

## **Update on the California Levee Database TO #2 Risk Factors Data Collection Task**

The following is an update on California levee database effort and Task Order 2 - levee database and the risk factor data collection and prototype application.

The levee alignment and attribution collection aspect task within Task Order 2 is complete. PBS&J has collected levees for the entire state including all 58 counties. This effort involved review of approximately 2,770 USGS quads, rectified and reviewed 860 FEMA FIRMs and used Digital Ortho Quads coverage (DOQs - aerial imagery) to check data spatial alignments. Existing digital levee data was merged with the data capture from the USGS quads and FEMA FIRMs and check for location accuracy against the statewide DOQs. The scale of the data collection was done at approximately USGS quad scale (1:24,000) for most of the data. The DOQs are somewhat better than 1:24,000 so the accuracy of the data is somewhere between +/- 33.3 to 40 feet per national map accuracy standards. Over 147 communities were contacted for collection of data. The levee geodatabase consists of approximately 13,740 miles of spatially located levees, canals, and flood control features totaling 8,712 records. A geodatabase feature class has been developed to house the levee information. The feature class is populated with the preliminary set of attributes that include:

- Unique ID assignment
- Primary Use
- Structure Type
- Maintenance Agency
- Owner Agency
- Local Authority
- Construction Agency
- Year Constructed
- Flooding Source (i.e. Stream name)
- Location Description
- Data Source
- Bankside (i.e. Left/Right)
- Category (i.e. Project/Non-Project)

Additional attribute information is associated through relationships to other feature classes including:

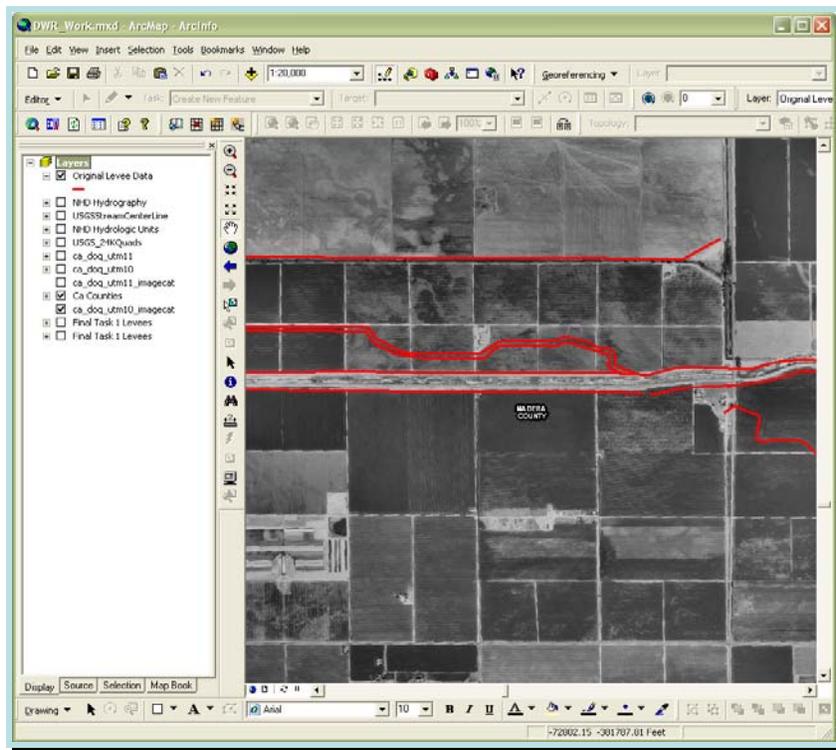
- County Name
- Assembly District
- Congressional District
- Senate District
- Reclamation District
- 24k Quad
- 100k Quad
- 250k Quad

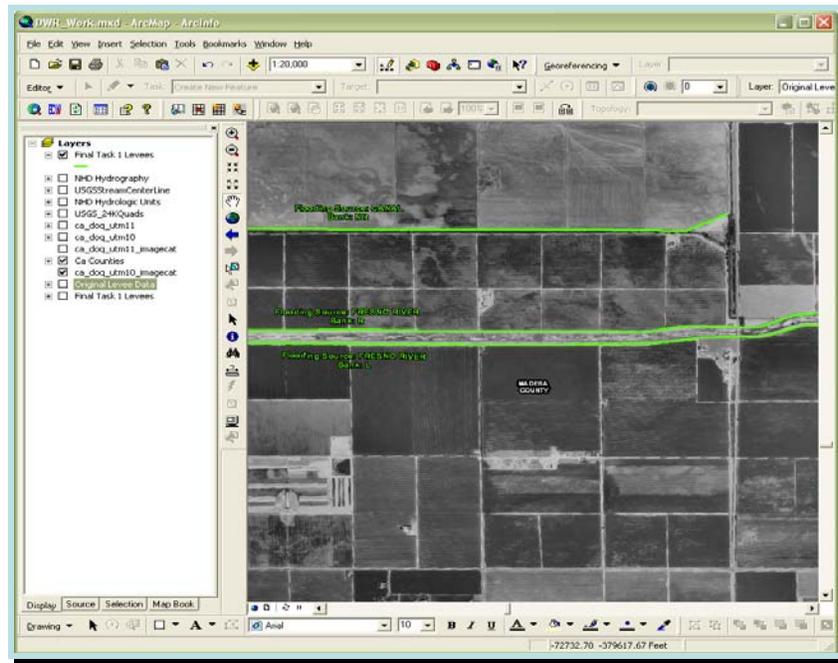
## Hydrologic Unit Name FEMA Flood Panel

