance, such action shall not affect the application of the provision to any other persons or circumstances.

(d) Entire Agreement. This instrument (including its exhibits and any [BEI *or* Conservation Bank Agreement], Development Plan, Management Plan, and endowment fund incorporated by reference in it) sets forth the entire agreement of the parties and the Signatory

Agencies with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings, or agreements relating to the Conservation Easement. No alteration or variation of this instrument shall be valid or binding unless contained in an amendment in accordance with Section 13.

(e) No Forfeiture. Nothing contained herein will result in a forfeiture or reversion of Grantor's title in any respect.

(f) Successors. The covenants, terms, conditions, and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall constitute a servitude running in perpetuity with the Property.

(g) Termination of Rights and Obligations. A party's rights and obligations under this Conservation Easement terminate upon transfer of the party's interest in the Conservation Easement or Property, except that liability for acts, omissions or breaches occurring prior to transfer shall survive transfer.

(h) Captions. The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon its construction or interpretation.

(i) No Hazardous Materials Liability. Grantor represents and warrants that it has no knowledge or notice of any Hazardous Materials (defined below) or underground storage tanks existing, generated, treated, stored, used, released, disposed of, deposited or abandoned in, on, under, or from the Property, or transported to or from or affecting the Property. Without limiting the obligations of Grantor under Section 9.2, Grantor hereby releases and agrees to indemnify, protect and hold harmless the Indemnified Parties (defined in Section 9.2) from and against any and all Claims (defined in Section 9.2) arising from or connected with any Hazardous Materials or underground storage tanks present, alleged to be present, released in, from or about, or otherwise associated with the Property at any time, except any Hazardous Materials placed, disposed or released by Grantee, its employees or agents. This release and indemnification includes, without limitation, Claims for injury to or death of any person or physical damage to any property; and the violation or alleged violation of, or other failure to comply with, any Environmental Laws (defined below). If any action or proceeding is brought against any of the Indemnified Parties by reason of any such Claim, Grantor shall, at the election of and upon written notice from Grantee, defend such action or proceeding by counsel reasonably acceptable to the Indemnified Party or reimburse Grantee for all charges incurred for services of the Attorney General in defending the action or proceeding.

Despite any contrary provision of this Conservation Easement, the parties do not intend this Conservation Easement to be, and this Conservation Easement shall not be, construed such that it creates in or gives to Grantee any of the following:

(1) The obligations or liability of an "owner" or "operator," as those terms are defined and used in Environmental Laws (defined below), including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. § 9601, *et seq.*; hereinafter, "CERCLA"); or

(2) The obligations or liabilities of a person described in 42 U.S.C. § 9607(a) (3) or (4); or

(3) The obligations of a responsible person under any applicable Environmental Laws; or

(4) The right to investigate and remediate any Hazardous Materials associated with the Property; or

(5) Any control over Grantor's ability to investigate, remove, remediate or otherwise clean up any Hazardous Materials associated with the Property.

The term "Hazardous Materials" includes, without limitation, (a) material that is flammable, explosive or radioactive; (b) petroleum products, including by-products and fractions thereof; and (c) hazardous materials, hazardous wastes, hazardous or toxic substances, or related materials defined in CERCLA, the Resource Conservation and Recovery Act of 1976 (42 U.S.C. § 6901, *et seq.*; hereinafter, "RCRA"); the Hazardous Materials Transportation Act (49 U.S.C. § 6901, *et seq.*; hereinafter, "HTA"); the Hazardous Waste Control Law (California Health & Safety Code § 25100, *et seq.*; hereinafter, "HCL"); the Carpenter-Presley-Tanner Hazardous Substance Account Act (California Health & Safety Code § 25300, *et seq.*; hereinafter "HSA"), and in the regulations adopted and publications promulgated pursuant to them, or any other applicable Environmental Laws now in effect or enacted after the date of this Conservation Easement.

The term "Environmental Laws" includes, without limitation, CERCLA, RCRA, HTA, HCL, HSA, and any other federal, state, local or administrative agency statute, ordinance, rule, regulation, order or requirement relating to pollution, protection of human health or safety, the environment or Hazardous Materials. Grantor represents, warrants and covenants to Grantee that activities upon and use of the Property by Grantor, its agents, employees, invitees and contractors will comply with all Environmental Laws.

(j) Warranty. Grantor represents and warrants that Grantor is the sole owner of the Property; there are no outstanding mortgages, liens, encumbrances or other interests in the Property (including, without limitation, mineral interests) which have not been expressly subordinated to this Conservation Easement, and that the Property is not subject to any other conservation easement or interest that is adverse to this Conservation Easement.

(k) Additional Interests. Grantor shall not grant any additional easements, rights of way or other interests in the Property (other than a security interest that is expressly subordinated to this Conservation Easement), nor shall Grantor grant, transfer, abandon or relinquish any water or water right associated with the Property, without first obtaining the written consent of Grantee and the USFWS. Grantee or USFWS may withhold such consent in its sole discretion if Grantee determines that the proposed interest or transfer is inconsistent with the purposes of this Conservation Easement or will impair or interfere with the Conservation Values of the Property. This Section 14(k) shall not limit the provisions of Section 2(d) or 3(n), nor prohibit transfer of a fee or leasehold interest in the Property that is subject to this Conservation Easement and complies with Section 11.

(l) Recording. Grantee shall record this Conservation Easement in the Official Records of the County in which the Property is located, and may re-record it at any time as Grantee deems necessary to preserve its rights in this Conservation Easement.

(m) Third-Party Beneficiary. Grantor and Grantee acknowledge that the USFWS is a third party beneficiary of this Conservation Easement with the right of access to the Property and the right to enforce all of the obligations of Grantor under this Conservation Easement.

(n) Funding. Funding shall be held in trust or by other means specified in the Management Plan for the perpetual management, maintenance, monitoring and reporting of this conservation easement and the Property in accordance with the Management Plan

IN WITNESS WHEREOF Grantor has executed this Conservation Easement Deed the day and year first above written.

GRANTOR:

BY: Potrero Hills Landfill, Inc.

NAME: _____

TITLE: _____

DATE: _____

GRANTEE:

BY: _____

NAME: _____

TITLE: _____

DATE: _____

EXHIBIT A

LEGAL DESCRIPTION

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EXHIBIT B

CONSERVATION EASEMENT AREA MAP

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APPENDIX E

TECHNICAL MEMO

POTRERO HILLS LANDFILL WETLAND MITIGATION

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October 31, 2008

Steve Peterson
Environmental Stewardship & Planning, Inc.
1621 13th Street
Sacramento, CA 95814

RE: Potrero Hills Landfill Wetland Mitigation

Mr. Peterson,

In June, 2008 Swanson Hydrology and Geomorphology (SH+G) prepared a memorandum outlining the hydrologic criteria and pond spacing rationale for a mitigation plan to address impacts to California Tiger Salamander (CTS) associated with the Phase II landfill expansion. Following several meetings with the U.S. Fish and Wildlife Service (USFWS) and the Bay Conservation and Development Commission (BCDC), a portion of the Eastern Valley property was added to the proposed mitigation lands. The addition of the Eastern Valley provided for a direct connection between the southern and northern mitigation parcels, thereby eliminating the need for additional ponds in and around the existing landfill and the Phase 2 expansion area. To reflect these changes, SH+G has revised the memorandum of June, 2008 to reflect these changes. The key issues addressed in this revised memo include:

- 1) Identification of new pond sites on the Potrero Hills Landfill properties that not only mitigate for Phase II impacts but enhance the long term viability of the Potrero Hills CTS population.
- 2) Hydrologic character of the proposed mitigation ponds and the existing ponds to be retained on properties owned by Potrero Hills Landfill.
- 3) Issues associated with the engineering design and implementation of the mitigation plan for CTS.

In order to mitigate the impacts of the landfill expansion, a network of ponds, that include the existing ponds, will be created to allow for CTS movement between the mitigation lands in the south (ie – Southern Hills), the eastern portion of the Potrero Hills Valley (Eastern Valley) and the mitigation parcels to the north (ie – Griffith Ranch and Director's Guild). The parcels that occur between the northern and southern mitigation parcels include the existing Phase I landfill, the proposed Phase II landfill and the Eastern Valley. Currently, CTS can freely access the northern and southern mitigation parcels through the Phase II parcel and the Eastern Valley, both of which contain viable CTS breeding ponds. Under a proposal mitigation approach maintenance of a movement corridor between the southern and northern mitigation parcels would be accomplished through long-term protection and maintenance of the portion of the Eastern Valley parcel that lies within the Potrero Hills Valley proper.

SWANSON HYDROLOGY + GEOMORPHOLOGY

To implement the proposed mitigation discussed above, a network of new CTS breeding ponds will be created that fit specific biological criteria and a design goal that provides for a connection between existing and proposed ponds that is no greater than 2,000 feet. This design standard represents a conservative estimate of the typical extent of radial movement of CTS. The proposed pond network was developed through an iterative process, taking into account the necessary physical properties and hydrologic character of the mitigation pond locations, the topography of the area, and the 2,000 foot connectivity requirement.

The criteria for the physical properties of the mitigation ponds were provided by LSA, and were based on the need to create ponds that would allow for successful breeding and rearing of CTS in most years. Each mitigation pond would be targeted to have a surface extent of approximately 0.33 acres with a maximum depth of four feet and a minimum depth of 6 inches through May of each year. Using these parameters, a water balance model was created to determine the required drainage area and preferred soil properties of the proposed pond locations.

The water balance model includes terms for contributing drainage area, infiltration and evaporation rates, monthly rainfall, expected runoff, and the properties of the underlying geologic units (described in “Potrero Hills – Phase II Landfill Expansion, Wetland Mitigation Plan Hydrologic Report” (Dvorsky, 2007)). Individual models were run, on a monthly timestep, for each existing and proposed pond location (Table 1). The model determined, as a general rule, that to be self-sustaining each pond required a drainage area of at least 5 acres and a soil infiltration rate of less than 0.11 micrometers per second.

One of the proposed ponds do not fit the conditions of our evaluation, but are required to provide adequate connectivity (Table 2). Pond GR1, located on Griffith Ranch, is an anomaly in that it receives water from both seasonal fluctuations in the ground water table and directly from dispersed overland flow. Making this pond viable will require additional engineering to ensure an infiltration rate of less than 0.11 micrometers per second to retain enough water to ensure that the pond will persist through May.

Several existing ponds, including Ponds 1 and 2 did not meet the drainage area requirements identified by the water balance, yet are viable CTS ponds based on direct observation of CTS use over the past 10 years (Pond 6 has had CTS attempting to breed in the pond, but larvae have never been observed here.). Consequently, a field visit was conducted to evaluate site conditions and determine what is unique about these ponds that make them viable. All of these ponds (Ponds 1, 2, and 6) are located in historic quarry pits that were cut into bedrock exposures along the northern margins of the Potrero Hills. Direct runoff from the exposed bedrock surface, combined with lower infiltration rates within the bedrock “basin” and the presence of a bedrock sill that prevents overflow, creates ponds that persist through the spring. There may be opportunities to mimic these conditions elsewhere or enhance conditions at Pond 2 and Pond 6 to make them more viable for CTS in most years.

The resulting network of existing and proposed ponds, as shown in Figure 1 and Figure 2, provides good continuity between the Southern Hills Parcel, through the Eastern Valley, and into Griffith Ranch and Director’s Guild. Due to unfavorable topography and expected long-term activity at the entrance to the landfill, limited options for connectivity exist between the Southern Hills and the

SWANSON HYDROLOGY + GEOMORPHOLOGY

northern mitigation parcels via the west side of the Phase I landfill. With the Eastern Valley included as a permanent mitigation area, connectivity to the west or over the capped or active landfill is not necessary to maintain connectivity between the existing populations.

With the exception of GR1 the engineering design process to create the ponds is expected to be fairly straightforward. The first step is to collect topographic data for each proposed pond site. The topographic data will then be used to design the pond and berm. Ideally, the cut and fill will be balanced for each pond site to minimize the import or off-haul of material. The berm will be designed to be 1 foot above the elevation of the pond when it is full to allow for a spillway. The spillway will be lined with rock and be designed to pass the expected peak flow. Other design considerations include temporary construction access, pond and berm compaction, and temporary and long term erosion control measures.

Please feel free to contact me if you have any questions or concerns about this memorandum or would like additional information. We look forward to continuing to work with you on this project.

