

3.0 RESPONSES

3.1 IMPACT EVALUATION

Issue I. Elimination of the Spring Branch Creek Headwaters and Reduction of Ecological Value within the Lower Watershed

The review author expresses concern regarding changes in the upper Spring Branch Creek watershed and possible effects to the lower watershed. These comments are further discussed in Appendix D2B (Airola et al., 2007).

Response: Existing Condition of the Spring Branch Creek. There is no woody riparian vegetation on the site, as noted by Dr. Muick. Herbaceous riparian vegetation consists of mostly non-native annual grasses. The dominant grasses that occur within the areas mapped as Corps jurisdictional “waters” are annual ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), and rabbitsfoot grass (*Polypogon monspeliensis*). Other species that occur in the drainages are inland saltgrass (*Distichlis spicata*), soft chess (*Bromus hordeaceus*), small patches of alkali heath (*Frankenia salina*) and patches of coyote thistle (*Eryngium aristulatum*). The drainages in general had 80 to 100 percent cover by vegetation. The vegetation consisted of FAC to FACW plants with some obligate species such as Baltic rush (*Juncus balticus*). Baltic rush is dominant in areas designated as wetlands and is not a dominant plant within the drainages. Areas designated as wetlands varied in composition but had all of the plant species mentioned for the drainages but were more likely to have either Baltic rush or coyote thistle as dominants. Several of the wetland “pools” in the Eastern Valley along the northern edge were trampled by cattle and had no vegetation.

The entire Potrero Hills Valley including the Phase II Expansion Area is heavily grazed by cows. In the past seven years, since 2000 when Ms. Valerius conducted the initial plant surveys with Dianne Lake, the vegetation on the Phase II and the Eastern Valley sites has always been closely grazed and has never been more than 6 to 12 inches tall, and usually less than 6 inches. Non-native species comprise the greatest cover in these areas. It should be noted that two special-status *Atriplex* species occur in this area (only one species, *Atriplex joaquiniana* occurs on the Phase II expansion parcel, the second species, *Atriplex coronata* occurs on the Eastern Valley portion of the Hillbourne Ranch parcel).

In the opinion of the project botanist and from a botanical viewpoint, the “herbaceous riparian” community along the Spring Branch Creek is extremely limited. With the exception of a very few areas, Spring Branch Creek lacks any scour lines, persistent pools, or defined bed and bank and is marginally a waters of the U.S. The creek is very disconnected, often linear, and have been extremely altered by cattle grazing and possibly through realignment during prior agricultural activities in the valley.

It should also be noted that the site visit on July 31, 2007, was done in a dry year and in a dry season so that the wetland areas were not in the best condition.

Jurisdictional Status of Spring Branch Creek. A delineation of wetlands and waters of the U.S. was conducted for the Phase II Expansion Area (LSA, 2001) and Eastern Valley and Southern Hills (LSA, 2003). The Phase II Expansion Area delineation was verified by the Corps. The verified delineation shows a drainage (Drainage A) terminating at stock pond 2 (also known as pond 4). Drainage B is a tributary to Drainage A and goes south towards a grove of blue gum trees (*Eucalyptus globulus*) with an associated seep wetland area. A third drainage, Drainage C, is shown as not being directly connected to Drainage A or B and terminating at Pond 3, which is on the Eastern Valley delineation map. Above, or eastward, of Pond 3 the drainage is highly disconnected, based on the delineation maps. The drainage becomes more continuous as it goes further east and south onto the Southern Hills parcel.

Spring Branch Creek is shown as a blue-line drainage on the Denverton USGS quadrangle, and it follows the drainages designated as Drainage A on the Phase II Expansion Area delineation and the disconnected drainage segments on the Eastern Valley delineation and then to the more defined drainage on the Southern Hills delineation map. A review of the Google Earth aerial photo referred to by Pamela Muick shows the areas identified on the delineation map; however, if only using the aerial photo as a reference, the tendency would be to assume that the dark line on the photo is a drainage channel when it is actually a cow path. Also, the dirt road looks like a continuation of the main drainage channel and yet it is a road created by vehicles and not a channel at all. The aerial photo is deceptive. The on-the-ground experience reveals that the channel is highly eroded and degraded and often lacks a defined bed and bank as compared to other drainages. The U. S. Army Corps of Engineers, which is the regulatory agency that determines what areas meet the definition of waters of the U.S., has determined that the drainage segments as shown on the delineation map are within the Corps jurisdiction, at least based on the criteria at the time of the site verification.

As stated by Dr. Muick, there is no woody riparian vegetation, such as willows, cottonwood, alder or other species associated with riparian woodland or forest communities. Vegetation community descriptions for California were reviewed using Robert Holland's "Preliminary descriptions of the terrestrial natural communities of California" (Holland, 1986) and "A Manual of California Vegetation" by John O. Sawyer and Todd Keeler-Wolf (Sawyer et al., 1995). These two manuals are often used in describing plant communities for biological reports. All the references to riparian communities in Holland (1986) describe plant communities that are defined by some tree or shrub species. In "A Manual of California Vegetation" the term riparian is not used and vegetation communities are described as "series", such as "mixed willow series". The "herbaceous riparian" community that Dr. Muick refers to is typically described as a seasonal wetland type and the term riparian is not typically used.

Herbaceous plant species that occur within the drainages are predominantly non-native annual grass species such as annual ryegrass (*Lolium multiflorum*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), rabbitsfoot grass (*Polypogon monspeliensis*) and soft chess

(*Bromus hordeaceus*). Soft chess is not a wetland species and is classified as a facultative upland plant by Reed (Reed, Jr., 1988). Other native species that occur in the drainages are inland saltgrass (*Distichlis spicata*), small patches of alkali heath (*Frankenia salina*) and patches of coyote thistle (*Eryngium aristulatum*). The drainages in general had 80 to 100 percent cover by vegetation. The vegetation consisted of FAC to FACW plants. Baltic rush (*Juncus balticus*), an obligate wetland plant, was a very minor component of the vegetation within the drainages. Baltic rush is dominant in areas designated as wetlands and is not a dominant plant within the drainages. Areas designated as wetlands varied in composition and had all of the plant species identified in the drainages (referenced above) but were more likely to have either Baltic rush or coyote thistle as dominants. Several of the wetland “pools” in the Eastern Valley along the northern edge were trampled by cattle and had no vegetation.

Data points taken in the drainage channel on July 31, 2007 failed to meet the Corps three parameter test for wetlands. Wetland vegetation was present but the soils did not meet the hydric soils criteria and wetland hydrology features such as water marks, sediment deposits, and oxidized root channels were lacking. This indicates that although the drainage channels support wetland plants, the dominant plants with the higher cover values are mostly FAC plants such as annual ryegrass, and these areas do not meet the wetland criteria so that the vegetation within the channels is just non-native grassland vegetation and not even a wetland type. Areas delineated as wetlands meet all three of the wetland criteria and typically have FACW to obligate wetland plants in addition to wetland soils and hydrology. The total acreage of wetlands on the site is very small and is a minor component of the overall vegetation community.

