

## Chapter 3. Vegetation Resources and Grazing Management

*Review Conducted by:*

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### SUMMARY

The proposed landfill expansion will take place on lands within the secondary management area of Suisun Marsh. This area has special status conveyed through the Suisun Marsh Preservation Act of 1974 (SB 1981) due to its importance as a watershed of Suisun Marsh and its values to wildlife.

The primary effects of the landfill expansion are the loss of upland wetlands and grassland habitats along with associated plant and animal species; degradation of remaining habitats surrounding the landfill; creation of capped landfills to be revegetated with species having low ecological value; permanent degradation of the Spring Branch Creek headwaters; and significant topographical reconfiguration of the interior of valley of Spring Branch Creek.

Although valued and protected by the Suisun Marsh Preservation Act, very little of the 6,500-acre Potrero Hills secondary management area is protected from development; the exception is the upland portion of Rush Ranch. Most of the Potrero Hills are owned by commercial and private entities. It is reasonable to assume, as the Project EIR does, that interests in commercial development of the Potrero Hills will increase and accelerate with the growing populations of Solano County, the Bay Area, and Sacramento Valley.

Recommendations include: (1) mitigate the loss of the upper Spring Branch Creek watershed with enhancements to the lower Spring Branch Creek watershed; (2) ensure permanent protection of the mitigation lands through donation of fee title lands and/or conservation easements with endowments to an appropriate entity; (3) develop a plan and methodology to restore the capped landfills and other bare soils with the native and non-native vegetation that currently grow onsite; and (4) implement the Grassland Management Plan.

# INTRODUCTION

## Background

The Landfill has proposed to expand its operations in the Potrero Hills, located in Solano County within the secondary management area of Suisun Marsh. BCDC will determine whether to grant a permit to the Landfill for this purpose. BCDC has directed the Landfill to fund an independent review panel to advise the Commission concerning certain effects of the proposed project. As a panel member, the scope of my review was to evaluate the potential environmental impacts of the proposed landfill expansion on grasslands, vernal pools, and wetland habitats; to review the appropriateness and adequacy of the proposed mitigation; and to make recommendations for improvements.

## Scope of Review

The scope of my review included: (1) identifying and analyzing existing grasslands, wetlands, vernal pools, and livestock grazing resources at the site; (2) evaluating whether the proposed project and mitigation would adversely impact the existing habitat and, if such an impact would occur, analyzing its significance; (3) analyzing whether the proposed mitigation is adequate and appropriate and, if not adequate, how it should be modified to make it adequate; and (4) proposing recommendations on potential modifications to the project or mitigation measures that could more effectively reduce the impact of the landfill expansion on the site's natural resources.

## Review Limitations

This review was limited by (1) the relatively brief amount of time available for field surveys; (2) lack of direct information from the grazing lessees; (3) lack of visual field benchmarks to assist with evaluating the final width and height of the landfill and screening berms relative to the surrounding hills; and (4) belated receipt, in March 2007, of "Assessment of Ecological Value of Spring Branch Creek in and near the Potrero Hills Landfill" by Swanson Hydrology + Geomorphology (2005). Items 3 and 4 resulted in the greatest limitations to my review.

**Limited Time.** In general, the limited field time did not interfere with review and analysis. This was because 2005–06 was an unusually high rainfall year that resulted in wetlands and ponds retaining water longer than usual; consequently, annual and perennial vegetation was growing and blooming during the field survey. In an average year, streams, creeks, pools, and ponds would have been dry by the time of the field survey; and most annual and many perennial species would have bloomed and died back.

This was confirmed by a visit to the project site in April 2007 to evaluate the Swanson hydrologic assessment. The rainfall in 2007 was below average; in late March, most of the ponds were only partly full, and the vegetation was much shorter than at the same time in 2006.

**Lack of Contact with Livestock Operators.** When working on grazing management plans in Solano County and elsewhere, I confer with the ranchers and grazing lessees (livestock operators) whose livestock graze the property. During a phone meeting on July 31 with Technical Manager Dan Airola and Landfill consultants Steve Peterson and Richard Nichols, the Landfill consultants agreed to interview the grazing lessees and make other requested improvements to the Grazing Management Plan. For this reason, I decided that it was not necessary for me to interview the ranchers. In April 2007, the Landfill consultants provided me with the revised Grasslands Management Plan.

**Final Facility Location.** The Landfill proponents did not provide locations of the power plant and screening berm, Phase II landfill edge, and related access roads until the week before the due date for the draft report. Therefore, when I conducted field surveys, I was not able to evaluate the specific locations of these developments and their effects, particularly on the habitats of the Griffith Ranch, the northern edge of the Southern Hills, and the pond 5 mitigation areas. Subsequently, I have learned that the Landfill decided to relocate the power plant site to the Phase I area, so this initial limitation became moot.

**Lack of Visual Benchmarks in the Field.** Establishment of field benchmarks would have facilitated project analyses. I have reviewed other development projects where proponents established temporary field benchmarks for the purpose of identifying project impacts. Due to the lack of benchmarks to indicate height, width, and dimensions of the project, I am not wholly confident that I have analyzed all of the ecological effects of the proposed Landfill expansion.

**Belated Receipt of the Hydrological Assessment.** The late receipt in March 2007 of the “Assessment of Ecological Value of Spring Branch Creek in and near the Potrero Hills Landfill” by Swanson Hydrology + Geomorphology delayed my final report. The content of the Swanson report required that I review my entire analysis and make substantial changes to portions of my report.

