CONCEPTUAL WETLANDS MITIGATION PLAN
ALTAMONT LANDFILL AND RESOURCE RECOVERY FACILITY
ALAMEDA COUNTY, CALIFORNIA

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(CORPS FILE #199300056)

February 22, 1994

Prepared for:

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LSA Project #WMI108

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EXECUTIVE SUMMARY

This conceptual mitigation and monitoring plan for the Altamont Landfill and Resource Recovery Facility provides a comprehensive approach for the replacement of wetlands and waters of the United States lost as a result of the expansion of the existing landfill facility over a 41-year period (minimum estimate for the four phases of the expansion project). The proposed project has been designed to avoid impacts to significant wetlands on the site. Wetland impacts will result from the fill of seasonal watercourses, two natural ponding areas and four stock ponds.

The plan proposes to create 2.5 acres of seasonal wetlands to compensate for the loss of 1.67 acres as a result of landfill activities in the Altamont expansion area, representing a compensation ratio of approximately 1.5:1 (new to filled). Mitigation will consist of 1) avoidance of primary, significant wetlands at the site and 2) creation of 2.5 acres of seasonally inundated wetlands with associated ponding areas to be constructed at four locations in the western portion of the site. This part of the site will be preserved as replacement habitat for the California tiger salamander and San Joaquin kit fox. The overall objective is to ensure no net loss of wetland and aquatic area or functional value due to the expansion project. Though the fill activities will occur during the course of the 41-year expansion period, all compensation areas would be constructed during Phase 1, thus minimizing temporal loss of wetlands.

The compensatory wetlands will be created on site by creating shallow excavations with berms, which may be partially lined or sealed to increase their ability to retain water on a seasonal basis. Portions of the replacement wetlands will be designed to retain water for a minimum of four months, at a depth of up to three feet. The remaining area will be designed to support seasonal wetland vegetation. These new ponding areas in the replacement wetlands will be managed to increase habitat opportunities for California tiger salamander.

The mitigation sites will be monitored and managed for five years under the direction of a restoration specialist to assure that the new wetlands are successfully established. The success of habitat establishment will be based on site-specific data and will be monitored as part of this plan.

INTRODUCTION

This report presents a plan for the mitigation for the fill of 1.67 acres of jurisdictional waters of the United States on the Altamont Landfill and Resource Recovery Facility (ALRRF) in eastern Alameda County, California. Waste Management of Alameda County, the landfill operator and owner, has retained LSA Associates, Inc. to prepare this mitigation plan.

PROPOSED PROJECT

The Altamont Landfill is an existing, permitted facility that receives refuse from Alameda County and the surrounding area. The landfill property covers approximately 3½ square miles near the crest of the Altamont Hills and lies north of Altamont Pass and Interstate 580. The site consists of sections 15, 16, 17 and the northern portion of section 21 in Township 2 East, Range 3 South. Primary access is along Altamont Pass Road, which abuts the property on the south. Dyer Road borders the property on the west, while the northern and eastern sides of the property border on open rangeland. Figure 1 locates the property in the region and Figure 2 shows the boundaries of the Altamont landfill property.

Central portions of the site support an ongoing landfill operation. Landfilling and construction of facilities began in 1978 and the landfill now covers approximately 225 acres. Outside of the landfill, the property consists primarily of undeveloped annual grasslands and is used as rangeland for cattle. Strings of wind-powered generators are located along most of the ridgelines on the property.

Waste Management of Alameda County is proposing to expand the Altamont Landfill. The proposed Class II landfill (ALRRF) would occupy approximately 950 acres with refuse placed over approximately 850 acres. The expansion project would progress in four phases, which will be implemented over the next 41 years (minimum estimate). The existing landfill (Fill Area 1), proposed Altamont expansion area, and phase boundaries are shown in Figure 3.

REGULATORY BACKGROUND

The Corps is responsible under Section 404 of the Clean Water Act to regulate the discharge of dredged and fill material into the 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 (33 CFR

