

STORMWATER SYSTEM IN VACAVILLE

The purpose of this document is to present the stormwater utilities and infrastructure relevant to the City of Vacaville General Plan study area, which mainly comprises the land within the combined limits of the Sphere of Influence and Urban Growth Boundary, and which is shown in Figure 1. The major elements of the document include a description of the existing stormwater drainage facilities, an explanation of the regulatory framework, and future system improvements.

A. Existing Conditions

The existing drainage systems in Vacaville include creeks, constructed channels, and an extensive network of storm drain pipes that collect and convey runoff from the streets and adjacent land.

1. Physical Environment

This section describes the physical environment that affects drainage systems in Vacaville, including the topography, soils, and climate conditions.

a. Topography

Vacaville is located within the 150-square mile Ulatis Creek watershed. The topography across most of the city is relatively flat. The western portion of the city is in the rugged, steep Vaca Mountain Range, which defines the western boundary of the Ulatis Creek watershed. The mountain range is dominated by Mount Vaca, with a peak elevation of 2,819 feet. Alamo, Ulatis, Encinosa, and Laguna Creeks, which are discussed further in Section A.2, all have their headwaters in the Vaca Mountains.

The northwestern portion of the city includes a series of foothills commonly referred to as the English Hills. Horse Creek and Gibson Canyon Creek have their headwaters in the English Hills. The eastern and southeastern portions of the city consist of the flat to very flat slopes of the Sacramento Valley. The natural land slope is generally downward to the east-southeast, ranging from 5 to 10 feet of drop per mile.

b. Soils

Soils in and around the city range from shallow loams (i.e. soil that has relatively equal proportions of sand, silt, and clay) overlaying sandstone bedrock in the mountainous areas to moderately-deep layers of sands, silts, and clays in the valley floor. The majority of soils in the Vaca Mountains and English Hills consist of Maymen-Los Gatos loam, Millsholm loam, and Dibble-Los Osos loam. These soils range in permeability from moderate to high, with very high erosion potential. Permeability of the soils influences the rate at which rainfall seeps into the ground. When soil permeability is high, rainwater will seep into the ground more easily. When the permeability is low, rain will tend to accumulate on the ground surface or flow across the ground surface.

Soils in the Vaca Valley floor and into the Sacramento Valley consist of Brentwood clay loam, Altamont clay, Capay clay and silty clay loams, Corning gravelly loam, San Ysidro sandy clay loam, and Yolo silt and silty clay loams, which have permeabilities in the moderate to low range. Soil types and characteristics have been evaluated and mapped by the U.S. Natural Resources Conservation Service (NRCS) and documented in the Soil Survey for Solano County.¹

c. Climate Conditions and Precipitation

Vacaville's climatic conditions are consistent with the temperate conditions that dominate the Sacramento Valley. The summers are hot and dry, and the winters cool and moist. Average monthly temperatures range from lows in the 40s and highs in the 50s during the winter months, to lows in the 60s and highs in the 100s during the summer months.

The predominant rainfall season is from November through April, with the heaviest storms of record occurring from December through February. Spatial rainfall distribution over the Vacaville area consists of higher intensities

¹ United States Department of Agriculture, May 1977, *Soil Survey of Solano County, California*.

and volumes in the upper elevations of the western portion of the Ulatis Creek watershed and lower intensities and volumes to the east. Mean annual precipitation varies from 45 inches at the ridgeline of the Vaca Mountains to 22 inches in the flat southeastern portion of the watershed near Elmira.²