Issue II. Elimination of San Joaquin Spearscale

The review author expressed concerns regarding the status of the San Joaquin spearscale (*Atriplex joaquiniana*) population on the Phase II expansion parcel.

Response: San Joaquin spearscale was observed on the Phase II expansion parcel during the early botanical surveys of the parcel in about 1998. However, this plant population was not observed during the protocol-level botanical surveys conducted in 2000 as part of the technical report prepared for the EIR. As CEQA requires that the project impacts analysis be based on the existing and not past conditions, impacts to this species were not considered significant as the population appeared to have been become extirpated. The San Joaquin spearscale was not observed again on the site until 2004, and then again in 2006 (about 10 individuals), even though additional surveys were conducted in the interim years. In 2007, approximately 40 individuals were observed on the parcel (E. Buxton (LSA), September 13, 2007; Figure 2).

This species was included in the MMP (LSA and ESP, 2006). Although a small population of San Joaquin spearscale will be impacted by the proposed landfill expansion (See Chapter 2 Botanical Section for more details), at least 12 larger populations will be preserved on the Director’s Guild parcel (Figure 3). Management of the grasslands on Director’s Guild parcel is expected to improve the suitability of the site for these and other native species and provide a secure habitat for the future. Within the past 2 years, voluntary implementation of controlled

grazing on the Director's Guild parcel has resulted in an increase in the population of this species and crownscale (*Atriplex coronata*) on the Director's Guild site (LSA field observations).

Issue III. Habitat Fragmentation

Dr. Muick has expressed concerns about habitat fragmentation resulting from the existing and proposed landfills.

Response: Currently, wildlife and plant populations are free to move, disperse, and relocate across the proposed Phase II landfill area and adjacent properties, from the edge of Highway 12 to the Suisun Marsh with few impassable barriers. The 320-acre Phase I landfill and the Explosive Technologies site pose a permeable barrier to movement that can be traversed by larger non-flying animals such as coyotes, jackrabbits, and ground squirrels, and by birds and bats that can fly over these areas. Small mammals, as well as reptiles and amphibians are also able to move across these existing features; however, truck traffic and activity on the active face of the landfill pose some risk to the small and large animals trying to cross the active landfill.

The landfill will grow slowly eastward over the years of operation. For about 15 years, 50% of the 150-acre footprint will not be significantly disturbed. Thus, the habitat changes will evolve and not be a wholesale, rapid changing environment. Additionally, the active landfill face (the location of work activity/disturbance) at any given point in time is a relatively small area, approximately 0.2 acres (a 90' x 90' x 20' deep area), and not the 75 acres as portrayed by Dr. Muick's assessment of "bare" ground she obtained from review of Google Earth satellite photographs.

Vehicle traffic, primarily truck traffic bringing solid waste, also poses some risk to animal movement, particularly smaller, slow moving amphibian species. In the designation of critical habitat for the California red-legged frog (*Rana draytonii*) (61 FR 25813, March 13, 2001), the FWS provides a lengthy discussion of the effects of roadways on anuran (frogs and toads) and other amphibian movement. In that document, the FWS concludes that traffic volumes in the range of 20 to 30 cars per hour during period when amphibians are moving can essentially form a complete barrier to movement.

Amphibians typically move at night and usually during rainy weather or heavy fog. In order to assess the potential for truck traffic to affect movement or create a barrier, PHLF looked at the 14-hour period from 4 p.m. to 6 a.m., when the landfill projects that it will receive approximately 85 truck loads under proposed future operations. This level of truck traffic equates to an average of approximately 6 trips per hour, not enough to create a complete barrier to movement, but could result in some mortality. Again, the extent of this impact/effect will vary depending on what portion of the landfill is being used. Undeveloped open spaces to the east and west of the existing and proposed landfill allow for movement around these barriers. Current zoning ensures that the lands will remain largely undeveloped.



FIGURE 2

— BOTANICAL SURVEY AREA BOUNDARY

☒ PAPPOSE TARPLANT (*CENTROMADIA PARRYI* SSP. *PARRYI*)
2007 SURVEY

■ PAPPOSE TARPLANT (*CENTROMADIA PARRYI* SSP. *PARRYI*)
2006 SURVEY

▨ SAN JOAQUIN SPEARSCALE (*ATRIplex JOAQUINANA*)
2007 SURVEY

Potrero Hills Landfill
Phase II Expansion

Phase II Expansion Area
Special-status
Plant Locations



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The only mitigation area that is near the concentrated haul route that enters the facility is the Director's Guild parcel. Kildeer Road forms the northern boundary of the Director's Guild parcel and lies parallel to SR 12 about 50-100 feet from the roadway. Potrero Hills Lane is located between 250 to 1,000 feet west of Director's Guild parcel. The nearest point of the Griffith Ranch parcel to the landfill access road is about 2,500 feet. All of the other mitigation areas are over a mile from the landfill facility access road (Potrero Hills Lane and Kildeer Road).

In discussing the concerns for habitat fragmentation, the review author asserts that her calculations based on aerial photos obtained via Google Earth show that a minimum of 75 acres of the Phase I landfill is currently bare soil and that this trend is likely to continue with the addition of the Phase II landfill. Although we have not confirmed her area calculation, it must be noted that the Phase I landfill is not in final closure, and therefore, the final vegetative cover has only been applied to a portion of the landfill cap. It should also be noted that the other landfill areas are not left in exposed-soil conditions. Erosion control vegetation is required to be grown on the dormant, non-final capped portions of the landfill. This vegetation does provide some sustenance and foraging areas. Upon closure of the landfill, the final cap will be vegetated according to the requirements of the California Integrated Waste Management Board and Regional Water Quality Control Board. Any conclusions drawn about the condition of the eventual revegetation of the landfill cap is premature and incorrectly assesses impacts for the final landfill conditions. Even if the land was in a sparse vegetative state, this still would not preclude movement across the landfill. Many species, such as the California tiger salamander can move better through barren or sparse, low-growing vegetation rather than tall, dense herbaceous vegetation.

It should further be noted, that for purposes of mitigation, PHLF has not proposed any credit be given for either the Phase I or Phase II area with respect to special-status species habitat or wetland creation, preservation, or restoration. All mitigation is proposed for parcels that are currently used as grazing lands and will be preserved as such in conservation easements with endowments for maintenance and management.

Issue IV. Reduction of the Biodiversity of the Grassland Vegetation

The reviewer has concerns regarding the condition of the vegetation of the landfill cap.

Response: The interim landfill cap is vegetated with ruderal as well as natural grasses for the purpose of erosion control until the final cap is constructed and vegetated. PHLF has not proposed any credit be given for either the Phase I or Phase II area with respect to special-status species habitat or wetland creation, preservation, or restoration. The final landfill will be revegetated according to permit conditions for closed landfill specified by the California Integrated Waste Management Board and Regional Water Quality Control Board.

