

Non-native Grassland

Non-native grassland is typically composed of a dense cover of annual grasses and forbs (broad-leaved plants) adapted to colonizing and persisting in disturbed upland areas.

Non-native grasslands occur both on the flat open fields as well as the ridges and hillsides of the property. Dominance of grass species observed during the August survey was split between equal parts of medusa head (*Taeniatherum caput-medusae*) and wild oats (*Avena fatua*). The most characteristic element of the flat open grasslands in summer are two invasive exotic plants, yellow star thistle (*Centaurea solstitialis*) and purple star thistle (*Centaurea calcitrapa*), both on the California Exotic Pest Plant Council (CalEPPC) list of exotic pest plants (1999). These species dominate the late summer flora on most of the flatter pasture areas. Other grasses observed include Italian wildrye (*Lolium multiflorum*), ripgut brome (*Bromus diandrus*), and soft chess (*B. hordeaceus*). Native and non-native forbs identifiable during the August surveys included milk thistle (*Silybum marianum*), rose clover (*Trifolium hirtum*), vetch (*Vicia* sp.), fluellin (*Kickxia spuria*), field bindweed (*Convolvulus arvensis*), fiddle dock (*Rumex pulcher*), wild radish (*Raphanus sativus*), wild teasel (*Dispacus sativus*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), slender madia (*Madia gracillis*), and hayfield tarweed (*Hemizonia congesta*). The hillside grassland areas contain non-native grasses and ruderal species similar to those found on the flat portion of the site, but the hills are less diverse in species composition.

No extensive native grasslands were identified during the August site visit. One small stand of creeping wildrye (*Leymus triticoides*) was found in association with a ditch near the unnamed creek.

Oak Woodland/Savanna

Oak woodland/savanna are the predominant plant communities on the ridges and sheltered hillsides of the Lagoon Valley property. Valley oak (*Quercus lobata*) and California buckeye (*Aesculus californica*) are the dominant species, and are present in varying densities throughout the woodland/savanna. They both grow within the non-native grassland habitat at lower densities. The shrub understory is sparse, most likely the result of past and ongoing grazing, but stands of poison oak (*Toxicodendron diversilobum*) occur in higher elevation areas of the property. The grasses that dominate the herbaceous understory, such as wild oats and medusa head are the same ones that constitute the dominants of the non-native grasslands community. Other herbs observed in low occurrence in the ridge/hillside oak community during the site visit include clover (*Trifolium* sp.), mule's ears (*Wyethia angustifolia*), yarrow (*Achillea millefolium*), yellow star thistle, bellardia (*Bellardia trixago*), chicory (*Cichorium intybus*), and Italian thistle. Yellow star thistle and Italian thistle occur in clusters on the ridges.

Other herbaceous plants are present at the site but were not identified due to the time of year of the site visit. Spring surveys of the property would locate plants that bloom earlier in the season.

Riparian Woodland

The Lagoon Valley site contains both dry riparian and wet riparian woodland habitat. The dry riparian woodland follows the seasonal, northwest-flowing, unnamed creek located in the southeast portion of the project site. The wet riparian woodland is associated with Lagoon Lake Creek west of Lagoon Valley Road, as well as in the ditches north and south of Lagoon Valley Road in the central area of the property.

The tree composition found along the unnamed creek includes valley oak, English and California black walnut (*Juglans regia*, *J. californica* var. *hindsii*), almond (*Prunus dulcis*), edible fig (*Ficus carica*), cherry plum (*Prunus cerasifera*), and willow (*Salix* sp.). California black walnut is used extensively as a rootstock for grafted English walnuts. This association is evident in the on-site orchards. The seed source of California black walnuts present at Lagoon Valley appear to have come from the basal root sprouts of the orchard trees. Herbs and shrub species growing along the unnamed creek channel include English ivy (*Hedera helix*), Himalayan blackberry (*Rubus discolor*), rabbit's foot grass (*Polypogon monspeliensis*), fennel (*Foeniculum vulgare*), prickly ox-tongue (*Picris echioides*), subterranean clover (*Trifolium subterraneum*), toyon (*Heteromeles arbutifolia*), oleander (*Nerium oleander*), western ragweed (*Ambrosia psilostachya*), mugwort (*Artemisia douglasiana*), and prickly lettuce (*Lactuca serriola*).

Trees found along the riparian section of Lagoon Lake Creek as well as the ditches north and south of Lagoon Valley Road include Fremont's cottonwood (*Populus fremontii* ssp. *fremontii*), interior live oak (*Quercus wislizenii*), valley oak, willows, and naturalized California black walnuts. The herb and shrub species present along these features include some of the same plants listed for the unnamed creek, with the addition of alkali bullrush (*Scirpus robustus*), tule (*Scirpus acutus* var. *occidentalis*), saltgrass (*Distichlis spicata*), broad-leaved cattail (*Typha latifolia*), spikerush (*Eleocharis macrostachya*), pennyroyal (*Mentha pulegium*), pyracantha (*Pyracantha angustifolia*), and pampas grass (*Cortaderia selloana*) (another CalEPPC list plant).

Emergent Wetland (Hydrophytic Vegetation)

Wetland vegetation occurs in areas where soils remain ponded and/or saturated for an extended period of time. Such soils support plant species that are adapted to various degrees of anaerobicity (oxygen-depleted soils).

Emergent hydrophytes occur in several places throughout the site. The Lagoon Lake Creek channel ranges from an average of 3 to 7 feet in width, is almost a mile in length (approximately 4,800 feet), and includes a mosaic of freshwater vegetation. This vegetation includes broad-leaved cattail, hyssop loostripe (*Lythrum hyssopifolia*), rabbit's foot grass, pennyroyal, toad rush (*Juncus bufonius*), spike rush, tall manna grass (*Glyceria elata*), and tule. Patches of narrow-leaved cattail (*Typha angustifolia*), and occasionally umbrella sedge (*Cyperus eragrostis*), are also present among the cattails in the channel. Plant species bordering the wet channel bed are typical of the species in the transitional zone between wetland and upland conditions. These species include hairy willow-herb (*Epilobium ciliatum*), fireweed (*E. angustifolia*), bird's-foot trefoil (*Lotus corniculatus*), scarlet

pimpernel (*Anagallis arvensis*), bristly ox-tongue, and curly dock (*Rumex crispus*). A drainage ditch adjacent to the Hines Nurseries contains similar wetland plants with the addition of brown head sedge (*Juncus phaeocephalis*), cocklebur (*Xanthium strumarium*), and lamb's quarters (*Chenopodium album*). An area of open water which is surrounded by perennial pepperweed (*Lepidium latifolium*), another CalEPPC list plant, occurs where Lagoon Lake Creek crosses under Lagoon Valley Road. A seasonal seep in the southeastern portion of the site contained mostly curly dock and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*).

Other Features

The project site has a long history of disturbance by ranching, agriculture, and other anthropogenic activities. The northern portion of the site contains a gliderport landing strip and associated buildings. Most of the ornamental vegetation on the site appears to be remnant landscape plantings associated with the abandoned buildings and foundations.

The vegetation associated with the old gliderport includes a grove of blue gum eucalyptus (*Eucalyptus globulus*), coyote brush (*Baccharis pilularis*), telegraph weed (*Heterotheca grandiflora*), narrow-leaf milkweed (*Asclepias fascicularis*), Peruvian pepper tree (*Schinus molle*), California fan palm (*Washingtonia filifera*), date palm (*Phoenix dactylifera*), Chinese tree of heaven (*Ailanthus altissima*), valley oak, oleander, deodar (*Cedrus deodora*), and periwinkle (*Vinca major*). The non-native grassland component is also present along the areas surrounding the old gliderport.

Abandoned buildings and orchards are located between the unnamed creek and Lagoon Valley Road in the southeastern area of the site. An abandoned house is the only location where California golden poppy (*Eschscholzia californica*) was found. The house area also has some ornamental plantings including deodar and pine trees (*Pinus* sp.). The main component of the orchards is grafted English walnuts, with California black walnut rootstocks.

WILDLIFE

Wildlife found on the Lagoon Valley property are species that inhabit the four plant communities present. Wildlife species observed during the reconnaissance survey are listed in Appendix B.

Grasslands . In California, many wildlife species are adapted to the conditions that occur in grassland areas. Most grassland areas are suffused with burrows as the result of the activity of California ground squirrels (*Citellus beecheyi*), Botta's pocket gophers (*Thomomys bottae*), California meadow voles (*Microtus californica*), and other rodents. Most grassland species use these burrows as escape cover from predators and as resting/nest sites. Several species of reptiles such as gopher snake (*Pituophis melanoleucus*) and western fence lizard (*Sceloporus occidentalis*) also use these burrows. Black-tailed jack rabbits (*Lepus californicus*) forage and rest in the grasslands. Numerous raptors such as red-tailed hawk (*Buteo jamaicensis*), white-tailed kite (*Elanus leucurus*), and American Kestrel (*Falco sparverius*), and carnivores like the coyote (*Canis latrans*) forage in grasslands

feeding on rodents and reptiles. Other birds commonly observed in grassland habitat include turkey vulture (*Cathartes aura*), American crow (*Corvus brachyrhynchos*), western meadowlark (*Sturnella neglecta*), red-winged blackbird (*Agelaius phoeniceus*), barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), western kingbird (*Tyrannus verticalis*), western bluebird (*Sialia mexicana*), rock dove (*Columba livia*), and ring-necked pheasant (*Phasianus colchicus*).

Woodlands . Woodland areas support wildlife species that require hiding cover, such as mule deer (*Odocoileus hemionus*), grey fox (*Urocyon cinereoargenteus*), mourning dove (*Zenaida macroura*), arboreal salamander (*Aneides lugubris*), and California slender salamander (*Batrachoseps attenuatus*). The trees in woodlands are also the home of other mammal species such as fox squirrel (*Sciurus niger*). Many bird species that use trees for nesting and feeding, such as Nuttall's woodpecker (*Picoides nuttallii*), acorn woodpecker (*Melanerpes formicivorus*), northern flicker (*Colaptes auratus*), great horned owl (*Bubo virginianus*), red-shouldered hawk (*Buteo lineatus*), northern mockingbird (*Mimus polyglottos*), oak titmouse (*Baeolophus inornatus*), lesser goldfinch (*Spinus psaltria*), and white-breasted nuthatch (*Sitta carolinensis*), also inhabit these woodland areas.