The database Entity Relationship Diagram (ERD) illustrates these relationships and is attached as an appendix. The ERD attached is the latest version of the database, as DWR moves forward with work on the database additional table and feature classes will be added to the database. Currently the database is expanding to include geotechnical and integrity information such as borehole locations, erosion sites, and high water marks, relief wells, sand boils, encroachment points, levee crossing points, piezometers, and failure points.

The information collected from the various sources required a large amount of verification and clean-up. Below is an example of the type of work performed on the data to update and validate the data.

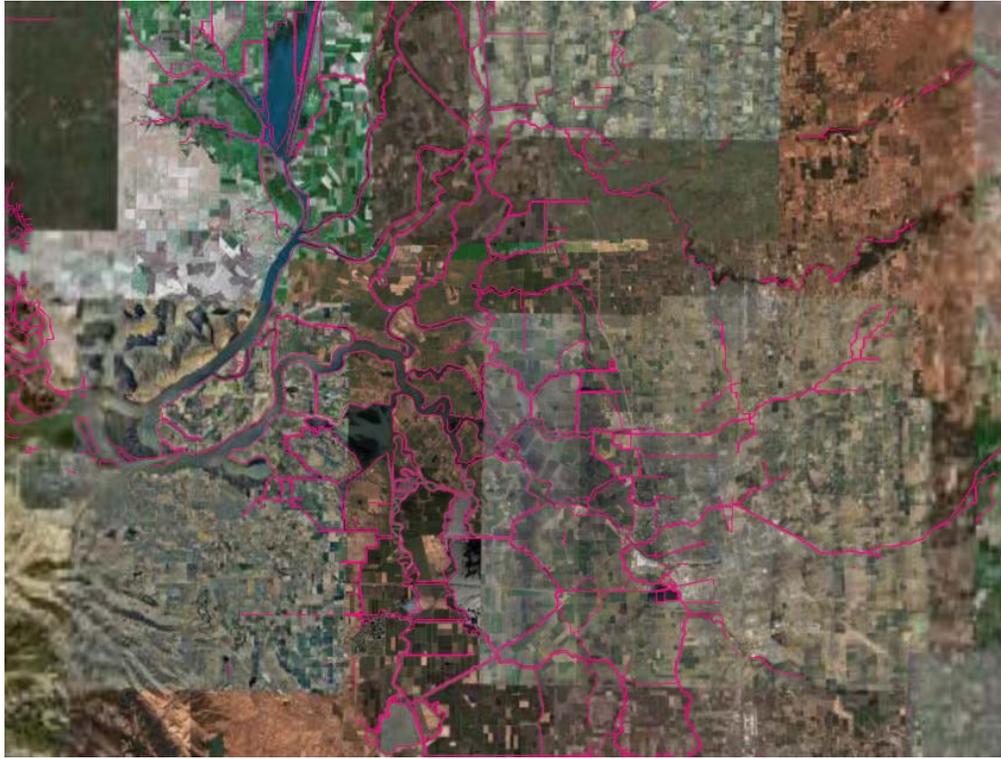
### **Example of rectified data using Digital Ortho Quads (DOQ)**