Sincerely,

John Dvorsky
Project Manager
Hydrology/Geomorphology/Fisheries
Swanson Hydrology and Geomorphology
A California Corporation

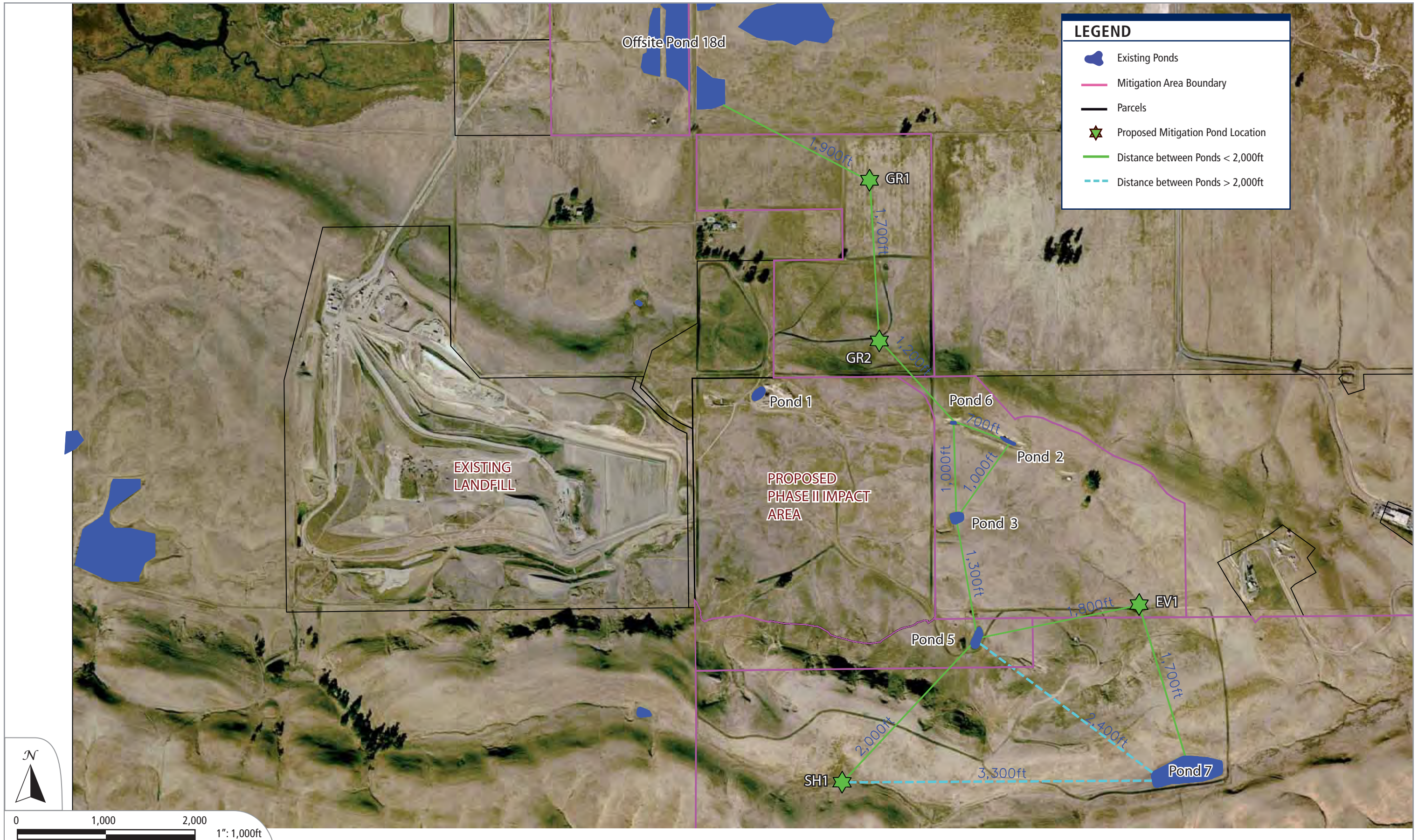


FIGURE 1A: Map of existing and proposed pond sites for the Potrero Hills Landfill and adjacent mitigation lands. Each pond that is within a distance of 2,000ft., which represents the typical extent of radial movement for the California Tiger Salamander, is connected by a line that is labeled with the actual distance.

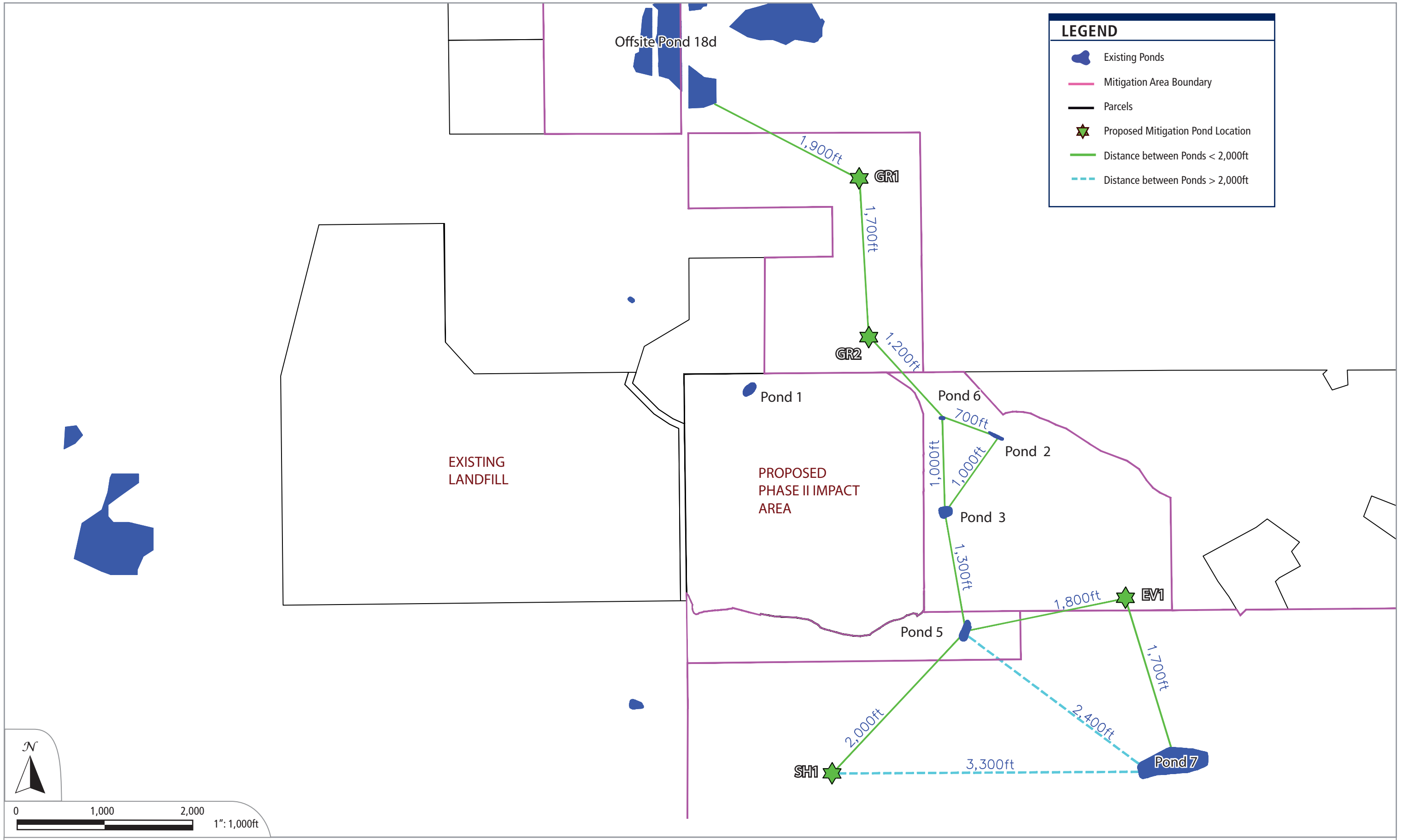


FIGURE 1B: Map of existing and proposed pond sites for the Potrero Hills Landfill and adjacent mitigation lands. Each pond that is within a distance of 2,000ft., which represents the typical extent of radial movement for the California Tiger Salamander, is connected by a line that is labeled with the actual distance.

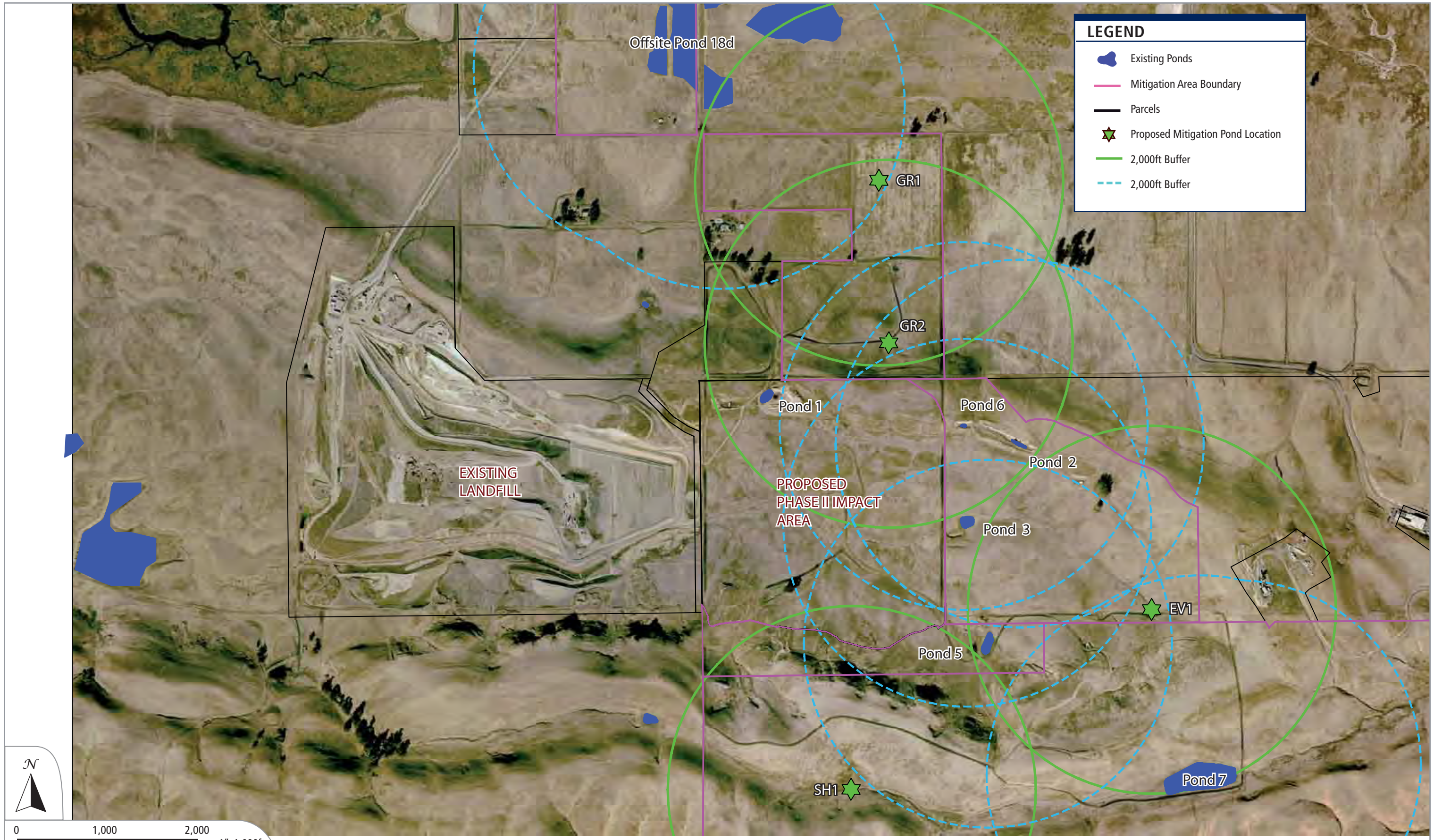


FIGURE 2B: Map of existing and proposed pond sites for the Potrero Hills Landfill and adjacent mitigation lands. Each pond is buffered to a distance of 2,000ft., which represents the typical extent of radial movement for the California Tiger Salamander.