Creeks . Several species of fish, as well as aquatic invertebrates such as dragonfly larvae and water boatman (Corixidae) occur in the open freshwater habitats of the creek, drainages, and ditches. Other species, such as the western pond turtle (*Clemmys marmorata*), non-native red-eared slider (*Trachemys scripta*), painted turtle (*Chrysemys picta*), and waterfowl, like the mallard (*Anas platyrhynchos*), include the creek as part of their habitat. Pacific tree frogs (*Hyla regilla*), bullfrogs (*Rana catesbeiana*), and common garter snakes (*Thamnophis sirtalis*) live and hide near the creeks. Racoons (*Procyon lotor*) and wading birds hunt for fish, frogs, and invertebrates.

Other Features. In addition to these three main habitats, wildlife also inhabit the developed features of the project site such as the old sheds and barns, the orchards, and the stockpond located near the southern boundary of the site. The old sheds and barns could host roosting bats and barn owls (*Tyto alba*). White-wash, potentially made by a barn owl, was observed in one of the sheds in the southeastern corner of the site. The orchards, located south of the Hines Nurseries in the central portion of the project site, support several foraging birds including yellow-billed magpie (*Pica nuttalli*), western scrub-jay (*Aphelocoma californica*), Brewer's blackbird (*Euphagus cyanocephalus*), and European starling (*Sturnus vulgaris*). The stockpond area was inhabited by black phoebes (*Sayornis nigricans*) and California ground squirrels.

POTENTIALLY JURISDICTIONAL WETLANDS AND DRAINAGES

Streams and Drainages

Lagoon Lake Creek drains the southern part of Lagoon Valley. The creek flows in its natural channel until it reaches the Hines Nurseries, where it becomes channelized into two ditches that parallel the western edge of the nursery. The two ditches receive run-off from the Hines Nurseries and are artificially perennial. The upper tributaries of the creek are seasonal, except for one tributary that

carries run-off from a City-owned water tank. The ditches and the tributary that carries run-off from the water tank contain riparian or wetland vegetation, while the other tributaries do not.

An unnamed intermittent stream drains the southeastern end of Lagoon Valley. This stream flows along its original configuration until it reaches the Hines Nurseries, where it becomes channelized into the same two ditches. This stream is seasonal and contains trees and understory riparian vegetation.

Several other seasonal, intermittent or ephemeral tributaries drain the southern ridgeline and collectively flow into the two ditches and Lagoon Valley Lake. A seasonal stream with riparian vegetation is located on the southeastern boundary of the project site near Interstate-80. Additionally, drainage of the site has been assisted by other ditches that run along Interstate-80, the project site's roads, and the Hines Nurseries.

Seasonal Wetlands

Several seasonal wetlands in the field west of the Hines Nurseries are associated with the original route of Lagoon Lake Creek. Segments of the creek were apparently filled in the past, but some lower areas remain and pond during the winter. The ponding of these areas has led to the growth of freshwater wetland plants.

Seasonal seep areas with some wetland characteristics are scattered at the toe of slope along the southern edge of the project site. These areas are most likely saturated during the winter but dry out soon thereafter. The seasonal seep areas do not support plants that are strongly associated with wetlands.

A perennial stockpond is present in the southern hills was created by damming one of the tributaries.

Another perennial pond is located within the Hines Nursery and receives run-off from the nursery.

SPECIAL-STATUS SPECIES

Special-Status Plant Species

Table A lists nine special-status plant species known to occur in the general vicinity of the property and which could occur in some of the vegetation communities on the project site. The table also presents the status and habitat requirements of each species, and an evaluation of whether suitable habitat for the species or community is present. Six of these nine species could potentially occur within the project area. Of these six species, two are federally-listed as endangered, and one is of federal concern. All of these species are on the CNPS's List 1B, indicating that they are considered rare, threatened, or endangered in California or elsewhere. None of these species were observed during the August field visit. The six plant species are:

- C San Joaquin saltbrush (*Atriplex joaquiniana*, List 1B)

- C Big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*, List 1B)
- C Carquinez goldenbush (*Isocoma arguta*, List 1B)
- C Contra Costa goldfields (*Lasthenia conjugens*, FE/List 1B)
- C Showy Indian clover (*Trifolium amoenum*, FE/List 1B)
- C Saline clover (*Trifolium depauperatum* var. *hydrophilum*, List 1B)

Habitat for the other three species is not present within the project boundaries.

No special-status plants were observed during the reconnaissance survey, and it is unlikely any of the nine special-status plants will occur on the property. This area has experienced a long history of disturbance including construction of the lagoon and nursery, diversion of water courses, hay-farming, walnut and almond harvesting, and horse and cattle grazing. These disturbances have displaced or removed native plant cover over much of the site.

Table A: Special-Status Plant Species in the Vacaville Vicinity

| Species | Status* Fed/State/CNPS | Habitat Requirements | Potential for Occurrence in Project Area/ Comments |
|---|---------------------------|---|--|
| <i>Atriplex joaquiniana</i> San Joaquin saltbrush | -/List 1B | General: Chenopod scrub, alkali meadows, valley and foothill grasslands. Micro: In seasonal alkali wetlands or alkali sink scrub with <i>Distichlis spicata</i> , <i>Frankenia</i> , etc.. | Marginal habitat present, but plant highly unlikely to occur. Not observed during field surveys. Closest occurrence is from southeast shore of Lagoon Valley Lake at margin of lake bordering <i>Scirpus acutus</i> marsh. |
| <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> Big-scale balsamroot | -/List 1B | General: Valley and foothill grassland, cismontane woodland. Micro: Sometimes on serpentine | Potentially suitable habitat present, but plant not present and unlikely to occur due to poor site conditions. |
| <i>Brodiaea californica</i> var. <i>leptandra</i> Narrow-anthered California brodiaea | -/List 1B | General: Broad-leafed upland forest, chaparral, lower montane coniferous forest. Micro: 110-915M. | No suitable habitat present. Plant not present. |
| <i>Fritillaria pluriflora</i> Adobe-lily | -/List 1B | General: Chaparral, cismontain woodland, foothill grassland. Micro: Usually on clay soils; sometimes serpentine | No suitable habitat present. Plant not present. |
| <i>Hesperolinon breweri</i> Brewer's western flax | -/List 1B | General: Chaparral, cismontain woodland, foothill grassland. Known only from Contra Costa, Napa, and Solano Counties Micro: Often in rocky serpentine soil in serpentine chaparral and serpentine grassland. | No suitable habitat present. Plant not present. |
| <i>Isocoma arguta</i> Carquinez goldenbush | -/List 1B | General: Valley and foothill grassland. Known only from Contra Costa and Solano Counties. Micro: Alkaline soils, flats, lower hills. On low benches near drainages and tops and sides of mounds in swale habitat. 1-20M. | Potentially suitable habitat present, but plant not observed during field surveys. |

| Species | Status* Fed/State/CNPS | Habitat Requirements | Potential for Occurrence in Project Area/ Comments |
|---|---------------------------|--|---|
| <i>Lasthenia conjugens</i> Contra Costa goldfields | FE/-/List 1B | General: Valley and foothill grasslands, vernal pools, cismountain woodland. Extirpated from most of its range; extrem. endangered. Micro: Vernal pools, swales, low depressions, in open grassy areas. | Potentially suitable habitat present, but unlikely to occur due to poor site conditions. |
| <i>Trifolium amoenum</i> Showy Indian clover | FE/-/List 1B | General: Valley and foothill grassland, coastal bluff scrub. Micro: Sometimes on serpentine soil, open sunny sites, swales. Most recently sited on roadside and eroding cliff face. 5-560M. | Potentially suitable habitat present, but unlikely to occur due to poor site conditions. |
| <i>Trifolium depauperatum</i> var. <i>hydrophilum</i> Saline clover | FC/-/List 1B | General: Marshes and swamps, valley and foothill grassland, vernal pools. Micro: Mesic, alkaline sites 0-300M. | Marginal habitat present, but plant unlikely to occur, due to disturbance level at site. Closest record is from vicinity of existing lagoon on April 21, 1960. Site may now be inundated. |

*Status:

FE = federally-listed as endangered

List 1B = California Native Plant Society (CNPS): Plants rare, threatened or endangered in California and elsewhere

Special-Status Wildlife Species

Table B presents a total of 15 special-status wildlife species known from or considered to potentially occur in the Lagoon Valley project vicinity based on the habitat types present.

Suitable or marginal habitat is present on the Lagoon Valley property for some of these special-status wildlife species. Information regarding the potential for occurrence of valley elderberry longhorn beetle (*Desmocerus californicus dimorphs*), Swainson's hawk (*Buteo swainsoni*), western pond turtle (*Clemmys marmorata*), and California red-legged frog (*Rana aurora draytonii*) are discussed below. Additionally, white-tailed kite (*Elanus leucurus*), golden eagle (foraging) (*Aquila chrysaetos*), loggerhead shrike (*Lanius ludovicianus*), tricolored blackbird (*Agelaius tricolor*), and western burrowing owl (*Speotyto cunicularia hypugea*) could inhabit the site.

Due to the lack of suitable habitat, vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), California tiger salamander (*Ambystoma californiense*), and yellow-breasted chat (*Icteria virens*) are unlikely to occur within the project site. A search of the CNDDDB (2003) showed no records of these species in close proximity to Lagoon Valley.

Valley Elderberry Longhorn Beetle . The Lagoon Valley project site is located along the western edge of the valley elderberry longhorn beetle range. This beetle species is completely dependent on its elderberry host plant and will not be present unless elderberry grows at a specific location. One large elderberry shrub is present along Lagoon Valley road adjacent to the southeast corner of the nursery. This shrub contained holes in the wood which may have been exit holes created by this species. Valley elderberry longhorn beetles may occur on the project site.

Swainson's Hawk . Swainson's hawks could potentially nest in the riparian and oak woodlands at Lagoon Valley. Thirteen Swainson's hawk nests have been recorded within the projected urban boundaries of Vacaville, with the closest nests occurring near the Nut Tree / Pine Tree Creek, approximately 4.5 miles from Lagoon Valley, and in the Cypress Lakes Golf Course (Travis Air Force Base) off Meridian Road, approximately 5 miles from Lagoon Valley (CNDDDB 2003). We observed an adult Swainson's hawk soaring over the project site on August 5, 2003. Swainson's hawks will forage in grasslands, riparian woodlands, and agricultural fields in search of toads, crayfish, insects, birds, voles, pocket gophers, deer mice, and other small mammals (Woodbridge 1998). The breeding season for Swainson's hawks begins in late March and ends in August, with young usually fledging by July.

