

TECHNICAL MEMORANDUM
PLANNING LEVEL WETLAND DETERMINATION
FOR PROPOSED AGRICULTURAL IRRIGATION AREAS

TO: Joyce Hunting
Harland Bartholomew Associates, Inc.

FROM: Randy Schock
Parsons Engineering Science, Inc.

DATE: July 3, 1996

RE: Santa Rosa Subregional Long-Term Wastewater Project Planning Level Wetland
Determination for Proposed Agricultural Irrigation Areas

INTRODUCTION

Request and Authorization for the Determination

Parsons Engineering Science has been authorized by the City of Santa Rosa to perform this Planning Level Wetland Determination on nine proposed agricultural irrigation areas in support of an EIR/EIS for the Santa Rosa Subregional Long-Term Project. The results of this Planning Level Wetland Determination are preliminary and subject to U.S. Army Corps of Engineers, San Francisco District (Corps) verification.

Objectives of the Determination

The objectives of this memorandum are: 1) to map the extent of potential wetlands and other waters of the United States within proposed agricultural irrigation areas; 2) to identify important wetland types for avoidance, and 3) to identify measures to avoid or minimize impacts associated with the proposed use of reclaimed water for agricultural irrigation. This Planning Level Wetland Determination should be used in combination with other technical studies (see Table of Other Related Studies) conducted on the proposed agricultural irrigation areas to determine the sites suitable for irrigation with reclaimed water within each area. The wetland determination should also be used for the EIR/EIS to assess the potential impacts to isolated jurisdictional wetlands due to incidental irrigation and to compare the impacts in each area. Additionally, it should be used for the Section 404 (b)(1) Alternatives Analysis to demonstrate avoidance of potential jurisdictional wetlands and other waters of the U.S. Avoidance, minimization of or compensation for impacts to potential jurisdictional wetlands and other waters of the U.S. due to construction and operation of other related project facilities such as proposed reservoir storage sites, transmission and distribution pipelines, and larger pump stations are assessed in other technical memoranda.

Regional Study Area Boundaries

There are nine proposed agricultural irrigation areas that are components of Alternatives 2 and 3 and their various sub-alternatives. The boundaries of the nine agricultural irrigation areas are defined largely by watershed breaks and to a lesser degree by political/jurisdictional boundaries and major roadways (see Figures A, B and C). These nine agricultural irrigation sub-component areas include: East of Rohnert Park, Adobe Road, North of Petaluma, Lakeville, Bayflats, Stemple Creek, Americano Creek, Sebastapol and miscellaneous

areas in the City of Santa Rosa. Planning Level Wetland Determinations were conducted for all of the proposed agricultural irrigation areas.

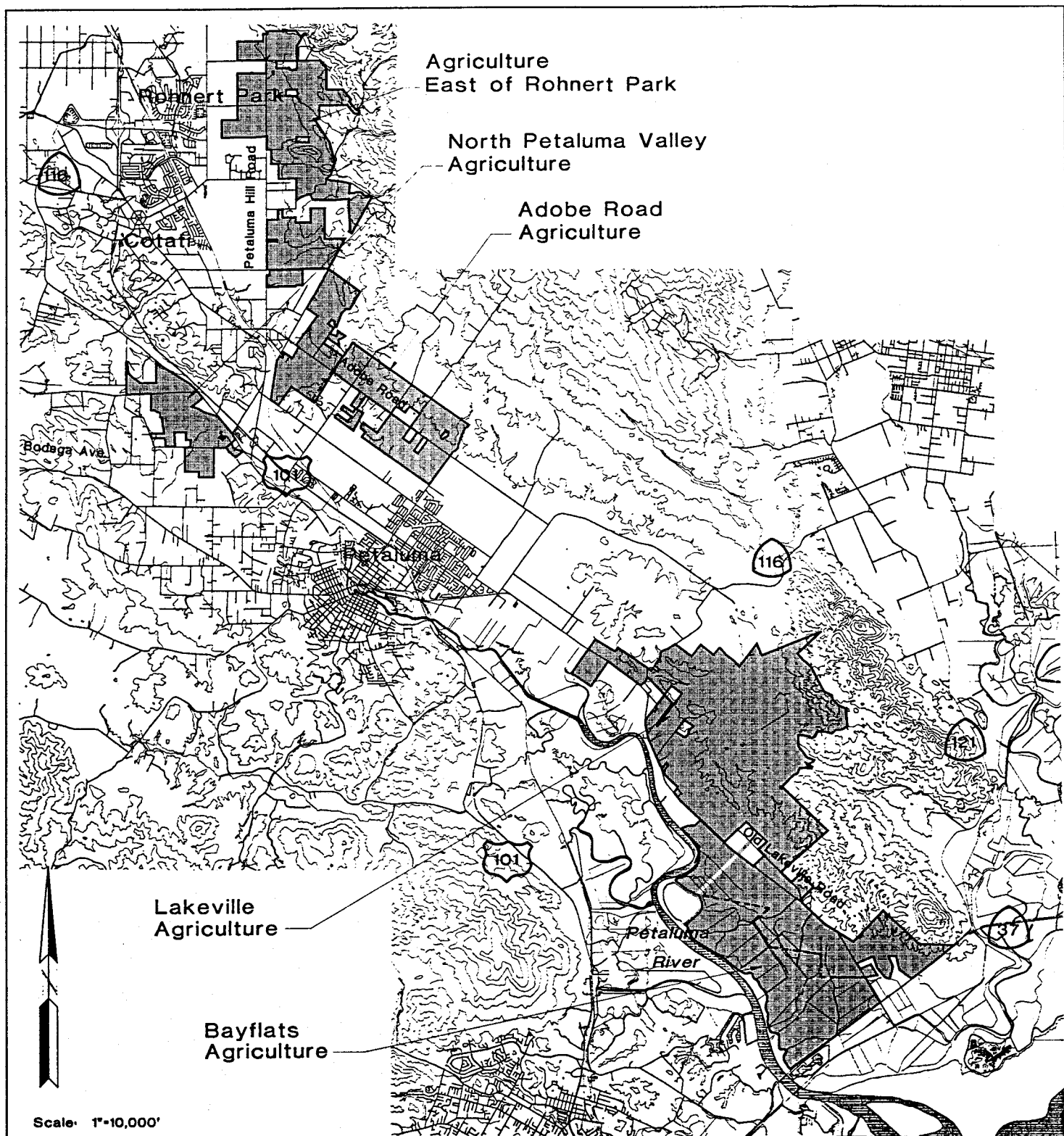
Project Approach/Irrigation Management Plan

The City has adopted a project approach that, as a condition of project design for the proposed agricultural irrigation program, reclaimed water would not be directly applied to potential jurisdictional wetlands or other waters of the U.S. The intent is to avoid potential adverse hydrologic and water quality modifications due to the application of irrigation water that (combined with agricultural management practices) could adversely affect wetlands, nearby surface waters and associated vegetation and wildlife.

Streams, creeks, and freshwater ponds, which are jurisdictional other waters of the U.S., and associated potential jurisdictional wetlands that occur along their fringe (adjacent wetlands) were excluded from the proposed agricultural areas during land use capability classification studies. Combined setbacks and grass filter strips ranging from 66 feet to 99 feet would protect these areas. Other obviously poorly drained areas with hydric soils were also excluded during the land use capability classification studies to avoid jurisdictional wetlands and prevent excessive runoff and related water quality degradation due to irrigation. However, many less distinct or smaller potential jurisdictional wetlands (isolated wetlands) remained within the areas determined to be suitable for application of reclaimed irrigation water.