2. Creek Systems

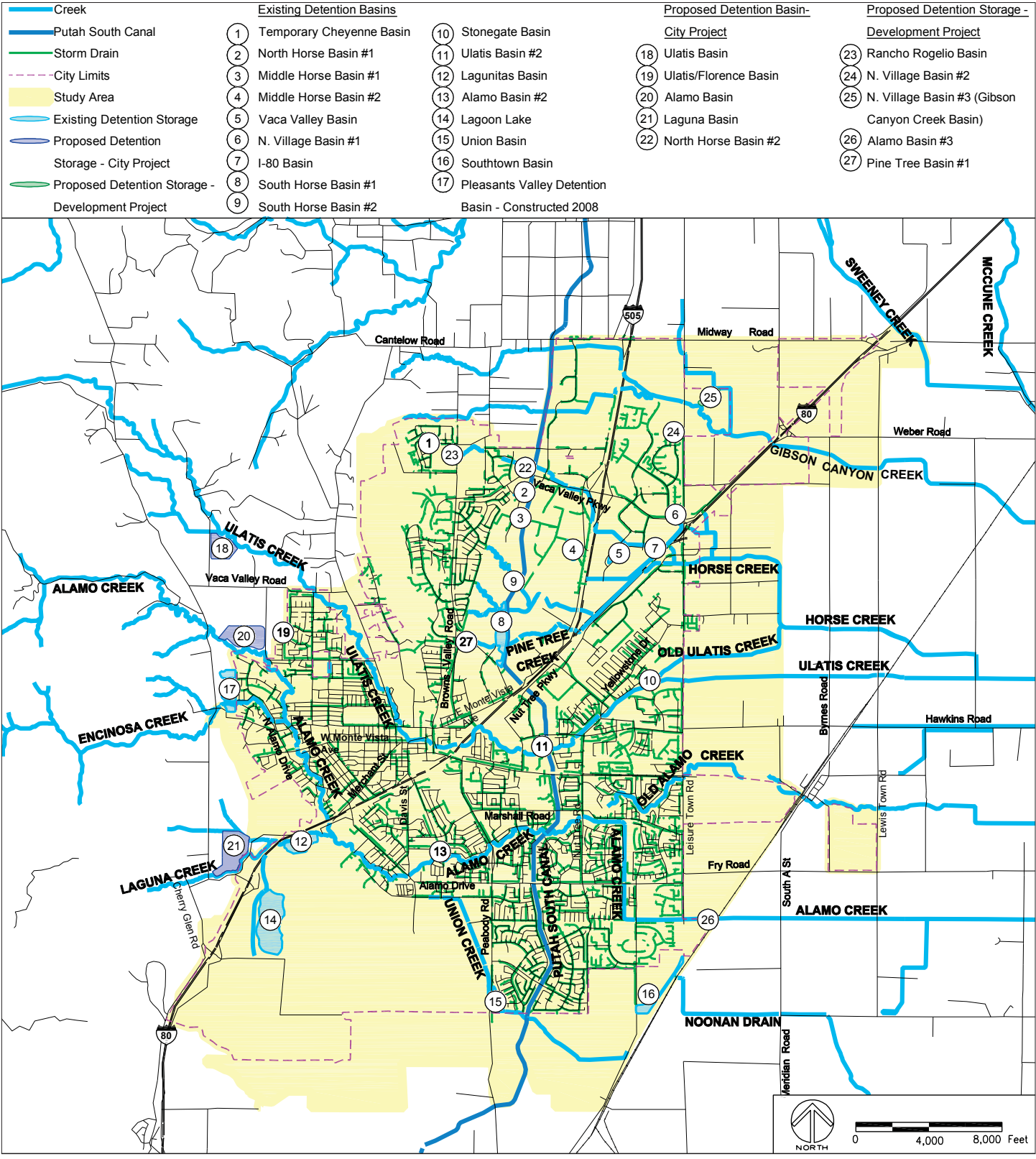
Vacaville's major creeks are shown in Figure 1. In general, the creeks flow in an east-southeasterly direction and ultimately drain into the Sacramento River via Cache Slough. The southern portion of Vacaville drains either to the Noonan Drain, which discharges ultimately to Barker Slough, or to Union Creek, which discharges to Suisun Bay.

The major stream courses within the city include:

- ◆ Alamo Creek, including its tributaries Laguna Creek and Encinosa Creek
- ◆ Ulatis Creek
- ◆ Horse Creek, including its tributary Pine Tree Creek
- ◆ Gibson Canyon Creek

The major stream courses that flow through Vacaville are largely in their natural state and alignment, except at the eastern edge of the city where flood control channels have been constructed. The natural, unaltered portions of the creeks generally do not have adequate flow capacity to convey a 100-year storm event, which is a storm that has a 1 percent chance of occurring in any given year. Maintenance for the majority of the natural streams in the city is the responsibility of adjacent property owners.

² West Yost Associates, June 1999, *Hydrology Manual*, prepared for the Solano County Water Agency.



Source: West Yost Associates, 2010.