## METHODS

### Pre-Field Review

Prior to conducting field surveys, I visited the site; reviewed documents and maps; and interviewed local agencies, organizations, and individuals. The overview site visit included the scientific review team, BCDC staff, and Landfill consultants. The documents I reviewed were provided by the Landfill and BCDC. I consulted with local land experts, the County, and the Solano Land Trust; I also utilized a range of maps and aerial photography available to the public through the U.S. Geological Survey and Google Earth (2007).

### Field Surveys

Field surveys were conducted on the four proposed mitigation properties, Griffith Ranch, Director’s Guild, Southern Hills, and pond 5, and the Phase II expansion site to evaluate the existing grasslands, wetlands, vernal pools, and livestock grazing resources. The surveys were conducted to better understand the inherent resource values, project impacts, effects of

the proposed mitigations, and key issues related to grazing management and use of conservation easements. Field survey dates were June 4, 10, 19, and 21, 2006; survey summaries are available upon request.

The field surveys were conducted in the following manner. Each survey began at one corner of the property and continued around the property perimeter, following the fence and/or property line and using air photos, parcel maps, and a compass for further information. Field data sheets were completed for each property, and digital photographs were taken. Field data sheets included information for habitat condition; vegetation (native and unusual non-native plants and invasive plant populations); type and condition of fencing, including gates; and potential management issues or concerns. During the survey, I inspected both the Landfill property and the neighboring properties because management and easement issues often involve the neighboring property. Some typical cross-boundary issues included wetlands and invasive weed populations, trespass or shared resource use, access points (formal and informal) between properties or pastures, and how connectivity within the Landfill properties and neighboring properties might be changed by the proposed project. I also inspected property features such as wetlands, rock outcrops, and unique stands of vegetation (trees, shrubs, and invasive weeds); buildings; water holding structures and debris; and internal fence lines.

Digital photographs were taken on each survey. The first photo was taken at the start of the survey, one at each property corner; and the remainder to capture habitat type and potential management issues or concerns, both inside and outside the property. The purpose and location of each photo was noted on a photo inventory sheet, and a power point presentation has been prepared.

Prior to the mitigation property field surveys, I accompanied panel member Ayzik Solomeshch on vegetation sampling surveys, on May 22 and 26, 2006. We sampled grassland and vernal pool plots on the Southern Hills, Eastern Hills, proposed Phase II expansion area, and Director's Guild.

Following receipt of the hydrological report (Swanson Hydrology + Geomorphology 2005), I conducted an additional field survey on March 31, 2007, to evaluate the analysis of the Spring Branch Creek watershed. In the Phase II area, I walked the main channel and tributaries, noted vegetation, and took photographs. Four photographs from my site visit to Spring Branch Creek watershed are included with this report (see "Elimination of Spring Branch Creek Headwaters and Reduction of Ecological Value within Lower Watershed" in the "Impact Evaluation" section).

### **Acquisition of Additional Background Information**

Additional background information was acquired from the Solano County Planning Office and Assessor's Office, visits to the California State Office of Mine Reclamation web site, meetings with Solano Land Trust staff, and information from the Landfill consultants Steve Peterson and Richard Nichols. Additionally, I drew on information from the peer review panel's roundtable discussion and my professional experience.

At the Solano County Planning Office, I spoke with Jeffrey S. Bell, Senior Environmental Health Specialist, and Ron Glas, Principal Planner. At the Assessor's Office, I located parcel numbers and maps of the properties owned by the Landfill and adjacent and nearby parcels. On a separate occasion, I researched the microfilm document archive for relevant public documents related to existing easements on Landfill properties. Table E-1 in Appendix E summarizes the legal property descriptions, acreage, parcel name, and owner for the general Landfill area. Table E-2 in Appendix E includes the acreage of each parcel provided by the Landfill consultants.

### **Materials Provided for Review in the Final Report**

Following submission of the draft review report, the Landfill submitted several additional reports that were reviewed during preparation of the final review report, including the revised Grasslands Management Plan, and the report on the hydrology of Spring Branch Creek (Swanson Hydrology + Geomorphology 2005).

### **Impact Evaluation and Recommendations**

The impacts of the proposed project were evaluated through the guided field trip; mitigation property field surveys; and review of maps, diagrams, and documents (see "Pre-Field Review" above). Constraints to this analysis are the same as those described previously.

### **Mitigation Evaluation and Recommendations**

The proposed mitigations were reviewed and evaluated for feasibility and their likely effects on maintaining and enhancing the site's biodiversity. Additional mitigation actions were considered to increase benefits to biodiversity. Recommendations from panel experts, local land managers, and best land management practices in Solano County were included in the evaluation.

The lack of specific project boundaries as identified under "Review Limitations" (Items 3 and 4) constrained the mitigation analysis. Also, I was not able to fully evaluate the value and feasibility of mitigation proposed for the Southern Hills because I was unable to acquire and review the legal documents identifying the rights and restrictions conveyed in an existing 80-acre easement in the southeast corner of this property.

## **IMPACT EVALUATION**

### **Direct and Indirect Project Effects**

**Direct Habitat Loss for Project Facilities.** The proposed project would result in direct loss of the following wetland and upland habitats:

- 2.42 acres of wetlands that are jurisdictional under Section 404 of the Clean Water Act;

- 0.076 acre of isolated (non-jurisdictional) waters;
- 0.61 acre of pond habitat;
- 179 acres of mixed native and non-native grasslands, including at least one stand of eucalyptus trees with raptor nesting potential, to be replaced after 10 to 40 years with “ruderal vegetation” and “natural grasses” without a restoration plan or methodology ; and
- Unspecified acreage of Griffith Ranch for roads and possibly an earthen berm for viewshed protection.