Although no reclaimed irrigation water would be directly applied to potential wetland areas, it is reasonable to assume that some upslope irrigation would result in downslope surface or subsurface runoff to potential isolated wetlands (incidental irrigation). Changing the frequency, amount, seasonality, and duration of ponding or near surface saturation in isolated wetlands could result in a shift or change in the plant species composition. This may result in adverse effects to special-status plants and wildlife that inhabit or frequent these isolated wetlands. Most isolated seasonal wetlands provide only limited, if any, suitable habitat for special-status species.

The wetland plant community descriptions and names used in this analysis were based primarily on Holland (1986) and Shuford and Timossi (1989), but have been modified to be applicable to the project study area. This classification scheme for wetland plant communities and specific community descriptions was developed in coordination with the classification scheme and plant community descriptions developed by Sycamore Environmental Consultants. The text of the Planning Level Wetland Determination Report for Proposed Reservoir Sites



San Pablo Bay

HARLAND BARTHOLOMEW and ASSOCIATES, INC.

A UNIT OF PARSONS INFRASTRUCTURE and TECHNOLOGY GROUP INC.



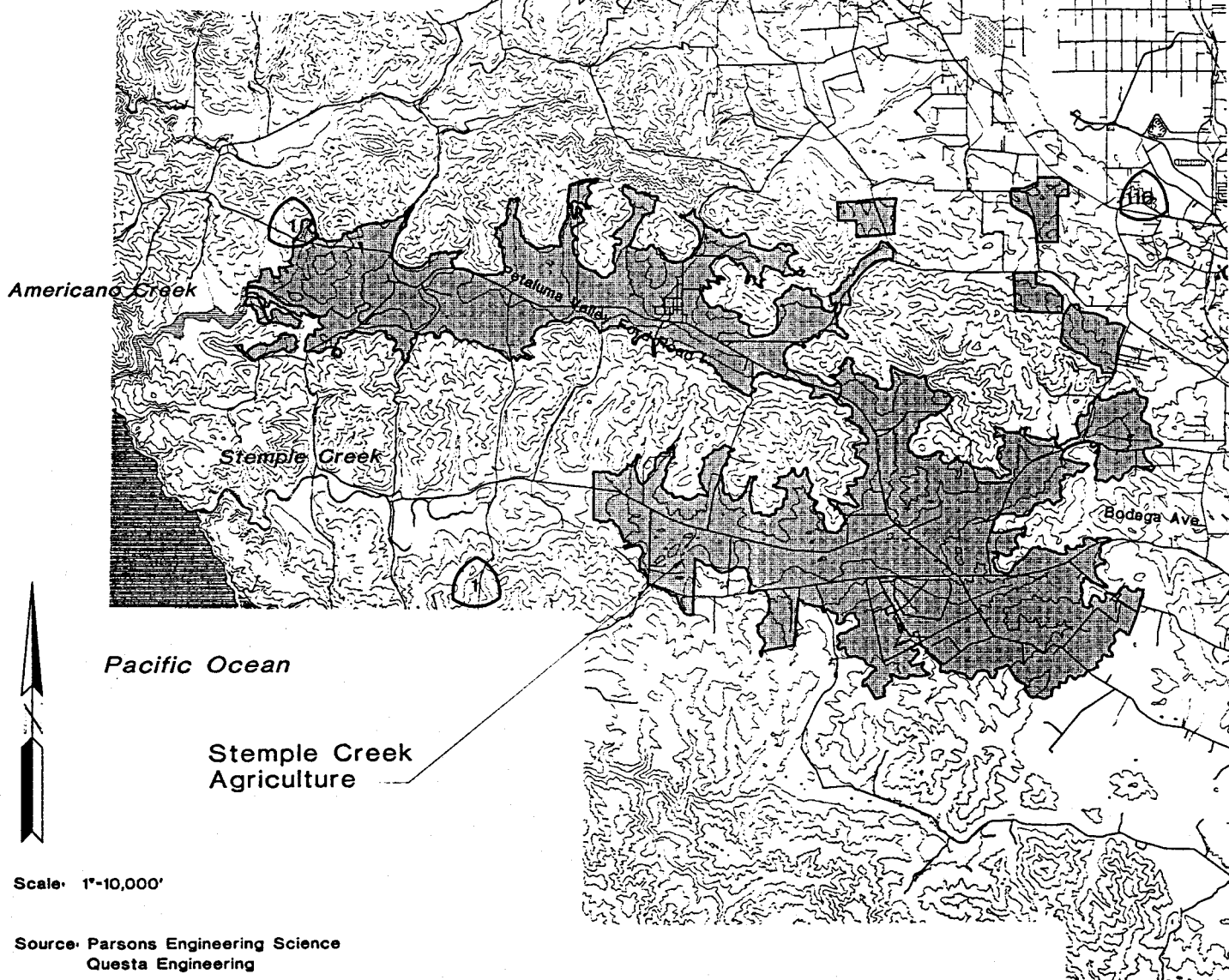
Santa Rosa

Subregional Long-Term
Wastewater Project

**SOUTH COUNTY
AGRICULTURAL
IRRIGATION AREAS**

Figure A

Americano Creek
Agriculture



(March 1996) and Biological Resources Technical Memorandum (July 1996) provides a description of the vegetative composition of each major wetland or plant community types encountered in the proposed agricultural irrigation areas.

Annual Grassland, Seasonally Wet Vegetation and Cropland wetlands, which comprise the majority of the isolated wetlands within the proposed agricultural irrigation areas, have undergone substantial modifications of vegetative cover and/or hydrologic regimes which limit their value for wildlife. However, vernal pools, a type of isolated wetland, have a high likelihood of providing suitable habitat for special-status plants, invertebrates and amphibians. The area of vernal pools within or adjacent to proposed irrigation areas is small compared to the total amount of isolated potential jurisdictional wetlands.

The City will prepare and implement an Irrigation and Conservation Management Program (ICMP) for each parcel that would receive reclaimed water for irrigation. The specific parcels participating in this program and actual irrigation layouts have yet to be determined. The program will contain measures to control the application of irrigation water and integrate irrigation with other resource management needs. Guidelines for the development of individual ICMPs are provided in the Irrigation Management Guidelines Technical Memorandum (March 1996). Measures contained in the ICMP would provide protection for potential wetland resources waters by restricting the location of distribution pipelines and pump stations to upland locations; prohibiting direct application of irrigation water to wetlands; and minimizing the potential for and amount of incidental irrigation of isolated seasonal wetlands. The individual ICMPs prepared by the City will contain, at a minimum, the following measures, which are in part related to the protection of potential jurisdictional wetlands and other waters of the U.S. and associated aquatic and semi-aquatic environments:

- Compile a Resource Map for Every Irrigation Parcel - Detailed wetland delineations would be performed for each parcel as part of the development of detailed irrigation management plans that avoid all wetlands and stream corridors. Irrigation distribution pipelines for each parcel would avoid all identified jurisdictional wetlands. A botanist/ biologist would also survey and identify any special aquatic sites or other unique biological or botanical resources associated with wetland resources.
- Restrict Surface and Subsurface Irrigation Water Runoff - Design application rates and routine flow monitoring would ensure that irrigation water is not over applied, avoid runoff to surface water bodies, and minimize incidental irrigation of isolated wetlands. Irrigation water would not be applied to mapped sensitive areas identified on resource maps (i.e., wetlands and stream corridors).
- Restrict Sediment Movement Resulting from Application of Reclaimed Water for Irrigation - Restrictions on the eligibility of lands receiving reclaimed water for irrigation based on slope and the type of cover crop would minimize the amount of sediment movement due to application of reclaimed irrigation water and, in

combination with design application rates and ongoing monitoring, provide protection for surface waters and wetlands.