Issue V. Potential for Future Landfill Expansion

The reviewer identifies future landfill expansion as a cumulative impact.

Response: CEQA and NEPA consider cumulative impacts to include closely related past, present and reasonable foreseeable probable future projects. PHLF has stated that there are no plans for further expansion at this site at this time. The current proposal will extend the life of the landfill from its current almost 10-year term to approximately 35 years. Given the company's stated current plans and the length of operational time the current proposed expansion would provide, any potential future cumulative effects are highly speculative. If there were to be further landfill expansion, that future proposal and any loss of habitat for sensitive native species or impacts to sensitive biological or wetland resources would also be subject to environmental review which can reasonably be expected to be at least as rigorous, if not more so, than the current review.

Issue VI. Degradation to Suisun Marsh Hydrology from Combined Effects of the Landfill and Quarrying Operations

Water from the Spring Branch Creek watershed will continue to flow to the Suisun Marsh as it does under current Phase I landfill operations. No diversions or impoundments that prevent water from reaching the Suisun Marsh are proposed as part of the Phase II expansion. The previously proposed Northern Sedimentation Basin, which would have received some diverted runoff, has been deleted from the project.

With respect to the quarrying operations, no quarrying will be allowed on any of the mitigation lands. PHLF is committed to compliance with all relevant laws and regulations regarding quarrying operations within the landfill areas themselves. If a regulatory agency identifies any permit non-compliance, PHLF will work with that agency to correct the problem.

3.2 MITIGATION EVALUATION

The following are responses to Comments I-IV by Dr. Muick on issues that were outside of the scope of the GMP and are organized by topic as in the review document:

Comment I: Scale of Phase II Landfill Expansion and Its Effects on Adjacent Lands in the Secondary Management Area of the Marsh

Dr. Muick discusses concerns regarding the revegetation of the landfill cap and the resulting habitat quality and its effects on wildlife movement, and the potential for the cap to support invasive plants that could spread onto adjacent mitigation land without active management.

Accordingly, Dr. Muick provides the following recommendations (in italics):

(1) Expand the Grasslands Management Plan, or draft a Grassland Revegetation/Restoration Plan for the landfills and roads. The plan should include demonstration sites and an implementation timeline before, during, and after capping. The species mix should include a complement of native and non-native species now growing onsite. Given the project timeline and the skill of the consultants, appropriate seed mixes and restoration methods can be developed to ensure successful restoration of grasslands on the capped landfills and associated areas

(2) Include a weed management component for mitigation lands.

Response: The GMP is intended to provide long-term management for preservation and enhancement of natural grasslands that have been set aside for mitigation purposes. PHLF has never proposed that revegetation of the landfill cap should be credited towards mitigation goals. It would be inappropriate to extend the provisions of a plan to manage natural grasslands to the artificial environment of a capped landfill.

The concerns of the commenter regarding the landfill cap being a source of invasive plants and erosion are legitimate. These potential impacts are mitigated by compliance with California Integrated Waste Management Board and Regional Water Quality Control Board Regulations (Title 27, Article 2, §2190: Closure and Post-closure Requirements for Solid Water Landfills) which state:

(A) Closed landfills shall be provided with an uppermost cover layer consisting of either:

- 1. Erosion-Resistance Via a Vegetative Layer — a vegetative layer consisting of not less than one foot of soil which:
 - a. contains no waste (including leachate);*
 - b. is placed on top of all portions of the low-hydraulic-conductivity layer described in (a)(2);*
 - c. is capable of sustaining native, or other suitable, plant growth;*
 - d. is initially planted - and is later replanted as needed to provide effective erosion resistance - with native or other suitable vegetation having a rooting depth not exceeding the depth to the top of the low-hydraulic-conductivity layer described in (a)(2). For any proposed vegetative cover, the discharger shall propose a species mix which harmonizes with the proposed post-closure land use, and which requires as little long-term maintenance as feasible by virtue of its tolerance of the vegetative layer's soil conditions (e.g., the presence of landfill gas), its resistant to foreseeable adverse environmental factors (e.g., climate, disease, and pests), its rapidity of germination and growth, its persistence and ease of**

self-propagation, its high percentage of surface coverage (sufficient to prevent surface erosion), and its minimal need for irrigation and maintenance; and

- e. by virtue of its composition, its maintained vegetation density, and its finished-and-maintained grade, will be resistant to foreseeable erosion effects by wind-scour, raindrop impact, and runoff;*

The establishment and maintenance of vigorous vegetative cover on the landfill cap required by this regulation will minimize the potential for erosion (see Comment IV-c below) and provide cover and competition to minimize establishment of invasive plants. Invasive plants typically thrive only in heavily disturbed areas with minimal competing vegetation. A noxious weed abatement program is being implemented at the landfill following the advise of Dr. Muick and others, recommending such a detection and control program.

To address the commenter's final comment, the GMP does require that an active weed detection and control program be implemented on the mitigation lands.

Comment II: Habitat Fragmentation and Habitat Loss

Dr. Muick states that currently, wildlife and plant populations are free to move, disperse, and relocate across all proposed Phase II landfill area and neighboring properties, from the edge of Highway 12 to the Suisun Marsh, excluding the 320-acre Phase I area.

She also asserts that the horizontal and vertical changes will affect daily, annual, and seasonal activities of wildlife and plant species. The horizontal development of Phase II developments and structures will interrupt, for approximately 35 to 40 years, existing movement patterns of plants and animals. The vertical development will permanently alter the topography of Potrero Hills Valley. Examples of species that will be affected include California tiger salamander adults and young, which will encounter an exposed landscape without cover or escape holes. Burrowing owls, raptors, and songbirds will lose foraging habitat.

Recommendation: *Identify and protect a habitat corridor to provide habitat connectivity between the Southern Hills, Pond 5, and the Griffith Ranch. One possibility would be to protect all or a portion of the Eastern Valley, along with additional acreage from the Griffith Ranch, as part of the mitigation conservation easements.*

Response: The mitigation properties and adjacent open space to the east and west of the landfill will allow passage of wildlife from north to south, even if the landfill does form a barrier. In addition, preservation, enhancement, and long-term management of the Griffith Ranch, Director's Guild, and Southern Hills parcels, corresponding to a mitigation ratio of 3.8:1 of acres preserved to acres protected, will fully mitigate any impacts to wildlife such as loss of foraging habitat. This preservation ratio is consistent with, if not higher than, other approved mitigation plans.

Please see the response to *Issue III: Habitat Fragmentation* earlier in this chapter for a discussion of the how the expansion will proceed slowly over time. See also the comments and responses in Chapter 4 of this document, which provides a detailed discussion on the Phase II expansion impact to California tiger salamanders.

Comment III: Spring Branch Creek Watershed Mitigation

The reviewer claims that the proposed Phase II landfill expansion will effectively eliminate the natural, remaining upper Spring Branch Creek watershed and permanently reconfigures the Spring Branch Creek Valley. The reviewer asserts that these changes will disrupt and impede watershed runoff and stream flow, alter the creek's temperature, and potentially affects water quality parameters.