FIGURE I
EXISTING DRAINAGE FACILITIES

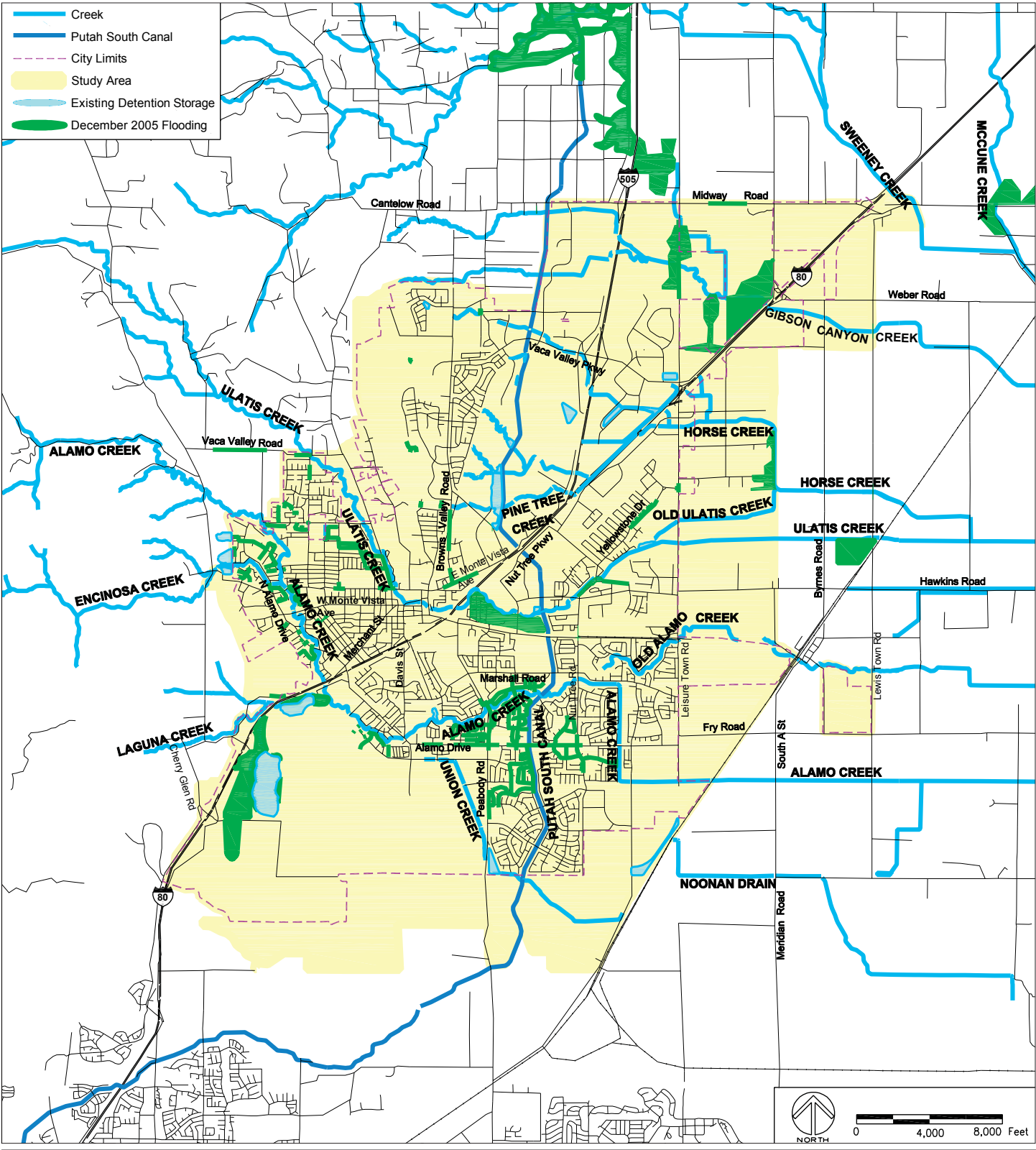
3. Flooding

Under existing conditions, considerable overbank flow has occurred during major storms (i.e. a 10-year event, which is a storm that has a 10 percent chance of occurring in any given year, or greater) in areas where channel and/or bridge capacities are exceeded. Overbank flow occurs when the creek water surface elevation exceeds the bank elevations, resulting in flow spilling out of the creek. Occasionally, the overbank flows have resulted in flooding residential properties, blocking roads, and disrupting traffic. Figure 2 shows areas that experienced flooding during a storm in December 2005 that caused significant property damage throughout the city.

4. Constructed Channels

In the 1960s, NRCS modified natural channels in the Vacaville area to provide a 10-year level of protection and maintain a minimum freeboard³ of 1.5 to 3.5 feet, except a few reaches along Horse Creek and Ulatis Creek that were designed by NRCS for a 50-year level of protection. The channel modifications by NRCS consisted of realigning and widening Ulatis, Alamo, Horse, Gibson Canyon, Sweeney, and McCune Creeks. The channel modifications generally extended from the eastern city limits to Cache Slough. The Alamo Creek channel modification begins just downstream of Nut Tree Road. The Ulatis Creek channel modification begins just downstream of Ulatis Drive. The Horse Creek and Gibson Canyon Creek modifications begin at Interstate 80. Horse Creek was also modified and realigned between Interstate 505 and Interstate 80 through the development of the Vaca Valley Business Park. Other improvements constructed by NRCS include stabilization structures along Ulatis, Alamo, and Horse Creeks and levees along the lower reaches of Ulatis Creek and Alamo Creek. In addition, a new diversion channel was constructed on Alamo Creek downstream of Nut Tree Road.

³ Freeboard is the vertical distance between the design peak water surface elevation and the top of creek bank.



Source: West Yost Associates, 2010.

