FINAL - Plan to Minimize Impacts on Adjacent Landowners
Alamo Creek Detention Basin Project

Program Background

The Flood Protection Corridor Program (FPCP) was created by the "Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection Act of 2000" (Proposition 13). Current funding comes from voter approved Proposition 84, the "Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006." The Program is authorized to fund projects providing non-structural approaches to flood management, including the acquisition and restoration of wildlife habitat and agricultural land preservation. Program guidelines require the applicant, in conjunction with the Department of Water Resources (DWR); develop a plan to minimize the impacts on adjacent landowners prior to acquiring any interest in land.

The Water Code Section states:

> "Water Code Section 79041: Prior to acquiring an easement or other interest in land pursuant to this article, the project shall include a plan to minimize the impacts on adjacent landowners. The plan shall include but not be limited to, an evaluation of the impact on floodwaters, the structural integrity of affected levees, diversion facilities, customary agricultural husbandry practices and timber extraction *operations, and an evaluation with regard to the maintenance required for any facilities that are proposed to be constructed or altered.*"

Project Overview

The Alamo Creek Detention Basin Project provides flood protection benefits to private and public properties, reduces the potential for downstream erosion and riparian corridor damage resulting from high water flows, improves water quality by reducing the turbidity and downstream erosion that occurs with fast moving flood waters, provides benefits to wildlife and improves habitat, preserves open space adjacent to farmlands and the riparian corridor, provides a perpetual open space setting for public benefit and affords opportunities for continued agricultural use. Cost estimates from the City's hydrology consultant (West Yost & Associates) indicate that damages expected after construction of the detention basin would be in the area of $40,533 for a 28 year event, while without the detention basin, over $16.5 million in private property and $1.8 million in public property damage would be directly attributable to Alamo Creek overtopping its banks.

The approximately 79 acre Alamo Creek Detention Basin site is located just outside the western border of the City of Vacaville, upstream of the residential areas within City limits which have experienced significant flooding during previous storm events. The site is currently occupied by a declining prune orchard and uncultivated open land. The purpose of the detention basin is to detain peak storm flows before they enter City limits in order to reduce and limit repetitive flooding that has occurred every 3 to 5 years downstream of the site. Twelve flood events have occurred since 1963 with six federally declared flood disasters being noted since

1986. During the most recent storm related flood event (December 30-31, 2005), approximately 900 personal residences were impacted, creating significant property loss ($23 million private property and $2 million in public property citywide). Damage occurring to homes, personal effects, automobiles and other items was related directly to flood waters overtopping the Alamo Creek Channel and its tributaries. Flooded streets created significant traffic delays, inhibited public mobility and restricted the availability of vital emergency services to flooded areas. Flood waters also spilled into the Putah South Canal, downstream of Vacaville's drinking water supply, but upstream from the drinking water supplies of Fairfield, Suisun, and Vallejo.

Construction of the Alamo Creek Detention Basin would alleviate these flood related costs and reduce the threat to public health and safety experienced during a storm event similar in magnitude to the one which occurred in December 2005. By removing and detaining, on a temporary basis, peak storm water flow from the stream, flow capacity in the Alamo Creek channel will be improved and debris and sediment loads will be reduced downstream. Flood protection will be improved, not only within the City limits, but also for regions of the County of Solano east and southeast of the City and west of the Sacramento River, including estuaries leading to the San Francisco Bay.

The Alamo Creek Detention Basin design, which has been refined based on environmental constraints and the requirements of the California Department of Water Resources, Division of Safety of Dams (DSOD), will temporarily detain up to 952 acre-feet of storm water run-off during moderate to high storm events and meter the flow of water back into the creek system after a 24 to 72 hour detention period following storm subsidence. Development of the detention basin includes the excavation of a detention floor, foundation excavation and building of an earth berm along the north, east and south sides of the basin, construction of an inlet structure to provide for the gravity flow of water into the detention basin from Alamo Creek, installation of an outlet pipe to meter the flow of storm water back into the creek and construction of an overflow spillway to provide for the re-entry of detained storm water into Alamo Creek in the event that the capacity of the detention basin is exceeded.

The detention basin will not impede normal and/or low flows of the creek. The proposed project will be designed to avoid and minimize impacts to Alamo Creek and the adjacent riparian area. Detention basin berms will be carefully sited to minimize and avoid the need for significant riparian tree removal. Maximum berm height at the eastern side of the basin is 27 feet measured from the interior basin floor to top of berm. Disturbance within the creek channel will be limited to the inlet and the outlet structures and related erosion control features.