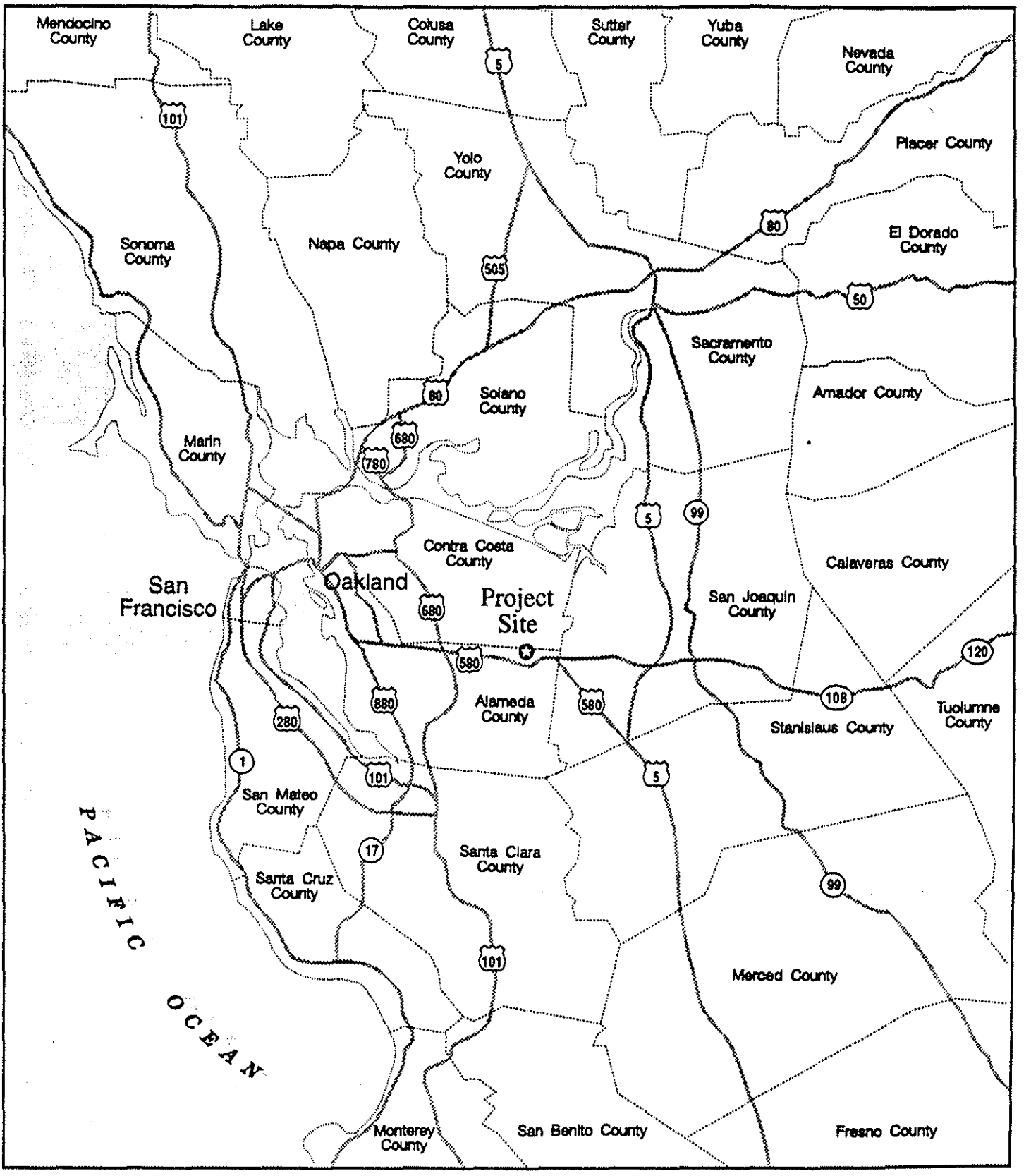

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Figure 1

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Scale in miles

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Regional Location

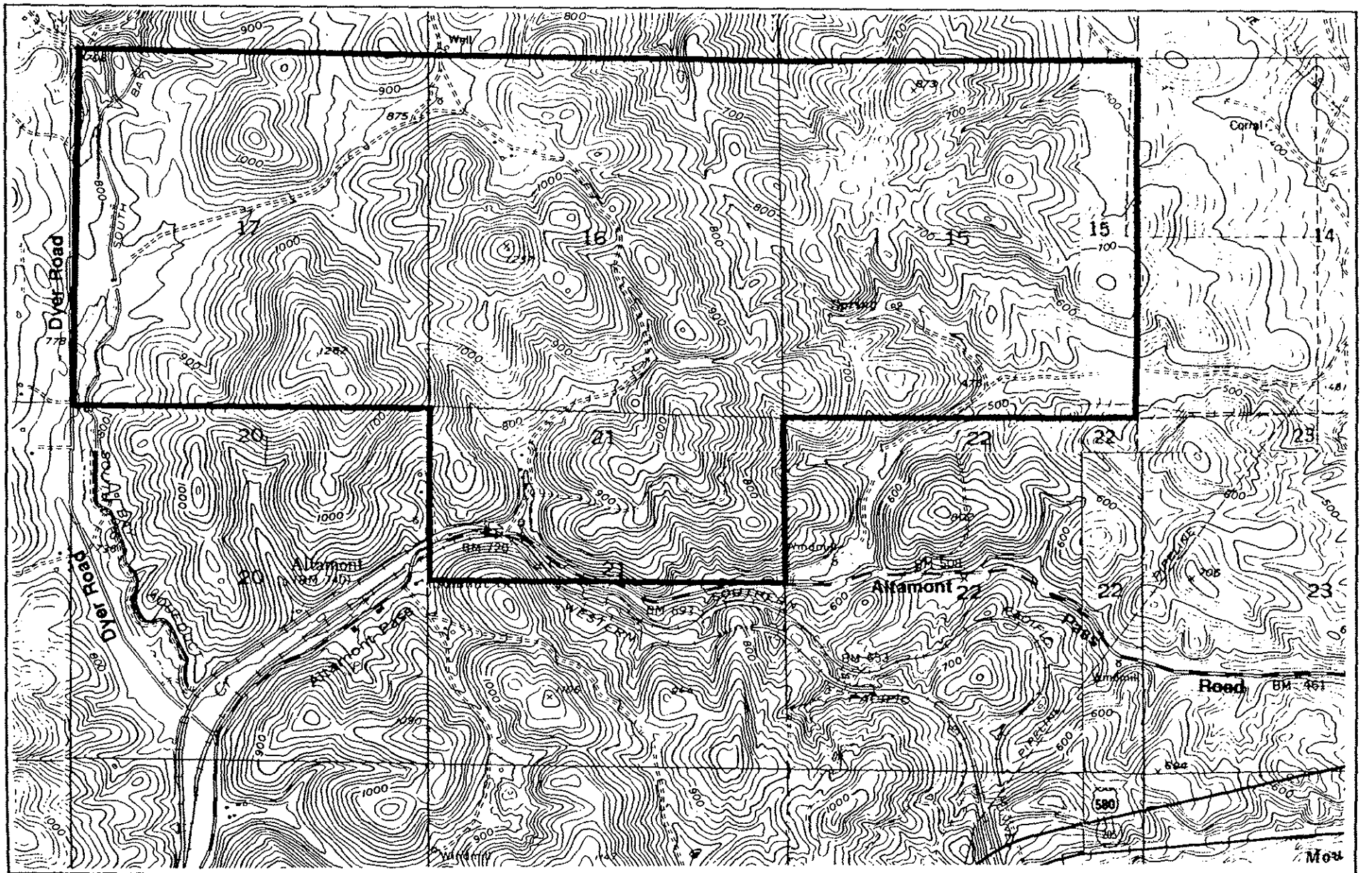

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Figure 2

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Scale in Feet

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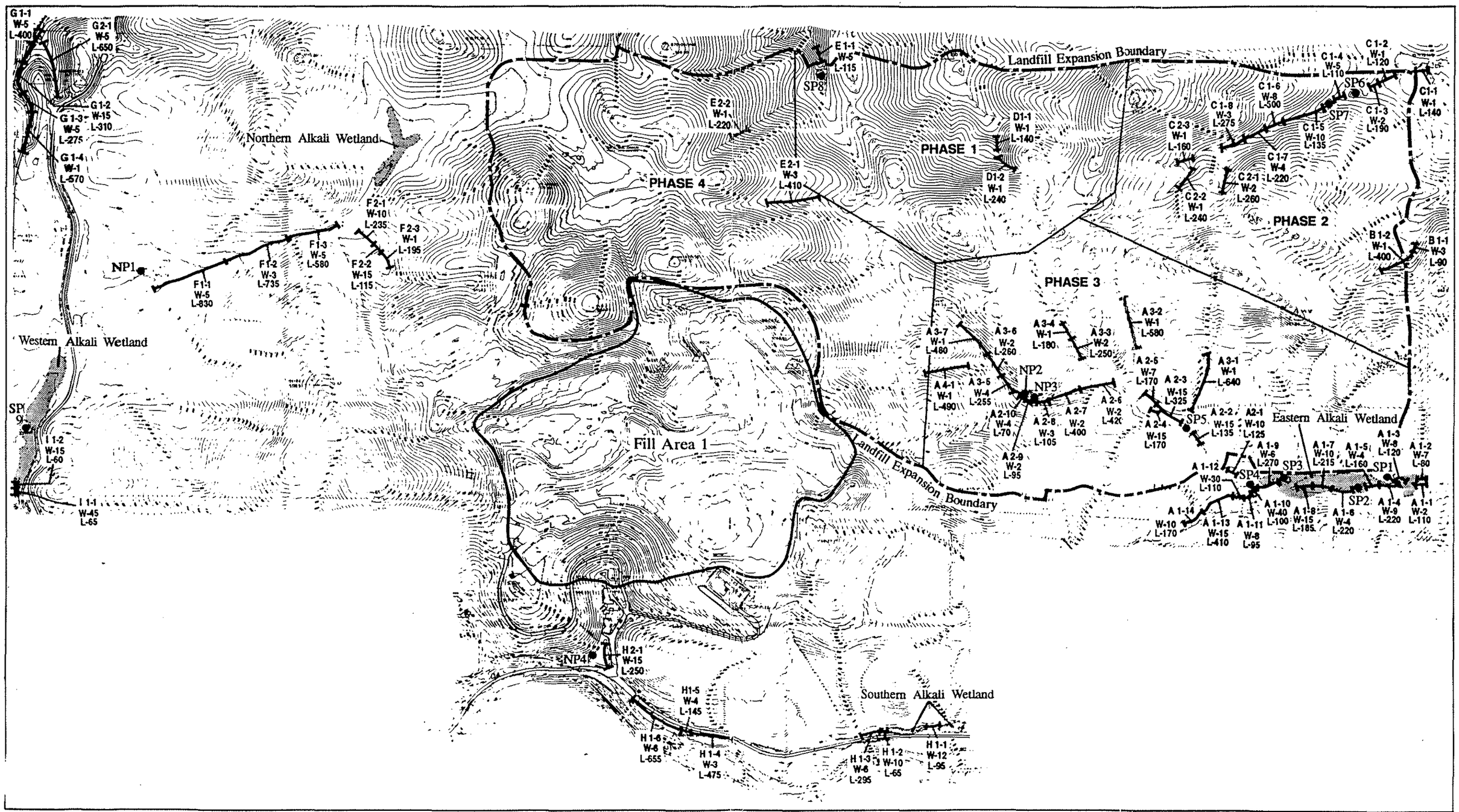
Project Site Boundary



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Scale in Feet
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Alkali Wetland
NP1 Natural Pond
SP1 Stock Pond

A1-2 — Drainage Designation
W-4 — Width of Segment
L-375 — Length of Segment
Stream Order
Stream Segment

Figure 3

Existing Jurisdictional Wetlands and Landfill Expansion Boundary

0717

Part 328.3(e)) or the limit of adjacent wetlands (33 CFR Part 328.3(b)). Waters of the U.S. located above headwaters may be eligible for Nationwide Permit #26.

A jurisdictional delineation of the site was completed by LSA on January 18, 1993 and verified by the Corps on April 7, 1993. The results of that analysis revealed that the total jurisdictional area on the property equals 19.3 acres of waters of the United States, composed of the following wetland types:

Alkali Wetlands	15.3 acres
Watercourses	2.1 acres
Stock Ponds	1.7 acres
Natural Ponding Areas	0.2 acres
	19.3 acres

Wetland types which will be impacted within the Altamont expansion area include watercourses, stock ponds and natural ponding areas. Figure 3 shows the location of existing wetlands at the landfill property, including those within the proposed Altamont expansion area. The alkali wetlands, representing the most valuable wetland type on the site, will not be impacted.

Responsible Parties

Waste Management of Alameda County
Administrative Offices
172 98th Avenue
Oakland, CA 94603-1004
Representative: Mr. Richard Thompson

Jurisdictional Areas to be Filled

Expansion of disposal operations at the Altamont Landfill would result in the elimination of approximately 1.67 acres of waters and wetlands of the United States over the life of the ALRRF project. This includes impacts to three wetland types:

- **Watercourse Segments** (0.66 acres). This includes drainages and watercourses which exhibit evidence of annual flow in the form of scour caused by runoff during and after winter storms.