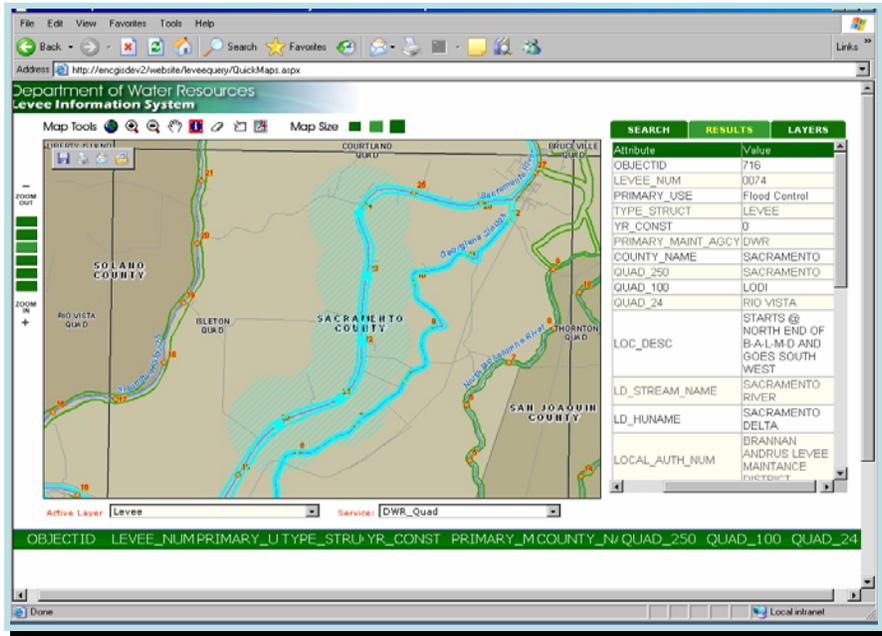
Emphasis was placed on locating levees spatially by reviewing USGS quads and georeferenced FEMA FIRMs. The data was then spatially verified/rectified using aerial imagery which consisted of state DOQs. The attribution level of the records varies by attribution fields within the database. We have attributed 100% or close to 100% of the following fields in the database: *assembly*, *congressional*, and *senate districts*, *county name*, *hydrologic units*, *24k*, *100k* and *250k Quads*, *left and right bank*, *stream name*, and *project/non project levees*. 83% of the levee miles have *structure type* along with 51% miles for the *primary use* attribute. Roughly 25% of the miles have *owner* and *maintenance* entity populated.

**Extent of levee information**

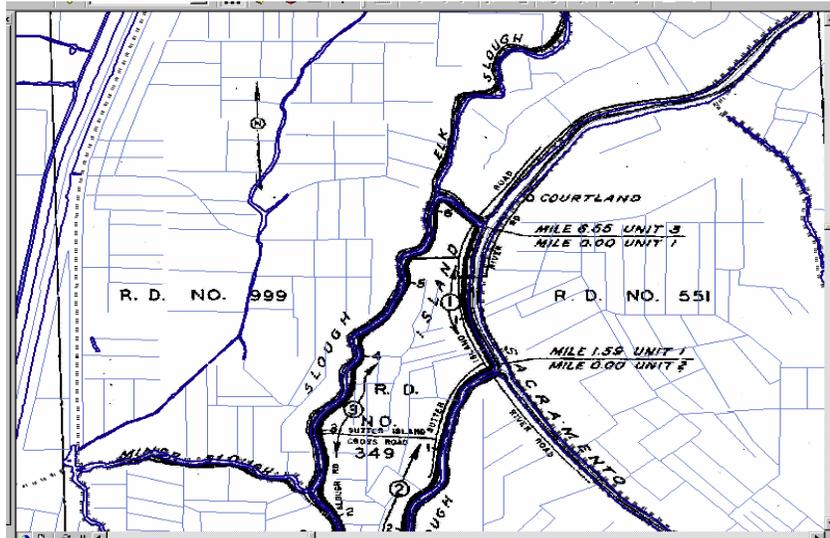


### **Delta Region**

Stream stationing for the major streams within the central valley was captured off of the USGS Quad map as part of the data collection effort. The stream station is a separate layer within the GIS. Additionally, stationing for levees within the delta region was obtained from the DWR - Delta group. Additionally, existing levee stationing information for various areas has been scan and rectified and can be used in the GIS as reference data for the levee database as shown on the following page.



### Stream Stationing



### Levee Stationing Reference Information

PBS&J has been actively coordinating the DWR effort with USACE and FEMA as part of this task order as well as thru other means. PBS&J has given several presentations on the DWR levee database and has also attended several workshops on the USACE national levee database. PBS&J continues to receive the latest version of the USACE database from the Sacramento District.

The database is being delivered in a geodatabase format for use with ESRI ArcMap software and an Oracle database as requested for David Parker. We are currently working with David to make sure the structure will meet DWR's future needs.

PBS&J has completed the work on the **Task Order 2 - Risk Factors data indexing**. PBS&J has reviewed a portion of the levee and floodplain documents at Santa Clara Valley Water District (SCVWD) as part of the risk factors development subtask within Task Order 2. This task is to begin the development of a library of existing information and documents associated with the levee systems in California. SCVWD was selected as part of this to prototype the database and system to retrieve the information data. The task look at several ways to link the library information to levee reaches and we settled on linking the library data to the unique levee ID by reviewing the documents and then assessing what levee reaches were associated with the that particular document. A MS Excel spreadsheet was used to initially capture the document attributes and the levee ID were captured directly from the levee geodatabase.