The reviewer also expresses concern over the mitigation within the Hill Slough watershed.

***Recommendations:** (1) Establish controls on the constructed Spring Branch channel that mimic natural flows, and then monitor water quality. (2) Mitigate, to the extent possible, for losses of the Spring Branch Creek channel in areas within its current watershed. The Landfill should contact all watershed landowners between the existing Landfill and Suisun Marsh to determine their interest in protecting and/or enhancing the watershed on their lands. The Solano Land Trust, owners of Rush Ranch and Spring Branch Slough, expressed an interest in protecting and enhancing the watershed on Rush Ranch (in a July 31, 2006 meeting with Solano Land Trust Mitigation Coordinator Rob Goldstein).*

Response 1: Controls will be constructed on the channel pursuant to permit requirements of the Corps, Regional Water Quality Control Board, State Water Resources Control Board, and California Integrated Waste Management Board (for drainages on the landfills) to control flows and allow monitoring as required.

Response 2: Since no water is proposed to be diverted from the watershed or impounded for long periods of time, the timing of peak flows and quantity of water flowing in Spring Branch Creek is expected to be similar to that prior to construction of the Phase II expansion. Given that downstream from the landfill the creek initially flows across pasture land and into a series of ponds, the flow volumes, water quality, and temperature in the creek downstream of the landfill is expected to be more influenced by these offsite features than from the construction and operation of the landfill.

The channel that will be created on the mitigation parcel will be similar to that which is filled, devoid of woody riparian vegetation and is appropriate mitigation for the impact. In response to the reviewer's concern with mitigating in the Hill Slough watershed, both Hill Slough and First Mallard Slough, the slough for which Spring Branch watershed enters, ultimately enter Suisun Slough and ultimately benefit the same marsh system.

Comment IV: Conservation Easement Stewardship

Dr. Muick registers her concern that the Project EIR and the MMP propose assigning the conservation easements to the County, Department of Fish and Game (DFG), Wildlife Conservation Board, or other public resource agency. She indicated that recently, however, DFG has tended to refuse mitigation easements due to understaffing and reduced state funding.

She also identified that the Bay Area Open Space Council (1999) conducted an extensive survey of conservation easements in the Bay Area, including Solano County. The report concludes that “seventy percent of easements held by public agencies are not monitored” (page 18) and further, that “...easements must be regularly checked to ensure that the terms of the easement are being followed” (page 21).

“My [Dr. Mucik’s] experience from 6 years working on conservation easements in Solano County (1996–2002) supports the Bay Area Open Space Council findings. The recommendation below is expanded in the section “Recommendations for Conservation Easements” and supports assignment of the mitigation conservation easements to Solano Land Trust, a local entity with a staffed easement stewardship program and a good track record of monitoring and enforcing its conservation easements. The Trust owns and manages nearby and similar lands such as Rush Ranch and Jepson Prairie.”

***Recommendation:** Assign mitigation conservation easements with endowments to Solano Land Trust, which has a staffed conservation easement monitoring program, manages similar and nearby lands, and has a track record for local easement stewardship. See “Recommendations for Conservation Easements” for additional information on conservation easement assignment and stewardship.*

Response: The suggestion to assign conservation easements to the Solano Land Trust (SLT) is well taken, as they have experienced staff, a local presence, and good track record. This suggestion should be considered during the permit process, but it is preliminary at this stage for either PHLF or SLT to make a commitment to that course of action. Further, to make such a commitment would preempt input on this issue from regulatory agencies during the permit process. The conservation easement would have to be approved by the Corps, BCDC, USFWS, CDFG, and RWQCB. It is not necessary to have a conservation agreement in place for CEQA mitigation purposes as long as it is a condition of approval. Additional responses to the section titled Recommendations for Conservation Easements for Mitigation Lands are provided below.

Comment V: Power Plant Location

“The Project EIR and other documents mention an alternative site for the power plant, sedimentation basin, and associated facilities. Since 2006, the Landfill has decided to relocate the power plant within the Phase I footprint, so I withdraw my objections.”

Response: The power plant and associated facilities are now planned to be placed within the Phase I area.

Comment VI: Dr. Muick comments on several topics related to the EIR (EDAW, 2005) and MMP (LSA and ESP, 2006) in her Table 3-1. These are addressed individually below:

EIR

Comment VII-a. Impact on Special-Status Plants (San Joaquin spearscale)

Response: See Response to Issue II (above).

Comment VII-b. Conservation Easement

Response: See Response to Comment IV (above).

Comment VII-c. Increased Erosion Potential (from Landfill Cap)

Response: See Response to Comment I (above).

Comment VII-d. Revegetation of the Visual Berm

Response: This portion of the landfill will also be subject to revegetation under County Use Permit, California Integrated Waste Management Board and Regional Water Quality Control Board Regulations. See Response to Comment II (above).

Comment VII-e. Debris and Structure Removal

Response: The GMP has been revised to require the removal of all metallic debris and trash. However, it is not necessary, or always desirable to remove all woody structures and debris, as they may temporarily provide thermal and escape cover for wildlife and will eventually decompose. Specifics are addressed in the response to the section of this chapter titled “Recommendations for Debris Removal.”

MMP

Comment VII-f. Southern Hills Parcel, Cursory Characterization of Vegetation

Response: The MMP only summarizes the results of previous botanical surveys. The botanical report (LSA, 2006b) that was provided to the reviewers has additional information about botanical resources on the various parcels.

Comment VII-g. Griffith Ranch, Presence of Creeping Wildrye.

Response: No creeping wildrye (*Leymus triticoides*), a native, perennial, sod-grass, has been recorded from the northern portion of the Griffith Ranch parcel during several years of surveys

(LSA 2006). Similarly, creeping wildrye was not observed on the southern portion of Griffith Ranch during a survey for the rare pappose tarplant (*Centromadia parryi* ssp. *parryi*) by LSA in September 2007. It is possible but extremely unlikely that stands of creeping wildrye have been overlooked during the several surveys for various resources (plant communities, rare plants, wetland features); however, as the entire Griffith Ranch parcel covers 137 acres, it could have occurred. Therefore, it would benefit the project if Dr. Muick would advise LSA (provide a map) where the stands of creeping wildrye throughout the Griffith Ranch were observed so that appropriate mitigation measures, if needed, can be incorporated into the Revised Mitigation and Monitoring Plan.

Comment VII-h. Seasonal Wetland Pastures.

Response: As noted in the comment, this concern was addressed in the revised GMP (LSA, 2007).

Comment VII-i. Re-establishment of channel connecting pools in Director's Guild could spread invasive non-native species (especially Lepidium).

Response: The MMP is a conceptual document. Final Mitigation Specifications will include the provision that mitigation construction be monitored by a qualified biologist to evaluate populations and minimize the likelihood of spread. In addition, control of *Lepidium* on this parcel has already been implemented, and a control program will be required by the GMP.