**Elimination of Spring Branch Creek Headwaters and Reduction of Ecological Value within Lower Watershed.** The footprint of the Phase II landfill expansion utilizes most of the remaining upper watershed of Spring Branch Creek, raises the valley floor from 80 feet above mean sea level (MSL) to 335 feet above MSL, and moves the Spring Branch Creek into an engineered channel. These changes will disrupt and impede runoff and stream flow, are likely to alter the downstream water temperature, and possibly may affect other water quality parameters such as turbidity and salinity.

The hydrological report (Swanson Hydrology + Geomorphology 2005) concludes that Spring Branch Creek was degraded in the early 1900s, lacks a bed and bank, and has very low ecological value. The four photographs from my field survey on March 31, 2007 provide evidence that demonstrate the presence of a bed and bank (Figure 3-1). In addition, wetland vegetation was identified within the stream channel.

The upstream channelization and relocation of Spring Branch Creek will decrease its ecological value and have repercussions, likely negative, on the lower watershed as it flows west into Suisun Marsh at First Mallard Slough. The MMP (on page 33) identifies a three-component mitigation program that includes channel preservation, enhancement, and swale creation on Southern Hills, Griffith Ranch, and Director’s Guild.

In the Project EIR (pages 4.1-16 and 17), no provision is made for storm water detention or control structures to mimic the natural flows of Spring Branch Creek once it is covered by the Phase II landfill. The ecological value of Spring Branch Creek and the importance of First Mallard Slough to native fish habitat as identified by Dr. Peter Moyle, UC Davis, are overlooked in the EIR and Swanson hydrologic assessment. Both documents fail to consider mitigation opportunities within the Spring Branch watershed, preferring instead to mitigate 2 miles away within the Hill Slough watershed. Without explaining their reasons, the Landfill proposes to mitigate with an entirely different type of wetland than the one that is being eliminated and in a different part of Suisun Marsh.

**Elimination of San Joaquin Spearscale Habitats.** The footprint of Phase II will cover the mapped locations of San Joaquin spearscale, a special-status plant. The Project EIR states that no impacts to special-status plant species are anticipated because the San Joaquin spearscale was last seen on the site in 1998; this is a risky assertion. There is a strong likelihood that viable seeds of this species remain within the soil seed bank in this area. A

**Figure 3-1. Spring Branch Creek, Potrero Hills, Solano County,  
Phase II Landfill Expansion Area – March 31, 2007**



a. The bed and bank of the creek are visible in this low rainfall year.



b. Livestock hoofprints in streambed.

Figure 3-1. Continued



c. Tributary of creek with eucalyptus.



d. Wetland vegetation.

web search for “soil seed bank longevity of *Atriplex*” indicates that some members of this genus do persist in the soil seed bank.

**Habitat Fragmentation.** Currently, livestock, wildlife, and plant propagules are free to move and disperse from the edge of Highway 12 across the Potrero Hills to the Suisun Marsh. The vertical development of the Landfill will permanently eliminate the valley topography of Spring Creek watershed. During the operational life of the Landfill (10 to 40 years), about a hundred+ acres will be bare for years, perhaps even decades, at a time. The horizontal development of Phase II landfill and structures will interrupt existing movements of wildlife and plant propagules.

The estimate of bare soil was verified through aerial photography of the Phase I landfill. In 2006–2007, a minimum of 75 acres of bare soil is visible in the aerial photographs available through GoogleEarth (see Appendices D2a and D2b) With the addition of another 179 acres and without operational changes, the trend toward acres of barren land is likely to continue.

**Reduction of the Biodiversity of the Grassland Vegetation.** The revegetation plan for the capped landfill soils of Phase I and II will consist of “ruderal vegetation” and “natural grasses.” No methodology or restoration plan is provided. Therefore, for long periods of time (decades), there will be no vegetation or low-quality, potentially weedy vegetation on the capped landfill.

## Cumulative Effects

**Potential for Future Landfill Expansion.** One potential cumulative effect of the Phase II Landfill Expansion Project will be to increase the likelihood of additional landfill development on adjacent lands.

The Landfill currently owns the two contiguous properties to the east of Phase II (APN 0046-120-210, 160 acres; and APN 0046-120-220, 137.39 acres). On project maps, this area is identified as the Eastern Valley. If the two properties were appraised today, it is reasonable to assume that the potential for landfill expansion would be included in their valuation due to County support and the lack of deed restrictions on the parcels.

Therefore, construction of the Phase II Landfill as proposed, without conservation easements or fee title donation of the two parcels identified above, sets the stage for expansion of the landfill onto adjacent undeveloped lands when Phase II reaches capacity.

**Potential Degradation to Suisun Marsh Hydrology from Combined Effects of the Landfill and Quarrying Operations.** The landfill and quarry operation could modify Suisun Marsh hydrology and water flow due to degradation of Spring Branch Creek watershed and unspecified quarrying activities on the Potrero Hills and mitigation properties. Three quarries are permitted within the Potrero Hills. The following language is taken directly from the California Department of Conservation Office of Mine Reclamation website files:

- (1) 91-48-0003: “Potrero Hills Landfill, 500 feet west of Kildeer Rd.” This is probably the sandstone quarry mentioned in the Project EIR.

- (2) 91-48-0004: “Potrero Hills Quarry. Gravel pit that has been idle since 1993. Unpermitted concrete rubble is stored on-site.”
- (3) 91-48-0006: “Tule Vista Livestock Company. Gravel pit 0.5 miles SE of Scully Rd in Suisun, surface water flows towards Montezuma Slough.” Assuming that Scully Rd is a typographical error and refers instead to Scally Road, the location points to the quarry pond (pond 1) in the Phase II expansion area.

I was not able to confirm or evaluate the effects of quarrying on the mitigation properties or watershed.

## MITIGATION EVALUATION

The following section identifies additions and changes to the proposed mitigation program. The recommendations are intended to protect and, when possible, enhance the biodiversity and habitats of the Potrero Hills.