FIGURE 2
FLOODED AREAS DURING DECEMBER 2005 STORM

5. Detention Basins

Vacaville has experienced significant flooding resulting in part from the large amount of flow coming from the Vaca Mountains. Therefore, the City built several regional detention basins that reduce the flow in the creeks before reaching the city in order to reduce flooding within the city. Detention storage basins are shown in Figure 1. There are two types of basins within the city: natural and constructed. Natural detention basins occur in natural depressions along the creeks where obstructions within the creek, such as culverts or roads, impede the flow. Constructed detention basins reduce the downstream flow within the creeks during major storm events. Many of the constructed detention basins were built as part of development projects. Development often changes the land use from open space, which has pervious surfaces, to urban uses, which have impervious surfaces, resulting in increased runoff. The purpose of these detention basins is to store the increased runoff resulting from developing the land so that the amount of runoff is less than or equal to the amount that occurred prior to development. Thus, the development does not adversely impact downstream neighborhoods.

City of Vacaville *Standard Specifications and Standard Drawings* requirements for the design of detention basins are discussed under Section B.4.d, below.

6. Storm Drain Systems

The City maintains a network of storm drains within the city. The City maintains most of the channel reaches of the storm drains, keeping the channel flowlines free from debris and vegetation. The Solano County Water Agency (SCWA) maintains Ulatis Creek, west of Nut Tree Road to the city limit line, and Alamo Creek from Nut Tree Road to the city limit. SCWA is also responsible for maintenance of the modified creeks downstream of the city.

The storm drain system is made up of a series of pipes under City streets that convey stormwater runoff to the various creeks. The storm drain pipes range in diameter from 12 to 96 inches. The capacities of these pipelines were de-

signed for a storm event with a 10-year return frequency, which is a standard design practice. Stormwater in excess of a 10-year event would pond in the streets or be conveyed through the streets until it reaches a channel or creek. The City's existing drainage facilities are shown in Figure 1.

7. Surface Drainage and Overland Release

Storm drains within the city are required to convey the 10-year design flows; therefore, storm events that result in design flows greater than the 10-year storm flow over the surface. This surface drainage typically flows along streets and/or overland release paths designed into a project.

In order to accommodate surface drainage, the City of Vacaville requires that streets and other public rights-of-way be designed to provide overland release of runoff for the 100-year storm. Overland release paths shall be designed to the following criteria:

- ◆ Shall assume that the underground storm drain system is plugged, all upstream areas are fully developed, and the rainfall has saturated the watershed.
- ◆ The 100-year storm flows shall be safely routed through and/or around a proposed development project to an acceptable downstream drainage facility. The overland flows shall maintain 1 foot of vertical clearance to building pads and shall not be higher than 0.5 feet above the roadway centerline elevation.

8. Existing Surface Water Quality

Water quality refers to the chemical, biological, and physical characteristics of water. The water quality within a watershed is influenced by surrounding land uses. Constituents found in urban runoff vary; variances can be the result of differences in rainfall intensity, geographic features, and the land use of the area, as well as vehicle traffic and the percentage of impervious surface.

Runoff from the Vaca Mountains and English Hills, which are the headwaters for the creeks draining through Vacaville, is laden with sediment, which increases the turbidity (cloudiness) of the water flowing in the creeks. The

sediment load in the runoff results from the erosive soils within the Ulatis Creek Watershed.

As described in Section A.1.c, the natural weather pattern in the Vacaville area consists of a long dry period from May to October, and a wet season from November to April. During the seasonal dry period, pollutants contributed by vehicle exhaust, vehicle tire and brake wear, spills, and atmospheric fallout accumulate within the watershed. Household herbicides, pesticides, fertilizers, and other chemicals also accumulate within the watershed. Precipitation during the early portion of the wet season displaces these pollutants into the stormwater runoff, which can result in elevated pollutant concentrations in the initial wet weather runoff.

Concentrations of heavy metals present in dry weather runoff are typically higher than concentrations measured in wet weather runoff because of the lower volume of water and infrequency of rain events. Sources of dry weather runoff constituent pollutants include commercial and domestic irrigation, general wash-off, groundwater infiltration, and other illicit discharges.

The City has instituted a program to survey storm drain outfalls and sample water in order to identify possible illicit discharges and determine water quality during the dry season.

B. Regulatory Framework

The purpose of this section is to discuss the key regulatory requirements applicable to stormwater in the study area, the system for which is shown on Figure 1.