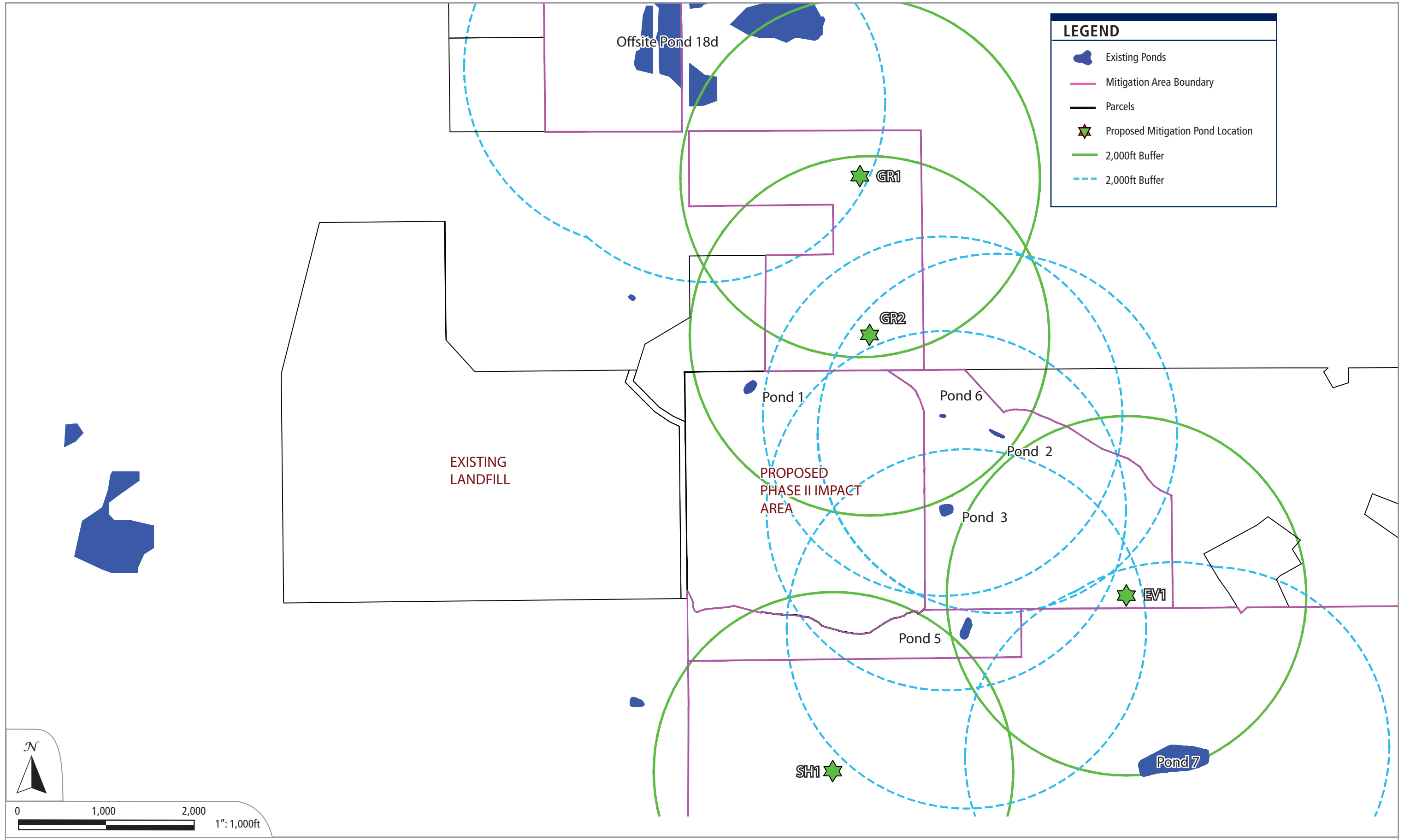


FIGURE 2B: Map of existing and proposed pond sites for the Potrero Hills Landfill and adjacent mitigation lands. Each pond is buffered to a distance of 2,000ft., which represents the typical extent of radial movement for the California Tiger Salamander.

Table 1a: Estimated Storage Depth, in feet, by Month for Existing Ponds

Month	Pond 1 (3.2ac)	Pond 2 (1.4ac)	Pond 3 (160.2ac)	Pond 5 (35.6ac)	Pond 6 (0.8ac)	Pond 7 (44.3ac)
Sept.	0.0	0.0	0.0	0.0	0.0	0.0
Oct.	0.0	0.0	0.0	0.0	0.0	0.0
Nov.	0.6	0.2	4.0	4.0	0.1	4.0
Dec.	1.7	0.7	4.0	4.0	0.4	4.0
Jan.	2.5	1.0	4.0	4.0	0.6	4.0
Feb.	3.4	1.1	4.0	4.0	0.6	4.0
Mar.	1.9	0.6	4.0	4.0	0.3	4.0
April	0.8	0.2	4.0	4.0	0.1	4.0
May	0.4	0.2	4.0	4.0	0.1	4.0
June	0.1	0.0	0.9	0.9	0.0	0.9
July	0.0	0.0	0.1	0.1	0.0	0.1
Aug.	0.0	0.0	0.1	0.1	0.0	0.1

Storage greater than 0.5 feet is predicted to exist in the pond.

Table 1b: Estimated Storage Depth, in feet, by Month for Proposed Ponds

Month	(53.4ac)	GR1	(11.6ac)	(29.1ac)
Sept.	0.0	Not Applicable	0.0	0.0
Oct.	0.0		0.0	0.0
Nov.	4.0		2.5	4.0
Dec.	4.0		4.0	4.0
Jan.	4.0		4.0	4.0
Feb.	4.0		4.0	4.0
Mar.	4.0		4.0	4.0
April	4.0		3.2	4.0
May	4.0		3.2	4.0
June	0.9		0.6	0.9
July	0.1		0.1	0.1
Aug.	0.1		0.0	0.1

Storage greater than 0.5 feet is predicted to exist in the pond.

	Location	Surface Water Dominated	Groundwater Dominated	Notes
Existing Ponds	Pond 1	X		Pond excavated into bedrock; Relies on direct runoff from bedrock
	Pond 2	X		Pond excavated into bedrock; Relies on direct runoff from bedrock
	Pond 3	X		
	Pond 5	X		
	Pond 6	X		Pond excavated into bedrock; Relies on direct runoff from bedrock
	Pond 7	X		
Proposed Ponds	EV1	X		Located on main Spring Branch Creek channel
	GR1		X	Ground water or sheet flow from adjacent lands
	GR2	X		
	SH1	X		

TABLE 2: Summary of the viability and hydrologic setting of existing and proposed California tiger salamander ponds on properties owned by the Potrero Hills Landfill. Viability is based on estimates of each ponds hydroperiod in combination with established biological criterion.

APPENDIX F

CALIFORNIA TIGER SALAMANDER

SALVAGE PLAN FOR THE PHASE II EXPANSION AREA

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M E M O R A N D U M

DATE: July 7, 2010

TO: Andy Raabe
U.S. Fish and Wildlife Service

FROM: Tim Lacy and Steve Foreman, LSA
Steve Peterson, ESP

SUBJECT: Update 3 – Salvaging California Tiger Salamanders at the Potrero Hills Landfill (PHLF) Phase II Expansion Site, Solano County

As requested during our meeting on January 14, 2009, this memo was prepared in February 2009 to describe the general timing of activities to be implemented for salvaging CTS from Phase II expansion site at the Potrero Hills Landfill. The approximate dates of other important milestones in the landfill expansion project area also shown in the table below. We have updated this memo to reflect changes in the dates of the salvage operation based on the expected issuance date of the Biological Opinion.

We assume that a Biological Opinion and Corps permit will be completed in the third quarter of 2010. PHLF must begin site preparation and cell construction in the Phase II area in 2011 as the existing Phase I landfill is expected to be near capacity by that time. If the Corps permit is issued by September 2010, one year of salvage trapping will be completed starting in the fall of 2010.

We assume that the conservation easement will be recorded, details of the financial assurances will be completed, and the monitoring plan will be implemented within six months of the issuance of the Corps permit and Biological Opinion.

Salvage will proceed as outlined below.

MONTH/YEAR	ACTIVITY
July 2010	<i>Corps Permit and BO completed.</i>
Aug-Sep 2010	a) Install salamander barrier around 167-acre Phase II landfill area, dividing area into a southern and northern area. The barrier will be constructed of Ertec E-Fence. This material was used at the Vista Del Mar site in Pittsburg. The material is made from a recycled plastic and has a mesh size of 0.25 inches. This material is expected to hold up much better than a solid fence material over the life of the project as it will allow wind to pass through but still present a solid face to salamanders and other small animals that encounter the fence. This fence is relatively easy to install as the semirigid panels come in 100 foot lengths. The height of the panels will be 30 inches, with 5 inches buried, leaving 25 inches above ground. The fence will be attached to a standard 4-strand barbed wire fence for durability and to avoid destruction by cattle grazing the adjacent mitigation lands. Wire be used to attach the E-fence to the

MONTH/YEAR	ACTIVITY
	<p>perimeter fence posts. (Manufacturer's information about this fencing material can be found at (http://www.ertecsystems.com/.)</p> <p>On the inside of the fence, pitfall traps will be installed every 33 feet. No traps will be installed on the outside of the fence. The barrier fence, therefore, will serve as the perimeter drift fence as well as permanent barrier. A maximum of three additional drift fence arrays will be installed within the Phase II impact area. These arrays would be installed in an "X" shape with each arm being 200 feet long. Traps would be installed so that animals walking along either side of the fence would be captured. Pitfall traps will be operated during the rainy season to trap CTS as the move within the Phase II area. CTS (and other animals) captured within the Phase II area will be relocated to the closest burrow outside the fence.</p> <p>Trapping would only occur in the southern portion of the Phase II that includes the Spring Branch Creek and its tributaries within the Phase II area will be trapped during fall 2010.</p> <p>Salvage trapping of the northern portion of the Phase II start in 2011 and finally around Pond 1 in 2015.</p>
<p>Year 1 (October 2010 – March 2011 (dates are approximate and will depend on rainfall))</p>	<p>Conduct salvage trapping of the southern portion the Phase II area (Spring Branch Creek area and tributaries). Pitfall traps to be installed at approximately 30 foot intervals around the interior perimeter of the site. Two additional pitfall trap arrays will be installed inside southern area.</p> <ul style="list-style-type: none"> • Traps to be installed by October 15 or before first rains of the season. Traps will be set and checked during all storm events between October 2010 and March 2011. Trapping method will be as described below: <ul style="list-style-type: none"> a. A permanent barrier fence/drift fence will be installed around the perimeter of the Phase II area. Up to four gates may be installed in the permanent barrier fence to allow access from the Phase II area to the mitigation parcels (these will be required to construct and monitor mitigation features, maintain fences, move cattle, etc.). Gates will be constructed to allow passage of vehicles, but prevent CTS from moving onto the Phase II area. One gate is proposed between Phase I and Phase II parcels, one gate between the Phase II parcel and Griffith Ranch parcel, and one gate between the Eastern Valley and Phase II parcels, and one gate between the Pond 5 buffer/Southern Hills and the Phase II parcel. Gates would be accessed via the perimeter roads in the Phase II parcel and connect to existing farm roads on the mitigation lands. Gates would be used minimally during the rainy season to minimize the opportunity for CTS to move onto the Phase II area.

MONTH/YEAR	ACTIVITY
	<ul style="list-style-type: none"> <li>b. Arrays will be constructed by 15 October. Beginning on or before October 15 and extending until about March 15, pitfall buckets will be opened before sunset if there is any rain during the day or if at 2 PM rain is forecast for the remainder of the day or subsequent night with 70% or greater probability (based on the nearest National Weather Service forecast - available at http://www.wrh.noaa.gov/Sacramento/). Traps will be open each night and checked each morning until no rain has fallen within the preceding 24 hours. If no rain is forecast, the traps will be closed until the next rain event. <li>c. To the extent possible pitfall traps will not be placed in a manner that will disturb or destroy rodent burrows or other refugia that could be used by CTS. <li>d. To avoid flooding traps will be placed in slightly elevated locations where flooding is less likely to the extent possible. Pitfalls in locations likely to flood will be free of holes. If ground saturation forces a pitfall out of the soil it will be weighted down with cement, gravel or other suitable materials. <li>e. All pitfall traps will have a rigid lid that closes securely. When not in use, traps will be closed in a manner that precludes entry by CTS and other animals. <li>f. Pitfall traps will be cylindrical, non-galvanized, metal or plastic containers. They will be at least 2-gallons in size and 8 in (20 cm) deep. <li>g. Each pitfall trap will contain non-cellulose sponges or other nontoxic absorbent material which will be kept moist at all times. <li>h. Each pitfall trap will have a rigid cover with legs one to two inches high to provide shade and shed water during extreme rain events. <li>i. When in use, pitfall traps will be checked at a minimum one time a day, with one of these checks occurring between one hour before sunrise and noon. Whenever possible, traps will be opened just before dark and checked and closed the following morning. <li>j. The drift fence and pitfall traps will be inspected weekly to ensure the system has not been disturbed by wind, equipment, etc. Repairs to fences will be completed prior to the next

MONTH/YEAR	ACTIVITY
	<p>sampling event (storm).</p> <ol style="list-style-type: none"> <li>k. Pitfall traps will be placed as far as possible from ant nests. If an ant nest develops within 10 feet of an existing pitfall trap, the pitfall trap will be moved, removed from the field, or closed. <li>l. Captured CTS will be released as near as possible to the point of capture, in a manner that maximizes their survival. CTS will be released into the mouth of a small mammal burrow or other suitable refugia. CTS will be watched after release to be sure that they are in a safe location and are not susceptible to increased predation risk. <li>m. To minimize mortality of small mammals that may become trapped during surveys, each pitfall trap should also incorporate either jute twine, as described in Karraker (2001). <ul style="list-style-type: none"> <li>• Standard measurement of animals including total length, snout/vent length, age (adult/juvenile), sex, and general physical condition will be recorded on data sheets. The trap number and location of the trap will also be noted. <li>• Animals will be released into burrows on the opposite side of the fence as close to the trap location as possible. <li>• CTS will be held no longer than necessary to record data and transport them to the burrows on the other side of the fence. Individuals will be held in separate containers until their release to prevent the possible spread of disease. <li>• A weekly report will be forwarded to USFWS and CDFG noting the number of animals captured.
March 2011 – June 2011	<p>Monitor CTS breeding in all preserved mitigation ponds. Ponds will be monitored for larvae once per month for at least 3 months each year. In years with extended pond inundation, surveys for larvae would be conducted through June for a total of 4 surveys. Ultimately, monitoring will be dependent on rainfall and pond conditions.</p> <p>California tiger salamander breeding activity will be monitored each year between about March and June (starting date for surveys for CTS larvae will depend on the rainfall and filling of the ponds each year). Surveys will entail sampling the created and preserved ponds at least three times each year (typically once each month March through May/June) to document the presence of CTS larvae and determine the density of larvae in the ponds. Each pond will be sampled quantitatively to determine the density of CTS larvae in the pond during each month. A representative sample of the CTS larvae also will be measured and the length of the larvae each month will be recorded for both the created and preserved ponds. Water depth in the ponds will be</p>