Comment VII-j. Use Local Inoculum, Not Commercial Seed to Revegetated Restored Mitigation Pools.

Response: As stipulated in the MMP, local inoculum will be used to seed the created pools. However, this issue will be balanced with concerns for preservation of genetic diversity, maintaining stable populations in preserved pools, and prevention of introduction of undesirable weeds into created pools.

Comment VII-k. Use Both CalEPPC (1999) Lists A and B to Target Weed Control Efforts, Not Just List A so that Purple Star-thistle is Included

Response: Lists A and B have been combined into single table in the new California Invasive Plant Inventory (Cal-IPC 2006) which is used to target control efforts in the GMP, therefore purple star-thistle will not be ignored. The revised GMP (LSA, 2007) specifically addresses control measures for purple star-thistle.

Comment VII-l. Extend Grassland Monitoring to Landfill Cap

Response: Monitoring of landfill cap vegetation will be conducted in compliance with California Integrated Waste Management Board Regulations (see response to Comment II).

Comment VII-m. Require All Vehicles And Equipment Used On Director's Guild Be Washed To Remove Seeds And Soil To Prevent Spread Of Invasive Plants (E.G. Lepidium)

Response: This measure will be included in Final Mitigation Specifications under direction of a biological monitor (see response to comment VII-i).

Comment VII-n. No Commercial Seed for Vernal Pool Restoration

Response: See Response to Comment VII-j.

Comment VII-o. Management Goals and Objectives Details

Response: See Responses to Grazing Management Recommendations (below).

Comment VII-p. Conservation Easements

Response: See responses to section titled "Conservation Easement Recommendations" (below).

Comment VIII. Recommendations for the Grassland Management Plan

Dr. Muick acknowledges that the revised GMP (LSA, 2007) was responsive to most of her comments and recommendations regarding the draft GMP (LSA, 2006a). She summarizes by stating: "*The most notable changes in the 2007 Grassland Management Plan are the establishment of a paid, part-time Resource Manager; inclusion of a figure showing specific fencing and range improvements; and a weed control program with priorities. The most notable omission continues to be restoration and grazing land management plans for the capped landfill area.*" (Please note that the omission of the landfill cap in the GMP is addressed in the Responses to Comment II above and to Comment VII-1 below.) Dr. Muick continues with a table with specific comments on the revised GMP. Responses to those comments are provided below.

Comment VIII-1. Restoration and Management Plan for Capped Landfill Grasslands

Response: This will be addressed during the CIWMB and SWRCB permit process. See also Response to Comment II (above).

Comment VIII-2. Inconsistencies Between 2006 And 2007 AUM Tables Noted And Information Conveyed To PHLF. Corrections made by R. Nichols. See e-mail memo April 9, 2007, from R. Nichols to D. Airola and P. Muick.

Response: This comment refers to the calculations of livestock carrying capacity and differences between the draft GMP (LSA, 2006) and the revised GMP (LSA, 2007). As noted by Dr. Muick, the discrepancies are explained in the e-mail she cited which is included below in quotations.

“As we discussed, the range analysis spreadsheet (Tables A and B) inconsistencies between the 2006 and 2007 versions of the GMP for Griffith Ranch and Director’s Guild in dry-weight production levels (which affect the available forage calculations) can be explained as follows: The Pescadero clay (Pc) and Antioch-San Ysidro (AsA, AsC) soils were not placed in a range site by the USDA Soil Survey, so we had to make a scientific guess based on extrapolation from soils and associated range sites with similar characteristics. In 2006, Greg Gallagher (LSA GIS specialist who originated the spreadsheets) assumed little or no forage for Pc because of its location in a playa pool and estimated production of the AsA-AsC soils based on the profile description in comparison with soils of other range sites. In 2007, I modified the Pc soil production estimates assuming it could be assigned to the clayey range site. Based on our discussion, this probably was a wrong assumption because the forage is unavailable due to inundation during the grazing season. Accordingly, as we agreed the Pc estimates should go back to zero. The AsA and AsC production levels were underestimated in the 2006 GMP on the other hand, and should remain in the range of the fine loamy range site as described in the 2007 plan, which is closer to the actual use levels. The GMP will be revised accordingly when we receive the rest of the review comments. It will also state the caveat that the range analysis estimates are based on several assumptions, and subject to variance due to factors such as to land use history, disturbance levels, and non-palatable weed cover, and should only be used as for general guidance. Stocking rates should be adjusted based on actual use and monitoring results.”

Comment VIII-3. Interview The Three Current Grazing Lessees And Incorporate Their Knowledge And Recommendations Into Pasture Improvements. *No indication if additional interviews took place. However, the 2007 plan provides more specific information about types and locations of pasture improvements.*

Response: There are two grazing lessees on the mitigation properties, Greg Tonneson on Director’s Guild and Griffith Ranch, and Ernie Ahart on Southern Hills. Additional interviews were conducted with each as documented below under “Personal Communications”.

Comment VIII-4. Create And Implement A Model Grazing Lease That Includes Record Keeping About Animal Types And Numbers As Part Of Lessee’s Or Land Manager’s Responsibility. *Addressed in two ways: discussion on p. 13 and model lease from East Bay Regional Park District included (Appendix A). The appraisal method of lessee selection on p. 13 contains a confusing low bid analogy. Perhaps the confusion is a typographical error?*

Response: The intent of this statement was to recommend an appraisal method based on qualifications to select a grazing lessee, instead of a low bid selection basis which is not recommended. The language will be revised for clarity.

Comment VIII-5. Do Not Rely On Grazing Income As The Sole Funding Source For Restoration And Management Activities. (A) Resource Manager (RM) oversight of grazing program fills a missing link in implementation of the Grassland Management Plan. However, RM should not be an employee of PHLF due to public perception and conflict of interest concerns that may arise around mitigation compliance issues. B) Funding identified for RM is from grazing income and Mitigation Fund. **Are there other issues around PHLF allocation of Mitigation monies for this position?** Depending upon the answer, this may or may not provide sufficient de-linking of grazing income from restoration and management activities. C) It is unclear if Grassland Management Plan proposes to accomplish restoration of mitigation parcels by volunteer activity alone. If so, this is inadequate and does not ensure timely or quality restoration work. (D) The part-time RM position, as described, is responsible for a wide range of activities. Some responsibilities (running a volunteer education program) appear inconsistent with overall job description and qualifications.

Response A: The long-term Resource Manager would not be a PHLF employee, but would be an employee of the Preserve Manager (land trust or other entity holding the conservation easement approved by the regulatory agencies). However, mitigation implementation and 5-year monitoring would be conducted by a qualified biologist or restoration ecologist hired by PHLF with permitting agency oversight as is standard practice.