Construction will conform to California Regional Water Quality Control Board Best Management Practices for construction and any conditions included in the Corps of Engineers or Fish and Game permits. The DSOD, has jurisdictional authority under the California Water Code to regulate the design, construction and operation of dams and other water impoundments, including detention basins with a berm height of 6 feet or greater that impound over 50 acre-feet of water. As such, construction plans and specifications for the Upper Alamo Creek Detention Basin (which includes storage design capacity of up to 1,000 acre-feet of water) will be subject to DSOD approval.

Based on the 95% plans, construction of the Alamo Detention Basin could require the movement of 500,000 cubic yards of soil. Soil required for construction of the berm would be excavated from the interior of the basin; however berm construction will use only a portion of the material and it is anticipated that a significant amount of excess soil will be hauled by truck from the site to locations unknown at this time. Top soil is intended to be stockpiled and spread on the project site as part of the finish grading to maintain agricultural cultivation opportunities for the site and support habitat restoration planting. Traffic will be maintained on the adjacent roadways during project construction; no road closures or detours are anticipated. Construction access to the project site will be via Rogers Lane from Vaca Valley Road.

The acquisition of fee title to the project site has already occurred utilizing funds from the Solano County Water Agency (SCWA), the City's Development Impact Fees (DIF) and a grant through the Habitat Conservation Fund Program. The project has been subject to analysis of impacts under the California Environmental Quality Act and the project design has been modified as necessary to incorporate mitigation measures that ensure that impacts to neighboring landowners will be minimized.

The City is has certified a Final Environmental Impact Report (FEIR) for the Alamo Creek Detention Basin Project. The design of the basin is has been revised in response to geotechnical, biological, cultural resource and other site and design constraints. In addition, details of project implementation are being refined to address potentially significant impacts that are caused by project construction and operation. The FEIR evaluated the potential impacts to neighboring properties associated with noise, dust, air quality, hours of operation, traffic, access, aesthetics and other environmental issues and includes mitigation measures that will be incorporated into the project so as to minimize these impacts. The mitigation measures relative to the contractor's operations will be included as required conditions in the construction contract. The CEQA process included public notification and participation as follows:

February 8, 2010	Notice of Preparation
March 1, 2010	Public Scoping Meeting
October 25, 2010	Notice of Availability, Draft EIR & start of 45 day public review
November 18, 2010	Public meeting to receive comments on DEIR
February 18, 2011	Notice of Availability FEIR and Notice of Public Hearing
March 8, 2011	City Council Public Hearing; certification of FEIR and approval of Alamo Creek Detention Basin preliminary design

The City Council adopted findings and overriding considerations and incorporated all feasible mitigation measures into the approval of the Alamo Creek Detention Basin preliminary design. See attached City Council Resolutions 2011-32 and 2011-33 for detailed findings, the description of mitigation measures and the mitigation monitoring and reporting plan.

The City is seeking to maintain a balance between flood reduction goals, habitat preservation/restoration and agricultural activities. The project will be subject to several state and federal permits that could result in specific requirements that may alter the project as

currently described. The City intends to facilitate communication between agencies and seek common ground where there are conflicting requirements in an effort to achieve a project that meets the objectives of all stakeholders while maintaining the primary purpose of the project as a flood reduction facility. Anticipated permits and agency involvement includes:

- Clean Water Act, Section 404 Permit from the US Army Corps of Engineers
- CWA Section 401 Water Quality Certification from the Regional Water Quality Control Board and Section 402 National Pollutant Discharge Elimination System Permit from the State Water Resources Control Board
- Fish and Game Code Section 1602 Streambed Alteration Agreement from the California Department of Fish and Game
- National Historic Preservation Act of 1966 Section 106 Compliance
- Federal Endangered Species Act Section 7 Consultation with U.S. Fish and Wildlife Service
- Fish and Game Code Section 2081.1 California Endangered Species Act Permit from the California Department of Fish and Game (unknown if potential exists at this time)
- Approval of Construction Plans and Specifications by the California Department of Water Resources, Division of Safety of Dams (DSOD)