1. Federal Agencies and Regulations

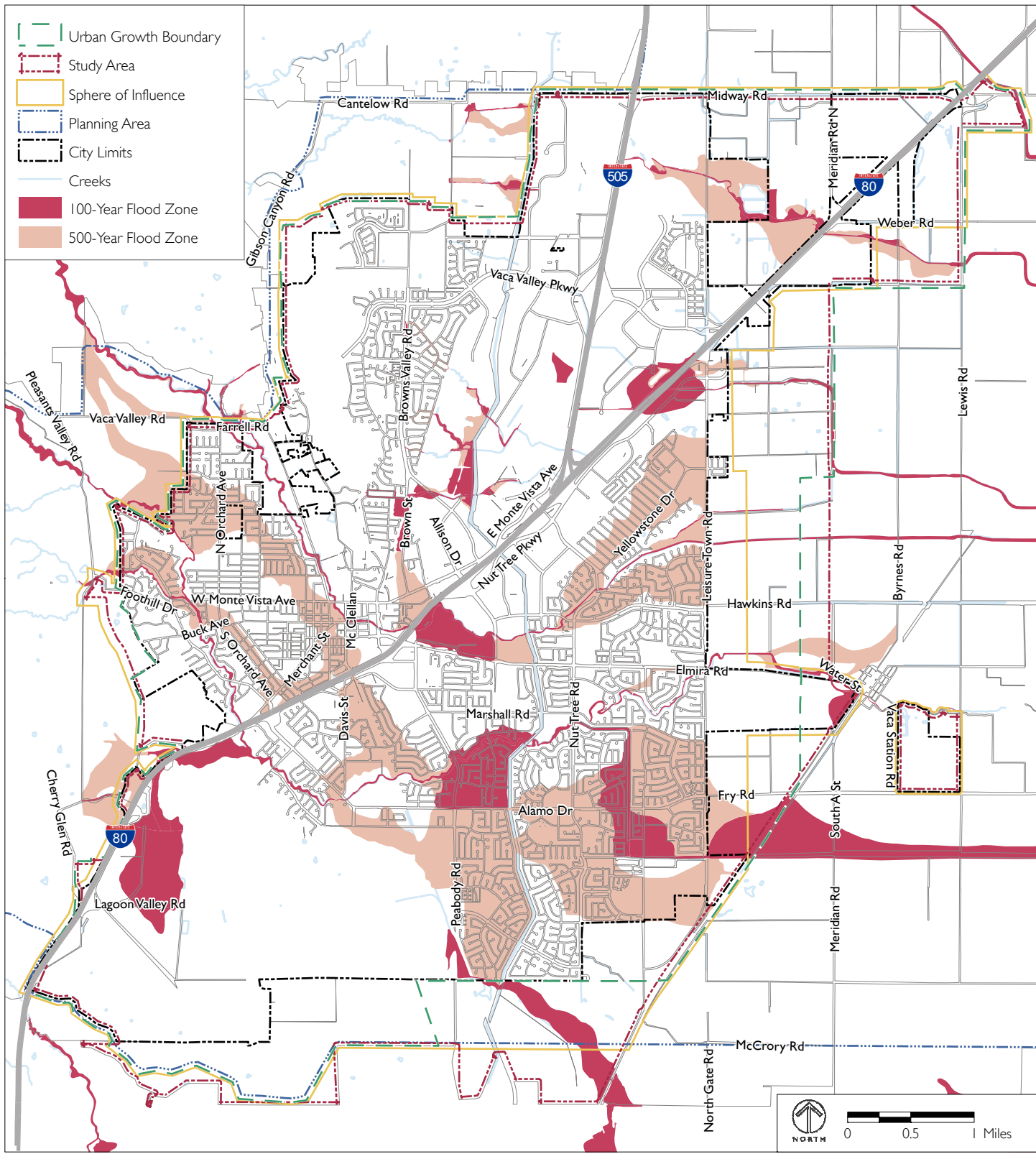
This section summarizes federal agencies and regulations pertaining to stormwater.

a. Stormwater Discharge Permitting Regulations

The Clean Water Act (CWA) prohibits the discharge of pollutants to navigable waters from a point source unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit. The State Regional Water Quality Control Board (SWRCB) is responsible for issuing NPDES permits to cities and counties through the Regional Water Quality Control Boards (RWQCB). Phase 2 implementation of NPDES permitting, effective March 10, 2003, extended urban runoff discharge permitting to include cities of 50,000 to 100,000 people, and to construction sites that disturb between 1 and 5 acres. Under Phase 2, federal regulations allow two permitting options for stormwater discharges: individual permits and general permits. The California SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0005-DWQ) for Small Municipal Separate Storm Sewer System (MS4) operators to efficiently regulate stormwater discharges under a single permit. Permittees must develop and implement a Stormwater Management Plan (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable. The City of Vacaville is considered a permittee under the statewide general permit.

b. Floodplain Regulations

The National Flood Insurance Act of 1968 made flood insurance available to property owners within communities that participate in the National Flood Insurance Program (NFIP). In order to be included in the NFIP, communities must adopt minimum floodplain management regulations established by the Federal Emergency Management Agency (FEMA), which are set forth in 44 Code of Federal Regulations Part 60. As shown in Figure 3, FEMA Flood Insurance Studies have identified several areas of potential flooding within the city that could occur during an estimated 100-year storm event. The City's Floodplain Management Code, which is described further in Section B.4.b, outlines the requirements for construction within a designated 100-year floodplain or areas prone to flooding in order to comply with these FEMA regulations.



Source: FEMA, 2009.