Response B: The GMP intended to state that grazing fees could be an additional source of income for range improvements or restoration activities beyond those required by the MMP or GMP. (This will be clarified in the revision). In actuality, a cost determination analysis has been conducted to calculate initial costs for both GMP implementation (installation of fencing, water improvements), and MMP implementation (mitigation implementation and 5-year mitigation monitoring and maintenance activities) that would be funded by PHLF. Another analysis was conducted to determine the cost of an endowment fund for PHLF to establish to pay for the Resource Manager's salary and all long-term management costs (maintenance, weed control etc.) in perpetuity. None of these analyses counted on grazing lease income to offset any of those costs.

Response C: Restoration of mitigation parcels for implementation of the MMP would not be done by volunteers; it would be conducted by qualified professionals funded by PHLF. The mention of volunteers conducting restoration activities is intended as an option for the Preserve Manager as a habitat enhancement and environmental education opportunity, to be implemented once the initial monitoring period had been completed and the performance criteria met. Volunteer activities, therefore, would not count towards establishing initial mitigation objectives but perhaps at the discretion of the Resource Manager would assist in maintaining habitat values once the lands were turned over to the third party for management. GMP activities would be financed in perpetuity by an endowment fund and would not rely on volunteer activities.

Response D: The Resource Manager would be ultimately responsible for implementing all GMP actions, but could hire staff or specialists as appropriate for activities beyond their expertise. This is accounted for in the calculations for the endowment fund.

Comment VIII-6. Incorporate Grazing Management Practices And Research Findings From The Jepson Prairie Management Committee. Use Of Jepson Prairie Management Committee Research Findings Proposed; No Other Connection Described.

Response: The Resource Manager should use any new relevant research findings including those from the Jepson Prairie. The GMP is clearly intended to be flexible as a “living document” which can incorporate lessons learned from monitoring and research. To be more specific about how research findings are incorporated into resource management activities would not be appropriate in this context.

Comment VIII-7. Griffith Ranch. Feasibility Problem Remains Due to Lessee Using Griffith Ranch for Access to Other Pastures

Response: PHLF has decided to relocate the power plant and ancillary facilities within the Phase I area. Therefore, a portion of the southern Griffith Ranch parcel will be included in the GMP (Figure 1). Extensive discussions with the grazing tenant, Greg Tonneson (see Personal Communications below), indicate that access will be unimpaired and continued livestock grazing operations will remain feasible.

Comment IX. Recommendations for Conservation Easements for Mitigation Lands.

Dr. Muick recommends that the Solano Land Trust as holder of the Conservation Easement. She also provides several recommendations for easement provisions.

Response: The PHLF appreciates these comments and recommendations and they will be considered by PHLF and likely by the regulatory agencies during the permit process. See also response to Comment IV (above).

Comment X. Recommendations on Debris Removal. Dr. Muick recommends that large structures and debris such as pipes, fencing, old appliances and old farm equipment be removed from the mitigation parcels. Specific recommendations for each parcel are then provided as follows:

Director’s Guild

Remove eucalyptus stumps on the edge of the playa pool, unless these might be useful for birds and other desirable wildlife;

Remove piles of rolled fence wire scattered about the property;

Remove old appliances and farm equipment scattered around the southern half of the property near the half-burned barn;

Remove pieces of wood, a redwood water tank, water troughs, and other wooden building materials on the ground, unless of value to California tiger salamanders and other reptiles and amphibians; and

Remove structures, including the partially-burned barn and intact metal silo and its concrete pad.

Griffith Ranch

Remove debris in and around the old barn and pump house near the eucalyptus grove; and

Remove structures, including the old barn and pump house.

Southern Hills and Pond 5

Remove various pieces of equipment in and around the pond 5 barn and spring box, and

Remove the barn near pond 5.

Response: The revised GMP is consistent with most of these suggestions. It specifies that all metallic debris such as wire and discarded appliances will be removed from the grazing parcels to enhance habitat values and eliminate grazing obstructions. Removal of the large eucalyptus stumps on the Director's Guild will also be specified, as that would benefit portions of the playa pool habitat that the stumps occupy. Removal of other woody debris as recommended above will be conducted selectively under direction of a qualified wildlife biologist to ensure that habitat values are not compromised. The collapsed barn near Pond 5 will not be removed because it provides cover for adult and metamorph CTS, which have frequently been observed there.

3.3 SCIENTIFIC PANEL REVIEW REPORT APPENDICES

3.3.1 Appendix D2a Clarifications

PHLF Clarification regarding Responses by Pam Muick to PHLF Comments VR1, VR3-VR8, and VR 10-VR 12

PM Response to VR1. *The limited information provided on revegetation of completed landfill cells, as well as evidence of substantial areas of bare ground on the Phase 1 landfill does not warrant a conclusion at this time that revegetation will be successfully accomplished. More information should be provided to support the assertion that the landfill cells will be successfully revegetated to habitat of similar value and character after filling. (See also, Response to Comment VR3 below).*

PHLF Clarification. See Response to Comment I (above) regarding information on revegetation of completed landfill (RWQCB and CIWMB regulations require revegetation of completed landfills). Regarding evidence of bare ground on the Phase I landfill, this is not disputed as PHLF has never claimed that the entire active landfill area would have vegetation. The operating areas of the construction project involve bare soil; however, dormant areas have

been and will be seeded prior to the onset of wet weather for erosion control requirements. It is acknowledged that the Phase II landfill would have a similar impact, which would require mitigation through the CEQA and permitting process.

PM Response to VR2. *Mr. Swanson’s report was not provided for review until April 2007, after the draft report was prepared. Responses to comments VR2 and VR9 are provided in Appendix D2b.*

PHLF Clarification. See Responses to Appendix D2b.

PM Response to VR3. *Using aerial photography on Google Earth (www.earth.google.com) to look at the Phase I landfill, I estimated a minimum of 160 acres of bare soil within the existing Phase I landfill. Considering the engineering “cell” program outlined for Phase II, the observed pattern of bare land is likely to continue. Therefore I do not see a reason to change this comment. I’ve attached a copy of my Google Earth measurement to verify the estimate.*

PHLF Clarification. The responder is discussing two separate issues. The active Phase I landfill and the revegetation of the closed Phase II landfill. It is acknowledged that operational portions of active landfills cannot support vegetation, hence a large part of the active Phase I landfill is currently unvegetated (see clarification to response VR1 above). California state regulations require that closed landfills be covered with vegetation (see PHLF Clarification to PM Response to VR1). The aerial photography shows that the Phase I active landfill is not completely vegetated. But, it should be noted in the photograph that the 20 acres on the west edge and southwest corner are completed operational areas subject to the revegetation regulations, and the final cover was placed there between 1986 and 2000. Those areas support vigorous growth of vegetation.