Evaluation of Impact of Development of Project on Floodwaters

Based on the most recent FEMA flood maps, the City has 555 acres in the 100 year flood plain and another 1,830 acres in flood prone areas. In addition, 13 miles of City roadways are in floodplains, with another 56 miles located in flood prone areas. The majority of these areas are within the floodplain of Alamo Creek as it passes through the City. The western boundary of the City of Vacaville lies adjacent to the foothills of the Blue Ridge Range. Because of Vacaville's proximity to this range which receives more than twice the rainfall of the City, substantial storm water run-off flows down the hillsides and enters the creeks that flow through the City, including Alamo Creek. The run-off quickly fills the creeks so that during significant storm events they are close to or exceeding capacity by the time they reach City limits. As a result, during severe storm events, creeks overtop their banks before entering the City limits and both City streets and surrounding properties located within the lower lying areas of the community become inundated with flood waters. Based on several studies, Alamo Creek is considered to pose the highest risk for flooding during a 10 year or greater flood event. Flood reduction strategies must take into account the need to detain storm waters until creek water levels have subsided sufficiently to allow run-off to be slowly metered back into the waterways.

The 1990 *Ulatis Creek Watershed Study*, prepared by Camp Dresser & Mckee Inc. evaluated several flood control alternatives that would provide 10-year flood protection within the urbanized areas of the City and determined that detention storage was the most feasible method. The 1990 conclusions and recommendations were re-evaluated in the 2000 *Storm Drainage Master Plan* prepared by West Yost & Associates which included recommendations for several large regional detention basins upstream of the City. Most recently the Solano County Water Agency (SCWA) engaged West Yost & Associates to prepare the 2008 *Ulatis*

System Drainage Study which updated the hydrologic and hydraulic modeling for the Ulatis Creek System, calibrated in models to the December 2002 and December 2005 storms. The SCWA study identified and evaluated flood control improvements that would reduce flooding along Ulatis Creek and Alamo Creek, including the recommendation for the Alamo Creek Detention Basin at the location of the proposed project site. The Alamo Creek Detention Basin is the highest priority detention basin project because it will significantly reduce the amount of water overtopping the banks of Alamo Creek and reduce or eliminate localized flooding to the greatest number of flood prone properties within the City.

The Alamo Creek Detention Basin will be constructed on approximately 78.87 acres of property along the north side of Alamo Creek, just west of the City limits. The preliminary design concept is for the detention basin to divert up to 1,000 acre feet of storm water flow from the creek channel through an inlet structure. The basin will cover an area of approximately 2100 x 1500 feet and will be surrounded on the north, east and south sides by an earthen berm. At its highest point, the inside slope of the berm will be approximately 27 feet from the bottom of the basin. A downstream outlet consisting of a 42-inch diameter concrete pipe will meter the flow of storm water back to the creek once high storm water subsides. A spillway is designed into the top of the berm to provide for the re-entry of detained storm water into Alamo Creek in the event that the capacity of the detention basin is exceeded.

Based on the drainage studies identified above, the design of the Alamo Creek Detention Basin Project will significantly reduce and in some cases eliminate flooding impacts currently occurring within the flood plain of Alamo Creek.

Evaluation of Impacts on Structural Integrity of Affected Levees

There are currently no levees on the project site or in the vicinity of the project site. The berms of the basin will be designed and constructed with oversight by the California Department of Water Resources, Division of Safety of Dams. Water will be detained infrequently and for short durations. Berms will be designed and constructed according to local, state and federal requirements to ensure the structural integrity of the project.

Evaluation of Impacts on Diversion Facilities

The diversion structure constructed at the upper (south west) end of the basin will be designed to allow low flows to remain in the creek and by-pass the basin. Only flows from larger storms will be allowed to spill over the intake structure into the basin. The intake/diversion structure is planned to be constructed with articulated concrete block, which will allow a low-growing re-vegetated surface to be established that will maintain a natural appearance. Storm water entering the intake structure will experience lower entrance velocities and reduce the potential for erosion. The design of the detention basin has been refined based on the information developed with the final Hydrologic and Hydraulic Design Report (March 2011) prepared by West Yost Associates Inc. The final design incorporates the recommendations resulting from a full hydraulic analysis so as to minimize or eliminate the potential for the operation of the intake structure to have impact on adjoining properties.