Several site visits were made to SCVWD's record libraries to review and inventory the appropriate documents. Data collection was focused on as-builts, planning studies and maintenance logs to provide sufficient sampling of risk factor data for purposes of preparing the pilot risk factor analysis application. The as-built review completed under this task order represents approximately 60% of available data, planning document review an estimated 40%, and maintenance log review 100%. The maintenance log review completion percentage considers only the most recent maintenance assessment. The information collected as part of the risk factors subtask has been compiled into a database table to link to the main levee database.

The onsite data collection effort was divided into two visits to provide sufficient time to evaluate the methodology and review the results and allow for any refinement or resolution to challenges faced. The evaluation and review is documented below.

## Summary

- There are 161 reports classified as floodplain management documents within the Santa Clara Valley Water District (SCVWD) library that have been reviewed to date. The initial step in the review process requires examination of the document to determine if levee data is contained within the report. At this time, 55% of these documents contain levee data. The remainder of the documents contains information relevant to stream segments but not levees. The stream name was captured for these documents and the associated stream segment captured in a tabular format.
- Roughly 5% of the documents referred to levees that have not been captured within the levee database. These levees were realized as a result of additional research and when identified in planning documents the levees were verified in an operations and maintenance manual, inspection log, or other post-construction documents as having

been built. In this instance, the document and the type of information contained were cited and the levees will be added to the database later

- Another 5% of the documents require additional post-processing to be performed following the initial research period. The levee ids were not extracted immediately from the document due to the large number of associated levees and these documents also contained a project area map that allows for efficient post-processing.
- Review of data proved to be a significant effort because the studies covered a variety of locations making it difficult to be very inefficient at the document review and analysis having to locate each individual levee. The review of planning documents can not be organized by the geographical locations, whereas the review of the as-built drawings may be better defined by project area. We are supplying the SCVWD with the locations of the drawings we intend to review and the water district is gathering the applicable drawing sets.
- Maintenance logs were also reviewed. The most recent maintenance log data is included as a single row entry for each stream maintained. Maintenance logs are link to many levee segments since the logs cover a large area and are not broken out by levee reach.
- Hydraulic models are available on the SCVWD's website and these are also being used in post processing to supplement the ability to capture levee identification numbers during post processing

## **Challenges Encountered and Resolutions**

### *Challenge 1: Documents not able to be associated with levee identification numbers*

*Description:* This poses a problem with the current levee database as the primary key to the database is the levee ID. The current application architecture does not readily fit this scenario. The application can eventually accommodate these documents through alternative search methods. However, these alternatives will need additional research and evaluation prior to implementation. It is possible that the stream name could be used as secondary search key. Using the stream name though, poses additional challenges as naming of streams can change along their course and can also be referenced by different names in different source documents potentially cause confusion. Additionally a stream layer has not been fully developed that can be used uniquely identify each stream reach.

*Resolution:* These documents will continue to be cataloged but will not be searchable in the prototype application to be delivered in this task. The recording of the appropriate information in the database is a small part of the entire effort. SCVWD and DWR may also find the cataloging of the documents useful in the future. Means of incorporating

such documents into the search capabilities of the application will continue to be evaluated and proposed methodology will be delivered at the conclusion of this task

*Challenge 2: During document review new levee features have been identified*

*Description:* These levees were realized as a result of additional research and when identified in planning documents the levees were verified in an operations and maintenance manual, inspection log, or other post-construction documents as having been built. In this instance, the documents and the type of information contained were cited, but the levee not added to the database.

*Resolution:* Any new levees discovered during the document review will be documented and held for incorporation into the levee database in a future data collection tasks.

*Challenge 3: Additional post-processing requirements were noted for capturing levee identification numbers.*

*Description:* Some documents reviewed encompassed numerous levee features and it was not efficient during the document review to identify each individual levee identification number. It was determined that post-processing through other means (e.g. spatial overlay) might provide a more efficient method of capturing these attributes.

*Resolution:* Some post-processing time had been accounted for in the budget for this effort and it has been determine at this time that the budget reserves for this type of post processing is sufficient for the required effort.

The risk factors that are being used to index the data and consist of 8 main categories with sub categories as listed below:

- Topography
  - Surveys
  - Conventional
  - IFSAR/LIDAR/etc
- Hydrologic data
  - Documentation/HEC Models
  - Documentation/Other Models
- Hydraulic data
  - Documentation/HEC Models
  - Documentation/Other Models
- Geotechnical
  - Stability
  - Seepage
  - Erosion

- Materials/Soils
- Borings/Lab/Reports
- Settlement/Subsidence
- Historical information
  - Certification
  - Aerial Photos/Maps
  - High Water Marks
  - Breach/Boils
- Operations information
  - Closure Gates
  - Evacuation Plans
  - Flood Fight Support
- Construction information
  - Design Documents
  - Construction Drawings
  - Levee Materials
- Inspection/Maintenance information
  - Vegetation
  - Structures Thru/Encroached
  - Erosion/Deposition Control
  - Armament
  - Rodents

Additional sub-categories can be added as needed. The document metadata has been compiled into a database, linked to levee segments, and indexed by risk factors. A prototype internet mapping application to view and search the data has been developed that allows the user to search both by a tabular method and geographically within a mapping GUI. The search can be based on many of the captured attributes about the document. As seen below the user can search on name or a portion there of, document type, source, date, location, risk factors, county, stream, or levee ID.