MONTH/YEAR	ACTIVITY
	<p>measured during each sampling event. The density of CTS larvae in created pond will be compared to the density of the preserved ponds. Since breeding in any pond is dependent on salamanders being able to reach the ponds and find a mate there, no specific larval density is required, but all ponds will be shown to be used as breeding and larval development habitat in order to meet the success criteria. Notes on prey and/or potential predators observed in the ponds also will be recorded. An assessment of the likelihood of larvae being able to successfully metamorphose will be made during the last survey each year. Additional surveys beyond May will be necessary in years with prolonged inundation.</p> <p>The Declining Amphibian Task Force Fieldwork Code of Practice will be followed during all CTS monitoring and trapping.</p>
May – July 2011	CTS postmetamorphs will be prevented from moving into the Phase II expansion area by the barrier fence that was installed around the Phase II expansion area in August – September 2010. The barrier will receive regular maintenance to ensure that it remains functional and will prevent salamanders from entering the Phase II landfill.
Late Spring – Early Summer 2011	CTS postmetamorphs will be prevented from moving into the Phase II expansion area by the barrier fence that was installed in August – September 2010. Barrier fence will receive regular maintenance to ensure that barrier remains functional.
<i>June 2011</i>	<i>Begin site preparation and cell construction in southern portion of the Phase II expansion area.</i>
August 2011- October 2011	<p>Construct mitigation ponds on mitigation parcels</p> <ul style="list-style-type: none"> • Southern Hills – Pond SH1 and deepening of Pond 7/Seasonal Wetland 4, Pond EV1 • Griffith Ranch – Ponds GR1, GR2, seasonal wetland complex. • Director’s Guild swale and berm removal
October 2011 – March 2012	Monitor constructed ponds (above) during 1 st year after construction to document inundation period and potential use as breeding habitat by CTS.
Year 2-5 (June 2011 – August 2015)	<p>Maintain barrier fence around expansion parcel. Conduct regular maintenance of fence.</p> <p>Trapping will continue annually in the northern portion of the Phase II Expansion Area through 2015. As a cell is constructed, the new cell construction area will be isolated from the remainder of the Phase II parcel using the barrier fence material described above with pitfall traps installed on the inside of the fence. The number of internal drift fence arrays would be reduced as the undeveloped Phase II area is reduced in size. Salvage trapping will be conducted during all storm events during the second year of salvage trapping. After the second year (2012-2013), salvage trapping will be initiated in the undeveloped portion of the Phase II area during the first storm events of the year. The duration of salvage trapping in subsequent years would be based</p>

MONTH/YEAR	ACTIVITY
	<p>on sustained captures rather than length of time. In years 3-5 (2013-2015), salvage trapping will continue until no CTS are trapped for two consecutive storms. If no CTS are trapped during two consecutive storms, then salvage trapping will be canceled for the remainder of the season. Trapping would be reinitiated in Years 4-5 (2014-2015) and be continued until no CTS are trapped during 2 consecutive storms. Additional salvage trapping will only occur in the undeveloped portion of the Phase II site, not in the cell construction area. c) Implement mitigation and monitoring plan for all mitigation parcels and report results to USFWS and CDFG annually.</p>
Year 6 (August – September 2015)	<p>Pond 1 will have been located outside the Phase II barrier fence for the first 5 years to allow the pond to continue to serve as a breeding site while the mitigation ponds (GR1 and GR2) on the Griffith Ranch parcel become established. At the end of the initial five year period, the permanent barrier fence will be extended around Pond 1 and salvage trapping will be initiated prior to removal of the pond and surrounding area.</p>
Year 6 (October 2015 – March 2016 (dates are approximate and will depend on rainfall))	<p>Conduct salvage trapping of the Pond 1 area as described for Year 1 above. Traps to be installed by October 15 or before first rains of the season. Traps to be run during storm event between October 2015 and March 2016. Trapping methods will be as described for Year 1 except no internal arrays are expected to be necessary in the Pond 1 areas due to its small size.</p> <ul style="list-style-type: none"> • Standard measurement of animals including total length, snout/vent length, age (adult/juvenile), sex, and general physical condition will be recorded on data sheets. The trap number and location of the trap will also be noted. • Animals will be released into burrows on the opposite side of the fence as close to the trap location as possible. • CTS will be held no longer than necessary to record data and transport them to the burrows on the other side of the fence. Individuals will be held in separate containers until their release to prevent the possible spread of disease. • A weekly report will be forwarded to USFWS and CDFG noting the number of animals captured.
June 2016	Remove Pond 1.
Year 6 through closure (June 2015 – 2045)	<p>a) Maintain barrier fence around expansion parcel. Conduct regular maintenance of fence. b) Continue salvage trapping in the Pond 1 area through 2019. c) Implement mitigation and monitoring plan for all mitigation parcels and report results to USFWS and CDFG.</p>
Approximately 2045	Landfill reaches capacity and final closure of landfill begins.

FIGURES

- Figure 1. Regional Location
- Figure 2. Proposed Project Site and Mitigation Areas
- Figure 3. Project Components
- Figure 4. Concept of Landfill Construction Sequence
- Figure 5. Waters of the United States on the Phase II Expansion Site
- Figure 6. Lands Owned by Potrero Hills Landfill
- Figure 7. Special-Status Animal Locations
- Figure 8. Phase II Expansion Area Special-Status Plant Locations
- Figure 9. Location of Mitigation Parcels
- Figure 10. Southern Hills and Eastern Valley Wetland Map
- Figure 11. Director's Guild Wetland Map
- Figure 12. Griffith Ranch Wetland Map
- Figure 13. Proposed New Excavated California Tiger Salamander Breeding Area in Pond 7 on the Southern Hills Proposed Mitigation Parcel
- Figure 14. Southern Hills Mitigation Pond
- Figure 15. Griffith Ranch Proposed and Existing Wetlands
- Figure 16. Eastern Valley Mitigation Pond
- Figure 17. Eastern Hills Wetland Map

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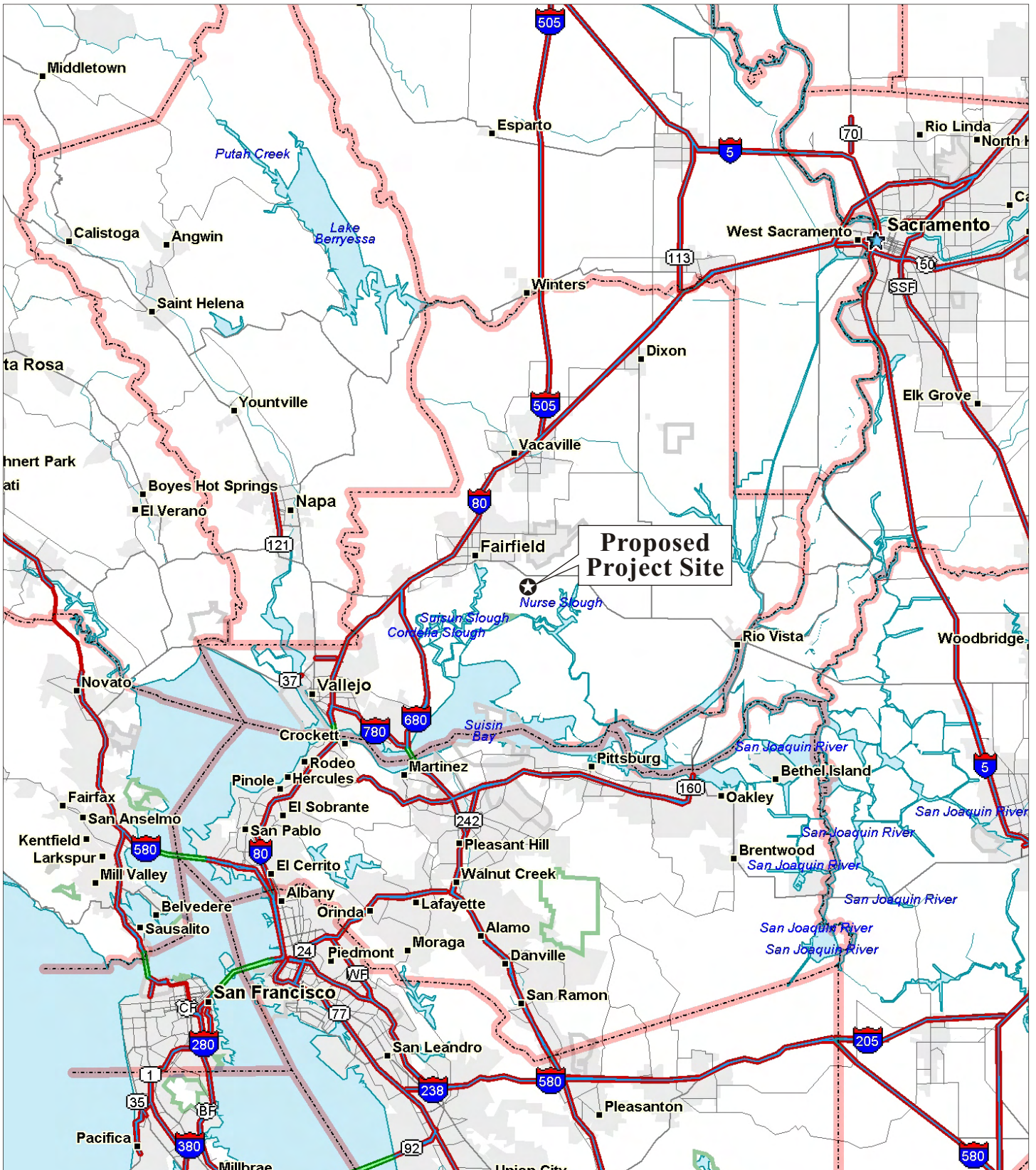
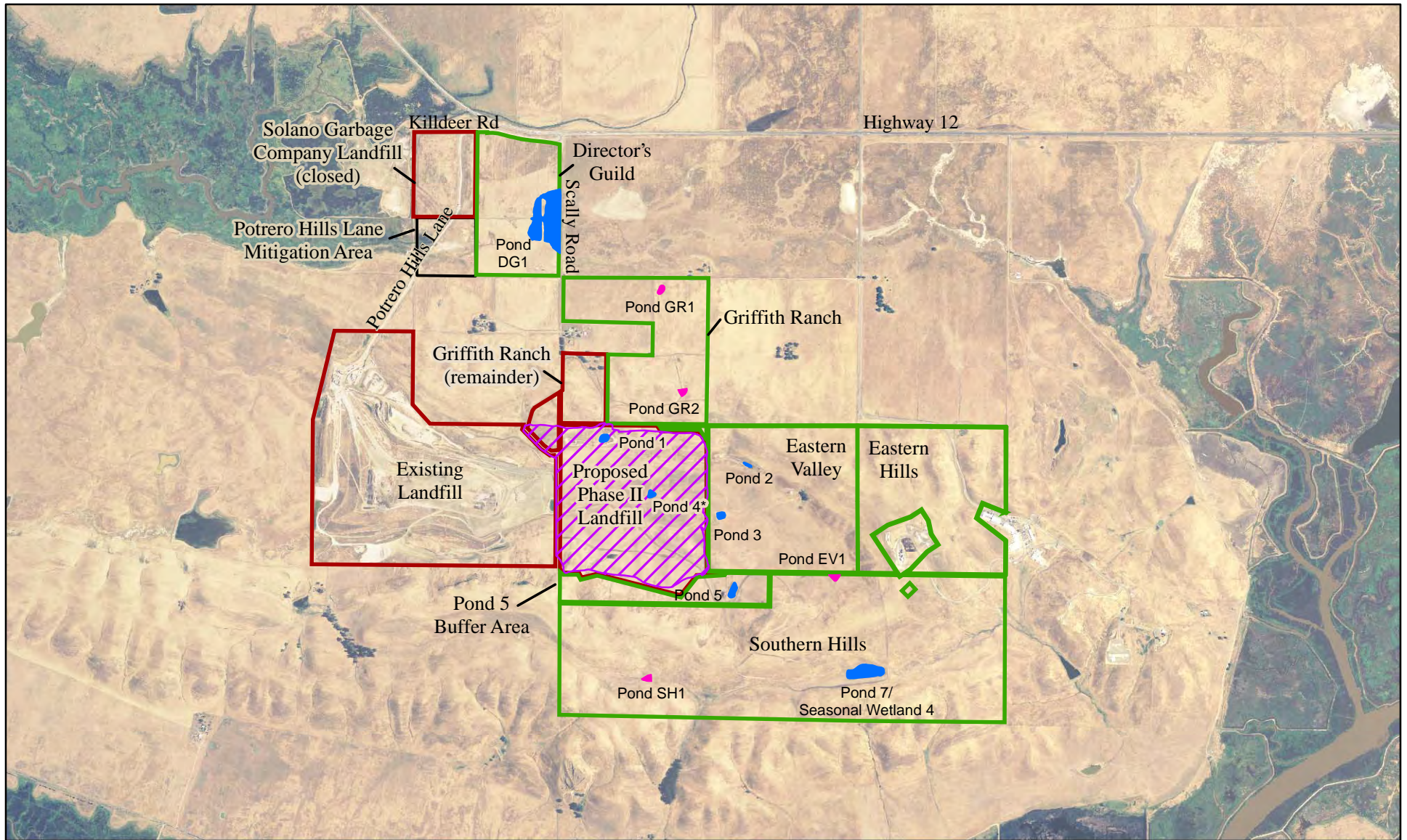


FIGURE 1


Potrero Hills Landfill Phase II Expansion
 Mitigation and Monitoring Plan
 Regional Location

SOURCE: ©2002 DeLORME. STREET ATLAS USA ©2003.