- **Stock Ponds** (0.99 acres). Four stock ponds will be impacted, which are artificial impoundments where the limit of jurisdiction was delineated at the high water mark.

- **Natural Ponding Areas** (0.02 acres). Two naturally occurring ponding areas will be impacted; these include one seasonal pool

occurring within a drainage, and one perennial seep which provides year-round moisture to the watercourses immediately downstream of the spring.

This loss will be mitigated by the creation of 2.5 acres of seasonal wetlands with ponding areas in the western portion of the site, which will not be impacted by development.

Phasing

Operation of the ALRRF is anticipated to occur over a 41-year time period. The Altamont expansion area will be filled in four phases, with impacts occurring during each phase. Table A indicates the proposed phase and impacts expected to occur during each phase. Impacts to the site's wetlands are expected to be minimal during the first phase of development (0.01 acre) and the implementation of Phase 2 will not commence for a minimum of approximately four years. However, the 1.5:1 mitigation plan involving four seasonal wetlands with ponding areas will be implemented concurrent with Phase 1 of the ALRRF project to minimize temporal loss of wetlands.

As habitat replacement for the California tiger salamander, four other ponding areas will be created during Phase 2 of project implementation at an offsite location in conjunction with San Joaquin kit fox mitigation requirements. Therefore, there will be no overall loss in number of jurisdictional and non-jurisdictional seasonal waterbodies due to the ALRRF project. Further information on habitat mitigation for impacts to California tiger salamander is presented in *Altamont Recycling and Disposal Facility Biological Assessment* (Biological Assessment) prepared by LSA, dated February 1993.

The establishment of the 2.5 acres of seasonal wetlands with ponding regions will commence at the beginning of Phase 1 of the ALRRF project. Construction will begin pending project approval and acquisition of necessary permits. It is anticipated that successful habitat creation and establishment can occur within five years.

Table A - Phases of Operation and Anticipated Impacts

Phase	Construction Begins	Acreage Impact
1	2000	0.01
2	2004	0.80
3	2010	0.56
4	2026	0.30
Total Impact to Waters of the United States		**1.67**

NOTE: Above estimates reflect maximum estimated waste disposal amounts. Lower volumes of waste will result in longer time periods for each phase.

GOAL OF MITIGATION

The overall goal of mitigation at this site is to ensure that no net loss of aquatic area or functional value will occur due to the ALRRF project. The specific objectives to achieve this goal include 1) avoidance and protection, to the extent feasible, of the majority of the existing wetlands and watercourses, including all of the site's alkali wetlands, and 2) the replacement of those waters of the United States which are impacted in the Altamont expansion area with created wetlands that are expected to provide hydrology and vegetation functions and values comparable to or better than the filled areas.

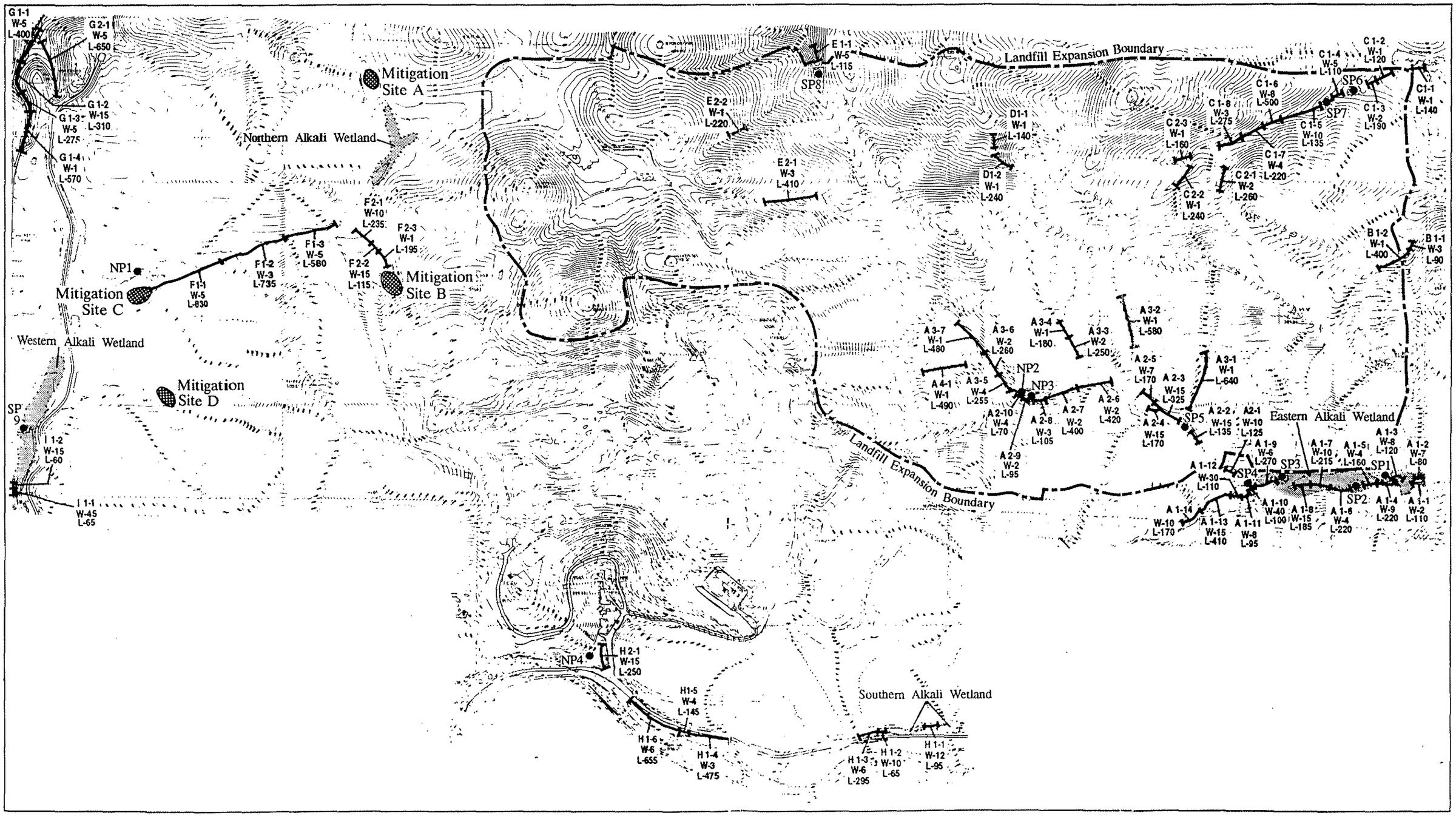
AVOIDANCE AND PROTECTION

The ALRRF project has been designed to avoid fill of most of the site's existing wetlands, ponding areas, and watercourses. The project design also avoids disturbing the alkali wetlands, which have the greatest vegetative diversity on the site. Of the total acreage (19.3 acres) of waters of the United States on the site, approximately 91 percent (17.3 acres) will be avoided by the project.

Existing wetlands that are not proposed to be filled will be protected with buffers, berms and/or fencing to minimize disturbance and surface runoff. These protection measures will be constructed outside the wetlands to limit intrusion by substances that can be harmful to aquatic wildlife.

TYPE OF HABITAT TO BE CREATED

Wetland compensation will occur by creating 2.5 acres of seasonally inundated wetlands with ponding areas in four locations by intercepting and containing watercourse and sheet flow surface runoff (Figure 4). A variety of plant materials native to the existing on-site wetlands will be utilized to vegetate the created wetlands. These new wetlands will be designed, through hydrology and vegetation considerations, to foster greater biodiversity than the impacted wetlands, thereby ensuring that the habitat value is adequately replaced.



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Scale in Feet

0 1025

Mitigation Site

Alkali Wetland

NP1 Natural Pond

SP1 Stock Pond

Drainage Designation
Stream Order
Stream Segment
A1-2
W-4 — Width of Segment
L-375 — Length of Segment

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Figure 4

Existing Jurisdictional Wetlands and Proposed Mitigation Sites

SETTING

HYDROLOGY

Drainage on the property consists of a network of intermittent and ephemeral watercourses that flow from the highest elevations at the center of the property outward in all directions. Most of these watercourses do not flow outside of the winter months and water was observed in only one of them when the site was delineated during July 1992. Several of the drainages have been dammed to create stock ponds which generally contain water for most of the year.