The application and database clearly allow for the inventory and assessment of exiting hard copy information at the County to be link to levee reaches as historical information on the levee systems in Santa Clara. The format used to record the documents allows for a multiple variable search of index documents to recall Linking existing library documents is one way of building a data store of pertinent information on the current levee systems. As evaluation of the levee systems in California continue, the data capture as part of Task 2 will allow for quick recovery of existing archived data.

1	REVIEWER	LEVEE_ID	DOC_NUM	DOC_NAME	DOC_TYPE 1	DOC_TYPE 2	SOURCE	IC FORM	DATE
2	A. Pedington	7095, 7440, 74	TC 425 A36 N69 1956	Channel/Lining for a Portion of the Palo Alto	Planning Study	Notice to Contractors	SCVWD	Paper	Jun-54
3	A. Pedington	7553, 7562	TC 425 A36 F5 1990	Adobe Creek Phase II Contract No. C0289 F	Construction Document	Final Inspection Report	SCVWD	Paper	27-Dec-89
4	A. Pedington	7553, 7562, 75	TC 425 A36 1965	Adobe Creek Planning Study (Palo Alto Flood)	Planning Study	Engineer's Report & Final Note	SCVWD	Paper	Jun-55
5	A. Pedington	7553, 7562, 75	TC 425 A36 1988	Adobe Creek Citizens Advisory	Planning Study	Committee Information Book	SCVWD	Paper	16-Apr-74
6	A. Pedington	7553, 7560		Construction Plans for Adobe Creek	As Built	Title Sheet	SCVWD	Paper	15-Jul-57
7	A. Pedington	7553, 7560	418-4121	Construction Plans for Adobe Creek	As Built	Plan & Profile	SCVWD	Paper	15-Jul-57
8	A. Pedington	7553, 7560	4120-4123	Construction Plans for Adobe Creek	As Built	Details	SCVWD	Paper	15-Jul-57
9	A. Pedington	7553, 7560	4124-4127	Construction Plans for Adobe Creek	As Built	Cross Sections	SCVWD	Paper	15-Jul-57
10	A. Pedington	7553, 7560		Adobe Creek between Hug 101 & Louis Rd	As Built	Title Sheet	SCVWD	Paper	10-Apr-86
11	A. Pedington	7553, 7560	13371	Adobe Creek between Hug 101 & Louis Rd	As Built	Index Map	SCVWD	Paper	10-Apr-86
12	A. Pedington	7553, 7560	13378	Adobe Creek between Hug 101 & Louis Rd	As Built	General Notes, Abbreviations,	SCVWD	Paper	10-Apr-86
13	A. Pedington	7553, 7560	13379-13321	Adobe Creek between Hug 101 & Louis Rd	As Built	Plan & Profile	SCVWD	Paper	10-Apr-86
14	A. Pedington	7553, 7560	13322-13323	Adobe Creek between Hug 101 & Louis Rd	As Built	Typical Sections	SCVWD	Paper	10-Apr-86
15	A. Pedington	7553, 7560	13324-13326	Adobe Creek between Hug 101 & Louis Rd	As Built	Typical Details & Standard Sect	SCVWD	Paper	10-Apr-86
16	A. Pedington	7553, 7560	13327-13340	Adobe Creek between Hug 101 & Louis Rd	As Built	Details	SCVWD	Paper	10-Apr-86
17	A. Pedington	7553, 7560	13341-13390	Adobe Creek between Hug 101 & Louis Rd	As Built	Layout	SCVWD	Paper	10-Apr-86
18	A. Pedington	7553, 7560	13391-13392	Adobe Creek between Hug 101 & Louis Rd	As Built	Log of Soil Borings	SCVWD	Paper	10-Apr-86