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 PROPOSED PHASE II IMPACT AREA

 ONSITE POND

 MITIGATION AREA

 PROPOSED MITIGATION POND

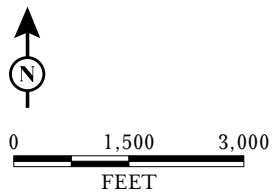
 OTHER LAND OWNED OR LEASED BY LANDFILL

* POND 4: BERM REMOVED IN 2000.

POND NO LONGER EXISTS.

 POTRERO HILLS LANE MITIGATION AREA

FIGURE 2



*Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan*

Proposed Project Site
and Mitigation Areas

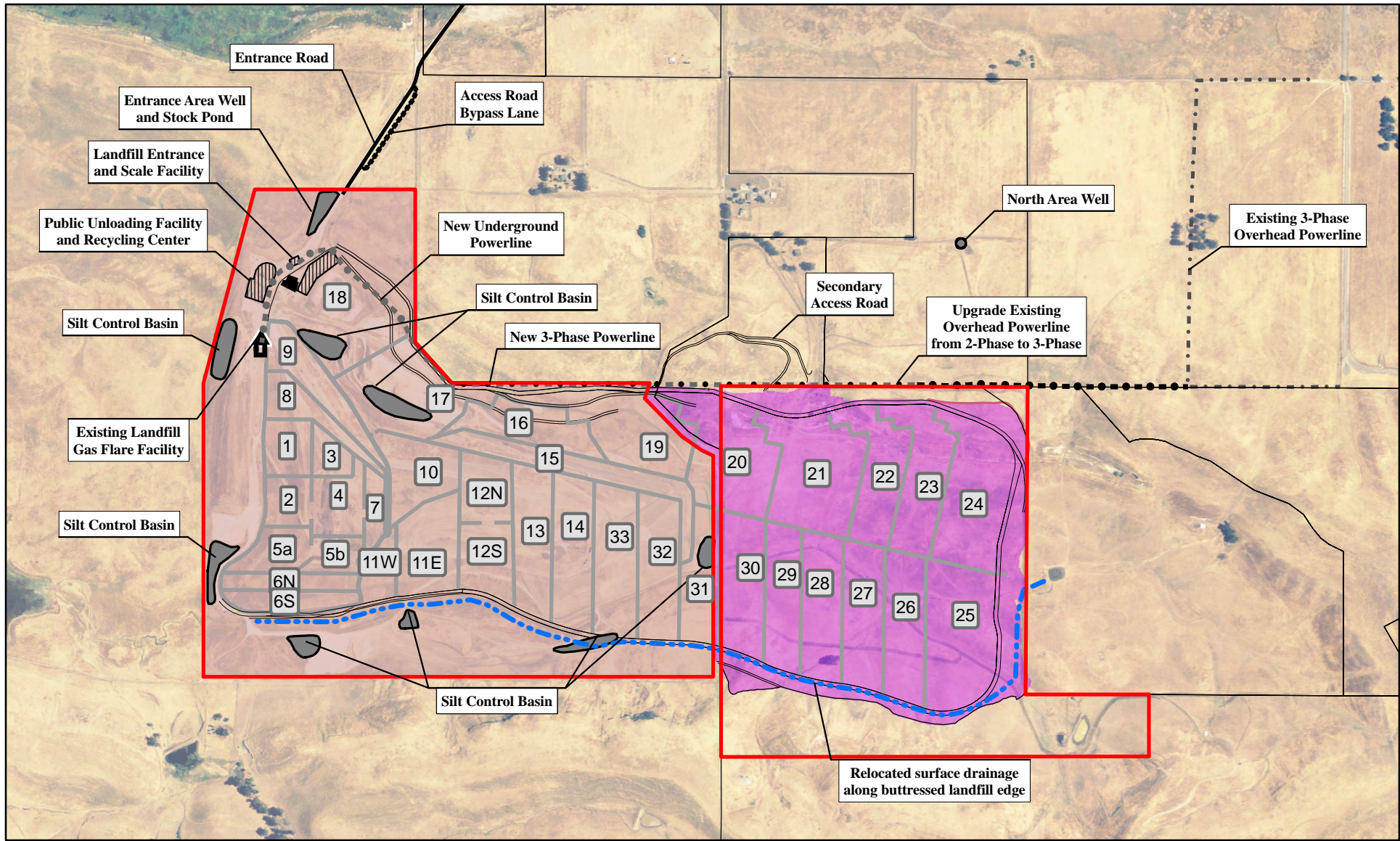
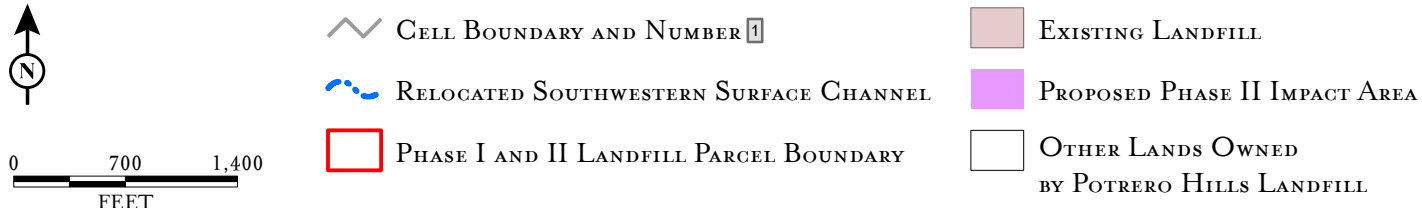


FIGURE 3



*Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan*
Project Components

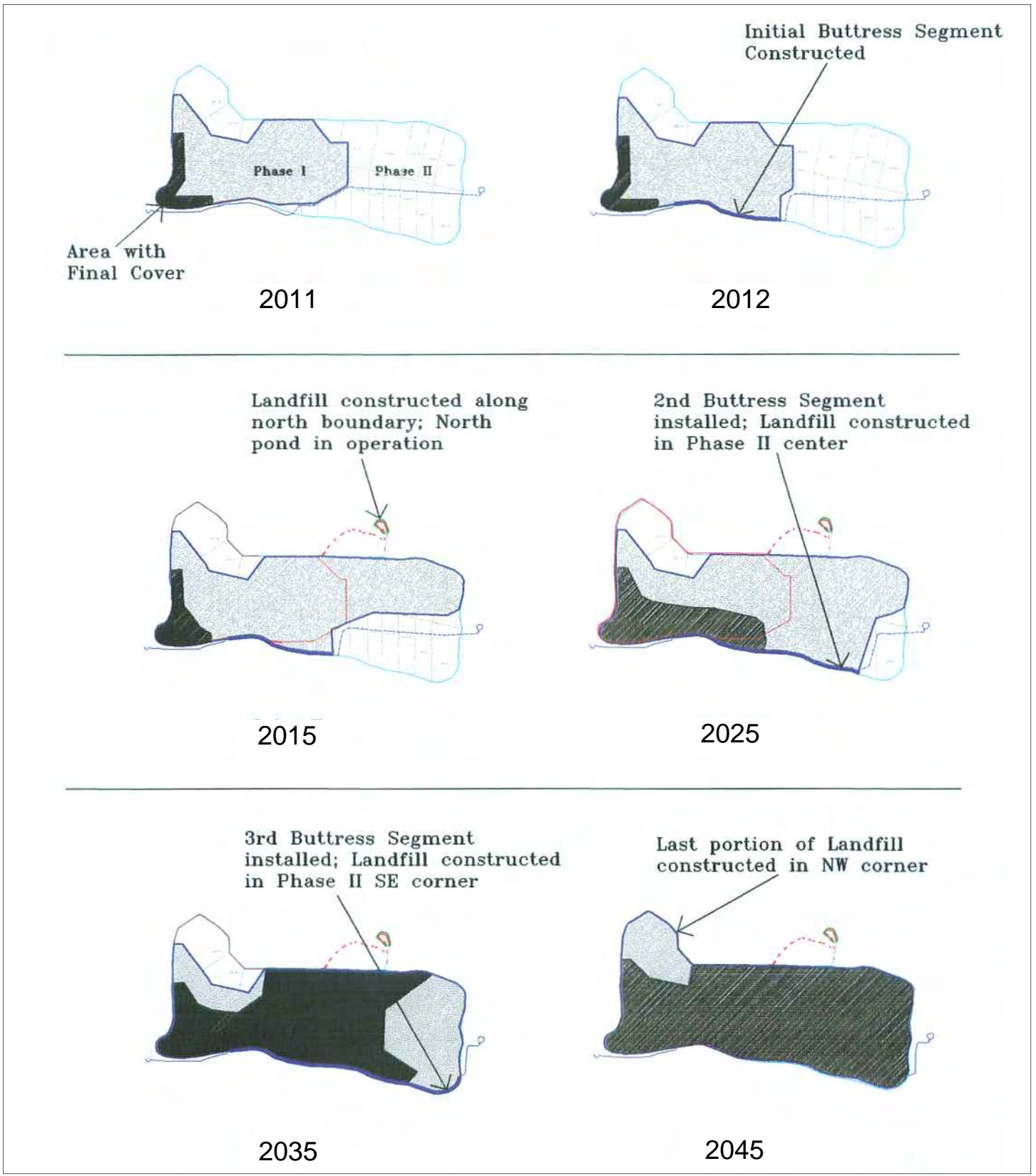


FIGURE 4

*Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan*
Concept of Landfill Construction Sequence