Western Pond Turtle. Western pond turtles inhabit slow moving shallow streams with emergent vegetation, rivers, lakes, and ponds. Pond turtles are present in the adjacent Lagoon Valley Lake area, at the bypass channel west of the lake and at the small pond in the southeastern edge of the lake (LSA 1999). The creek and ditches on the project site provide suitable migration and possibly upland nesting habitat for pond turtles. The western pond turtle is likely to occur on the Lagoon Valley project site.

California Red-Legged Frog. No recent or historical records of California red-legged frogs in the Lagoon Valley area are known to exist and there are no records from within five miles of the project site. The closest verified records of red-legged frogs are from: along McGary Road just west of the Lynch Road intersection, Solano County, July 31, 2000, about 13 miles west of the site, considered

Table B: Special-Status Wildlife Species in the Vacaville Vicinity

| Species | Status State/Fed | Habitat Requirements | Suitable Habitat on Site |
|--|------------------|---|---|
| <i>Desmocerus californicus dimorphs</i> Valley elderberry longhorn beetle | FT/-- | Riparian areas in the Sacramento and San Joaquin Valleys where elderberry host plant occurs | One large elderberry shrub with exit holes observed. |
| <i>Branchinecta lynchi</i> Vernal pool fairy shrimp | FT/-- | Seasonal ponds and vernal pools | No suitable seasonal or vernal pools present on-site. |
| <i>Lepidurus packardii</i> Vernal pool tadpole shrimp | FE/-- | Vernal pools and swales in the Sacramento Valley in clear to highly turbid water | No suitable seasonal or vernal pools present on-site. |
| <i>Ambystoma californiense</i> California tiger salamander | FP/CSC | Vernal pools, stockponds and adjacent grasslands | No suitable seasonal or vernal pools present on-site. |
| <i>Rana aurora draytonii</i> California red-legged frog | FT/CSC | Ponds and streams | None observed during surveys at adjacent Lagoon Valley Lake. No known records within close proximity of site. |
| <i>Clemmys marmorata</i> Western pond turtle | CSC | Ponds and streams | Known to occur in creeks and ditches within project area. |
| <i>Aquila chrysaetos</i> Golden eagle | --/CSC | Large trees for nesting; open grassland and woodland for foraging | No suitable nesting habitat on site, foraging habitat present. |
| <i>Elanus leucurus</i> (nesting) White-tailed kite | CFP/-- | Open grasslands, meadows, or marshes for foraging. Isolated, dense-topped trees for nesting and perching | Could potentially nest in riparian woodland within the site. Species observed foraging on site. |
| <i>Buteo swainsoni</i> Swainson's hawk | ST | Breeds in riparian areas and oak savanna. Requires adjacent grasslands or cultivated fields with rodent-prey source | Could potentially nest in riparian and oak woodland on site. Observed soaring over site. |

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|--|--------|---|--|
| <i>Accipiter striatus</i> (nesting) Sharp-shinned Hawk | --/CSC | Nests in trees in woodlands, forages over a variety of habitats | No suitable nesting habitat on site. |
| <i>Accipter cooperi</i> (nesting) Cooper's Hawk | --/CSC | Nests in dense woodlands and forests, forages in same | No suitable nesting habitat on site. |
| <i>Lanius ludovicianus</i> Loggerhead shrike | --/CSC | Open country for foraging; dense shrubs for nesting | Could potentially nest in riparian and oak woodland on site. |
| <i>Speotyto cunicularia hypugea</i> Western burrowing owl | --/CSC | Grassland/pastureland; nest in ground squirrel dens | Could potentially occupy California ground squirrel burrows on site. |
| <i>Agelaius tricolor</i> (nesting) Tricolored blackbird | --/CSC | Grasslands and marshes | No suitable nesting habitat on-site. |
| <i>Icteria virens</i> Yellow-breasted chat | --/CSC | Riparian thickets, brush tangles near water | No suitable dense riparian habitat present. |

Status*

FE = federally listed as endangered

FT = federally listed as threatened

FP = Federal proposed for listing

SE = California State listed as endangered

ST = California State listed as threatened

BEGPA = Bald and Golden Eagle Protection Act

CSC = California species of special concern

CFP = California fully protected

part of the American Canyon population and; Wragg Canyon Creek where it intersects Highway 128 in Napa County, spring 1983, just over 10 miles north of the site (Muth, pers. comm., CNDDB 2003). LSA conducted surveys for California red-legged frogs at the Lagoon Valley Lagoon Lake watershed in February 2001 and concluded that the frogs were absent from the site (LSA 2001a). The U.S. Fish and Wildlife Service expressed no concerns or comments in response to these findings (LSA 2001b). California red-legged frogs are not likely to occur on the Lagoon Valley project site.

Other Special-Status Species. The trees and taller shrubs on the Lagoon Valley project site provide suitable nesting locations for loggerhead shrike, white-tailed kite, red-tailed hawk, red-shouldered hawk, and other species of raptors. One potential raptor nest was observed in the riparian woodlands during the reconnaissance level survey and others may be present. One or more raptor species, which could include a special-status species, are likely to nest in wooded areas on the Lagoon Valley project site.

Western burrowing owls nest in ground squirrel burrows and other burrow sites, such as small culverts and pipes. Ground squirrel burrows were observed in the orchards, near one of the barns, and near the stockpond.

PLANNING CONSIDERATIONS AND RECOMMENDATIONS

The proposed Lagoon Valley project will develop the valley floor and lower portions of the adjacent hillsides.

Based on LSA's assessment of the natural resources on the Lagoon Valley property, the following is necessary to provide sufficient information to thoroughly address natural resource issues.

- C Conduct spring rare plant surveys to determine whether spring blooming rare plant species are present.
- C Conduct raptor nesting surveys to determine if Swainson's hawk nest on the property and to identify nest locations of other raptor species
- C Conduct a survey for the presence of the valley elderberry longhorn beetle and map the location of all elderberry shrubs on the property.

WETLANDS AND OTHER WATERS OF THE U.S.; WATERS OF THE STATE

Evaluation of the conceptual site plan (Triad, 2002) indicates that the design will result in the fill of jurisdictional areas including small seasonal wetlands which are present and riparian zones. The riparian areas include the upper portion of Lagoon Lake Creek, and portions of an unnamed creek, both located south of Lagoon Valley Road. Due to the presence of significant riparian habitat along Lagoon Lake Creek and the unnamed creek, fill of these creeks should be avoided. The project as proposed will also result in the fill of several small seasonal wetlands. The fill of any of these areas will require obtaining a permit from the U.S. Army Corps of Engineers. The type of permit will depend on the amount and type of jurisdictional fill. As currently proposed an Individual permit would be necessary due to the total amount of fill (over ½ acre) and the length of drainages which would be filled (over 300 lineal feet). In addition, the Regional Water Quality Control Board will need to issue water quality certification under Section 401 of the Clean Water Act for jurisdictional fills. The fill or modification of drainages on the site will also require obtaining a Streambed Alteration Agreement from the Department of Fish and Game.

All of these agencies will require mitigation for the loss or modification of jurisdictional area. This will require preparation of a mitigation plan which addresses the types of loss which will occur, the amount, type and location of mitigation and how these areas will be maintained and monitored.

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PERSONAL COMMUNICATIONS

David Muth, LSA Associates, Inc., staff herpetologist.

APPENDIX A
PLANT SPECIES OBSERVED AT LAGOON VALLEY

Appendix A: Plant Species Observed at Lagoon Valley

Yarrow (*Achillea millefolium*)
California buckeye (*Aesculus californica*)
Chinese tree of heaven (*Ailanthus altissima*)
Western ragweed (*Ambrosia psilostachya*)
Scarlet pimpernel (*Anagallis arvensis*)
Mugwort (*Artemisia douglasiana*)
Narrow-leaf milkweed (*Asclepias fascicularis*)
Wild oats (*Avena fatua*)

Coyote brush (*Baccharis pilularis*)
Bellardia (*Bellardia trixago*)
Ripgut brome (*Bromus diandrus*)
Soft chess (*Bromus hordeaceus*)

Lamb's quarters (*Chenopodium album*)
Umbrella sedge (*Cyperus eragrostis*)
Deodar (*Cedrus deodora*)
Purple starthistle (*Centaurea calcitrapa*)
Field bindweed (*Convolvulus arvensis*)
Italian thistle (*Carduus pycnocephalus*)
Yellow star thistle (*Centaurea solstitialis*)
Chicory (*Cichorium intybus*)
Bull thistle (*Cirsium vulgare*)
Pampas grass (*Cortaderia selloana*)

Teasel (*Dispacus sativus*)
Saltgrass (*Distichlis spicata*)

Spikerush (*Eleocharis macrostachya*)
Blue wild rye (*Elymus glaucus*)
Fireweed (*Epilobium angustifolia*)
Hairy willow-herb (*Epilobium ciliatum*)
California golden poppy (*Eschscholzia californica*)
Blue gum eucalyptus (*Eucalyptus globulus*)

Edible fig (*Ficus carica*)
Fennel (*Foeniculum vulgare*)

Tall manna grass (*Glyceria elata*)

English ivy (*Hedera helix*)
Hayfield tarweed (*Hemizonia congesta*)

Toyon (*Heteromeles arbutifolia*)
Telegraph weed (*Heterotheca grandiflora*)
Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*).
Toad rush (*Juncus bufonius*)
Brown head sedge (*Juncus phaeocephais*)
California black walnut (*Juglans californica* var. *hindsii*)
English walnut (*Juglans regia*)

Fluellin (*Kickxia spuria*)

Prickly lettuce (*Lactuca serriola*).
Perennial pepperweed (*Lepidium latifolium*)
Creeping wildrye (*Leymus triticoides*)
Bird's foot trefoil (*Lotus corniculatus*)
Italian wildrye (*Lolium multiflorum*)
Hyssop loostrife (*Lythrum hyssopifolia*)

Slender madia (*Madia gracillis*)
Pennyroyal (*Mentha pulegium*)

Purple needlegrass (*Nassella pulchra*)
Oleander (*Nerium oleander*)

Date palm (*Phoenix dactylifera*)
Prickly ox-tongue (*Picris echioides*)
Pine (*Pinus* sp.)
Rabbit's foot grass (*Polypogon monspeliensis*)
Fremont's cottonwood (*Populus fremontii* ssp. *fremontii*)
Cherry plum (*Prunus cerasifera*)
Almond (*Prunus dulcis*)
Pyracantha (*Pyracantha angustifolia*)

Valley oak (*Quercus lobata*)
Interior live oak (*Quercus wislizenii*)