Proposed mitigation for the landfill expansion is presented in three documents: Section 4 in the Project EIR, the MMP, and the revised Grassland Management Plan. Before presenting comments on the individual documents, I’ll step back to the landscape level and address overarching concerns. This discussion is followed with a table detailing specific concerns and recommendations for each document. Recommendations that relate to more than one document have been placed at the end of this section (see “Grassland Management Plan Recommendations,” “Conservation Easement Recommendations,” and “Debris Removal Recommendations”).

### Overarching Concerns

The overarching concerns describe Landfill expansion impacts that are not addressed, or are addressed inadequately, within the mitigation documents:

- **Project scale.** The project will permanently affect a large percentage of the secondary management area of Suisun Marsh.
- **Habitat fragmentation.** The project will result in long-term and potentially permanent habitat fragmentation of the secondary management area lands within the Potrero Hills by dividing large blocks of contiguous habitat into smaller pieces through development of the Landfill and ancillary construction.
- **Spring Branch Creek watershed mitigation.** The Landfill proposed mitigation outside the Spring Branch Creek watershed. There is no information provided to enable a reviewer to compare the benefits of the Hill Slough mitigation with mitigation within the Spring Branch Creek watershed.

- **Conservation easements.** The mitigation program does not ensure or require that the mitigation conservation easement holder has a track record for local easement stewardship.
- **Power plant location.** In 2006, I recommended the use of an alternative location for the power plant and sedimentation basin. This concern was addressed, and the power plant was relocated in 2007.

**Scale of Phase II Landfill Expansion and Its Effects on Adjacent Lands in the Secondary Management Area of the Marsh.** The project will encompass 13 percent of the 6,500 acres within the designated secondary management area of Suisun Marsh. As proposed, the landfill expansion will permanently change nearly a square mile (500+ acres) of the Potrero Hills by converting grassland-dominated valley habitat to disturbed soils and ruderal, weedy upland grasslands.

Currently, the Phase II expansion area is a diverse valley grassland habitat with an ephemeral creek and a large component of native grasses and forbs along with non-native grasses and weedy species, as described in the Project EIR. The plan, according to the Project EIR, is to allow the 179 acres of Phase II and 320 acres of Phase I to revegetate naturally to “ruderal vegetation” and “natural grasses.” At present, there is no plan or mitigation measures to address restoration of native or non-native annual grassland vegetation on the capped landfill cells.

The Project EIR (page 3-59) presents the following plan for restoration and revegetation of the landfill: “Final cover construction within the Pre-Subtitle D area began in 1996. Additional final cover was constructed in 1997, 1998, 2000, and 2001. The total area covered to date is about 18 acres (as of 2003). Thus the southwestern corner of the site is capped along with the lower slope.” The EIR also specifies that the final cover will consist of a 4-foot layer of soil composed of a 1-foot-thick vegetative soil layer, a 1-foot-thick low-permeability soil layer, and a 2-foot-thick soil foundation layer. Occasionally, the landfill proposes to till a layer of biosolids into the top layer.

Continuing on page 4.4-7, the plan states that “Covered landfill slopes are mulched or seeded to promote the growth of natural grasses. . . . Covered slopes will be allowed to grow natural grasses. To promote grass growth, these slopes initially will be mulched or seeded to control erosion of the landfill cover. After several years of grass growth, these areas will be plowed or back-bladed with a dozer to smooth minor erosion rills and promote more vigorous grass growth.” On page 4.4-10, “Soil amendments will be added to surface soils on completed landfill areas to support revegetation and reduce cracking from soil desiccation. Grazing on completed landfill areas will be controlled so that grass provides adequate erosion protection; grazing will be especially restricted in the first two years after revegetation to ensure that adequate vegetation growth is established.”

Ultimately, the vegetation of the capped landfills will determine the quality of the habitat and will affect “. . .the movement of native resident or migratory wildlife species, or impede the use of native wildlife nursery sites” (see significance criteria in the Project EIR on page 4.2-18). Whether the degree of such interference meets the significance criteria’s

wording of “interferes substantially” is difficult to analyze, but it seems appropriate that the landfill should seek to minimize such effects by conducting restoration to restore pre-project vegetation conditions to the extent possible.

During field surveys, I observed robust and diverse invasive weed populations on the 4-acre southwest corner of the Griffith property adjacent to the operating Phase I landfill. There, purple and yellow star thistle, artichoke thistle, prickly ox-tongue, and anise were thriving (species on the California Invasive Plant Pest Council’s [CIPPC’s] List A and B). This indicates that vigorous stands of invasive weeds are likely to establish on mitigation properties adjacent to the Phase II landfill without an active weed management program.

Over the next 40 years, without restoration and vegetation management on Phase I and II landfill areas, the ongoing weed seed influx onto mitigation lands from the landfill will degrade the adjacent mitigation grasslands. The likely effects will be to increase the non-native vegetation cover, including invasive weeds, along with a concomitant reduction of the native species component, leading to reduced habitat values for wildlife.

**Recommendations:** (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.

**Habitat Fragmentation and Habitat Loss.** 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.

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 plant and animals. The vertical development will permanently alter the topography of Spring Creek 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 protect all or a portion of the Eastern Valley, along with additional acreage from the Griffith Ranch, as part of the mitigation conservation easements.

**Spring Branch Creek Watershed Mitigation.** The Phase II Landfill expansion effectively eliminates the natural, remaining upper Spring Branch Creek watershed and permanently reconfigures the Spring Branch Creek valley. The footprint of Phase II utilizes most of the

remaining upper watershed and reshapes the valley, from 80 feet above MSL to a ridge with a proposed elevation of 335 feet above MSL; it moves the creek south into an engineered channel approximately 5,500 feet long (MMP, page 5) and just over 1 mile in length. Table A (MMP, page 7) identifies a total impact on 5,030 feet of waters (drainages A, B, C, and D). These changes will disrupt and impede watershed runoff and stream flow, alter the creek's water temperature, and have the potential to affect other water quality parameters.