- **Protect Sensitive Areas** - The Irrigation Management Guidelines provide that reclaimed irrigation water shall not be applied within 50 feet of identified jurisdictional wetlands and other waters of the U.S. Upland riparian corridors would also include a 50-foot setback, which in many cases (along incised streams) would increase the setback distance from linear waterways including streams, creeks and rivers. This measure also specifies a 100-foot setback from any identified sensitive terrestrial or aquatic habitat. Additionally, filter strips would be used to buffer sensitive resources and waterways by passively filtering sediments, nutrients and pesticides that may be contained in runoff water. Gullied lands would be restored to reduce erosion and downstream scour and sedimentation, thereby protecting water quality and offsetting any increased erosion due to the application of reclaimed irrigation water. These measures could be modified during the implementation stage of a reclamation alternative if necessary to meet the performance criteria established in the EIR.
- **Implement Agrochemical Best Management Procedures** - This provides protection of water quality in streams and adjoining wetlands by limiting the types, amounts and methods of pesticide application.
- **Minimize Potential for Creation of Mosquito Habitat** - This limits surface ponding due to irrigation with reclaimed water to no more than four days. These limits would also minimize the amount of incidental irrigation, the degree of modification of the hydrological regimes, and resultant shifts in vegetative composition in isolated seasonal wetlands.

METHODOLOGY

Preliminary Investigation

The first stage of the wetland determinations for proposed agricultural irrigation areas involved a reconnaissance level evaluation in the office to identify lands potentially suitable for irrigation and avoid obvious seasonally wet or poorly drained areas. This was followed by a reconnaissance verification by automobile from existing public roadways. The reconnaissance study was initiated in the fall of 1994 by Questa Engineering (Questa) as part of the land classification and irrigation suitability study. Broad areas were identified based upon local knowledge and readily obtainable sources. Criteria included present land use, proximity to the existing City of Santa Rosa wastewater treatment facilities, physiographic features, and occurrence of obvious sensitive wetlands. Identified areas were field-verified. After verification, a gross estimate was made of acres of potentially irrigable lands, obvious wetland areas, and potential wetland creation/ restoration areas. It was concluded from the reconnaissance study that additional lands potentially suitable for irrigation were needed. As a result, two additional study areas were added.

All of the identified potentially irrigable areas were evaluated during second-stage screening for land use capability classification. Potential irrigable area boundaries were refined based on soil and slope limitations, acreage limitations, and setbacks from major sensitive wetland areas. Follow-up prescreen surveys for wetlands were conducted during the spring of 1995 in conjunction with land capability surveys by Questa to verify the location and extent of potential jurisdictional wetlands and refine agricultural irrigation area boundaries. During irrigation soil suitability studies, possible wetlands were identified and mapped on 1 inch to 1000 feet Irrigation Suitability Land Classification topographic maps. Possible wetland areas were identified by analyzing mapped poorly drained or hydric soils, landform features associated with poor drainage, observations of ponding or near surface saturation, and obvious wetland vegetation.

Planning Level Wetland Determination

Planning level wetland determinations were performed between March and July 1995 by Parson ES with assistance from Questa Engineering and Harland Bartholomew and Associates. On-site and off-site planning-level wetland determinations were used to identify and estimate the extent of potential jurisdictional wetlands and other waters of the United States within the proposed irrigation areas. Planning level determinations were appropriate given the large acreage involved and the conceptual nature of the proposed irrigation system and parcels at this stage of project development. Specific irrigation users have not yet been identified. A planning level wetland determination is lower in intensity and resolution than wetland delineation for permitting purposes as described in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual (1987 Manual). A wetland delineation for permit purposes involves detailed boundary mapping, while a planning level wetland determination is intended to provide enough information about the location and extent of potential jurisdictional wetlands to allow a comparison of different project components and alternatives. For permitting purposes, more detailed wetland surveys and a 1"=100' scale wetland delineation map will be needed.

Prior to field surveys for planning level wetlands determinations, the following information was evaluated for the nine agricultural irrigation areas: Stemple Creek, Americano Creek, miscellaneous areas in the City of Santa Rosa, east of Rohnert Park, Adobe Road, north of Petaluma, Lakeville, Bayflats, and Sebastapol.

- 1" = 500' black and white aerial photographs, June 1990;
- Soil Survey of Marin County, 1985, prepared by Soil Conservation Service;
- Soil Survey of Sonoma County, 1972, prepared by Soil Conservation Service;
- USGS 1"=12,000' quadrangle maps of the project site and surrounding region (1950s, photo-revised 1980s);

- 1" =1000' Irrigation Suitability Land Classification maps (march 1996, Questa Engineering Corporation); and,
- Jurisdictional Wetland Delineation for Portions of the Stemple and Americano Creek Basins and the Tolay Valley prepared by North State Resources and Golden Bear BioStudies for CH2M Hill (June 1990).

Surveys of jurisdictional wetlands and other waters of the U.S. on the proposed agricultural irrigation areas were performed following the manual currently in effect (Environmental Laboratory 1987) and required both on site and off site surveys. The identification of potential jurisdictional wetlands was based on an analysis of the resources listed above, field observations, and comparisons with vegetation mapping prepared by Sycamore Environmental Consultants. Areas identified on USGS, SCS, and project land use capability maps and aerial photos that appeared to support potential jurisdictional wetlands and other waters of the U.S. were visited for further investigation.

The on-site portion of the planning level wetland determination followed the Corps Routine On-Site Method (Environmental Laboratory 1987). The Routine On-Site Determination Method utilizes a three parameter approach (vegetation, soils, and hydrology) to identify jurisdictional wetlands. This process relies upon the prevalence of wetland vegetation, presence of hydric soil conditions, and evidence of soil saturation by surface or groundwater to define the occurrence of jurisdictional wetlands. Somewhere between two to three field observations were taken, on average, for every 10 acres of potential wetlands surveyed. No consociations, traverses, or transects were performed. The minimum linear feature width was about 5 feet. Polygon boundaries were accurate to within about 100 feet. However, many wetlands smaller than 0.1 acre may not have been identified during surveys.

While all accessible portions of parcels in the proposed agriculture irrigation areas were visited, surveyors focused on identifying potential isolated seasonal wetlands within them that could be impacted by irrigation with reclaimed water. Surveyors expended less effort on linear and larger obvious wetland features and lands determined to be unsuitable for irrigation that were excluded from agricultural irrigation areas. Additionally, less effort was extended to areas having ground slopes of more than 20 percent, high hills, broken topography, shallow soils, and rocky and stony lands.