Himalayan blackberry (*Rubus discolor*)
Curly dock (*Rumex pulcher*)
Fiddle dock (*Rumex pulcher*)
Wild radish (*Raphanus sativus*)

Willow (*Salix* sp.)
Blue Elderberry (*Sambucus mexicana*)
Peruvian pepper tree (*Schinus molle*)
Tule (*Scirpus acutus* var. *occidentalis*)

Alkali bullrush (*Scirpus robustus*)
Milk thistle (*Silybum marianum*)

Medusa head (*Taeniatherum caput-medusae*)
Poison oak (*Toxicodendron diversilobum*)
Rose clover (*Trifolium hirtum*)
Clover (*Trifolium* sp.)
Subterranean clover (*Trifolium subterraneum*)
Narrow-leaved cattail (*Typha angustifolia*)
Broad-leaved cattail (*Typha latifolia*)

Vetch (*Vicia* sp.)
Periwinkle (*Vinca major*)

California fan palm (*Washingtonia filifera*)
Mule's ears (*Wyethia angustifolia*)

Cocklebur (*Xanthium strumarium*)

APPENDIX B
WILDLIFE SPECIES OBSERVED AT LAGOON VALLEY

Appendix B: Wildlife Species Observed at Lagoon ValleyST = California State listed as threatened
CFP = California fully protected**Species**

California ground squirrel (*Citellus beecheyi*)
 California meadow vole (*Microtus californica*)
 black-tailed jack rabbit (*Lepus californicus*)
 mule deer (*Odocoileus hemionus*)
 Botta's pocket gopher (*Thomomys bottae*)

Status

red-tailed hawk (*Buteo jamaicensis*)
 Swainson's hawk (*Buteo swainsoni*)
 red-shouldered hawk (*Buteo lineatus*)
 white-tailed kite (*Elanus leucurus*)
 American Kestrel (*Falco sparverius*)
 great horned owl (*Bubo virginianus*)
 turkey vulture (*Cathartes aura*)
 American crow (*Corvus brachyrhynchos*)
 yellow-billed magpie (*Pica nuttalli*)
 western scrub-jay (*Aphelocoma californica*)
 barn swallow (*Hirundo rustica*)
 cliff swallow (*Petrochelidon pyrrhonota*)
 western kingbird (*Tyrannus verticalis*)
 western bluebird (*Sialia mexicana*)
 mourning dove (*Zenaida macroura*)
 Nuttall's woodpecker (*Picoides nuttallii*)
 acorn woodpecker (*Melanerpes formicivorus*)
 northern flicker (*Colaptes auratus*)
 killdeer (*Charadrius vociferus*)
 western meadowlark (*Sturnella neglecta*)
 northern mockingbird (*Mimus polyglottos*)
 oak titmouse (*Baeolophus inornatus*)
 lesser goldfinch (*Spinus psaltria*)
 black phoebe (*Sayornis nigricans*)
 white-breasted nuthatch (*Sitta carolinensis*)
 red-winged blackbird (*Agelaius phoeniceus*)
 Brewer's blackbird (*Euphagus cyanocephalus*)
 European starling (*Sturnus vulgaris*)
 rock dove (*Columba livia*)
 ring-necked pheasant (*Phasianus colchicus*)
 barn owl (*Tyto alba*)

ST

CFP

Status*

LSA ASSOCIATES, INC. BIOLOGICAL RESOURCES

SEPTEMBER 2003 LAGOON VALLEY PROPERTY

SOLANO COUNTY

Possible white wash observed in a shed

TECHNICAL APPENDIX O

Delineation of Waters of the United States
on the Lagoon Valley Residential/Commercial Project Site

DELINEATION OF WATERS OF THE
UNITED STATES

ON THE
LAGOON VALLEY RESIDENTIAL/COMMERCIAL
PROJECT SITE

SOLANO COUNTY, CALIFORNIA

LSA

October 7, 2003

DELINEATION OF WATERS OF THE
UNITED STATES

ON THE
LAGOON VALLEY RESIDENTIAL/COMMERCIAL
PROJECT SITE

SOLANO COUNTY, CALIFORNIA

LSA

October 7, 2003

DELINEATION OF WATERS OF THE
UNITED STATES

ON THE
LAGOON VALLEY RESIDENTIAL/COMMERCIAL
PROJECT SITE

SOLANO COUNTY, CALIFORNIA

Submitted to:

Triad Development, Inc.
c/o Fred Grimm
2801 Alaskan Way, Suite 107
Seattle, WA 98121

Prepared by:

LSA Associates, Inc.
157 Park Place
Pt. Richmond, CA 94801
(510) 236-6810

LSA Project No. TRI 330

LSA

October 7, 2003

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INTRODUCTION

This report presents the results of a delineation of the potential extent of waters of the United States, including wetlands, on the Lagoon Valley Residential/Commercial Project Site in the City of Vacaville, Solano County, California. Waters of the United States are subject to U. S. Army Corps of Engineers (Corps) regulation under Section 404 of the Clean Water Act (CWA). The data and conclusions of this report are subject to confirmation by Corps staff.

This report was prepared by LSA Associates Inc. (LSA) for Triad Development, Inc.

PROJECT SITE DESCRIPTION

The project site encompasses approximately 900 acres located in Lagoon Valley along the eastern edge of Interstate Highway 80. The site includes parcels situated both north and south of Lagoon Valley Road in the City of Vacaville. The site is within T5N and T6N, R1W, on the Fairfield North, California and the Elmira, California 7½-minute series U.S.G.S. quadrangles (see Figures 1 and 2).

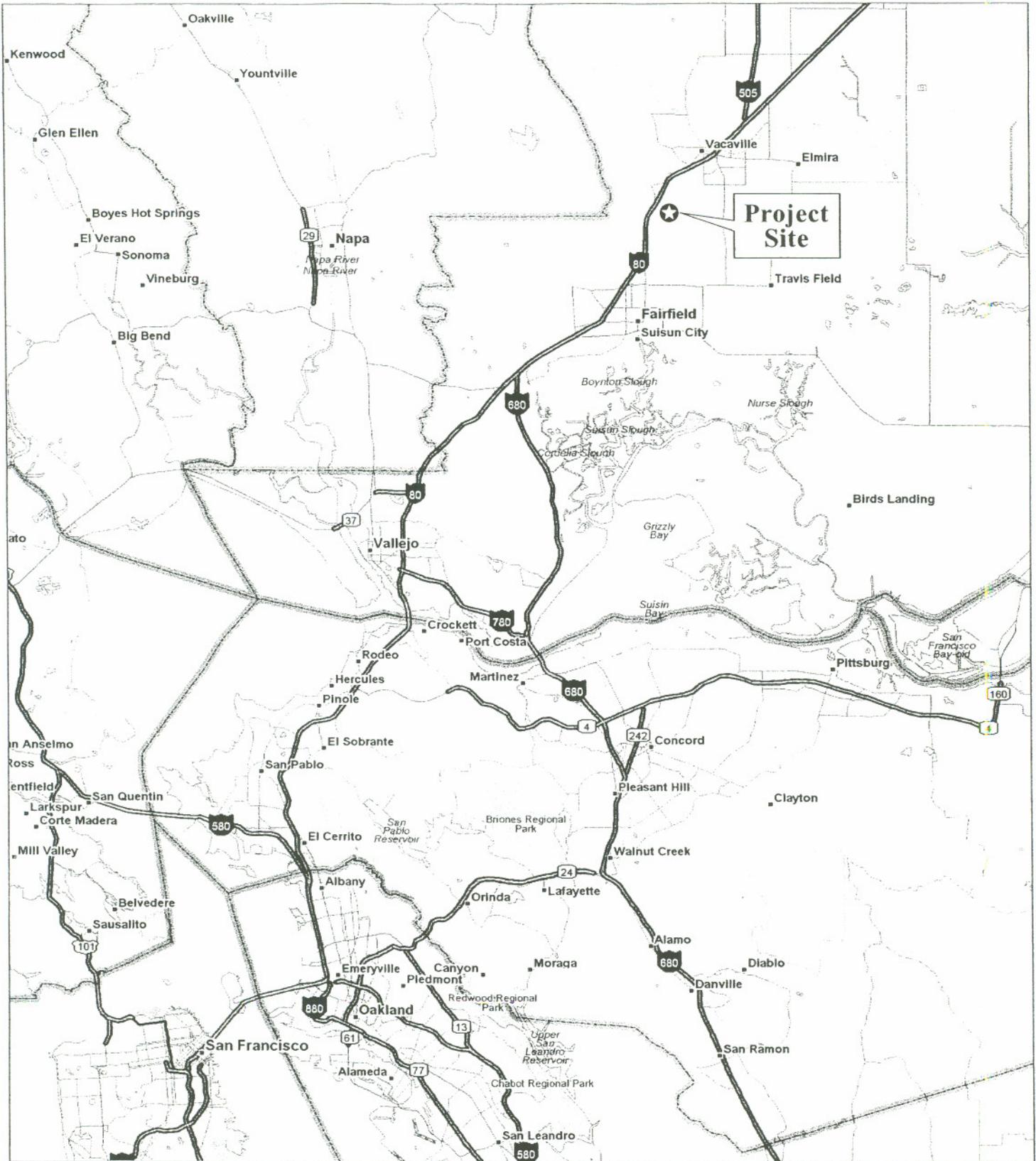
The project site is comprised of numerous assessor's parcels, which are listed in Appendix A,

The portion of the study site located to the north of Lagoon Valley Road is bounded on the west by Rivera Road and on the east by Lagoon Valley Regional Park. This part of the site includes the former Vacaville Glider Port, a former farmstead at the corner of Rivera Road and Lagoon Valley Road, and several former commercial properties along Rivera Road. All structures on these latter parcels have been torn down. The majority of the area north of Lagoon Valley Road is dominated by non-native grassland, is not currently grazed, and was formerly used for hay production.

The portion of the project site located to the south of Lagoon Valley Road and west of the Hines Nursery is non-native grassland. It contains relatively flat land nearer Lagoon Valley Road that is not currently grazed, and was formerly used for hay production. The site extends south to include a ridge of hills dominated by non-native grassland that is used for grazing. This area has no structures, other than an abandoned pump house.

The portion of the study site south of the Hines Nursery contains mostly non-native grassland. The flat land on the northern part of the area contains a ranch residence and outbuildings, some unused ranch buildings, and a walnut orchard. The hills in the southern part have non-native grassland and oak savanna. All of the undeveloped parts of this area are grazed.