The Landfill states that its proposed mitigation for the loss of Spring Branch Creek watershed meets and exceeds the U.S. Army Corps of Engineers mitigation requirements (MMP, pages 26 and 27 and Table F). Unfortunately, the mitigation is planned within the Hill Slough watershed, an entirely different type of wetland, and 2 miles away from the affected watershed. The Spring Branch watershed enters Suisun Marsh at First Mallard Slough and is identified as particularly important to native fish by Dr. Peter Moyle of UC Davis.

**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).

**Conservation Easement Stewardship.** 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. Recently, however, DFG has tended to refuse mitigation easements due to understaffing and reduced state funding.

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 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.

**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.

### **Specific Evaluation of the Mitigation Program Components**

**Mitigation Goals and Objectives.** My evaluation of the mitigation program for special-status plants, invertebrate habitat, sensitive habitats, grassland restoration and revegetation, wetland restoration, and the Grassland Management Plan is provided in Table 3-1.

**Table 3-1. Evaluation of Mitigation Measures Identified  
in Potrero Hills Landfill Phase II Project Documents**

Item	Page	Evaluation and Comments
<b>Environmental Impact Report 2003 (Project EIR)<sup>a</sup></b>		
Impact 4.2-1 Effects on Special-Status Plants	4.2-18	<p>The Project EIR states that no impacts to special-status plant species are anticipated because the San Joaquin spearscale was last seen on the site in 1998. However, this is a risky assertion. There is a strong likelihood that viable seeds of this species remain within the soil seed bank in this area. A web search for “soil seed bank longevity of <i>Atriplex</i>” indicates that some members of this genus do persist in the soil seed bank.</p> <p><b>Recommendation:</b> Continue monitoring for spearscale.</p>
Mitigation Measure 4.2-9 Effects on Sensitive Habitats	4.2-28	<p>“All wetland mitigation sites shall be located within southern Solano County between Potrero Hills and Jepson Prairie.”</p> <p>and</p> <p>“The County or other public resource agency shall hold the easement to ensure retention of this land in perpetuity.”</p> <p>Restricting the conservation easement grantee to the County or other public resource entity is contrary to established practice in the Bay Area and is unlikely to protect conservation values, based on research by Bay Area Open Space Council.</p> <p><b>Recommendation:</b> See “Conservation Easements” in the text.</p>
Impact 4.4-1 Increased Erosion Potential	4.4-16	<p>There is no reference to the types of vegetation and natural habitat being restored on the landfill. Restoration of the vegetation on top of the approximately 580 acres of capped landfill is not adequately addressed, along with restoration and revegetation of roads, berms, and other bare lands.</p> <p><b>Recommendation:</b> Prepare a detailed restoration and management plan for the capped landfills and other disturbed areas. Develop methods for successful restoration methods onsite as soon as possible.</p>
Impact 4.10-3 Visual Changes Associated with the Construction of Ancillary Facilities	4.10-17	<p>The earthen berm, constructed to minimize the impacts of four metal water storage tanks on the peak of the northern ridgeline, is to be “vegetated with non-native grasses to ensure that it visually blends with the surrounding vegetation.” Field surveys revealed that the surrounding vegetation is a mix of native and non-native grasses.</p> <p><b>Recommendation:</b> Revegetate the berm using the mix of species found at the site, native and non-native. If not carefully revegetated the upland habitat values will be degraded rather than “preserved and enhanced” as required in the Local Protection Program.</p>
4.11 Cultural Resources	4.11-1	<p>Removal of structures, recommended under grazing mitigation, is not precluded by any findings in this section.</p> <p><b>Recommendation:</b> See “Debris Removal” in the text.</p>
<b>Mitigation and Monitoring Plan 2006<sup>b</sup></b>		
3.3.1. Southern Hills Parcel	18	<p>Characterization of the vegetation is cursory. An extensive number of native and non-native species, annual and perennial, are found in this area. The areas around pond 7 are less diverse.</p>

**Table 3-1. Continued**

Item	Page	Evaluation and Comments
<b>Mitigation and Monitoring Plan 2006<sup>b</sup> (continued)</b>		
3.3.4. Griffith Ranch Parcel	25	In addition to the species named under “Vegetation,” there are numerous stands of creeping wild rye (a native perennial grass) found throughout the Griffith Ranch.
4.3.2 Seasonal Wetlands	32	<p>Preservation of seasonal wetlands will be accomplished on Southern Hills, Griffith Ranch, and Director’s Guild. Preservation can be further enhanced by creation of wetland pastures.</p> <p><b>Recommendation:</b> Implement the recommendations under “Grazing Management Recommendations” in the text, which specifies (1) creation of fenced and gated wetland pastures and additional water troughs to improve wetlands vegetation species and structure, and (2) to manage (not eliminate) livestock use to enhance seasonal wetlands.</p> <p><b>Note:</b> recommendation included in the 2007 Grassland Management Plan.</p>
4.3.2. Stream Channel	33	<p>The proposed reestablishment of connection between pools at the Director’s Guild site could encourage spread of invasive non-native species.</p> <p><b>Recommendation:</b> Ensure that weed populations (particularly <i>Lepidium</i>) are not spread through construction. Prior to connecting ponds, evaluate current weed populations and the likelihood of spread if pools are connected.</p>
4.6 Vegetation	40	<p>4.6.1 Southern Hills</p> <p>Use of stored topsoil is a good practice. However there is no research to support the long-term viability of species stored in the seed bank.</p> <p>4.6.2 Griffith Ranch and 4.6.3 Director’s Guild</p> <p>Use of onsite inoculums is a good practice.</p> <p><b>Recommendation:</b> For pool restoration, do not use commercially available seed from local sources because the goal is to preserve the biodiversity of these pools and the variation between pools.</p> <p>Due to the 1 to 4 decades involved in the landfill expansion, there is a time to conduct studies to determine the length of time various species remain viable in the soil seed bank.</p>
5.1 Performance Criteria	43	<p>Overall, this section is good; however, use of California Invasive Plant Pest Council (CIPPC) List A as the definitive list of invasive species is inadequate. Purple star thistle, (<i>Centaurea calcitrapa</i>), an invasive species that is prevalent throughout the mitigation properties and is the logo of the Solano County Weed Management Area Program, also must be controlled.</p> <p><b>Recommendation:</b> Use both CIPPC Lists A and B to define targeted species for weed control. This ensures the control of purple star thistle, which is common in the Potrero Hills.</p> <p><b>Note:</b> recommendation included in the 2007 Grazing Plan.</p>