Obvious extensive larger wetland and riparian areas, especially along linear drainage features, were not surveyed intensively but were visited to characterize vegetation and wetlands for demonstration of avoidance and consideration for future wetland mitigation, enhancement, or restoration. These areas included areas that are prone to flooding, particularly along larger mainstem creeks; areas that are permanently wet or have prolonged surface ponding; and larger areas of willow riparian or mixed riparian habitats. Irrigation application setbacks and buffers would be applied to these sensitive areas to reduce the impact from runoff or sub-surface water flow.

On-site planning level wetland determinations typically began with a review of the entire parcel and available recorded background information. Areas within potential agricultural irrigation areas that were likely to support larger areas of potential isolated wetlands were then visited for further characterization. Time and access permitting, the entire site was walked, looking for site conditions favorable for wetlands. When a potential wetland was encountered, the surveyor would perform a three-parameter evaluation on the site. Routine On-Site Determination Method Data Forms were completed at many potential wetland locations (See Appendix A, bound separately in Volume II). If the surveyor determined that the location supported a potential wetland that was characteristic of wetlands on the site or a large or unique wetland, a Routine On-Site Data Form was completed. A pit was excavated, hydric soil and hydrology indicators were noted, and a representative vegetation community recorded on a Routine On-Site Determination data form. A reference number was recorded on the data sheet and on a map or photo for each sample location. Occasionally, an additional Data Form was completed on an upland nearby to describe the habitat adjacent to a wetland.

Once an area was determined to be a potential jurisdictional wetland, the surveyors would look for a wetland/non-wetland boundary. Approximate wetland boundaries were not necessarily determined by recorded data points on Routine On-Site Data Forms. Boundaries were typically identified by distinct breaks in vegetation, changes in slope, and land form position observed in the field and correlated with shading, textures, and other features visible on the aerial photos. Approximate wetland boundaries were field mapped on 1 inch to 500 feet, June 1990 aerial photographs and 1 inch to 1000 feet topographic maps.

The use of off-site methods to augment on-site surveys was necessitated by access restrictions, presence of livestock, modifications to vegetative cover and hydrology, the large area, and the limited time frame. Off-site methods were the only option available on parcels where access was denied, where homeowners could not be contacted, or where homeowners allowed access but were unavailable at the time of surveys. On some other parcels, access was restricted to certain portions by the presence of livestock or participation in another reclaimed water irrigation program.

Off-site methods were determined to be the most effective method for mapping the extent of potential wetlands on many agricultural lands and areas of Reyes soils because of the limited time, large study area and problematic nature of wetland determinations on these modified areas. Past modifications to hydrology and vegetation on agricultural lands make wetland determinations problematic in these areas. Natural vegetation is either heavily modified or absent due to cropping practices, grazing and invasion by exotic species. Vegetation on agricultural lands commonly consisted of a relatively homogenous community dominated by a mix of facultative invasive species planted for forage. Consequently, it was of limited use in identifying the extent of wetlands. Many of these agricultural areas have been ditched and drained and the hydrologic conditions under which redoximorphic soil features have formed no longer exist, thus the presence of mottles or other hydric soil conditions cannot be relied upon to accurately estimate the extent of potential wetlands.

The majority of the Reyes soils in the proposed irrigation areas were reclaimed and drained or partially drained prior to December 3, 1985 to make possible the production of an agricultural commodity. These areas are commonly planted with oats and hay and most have been in continuous agricultural production. Nearly all areas of Reyes soils in the proposed project area would be considered prior converted wetlands or farmed wetlands. Prior converted croplands (PCs) are agricultural lands that were former wetlands. Their hydrology was modified prior to December 23, 1985. These areas do not flood or pond for 15 consecutive days during the growing season in most years under normal hydrologic conditions. They are either partially drained, filled or manipulated in such a manner that they will not revert to wetland vegetation under normal farming practices. Similarly, farmed wetlands are former wetlands in which the hydrology was modified before December 23, 1985. However, farmed wetlands still flood or pond under normal hydrologic conditions in most years for 15 consecutive days during the growing season. The conditions for classification as a farmed wetland pasture are similar to those for farmed wetlands, but are specific to pasture or hayland management for forage. Both farmed wetlands and farmed wetland pasture still meet specific hydrologic criteria for jurisdictional wetlands and would likely revert to natural wetland vegetation if abandoned. Some small isolated areas of seasonal wetlands remain which are not subject to continuing agricultural practices.

Therefore, an assessment of aerial photography and existing soils maps was determined to be the most effective method for conducting preliminary determinations of potential jurisdictional wetlands on inaccessible parcels, agricultural lands and areas of Reyes soils. In addition, information from other studies such as Jurisdictional Wetland Delineation for Portions of Stemple and Americano Creeks Basins and Tolay Valley (North State Resources 1989), and observations made from adjoining properties and roadways during on-site agricultural irrigation area, pipeline and reservoir wetland determination investigations were used to augment the aerial photo and soil mapping interpretations.

Aerial photography of the proposed agricultural irrigation areas from multiple years was collected and assessed, including 1" to 100' black and white photos taken in June of 1990 and 1" to 500' black and white photos and color slides taken in May of 1994. The aerial photos from different years were examined individually and compared to one another, taking into account the time of year and amounts of seasonal precipitation, to identify signs of surface ponding or suppressed germination within cropped areas. Differences in shading, texture and color in seasonally ponded or wet areas were somewhat distinct on the aerial photos of agricultural lands because of the homogeneity of the vegetation. Soil surveys of Sonoma County (1972) and Marin County (1985) were reviewed to evaluate mapped soil types, drainage classes and seasonal depth to groundwater in areas of potential jurisdictional wetlands identified by aerial photo analysis. Mapped soils were compared with the Sonoma County Hydric Soils List (SCS 1987). If information in the County Soil Survey or Hydric Soils list indicated that the mapped soil unit was hydric in that landform position or was subject to seasonal ponding, flooding or near surface saturation then the area was classified as a potential jurisdictional wetland.

Wetland mapping from previous studies was also used to supplement wetland determinations performed by off site methods. Information from the Jurisdictional Wetland Delineation for Portions of the Stemple and Americano Creek Basins and the Tolay Valley 1 to 400 feet photo/topographic maps, including wetland delineations and wetland data points, was also incorporated into the mapping. Areas mapped as potential wetlands were incorporated into this Planning Level Wetland Determination by extending the mapped areas into nearby similar landform positions and other areas of apparent hydrologic connectivity. Observations and wetland mapping from related pipeline studies and reservoir studies performed by Parsons Engineering Science were also incorporated.

The approximate extent of jurisdictional wetlands was mapped on 1 inch to 500 feet, June 1990 aerial photographs and 1 inch to 1000 feet topographic maps. This information was then transferred to 1"=1000' contour base maps of agriculture irrigation areas and entered into the project electronic CAD files. The wetland electronic CAD mapping was coordinated with vegetation community mapping performed by Sycamore Environmental Consultants. The qualitative assessment of wetland functions and values is based on the existing vegetation cover.