PM Response to VR4. *PHLF currently owns the contiguous properties due east of Phase II expansion (APNs 0046 120 210, 160 acres, and 0046 120 220, 137.39 acres). These properties are mapped as the “Eastern Valley” on various maps in the Phase II documents. Because the two parcels currently do not have and are not proposed to have deed restrictions prohibiting their use for landfill expansion (based on my research at the County Assessor’s office) it is reasonable to assume that the rights to use these parcels for landfill or other compatible commercial or industrial uses continues to exist. Whether PHLF or another entity intends to exercise these rights is a separate question. The development rights exist on the “Eastern Valley” based on current title and zoning law. If PHLF wishes to moot this concern about landfill expansion it would sever these rights from the parcels now known as the Eastern Valley.*

PHLF Clarification. PHLF has no plans to use the Eastern Valley for landfill expansion or for any other development. If at sometime after the year 2045 when the Phase II landfill (if approved) would close, use of the Eastern Valley for landfill expansion would be subject to the same approval process as the Phase II expansion is now, and significant impacts would require mitigation. It is just as likely that the Eastern Valley would be used as a landfill buffer, or some other unforeseeable future use.

PM Response to VR5. Regarding “Unpermitted concrete rubble is stored on-site”. *This quote is taken from California Division of Mines website on the quarries located within the PHLF.*

PHLF Clarification. Only one quarry is located within the boundary of the PHLF (Phase I Area). This quarry operation, which is located within the approved landfill permit, is approved under the existing County Use Permit/Marsh Development Permit. The reference to “Unpermitted concrete rubble is stored on-site” is unfamiliar to PHLF, Inc. The existing County Use Permit/Marsh Development Permit allows the processing of concrete rubble within the Phase I area. No regulatory issues have been raised regarding this operation. PHLF is committed to compliance with all relevant laws and regulations. If a regulatory agency identifies any permit non-compliance, the company will work with that agency to correct the problem.

PM Response to VR6 Regarding Elsie Gridley Mitigation Bank. *Its identification as a contingency site suggests some possibility for its use. The statement that such mitigation would result in a net loss to the secondary zone is factually true. Given the apparent low likelihood of use of this site, the characterization has been deleted from the report.*

No clarification necessary.

PM Response to VR7. *This objection is moot, as the landfill has agreed to site the power plant within the Phase I footprint.*

No clarification necessary.

PM Response to VR8 Regarding habitat fragmentation. *I consider most of the impacts described in this section as obvious and not requiring a high level of support. I deleted the second half of this paragraph starting with the sentence that begins “Examples of species . . .” to the end of this paragraph.*

PHLF Clarification. See Response to Comment II (above).

PM Response to VR9. *The characterization of Spring Branch Creek “as habitat for winter-run chinook salmon” was intended to indicate that the lower watershed receives salmon use. Changes in the upper watershed could therefore affect downstream habitat conditions for chinook salmon. See Appendix D2b for citations.*

PHLF Clarification. No permanent impoundments or diversions of the Spring Branch Creek from its natural watershed are included in the Phase II expansion. Water from the watershed will continue to flow through the lower reaches of the Spring Branch Creek. These waters will be monitored as is required by permit conditions for the landfill issued by the Regional Water Quality Control Board.

PM Response to VR10. *The concern has been alleviated by clarification of the size and location of the 179-acre footprint and boundary for Phase II. The comment has been deleted.*

No clarification necessary.

PM Response to VR11. *This comment will be reworded as follows. “During field surveys, I observed bulldozer scrapes about 1 foot deep in the northeast corner of the Griffith Ranch that date from 2005–06, based on living and dead vegetation. According to the Landfill consultants these are not related to any investigations they initiated. However, these scrapes, which are located near the area where wetland mitigation construction is planned, were not holding water nor growing wetland plants, despite the high rainfall year.”*

Recommendation: Successful wetland mitigation on the northern Griffith Ranch could be problematic.

PHLF Clarification. The vegetative and hydrological response to an unplanned, un-engineered excavation made by a bulldozer for other purposes does not provide useful information on the likelihood of successful wetland mitigation. Scientific investigations of soils and hydrology on the Griffith Ranch for wetland restoration planning indicate otherwise. Extensive long-term LSA restoration experience indicates that desirable native wetland vegetation can become established and sustainable with appropriate soil-moisture relationships.

PM Response to VR12. *I believe that the wood debris onsite should be removed unless it is serving as important tiger salamander habitat. Because there is a California tiger salamander expert team on the panel, I will defer to his recommendation.*

PHLF Clarification. Woody debris will be removed where it is occupying habitat that could support wetland or special-status species habitats (as with the eucalyptus stumps on Director’s Guild which will be removed). During the winter and spring, California tiger salamanders (CTS) are regular found underneath the wood debris onsite and particularly around the barn on the Pond 5 buffer area. Because removing the wood debris may result in the unnecessary disturbance of CTS, the workers assigned to remove litter and other debris from the Phase II area have been ordered to not remove these boards and debris from the Phase II area. The removal of other woody debris as recommended above will be conducted selectively under direction of a qualified wildlife biologist to ensure that habitat values for CTS are not compromised. As mentioned above, the collapsed barn near Pond 5 will not be removed because it provides cover for adult and metamorph CTS, which have frequently been observed there.

3.3.2 Appendix D2b Clarifications

The reader is referred to the assessment of the Spring Branch Creek under Issue I.

4.0 REFERENCES

4.1 LITERATURE REVIEWED

- California Exotic Pest Plant Council (CalEPPC). 1999. Exotic Pest Plants of Greatest Ecological Concern in California.
- California Invasive Plant Council (Cal-IPC). 2006. Invasive Plant Inventory. Cal-IPC 2006-02. Berkeley CA. Available online at www.cal-ipc.org
- Clawson, J.W., N.K. McDougald, and D.A. Duncan. 1982. Guidelines for residue management on annual range. Leaflet 21327. Cooperative Extension, Division of Agricultural Sciences, University of California, Davis, CA. 4pp.
- Marty, J. 2005. Effects of cattle grazing on diversity in ephemeral wetlands. *Conservation Biology* 19: 1626-1632.

4.2 LITERATURE CITED

- Airola, D., P. C. Muick, H. B. Shaffer, C. Searcy, W. D. Shuford, and A. Solmeshch. 2006. Draft Scientific Panel Review of Biological Resource Impacts and Proposed Mitigation for the Potrero Hills Landfill Phase II Expansion. Prepared for Bay Conservation and Development Commission. Prepared by Airola Environmental Consulting, Sacramento, CA.
- Airola, D., P. C. Muick, H. B. Shaffer, C. Searcy, W. D. Shuford, and A. Solmeshch. 2007. Scientific Panel Review of Biological Resource Impacts and Proposed Mitigation for the Potrero Hills Landfill Phase II Expansion. Prepared for Bay Conservation and Development Commission. Prepared by Airola Environmental Consulting, Sacramento, CA.
- EDAW. 2005. Final Environmental Impact Report for the Potrero Hills Landfill Expansion Project, Volumes 1 and 2. Report No.: SCH #2003032112 Prepared for Solano County Department of Environmental Management. Prepared by EDAW, Sacramento, CA.
- Holland, R. F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Prepared by California Department of Fish and Game, Nongame-Heritage Program, Sacramento, California.
- LSA. 2001. Delineation of Areas Subject to Clean Water Act Jurisdiction within the Potrero Hills Landfill Expansion Project Area, Solano County, California. Prepared for Potrero Hills Landfill. Prepared by LSA Associates, Inc., Pt. Richmond, CA. 11 pp.