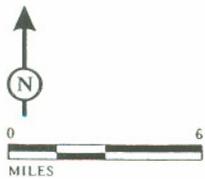
The area east of Lagoon Valley Road is the Hines Nursery. The entire area is graveled and is being used to grow commercial ornamental plants in containers. The northwest corner of the nursery contains office buildings and shipping facilities. Greenhouses, shade houses, and potting facilities occur at various locations on the remainder of the nursery.



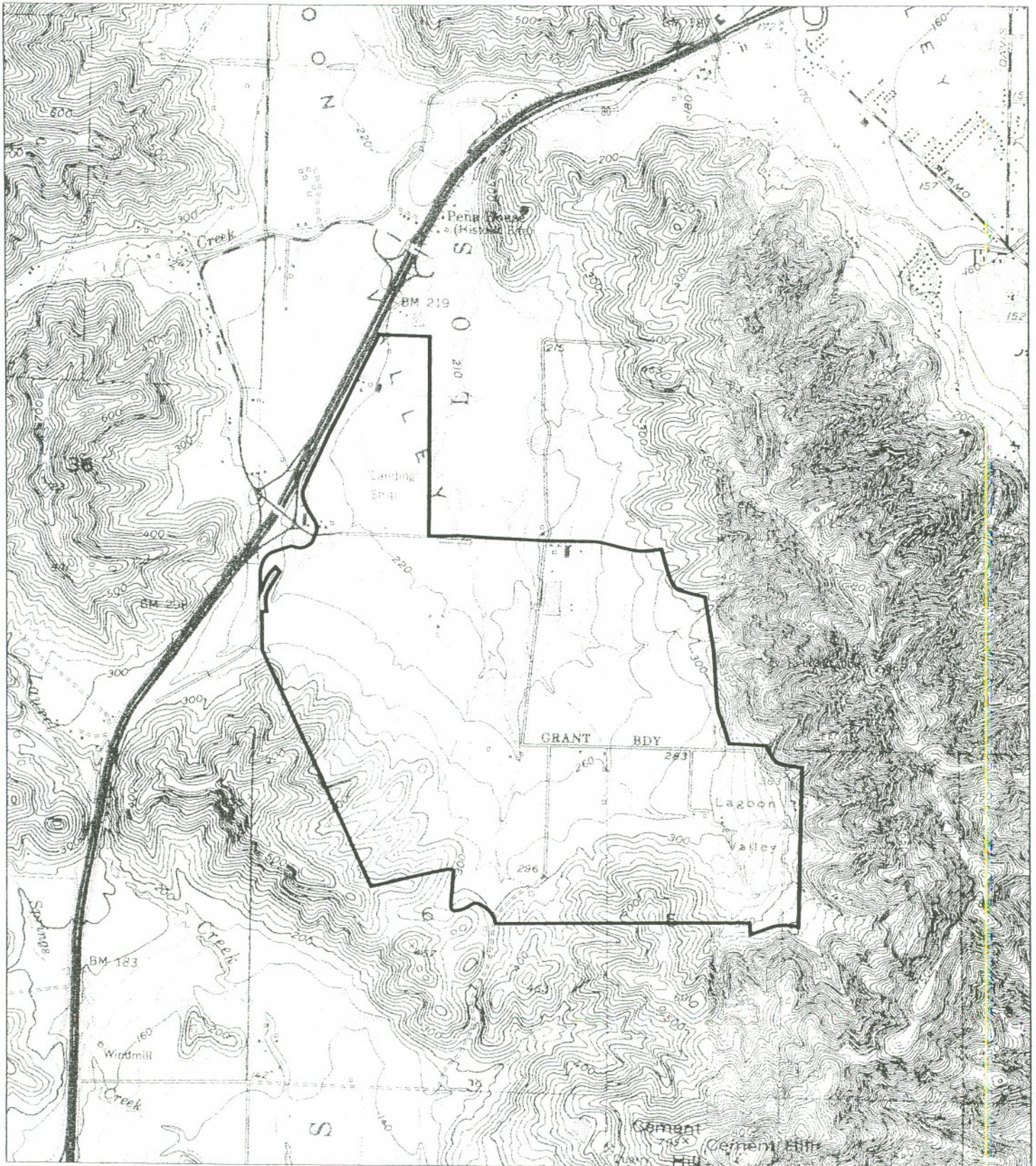
LSA

FIGURE 1

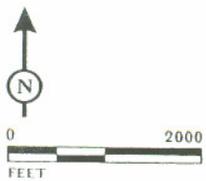
Lagoon Valley
Regional Location



SOURCE: ©2002 DELORME, STREET USA © 2003.



LSA



SOURCE: USGS 7.5' QUADS - FAIRFIELD NORTH, ELMIRA CALIF.

P:\TRI330\g\SiteLoc.cdr (9/22/03)

FIGURE 2

Lagoon Valley
Site Location

Hydrology

The project site encompasses the southern end of Lagoon Valley. The hillsides surrounding the valley on the west, south, and east drain to the valley floor through a number of small to moderate-sized streams. Upon reaching level ground these streams merge into a pair of large ditches that proceed northward toward Lagoon Valley Lake. The streams are usually comprised of natural channels that have been modified by cattle grazing. Natural wetland characteristics exist in many of the hillside drainage channels. Some segments have well-defined, scoured channels, while others broaden to shallow swales. One stream is fed by periodic releases from a City of Fairfield municipal water tank located immediately south of the project site. A pair of stock ponds are located at the base of the hills in the southern part of the site. Much of the drainage on the level valley floor areas has been re-directed into linear channels placed along roadsides or property lines.

Drainage from some of the watersheds south of Lagoon Valley Road that must once have flowed into Lagoon Valley Lake now flows around the lake through a bypass channel. The bypass channel flows northeast along Interstate 80 and merges with overflow from Lagoon Valley Lake before continuing on to Laguna Creek. Laguna Creek joins with Alamo Creek in the City of Vacaville. Alamo Creek in turn flows east through a modified channel to Cache Slough, and thence to the Sacramento River, a navigable water of the United States

Vegetation

The predominant plant community on the study site is non-native grassland composed of annual, introduced grasses as well as native and non-native forbs (broad-leaved plants). Non-native grasslands occur both on the flat open fields as well as on the ridges and hillsides that bound the southern and eastern edges of the site. Dominant grass species observed during the August survey were medusa head (*Taeniatherum caput-medusae*) and wild oats (*Avena fatua*). Other grasses observed include Italian wild rye (*Lolium multiflorum*), ripgut brome (*Bromus diandrus*), and soft chess (*B. hordeaceus*). Two invasive exotic plants, yellow star thistle (*Centaurea solstitialis*) and purple star thistle (*Centaurea calcitrapa*) are common on the level parts of the site. Bristly ox-tongue (*Picris echioides*), and curly dock (*Rumex crispus*) are quite common on the lower elevation parts of the valley south of Lagoon Valley Road.

The site also includes oak savanna in the hills and some riparian woodland along the largest creek and ditch channels. Valley oak (*Quercus lobata*) and California buckeye (*Aesculus californica*) are the dominant species in the oak savanna, joined with occasional stands of poison oak (*Toxicodendron diversilobum*). Trees along the natural creeks include valley oak, English and California black walnut (*Juglans regia*, *J. californica* var. *hindsii*), almond (*Prunus dulcis*), edible fig (*Ficus carica*), cherry plum (*Prunus cerasifera*), and willow (*Salix* sp.). Trees found along the sections of Lagoon Lake Creek as well as the ditches north and south of Lagoon Valley Road include Fremont's cottonwood (*Populus fremontii* ssp. *fremontii*), interior live oak (*Quercus wislizenii*), valley oak, willows, and naturalized California black walnuts. Herbs and shrubs present in riparian areas include alkali bullrush (*Scirpus robustus*), tule (*Scirpus acutus* var. *occidentalis*), saltgrass (*Distichlis spicata*), broad-leaved cattail (*Typha latifolia*), spikerush (*Eleocharis macrostachya*), pennyroyal (*Mentha pulegium*), pyracantha (*Pyracantha angustifolia*), and pampas grass (*Cortaderia selloana*).

Wetter areas of the flat lands contain perennial pepperweed (*Lepidium latifolium*) and rabbit's foot grass (*Polypogon monspeliensis*). Some of these areas are alkaline and support salt grass and pickle weed (*Salicornia virginica*).

Soils

The soils on the hill slopes of the Lagoon Valley study site are mapped by the Natural Resources Conservation Service (formerly Soil Conservation Service) as Dibble-Los Osos clay loam, both 9 to 30 percent and 30 to 50 percent slopes (USDA Soil Survey of Solano County, California, 1977). The soils on the lower ephemeral stream valleys and the shallow-sloped foot slopes of the hills are mapped as Dibble-Los Osos clay loam, 2 to 9 percent slopes; Rincon clay loam, 2 to 9 percent slopes; and San Ysidro sandy loam, 2 to 5 percent slopes. The soils on the more level fields and along stream courses are mapped as Brentwood clay loam, 0-2 percent slopes; Capay silty clay loam; Clear Lake clay, 0 to 2 percent slopes; Pescadero clay loam; and Rincon clay loam, 0 to 2 percent slopes.

The Dibble and Los Osos series are both underlain by the sandstone bedrock of the hills. They are both described as being well drained with slow permeability. The Rincon clay loams are well drained and have slow permeability in the subsoil. The San Ysidro sandy loam is moderately well drained with very slow permeability. The Brentwood clay loam is well drained with moderately slow permeability. The Capay silty clay loam is moderately well drained with slow permeability. The

Clear Lake clay is poorly drained and has slow permeability. The Pescadero clay loam is somewhat poorly drained and has slow permeability in the subsoil. The Clear Lake clay is listed in Solano County as possibly having hydric inclusions of Omni silty clay if the water table is within 1.5 feet of the surface. The Pescadero clay loam is listed as hydric where ponded. None of the other soils are listed as being hydric or containing hydric inclusions. Nonetheless, all soils may contain inclusions of soils with hydric properties in wetlands or stream channels.

The Pescadero clay loam is described as being on a saline-alkali subsoil. Alkali tolerant plants were found near the area mapped as Pescadero.

REGULATORY BACKGROUND

The Corps is responsible under Section 404 of the Clean Water Act to regulate the discharge of fill material into waters of the United States. Waters of the United States and their lateral limits are defined in 33 CFR Part 328.3(a) and include streams that are tributaries to navigable waters and their adjacent wetlands. The lateral limits of jurisdiction for a non-tidal stream are measured at the line of ordinary high water (OHWM) or the limit of adjacent wetlands.