FIGURE 3
 FEMA FLOOD ZONES

2. State Laws and Regulations

The City of Vacaville is located in Solano County, which lies within the boundary of the Central Valley. The State of California passed several bills to address flood protection and liability and allocate bond funds in the Central Valley. Assembly Bills (AB) 5 and 70 are relevant to the Vacaville General Plan study area. In addition, AB 162 requires consideration of flood risk in local land use planning throughout California. A summary of each bill relevant to the city is provided below.

a. Assembly Bill (AB) 5

The requirements of this bill are listed below.

- ◆ The State must develop 100-year and 200-year flood maps for the Central Valley by July 1, 2008. Preliminary maps for Solano County, based on available floodplain delineations, were published in December 2008.⁴ The preliminary maps show flooding in several areas in Vacaville including:
 - Along Horse Creek at Interstate 80
 - North of Interstate 80 between Midway Road and Vaca Valley Road
 - East of Leisure Town Road along Maple Road
 - Alamo Creek at Marshall Drive
 - Alamo Creek from Alamo Drive to about 1 mile past Lewis Road
- ◆ The Central Valley Flood Protection Board (CVFPB) (formerly the Reclamation Board) must establish a Central Valley Flood Protection Plan (CVFPP) by 2012. The CVFPP will establish a system-wide approach to improving flood management, including recommendations for structural and non-structural means for improving performance and eliminating the deficiencies of flood management facilities.
- ◆ Within two years after the adoption of the CVFPP, communities within the Sacramento-San Joaquin Valley, including Vacaville, must amend

⁴ PBS&J, December 2008, *California Senate Bill Number 5- Best Available Mapping Sacramento-San Joaquin Valley Floodplain Mapping*, prepared for the State of California Central Valley Flood Protection Board, Department of Water Resources.

their General Plans to include data and analysis, goals and policies for the protection of lives and property from flooding, and related feasible implementation measures that are consistent with the CVFPP. Within one year of General Plan adoption, zoning ordinance amendments must be enacted to maintain consistency with the General Plan.

- ◆ Counties must collaborate with cities within their jurisdiction to develop flood emergency plans.

Note that the implications for the City of Vacaville from the two AB 5 requirements listed below is currently uncertain. The State has not clarified whether these requirements apply to communities like Vacaville that are not protected by the State Project Levees and are not within the Sacramento-San Joaquin Watershed.

- ◆ Cities and counties must revise the Safety Element of their General Plan in order to show 200-year flood maps and maps of levee protection zones.
- ◆ By 2015, for areas with a population of 10,000 people or greater, local governments cannot approve new developments unless the land under review has 200-year flood protection, the city has conditioned the project to provide an adequate level of protection, or efforts are in place to provide that level of protection.

b. AB 70

Beginning in 2008, local governments, including the City of Vacaville, could be held financially liable if they unreasonably approve new developments that are susceptible to flood damage.

c. AB 162

This bill applies statewide. The City of Vacaville and all other local governments are required to consider flood risks in the land use, conservation, and safety elements of their general plans.

- ◆ **Land Use Element.** This element must be reviewed annually and updated to identify areas subject to flooding, as defined by FEMA or the California Department of Water Resources (DWR).

- ◆ **Conservation Element.** This element must identify rivers, creeks, streams, flood corridors, riparian habitats, and land that may contain flood water for groundwater recharge and stormwater management.
- ◆ **Safety Element.** In addition to indentifying flood hazards and flood plain management, the safety element must set goals, policies, objectives, and implementation measures for flood protection of the community. Prior to the enactment of the safety element, the communities in the Central Valley must consult with CVFPB.

3. Solano County General Plan

The Health and Safety Element of the Solano County General Plan contains the following flood control policy that is applicable to the unincorporated portion of the Vacaville General Plan study area: “The County and Cities should implement those flood control and drainage improvement recommendations included in locally-formulated plans and should give due consideration to those recommendations made by the Corps and the California Reclamation Board, which do not conflict with locally adopted open space and conservation policies regarding natural water course preservation.”

4. Local Plans and Regulations

This section summarizes the City plans and regulations pertaining to stormwater in the Vacaville General Plan study area.

a. Vacaville General Plan

Stormwater is addressed in the Safety Element of the General Plan. The policies related to stormwater are listed in Table 1.

b. Floodplain Management Ordinance

The City has adopted a Floodplain Management Ordinance (Section 14.18 of the Municipal Code) that contains the following requirements for development within the city:

TABLE I **EXISTING GENERAL PLAN POLICIES RELATED TO STORMWATER**

Policy Number	Policy
Policy 9.2-G 1	Locate development outside mapped flood-prone areas unless mitigation of flood risk is assured.
Policy 9.2-G 2	Continue to develop a comprehensive system of drainage improvements to minimize flood hazard.
Policy 9.2-G 3	The additional runoff caused by development shall be mitigated.
Policy 9.2-I 1	Develop a financing plan and construct upstream detention flood basins.
Policy 9.2-I 2	Evaluate storm drainage needs for each project in the context of demand and capacity when the drainage area is fully developed. Continue to require Development Impact Fees for new development to construct planned regional drainage detention basins to accommodate increased flow. In the Alamo Creek watershed upstream of Peabody Road, which includes Alamo, Laguna and Encinosa creeks, require post-development 10-year and 100-year peak flows to be reduced to 90 percent of predevelopment levels. For the remainder of the study area, for development involving new connections to the creeks, peak flows shall not exceed predevelopment levels for a 10- and 100-year peak flow.
Policy 9.2-I 3	Continue to cooperate with the Solano County Water Agency on developing a comprehensive stormwater management program to accommodate additional development outside the existing urban area.
Policy 9.2-I 4	Assure through a Master Drainage Plan and development ordinances that proposed new development adequately provides for development of on-site and downstream off-site mitigation of potential flood hazards and drainage problems and require development fees to fund the required improvements.
Policy 9.2-I 5	Encourage the formation of flood control assessment districts or consider fees for those areas in which flooding and drainage problems exist, to mitigate flooding through physical improvements.

Source: Vacaville General Plan, 1990.

- ◆ Residential construction, either new or a substantial improvement, must have the lowest floor, including the basement, elevated to, or above, the base flood elevation, the computed elevation to which floodwater is anticipated to rise during a 100-year storm event. A 100-year storm is de-

defined as a storm that has a 1 percent chance of occurring in any given year. Upon the completion of the structure, the elevation of the lowest floor must be certified by a registered professional engineer or surveyor, and verified by the community building inspector to be properly elevated.

- ◆ Nonresidential construction, either new or a substantial improvement, must either be elevated to conform to the requirements described above for residential construction, or be flood-proofed below the base flood elevation. If the structure is flood-proofed, it must be watertight with the wall substantially impermeable to the passage of water, have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy, and be certified by a registered engineer or architect.
- ◆ All preliminary subdivision proposals must identify the special flood hazard area and the elevation of the base flood.
- ◆ All subdivision plans must provide the elevation of the proposed structure(s) and pad(s). If the site is filled above the base flood elevation, the lowest floor and pad elevations must be certified by a registered professional engineer or surveyor.
- ◆ All subdivision proposals must be consistent with the need to minimize flood damage.
- ◆ All subdivision proposals must have public utilities and facilities located and constructed to minimize flood damage.
- ◆ All subdivisions must provide adequate drainage to reduce exposure to flood hazards.
- ◆ Encroachments within designated floodways are prohibited, including fill, new construction, substantial improvement, and other new development, unless certification by a registered professional engineer is provided demonstrating that encroachments do not result in any increase in the base flood elevation during the occurrence of the base flood discharge.

c. Storm Drainage Master Plan

The City completed a draft Storm Drainage Master Plan (SDMP) in 1996, and updated it in 2001. The SDMP evaluates the existing storm drain systems to

identify existing deficiencies and required improvements. The focus of the SDMP is to identify improvements necessary to provide 100-year level flood protection to areas in Vacaville proposed for new development while maintaining, as a minimum, the existing level of protection in developed areas within the city that periodically flood. To this end, the SDMP outlined a staged capital improvements program to resolve existing storm drain deficiencies, and developed appropriate development impact fees for storm drainage facilities to ensure future development does not impact storm drainage for existing development within the city. The SDMP also provided a detailed inventory of existing storm drainage facilities.

d. Vacaville Standard Specifications and Standard Drawings

City of Vacaville *Standard Specifications and Standard Drawings* require that detention basins be designed to the following criteria:⁵

- ◆ New development shall mitigate the increase of the 10- and 100-year peak runoff from a project site over the predevelopment conditions (due to higher peak flows from the site, filling or building in overflow area, or altered flow paths).
- ◆ In the Alamo Creek Watershed upstream of Peabody Road, which includes Alamo Creek, Encinosa Creek, and Laguna Creek, the 10- and 100-year post-development peak flows shall be reduced to 90 percent of pre-development levels. Additionally, the 5-year storm shall be evaluated in the Alamo Creek Watershed upstream of Peabody Road to ensure that drainage facilities do not increase the peak 5-year flows downstream in the open channels or to receiving waters.
- ◆ Detention facilities must be designed for the 100-year, 24-hour storm event.

⁵ City of Vacaville, September 2006, *City of Vacaville Standard Specifications and Standard Drawings*.