19	A. Pedington	7553, 7560	13393-13370	Adobe Creek between Hug 101 & Louis Rd	As Built	Cross Sections	SCVWD	Paper	10-Apr-86
20	A. Pedington	7553, 7559	TC 425 A36 F4 1956 n C 1 Libr	Channel Improvements for Adobe Creek with	Planning Study	Engineer's Report	SCVWD	Paper	Apr-56
21	A. Pedington	N/A	TC 425 A36 1954	Adobe Creek Watershed Creekbed Sediment	Planning Study		SCVWD	Paper	14-Dec-54
22	A. Pedington	N/A	TC 425 A36 A.3 1989 c.5 REF	Adobe Creek El Camino Real to Upstream of	Planning Study	Engineer's Report & FEIR	SCVWD	Paper	Mag-89
23	A. Pedington	N/A	TC 425 A36 A.3 1974 REF	Adobe Creek Reach I Subcommittee Report	Planning Study	Subcommittee Report	SCVWD	Paper	Sep-74
24	A. Pedington	N/A	TC 425 A36 A.3 1989 c.2 Libr	Adobe Creek Restoration Plan	Planning Study		SCVWD	Paper	Mag-89
25	A. Pedington	N/A	TC 425 A36 A.3 1994 c.2 Libr	Adobe Creek Planning Study	Planning Study	Impact and Mitigation Analysis	SCVWD	Paper	23-Sep-94
26	A. Pedington	N/A	TC 425 A36 E5 1972	Flood Control Improvements on Adobe Creek	Planning Study	EIR	SCVWD	Paper	Sep-72
27	A. Pedington	N/A	TC 425 A36 F4 1990	Adobe Creek Channel Improvements Charter	Planning Study	FEIR	SCVWD	Paper	Apr-90
28	A. Pedington	N/A	TC 425 A36 H6 1973	Flood Control Improvements on Adobe Creek	Planning Study	FEIR	SCVWD	Paper	Jun-73
29	A. Pedington	N/A	TC 425 A36 F4 1956 a C 1 Libr	Adobe Creek Improvement Project No. MV1	Planning Study		SCVWD	Paper	Dec-56
30	A. Pedington	N/A	TC 425 A36 F4 1956 a C 1 Libr	Adobe Creek Improvement Project No. MV1	Planning Study	Aerial Photographs	SCVWD	Paper	Dec-57
31	A. Pedington	N/A	TC 425 A36 F4 1973 REF	Proposed Improvements on Adobe Creek (E)	Planning Study		SCVWD	Paper	Aug-73
32	A. Pedington	N/A	TC 425 A36 F7 1972	Adobe Creek Watershed Mitigation and Mon	Planning Study		SCVWD	Paper	806
33	A. Pedington	N/A	TC 425 A36 U66 1993 c.2 LIBR	Upper Adobe Creek Identification of Valers o	Planning Study		SCVWD	Paper	21-Dec-93
34	A. Pedington	7553, 7562, 75	TC 425 A36 V6 1973 REF	Flood Control Improvements on Adobe Creek	Planning Study	FEIR	SCVWD	Paper	Jun-73
35	A. Pedington	7553, 7559, 75	TC 425 A36 P7 1972	Adobe Creek and Barron Creek Levee Impro	Planning Study	Preliminary Design Report	SCVWD	Paper	Aug-72
36	A. Pedington	N/A	TC 425 A38 E5 1972	Flood Control Improvements on Alamas Creek	Planning Study	EIR	SCVWD	Paper	Aug-72
37	A. Pedington	N/A	TC 425 A38 F4 1972 REF	Proposed Improvements on Alamas Creek	Planning Study		SCVWD	Paper	Aug-72
38	A. Pedington	7551	TC 425 A4 R3 1975 REF	Alamitos Creek Flood Control	Planning Study	Information Booklet	SCVWD	Paper	14-Sep-75
39	A. Pedington	7551	1063	Graystone Lane Bridge at Alamitos Creek	As Built	Title Sheet	SCVWD	Paper	23-May-81
40	A. Pedington	7551	1064-1069	Graystone Lane Bridge at Alamitos Creek	As Built	Details	SCVWD	Paper	23-May-81
41	A. Pedington	7551	1070-1074	Graystone Lane Bridge at Alamitos Creek	As Built	Plan & Profiles	SCVWD	Paper	23-May-81