Waters of the United States fall into two categories, wetlands and non-wetland waters. Non-wetland waters include waterbodies and watercourses such as rivers, streams, lakes, springs, ponds, coastal waters, and estuaries. Wetlands include marshes, meadows, seep areas, flood plains, basins, and other areas experiencing extended seasonal soil saturation and dominated by wetland plant cover.

Waters and wetlands that cannot trace a continuous hydrological connection to a navigable water of the United States are not tributary to waters of the United States. These are termed "isolated wetlands." Isolated wetlands are generally not considered to be waters of the United States.

In general, a Corps permit must be obtained before placing fill in wetlands or other waters of the United States. The type of permit depends on the acreage involved and the purpose of the proposed fill.

METHODS

WETLAND IDENTIFICATION METHODOLOGY

Field investigations of potential wetlands occurring on the project site were conducted using the routine determination method given in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). This methodology entails examination of specific sample points within suspected wetlands for hydrophytic vegetation, hydric soils, and wetland hydrology. By the federal definition, all three of these parameters must be present for an area to be considered a wetland.

Hydrophytic plant species are listed by the U.S. Fish and Wildlife Service in the *Revision of The National List of Plant Species That Occur in Wetlands* (Reed 1997). The *National List* identifies five categories of plants according to their frequency of occurrence in wetlands. The categories are:

| | |
|-----------------------------------|--|
| Obligate wetland plants (OBL) | Plants that occur almost always in wetlands. |
| Facultative wetland plants (FACW) | Plants that usually occur in wetlands. |
| Facultative plants (FAC) | Plants that are equally likely to occur in wetlands or non-wetlands. |
| Facultative upland plants (FACU) | Plants that usually occur in uplands. |
| Obligate upland plants (UPL) | Plants that occur almost always in non-wetlands. |

An area is considered to have hydrophytic vegetation when more than 50 percent of the dominant species in each stratum (tree, shrub, and herb) are in the obligate wetland, facultative wetland, or facultative categories.

Hydric soils are defined by criteria set forth by the National Technical Committee for Hydric Soils (NTCHS). These criteria are given in the *Wetlands Delineation Manual* and are based on depth and duration of soil saturation. Hydric soils are commonly identified in the field by using indirect indicators of saturated soil, technically known as redoximorphic features. These features are caused by anaerobic, reduced soil conditions that are brought about by prolonged soil saturation. The most common redoximorphic features are distinguished by soil color, which is strongly influenced by the frequency and duration of soil saturation. Hydric soils tend to have dark (low chroma) colors which are often accompanied by reddish mottles (iron mottles), reddish stains on root channels (oxidized rhizospheres) or grey colors (gleying).

Under natural conditions, development of hydrophytic vegetation and hydric soils are dependent on a third characteristic, wetland hydrology. The wetland hydrology criterion is met if the area experiences inundation or soil saturation to the surface for a period equal to at least 5 percent of the

growing season (about 14 days in the project area) in a year of average rainfall. In most cases, this criterion can only be measured directly by direct monitoring of the site through an entire wet season. In practice, the hydrological status of a particular area is usually evaluated using indirect indicators. Some of the indicators that are commonly used to identify wetland hydrology include recent sediment deposits, surface scour, and oxidized rhizospheres around living roots.

FIELD METHODOLOGY

LSA surveyed the study site on 17 July, and 5, 14, 21, and 26 August 2003 to identify potential waters of the United States. A 1-inch to 200-foot scale topographic survey map of the project site was used in the field for mapping and note-taking. Areas determined by LSA to meet CWA jurisdictional criteria are mapped on Figure 3 (in map pocket).

Wetlands and other waters potentially subject to regulation were identified by the presence of basins, ditches or other depressed topographic features, and by the presence of hydrophytic vegetation. Sample points were established within each potential wetland area. Where a particular sample point was determined to meet federal wetland criteria, additional sample points were established to determine the location of the wetland boundary. Wetland boundaries were traced by following vegetational and landform indicators. LSA established 51 sample sites in the study area. The field data sheets for these sites are included as Appendix B, and their locations are shown on the enclosed delineation map (Figure 3).

The area had last received significant rain of approximately 0.84 inches on May 2 and 3, 2003. The area also received approximately 0.52 inches of rain on 21 August.

RESULTS

Potential waters of the United States identified within the study area consist of numerous ephemeral and intermittent streams, drainage ditches, seasonal wetlands, a stock pond, and a storage pond. The acreages of specific features are listed in Appendix C, and the locations of all potentially jurisdictional features are shown on Figure 3.

STREAMS AND DITCHES

Lagoon Valley is a bowl-shaped valley with Lagoon Valley Lake situated in the northern part of the valley. The project site occupies the southern part of the valley and drains toward Lagoon Valley Lake via several tributaries. The tributaries are designated A through J on Figure 3, and range from a short, single segment ditch (Tributary C) to a long, multi-branched stream system that traverses the length of the project site (Tributary G). Each of these tributaries falls in a separate watershed that drains toward the lake, and the tributaries collectively drain the entire southern half of the valley.

Tributary Orientation, Origin and Jurisdictional Status

The largest tributaries originate in the hills that bound the southern and eastern edges of the project site. Prior to European settlement some of the tributaries flowing from these hills probably passed across the flatlands in the center of the site to feed extensive wetlands located in the northern part of the valley. Soil conditions and historical notes indicate that these wetlands probably extended into the northern portion of the project site. Since European settlement, the lower reaches of the tributaries have been channelized and consolidated into large ditches that parallel Lagoon Valley Road. The historic streambeds of the larger tributaries were filled. The smaller tributaries probably dispersed to unconfined and/or subsurface flow prior to reaching the lake.

The exact historic orientation of the tributaries prior to agricultural alteration has not been determined by LSA, but some assumptions may be made based on topographic and other evidence. The two largest tributaries, F and G, probably once merged into an even larger tributary that would have flowed through to Lagoon Valley Lake. The former streambed of this large tributary appears to have passed through the open field area immediately to the west of the Hines Nursery. Tributaries F and G now flow to large artificial ditches along Lagoon Valley Road. These ditches eventually join into a single ditch that proceeds north off the project site and empties into the lake immediately thereafter.

Tributary D may once have flowed through to the lake as well, but there is no evidence of a pre-existing stream channel. The tributary now becomes a channelized ditch upon reaching the valley floor. This ditch proceeds straight to Lagoon Valley Road and then continues along the roadside in the direction of the lake.

The remaining tributaries are generally short, artificial drainage ditches located in the northern parts of the site or on the Hines Nursery property.

Most of the drainage ditch segments on the site, including the large ditches along Lagoon Valley Road and the smaller tributary ditches located elsewhere, are represented as likely to be subject to CWA jurisdiction on Figure 3. These ditches are represented in this manner because they are most often continuous with the natural channels emerging from the surrounding hills, and it is reasonable to assume that some are serving as functional replacements for pre-existing natural stream segments that have been filled.

A few drainage ditches are represented as likely non-jurisdictional on Figure 3. These ditches are usually providing a specific artificial drainage function (e.g., nursery drainage), are short, and are often constructed across contour and perpendicular to the natural gradient.

Stream Characteristics

The natural streams on the property tend to carry high volumes of runoff for short periods during the winter, and dry rapidly. These flow conditions are a result of the semi-arid Vacaville climate and permeable streambeds. Long-term riparian cover only occurs on Tributary G and on part of Tributary D. This cover is mostly comprised of mature valley oak and California black walnut, and appears to have survived intact since pre-settlement. Most of the remaining, smaller natural channels are too ephemeral to support tree and brush cover.

The large ditches adjacent to Lagoon Valley Road also support dense riparian cover, but this cover is comprised of younger willow and Fremont's cottonwood trees. The riparian cover along the roadside ditches is supported by summer irrigation runoff emanating from Hines Nursery. Some of the tree cover adjacent to the Lagoon Valley Road ditches was probably planted.

SEASONAL WETLANDS

All potential jurisdictional seasonal wetlands are shown on Figure 3, in the map pocket. The potential jurisdictional areas of the seasonal wetlands are listed in Appendix C.

Incidental Seasonal Wetlands

Many of the mapped seasonal wetlands are small basins at various locations in the fields on the valley floor. The origins of these basins are mostly incidental to human agricultural and grading activities. Soil studies conducted in the fields adjacent to Lagoon Valley Road by LSA in the 1990's revealed that these fields had previously been graded. The grading was most likely conducted to level the fields and provide positive drainage. The leveling and drainage activities would have included filling of any pre-existing wetlands and stream channels, and included installation of new drainage ditches and drainage swales. Many of the installed ditches and swales do not have persistent jurisdictional characteristics, but do include occasional basins or short lengths of swale that are ponded long enough to meet wetland criteria.

The largest of these incidental wetlands is SW-G. This wetland lies atop what appears to be the original course of Tributary F. The wetland plant cover at this location either results from seasonal saturation within a narrow basin caused by settling of the fill in the old channel, or from persistent movement of subsurface moisture within the filled streambed.

Many of the remaining seasonal wetlands are associated with a berm and swale constructed along the base of the hills at the southwestern edge of the open field south of Lagoon Valley Road. The berm and swale were constructed by past landowners in an attempt to re-direct runoff emerging from the southern hills away from the open field. The flows are re-directed toward the ditches along Lagoon Valley Road and toward the channelized portion of Tributary D.

The effort that was put into the ditch and berm described above provides additional evidence that there were once wetlands in the lower parts of the field to the south of Lagoon Valley Road. Few wetlands now occur in this field, so the grading of the field and re-direction of runoff into the roadside ditches was apparently successful at reducing the occurrence of wetlands.

Footslope Seasonal Wetlands

There are several additional seasonal wetlands on the site that have natural origins. These occur on the footslopes of the hills due south of the Hines Nursery. Specific footslope wetlands include SW-T, SW-S, and SW-U

The footslope wetlands are maintained by seepage of groundwater, and could be described as seeps. They differ from normal seeps, however, in that they are maintained by near-surface flow of percolating rainwater rather than by a connection with the regional water table. The soils and underlying parent material on the upper slopes of the hills must be permeable, allowing for a relatively high volume of subsurface percolation of rainfall during the winter. This near-surface flow emerges from the ground surface at the base of the hills, at the point where the slope gradient begins to level. The emerging groundwater maintains extended soil saturation on the footslopes of the hills through late winter and into the spring, leading to the development of seasonal wetland characteristics.