Survey Limitations

Much of the Planning Level Wetland Determination for the agricultural irrigation areas was performed by off-site methods. The conceptual stage of project development for irrigation areas, large study area, extensive modifications to hydrology and vegetation on agricultural lands and limited access necessitated this approach. However, because wetland determinations were performed in an extremely wet year, relying extensively on off-site observations, the actual extent of jurisdictional wetlands was likely overestimated. Conversely, many smaller isolated jurisdictional wetlands may not have been mapped because of large study area and limited access. This should not be construed as a shortcoming of this wetland determination, which was intended as a tool to compare impacts that could result to potential jurisdictional wetlands in the various agricultural irrigation areas for the EIR/EIS. This information should not be used to permit or constrain other projects without further refinement and Corps verification. The information generated during this Planning Level Wetland Determination could be used as a basis for later detailed wetland determinations that may be required as part of this project.

A considerable amount of the area within the proposed agricultural irrigation areas would be considered "agricultural lands" much of which is not subject to Corps section 404 authority in its current state and use. "Agricultural lands" are lands that are intensively managed for the production of fiber and food to the extent that the natural vegetation has been removed and cannot be used to establish if the area meets hydrophytic vegetation criteria for making a wetland determination or delineation. Agricultural lands with modified wetland hydrology were not differentiated into the different Farm Security Act (FSA) wetland mapping convention categories, leaving the determination of jurisdictional status of certain agricultural lands to a later date.

Wetland areas on agricultural lands have been classified as Cropland wetlands in this Planning Level Wetland Determination. The Natural Resources Conservation Service (NRCS) has jurisdiction over these areas for the purpose of implementing the Farm Security Act (FSA), but has expressed a preference to limit their involvement to verifying wetland delineations for specific irrigation layouts during the project implementation stage. Because these areas have not been differentiated into FSA mapping convention categories, it must be assumed at this point that conversion of any wetlands on agricultural lands would constitute a impact that is subject to Corps Section 404 jurisdiction. If they were delineated into FSA mapping conventions, the Corps would not have jurisdiction over the conversion of areas of prior converted croplands. According to Gene Kelley, NRCS State wetlands biologist, barring substantial modification of the existing cropping or management practices, the sprinkler application of reclaimed irrigation water to potential isolated seasonal wetlands on agricultural lands would not in itself be a NRCS-regulated impact on wetlands and would not affect a landowner's eligibility under the FSA. Other activities such as land leveling, draining, or installing tile drains could constitute significant wetlands impacts as they potentially permanently change hydrology (NRCS/Corps Wetland Meeting 1/31/95). If areas of farmed wetlands, farmed wetland pasture, or isolated seasonal wetland are converted to another crop type due in part to the availability of reclaimed irrigation water, the landowner would lose eligibility under the FSA and those impacts to wetlands would be subject to Section 404 Corps jurisdiction.

RESULTS AND DISCUSSION

The results of the planning level wetland determinations field studies have been entered into project Auto CAD files. Surveys performed on site are differentiated from those performed by off-site methods by the use of data points in the project Auto CAD files. Parcels where on-site surveys were performed are designated by numbered data points which correspond to Routine On-Site Wetland Determination Forms located in Appendix A. Areas where off-site determinations were performed can be identified by the notable absence of numbered data points in mapped areas of wetlands. The qualitative assessment of wetland functions and values is based on the existing vegetation cover observed during surveys. Potential wetland mapping and vegetation mapping have been coordinated in the project Auto CAD files to the extent that the cover type of potential wetland areas can

be easily distinguished. A set of 13 1'=1000' maps, Irrigation Area Vegetation Communities and Special-Status Species Occurrences, which shows potential wetland areas by vegetation type.

The total area of potential jurisdictional wetlands and other waters of the U.S., classified by vegetative cover type, within each proposed agricultural irrigation area is contained in Table A. The totals in Table A are inclusive of land use classification subclasses 1 through 6. The totals in Table A represent the area of potential jurisdictional wetlands and waters of the U.S. within each agricultural irrigation area that could be affected prior to mitigation. Table B contains the total area of potential jurisdictional wetlands and other waters of the U.S., classified by vegetative cover type, within each proposed agricultural irrigation area for land use classification subclasses 1 through 4. Land use classification subclasses 5 and 6 were excluded

from the totals in Table B because these areas are not likely to be directly irrigated. Land classification subclass 5 are marginally irrigable lands with significant limitations regarding crop choice and management needs, and subclass 6 are lands that do not meet the minimum requirements for irrigation as defined in the land classification specifications (Questa Engineering Corporation, March 1996). Large areas of potential jurisdictional wetlands and other waters of the U.S. typically occur in low lying topographic landscape positions in subclasses 5 and 6.

Direct application of irrigation water to potential wetlands and other waters of the U.S. would be avoided by buffers and setbacks established in the ICMPs developed for each parcel. These buffers, setbacks and other irrigation management measures contained in the ICMPs would also minimize the potential for excessive runoff and indirect irrigation of potential jurisdictional wetlands and other waters of the U.S.

In general, the functions and values of potential wetland areas are assumed to be impaired if they are altered by ditching and draining or other hydrological modifications, or disturbed by cropping practices, grazing or introduction of native weedy species. Potential wetland types within proposed agricultural irrigation areas with impaired and somewhat limited functions include: Cropland, Annual Grassland and Seasonally Wet Vegetation wetlands.

Potential wetland areas within the proposed agricultural irrigation area boundaries, such as Vernal Pools and Freshwater Seeps, which continue to support an assemblage of native vegetation or relatively undisturbed, localized wetland hydrology are assumed to provide some important functions and values for wildlife. Vernal Pool wetlands are greatly reduced in number and acreage and provide unique suitable habitat for numerous special status plants, amphibians and invertebrates. Freshwater Seep wetlands provide a permanent to semi-permanent fresh water source which attracts an abundance and wide assortment of wildlife. The other physical and chemical functions provided by these wetlands are very limited due to their limited size and relative isolation.

The vast majority of linear potential wetlands and waters of the U.S. were excluded from agricultural irrigation areas during the land use capability studies, including Mixed Riparian, Willow Riparian, Non-wooded Riparian, Excavated Drainages, Drainages, Irrigation Ditches and communities typically not associated with wetlands such as Coast Live Oak Woodland, Eucalyptus, Cypress and others which line the upland fringe of waters of the U.S. A few small drainages that were not identified during preliminary land use capability studies were identified to occur within proposed agricultural irrigation areas during planning level wetland determinations. Reclaimed irrigation water would not be applied to these drainages if they were determined to be jurisdictional wetlands or other waters of the U.S. during later wetland delineations for permitting purposes. Freshwater Marsh and Freshwater Ponds were also avoided as part of the land use capability studies.