Evaluation of Impacts on Customary Agricultural Husbandry Practices

The basin site and surrounding land is zoned A-40, Agriculture with some areas under cultivation in orchards, row crops and hay and other properties in a fallow condition. The orchard to the east of the project site has recently been removed by the land owner and the land has not been re-planted; a producing walnut orchard exists to the northeast; hay and other field crops are produced on properties to the north and a remnant and declining prune orchard exists to the west of the site. The detention basin site is occupied by an abandoned prune orchard (approx. 52 acres) and fallow hay field (approx 26 acres). The project site and surrounding agricultural lands are served with irrigation water from the Solano Irrigation District. The bottom of the completed basin has the potential for continued agricultural cultivation activities, provided that such cultivation does not conflict with the operation of the basin or the provisions of other agency permits or regulations.

The adjacent landowners will experience a minimal impact due to the general agricultural character of the land in the area. At present, there are only 3 or 4 residences in the vicinity of the detention basin site; two of these share access along Rogers Lane, which will be the construction access for the project. Agricultural practices on adjoining properties involve the use of equipment during times of cultivation and harvest and property owners rely on access to their fields via Rogers Lane. Construction activities and traffic will be coordinated to enable continued free access for agricultural equipment on neighboring properties. The passive nature of the completed basin is not anticipated to have any impact on neighboring agricultural practices. Neighboring parcels will continue with agricultural production and as open space. The project has been well received by adjacent landowners due to the fact that it provides for continued open space preservation, and the flood control efforts help eliminate surface erosion and loss of valuable topsoil. The detention basin will help retain the agricultural character of the area by preserving its acreage as perpetual open space within a conservation easement and making the basin floor available for agricultural cultivation. The City intends that any public access to the property will be controlled through docent led programs that focus on passive use and observation of the natural environment and that the property will be sufficiently fenced to protect both the basin facilities and the adjacent agricultural and residential uses.

Evaluation of Impacts on Timber Extraction Operations

There are no timber extraction operations in the vicinity of the project, and thus the project will not impact any timber extraction operations.

Evaluation of Impacts on Maintenance of any Facilities Proposed to be Altered or Constructed

Annual maintenance activities for the basin will include mowing and disking as well as inlet and outlet structure maintenance. Bi-annual maintenance activities may include siltation removal on alternative sides of the basin channel to preserve habitat and maintain flows. The City anticipates that these activities will be conducted by Public Works field maintenance staff and included in the annual maintenance budget for the City.

Preliminary consultation with Fish and Game and the Department of Water Resources indicates that a conservation easement will be required to protect and maintain habitat as well as to preserve the property as agricultural open space. The City will establish the necessary maintenance plan and associated funding mechanism to support long term maintenance as required by permitting agencies. The City intends to investigate partnership opportunities with the Solano Resource Conservation District and/or the Solano Land Trust where possible to hold easements and implement restoration and maintenance programs on the site.

Agricultural activities that are undertaken in the basin may be implemented by a separate entity under contract with a maintenance component included in the agricultural lease terms.

In conclusion, it is not anticipated that the development of the facility and/or its subsequent maintenance will have any significant impact upon the adjoining property owners.

Attached: City of Vacaville City Council Resolutions 2011-32 and 2011-33

Public comment period: September 28, 2011 – October 27, 2011.

No comments received.

RECOMMENDED:

Earl D. Nelson

Earl Nelson
Chief, Flood Corridor Programs and
Environmental Support Branch

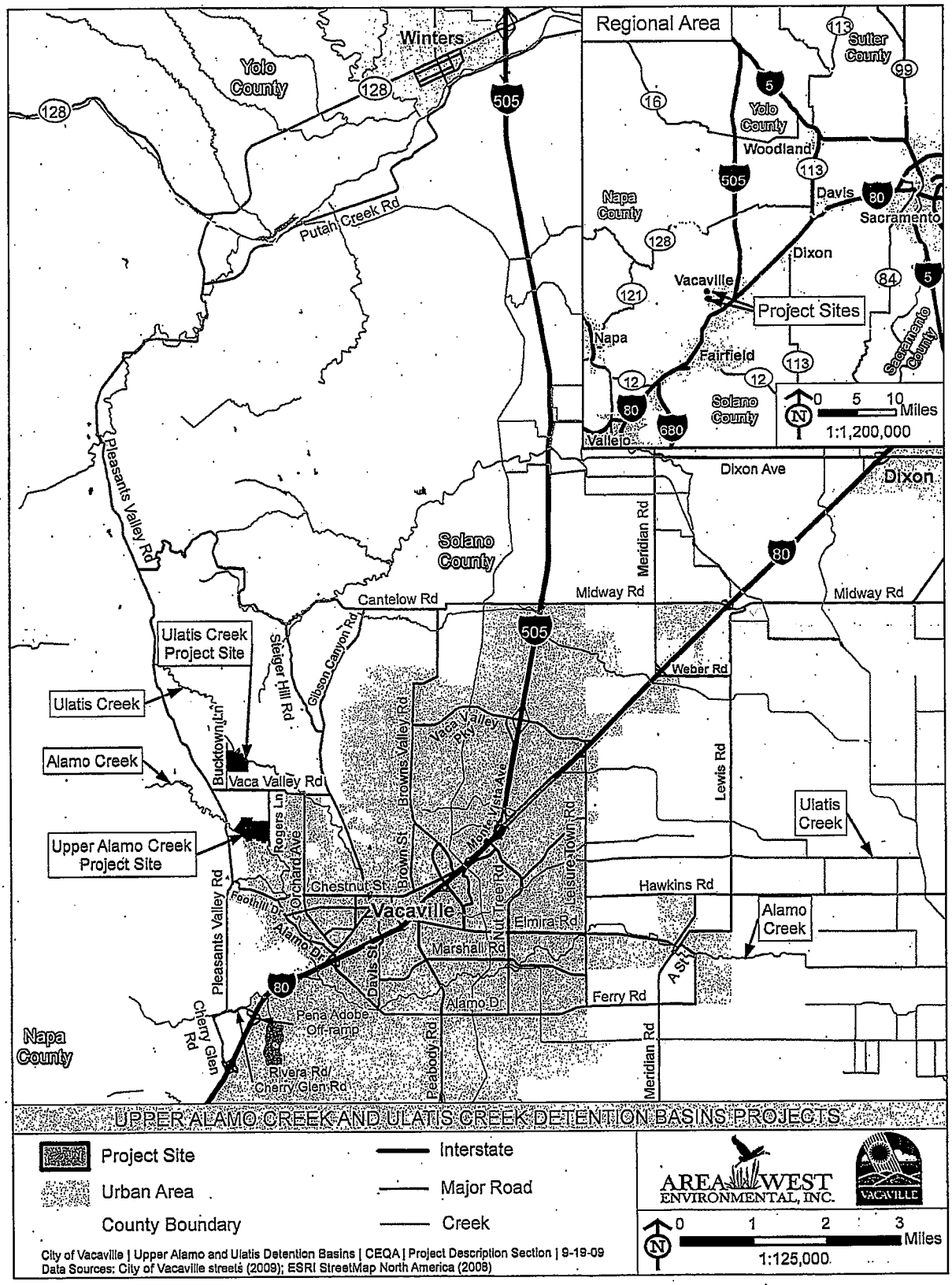
11/3/11
Date

APPROVED:

Noel Lerner

Noel Lerner
Chief, Flood Projects Office

11/9/11
Date


Regional Area
Winters
Yolo County
Putah Creek Rd
Pleasants Valley Rd
Solano County
Napa County
Cantelow Rd
Midway Rd
Dixon Ave
Dixon
Meridian Rd
Weber Rd
Lewis Rd
Hawkins Rd
Ferry Rd
Ulatis Creek Project Site
Ulatis Creek
Alamo Creek
Upper Alamo Creek Project Site
Steiger Hill Rd
Gibson Canyon Rd
Bucktown Ln
Vaca Valley Rd
Vaca Valley Pkwy
Browns Valley Rd
Brown St
Rogers Ln
Orchard Ave
Chestnut St
Vacaville
Foothill Dr
Alamo Dr
Davis St
Marshall Rd
Nut Tree Rd
Elmira Rd
Leisure Town Rd
Peabody Rd
Cherry Glen Rd
Rivera Rd/ Cherry Glen Rd
Pena Adobe Off-ramp
A St
Woodland
Davis
Sacramento
Sutter County
Sacramento County
Vacaville
Fairfield
Napa
Vallejo
Solano County
Project Sites
0 5 10 Miles
1:1,200,000
UPPER ALAMO CREEK AND ULATIS CREEK DETENTION BASINS PROJECTS
Project Site
Urban Area
County Boundary
Interstate
Major Road
Creek
AREA WEST ENVIRONMENTAL, INC.
VACAVILLE
0 1 2 3 Miles
1:125,000
City of Vacaville | Upper Alamo and Ulatis Detention Basins | CEQA | Project Description Section | 9-19-09
Data Sources: City of Vacaville streets (2009); ESRI StreetMap North America (2008)