C. Future System Improvements

In 2008, SCWA conducted the *Ulatis System Drainage Study* (USDS),⁶ which recommended a number of storm drainage improvements in the Vacaville General Plan study area. The recommended improvements will mitigate the routine flooding that has occurred in the Peabody/Tulare area along Alamo Creek and downstream of Interstate 80 along Ulatis Creek. The following four regional detention basins, which are shown in Figure 1, were recommended to reduce peak flows through the city:

- ◆ **Ulatis Creek Detention Basin.** This 540-acre-foot (AF)⁷ detention storage will be located on Ulatis Creek east of Bucktown Lane and north of Vaca Valley Road.
- ◆ **Alamo Creek Detention Basin.** This detention storage will be located on Alamo Creek east of Pleasants Valley Road. After the completion of the USDS, a detailed analysis determined that the maximum storage that can be achieved is about 625 AF.⁸
- ◆ **Pleasants Valley Detention Basins.** This 200-AF detention storage facility consists of three basins located on Encinosa Creek east of Pleasants Valley Road. Soon after the USDS was published, the Pleasants Valley Creek Detention Basins were constructed.
- ◆ **Laguna Creek Detention Basin.** This detention storage will be located on Laguna Creek between Cherry Glen Road and Pleasants Valley Road. After the completion of the USDS, a detailed analysis determined that the maximum storage will be 950 AF.⁹

⁶ West Yost Associates, May 2008, *Ulatis System Drainage Study*, prepared for the Solano County Water Agency.

⁷ An acre-foot is the volume of water that is 1 foot deep over 1 acre of area. 1 acre-foot is equal to 325,850 gallons, or the volume of two Olympic-sized swimming pools.

⁸ West Yost Associates, December 2009, *Draft Alamo Creek Regional Detention Basin Preliminary Design Report*, prepared for the City of Vacaville.

⁹ West Yost Associates, July 2008, *Draft Laguna Creek Regional Detention Basin Preliminary Design Report*, prepared for the City of Vacaville.

The USDS also recommended the following channel improvements to increase conveyance throughout the city and increase flood protection:

- ◆ **Ulatis Creek.** Modify the existing concrete in-channel drop structure downstream of Nut Tree Road, which restricts flow, and construct a 3-foot levee 2,000 feet downstream of Interstate 80.
- ◆ **Alamo Creek.** Install an additional 25-foot by 10-foot reinforced concrete box culvert at Peabody Road and remove sediment from the creek channel upstream and downstream of Peabody Road.

The City's Storm Drainage Master Plan identified additional channel improvements along Horse Creek to increase channel capacity and to reduce risk of flooding.¹⁰

As a result of recent frequent flooding, the City also identified additional storm drainage improvements at these locations:

- ◆ **Brown Street.** One or two detention basins totaling 16 AF will be located on Pine Tree Creek upstream of Browns Valley Parkway, identified on Figure 1 as Pine Tree Basin #1. Also, additional storm drains will be constructed to increase capacity of the storm drain system along Brown Street.¹¹
- ◆ **Florence Drive.** A 16-AF detention basin will be constructed at Florence Drive and designed to store runoff from agricultural lands during large storm events to reduce downstream flooding.¹²

¹⁰ West Yost Associates, April 2001, *Storm Drainage Master Plan Update*, prepared for the City of Vacaville.

¹¹ West Yost Associates, March 2010, *Brown Street Flood Control Study*, prepared for the City of Vacaville.

¹² West Yost Associates, October 2008, *Ulatis/Florence Detention Basin Preliminary Design Report*, prepared for the City of Vacaville.

In addition, there are several proposed detention basins shown in Figure 1 that are part of future development projects. These basins are in various phases of analysis and design and the timeframe for their completion is unknown at this time. The locations for these basins have been identified, but design parameters have not been set. Once the basins are built, the City will maintain and operate them.

D. Implications for the General Plan Update

Based on the information contained in this memorandum, the General Plan Update process should consider the following:

- ◆ Historically, the city has experienced flooding. The City is currently implementing measures to reduce flooding through construction of large regional upstream detention basins. The General Plan should consider whether these measures are sufficient to reduce flooding or, if additional measures are needed, how they can best be encouraged in the updated General Plan.
- ◆ The City is subject to several recent State laws pertaining to flood management in the Central Valley. Within two years following completion of the Central Valley Flood Protection Plan (CVFPP), which is scheduled for 2012, the City will be required to amend its General Plan. To minimize the level of change required for this future amendment, the General Plan Update should include as much of the required background information and policy language as feasible given the current state of the CVFPP.
- ◆ Pursuant to AB 162, the Land Use, Conservation, and Safety Elements must: identify areas subject to flooding; identify areas that may contain flood water for groundwater recharge and stormwater management; and include goals, policies, objectives, and implementation measures for flood protection.
- ◆ Aspects of AB 5 may have significant implications for future development within the city; however, the State has not clearly defined if com-

munities like Vacaville will have to meet all of the legislative requirements. Specifically, the State has not clarified whether communities like Vacaville that are not protected by the State Project Levees and that are not within the Sacramento-San Joaquin Watershed will be required to show 200-year flood maps and maps of levee protection zones in the General Plan Safety Element, or be prohibited from approving new development unless the land under review has 200-year flood protection.

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GENERAL PLAN UPDATE
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