Table A

Potential Jurisdictional Wetland Area by Vegetation Type
Within Proposed Agricultural Irrigation Areas
Land Use Classification Subclasses 1-6

Irrigation Area	Vegetation Type	Acres
E. Rohnert Park	Annual Grassland	147.96
E. Rohnert Park	Buckeye	0.00
E. Rohnert Park	Coast Live Oak	0.27
E. Rohnert Park	Cropland	409.88
E. Rohnert Park	Drainage	4.32
E. Rohnert Park	Eucalyptus	1.95
E. Rohnert Park	Freshwater Pond	6.12
E. Rohnert Park	Freshwater Seep	0.30
E. Rohnert Park	Mixed Riparian	18.87
E. Rohnert Park	Native Grassland	0.06
E. Rohnert Park	Non-Wooded Riparian	3.53
E. Rohnert Park	Oak-Bay Woodland	1.73
E. Rohnert Park	Orchard	0.00
E. Rohnert Park	Oak Woodland	0.32
E. Rohnert Park	Seasonally Wet Vegetation	44.88
E. Rohnert Park	Urban	0.61
E. Rohnert Park	Vernal Pool	5.75
E. Rohnert Park	Willow Riparian	2.61
	Total	649.15
North Petaluma	Annual Grassland	103.58
North Petaluma	Cropland	6.91
North Petaluma	Drainage	6.59
North Petaluma	Excavated Drainage	0.30
North Petaluma	Mixed Riparian	0.60
North Petaluma	Non-Wooded Riparian	0.50
North Petaluma	Oak Woodland	0.00
North Petaluma	Seasonally Wet Vegetation	255.83
North Petaluma	Urban	2.93
North Petaluma	Vernal Pool	0.83

Table A (continued)

Irrigation Area	Vegetation Type	Acres
North Petaluma	Willow Riparian	4.47
	Total	382.53
Adobe Road	Annual Grassland	34.64
Adobe Road	Coast Live Oak	0.59
Adobe Road	Cropland	44.72
Adobe Road	Drainage	1.62
Adobe Road	Excavated Drainage	0.41
Adobe Road	Eucalyptus	0.09
Adobe Road	Freshwater Pond	1.38
Adobe Road	Mixed Riparian	18.02
Adobe Road	Native Grassland	0.00
Adobe Road	Non-Wooded Riparian	8.58
Adobe Road	Poplar	2.40
Adobe Road	Seasonally Wet Vegetation	0.49
Adobe Road	Too Steep	1.72
Adobe Road	Urban	1.37
Adobe Road	Willow Riparian	12.02
	Total	128.07
Lakeville	Annual Grassland	79.56
Lakeville	Cropland	0.82
Lakeville	Cypress	0.69
Lakeville	Drainage	3.95
Lakeville	Excavated Drainage	1.06
Lakeville	Eucalyptus	6.43
Lakeville	Freshwater Pond	21.17
Lakeville	Mixed Riparian	4.35
Lakeville	Non-Wooded Riparian	15.93
Lakeville	Oak Woodland	0.21
Lakeville	Seasonally Wet Vegetation	16.02
Lakeville	Too Steep	5.72
Lakeville	Urban	2.24

Table A (continued)

Lakeville	Vineyard	0.01
Lakeville	Vernal Pool	0.73
Lakeville	Willow Riparian	2.37
	Total	161.26
Bayflats	Annual Grassland	61.17
Bayflats	Cropland	69.77
Bayflats	Drainage	21.88
Bayflats	Excavated Drainage	45.77
Bayflats	Eucalyptus	0.22
Bayflats	Freshwater Pond	0.24
Bayflats	Native Grassland	1.05
Bayflats	Seasonally Wet Vegetation	67.36
Bayflats	Urban	11.62
Bayflats	Unidentified Wetland Vegetation	673.56
Bayflats	Vernal Pool	17.88
Bayflats	Willow Riparian	0.87
	Total	971.39
Americano Creek	Annual Grassland	608.85
Americano Creek	Brackish Marsh	117.03
Americano Creek	Cropland	108.67
Americano Creek	Coastal Scrub	1.94
Americano Creek	Cypress	0.15
Americano Creek	Drainage	17.23
Americano Creek	Estero	6.10
Americano Creek	Eucalyptus	5.70
Americano Creek	Freshwater Pond	18.81
Americano Creek	Freshwater Seep	5.06
Americano Creek	Mixed Riparian	0.12
Americano Creek	Native Grassland	0.29
Americano Creek	Non-Wooded Riparian	25.40
Americano Creek	Poplar	0.36
Americano Creek	Seasonally Wet Vegetation	532.10

Table A (continued)

Americano Creek	Urban	26.15
Americano Creek	Unable To View	75.30
Americano Creek	Vernal Pool	2.92
Americano Creek	Willow Riparian	139.24
	Total	1691.43
Stemple Creek	Annual Grassland	713.36
Stemple Creek	Cropland	252.88
Stemple Creek	Coastal Scrub	0.04
Stemple Creek	Cypress	0.98
Stemple Creek	Drainage	14.26
Stemple Creek	Excavated Drainage	2.79
Stemple Creek	Eucalyptus	6.39
Stemple Creek	Freshwater Pond	66.76
Stemple Creek	Freshwater Seep	1.65
Stemple Creek	Mixed Riparian	5.34
Stemple Creek	Non-Wooded Riparian	42.02
Stemple Creek	Oak-Bay Woodland	0.85
Stemple Creek	Oak Woodland	5.35
Stemple Creek	Seasonally Wet Vegetation	628.29
Stemple Creek	Urban	27.79
Stemple Creek	Vernal Pool	1.02
Stemple Creek	Willow Riparian	63.20
	Total	1832.97
Sebastopol	Annual Grassland	51.86
Sebastopol	Coast Live Oak	2.77
Sebastopol	Cropland	2.77
Sebastopol	Eucalyptus	0.94
Sebastopol	Freshwater Marsh	39.52
Sebastopol	Freshwater Pond	19.69
Sebastopol	Mixed Riparian	154.44
Sebastopol	Non-Wooded Riparian	1.98
Sebastopol	Oak-Bay Woodland	0.13
Sebastopol	Orchard	3.99

Table A (continued)

Sebastopol	Oak Woodland	0.39
Sebastopol	Excavated Drainage	0.09
Sebastopol	Seasonally Wet Vegetation	101.48
Sebastopol	Urban	3.82
Sebastopol	Vineyard	6.20
Sebastopol	Willow Riparian	35.35
	Total	425.42
Misc.-City of Santa Rosa	Annual Grassland	50.93
Misc.-City of Santa Rosa	Cropland	1.86
Misc.-City of Santa Rosa	Drainage	0.43
Misc.-City of Santa Rosa	Eucalyptus	0.03
Misc.-City of Santa Rosa	Freshwater Pond	4.62
Misc.-City of Santa Rosa	Mixed Riparian	2.95
Misc.-City of Santa Rosa	Non-Wooded Riparian	1.15
Misc.-City of Santa Rosa	Oak Woodland	0.01
Misc.-City of Santa Rosa	Seasonally Wet Vegetation	2.43
Misc.-City of Santa Rosa	Urban	0.14
Misc.-City of Santa Rosa	Willow Riparian	1.50
	Total	66.05

Table B

Potential Jurisdictional Wetland Area by Vegetation Type

Within Proposed Agricultural Irrigation Areas

Land Use Classification Subclasses 1-4

Irrigation Area	Vegetation Type	Acres
E.Rohnert Park	Annual Grassland	122.33
E.Rohnert Park	Cropland	403.55
E.Rohnert Park	Drainage	3.39
E.Rohnert Park	Eucalyptus	1.26
E.Rohnert Park	Freshwater Pond	6.12
E.Rohnert Park	Freshwater Seep	0.30
E.Rohnert Park	Mixed Riparian	0.81
E.Rohnert Park	Native Grassland	0.06
E.Rohnert Park	Non-wooded Riparian	0.48
E.Rohnert Park	Oak-Bay Woodland	1.27
E.Rohnert Park	Oak Woodland	0.32
E.Rohnert Park	Seasonally Wet Vegetation	42.24
E.Rohnert Park	Urban	0.61
E.Rohnert Park	Vernal Pool	5.74
E.Rohnert Park	Willow Riparian	0.75
	Total	589.23
North Petaluma	Annual Grassland	89.56
North Petaluma	Cropland	6.91
North Petaluma	Drainage	4.68
North Petaluma	Excavated Drainage	0.30
North Petaluma	Mixed Riparian	0.64
North Petaluma	Non-wooded Riparian	0.50
North Petaluma	Oak Woodland	0.00
North Petaluma	Seasonally Wet Vegetation	219.65
North Petaluma	Urban	2.63
North Petaluma	Vernal Pool	0.83
North Petaluma	Willow Riparian	1.59
	Total	327.29