**Table 3-1. Continued**

Item	Page	Evaluation and Comments
<b>Mitigation and Monitoring Plan 2006<sup>b</sup> (continued)</b>		
5.2 Monitoring	46	<p>The monitoring methods should be extended to grassland restoration of the capped landfill. Also, 50-meter belt transects would be appropriate for monitoring vegetation on more extensive sites such as grasslands.</p> <p><b>Note:</b> recommendation included in the 2007 Grassland Management Plan.</p>
6.1 Site Preparation	50	<p>6.1.2 Director’s Guild</p> <p>Due to the importance of the intact biodiversity of pools on this property, introduction or spread of invasive species is a serious threat. In June 2006, I found two populations of <i>Lepidium</i> on the Director’s Guild. Spreading this invasive weed will be deleterious to and thwart mitigation efforts. Extra care must be taken to avoid inadvertent spread of the seed and roots.</p> <p><b>Recommendation:</b> Require that all vehicles and equipment used on Director’s Guild for site preparation for enhancement and restoration work be washed to remove soil and seeds prior to working on this property.</p>
6.2 Planting and Seeding	53	<p>6.2.1 Southern Hills and Griffith Ranch</p> <p>Methodology is good overall.</p> <p><b>Recommendation:</b> No supplemental seed should be used for vernal pool species in order to preserve the biodiversity of these pools and genetic variation between pools.</p>
7.0 Management and Maintenance during Monitoring	55	<p>Overall goals and objectives are good; details are provided in the Grassland Management Plan, which is addressed later.</p> <p><b>Recommendation:</b> See “Grazing Management Recommendations” in the text.</p>
11.0 Long-Term Management	61	<p>11.2.2 Conservation Easements on Preserved Lands.</p> <p><b>Recommendation:</b> Extensive comments; see “Conservation Easement Recommendations” in the text.</p>

<sup>a</sup> EDAW 2003.

<sup>b</sup> LSA Associates 2006.

## **RECOMMENDATIONS FOR THE GRASSLAND MANAGEMENT PLAN**

In 2006, I reviewed and commented on the “Potrero Hills Mitigation Site Grazing Management Plan.” In 2007, the Landfill’s consultants provided a revised grazing plan “Potrero Hills Landfill Grassland Management Plan for Mitigation Areas (LSA Associates and ESP 2007).” The 2007 Grassland Management Plan was responsive to most of my comments and recommendations on the previous plan. The following review addresses the revised plan; Table 3-3 compares the 2006 Grazing Management Plan with the revised 2007 Grassland Management Plan, in terms of my comments.

Overall, the grasslands of the Potrero Hills mitigation properties are in good condition, based on the species mix and cover of native and non-native vegetation. The grasslands may superficially appear to support non-native annual species. In reality, they contain a variety of native species, including annual forbs, perennial grasses, and bulbs, along with a few woody shrubs (see the Project EIR, [Appendix B](#), Exhibit 1, plant species list).

The goals and objectives of both the 2006 Grazing Management Plan and the 2007 Grassland Management Plan are appropriate: to use livestock as a resource management tool to maintain and enhance biodiversity, to eliminate or minimize impacts associated with unrestricted year-long use by cattle, and to change the program to a seasonal operation. In fact, grazing on both the Director’s Guild and the Southern Hills is seasonal due to limited fresh water for livestock.

Currently, the livestock stocking numbers are appropriate. The three grazing lessees, whose properties adjoin the mitigation properties, manage their livestock at levels very close to those recommended in the Grassland Management Plan, summarized here in Table 3-2. In the table, the current grazing levels (in animal unit months [AUMs], see definition in table footnote) are compared to the recommended levels.

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.

**Table 3-2. Summary of Mitigation Parcels, Current and Proposed Grazing Levels, and Season of Use to Achieve 750 Residual Dry Matter in an Average Rainfall Year**

<b>Parcel</b>	<b>Acres: Mitigation Acres versus Parcel Acres</b>	<b>Lessee</b>	<b>Animal Type</b>	<b>Current AUM/ Acre</b>	<b>Proposed AUM/Acre, Number of Cow/Calves, and Season of Use</b>	<b>Comments</b>
Director's Guild	87 of 87	G. Tonnessen	Cow/calf	N/A	1.0 AUM/acre (ac), 32 pairs, 2 months, Jan–Mar	Create fresh water source per 2007 Grassland Management Plan.
Griffith Ranch	61.3 of 142.2	G. Tonnessen	Cow/calf	1.2	1.6 AUM/ac, 16 pairs, 3 months, Nov–Jan	Feasibility problems: Griffith is used for access to adjacent pastures.
Southern Hills and pond 5	428 + 18 = 446 of 446	E. Ahart	Cow/calf	1.5	1.0 AUM/ac, 156 pairs, 6 months, Dec–May	Per 2007 Grassland Management Plan: Improve livestock distribution with new water sources, new fences, and fenced wetland pastures.

AUM = animal unit month (the amount of forage required to support an animal unit [one cow/calf pair or five sheep] for 1 month).

Source: LSA Associates and ESP 2007.

**Table 3-3. Treatment of Pam Muick’s Recommendations on the 2006 Grazing Management Plan within the 2007 Grassland Management Plan**

<b>Topic</b>	<b>Recommendation</b>	<b>How and Where 2006 Recommendations Are Addressed in Revised 2007 Plan</b>	<b>Comment</b>
<b>Missing Items</b>			
	Restoration and management plan for capped landfill grasslands.	Not addressed in 2007 plan.	When will this be addressed in the permitting process?
<b>Enhancing Biodiversity</b>			
	Describe in detail the specific biodiversity management goals, what kind of vegetation to manage for and how biodiversity can be measured. Include targets, timelines, and monitoring methods.	Biodiversity targets goals on pp. 24–25; grazing goals and monitoring on pp. 10–12. Monitoring methods identified on pp. 24-25. Timeline commences after mitigation signoff.	Inconsistencies between 2006 and 2007 AUM tables noted and information conveyed to PHLF. Corrections made by R. Nichols. See email memo April 9, 2007, from R. Nichols to D. Airola and P. Muick.
	Separately fence and gate sensitive habitat areas, for example the wet meadow, to facilitate livestock management.	Figure 4 Range Improvements identifies specific new fence installation, old fence removal, and installation of new water troughs and lines.	
	Remove debris on parcels, such as buildings, spools of wire, and old equipment, as long as it is not being used as wildlife habitat.	Figure 4 (above) and in text on p. 23.	
<b>Local Knowledge and Livestock Management</b>			
	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.	
	Prior to implementing pasture improvements, such as water troughs and placing salt blocks, evaluate the presumed outcomes of these improvements and how they may positively or negatively affect the biodiversity goals.	This analysis will be addressed through the overall planning method and oversight of Resource Manager (RM).	

**Table 3-3. Continued**

<b>Topic</b>	<b>Recommendation</b>	<b>How and Where 2006 Recommendations Are Addressed in Revised 2007 Plan</b>	<b>Comment</b>
<b>Local Knowledge and Livestock Management (continued)</b>			
	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 ( <a href="#">Appendix A</a> ).	The appraisal method of lessee selection on p. 13 contains a confusing low bid analogy. Perhaps the confusion is a typographical error?
	Re-examine the recommendation to graze stocker calves because current lessees have cow and calf operations.	Recommendation to use stocker calves dropped. Horses and goats added to livestock types allowable.	
	Do not rely on grazing income as the sole funding source for restoration and management activities.	<p>On p.13, the plan proposes to hire an RM to oversee:</p> <ul style="list-style-type: none"> <li>▪ livestock grazing,</li> <li>▪ landfill trash removal,</li> <li>▪ data monitoring,</li> <li>▪ report writing,</li> <li>▪ mosquito control measures,</li> <li>▪ compliance with Sheriff's Department,</li> <li>▪ the volunteer restoration and education program</li> </ul> <p>Topics and timeline for the annual monitoring report, to be submitted by December 15 each year, are identified on p. 25.</p>	<p>(A) 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.</p> <p>B) Funding identified for RM is from grazing income and Mitigation Fund. <b>Are there other issues around PHLF allocation of Mitigation monies for this position?</b> Depending upon the answer, this may or may not provide sufficient de-linking of grazing income from restoration and management activities.</p> <p>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.</p>

**Table 3-3. Continued**

Topic	Recommendation	How and Where 2006 Recommendations Are Addressed in Revised 2007 Plan	Comment
<b>Local Knowledge and Livestock Management (continued)</b>			
			(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.
<b>Weeds and Invasive Species</b>			
	The goal of enhanced biodiversity should include monitoring and reduction of invasive weed populations, utilizing protocols consistent with Solano County Weed Management Area and California Invasive Plants Council guidelines.	Addressed in detail in Section 2.4 pp. 19–23 and Figure 5, Invasive Plant Species. The existing invasive species have been prioritized for management.  Revised plan addressed concerns regarding weeds introduced through supplemental feed on p. 18.	
	Weed monitoring and management should be an ongoing component of grazing management and not a one time or 1- to 3-year program.	Addressed above.	
<b>Director’s Guild</b>			
	Establish fresh water source for livestock.	Figure 4, Range Improvements, and in text.	
	Utilize livestock to ensure that the buildup of dead plant material (thatch) does not reduce or negatively affect native species.	Addressed in text on p. 15.	
	Incorporate grazing management practices and research findings from the Jepson Prairie Management Committee.	Partly addressed though reference on p. 10.	Use of Jepson Prairie Management Committee research findings proposed; no other connection described.

**Table 3-3. Continued**

<b>Topic</b>	<b>Recommendation</b>	<b>How and Where 2006 Recommendations Are Addressed in Revised 2007 Plan</b>	<b>Comment</b>
<b>Griffith Ranch</b>			
	Establish fresh water source for livestock.	Figure 4, Range Improvements, and in text.	
	Work with the neighbor, who is also the lessee, in developing pasture improvements.	Figure 4, Range Improvements, and in text.	Feasibility problem remains due to lessee using Griffith Ranch for access to other pastures.
<b>Southern Hills and Pond 5</b>			
	Fence the Southern Hills. The property does not have a fence along much of its northern and southern borders; this makes it difficult to effectively manage livestock grazing.	Figure 4, Range Improvements, and in text.	
	Establish additional fresh water sources (troughs on concrete and rock pads) in the western part of the Southern Hills.	Figure 4, Range Improvements, and in text.	
	Establish wetland pastures (with fences and gates) to reduce the extensive areas of bare and churned earth around stock ponds, wet meadows and other areas of seasonal water, including the areas in the northwestern corner of the parcel.	Figure 4, Range Improvements, and in text.	