## Data Collection Spreadsheet

Apply filters based on the following selection choices to retrieve document information related to various levee risk indicators.

Document Name:

Document Type:

Source:

Date: From (mm/dd/yyyy):  To (mm/dd/yyyy):

Location:

**User Note:** Please refine search by selecting or deselecting specific risk factors.

Risk Indicator:  Topography  Hydrology  Hydraulics  Historical Data  
 Operations  Maintenance  Construction  Geotechnical

County:

Reclamation District:

Associated Stream:

Associated Levee:  (Enter levee ID number)

Remarks:

## Web Application Document Search

### Levee Risk Indicator Search - RESULTS

Document Number	Document Name
<a href="#">TC 425 C69 S45 v 2004/05 c 1 LIBRARY</a>	Semi-Annual Report for the Period December 1, 2004 to June 1, 2005, Coyote and Berryessa Creeks, CA - Coyote Creek Element
<a href="#">TC 425 C69 1970 c 6 LIBRARY</a>	Flood Plain Information Coyote Creek San Francisco Bay to Anderson Reservoir
<a href="#">TC 425 C69 C6 1984w REF</a>	Coyote Creek Engineer's Report and Draft EIR
<a href="#">TC 425 C69 C6 1990</a>	SCVWD Coyote Creek Flood Control Project
<a href="#">TC 425 C69 C6 1994</a>	Coyote Creek Project Financing Plan
<a href="#">TC 425 C69 C6 1984 c 2 LIBRARY</a>	Coyote Creek (San Francisco Bay to Montague Expressway)
<a href="#">TC 425 C69 C69 1997</a>	Coyote Creek Flood Control Project Upstream from San Francisco Bay to Montague Expy Trouble Spots, Anderson Dam & Spillway, Coyote Dam & Spillway
<a href="#">TC 425 C69 F56 1987 c 4 LIBRARY</a>	Coyote Creek Flood Control
<a href="#">TC 425 C69 I58 1907</a>	Interim Feasibility Report Coyote Creek and Berryessa Creek
<a href="#">TC 425 C69 I5 1996</a>	Interim - Operation and Maintenance Manual

## Search Results

The following results page depicts the document information collected on each of the documents including the risk factors and associated levees.

## Levee Risk Indicator Search - Document Details

Based on the search criteria established, the following documents are available for review.

### Summary:

Document Name: Flood Plain Information Coyote Creek San Francisco Bay to Anderson Reservoir  
 Document Type: Planning Study  
 Document Subtype: SCVWD  
 Source: Paper  
 Format: 02/01/1970  
 Date: SCVWD Central Library  
 Location: Remark:

Risk Indicators:  Topography  Hydrology  Hydraulics  Historical Data  
 Operations  Maintenance  Construction  Geotechnical

### Associated Reclamation Districts:

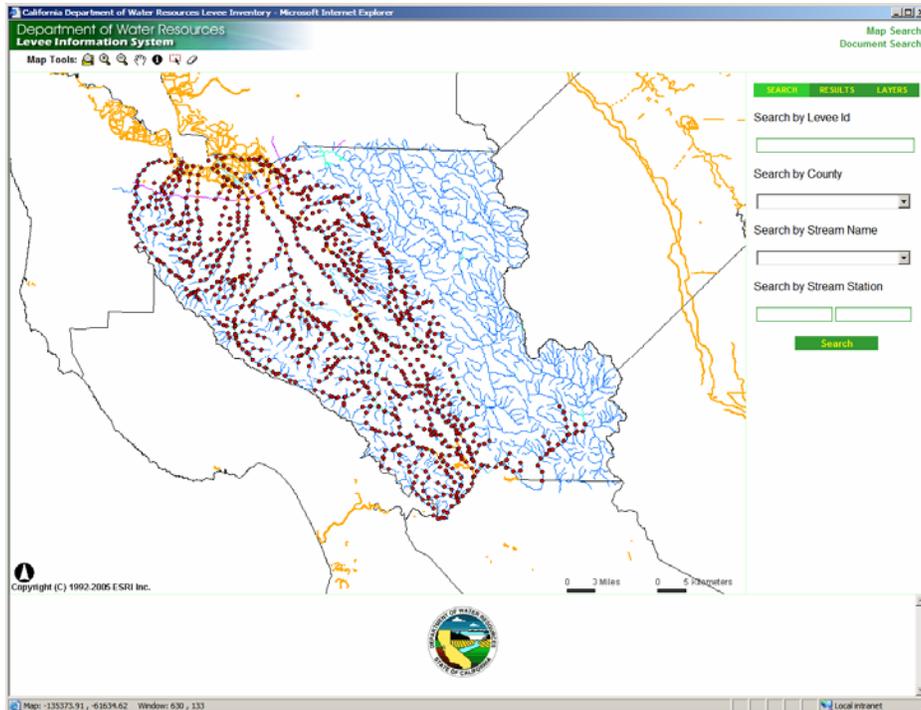
### Associated Streams:

### Associated Levees:

Levee ID	Loc Desc	Primary Use	Structure Type	Construction Year	Stream Name	Primary Maintainer	Local Authority	First Name	Middle Initial	Last Name	Address	City	State	Zip	Phone	Fax	Owner Agency	Construction Agency	Data Source	Levee Bank	Levee Category
7522	-	FLOOD CONTROL	LEVEE	0.0	COYOTE CREEK	-	-	-	-	-	-	-	-	-	-	-	-	SANTA CLARA LEVEE WORKSHOP	RIGHT	NON-PROJECT LEVEE	
7521	-	FLOOD CONTROL	LEVEE	0.0	FISHER CREEK	-	-	-	-	-	-	-	-	-	-	-	-	SANTA CLARA LEVEE WORKSHOP	LEFT	NON-PROJECT LEVEE	
3482	-	FLOOD CONTROL	LEVEE	0.0	FISHER CREEK	-	-	-	-	-	-	-	-	-	-	-	-	SANTA CLARA LEVEE WORKSHOP	RIGHT	NON-PROJECT LEVEE	
7447	-	FLOOD CONTROL	LEVEE	0.0	COYOTE CREEK	SCVWD	SCVWD	-	-	-	-	-	-	-	-	-	-	DRG, DOQ, LEVEE WORKSHOP	LEFT	NON-PROJECT LEVEE	
7828	-	FLOOD CONTROL	FLOOD WALL	0.0	COYOTE CREEK	PRIVATE	PRIVATE	-	-	-	-	-	-	-	-	-	PRIVATE	SANTA CLARA LEVEE WORKSHOP	LEFT	NON-PROJECT LEVEE	
7446	-	FLOOD CONTROL	LEVEE	0.0	COYOTE CREEK	SCVWD	SCVWD	-	-	-	-	-	-	-	-	-	SCVWD	DRG, DOQ, LEVEE WORKSHOP	RIGHT	NON-PROJECT LEVEE	
7820	RIGHT	FLOOD CONTROL	LEVEE	1995.0	COYOTE CREEK	SCVWD	SCVWD	-	-	-	-	-	-	-	-	-	SCVWD	SCVWD MAINTENANCE SPREADSHEET, OES LEVEE SHAPEFILE	RIGHT	NON-PROJECT LEVEE	
7459	LEFT	FLOOD CONTROL	LEVEE	1995.0	COYOTE CREEK	SCVWD	SCVWD	-	-	-	-	-	-	-	-	-	SCVWD	SCVWD MAINTENANCE SPREADSHEET, OES LEVEE SHAPEFILE	LEFT	NON-PROJECT LEVEE	
7543	-	FLOOD CONTROL	LEVEE	0.0	COYOTE CREEK	SCVWD	SCVWD	-	-	-	-	-	-	-	-	-	SCVWD	SC LEVEE WORKSHOP, OES LEVEE SHAPEFILE	LEFT	NON-PROJECT LEVEE	

## Document Details Result Page

The Geospatial search is an ESRI ArcIMS based GUI that allows the user to search for documents based on levee ID, stream name, stream name and stream station as well as county.



Web Mapping Geospatial Search Screen

SEARCH	RESULTS	LAYERS
Document Number	Document Name	
<a href="#">TC 425 C89.S45 v.2004/05 p.1 LIBRARY</a>	Semi-Annual Report for the Period December 1, 2004 to June 1, 2005, Coyote and Berryessa Creeks, CA - Coyote Creek Element	
<a href="#">TC 425 C89 1970 c.6 LIBRARY</a>	Flood Plain Information Coyote Creek San Francisco Bay to Anderson Reservoir	
<a href="#">TC 425 C89.C6 1984w REF</a>	Coyote Creek Engineer's Report and Draft EIR	
<a href="#">TC 425 C89.C6 1990</a>	SCVWD Coyote Creek Flood Control Project	
<a href="#">TC 425 C89.C6 1984</a>	Coyote Creek Project Financing Plan	
<a href="#">TC 425 C89.C69 1999 p.1 LIBRARY</a>	The Coyote Creek Flood Protection Project	
<a href="#">TC 425 C89.C6 1984 c.2 LIBRARY</a>	Coyote Creek (San Francisco Bay to Montague Expressway)	
<a href="#">TC 425 C89.C69 1997</a>	Coyote Creek Flood Control Project Upstream from San Francisco Bay to Montague Expy Trouble Spots; Anderson Dam & Spillway; Coyote Dam & Spillway	
<a href="#">TC 425 C89.F56 1987 c.4 LIBRARY</a>	Coyote Creek Flood Control	
<a href="#">TC 425 C89.I58 1987</a>	Interim Feasibility Report Coyote Creek and Berryessa Creek	
<a href="#">TC 425 C89.I5 1996</a>	Interim - Operation and Maintenance Manual	

SEARCH	RESULTS	LAYERS
Document Name:	Semi-Annual Report for the Period December 1, 2004 to June 1, 2005, Coyote and Berryessa Creeks, CA - Coyote Creek Element	
Document Type:	Planning Study	
Document Subtype:	null	
Source:	SCVWD	
Format:	Paper	
Date:	06/10/2005	
Location:	SCVWD Central Library	
Remark:	Inspections Spreadsheet corresponds to Maintenance Log, see attached photocopy of one page	

Indicators:

Topography    Hydrology  
 Hydraulics    Historical Data  
 Operations    Maintenance  
 Construction    Geotechnical

Associated Reclamation Districts:

Associated Streams:  
 Coyote Creek  
 Berryessa Creek

[Levee Details](#)  
[Return to Results](#)

### Geospatial Search Results Tab and Document Details

The pilot application has been complete and presented to DWR. Minor revisions will be made based on the presentation by PBS&J to complete the project. A user guide has been developed for the application as reference. The application will be hosted by PBS&J until DWR has the ability to host the application.

**APPENDIX A**  
**LEVEE DATABASE**  
**ENTITY RELATIONSHIP DIAGRAM**