VEGETATION

Grassland

Non-native annual grassland dominated by soft chess (*Bromus hordeaceuos*) and slender oats (*Avena barbata*) is the predominant vegetation type in upland portions of the property. These two plant species were also common within many watercourses and drainage segments.

Natural Ponding Areas

Small natural ponding areas on the site support several plant species dependent on permanent or nearly permanent water sources. Dominant vegetation includes monkey-flower (*Mimulus guttatus*), curly dock (*Rumex crispus*), hedge nettle (*Stachys* sp.), and water-cress (*Rorippa nasturtium-aquaticum*).

Stock Ponds

The stock ponds are predominantly barren in their bottoms, although edges generally support grassland vegetation as the pond dries. However, Stock Pond 7 located in the expansion footprint supports emergent vegetation including cattails (*Typha* sp.).

Alkali Wetlands

There are four large alkali wetlands on the site occurring in valleys on the eastern, northern, and southern edges of the project site. The alkali meadow is a special-status natural community, considered rare in California because of its limited distribution. Typical species included alkali-heath (*Frankenia grandifolia*), saltgrass (*Distichlis spicata*), Baltic rush (*Juncus balticus*), and dwarf peppergrass (*Lepidium oxycarpum*). Non-native vegetation within the alkali wetlands includes Mediterranean barley (*Hordeum hystrix*) and Italian

ryegrass (*Lolium multiflorum*). None of these alkali wetlands will be impacted by the landfill development.

The Northern Alkali Wetland is located south of Mitigation Site A and north of Mitigation Site B (Figure 4). This 2.6-acre wetland occurs within a large flat valley area, receiving sheet flow runoff from all directions. Dominant vegetation includes meadow barley (*Hordeum brachyantherum*) and spikeweed (*Hemizonia pungens*).

The Western Alkali Wetland is located west of Mitigation Sites C and D (Figure 4). Equal to approximately 4.95 acres in size, the wetland is located in a topographically low area of the site and receives runoff from the surrounding hills. Vegetation was dominated by rabbitsfoot grass (*Polypogon monspeliensis*), bird's foot trefoil (*Lotus corniculatus*), alkali heath, Baltic rush, meadow barley, saltgrass and spikeweed.

SOILS

The USDA Soil Conservation Service (SCS) mapped two soil series in the survey area. The following descriptions of these soils are adapted from the *Soil Survey of Alameda County, California* (USDA Soil Conservation Service, 1977).

Altamont clay is the primary soil in the project area. This soil is 40 to 60 inches deep, has very slow permeability, is well drained, and has high shrink-swell potential. It is classified as a fine, montmorillonitic, thermic, Typic Chromoxerert. Altamont soils form in small drainages over shale or soft sandstone. Altamont is classified as non-hydric by the SCS.

Pescadero clay loam occurs in some of the larger valley bottoms. This soil is deep, has slow permeability, and is poorly drained. It is classified as a fine, montmorillonitic, thermic, Aquic Natrixeralf. This soil forms in inland valleys in alluvium from sedimentary rock. Pescadero is classified as hydric by the SCS.

WILDLIFE

A biological assessment was previously conducted on the site; results were presented in *Altamont Sanitary Landfill Expansion, Biological Resource Study* (Leitner and Leitner, 1992). This study, coupled with additional field surveys, is summarized in the *Biological Assessment* (LSA 1994). These documents include detailed assessments of existing wildlife and sensitive species at the site.

Wildlife inhabiting the study area are typical of grassland habitat in the Inner Coast Range. A list of species observed on the project site is contained in the *Biological Assessment*. The number of wildlife species present is relatively

low because the project site is dominated by a single vegetation type composed of non-native grassland. Only a few trees are present on the project site to provide nesting habitat. The rock outcrops are small and provide little potential for nesting or denning.

Amphibians expected on the project site include California tiger salamanders (*Ambystoma californiense*), California slender salamander, (*Batrachoseps attenuatus),* Pacific treefrogs (*Pseudacris regilla*), and western toad (*Bufo boreas*). The ponding areas on the project site provide breeding habitat for amphibians. Because they are seasonal waterbodies, amphibians which require permanent water are not expected to occur. The two amphibian species observed on the project site, Pacific treefrogs (*Pseudacris regilla*) and California tiger salamanders (*Ambystoma californiense*), are able to breed in seasonal ponds.

Reptiles observed or expected on the project site include the western fence lizard (*Sceloporus occidentalis*), Gilbert skink (*Eumeces gilberti*), gopher snake (*Pituophis melanaoleucus*), racer (*Coluber constrictor*), and western rattlesnake (*Crotalus viridis*).

Several ground nesting bird species typical of grasslands were observed on the site. These include western meadowlarks (*Sturnella neglecta*), savanna sparrows (*Passerculus sandwichensis*), and California horned larks (*Eremophila alpestris*). Mixed flocks of Brewer's blackbird (*Euphagus cyanocephalus*), and red-winged blackbird (*Agelaius phoeniceus*) forage in grasslands on-site. Rock wrens (*Salpinctes obsoletus*) were observed in the larger rock outcrops and house finches (*Carpodacus mexicanus*), European starlings (*Sturnus vulgaris*), and western kingbird (*Tyrannus verticalis*) were observed near the ranch buildings and associated trees.

Resident, migrant and overwintering raptors which may be present include golden eagle (*Aquila chrysaetos*), prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), and burrowing owl (*Speotyto cunicularia*).

SENSITIVE SPECIES

The site was surveyed by Leitner and Leitner (1992) for the presence of 11 special status plant species, as well as 17 special status wildlife species. The site was subsequently studied by LSA biologists in 1993 (see *Biological Assessment*). Results of these surveys indicate that no special status plants occur at the site. Five sensitive vertebrate species may be impacted by project development, including San Joaquin kit fox, California tiger salamander, ferruginous hawk, loggerhead shrike, and California horned lark. Of these species, only the California tiger salamander is wetland dependent, and habitat mitigation is therefore included as a component of this mitigation plan.

California Tiger Salamander

The California tiger salamander is a federal category 2 candidate and a California species of special concern. They inhabit grassland, savanna or deciduous oak woodland environments that contain ponds, pools, intermittent streams or stock ponds. The adults lay their eggs in these wetlands, which are devoid of fish or other predators such as bullfrogs.

The project proposes to fill four jurisdictional stock ponds, 5, 6, 7 and 8, as well as two jurisdictional natural ponding areas, 2 and 3 (Figure 4). While the Leitner and Leitner report identified two ponds within the impact area where the species were present (Ponds SP6 and SP8), LSA biologists have concluded that all the waterbodies on the site provide potential habitat for the salamander.

PROPOSED MITIGATION

LOCATION AND SIZE OF MITIGATION AREA

As shown in Figure 4, the mitigation sites totaling 2.5 acres consist of four seasonal wetlands designed with ponding areas. All sites are within the proposed habitat replacement area for the San Joaquin kit fox (see *Biological Assessment*), so that the compensatory wetlands, upland buffer areas, existing watercourses, stock ponds and alkali wetlands will all be preserved within a management area to support endemic species. The habitat replacement area has sufficient surrounding upland buffer to support California tiger salamanders.

Ownership Status

All mitigation to address impacts to jurisdictional waters and wetlands of the United States will take place onsite in the western portion of the project site outside of the Altamont expansion area on lands owned by the Applicant.

CALIFORNIA TIGER SALAMANDER MITIGATION CONCEPT

The western portion of the landfill property will also be used as the mitigation area for the California tiger salamander. The use of this area for both kit fox and tiger salamander habitat replacement is not inconsistent, as there is no conflict between the habitat requirements and management needs of the two species. The six jurisdictional stock ponds and natural ponding areas affected by the proposed project will be replaced with four ponding areas on the Altamont Landfill property, at a 1.5:1 acreage ratio (to satisfy jurisdictional area impacts), and four additional off-site ponding areas on land to be acquired by the Applicant for Phase 2 kit fox habitat mitigation requirements. All ponding areas established for mitigation purposes will be surrounded with suitable upland habitat. The two existing ponds in the western portion of the property have been identified as supporting breeding California tiger salamanders, validating the use of proposed mitigation area for suitable habitat.

Additional detailed guidelines for the establishment of California tiger salamander are contained in the *Biological Assessment* and are summarized briefly below.

Existing Breeding Habitat

Stock pond 9 and natural ponding area 1 are existing seasonal wetlands within the western portion of the property. Both ponding areas represent good habitat for California tiger salamanders and supported breeding population in 1992 (LSA 1994).