## RECOMMENDATIONS FOR CONSERVATION EASEMENTS FOR MITIGATION LANDS

This analysis addresses concerns raised by Project EIR Section 4.2-9, “Effects on Sensitive Habitats,” and MMP Section 11.2, “Conservation Easements on Preserved Lands.”

### General Recommendations Regarding Easements

**Easement Holder.** The Project EIR and the MMP propose assigning the conservation easements to the County, DFG, Wildlife Conservation Board, or other public resource agency. DFG holds title to lands adjacent to the Director’s Guild in Hill Slough within the Suisun Marsh (see Table 3-1 in Appendix 3). Recently, however, DFG has tended to refuse mitigation easements due to understaffing and reduced state funding.

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 professional experience with conservation easements in Solano County, along with findings of this report, underpins the recommendation to assign the conservation easements to Solano Land Trust for Landfill mitigation. The Trust has a staffed easement stewardship program and a good track record of monitoring and enforcing its conservation easements. In addition, the Trust owns and manages nearby and similar lands such as Rush Ranch and Jepson Prairie.

On July 31, 2006, I met with Solano Land Trust staff, Rob Goldstein (Mitigation Coordinator) and Wendy Low (Land Transaction Specialist), to learn about the Trust’s conservation and mitigation easement program and process. To initiate the process, the Trust requires a completed application available online, and a \$1,000 screening fee to cover staff time. The staff screens the conservation easement application, which is then forwarded to the Board’s Mitigation Committee. If approved, the easement is evaluated further by staff and an appropriate endowment is calculated. The final conservation easement is brought to the Trust’s Board for approval. A conservation easement can be completed within 6 months to 2 years. Trust staff told me that they are able to process easements in a timely manner.

**Easement Provisions.** Existing rights and restrictions on each mitigation property must be clarified through a comprehensive title search. In some cases, the following rights and restrictions may have been granted previously and could compromise mitigation values. These rights and restrictions, most of which were listed on title searches of Landfill lands include:

- Energy /power generation facilities (wind, solar, and other);
- Oil, gas, and other hydrocarbons and mineral exploration, production, and transportation;

- Rights of pedestrians, vehicles, and livestock to ingress and egress on and across existing private roads;
- Use of sedimentation ponds for recreation and watering livestock;
- Rights to water for livestock;
- Other water uses;
- Quarries (several are permitted within the Potrero Hills; see discussion under “Cumulative Effects”);
- Grazing rights;
- Hunting rights; and
- Disposal of compost, biosolids, and clean fill, including berms for viewshed protection.

To maintain the long-term viability of mitigation lands, conservation easements should prohibit all uses that would compromise mitigation values, including, but not limited to:

- Energy /power generation facilities (windmills, turbines, solar arrays, and other power-generating facilities);
- Oil, gas, and other hydrocarbons and mineral exploration, production and transportation;
- Construction of sedimentation ponds;
- Removing water from the property or using it for non-wildlife purposes;
- Use or construction of quarries;
- Disposal of compost, biosolids, and clean fill, including berms for viewshed protection; and
- Development and construction of buildings and structures.

### **Parcel-Specific Easement Recommendations**

The project proponents plan to put conservation easements on the three mitigation parcels. The following issues specific to individual properties were identified during the course of this consultation:

#### **Director’s Guild**

In addition to the usual mitigation easement issues, the conservation easement for Director’s Guild should address the following issues:

- Limitation on any widening or creation of roads through this area;

- Ensuring that any linkages or increase of tidal flow through the east-west ditch is studied and evaluated to ensure that ecological values are not diminished;
- Weed control;
- Linking management decisions on Director's Guild with the Jepson Prairie Management Committee, which could serve as an overseer and/or source of management guidance;
- Management of wetland mitigations; and
- Use by grazing lessee.

### **Griffith Ranch**

In addition to the usual mitigation easement issues, the conservation easement for Griffith Ranch, should address the following issues:

- Limitation on any widening or creation of roads through this area,
- Weed control,
- Management of wetland mitigations, and
- Use by grazing lessee for access to adjoining lands.

### **Southern Hills and Pond 5**

In addition to the usual mitigation easement issues, the conservation easement for Southern Hills should address the following issues:

- Limitation on any widening or creation of roads through this area;
- Access limitations on existing private roads;
- Potential conflicts with the existing 80-acre easement;
- Potential conflicts with approved quarry operations; and
- For pond 5, separate the 18.1 acres encompassing pond 5 from its current parcel (APN 0046-120-4500) to stand alone or to append to the Southern Hills parcel, per legal advice and county zoning.

## **RECOMMENDATIONS ON DEBRIS REMOVAL**

### **General Recommendations**

Mitigation parcels should be enhanced by cleaning up the large structures and litter (pipes, fencing, old appliances, and old farm equipment) and other debris currently found on the

properties. Section 4.11 “Cultural Resources,” in the Project EIR states that none of the existing agricultural structures have historical significance. Therefore, removal of structures, which is generally recommended under grazing mitigation, is not precluded by any findings in this section.

### **Parcel-Specific Recommendations**

Incorporate the following debris removal recommendations into mitigation plans, unless wildlife values indicate otherwise.

#### **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.