Table B (continued)

Irrigation Area	Vegetation Type	Acres
Adobe Road	Annual Grassland	21.50
Adobe Road	Coast Live Oak	0.59
Adobe Road	Cropland	33.77
Adobe Road	Drainage	0.63
Adobe Road	Excavated Drainage	0.41
Adobe Road	Freshwater Pond	1.38
Adobe Road	Mixed Riparian	0.79
Adobe Road	Native Grassland	0.00
Adobe Road	Non-wooded Riparian	0.27
Adobe Road	Poplar	0.22
Adobe Road	Seasonally Wet Vegetation	0.49
Adobe Road	Urban	0.46
	Total	60.52
Lakeville	Annual Grassland	43.30
Lakeville	Cropland	0.43
Lakeville	Cypress	0.67
Lakeville	Drainage	2.11
Lakeville	Excavated Drainage	0.01
Lakeville	Eucalyptus	4.07
Lakeville	Freshwater Pond	19.81
Lakeville	Mixed Riparian	1.40
Lakeville	Non-wooded Riparian	3.40
Lakeville	Oak Woodland	0.03
Lakeville	Seasonally Wet Vegetation	15.69
Lakeville	Urban	2.07
Lakeville	Vineyard	0.01
Lakeville	Vernal Pool	0.73
Lakeville	Willow Riparian	1.22
	Total	94.95
Bayflats	Annual Grassland	38.13
Bayflats	Cropland	57.57
Bayflats	Drainage	2.49

Table B (continued)

Irrigation Area	Vegetation Type	Acres
Bayflats	Excavated Drainage	25.98
Bayflats	Eucalyptus	0.22
Bayflats	Freshwater Pond	0.23
Bayflats	Native Grassland	0.23
Bayflats	Seasonally Wet Vegetation	58.21
Bayflats	Urban	10.85
Bayflats	Unidentified Wetland Vegetation	649.39
Bayflats	Vernal Pool	17.49
	Total	860.79
Americano Creek	Annual Grassland	394.07
Americano Creek	Brackish Marsh	74.46
Americano Creek	Cropland	44.74
Americano Creek	Coastal Scrub	0.93
Americano Creek	Drainage	5.87
Americano Creek	Eucalyptus	4.10
Americano Creek	Freshwater Pond	15.83
Americano Creek	Freshwater Seep	2.61
Americano Creek	Mixed Riparian	0.12
Americano Creek	Native Grassland	0.29
Americano Creek	Non-wooded Riparian	4.12
Americano Creek	Seasonally Wet Vegetation	252.56
Americano Creek	Urban	18.00
Americano Creek	Unable To View	31.35
Americano Creek	Vernal Pool	2.60
Americano Creek	Willow Riparian	15.93
	Total	867.59
Stemple Creek	Annual Grassland	343.42
Stemple Creek	Cropland	134.08
Stemple Creek	Cypress	0.98
Stemple Creek	Drainage	6.97
Stemple Creek	Excavated Drainage	0.11
Stemple Creek	Eucalyptus	1.54

Table B (continued)

Irrigation Area	Vegetation Type	Acres
Stemple Creek	Freshwater Pond	56.43
Stemple Creek	Freshwater Seep	1.41
Stemple Creek	Mixed Riparian	2.34
Stemple Creek	Non-wooded Riparian	2.06
Stemple Creek	Oak-Bay Woodland	0.07
Stemple Creek	Oak Woodland	0.24
Stemple Creek	Seasonally Wet Vegetation	270.24
Stemple Creek	Urban	26.19
Stemple Creek	Vernal Pool	0.98
Stemple Creek	Willow Riparian	7.07
	Total	854.11
Sebastopol	Annual Grassland	49.41
Sebastopol	Coast Live Oak	2.59
Sebastopol	Cropland	2.47
Sebastopol	Eucalyptus	0.50
Sebastopol	Freshwater Marsh	28.74
Sebastopol	Freshwater Pond	19.61
Sebastopol	Mixed Riparian	66.18
Sebastopol	Native Grassland	1.24
Sebastopol	Non-wooded Riparian	0.30
Sebastopol	Orchard	2.64
Sebastopol	Oak Woodland	0.39
Sebastopol	Seasonally Wet Vegetation	96.22
Sebastopol	Urban	3.75
Sebastopol	Vineyard	6.14
Sebastopol	Willow Riparian	24.82
	Total	305.01
Misc.-City of Santa Rosa	Annual Grassland	40.89
Misc.-City of Santa Rosa	Cropland	0.88
Misc.-City of Santa Rosa	Eucalyptus	0.01
Misc.-City of Santa Rosa	Freshwater Pond	2.75
Misc.-City of Santa Rosa	Mixed Riparian	0.00

Table B (continued)

Irrigation Area	Vegetation Type	Acres
Misc.-City of Santa Rosa	Non-wooded Riparian	0.16
Misc.-City of Santa Rosa	Oak Woodland	0.01
Misc.-City of Santa Rosa	Seasonally Wet Vegetation	0.29
Misc.-City of Santa Rosa	Urban	0.14
Misc.-City of Santa Rosa	Willow Riparian	0.14
	Total	45.27

The vegetative cover of identified areas of potential wetlands or other waters of the U.S. is not designated in areas classified as Unable to View. The functions and values of wetlands in these areas could vary tremendously. If these areas are to receive reclaimed water they should be surveyed to determine that no actual jurisdictional wetlands would be irrigated.

RECOMMENDATIONS

Although no waste water would be directly applied to any potential jurisdictional wetlands or other waters of the U.S., application of reclaimed irrigation water upslope of potential wetland areas could result in incidental irrigation of downslope wetlands. Application of reclaimed irrigation water to potential wetlands in agricultural irrigation areas, intentional or incidental, should not be an impact subject to Corps Section 404 jurisdiction if the measures in the Irrigation Management Guidelines are properly implemented, monitored, and enforced. These measures would prevent over-irrigation and flooding, which could be construed as a fill subject to Section 404 authority. The potential impacts of modifying the composition of vegetative communities in isolated wetlands are addressed in the Terrestrial Biotic Technical Memorandum. Modification of vegetative cover in these potential jurisdictional wetland areas would be minimized by application of a 50-foot setback around all isolated jurisdictional wetlands.

The availability of reclaimed water for agricultural irrigation could induce tilling or other ground disturbance that could disturb or modify wetlands. This would constitute a consequent loss of wetland acreage subject to Section 404 jurisdiction. Although no irrigation water would be directly applied to jurisdictional wetlands, these areas could be subject to conversion because providing irrigation water to adjacent non-wetland areas may make it marginally profitable or otherwise practical to change agricultural practices or convert to different crop types in both wetland and non-wetland areas. While non-wetland areas require irrigation before they can be converted to other crop types, nearby isolated wetland areas do not necessarily require additional irrigation to convert to different crop types because they naturally tend to collect and retain more moisture than surrounding upland areas.

A measure should be included within each ICMP indicating that provision of irrigation water would be discontinued to any parcel or participant who knowingly irrigates or converts delineated jurisdictional wetland areas without first obtaining permits or clearance from the Corps or agency responsible for administering agricultural wetland regulations at the time of such actions. This would apply regardless of whether or not potential jurisdictional areas are directly irrigated. During preparation of the ICMPs for each parcel, all wetlands which could reasonably be assumed to be affected by direct irrigation application, downslope runoff, subsurface flows, or crop type conversion related to this project should be delineated. This delineation would establish existing conditions for the ICMP. It would also use FSA designations that would allow users to continue existing agricultural practices in areas of Farmed Wetlands and Farmed Wetland Pasture. As part of the on-going routine maintenance and monitoring of the system, any modifications to the existing cropping or agricultural

practices on the parcel would be noted to ensure consistency with measures contained in the ICMP, and specifically, those measures preventing the conversion of wetlands.

The operational lifespan of the irrigation system could span 20 years or more, during which users would be added and subtracted. Any new users would need to comply with applicable laws and regulations in effect at that time. Existing users should not be subject to retroactive penalties for earlier approved ICMPs.

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OTHER RELATED TECHNICAL STUDIES

Biological Resources Technical Memoranda

Aquatic Habitat Survey Results Technical Memorandum

Aquatic Biological Impacts Assessment Technical Memorandum

Water Quality Impact Analysis

Draft Irrigation Management Plan for the West County and South County Alternatives

Baseline Hydrology and Irrigation Drainage Evaluation for West and South County Reclamation Alternatives

Technical Memorandum, Irrigation Water Quality and Salt Management Leaching Requirements, South County and West County Reclamation Alternatives

Estimation of Nitrogen, Salt and Herbicide/Pesticide Concentrations in Surface Water, and Mass Loading Analysis from Irrigation with Reclaimed Water, West County and South County Alternatives

Evaluation of Metals in Irrigation Affected Percolate, West County and South County Alternatives

Evaluation of Soil Erosion Impacts of the West and South County Reclamation Alternatives

Urban Irrigation Management Guidelines

Memorandum, Baylands (Reyes Soils) Screening Study

Memorandum, Trace Loading Analysis for the South and West County Reclamation Alternatives

Memorandum, Irrigation Nitrogen Loading to Groundwater, West County and South County Reclamation Alternatives

Irrigation Suitability Land Classification and Existing and Potential Agricultural Land Uses, Sebastapol and South County Reclamation Study Area

Irrigation Management Plan for the West and South County Alternatives

Irrigation Suitability Land Classification and Existing and Potential Agricultural Land Uses, West County Reclamation Study Area (March, 1996 Update)

Technical Memorandum, Cropping Scenarios for the West County and South Reclamation Alternatives

Memorandum, Revisions to Cropping Scenarios Technical Report

Memorandum, Addition to Conclusions/REcommendations Baylands Technical Memorandum

Hydrologic/Water Quality Evaluation of Irrigation Baylands (Reyes Soils) with Reclaimed Water

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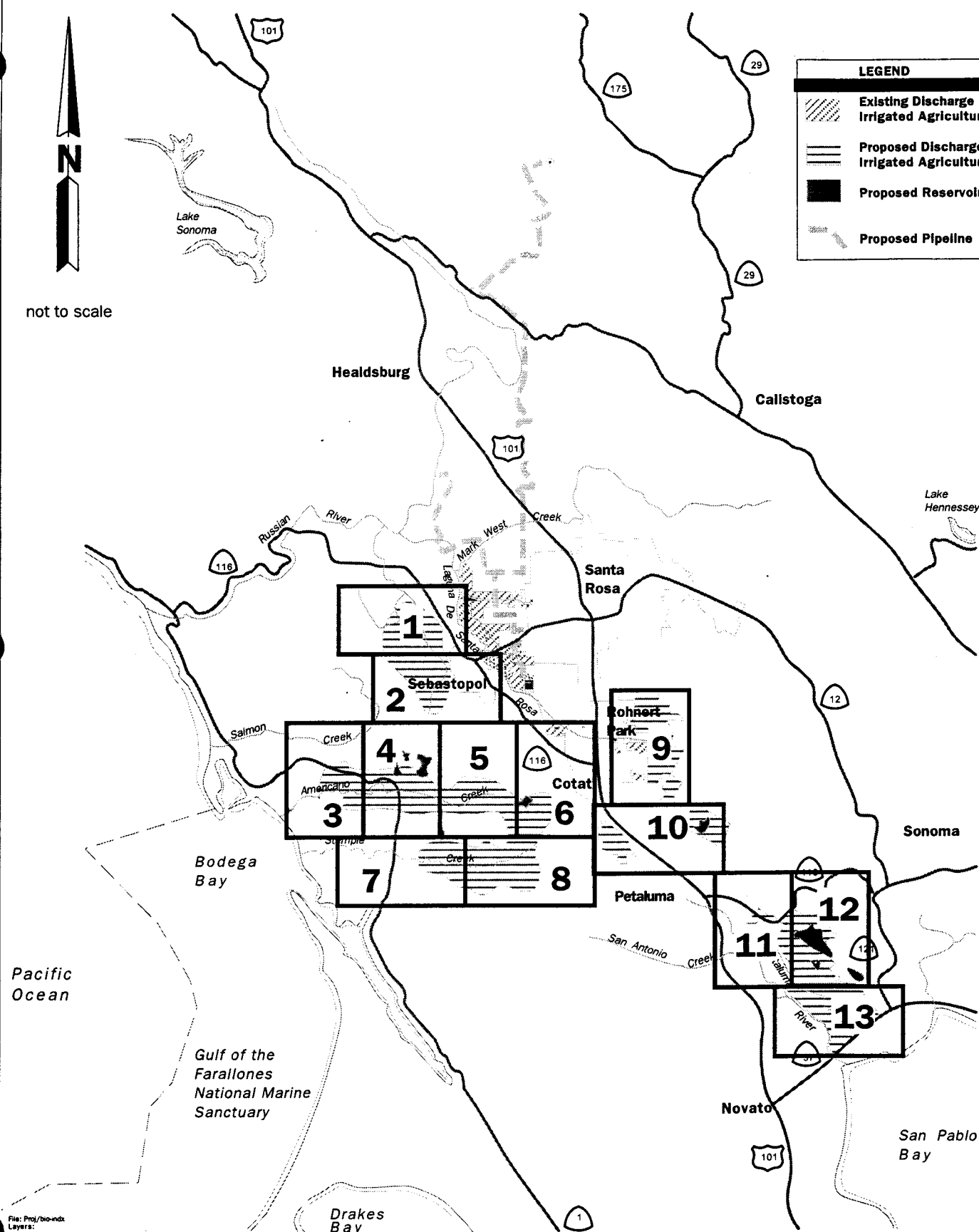
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not to scale

LEGEND	
	Existing Discharge Irrigated Agriculture
	Proposed Discharge Irrigated Agriculture
	Proposed Reservoir
	Proposed Pipeline



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Santa Rosa

Subregional Long-Term
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