The existing ponds will be maintained as tiger salamander breeding sites by protecting the ponds and preserving the adjacent upland habitat.

Proposed Breeding Habitat

Four constructed seasonal wetlands with ponding areas having a combined area of 2.5 acres are proposed to compensate for the loss of waters and wetlands of the United States, including California tiger salamander breeding habitat within the Altamont expansion area.

Prior to the introduction of tiger salamander larvae, each of the newly constructed wetlands will be inspected for the presence of tiger salamander eggs and sampled by dip net and seine in mid-February and mid-March to determine if adult salamanders in the area naturally colonized and bred in the ponding areas. Tiger salamander larvae from existing ponds will be introduced into any newly created ponding areas which do not have larvae present by mid-March. An introduction of fifty to one hundred larvae will occur in each of the first two years after pond construction to establish new breeding populations. If tiger salamanders do occur in any of the newly created ponding areas, the population will be supplemented with additional larvae from existing ponds to achieve the desired density. The introduction of California tiger salamander larvae to newly created ponding areas will be done when the larvae are small in order for them to become acclimated to their new environment.

IMPLEMENTATION

Within three months of project approval, a detailed mitigation plan will be submitted for Corps of Engineers approval which includes the following: specific locations of existing wetlands, including buffer areas; the specific location of wetlands to be created; typical cross sections showing construction techniques and soil profiles in the created wetlands; plant species composition and revegetation techniques; and a detailed monitoring component, which will include post-construction drawings, hydrologic and vegetative monitoring criteria, and contingency plans.

RESPONSIBLE PARTIES FOR PLAN IMPLEMENTATION

All work will be completed by qualified biologists and restoration specialists with expertise in wetland mitigation as well as habitat creation and lifecycle of the California tiger salamander. All work will be performed under the direction of a Waste Management of Alameda County representative.

GENERAL CONSTRUCTION GUIDELINES

In general, the mitigation sites receive flows as a result of seasonal surface runoff or from existing seeps. To determine the appropriate berm heights to achieve the desired amount of ponding, the existing hydrology of the mitigation site will be analyzed to determine the runoff volume from the watersheds. Pond bottom contours and hydrology will be designed so that 1) it will contain ponded water for at least four months in a median rainfall year, considering evapotranspiration and percolation losses and 2) it will fill in a median year. If the analysis indicates that the ponding area does not fill in a median year and/or will not hold water in a median year, then modifications such as deepening or lining the pond bottom will be incorporated. The ponding areas will be designed to dry out in normal rainfall years, preventing long-term establishment of fish or bullfrogs. The ponding areas will also be constructed so that they can be drained under unusually wet conditions as a management measure to avoid predation by fish or bullfrogs.

Soils will be investigated at each ponding area to determine permeabilities. This information will be used to evaluate the need for compaction and/or appropriate pond lining techniques to achieve hydrologic specifications.

All existing wetlands and mitigation areas will be fenced prior to and during construction activities to minimize the potential for inadvertent construction-related impacts. Following construction, all mitigation sites will be separated from active landfill areas by fencing. The exact design of the fencing will be the responsibility of the landfill operator; however, it must be sufficient to preclude access by off-road vehicles.

Seasonal Wetland Creation

Creation Concept

Four seasonal wetlands will be created, two containing approximately 0.75 acre, and two containing 0.5 acre, within low-lying areas of the watershed. The seasonal wetlands will be designed so that portions of the area will pond water for approximately four months. These seasonal wetlands will be created to replace the 1.67 acres of watercourses and ponding areas that will be impacted by project development.

The seasonal wetlands will be created at several locations on the property. Mitigation Site A will be constructed within a small drainage on the site and designed to intercept surrounding runoff (Figure 5). Mitigation Site B will be constructed at the base of a drainage that currently contains a soil stockpile for the existing landfill operation; once Phase 1 begins and the mitigation plan is implemented, the stockpile will have been removed (Figure 6). Mitigation Site C will be located at the end of an existing jurisdictional stream segment and will be designed to retain water flowing down the drainage (Figure 7). Mitigation Site D will be constructed at the base of two poorly defined drainages and will retain water due to berm and pond construction (Figure 8).

Each mitigation site will be equipped with a water control structure located at a level that will allow water to be retained on a seasonal basis, for the appropriate management of the California tiger salamander. These areas will be seeded with native herbaceous wetland species which reflect the mix of species present within the existing wetlands.

Hydrologic Measures

Approximately 2.5 acres of seasonal wetlands with ponding regions will be constructed. Of this total, 0.8 acre will be designed to pond water, representing approximately one-third of the area of each mitigation site. The ponding areas will range in size from 0.17 to 0.23 acre, similar to the sizes of stockponds and natural ponding areas filled by the project.

The replacement wetlands will be designed so that portions will pond water to a depth of approximately three feet. The ponding areas will also be designed to retain water for at least four months of the year to accommodate salamander breeding requirements.

Site Preparation and Grading

Grading activities will consist of stockpiling existing wetland and upland soils which are removed during construction, and subsequent emplacement in the replacement wetlands. The top four inches of topsoil from stockponds and

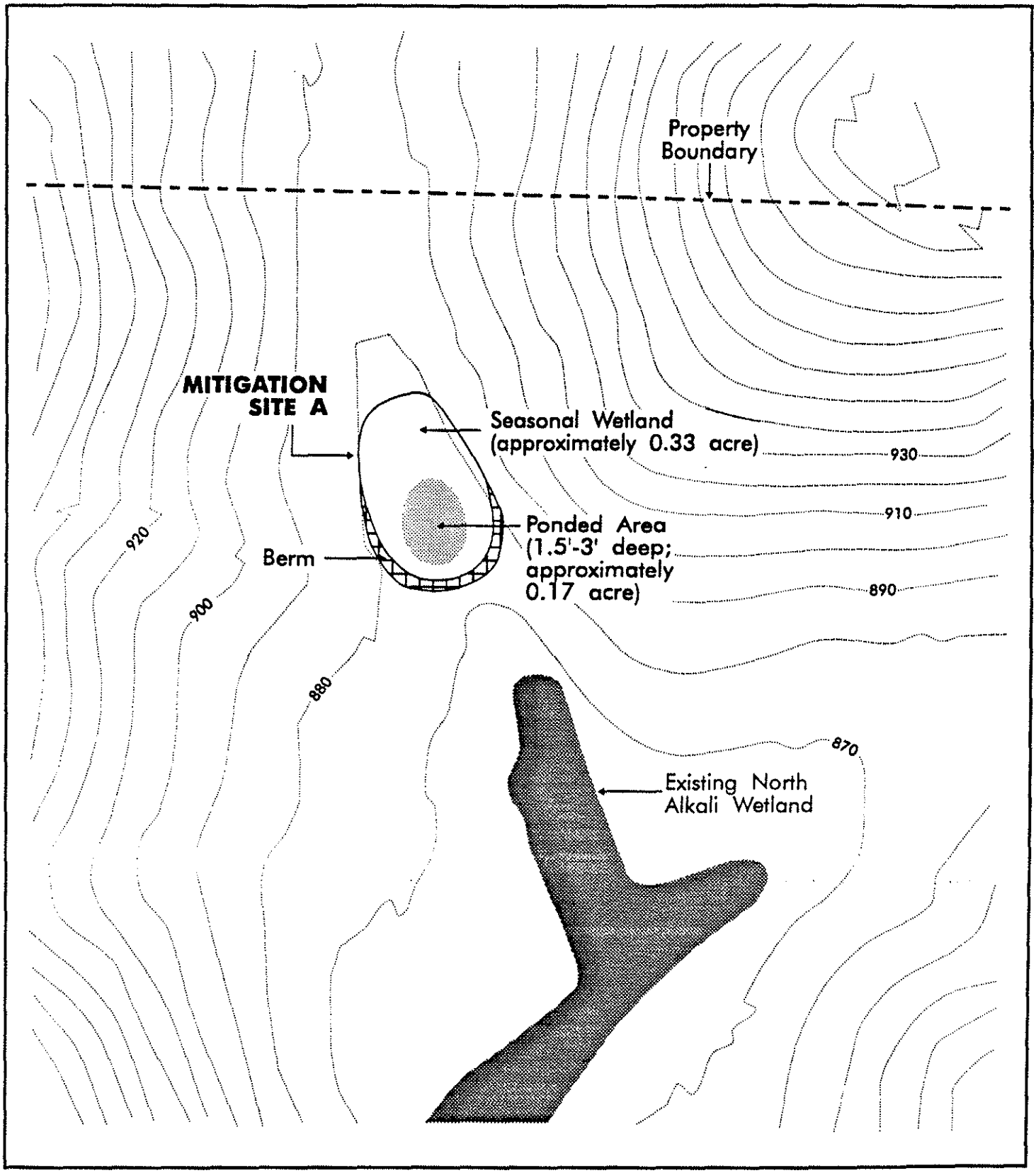

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Figure 5

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Mitigation Area A:
Conceptual Plan View

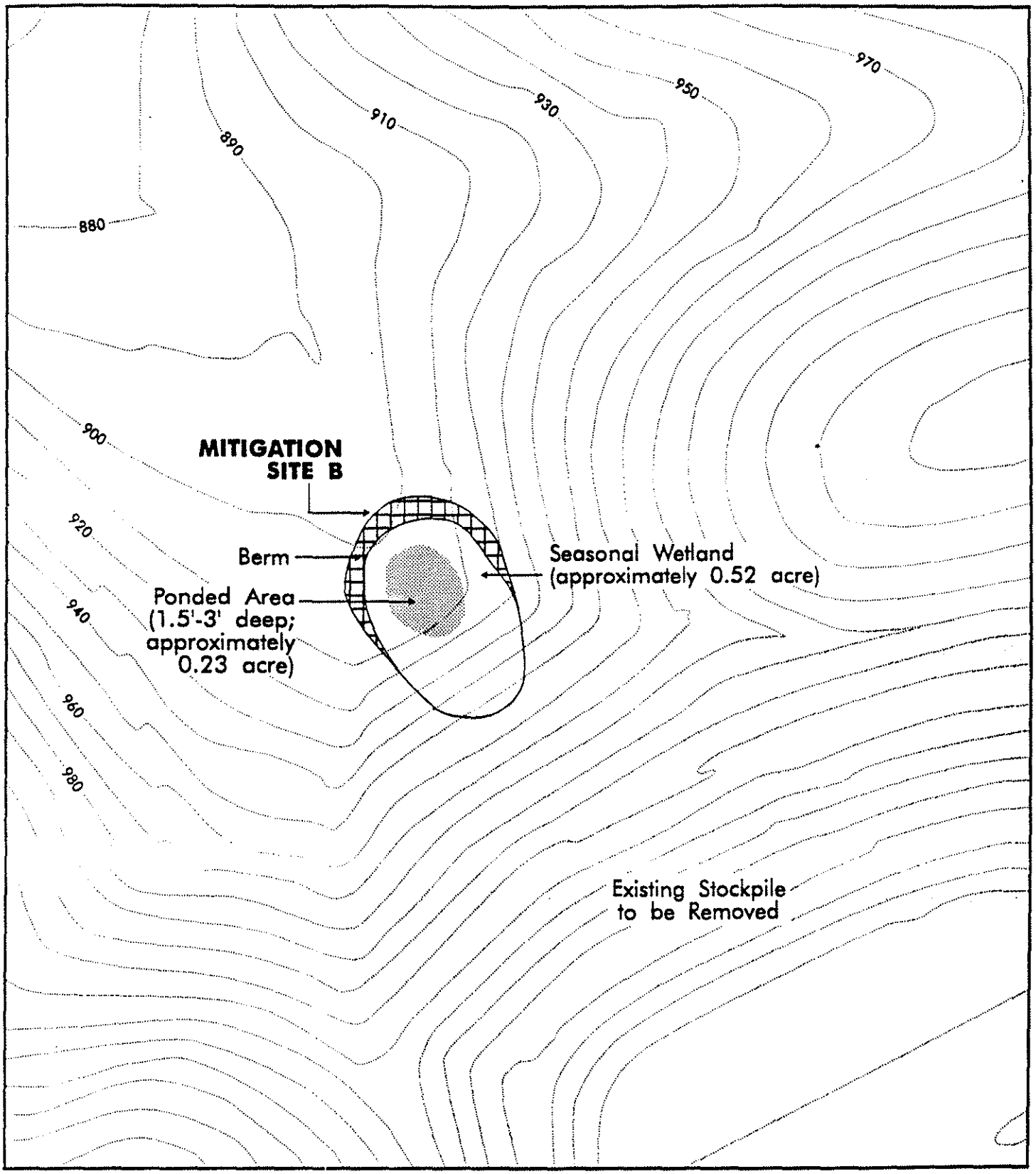

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Figure 6

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Mitigation Area B:
Conceptual Plan View

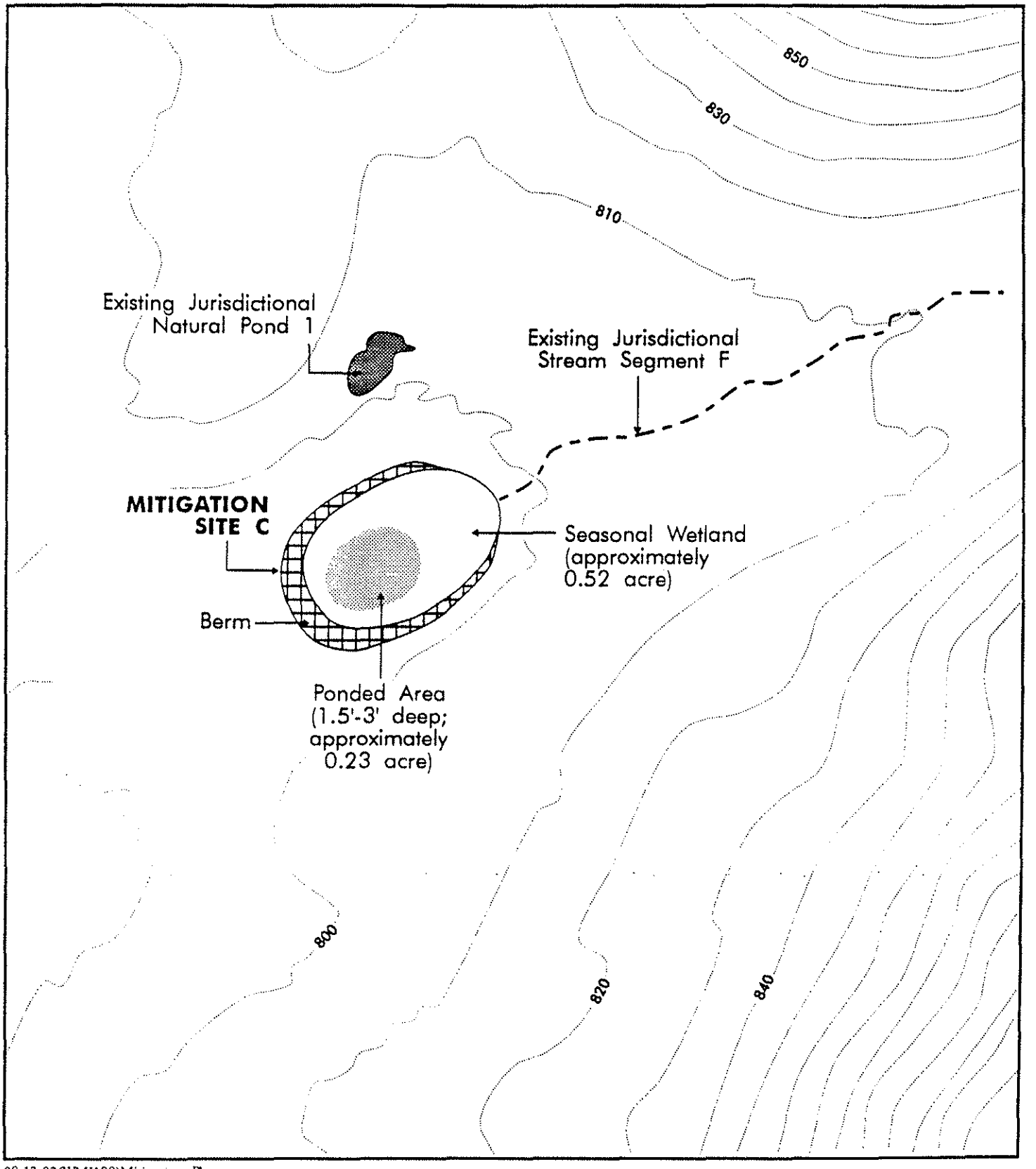

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Figure 7

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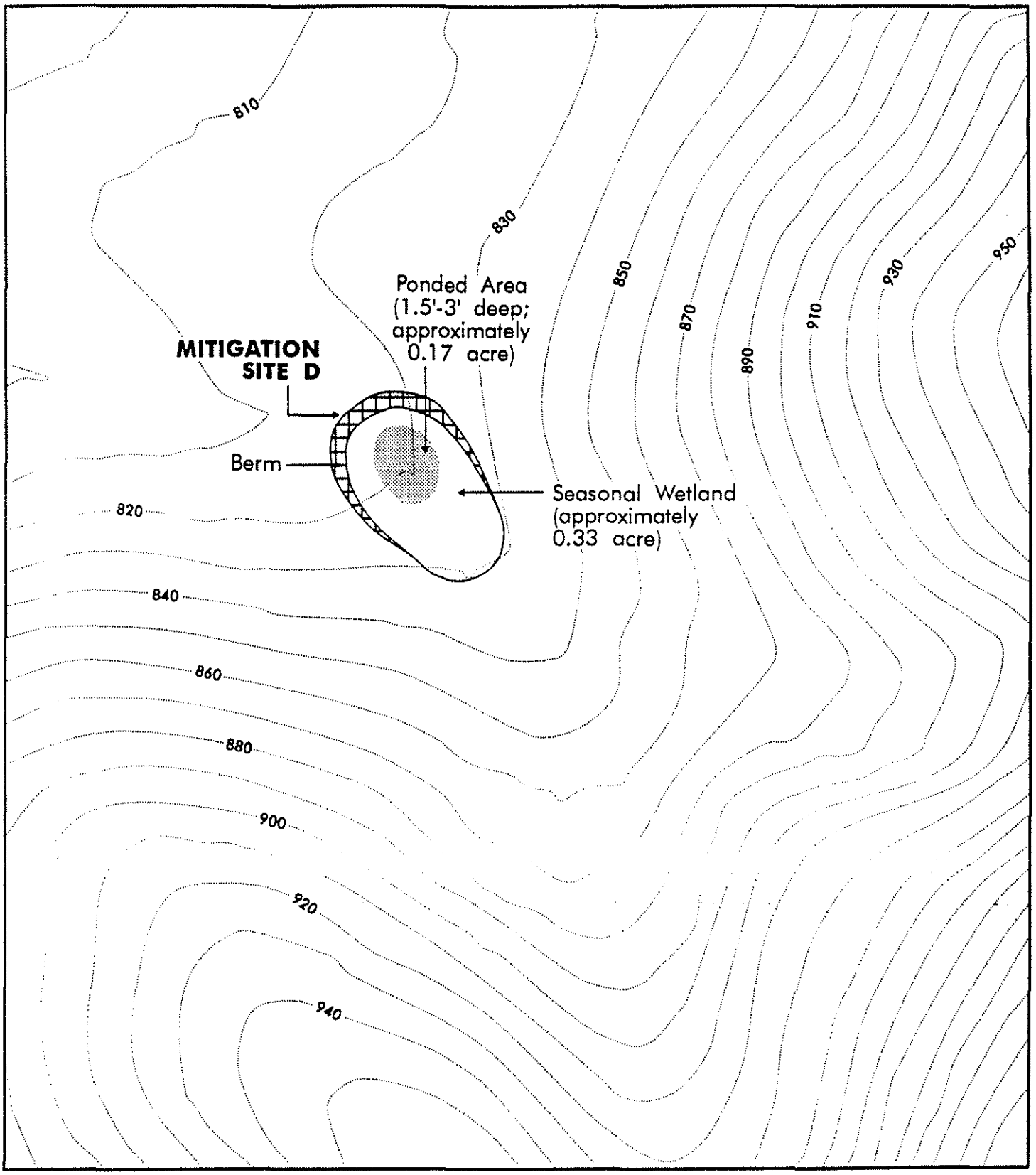
Mitigation Area C:
Conceptual Plan View



11-15-93(WMI108)Mitigation Plan

Figure 8

N

LSA

Not to scale

Mitigation Area D:
Conceptual Plan View

natural ponding areas to be filled will be stripped, salvaged, and separately stockpiled for emplacement as a source of seeds, invertebrate eggs and desirable aquatic species. The remaining one- to two- feet of topsoil will then be salvaged and stockpiled for use in creation of the wetlands. The topsoil stockpiles will be protected with silt fencing until it is utilized. Measures will be implemented to ensure that the stockpiled soil is protected from climatic extremes. Such measures include periodic watering or the use of a stockpile cover to prevent desiccation.

The seasonal wetlands with ponding areas will be excavated, and berms will be constructed using excess on-site material (Figure 9). The ponding areas will be contoured as relatively flat basins with maximum 4:1 sideslopes around the basin edges and on the berm faces. The berms will be designed so that the ponding areas exhibit the desired hydroperiod. If necessary, ponding areas will be sealed or lined to increase the water retention capabilities of the sites. A four-inch layer of material from the wetland soil stockpile will be emplaced within the ponding areas to facilitate invertebrate transplant and to create the appropriate medium for plant establishment. A six- to twelve-inch layer of stockpiled upland topsoil will be placed in the seasonal wetland portions of the mitigation sites to provide a substrate for plant growth.

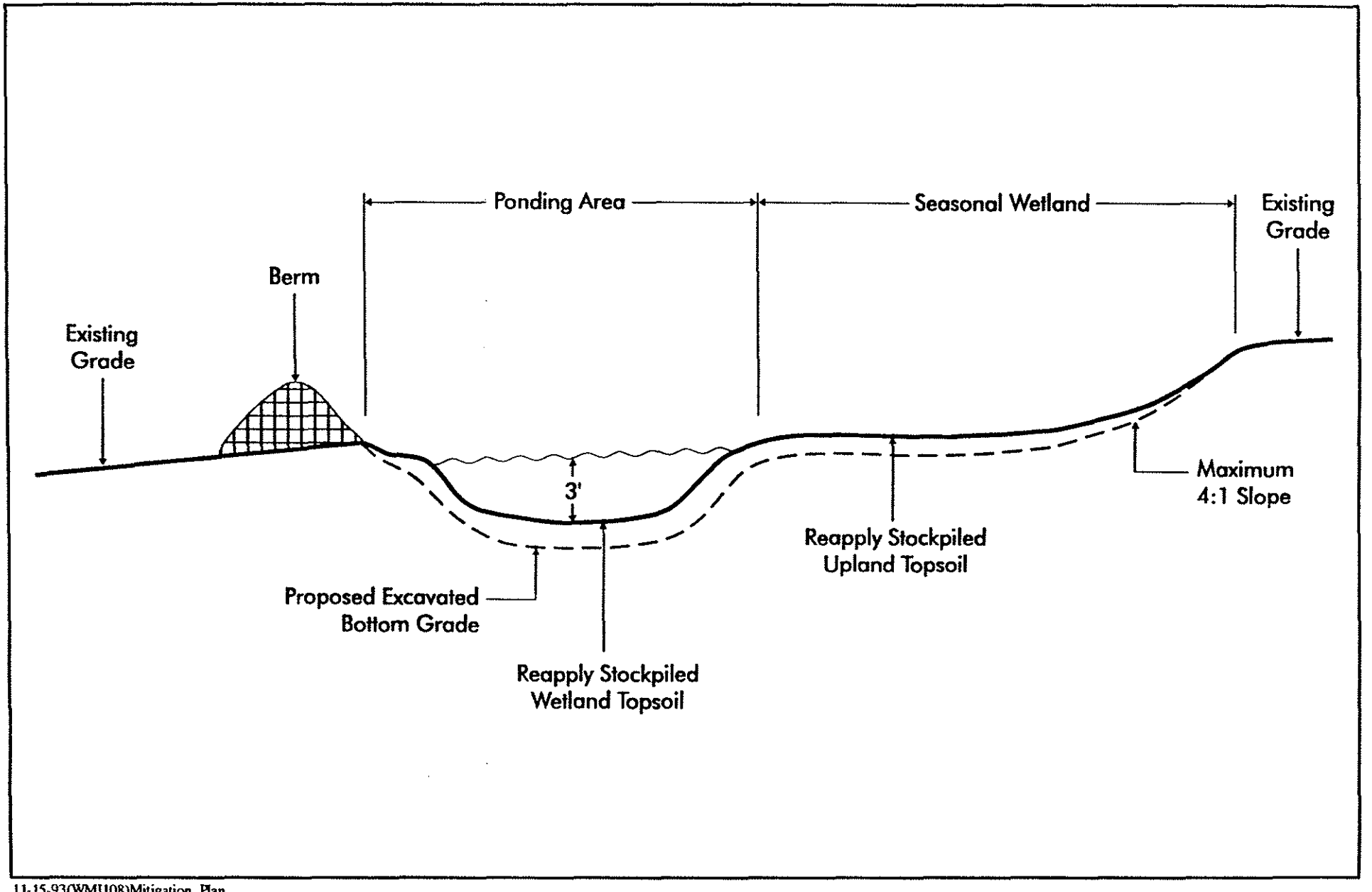
Planting Plan and Methods

The created seasonal wetlands will have a maximum depth of approximately three feet. Establishment of vegetation in the ponding areas will be accomplished by spreading wetland topsoil that is salvaged during grading operations. The topsoil will contain desirable seeds and rhizomes.

The seasonal wetland portions of the mitigation sites will be seeded and planted with hydrophytic species which are present at the site. Seeding and planting will include a mix of species as shown in Table B. Material will be planted in a mosaic configuration typical of natural habitats, while recognizing the appropriate zones for species based on anticipated hydroperiods. Where necessary, this revegetation effort will be supplemented by spreading soil scraped from the top three inches of drainages to be filled.

Irrigation

All plant material will be irrigated directly after seeding. No supplemental irrigation is proposed, as it is anticipated that water levels will be managed and seasonal inundation will provide sufficient moisture to the plants.



11-15-93(WMI108)Mitigation Plan

Figure 9

LSA Not to scale

Mitigation Sites A, B, C, and D:
Conceptual Cross Section

Table B - Seasonal Wetland Plant Species

Common Name	Scientific Name	Propagule
Baltic rush	*Juncus balticus*	Seed
Wild rye	*Elymus triticoides*	Seed
Meadow barley	*Hordeum brachyantherum*	Seed
Alkali heath	*Frankenia grandifolia*	Seed
Saltgrass	*Distichlis spicata*	5-12" diameter clumps
Monkey flower	*Mimulus guttatus*	5-12" diameter clumps

MONITORING PLAN

The new seasonal wetlands will be monitored for a period of five years after installation. Annual monitoring will assess survival and health of seeded vegetation, the approximate area of seasonal wetlands, and the approximate plant cover in seasonal wetlands. Water levels in the ponding portions of the replacement wetlands will be monitored and adjusted if necessary.

Regions of the proposed seasonal wetlands will be created to replace impacted ponding areas which provide habitat for the California tiger salamander. Accordingly, monitoring and performance standards focus on maintaining a hydrologic regime suitable for the salamander's survival, as well as establishing a mix of species typical of the site's existing ponding areas.

SITE MANAGEMENT

Maintenance

During the establishment period, maintenance and monitoring of the mitigation area will be the responsibility of the Applicant. A qualified restoration specialist/biologist will be retained by the applicant to provide maintenance services to the extent necessary to meet the performance standards. Short term maintenance will include repairs to fences, basic caretaking of plant materials, and weed eradication, either by hand or hand application of an herbicide labeled for such use.

Protection from Disturbance

The design of the mitigation plan incorporates a large upland area surrounding the created and preserved wetlands to provide habitat for the California tiger salamander, as well as other wildlife populations using the preserved and created wetlands. Existing wetlands which are to be preserved will be fenced during construction to avoid construction impacts.

The mitigation sites will be fenced and signs will be posted to prevent inadvertent intrusion from livestock and humans. These signs will be constructed of heavy ply aluminum and should read: **Protected Mitigation Site - Do Not Enter**.

Sedimentation/Erosion

Erosion protection, such as biotechnical slope protection (coir or jute blanket), riprap, or other effective techniques will be incorporated into the design where concentrated flows or slopes are present.

As-Built Conditions

Upon completion of site preparation and seeding, as-built drawings will be submitted to responsible agencies, describing the installed condition of the project. The as-built report will include maps showing the location of installed plantings, as well as fencing and other improvements which delineate areas to be protected from disturbance.

MAINTENANCE DURING MONITORING PERIOD

Maintenance Activities

Maintenance will consist primarily of basic caretaking during the first five years after construction, as well as regulation of water flows to establish the optimum hydrologic regime for successful habitat establishment. Once the appropriate hydrology is established, the water control structure, such as flashboard weirs, will be permanently fixed in place. Any repairs necessary to fences, berms, erosion control and other facilities will be performed promptly if the need occurs.

If any noxious wetland weeds are detected in a replacement wetland, they will be eradicated to the maximum extent possible. Wetland weeds include giant reed (*Arundo donax*), tamarisk (*Tamarix* sp.), and perennial pepperweed (*Lepidium latifolium*). Eradication techniques may include hand removal or hand application of an herbicide labeled for such use. Broadcast spraying and mechanized plant removal may be done if the infestation involves more than 20% of the replacement wetland.

Responsible Parties

Maintenance tasks will be done under supervision of the project restoration specialist.

Schedule

Maintenance activities will occur on a bi-weekly basis for the first quarter, and on a monthly basis thereafter for the first wet season. Subsequent maintenance will occur bi-monthly during the growing season and quarterly during the dormant season. Frequency of maintenance site visits will be adjusted as necessary.

MONITORING STRATEGY

The purpose of monitoring is to either 1) document that the desired compensatory waters and wetlands have been established, or 2) identify any

shortcomings so that appropriate corrective actions can be taken. Waste Management of Alameda County will retain the services of a professional restoration specialist to perform the monitoring described below.

A restoration specialist qualified in the creation and management of freshwater wetlands and associated wildlife species will be designated to serve as the Project Monitor. The Monitor will assess compliance with the wetland mitigation plan.

The plantings and other measures will be monitored for compliance with the performance standards outlined herein. Should major corrective measures be required within the five year monitoring period, the applicant will submit a corrective action plan demonstrating how the performance standards will be achieved, or substitute an acceptable alternative plan.

Monitoring will begin following construction of the replacement wetlands during the year of permit issuance and will continue until five years after the new wetlands are created, or until the performance standards are achieved, which ever is less. The monitor will inspect the site within 30 days after the new wetlands are created, and at least quarterly during the first three years. Monitoring will occur annually thereafter, until the performance standards are achieved or for five years.

PERFORMANCE CRITERIA

Wetland Hydrology Performance Criteria

Wetland hydrology is the driving force behind wetlands, and consequently is the most important factor to be monitored. If the desired hydrologic regime is established, the created wetlands will in all likelihood exhibit wetland functions in time.

The following hydrologic performance standards will be used in the evaluation:

- The ponding areas will fill to a depth of 1-1/2 to three feet for approximately four months in a median rainfall year.

- The ponding areas will be dry for a portion of each year to facilitate management of predators.

If the ponding areas do not fill during a median rainfall year, corrective actions may include berm modification, changes to the water control structure, or reduction of the ponding area size consistent with the performance standard priorities above.

Monitoring for hydrologic function will occur at least twice annually, at the peaks of both the wet season and dry season. Maximum and minimum pool elevations will be documented, and gauges may be used for this purpose.

Vegetative Performance Criteria

Vegetation is a key component of wetlands, and greatly affects the perceived value of wetlands. Each mitigation site will be seeded with a mix of native species which are present at the site. Monitoring will assure that a sufficient mix of native species becomes established at the four sites.

The following vegetative performance standards will be used in the evaluation:

- Vegetation within the seasonal wetland portions of the mitigation sites will consist of a predominance of hydrophytes, as measured by methods outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) at permanently established locations in each created wetland.

- A minimum of three of the species from the introduced seed and plant material will be present in each mitigation site.

Vegetative monitoring will occur at least once annually, at a time when the maximum number of herbaceous species can be identified. Predominant vegetation and dominant species diversity will be documented.

Performance Standard

The above success criteria can be considered satisfied if 1) the hydrophytic vegetation and dominant species diversity standards have been met for two consecutive years, and 2) the hydrologic standard has been met for two consecutive years.

MONITORING METHODS

Installation Monitoring

As construction of the replacement wetland occurs, the monitor will visit the site as necessary to ensure that construction is being done in accordance with the specifications in this plan and in the working drawings. The restoration specialist will determine if field adjustments to the plans are necessary. If field adjustments are made, they will be documented in as-built plans or by other appropriate means.

LONG-TERM MANAGEMENT

Long-term maintenance of the mitigation program (after the establishment period) will be the responsibility of the Applicant, with the assistance of qualified consultants, until it can find a qualified agency or private organization to take over the long-term maintenance responsibility. This management entity will be selected based on its financial and technical ability to carry out the long-term maintenance requirements, and its mission commitment to goals consistent with long-term maintenance. Selection of the management entity will be subject to Corps and County approval. Maintenance will not be necessary on a regular basis, but will be limited to correcting any major problems that may occur, such as a malfunction of the inlet or outlet structures for the created seasonal wetlands.