MAP SYMBOLS

- STUDY SITE BOUNDARY
- SP-1 WETLAND SAMPLE POINT
- SP-2 NON-WETLAND SAMPLE POINT
- CONTOUR LINES AND FOOT INTERVAL

NON-JURISDICTIONAL FEATURES

- NON-JURISDICTIONAL STOCK POND

JURISDICTIONAL FEATURES

- STREAM, SWALE, OR DITCH SEGMENT
- W-1' WIDTH
- L-10' LENGTH
- OTHER WATER
- SEASONAL WETLAND
- SEASONAL WETLAND SEEP

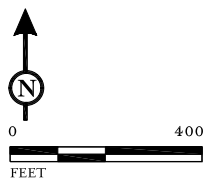


FIGURE 5

*Potrero Hills Landfill
Phase II Expansion*

**Waters of the United States on
the Phase II Expansion Site**

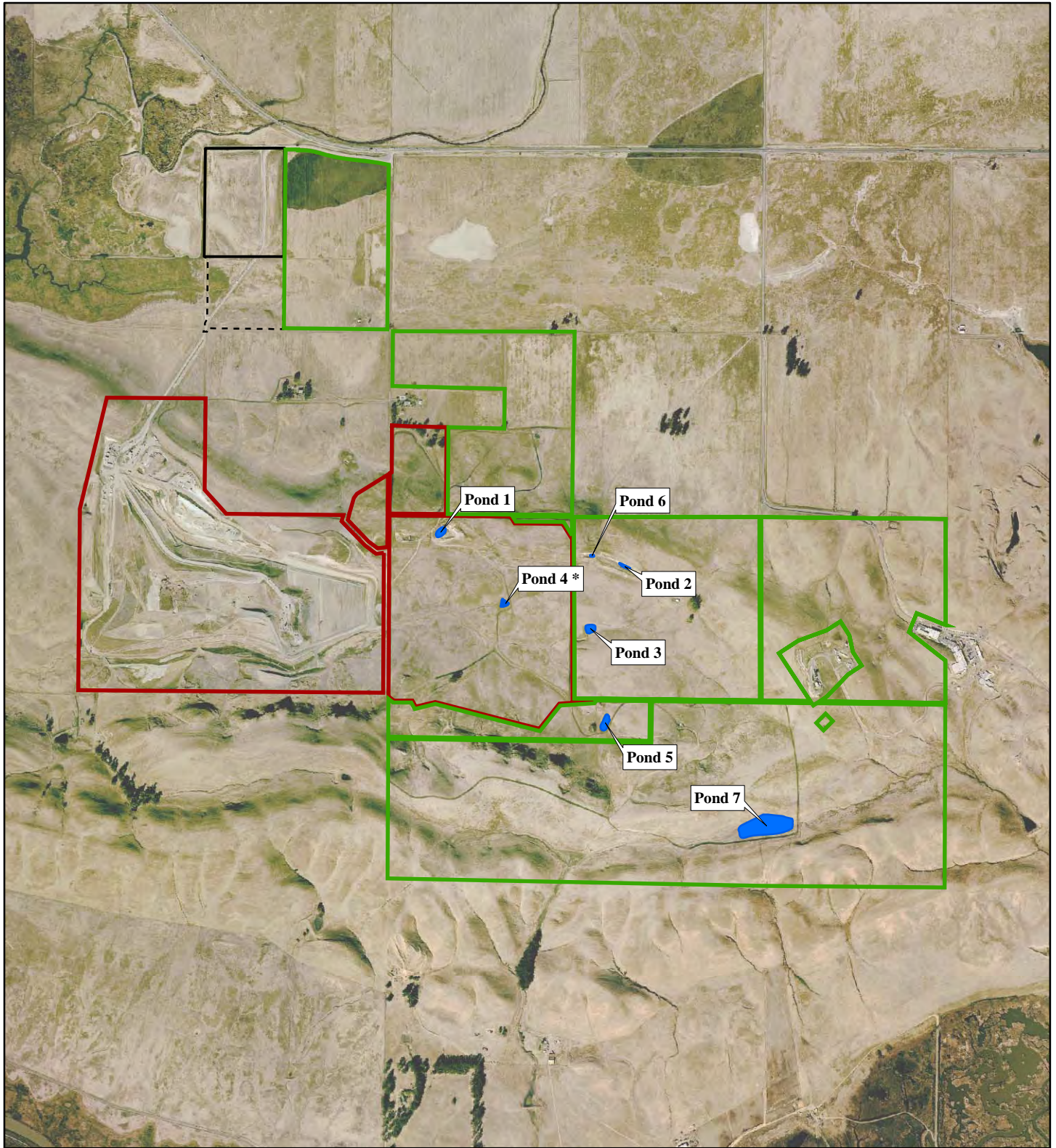
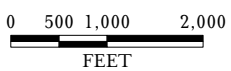


FIGURE 6

*Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan*

Lands Owned by
Potrero Hills Landfill



- MITIGATION AREA
- OTHER LAND OWNED BY LANDFILL
- SOLANO GARBAGE COMPANY LANDFILL
(CLOSED; LEASED BY POTRERO HILLS LANDFILL)
- POTRERO HILLS LANE MITIGATION AREA
(NO LONGER OWNED BY POTRERO HILLS LANDFILL)
- PONDS * POND 4: BERM REMOVED IN 2000.
POND NO LONGER EXISTS.

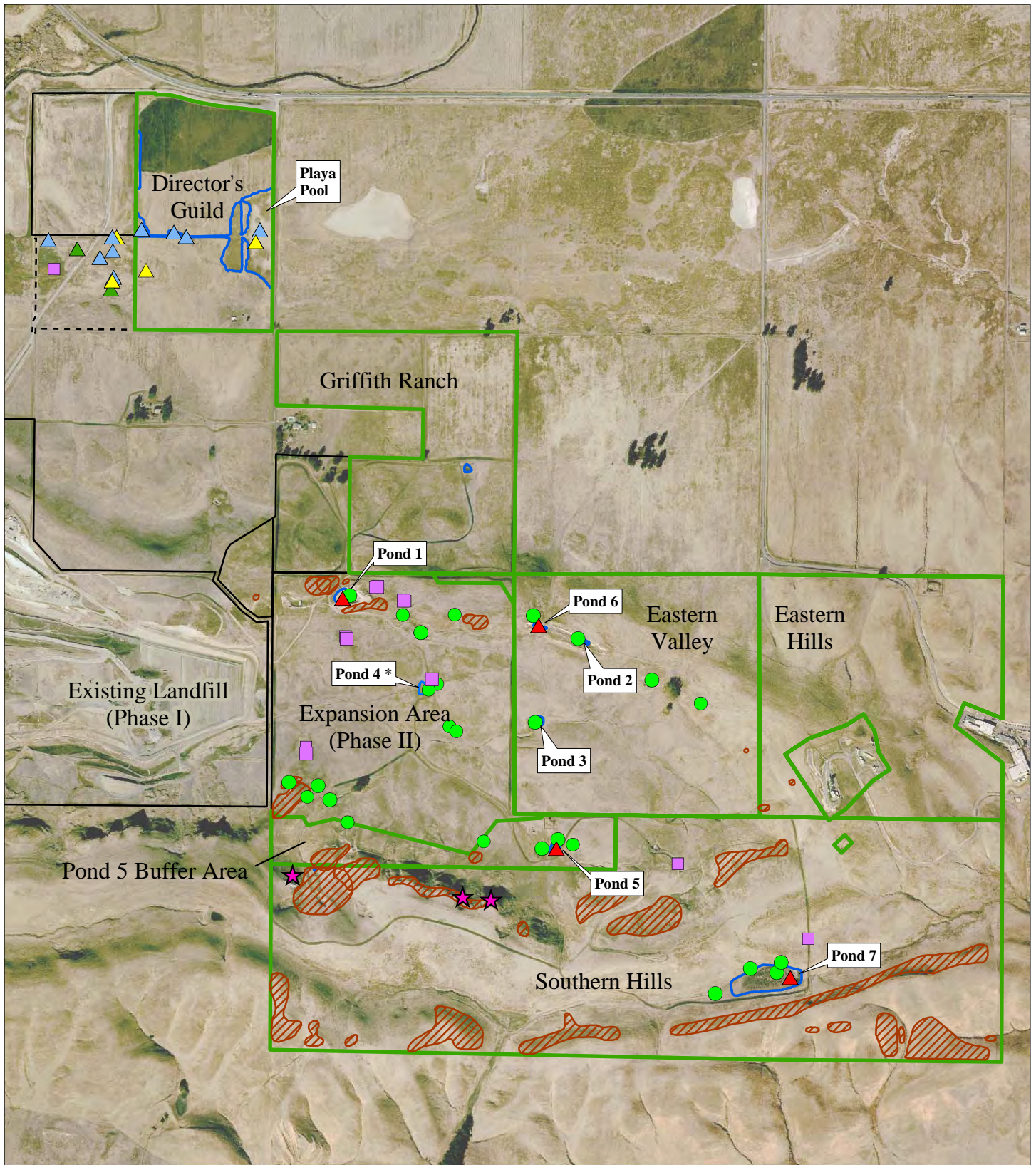


FIGURE 7

Potrero Hills Landfill
Phase II Expansion
Mitigation and Monitoring Plan

Special-status
Animal Locations

- ▲ CALIFORNIA FAIRY SHRIMP
- ▲ CONSERVANCY FAIRY SHRIMP
- ▲ VERNAL POOL FAIRY SHRIMP
- ▲ VERNAL POOL TADPOLE SHRIMP
- CALIFORNIA TIGER SALAMANDER
- POOLS
- * POND 4 NO LONGER EXISTS.
- BURROWING OWL
- ★ ELDERBERRY SHRUB (HOST PLANT)
- ▨ VIOLA PEDUNCULATA (HOST PLANT)
- MITIGATION AREA
- OTHER LAND OWNED OR LEASED BY LANDFILL
- POTRERO HILLS LANE MITIGATION AREA

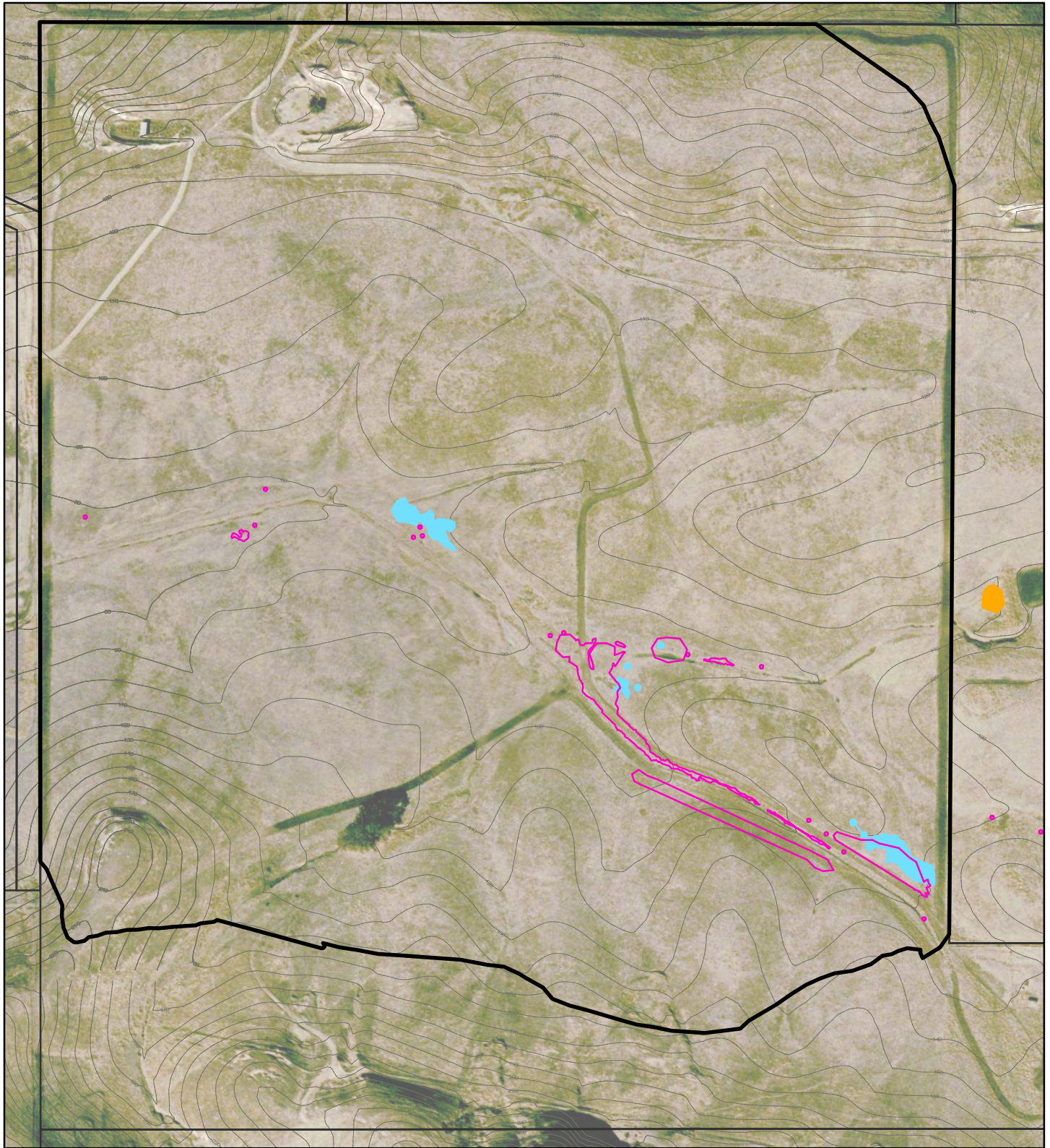
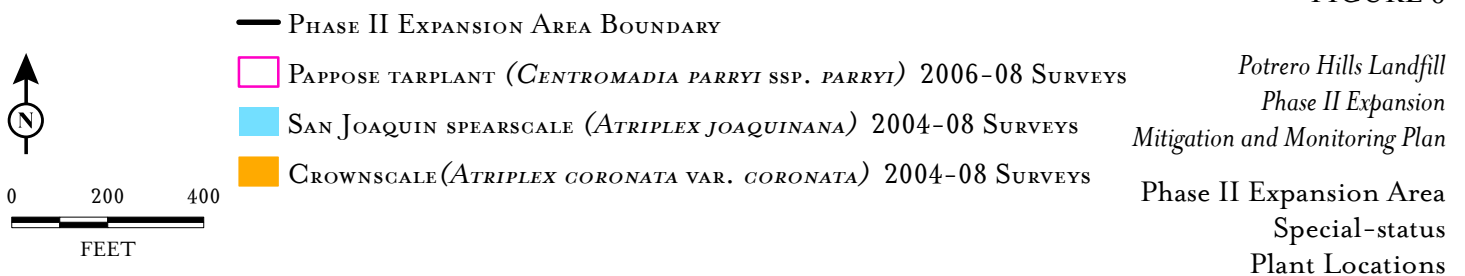


FIGURE 8



Source: Aerial Imagery from the U.S. Department of Agriculture (NAIP 2005)
I:\ESP930\GIS\Maps\Mit&MonPlan\Figure08_Special-status Plant Locations.mxd (12/20/2007)