- LSA. 2003. Delineation of Waters of the United States on the Southern Hills and Eastern Valley Study Area, Potrero Hills Landfill, Solano County, California (Verified May 2004). Prepared for Potrero Hills Landfill. Prepared by LSA Associates, Inc., Pt. Richmond, CA.
- LSA. 2006a. Potrero Hills Landfill Mitigation Site Grazing Management Plan: Southern Hills, Griffith Ranch, and Director's Guild Parcels. Prepared for Potrero Hills Landfill, Inc. Prepared by LSA Associates, Inc., Pt. Richmond, CA. 18 pp.
- LSA. 2006b. Special-Status Plants and Sensitive Communities/Habitats Survey Results – Southern Hills, Eastern Valley, Griffith Ranch and Director's Guild Parcels, Potrero Hills Landfill Property, Solano County. Prepared for Potrero Hills Landfill, Inc. Prepared by LSA Associates, Inc., Pt. Richmond, CA. 29 pp. + appends.
- LSA. 2007. Potrero Hills Landfill Grassland Management Plan for Mitigation Areas Southern Hills, Griffith Ranch and Director's Guild Parcels, Solano County, California. Prepared for Potrero Hills Landfill. Prepared by LSA Associates, Inc., Pt. Richmond, CA. 28 pp.
- LSA and ESP. 2006. Mitigation and Monitoring - Plan Potrero Hills Landfill Phase II Expansion, Solano County, Corps. File No. 26024N. Prepared for Potrero Hills Landfill. Prepared by LSA Associates, Inc. and Environmental Stewardship and Planning, Pt. Richmond, CA. 64 pp. + appends.
- Reed, P. B., Jr. 1988. Federal List of Plant Species That Occur in Wetlands: California (Region 0). Biological Report. Report No.: 88 (26.10) Prepared by U.S. Fish and Wildlife Service,
- Sawyer, J., Keeler-Wolf, and T. 1995 *A Manual of California Vegetation*. California Native Plant Society Sacramento, CA.
- Soil Conservation Service. 1977. Soil Survey of Solano County, California. Prepared by U.S. Dept. of Agriculture, Soil Conservation Service, Washington, D.C.
- U.S. Army Corps of Engineers. 2006. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. Report No.: ERDC/EL TR-06-16 Prepared by U.S. Army Engineer Research and Development Center, Vicksburg, MS. 122 pp.

4.3 PERSONAL COMMUNICATIONS

- Ahart, Ernie. Livestock Operator, Southern Hills parcel. February 15, 2006 and August 24, 2006.
- Tonnesen, Greg. Livestock Operator, Griffith Ranch and Director's Guild parcels. February 22, 2006, March 8, 2006, and April 12, 2006.

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APPENDIX

DEFINITIONS OF RANGE MANAGEMENT TERMS

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APPENDIX

Definitions of Range Management Terms

Term	Definition
Air-dry weight	The weight of a substance (usually forage) after it has been allowed to dry to equilibrium with the atmosphere.
Animal-unit (AU)/ Animal Unit Equivalent (AUE)	Defines forage consumption on the basis of one standard mature 1,000-pound cow, either dry or with calf up to 6 months old; all other classes and kinds of animals can be related to this standard as animal unit equivalents (AUE), e.g., a bull equals 1.25 AU, a yearling steer or heifer equals 0.75 AU.
Animal-unit-month (AUM)	The amount (780 pounds) of air-dry forage calculated to meet one animal unit's requirement for one month.
Carrying capacity	The average number of livestock and wildlife that may be sustained on a management unit compatibly with management objectives. It is a function of site characteristics, and management goals and intensity.
Class of animal	Description of age and sex group for a particular kind of animal, e.g., cow, calf, yearling heifer, ewe, fawn.
Cover	(1) The plant or plant parts, living or dead, on the ground surface. (2) The proportional area of ground covered by plants on a stated area.
Ecological site	Land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and to respond to management. Synonymous with range site.
Forage	Browse and herbage that are available for food for grazing animals or to be harvested for feeding.
Forage production	The weight of forage that is produced within a designated period of time on a given area (e.g., pounds per acre).
Forb	A non-woody, broad-leaved plant.
Grass	A plant with long, narrow leaves having parallel veins and nondescript flowers. Stems are hollow or pithy in cross-section.

APPENDIX (Continued)
Definitions of Range Management Terms

Term	Definition
Grazing distribution	Dispersion of livestock grazing within a management unit.
Grazing management	The control of grazing and browsing animals to accomplish a desired result.
Grazing pressure	An animal-to-forage relationship measured in terms of animal units per unit weight of forage at any instant.
Key area	A relatively small portion of a management unit selected because of its location, use, or grazing value as a monitoring point for grazing use. It is assumed key areas will reflect the overall acceptability of current grazing management over the whole unit.
Kind of animal	An animal species or species group such as sheep, cattle, goats, deer, horses, elk, antelope.
Monitoring	The orderly collection, analysis, and interpretation of resource data over time to evaluate progress toward meeting management objectives.
Native species	A species that is a part of the original fauna or flora of a given area.
Overgrazing	Continued heavy grazing that exceeds the recovery capacity of individual plants in the community and creates a deteriorated range.
Overstocking	Placing a number of animals on a given area that exceeds the forage supply during the time they are present.
Overuse	Using an excessive amount of the current year's growth.
Palatability	The relish with which a particular species or plant part is consumed by an animal.
Pasture	A grazing area enclosed and separated from other areas by fencing or other barriers.
Photopoint	A point from which photos are periodically taken to monitor long-term management responses.

APPENDIX (Continued)
Definitions of Range Management Terms

Term	Definition
Plant community	An assemblage of plants occurring together at any point in time, denoting no particular ecological status.
Range (Rangeland)	Any land supporting grazable or browsable vegetation and managed as a natural ecosystem; can include grasslands, forestlands, shrublands, and pasture. "Range" is not a land use.
Range improvement	Any practice designed to improve range condition or allow more efficient use.
Range management	A distinct discipline founded on ecological principles with the objective of sustainable use of rangelands and related resources for various purposes.
Residual dry matter (RDM)	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).
Rest	Leaving an area ungrazed for a specified time.
Stocking rate	The number of specific kinds and classes of animals grazing a unit of land for a specified time period.
Use	The proportion of current years forage production that is consumed or destroyed by grazing animals.
Weed	(1) A plant growing where unwanted. (2) A plant having a negative value within a given management system.

Reference:

Ortmann, J., L.R. Roath and E.T. Bartlett. 2000. Glossary of range management terms no. 6.105. Colorado State University Cooperative Extension. 5pp.

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