The footslope wetlands do not support very distinct wetland plant communities, but display strong evidence of hydric soil conditions. As documented at Sample Points 28 and 30, the plant cover is dominated by Italian ryegrass and fiddle-dock (*Rumex pulcher*). These facultative species are not normally reliable indicators of wetland hydrology, but on this site they are clearly coincident with soils that display strong redoximorphic mottling. Surrounding plant communities are dominated by non-hydrophytic grasses (such as medusa-head), as might be expected on a permeable, well-drained soil. Italian rye and fiddle-dock do not normally thrive on permeable hillside soils, however, the extended springtime saturation present on the footslope wetland areas provides an extended source of soil moisture. This mechanism explains why Italian rye and fiddle-dock are indicative of potential seasonal seepage and wetland conditions on the project site.

Stockponds

Two stockponds are present on the site and are depicted on Figure 3. These ponds were constructed by ranchers by damming two different segments of Tributary F. Both stockponds continue to hold standing water well into the dry season, and Stockpond A is probably perennial. We have characterized the stockponds as non-wetland waters because the duration and depth of ponding prevents establishment of wetland plant cover in the centers of the ponds. Wetland plant cover, such as rabbit's-foot grass, does occur on the pond margins.

Alkali Wetlands

Some areas that support alkali vegetation are present in the fields south and west of Lagoon Valley Lake. Areas south of Lagoon Valley Road supporting salt grass appear to have a moderate alkali influence in the soil but do not otherwise display wetland characteristics.

The area west of Lagoon Valley Lake surrounding Alkali Wetland B is a very shallow basin in the field which has been dammed by a berm alongside the bypass channel running along the west side of the lake. This area probably graded into the lagoon previous to disturbance associated with the development of Lagoon Valley Lake and the bypass channel. This soil in this area is mapped as Pescadero clay loam, which is listed as hydric where ponded and described as being on a saline-alkali subsoil. White alkali stains are occasionally visible on the soil surface in this area. Parts of this area contain almost monoculture stands of salt grass (see Sample Point 43), occasionally mixed with pickle weed. These salt grass patches are mapped as Alkali Wetlands A through G. These areas show matting of the previous year's vegetation that appears to indicate shallow seasonal inundation. The surface soil horizon does show low chroma (Munsell Soil Color Chart chroma of 1) as a hydric indicator, but the soil profile does not have iron mottling or rhizospheres. The alkali conditions in the soil are thought to be preventing the formation of mottling and rhizospheres that would otherwise be expected to be present based on the vegetation and wetland hydrology evidence at these locations. The characteristics of these mapped alkali wetlands appear to be the result of a combination of alkali soil and seasonal soil saturation.

ISOLATION

Wetlands, watercourses and waterbodies that cannot trace a continuous surface hydrological connection to a navigable water of the United States are isolated. Isolated features are not subject to Clean Water Act or Corps regulation, except under certain special circumstances. The Corps is still developing guidance on what constitutes a hydrological connection, but interim Corps policy is that any direct or indirect evidence of overland flow between two waters may constitute a connection. Man-made drainage facilities, such as ditches, swales, gutters, and culverts may also serve as hydrological connections.

Due to the lack of determinant guidance on isolation, it is difficult to draw meaningful conclusions prior to consultation with Corps staff. We have therefore not attempted to distinguish isolated features on Figure 3 or in Appendix A. Presented below is a list of features that LSA believes are potentially isolated and not subject to CWA jurisdiction.

Streams

Many of the streams on the site are directly or indirectly tributary to Lagoon Valley Lake. Lagoon Valley Lake outlets to Laguna Creek, which is tributary to Alamo Creek. Alamo Creek is tributary to the Sacramento River by way of Cache Slough and other delta waterways. Those streams on the project site that do not flow to Lagoon Valley Lake still flow to Laguna Creek via ditches that bypass the lake.

CWA jurisdiction along the streams and ditches on the project site is often discontinuous. Many stream and ditch segments lack all evidence of water flow or ponding and are thus not mapped as potentially jurisdictional on Figure 3. Despite the many gaps in jurisdiction, there are no clear cases where stream or ditch segments are completely isolated from downstream waters. Non-jurisdictional ditch segments or other recognizable evidence of flowlines bridge the gaps in all cases. No stream or ditch segments appear to be isolated.

Wetlands

Most wetlands occur in sequence with streams, ditches or non-jurisdictional drainageways. The only exceptions are Seasonal Wetland SW-S and Alkali Wetlands AW-E, AW-F, and AW-G. Seasonal Wetland S is a footslope wetland maintained by groundwater. There is no evidence that the wetland generates surface runoff, and the wetland has no surface connection to other wetlands. All other footslope wetlands are contiguous with stream channels.

Alkali Wetlands AW-E, AW-F and AW-G are located in an open field with no other adjacent waters. The three wetlands appear to be self-contained and have no obvious spillover point or associated swale.

CONCLUSIONS

Potential waters of the United States on the Lagoon Valley Residential/Commercial study site includes multiple streams and ditches, twenty-six seasonal wetlands, seven alkali wetlands, and two stock ponds. All potential jurisdictional features are mapped on Figure 3.

Areas of individual stream segments, seasonal wetlands, alkali wetlands, and stock ponds are listed in Appendix C. Acreage totals are summarized in Table A, below.

Table A: Summary of Potentially Jurisdictional Areas

| Feature | Square Feet | Acres |
|---------------------------|--------------------|--------------|
| Stream and Ditch Segments | 337,320 | 7.74 |
| Seasonal Wetlands | 96,730 | 2.22 |
| Alkali Wetlands | 82,050 | 1.88 |
| Stock Ponds | 11,700 | 0.27 |
| TOTAL | 527,800 | 12.12 |

No other potential waters of the United States were identified in the study area.

The data and conclusions of this report are subject to verification by the Corps of Engineers.

LITERATURE CITED

- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical report Y-87-1, U.S. Army Engineers Waterways Experiment Station, Vicksburg, Mississippi.
- Hickman, J.C., ed. 1993. *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley, CA. 1400 pp.
- Reed, P. B., Jr. 1988. *National List of Plant Species that Occur in Wetlands: California (Region 0)*. U.S. Fish and Wildlife Service Biological Report 88(26.10). 135 pp.
- U.S.D.A. Soil Conservation Service. 1972. *Soil Survey of Sonoma County, California*.

APPENDIX A

ASSESSOR'S PARCEL NUMBERS

Appendix A
Solano County Assessors Parcel Numbers
on the Lagoon Valley Residential/Commercial Project Site

| |
|--|
| Area north of Lagoon Valley Road and west of Lagoon Valley Park |
| 127-020-040 |
| 127-020-110 |
| 127-020-050 |
| 127-020-120 |
| 127-010-080 |
| 127-010-090 |
| 127-010-070 |
| 127-010-060 |
| 127-030-110 |
| 127-030-120 |
| 127-030-100 |
| 127-030-130 |
| City of Vacaville owned Saddleback Parkway ROW |
| |
| Area south of Lagoon Valley Road and west of Hines Nursery |
| 128-040-210 |
| 128-040-070 |
| 128-040-080 |
| 128-040-090 |
| 128-040-100 |
| 128-040-110 |
| 128-040-120 |
| 128-040-130 |
| 128-040-140 |
| 128-040-170 |
| 128-040-180 |
| 167-020-110 |
| 167-020-120 |
| 167-020-050 (part of parcel, owned by City of Vacaville) |
| City of Vacaville owned Saddleback Parkway ROW |
| City of Vacaville owned Lagoon Valley Parkway ROW |
| |
| Hines Nursery Property |
| 128-050-070 |
| |
| Area south of Lagoon Valley Road and south of Hines Nursery |
| 167-030-080 |
| 167-030-020 |
| 167-030-030 |
| 167-030-050 |
| 167-030-060 |
| 167-030-040 |

APPENDIX B
DATA SHEETS

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

| | |
|--|--|
| Project/Site: Lagoon Valley Applicant: Triad Homes Investigator(s): S. Lohmann, C. Bouril LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801 Have vegetation, soils, or hydrology been disturbed? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the area a potential Problem Area? <input checked="" type="radio"/> Yes <input type="radio"/> No | Sample Site No.: <u>1</u> Date: July 17, 2003 Location: Vacaville County: Solano State: CA |
|--|--|

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "**")

| Dominant Plant Species | % Cover | Indicator | Associated Plant Species | % Cover | Indicator |
|-----------------------------------|-----------|-------------|--------------------------|---------|-----------|
| 1. <u>PICRIS ECHINOIDES</u> | <u>20</u> | <u>FAC</u> | 1. _____ | _____ | _____ |
| 2. <u>AURELIA SP.</u> | <u>10</u> | <u>UPL</u> | 2. _____ | _____ | _____ |
| 3. <u>TAKENATHERUM CAPTIVOSAE</u> | <u>30</u> | <u>UPL</u> | 3. _____ | _____ | _____ |
| 4. <u>DIPSACUS SYLVESTRIS</u> | <u>5</u> | <u>NI</u> | 4. _____ | _____ | _____ |
| 5. <u>LOLLIUM MULTIFLORUM</u> | <u>20</u> | <u>FAC</u> | 5. _____ | _____ | _____ |
| 6. <u>BROMUS HORDEACEUS</u> | <u>10</u> | <u>FACU</u> | 6. _____ | _____ | _____ |
| 7. <u>LEPIDIUM TRITICOIDES</u> | <u>5</u> | <u>FAC</u> | 7. _____ | _____ | _____ |

67 % dominant species that are OBL, FACW or FAC (except FAC-). 0 % bare ground

Remarks: DITCH US, CONTAINS FLOW, CURVES
DITCH CONTAINS ELEOCHARIS SP.