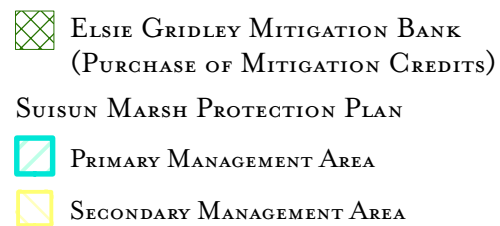
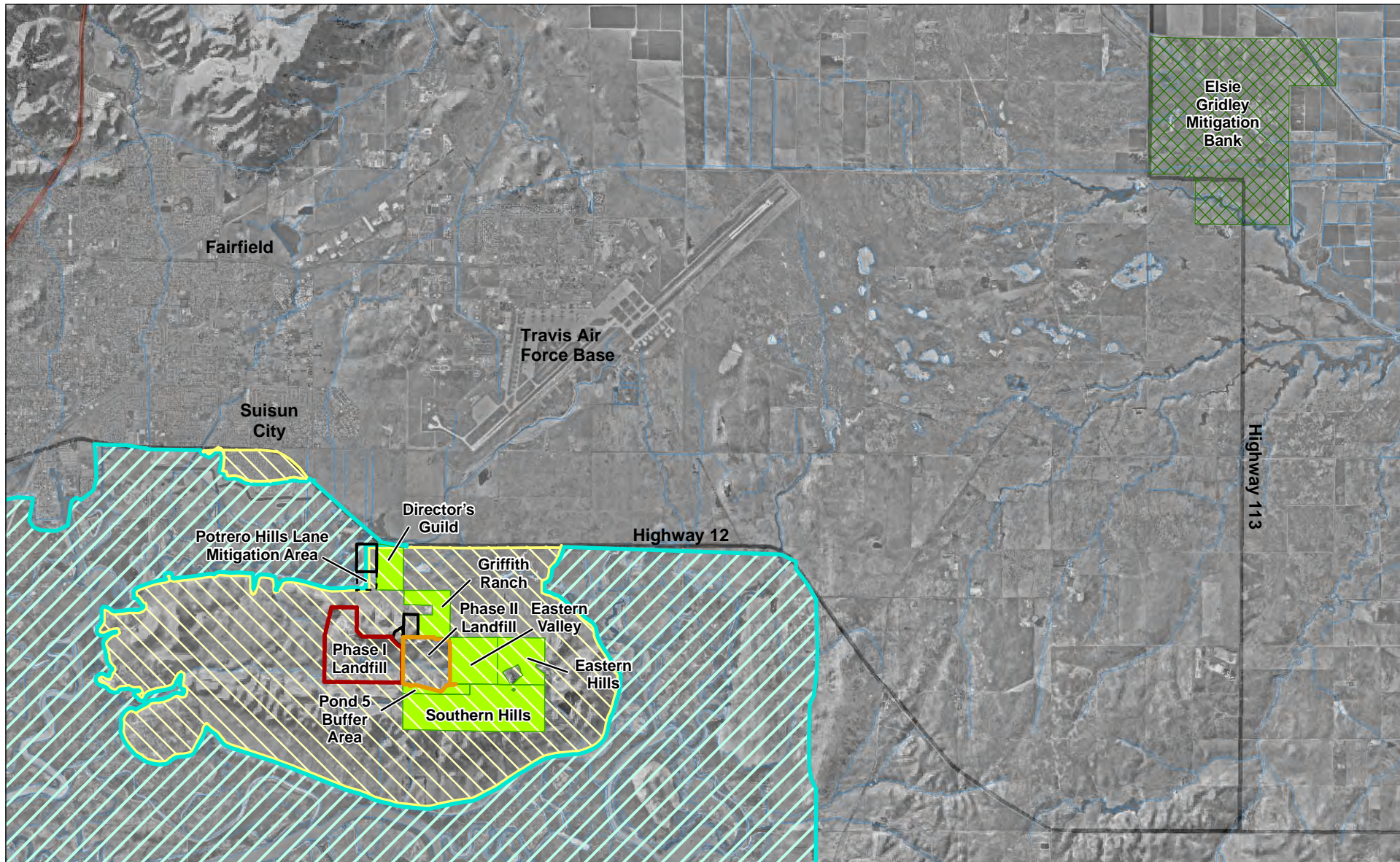
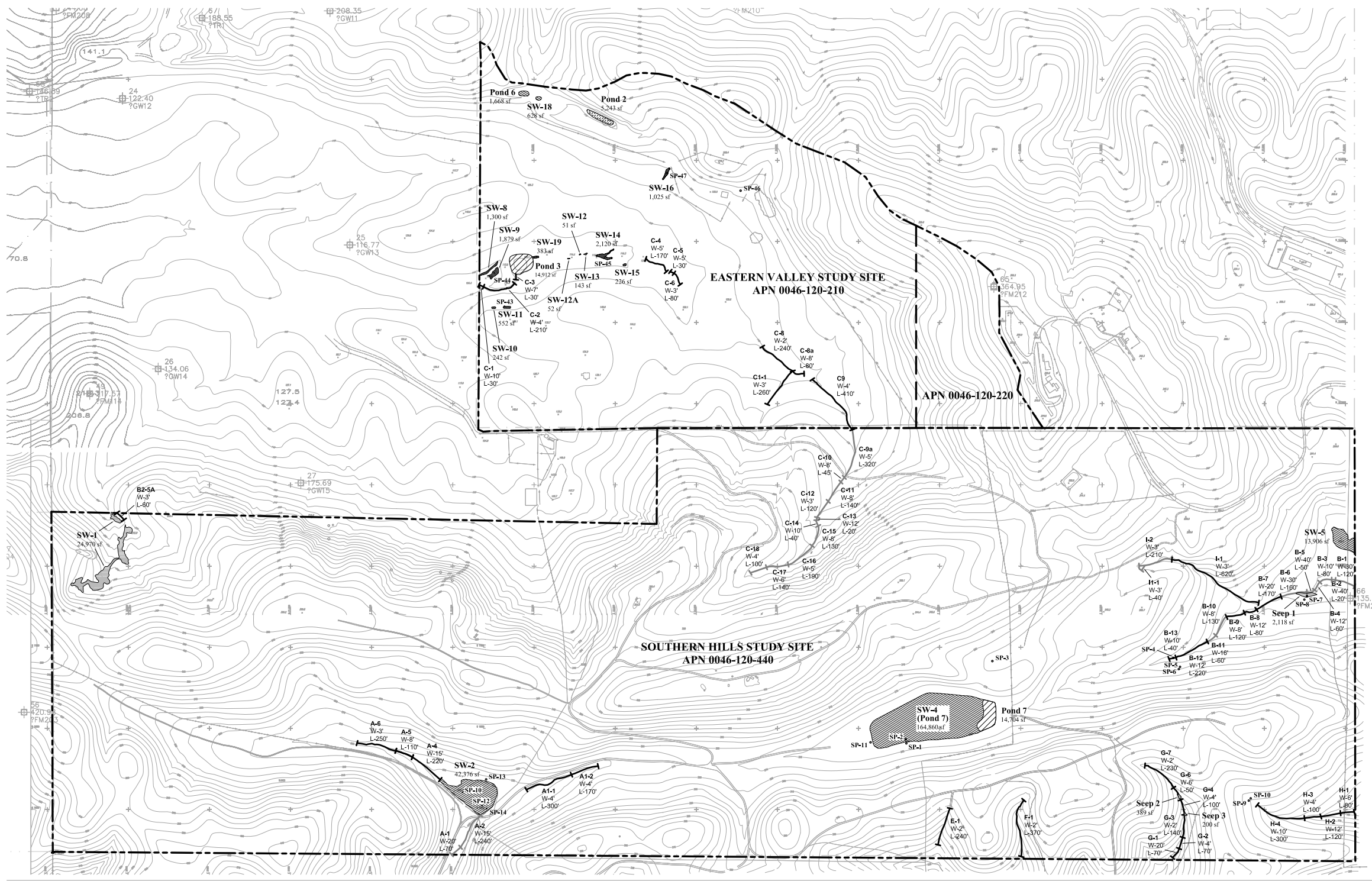


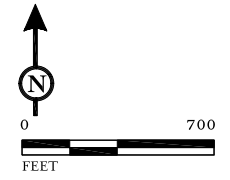
FIGURE 9

*Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan*

Location of Mitigation Parcels



LSA



MAP SYMBOLS

- STUDY SITE BOUNDARY
- SP-1 WETLAND SAMPLE POINT
- SP-2 NON-WETLAND SAMPLE POINT

NON-JURISDICTIONAL FEATURES

- ▨ ISOLATED STOCK POND

JURISDICTIONAL FEATURES

- > CULVERT
- JURISDICTIONAL STREAM OR DITCH SEGMENT
- JURISDICTIONAL WETLAND SWALE
- W-1' WIDTH
- L-10' LENGTH
- ▨ SEASONAL WETLAND
- ▨ SEEP
- ▨ STOCK POND

FIGURE 10

Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan
Waters of the United States on the
Southern Hills and Eastern Valley Parcels
(Verified May 4 and 5, 2004)



To Landfill
Potrero Hills Lane
Solano Garbage Company Landfill Closed

Killdeer Road

Scally Road

Ponded Ditch

Playa Pool

Barn

LEGEND

□ STUDY SITE BOUNDARY

● WETLAND SAMPLE POINT

○ NON-WETLAND SAMPLE POINT

— APPROXIMATE LIMIT OF PONDED

.... PLAYA POOL AND PONDED DITCH

JURISDICTIONAL FEATURES

▨ SEASONAL WETLAND

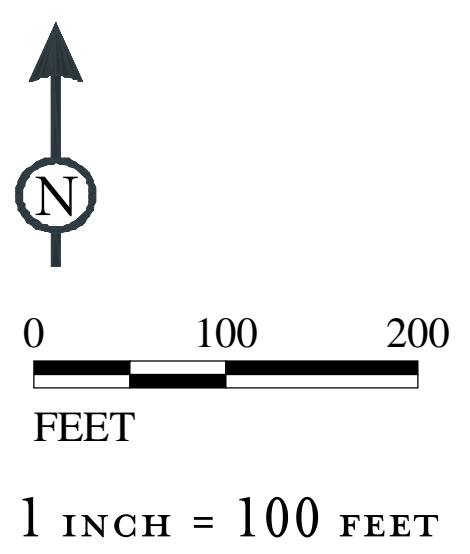
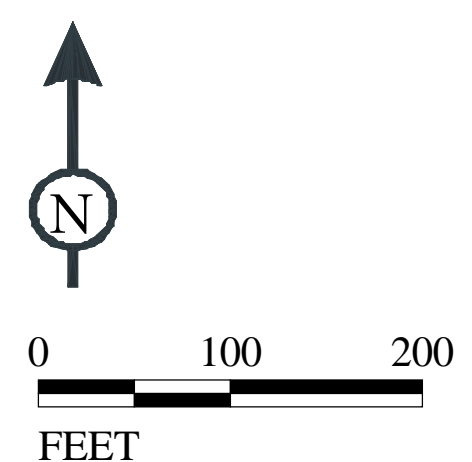


FIGURE 11

Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan

Waters of the United States, Directors Guild Parcel
(Field Verified by the Corps on 13 May 2010)



1 INCH = 100 FEET
 I:\ESP950\GIS\Maps\Wetland Delineations\Griffith Ranch\Verified Griffith Ranch Wetland Delineation 2010.mxd (7/8/2010)

- LEGEND**
- STUDY SITE BOUNDARY
 - NON-WETLAND SAMPLE POINT
 - WETLAND SAMPLE POINT

- JURISDICTIONAL FEATURES**
- Seasonal Wetland
 - Stock Pond

FIGURE 12

Potrero Hills Landfill Phase II Expansion
 Mitigation and Monitoring Plan

Waters of the United States, Griffith Ranch Parcel
 (Field Verified by the Corps on 23 March 2010)

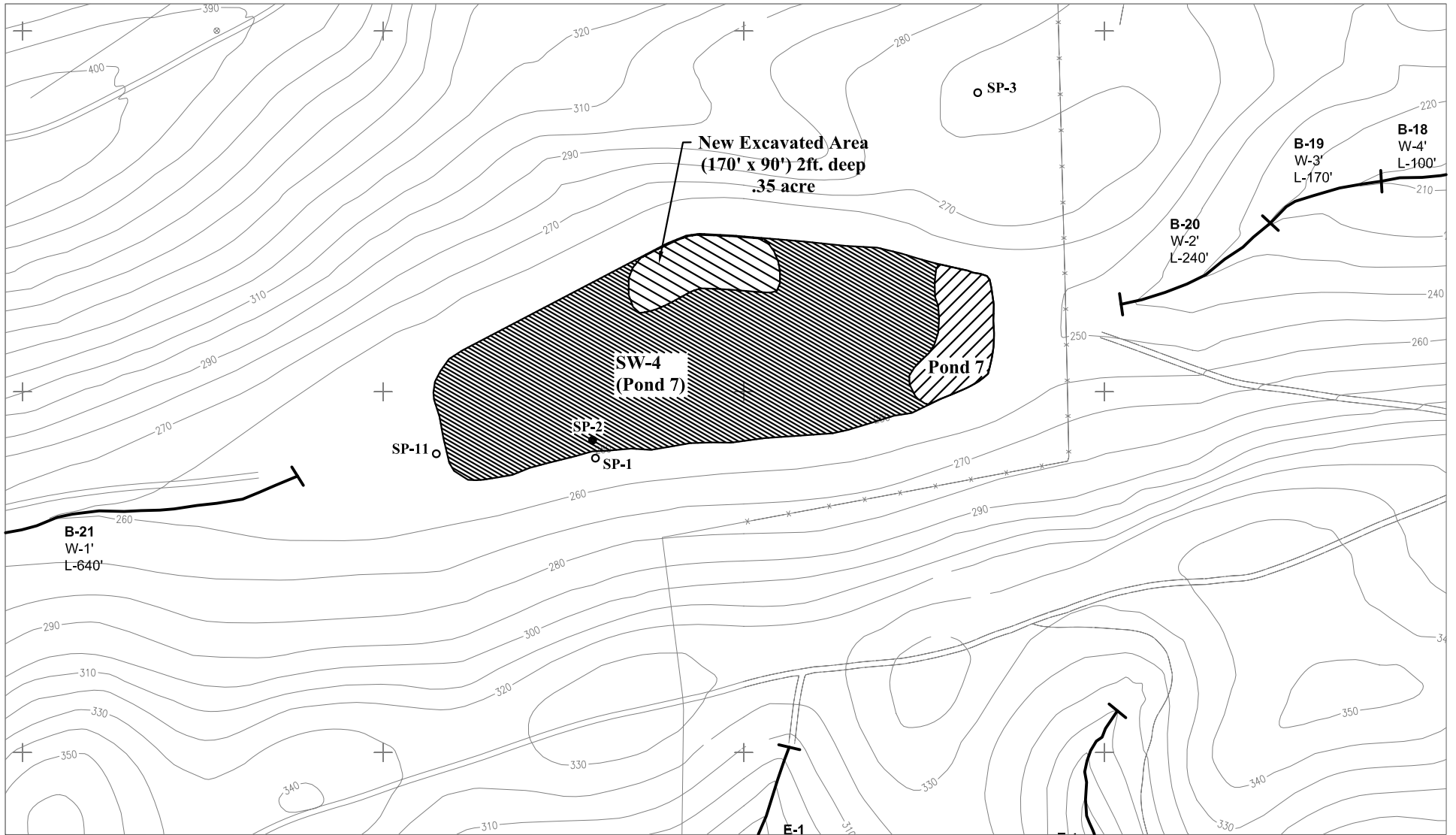
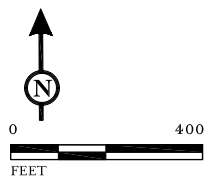


FIGURE 13

*Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan*

Proposed New Excavated California Tiger Salamander Breeding Area in Pond 7 on the Southern Hills Proposed Mitigation Parcel



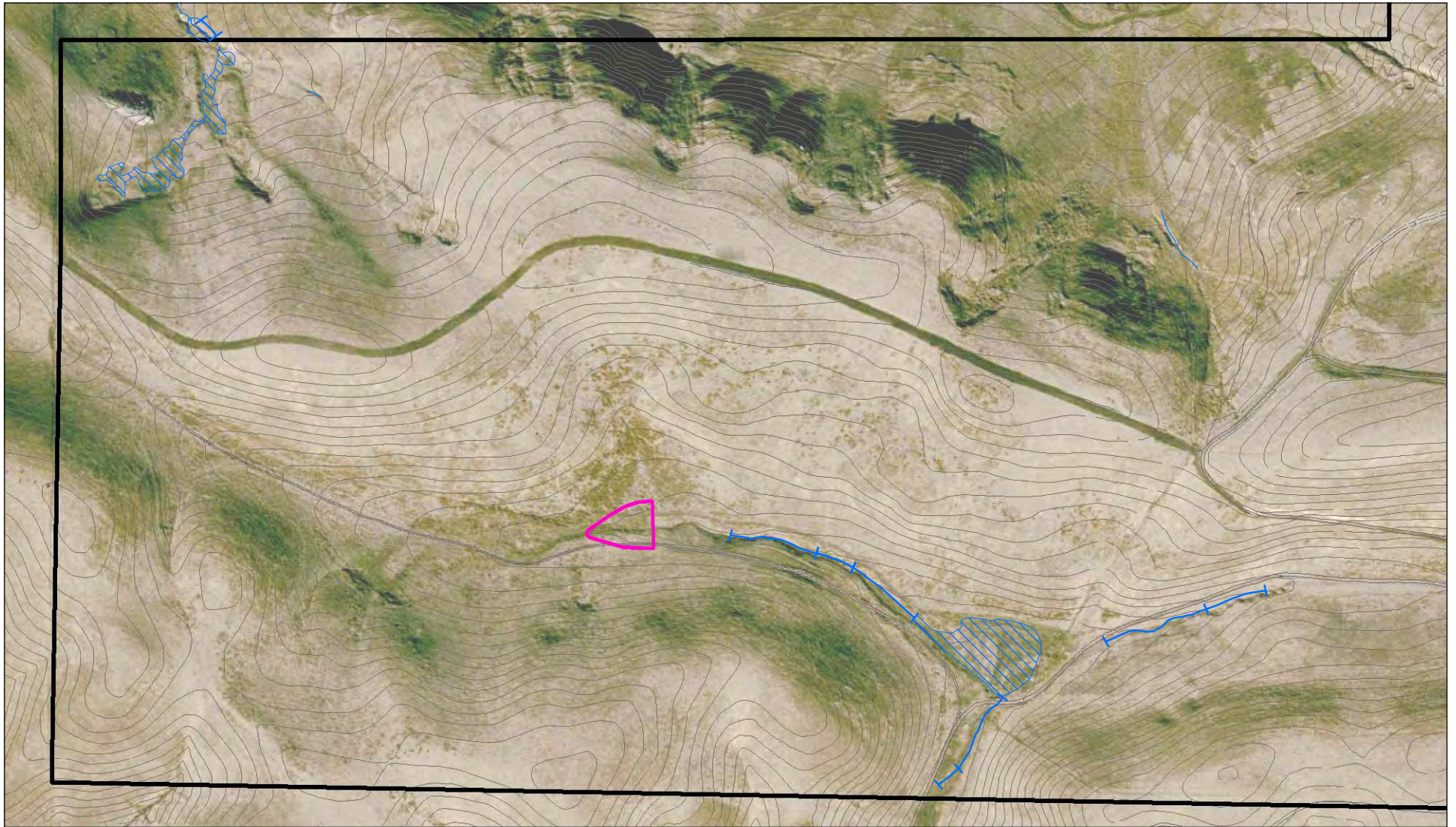


FIGURE 14

*Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan*

**Southern Hills
Mitigation Pond**

- PROPOSED MITIGATION POND SITE (SH1)
- POND OR WETLAND
- ~ CHANNEL OR DITCH
- SOUTHERN HILLS MITIGATION AREA



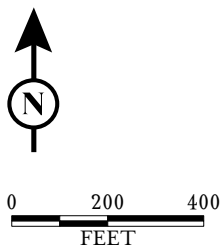


- STUDY SITE BOUNDARY
- JURISDICTIONAL FEATURES**
- SEASONAL WETLAND
- MITIGATION WETLANDS TO BE CONSTRUCTED**
- SWALE
- SEASONAL WETLAND
- CTS BREEDING POND

FIGURE 15

*Potrero Hills Landfill Phase II Expansion
Mitigation and Monitoring Plan*

**Griffith Ranch Proposed
and Existing Wetlands**



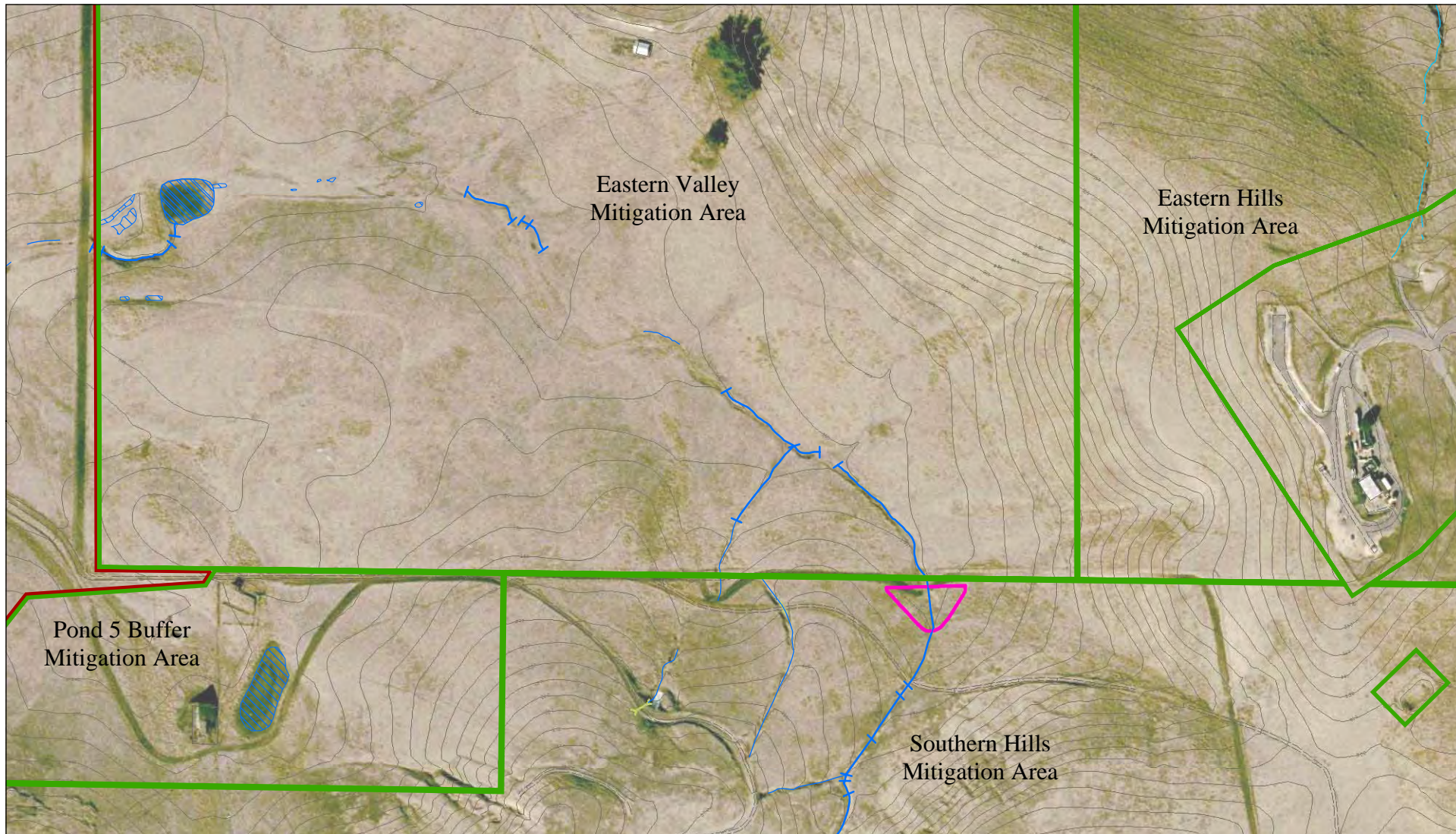


FIGURE 16

Potrero Hills Landfill
Phase II Expansion
Mitigation and Monitoring Plan




Eastern Valley
Mitigation Pond

- PROPOSED MITIGATION POND SITE (EV1)
- EXISTING POND OR WETLAND
- ~ EXISTING CHANNEL OR DITCH
- MITIGATION AREA
- OTHER LAND OWNED BY LANDFILL



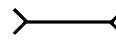
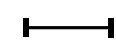




Legend

-  STUDY SITE BOUNDARY
-  SP 55 WETLAND SAMPLE POINT
-  SP 50 NON-WETLAND SAMPLE POINT

Potential Jurisdictional Features

-  SEASONAL WETLAND
 -  POLYGON GULLY
 -  CULVERT
 -  GULLY OR DITCH SEGMENT
- W = WIDTH (FEET)
L = LENGTH (FEET)

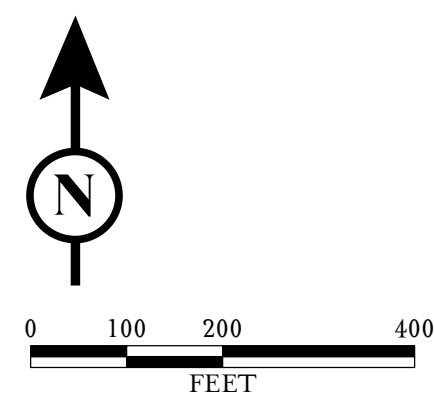


FIGURE 17

Potrero Hills Landfill

Waters of the United States, Eastern Hills Parcel
(Field Verified by the Corps on 26 January 2010)