HYDROLOGY

| | |
|---|--|
| Field observations: Depth of surface water: _____ (in.) Depth to free water in pit: _____ (in.) Depth to saturated soil: _____ (in.) Approximate slope: <u>1%</u> Within 100-year floodplain? Yes <input checked="" type="radio"/> No <input type="radio"/> Below OHWM or High Tide Line? Yes <input checked="" type="radio"/> No <input type="radio"/> | Wetland hydrology indicators: <u>NONE</u> <input type="checkbox"/> Inundated <input type="checkbox"/> Water marks <input type="checkbox"/> Sediment deposits <input type="checkbox"/> Suppressed vegetation <input type="checkbox"/> Matting (algal or other) <input type="checkbox"/> Other (explain in remarks) <input type="checkbox"/> Saturated in upper 12" <input type="checkbox"/> Organic duff layer <input type="checkbox"/> Drainage patterns in wetlands <input type="checkbox"/> Oxidized root channels |
|---|--|

Physiographic position of site/Remarks: EDGE OF DITCH

SOILS

| | |
|----------------------------|---|
| Map unit name: _____ | Soil series permeability (from NRCS survey): _____ |
| Taxonomy (subgroup): _____ | Field observations confirm mapped soil series? Yes <input type="checkbox"/> No <input type="checkbox"/> |

| Depth (inches) | Horizon | Matrix Color (moist) | Redoximorphic Colors (moist) | Abundance/Contrast | Additional observations (texture, concretions, porosity, etc.) |
|----------------|---------|----------------------|------------------------------|--------------------|--|
| <u>0-2A"</u> | _____ | <u>10YR4/3</u> | _____ | _____ | <u>SL</u> |
| | | | | | |
| | | | | | |
| | | | | | |

| | | |
|--|--|---|
| Hydic Soil Indicators: <u>NONE</u> | Gleying | Probable aquic moisture regime |
| <input type="checkbox"/> Abundant rhizospheres | <input type="checkbox"/> Non-mollic, low-chroma colors | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Reducing conditions | <input type="checkbox"/> Iron or Mn mottles | <input type="checkbox"/> Listed on county hydric soils list |
| <input type="checkbox"/> High organic content in surface layer | <input type="checkbox"/> Sulfidic odor | <input type="checkbox"/> Other (explain in remarks) |
| <input type="checkbox"/> Depleted mottles or matrix | | |

Remarks: CUT BANK @ DITCH

WETLAND DETERMINATION

| | |
|---|---|
| Hydrophytic vegetation present <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric soils present Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland hydrology present Yes <input checked="" type="radio"/> No <input type="radio"/> | Is this sampling point within a wetland? Yes <input type="checkbox"/> No <input checked="" type="radio"/> |
|---|---|

Remarks:

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

| | |
|--|--|
| Project/Site: Lagoon Valley Applicant: Triad Homes Investigator(s): S. Lohmann, C. Bouril LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801 Have vegetation, soils, or hydrology been disturbed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is the area a potential Problem Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Sample Site No.: <u>2</u> Date: July 17, 2003 Location: Vacaville County: Solano State: CA |
|--|--|

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "**")

| Dominant Plant Species | % Cover | Indicator | Associated Plant Species | % Cover | Indicator |
|--|-----------|-------------|--------------------------|---------|-----------|
| 1. <u>LEPTOCARPUS TRITICOIDES</u> | <u>55</u> | <u>FACW</u> | 1. _____ | _____ | _____ |
| 2. <u>PICRIS ECHINOIDES</u> | <u>25</u> | <u>FAC</u> | 2. _____ | _____ | _____ |
| 3. <u>VULPIA SP</u> | <u>5</u> | <u>?</u> | 3. _____ | _____ | _____ |
| 4. <u>PROSOPIS BORDOUCOSUS</u> | <u>5</u> | <u>FACU</u> | 4. _____ | _____ | _____ |
| 5. <u>TORULOTRICHETUM CIPUT-UNUSAE</u> | <u>5</u> | <u>UPL</u> | 5. _____ | _____ | _____ |
| 6. <u>CORDEUS PACHYCEPHALUS</u> | <u>5</u> | <u>UPL</u> | 6. _____ | _____ | _____ |
| 7. _____ | _____ | _____ | 7. _____ | _____ | _____ |

100 % dominant species that are OBL, FACW or FAC (except FAC-). 0 % bare ground

Remarks:

HYDROLOGY

| | |
|---|---|
| Field observations: Depth of surface water: _____ (in.) Depth to free water in pit: _____ (in.) Depth to saturated soil: _____ (in.) Approximate slope: <u>2%</u> Within 100-year floodplain? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Below OHWM or High Tide Line? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Wetland hydrology indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Water marks <input type="checkbox"/> Sediment deposits <input type="checkbox"/> Suppressed vegetation <input type="checkbox"/> Matting (algal or other) <input type="checkbox"/> Other (explain in remarks) <input type="checkbox"/> Saturated in upper 12" <input type="checkbox"/> Organic duff layer <input type="checkbox"/> Drainage patterns in wetlands <input checked="" type="checkbox"/> Oxidized root channels |
|---|---|

Physiographic position of site/Remarks: ONLY RHIZOS = FEEBLE

SOILS

| | |
|----------------------------|---|
| Map unit name: _____ | Soil series permeability (from NRCS survey): _____ |
| Taxonomy (subgroup): _____ | Field observations confirm mapped soil series? Yes <input type="checkbox"/> No <input type="checkbox"/> |

| Depth (inches) | Horizon | Matrix Color (moist) | Redoximorphic Colors (moist) | Abundance/Contrast | Additional observations (texture, concretions, porosity, etc.) |
|----------------|---------|----------------------|------------------------------|--------------------|--|
| <u>0-6</u> | | <u>10TR3/1</u> | <u>5YR 4/6</u> | <u>5%</u> | <u>Cl</u> |
| | | <u>+N 2/0</u> | | | |
| <u>6-10</u> | | | | | |

| | | |
|--|---|---|
| Hydric Soil Indicators: <input type="checkbox"/> Abundant rhizospheres <input type="checkbox"/> Reducing conditions <input type="checkbox"/> High organic content in surface layer <input type="checkbox"/> Depleted mottles or matrix | <input type="checkbox"/> Gleying <input type="checkbox"/> Non-mollic, low-chroma colors <input type="checkbox"/> Iron or Mn mottles <input type="checkbox"/> Sulfidic odor | <input type="checkbox"/> Probable aquic moisture regime <input type="checkbox"/> Concretions <input type="checkbox"/> Listed on county hydric soils list <input type="checkbox"/> Other (explain in remarks) |
|--|---|---|

Remarks: LOCALIZED REDUCING! ASSOC. w/ BURIED O.M.

WETLAND DETERMINATION

| | |
|---|--|
| Hydrophytic vegetation present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric soils present <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland hydrology present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Is this sampling point within a wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
|---|--|

Remarks: RHIZOS LIMITED TO PATCH OF LEPTOCARPUS

DATA FORM: ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

| | |
|--|--|
| Project/Site: Lagoon Valley Applicant: Triad Homes Investigator(s): S. Lohmann, C. Bouril LSA Associates, Inc., 157 Park Place, Point Richmond, CA 94801 Have vegetation, soils, or hydrology been disturbed? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the area a potential Problem Area? <input checked="" type="radio"/> Yes <input type="radio"/> No | Sample Site No.: <u>3</u> Date: July 17, 2003 Location: Vacaville County: Solano State: CA |
|--|--|

VEGETATION (Note those species observed to have morphological adaptations to wetlands with an asterisk "**")

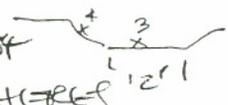
| Dominant Plant Species | % Cover | Indicator | Associated Plant Species | % Cover | Indicator |
|---|---------|-----------|--------------------------|---------|-----------|
| 1. RUMEX PULCHER | 15 | FAC | 1. _____ | _____ | _____ |
| 2. LOTUM MULTIFLORUM | 25 | FAC | 2. _____ | _____ | _____ |
| 3. BROMUS HORDEACEUS | 30 | FACU | 3. _____ | _____ | _____ |
| 4. HORDEUM V. RINUM | 15 | FAC | 4. _____ | _____ | _____ |
| 5. TORILIS TORILIS CAPUT-MEDUSAE | 5 | UPL | 5. _____ | _____ | _____ |
| 6. VULPIA SP. | 5 | ? | 6. _____ | _____ | _____ |
| 7. _____ | _____ | _____ | 7. _____ | _____ | _____ |

50 % dominant species that are OBL, FACW or FAC (except FAC-). 0 % bare ground

Remarks:

HYDROLOGY

| | |
|---|---|
| Field observations: Depth of surface water: _____ (in.) Depth to free water in pit: _____ (in.) Depth to saturated soil: _____ (in.) Approximate slope: <u>8%</u> Within 100-year floodplain? Yes <input checked="" type="radio"/> No <input type="radio"/> Below OHWM or High Tide Line? Yes <input checked="" type="radio"/> No <input type="radio"/> | Wetland hydrology indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Water marks <input type="checkbox"/> Sediment deposits <input type="checkbox"/> Suppressed vegetation <input type="checkbox"/> Matting (algal or other) <input type="checkbox"/> Other (explain in remarks) <input type="checkbox"/> Saturated in upper 12" <input type="checkbox"/> Organic duff layer <input type="checkbox"/> Drainage patterns in wetlands <input checked="" type="checkbox"/> Oxidized root channels |
|---|---|

Physiographic position of site/Remarks:
 IN EXCAVATED DRAINAGEWAY
 NO INDICATORS BESIDES RHIZOSPHERES


SOILS

| | |
|--|---|
| Map unit name: _____ Taxonomy (subgroup): _____ | Soil series permeability (from NRCS survey): _____ Field observations confirm mapped soil series? Yes <input type="checkbox"/> No <input type="checkbox"/> |
|--|---|

| Depth (inches) | Horizon | Matrix Color (moist) | Redoximorphic Colors (moist) | Abundance/Contrast | Additional observations (texture, concretions, porosity, etc.) |
|----------------|---------|----------------------|------------------------------|--------------------|--|
| 0-6 | | 10YR4/3 | 5YR4/6 | 20% | SIL |
| | | | | | |
| | | | | | |
| | | | | | |

| | | |
|---|---|---|
| Hydric Soil Indicators: <input checked="" type="checkbox"/> Abundant rhizospheres <input type="checkbox"/> Reducing conditions <input type="checkbox"/> High organic content in surface layer <input type="checkbox"/> Depleted mottles or matrix | <input type="checkbox"/> Gleying <input type="checkbox"/> Non-mollic, low-chroma colors <input type="checkbox"/> Iron or Mn mottles <input type="checkbox"/> Sulfidic odor | <input type="checkbox"/> Probable aquic moisture regime <input type="checkbox"/> Concretions <input type="checkbox"/> Listed on county hydric soils list <input type="checkbox"/> Other (explain in remarks) |
|---|---|---|

Remarks: ABUNDANT RHIZOSPHERES ARE SURPRIZING GIVEN WEAK PRESENCE OF HYDROPHATES

WETLAND DETERMINATION

| | |
|---|--|
| Hydrophytic vegetation present Yes <input type="radio"/> No <input checked="" type="radio"/> Hydric soils present Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland hydrology present Yes <input type="radio"/> No <input checked="" type="radio"/> | Is this sampling point within a wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
|---|--|

Remarks: